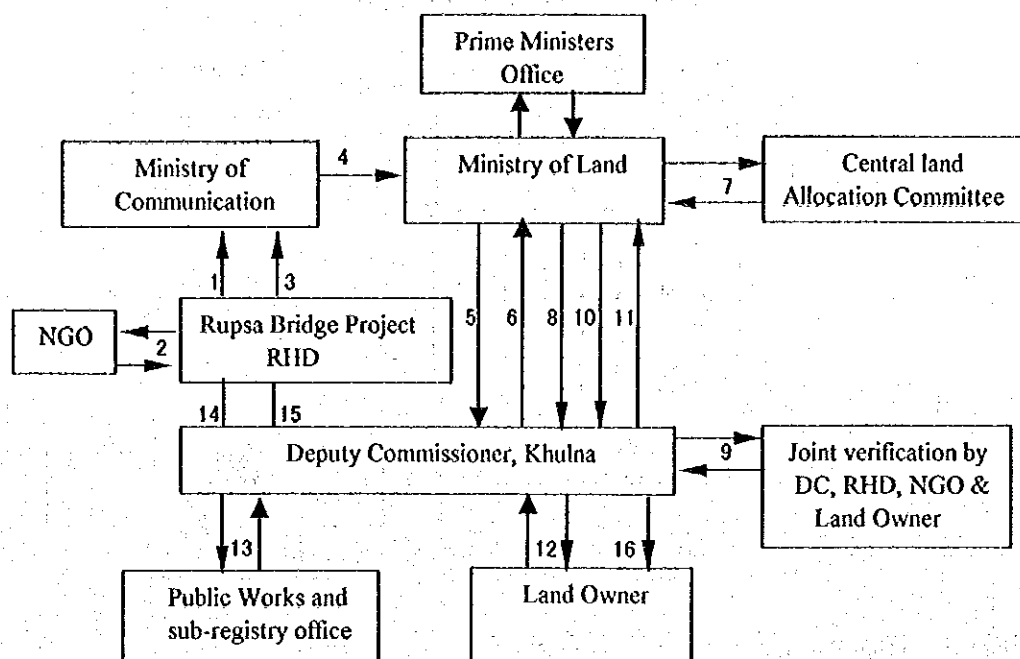


**APPENDIX TO CHAPTER 8**  
**Resettlement Action Plan and**  
**Landscape Conservation Plan**

## LIST OF APPENDIX TO CHAPTER 8

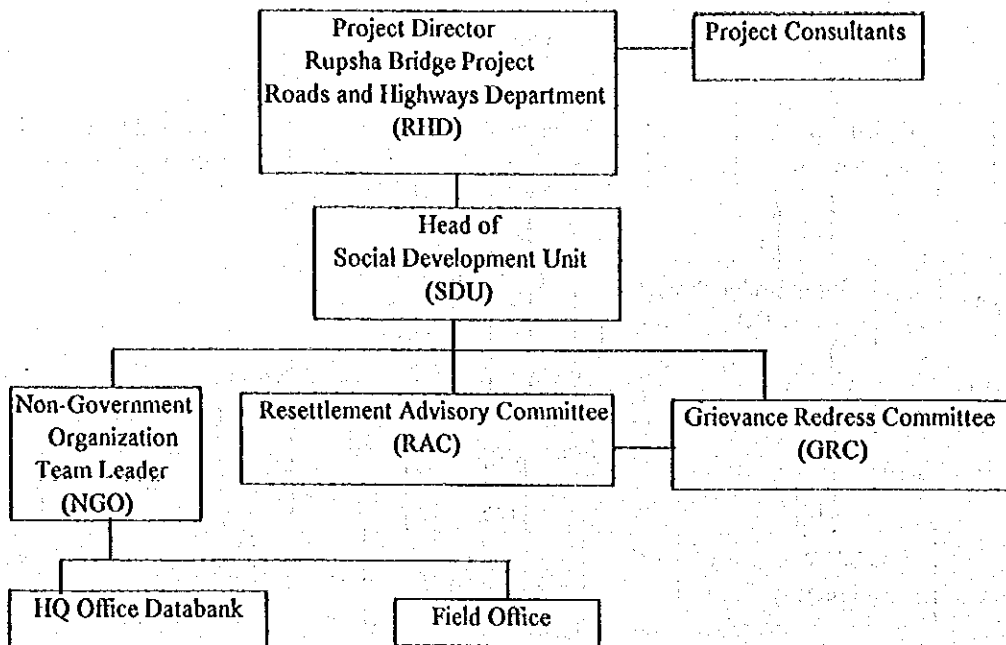
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Land Acquisition Procedure
1. Roads and Highways Department (RHD) provide general information to the Ministry of Communication about the project.
2. RHD involves NGO to prepare detail land acquisition plan and then supply it to RHD.
3. RHD formally submit land acquisition application to Ministry of Communication
4. Ministry of Communication forwards the land acquisition application to the Ministry of Land.
5. The Ministry of land requests the Deputy Commissioner (DC) concerned for the processing of land acquisition and to examine the application.
6. The DC reports the examination result to the Ministry of Land.
7. Ministry of Land takes the matter to the Central Land Allocation Committee (CLAC) and receive approval from CLAC.
8. After receiving approval from CLAC, Ministry of Land requests DC to proceed with the land acquisition.
9. Then DC will make joint verification along with RHD, NGO and Land Owner.
10. The DC complies the land owners objection and together with his opinion, reports to the Ministry of Land and formally announces the proposed land acquisition to the public in the Bangladesh Gazette.
11. The Ministry of Land examine the report from DC and makes the final Government decision on the proposed land acquisition.
12. After the approval of the Ministry, the DC informs the land owners directly of the land acquisition order. The land owner then make a declaration to the DC of how much of their property is affected by the land acquisition order within 15 days of receiving the above notification.
13. The DC examines the declaration of the land owners and the land prices in the area in the previous 12 months and then decides on the compensation, to be paid to each land owner.
14. The DC claims the land acquisition expenses from the RHD.
15. The RHD remits the land acquisition expenses to the DC.
16. The DC pays the compensation to each land owner and the ownership of the acquired land is transferred to the RHD with in 7 days of the payment.

Fig. 8.2.1 Land Acquisition Procedure Organization Chart

### Resettlement Organization Chart



### Resettlement Implementation Flow Chart

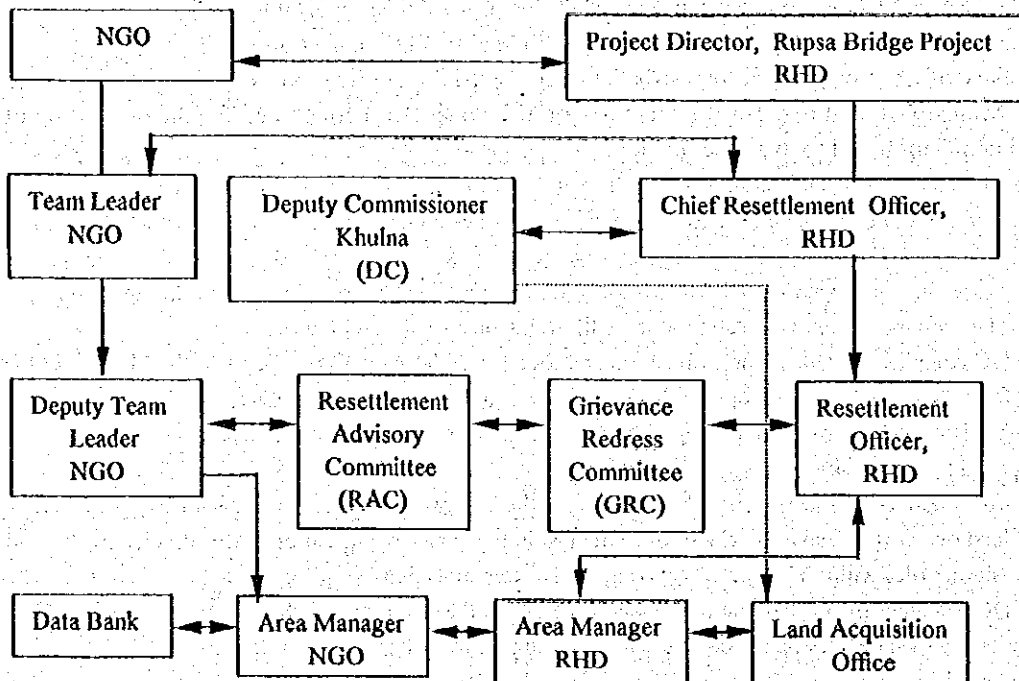


Fig. 8.2.2 Resettlement Implementation Organization Chart

Table8.2.5 Detail Cost Estimation for Resettlement: Compensation and Rehabilitation cost of the PAPs on Route-1.

Compensation Items	Quantity/ No. (in Sqm.)	Value (per sqm. In	Total Value
<b>1. Land</b>			
a. Agriculture	354931	375	133,100,000
b. Residential	11,620	430	4,997,000
c. Commercial	2,423	475	1,151,000
d. Industrial	2,150	475	1,021,000
e. Pond	6,232	375	2,337,000
f. Shrimp Gher	15,040	400	6,016,000
g. Low Land	6,512	350	2,279,000
<b>I. Sub-Total</b>	<b>398,908</b>		<b>150,901,000</b>
<b>2. Structure</b>			
a. Dwelling houses			
i) Pucca	193.6	5790	1,121,000
ii) Semi pucca	139.9	2802	392,000
iii) Kutcha	1194.7	725	852,000
b. Kitchen	192.2	475	85,000
c. Latrine	41.2	2457	101,000
d. Cowshed	52.4	706	37,000
e. Commercial	656.4	1590	1,044,000
f. Others	1092.9	945	1,033,000
<b>II. Sub-Total</b>	<b>3530.3</b>		<b>4,665,000</b>
<b>3. Trees</b>			
a. Timber	1452	650	443,000
b. Fruit	2668	350	934,000
c. Fire wood	1714	175	128,000
<b>III. Sub-Total</b>	<b>5834</b>		<b>2,005,000</b>
<b>Total (I+II+III)</b>			<b>157,571,000</b>

Table8.2.6 Detail Cost Estimation for Resettlement: Compensation and Rehabilitation cost of the PAPs on Route-1.

Compensation Item	Quantity/No.	Amount in Tk.
4. Relocation Grant @ 10% of the structure value assessed by the DC office		466,500
5. House Construction Grant @ 10% of the struc. Value assessed by the DC office.		466,500
6. Relocation Grant for rental and others households @ Tk. 2000 (Lump sum)	30	60,000
7. Additional cash grant to match market value for purchase of homestead land (subject to purchase of replacement land, @ 130/- per sqm.	11620	1,510,000
8. Stamp duty for land registration (22% of transaction price)		1,431,000
9. Loss of Income of Households @ Tk. 70/per day X 90 days)	53	334,000
10. Additional Assistance for Female headed households (considering gender issues) @ Tk. 2500 per family	4	12,500
11. Loss of standing crops (considering paddy) @ 0.6 K.g. per Sqm. X Tk. 10/per Kg.	354,931 (Sqm.)	2,130,000
12. Administrative cost for RHD resettlement unit (Lump sum)		1,000,000
13. NGO contract for Resettlement implementation (lump sum)		3,500,000
14. Contingency (lump sum)		5,000,000
<b>Sub-Total (3 - 14)</b>		<b>15,908,000</b>

Table 8.2.7 Number of Affected Structure and floor area by section

Name of Section	Name of Structure													
	Dwelling		Kitchen		Latrine		Cowshed		Industrial		Commercial		Others	
	No	Area (in Sqm)	No	Area (in Sqm)	No	Area (in Sqm)	No	Area (in Sqm)	No	Area (in Sqm)	No	Area (in Sqm)	No	Area (in Sqm)
Section-1. Satkhira road to Hatia river	9	186.7	3	15.3	8	8	-	-	3	987.1	-	-	-	1,000.0
Section-2. Hatia River to Khatra khal	-	-	-	-	-	-	-	-	-	-	1	32.2	-	-
Section-3. Khatra Khal to west bank of Rupsa River	49	1,277.6	22	158.9	24	32.2	3	52.4	-	-	-	-	-	92.9
Section-4 West bank of Rupsa to Jabusha Road	2	43.9	1	5	1	1	-	-	-	-	2	92.3	-	-
Section-5. Jabusha Road to Khulna Mongla Road	-	-	-	-	-	-	-	-	-	-	7	144.8	-	-
Total	60	1,508.2	26	179.2	33	41.2	3	52.4	3	387.1	10	269.3	0	1,092.9

Table 8.2.8 Number of Affected Trees under different section

Name of Section	Timber	Fruit	Fuel	Total
Section-1. Satkhira road to Hatia river	47	44	81	172
Section-2. Hatia River to Khatra khal	4	6	12	22
Section-3. Khatra Khal to west bank of Rupsa River	1,317	2,392	1,402	5,111
Section-4 West bank of Rupsa to Jabusha Road	62	208	186	456
Section-5. Jabusha Road to Khulna Mongla Road	22	18	33	73
Total	1,452	2,668	1,714	5,834

Table 8.2.9 Number of Household with Population, Commercial Industrial Establishment under Route-1 by Section

Name of Section	No. of Households	No. of Population	Shrimp Gher Establishment	Commercial establishment	Industrial establishment
Section-1. Satkhira road to Hatia river	9	39	-	-	1
Section-2. Hatia River to Khatra khal	-	-	1	-	-
Section-3. Khatra Khal to west bank of Rupsa River	43	198	-	-	-
Section-4 West bank of Rupsa to Jabusha Road	1	5	1	-	-
Section-5. Jabusha Road to Khulna Mongla Road	-	-	1	7	-
Total	53	242	3	7	1

Table 8.2.10 Land Area under Affected different uses by section

Name of Section	Land affected (in Sqm)							Total
	Agriculture	Residential	Commercial	Industrial	Pond	Shrimp Gher	Low land	
Section-1. Satkhira road to Hatia river	61,155	2,250	-	2,150	900	-	1,720	68,175
Section-2. Hatia River to Khatra khal	121,568	-	-	-	275	75	1,022	122,940
Section-3. Khatra Khal to west bank of Rupsa River	45,516	9,185	-	-	1,672	-	560	56,933
Section-4 West bank of Rupsa to Jabusha Road	81,922	185	-	-	3,385	7,200	1,060	93,752
Section-5. Jabusha Road to Khulna Mongla Road	44,770	-	2,423	-	-	7,765	2,150	57,108
Total	354,931	11,620	2,423	2,150	6,232	15,040	6,512	398,908

Table 8.2.11 Occupational Pattern of the Affected Population

Type of Occupation	Section-1	Section-2	Section-3	Section-4	Section-5	Total
Service	1	-	14	1	-	16
Business	2	-	21	-	-	23
Agriculture	-	-	1	-	-	1
Day Labourer	5	-	15	1	1	21
Transport Drivers	2	-	2	-	-	4
Other profession	1	-	4	-	-	5
House wife/ household	8	-	33	1	-	42
Student	6	-	54	-	-	60
Unemployed	3	-	8	-	-	11
Children	8	-	21	2	-	31
Retired old aged etc.	3	-	25	-	-	28
Total	39	-	198	5	-	242

Table 8.2.12 Residency Status of the Affected Households

Residency Status	Section-1	Section-2	Section-3	Section-4	Section-5	Total
Own	3	-	20	-	-	23
Rented	-	-	17	-	-	17
Legally occupied sheltered	6	-	6	1	-	13
Total	9	-	43	1	-	53

Table 8.2.13 Section wise preferred mode of compensation by the affected households

Mode of compensation	Section-1	Section-2	Section-3	Section-4	Section-5	Total
Cash	8	-	36	1	-	45
Land for substitute land	1	-	2	-	-	3
House plot	-	-	3	-	-	3
House in resettlement site	-	-	2	-	-	2
Total	9	-	43	1	-	53

Table 8.2.14 Section wise resettlement choice of the PAPs.

Preferences	Section-1	Section-2	Section-3	Section-4	Section-5	Total
Same Village	5	-	32	-	-	37
Nearby village	2	-	-	-	-	2
In Khulna Town	1	-	10	1	-	12
Thana Town	1	-	-	-	-	1
Outside Khulna District	-	-	1	-	-	1
Not known yet	-	-	-	-	-	-
Total	9	-	43	1	-	53

Table 8.2.15 Concerns about land acquisition and resettlement by section

Concerns	Section-1	Section-2	Section-3	Section-4	Section-5	Total
Fair compensation	4	-	18	-	-	22
Replacement land	7	-	-	-	-	7
Timely compensation	12	-	5	1	-	18
Assistance during relocation	6	-	-	-	-	6
Total	29	-	23	1	-	53

Table 8.2.16 Occupational preference in post Resettlement period by section

Preferred occupation	Section-1	Section-2	Section-3	Section-4	Section-5	Total
Same as before	6	-	35	-	-	41
Employment in RBP	1	-	3	-	-	4
Job in Town	-	-	2	-	-	2
New business	1	-	2	1	-	4
Do not knows	1	-	1	-	-	2
<b>Total</b>	<b>9</b>	<b>-</b>	<b>43</b>	<b>1</b>	<b>-</b>	<b>53</b>

Table 8.2.17 PAPs response to Rupsa Bridge Project by Section

Opinion	Section-1	Section-2	Section-3	Section-4	Section-5	Total
Improve economic condition of people	5	-	35	1	-	41
Employment during construction	1	-	4	-	-	5
Improve communication net work	3	-	4	-	-	7
<b>Total</b>	<b>9</b>	<b>-</b>	<b>43</b>	<b>1</b>	<b>-</b>	<b>53</b>

Table 8.2.18 Resettlement , Compensation and Rehabilitation Policy

No.	Type of loss or disturbance	Nature of Entitlement(s)	Rate / amount	Remarks
1	Loss of Agr. land	• Cash Compensation as per law (CCL)	• CCL-rate of Agri. Land	• CCL-DC
2	Loss of Homestead land	• CCL • Stamp Duty  • Maximum Allowable Replacement value (MARV)	• CCL-rate of Homestead land • Actual amount incurred during land transaction • Difference between MARV and compensation received from DC	• CCL-DC • Affected person is to buy land  • MARV is Tk. 5,22000 per acre • MARV is Conditional • Affected person should buy land to get MARV
3	Loss of living structures and other physical structures.	a) CCL b) Per Transfer Grant (TG)  c) Per House Construction Grant (HCG)	a) CCL-rate of structure b) @ 10% of the structure value assessed by the DC  c) @ 10% of the structure value assessed by the DC	• CCL-DC • All the affected household will get TG and only the owner of the structure will get HCG • EP is allowed to take the salvageable free of cost.
4	Loss of economically valuable perennial	• CCL of tree • EP is allowed to cut and take the tree	• Timber tree Tk. 650 • Fruit tree Tk. 350 • Fire wood tree Tk. 150	• CCL-DC
5	Loss of tenant/contract for farming	• One Time Cash Grant (OTCG)	• Tk. 5000	• OTCG-RU
6	Loss of wage income	• OTCG	• Tk.6300 per family	• OTCG-RU
7	Loss of commercial plots	a) CCL	a) Rate depends on the type of loss	• CCL-DC
8	Loss of structures used for commercial or industrial activity	a) CCL b) Dismantling & removal costs (DRG) c) Reconstruction grant (RG)	a) CCL rate of structure b) @ 10% of the structure value assessed by the DC c) @ 10% of the structure value assessed by the DC	• CCL-DC • DRG-RU • RG-RU
9	Displacement from rented / occupied dwelling or commercial premises	• One Time Moving Assistance (OTMA)	d) Tk. 2000	• OTMA-DC
10	Loss of standing crop	• CCL-If applicable	• Affected Persons will be given 4 months notice	• CCL-DC



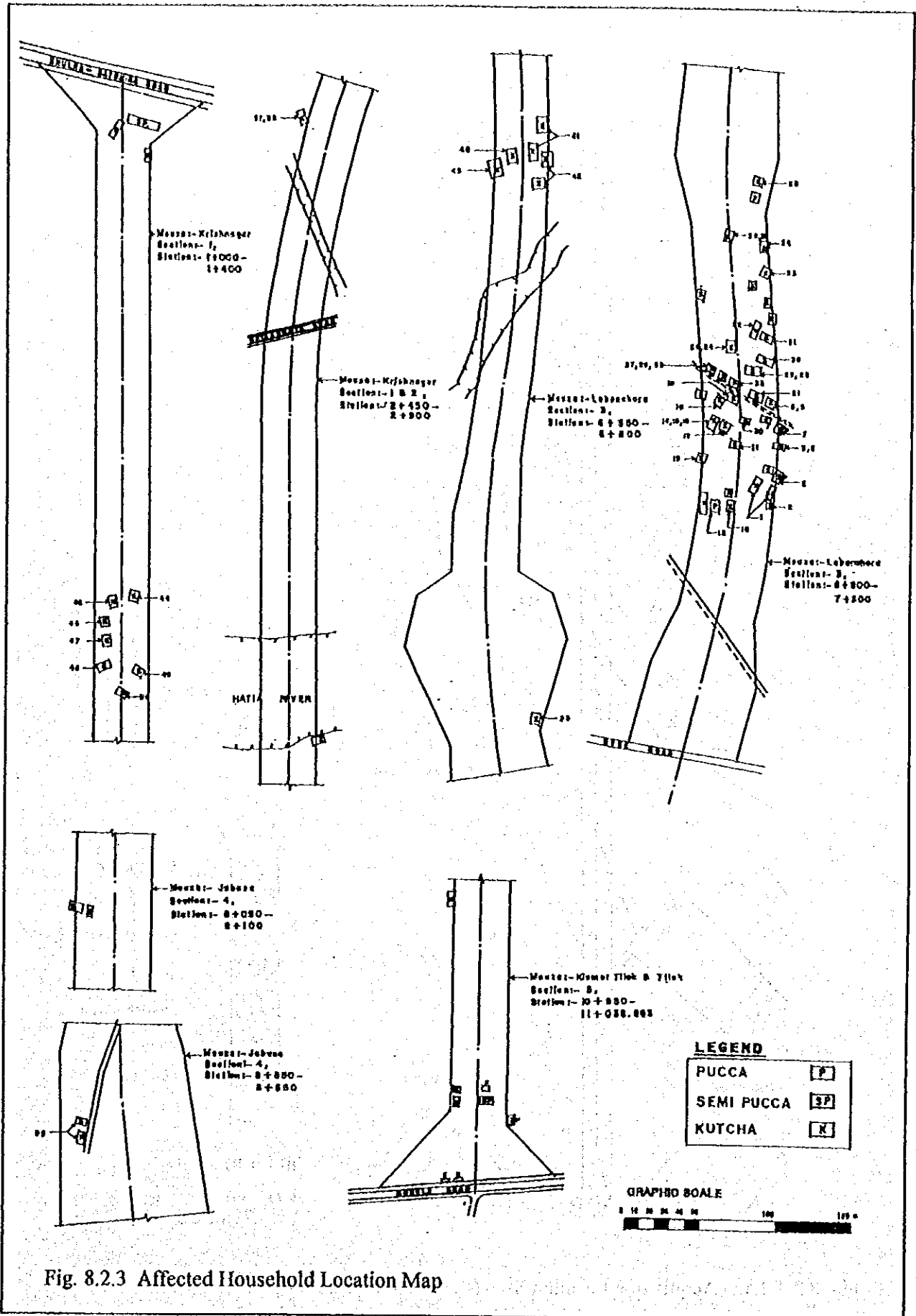


Fig. 8.2.3 Affected Household Location Map

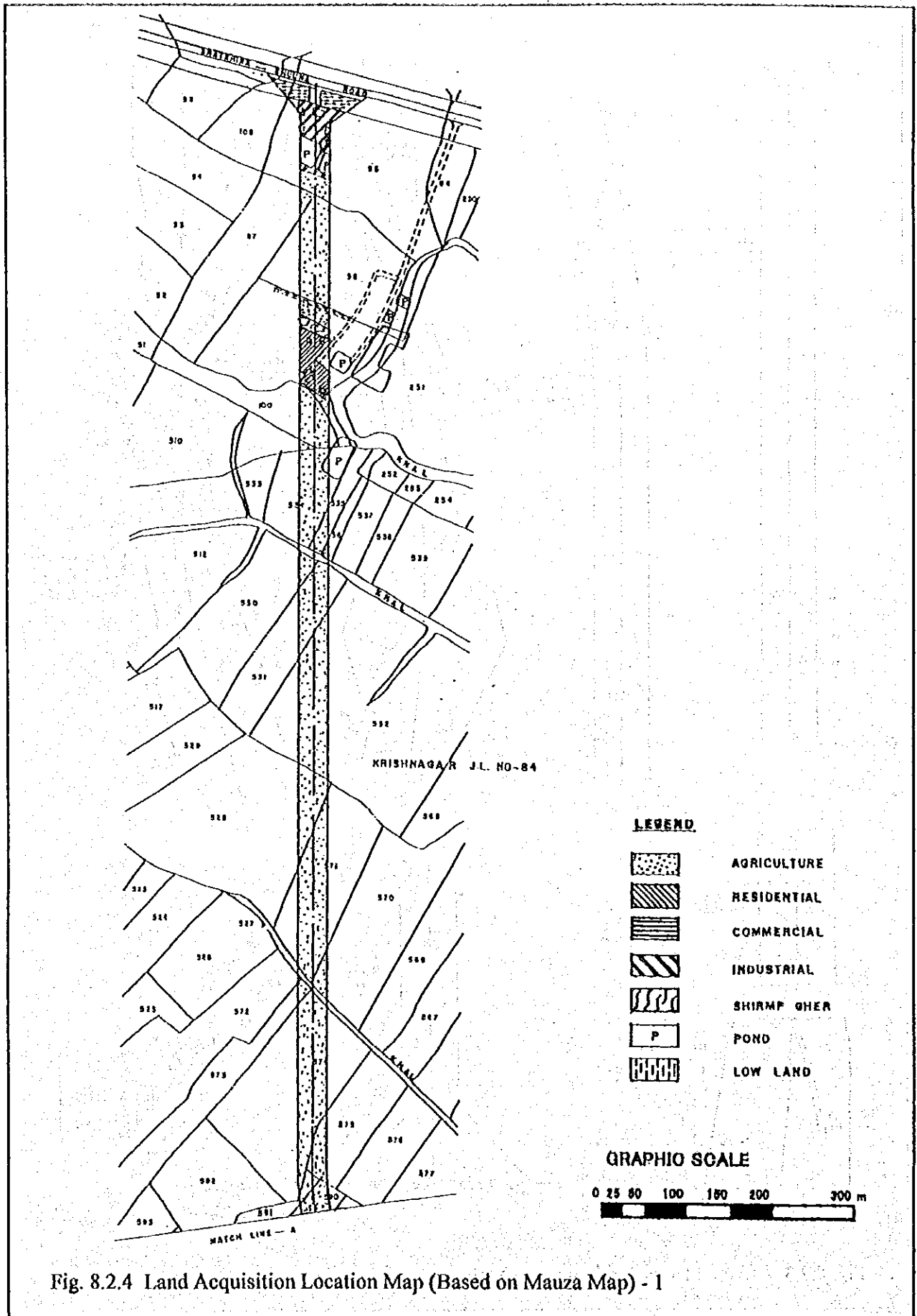


Fig. 8.2.4 Land Acquisition Location Map (Based on Mauza Map) - 1

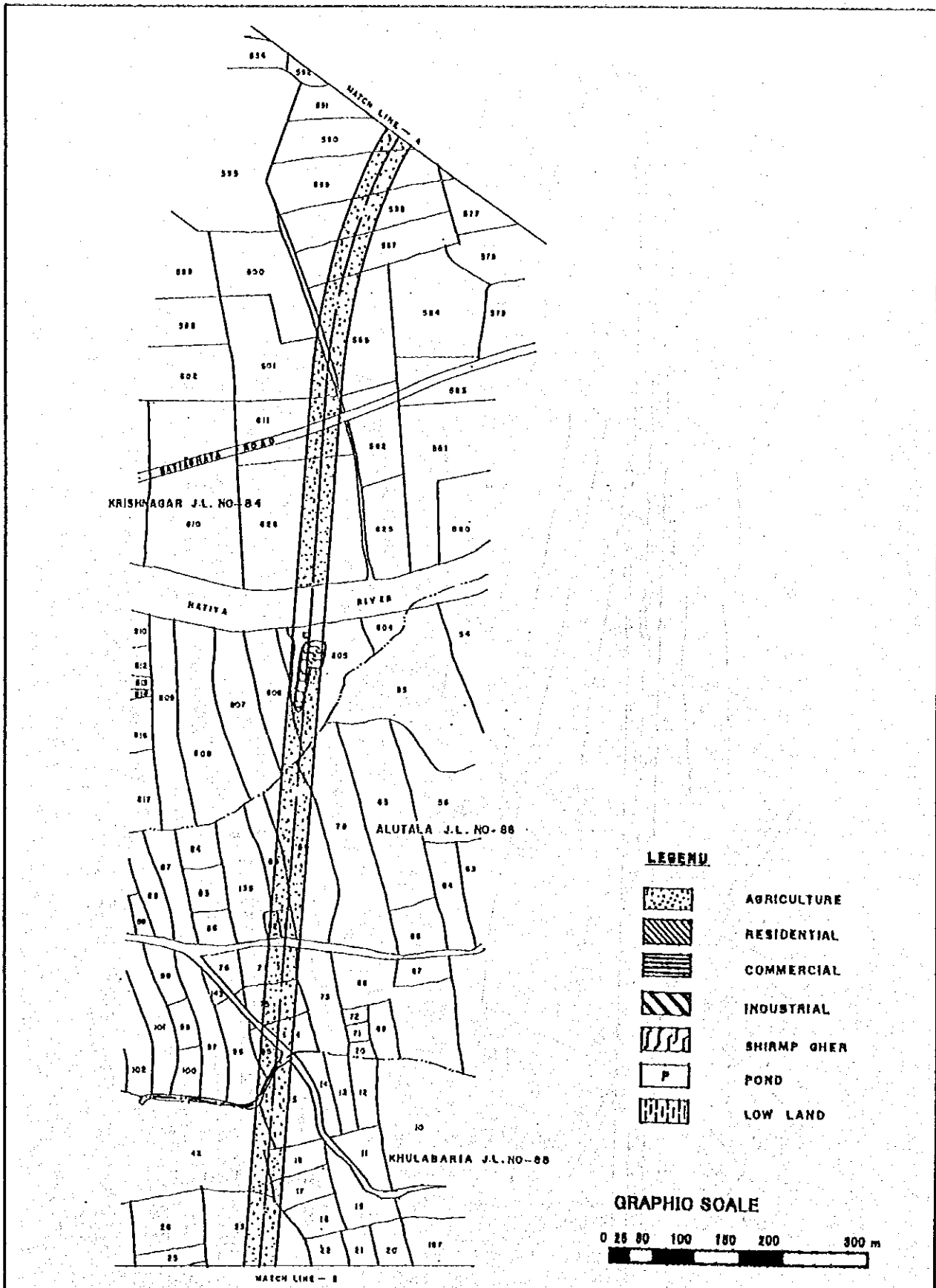
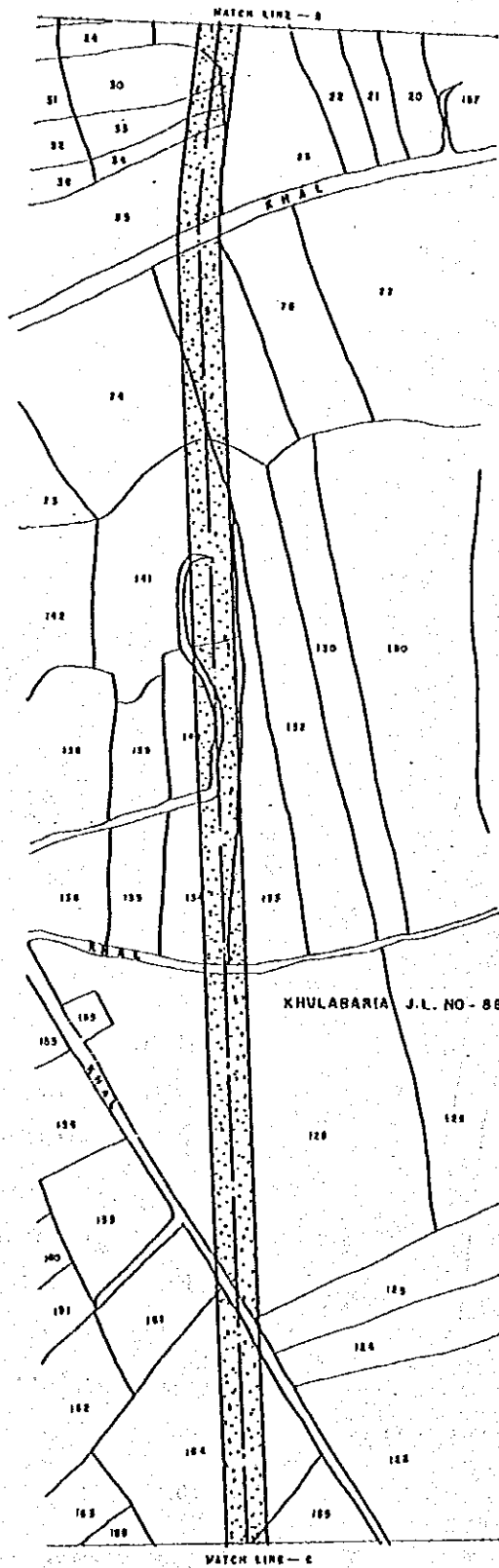









Fig. 8.2.5 Land Acquisition Location Map (Based on Mauza Map) - 2



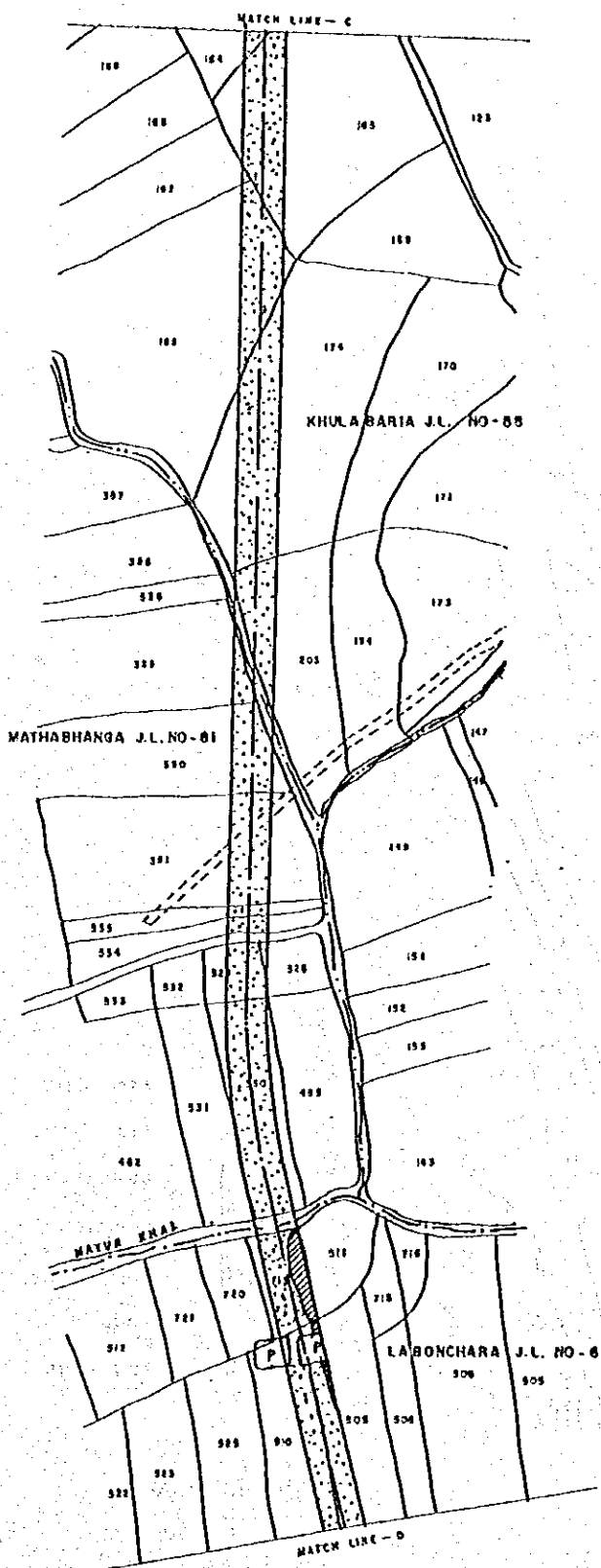
**LEGEND**

-  AGRICULTURE
-  RESIDENTIAL
-  COMMERCIAL
-  INDUSTRIAL
-  SHRIMP GHER
-  POND
-  LOW LAND








**GRAPHIC SCALE**



Fig. 8.2.6 Land Acquisition Location Map (Based on Mauza Map) - 3



**LEGEND**

-  AGRICULTURE
-  RESIDENTIAL
-  COMMERCIAL
-  INDUSTRIAL
-  SHRIMP GHER
-  POND
-  LOW LAND

**GRAPHIC SCALE**

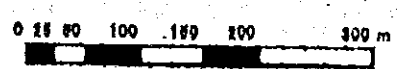


Fig. 8.2.7 Land Acquisition Location Map (Based on Mauza Map) - 4

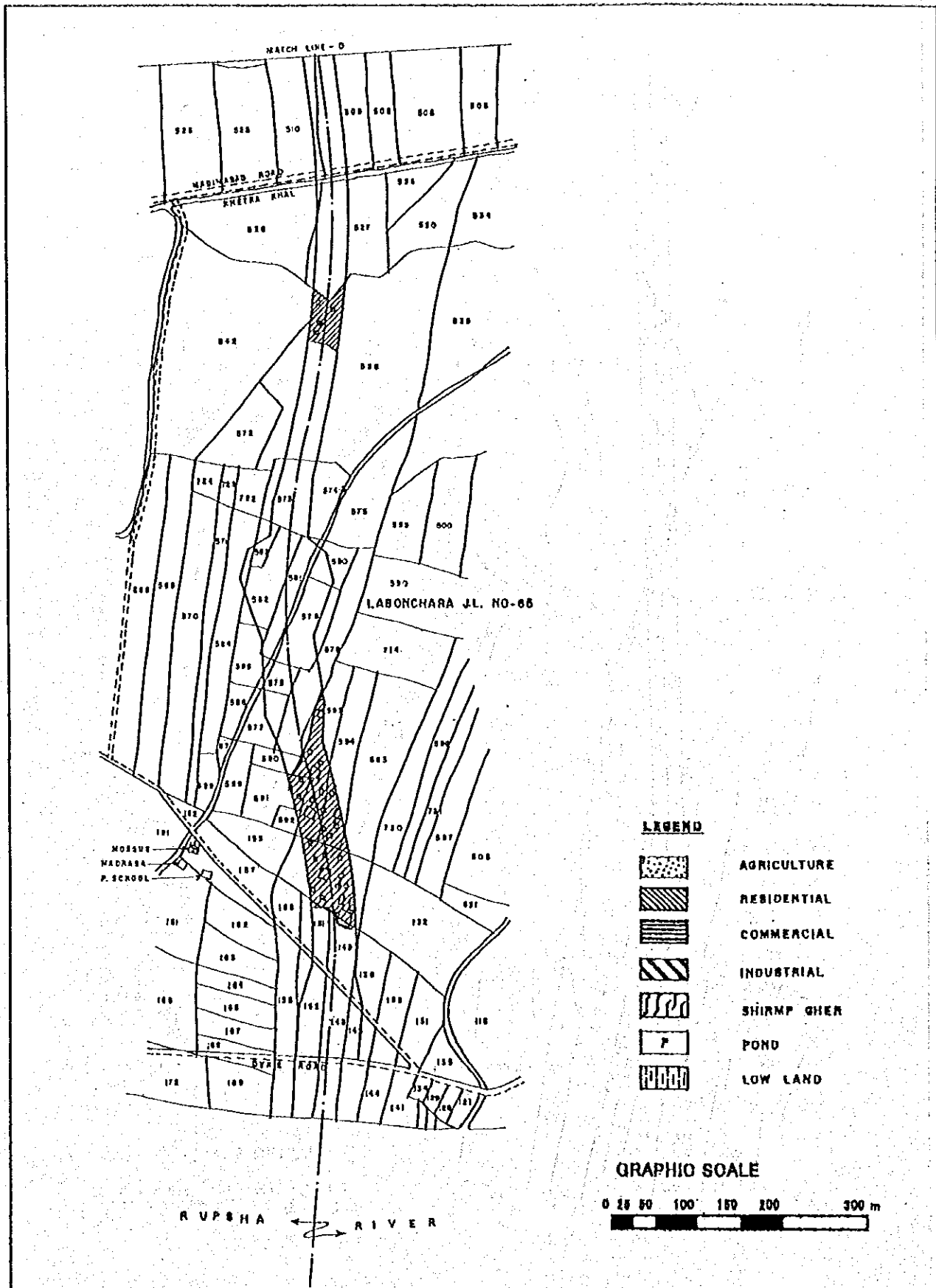


Fig. 8.2.8 Land Acquisition Location Map (Based on Mauza Map) - 5

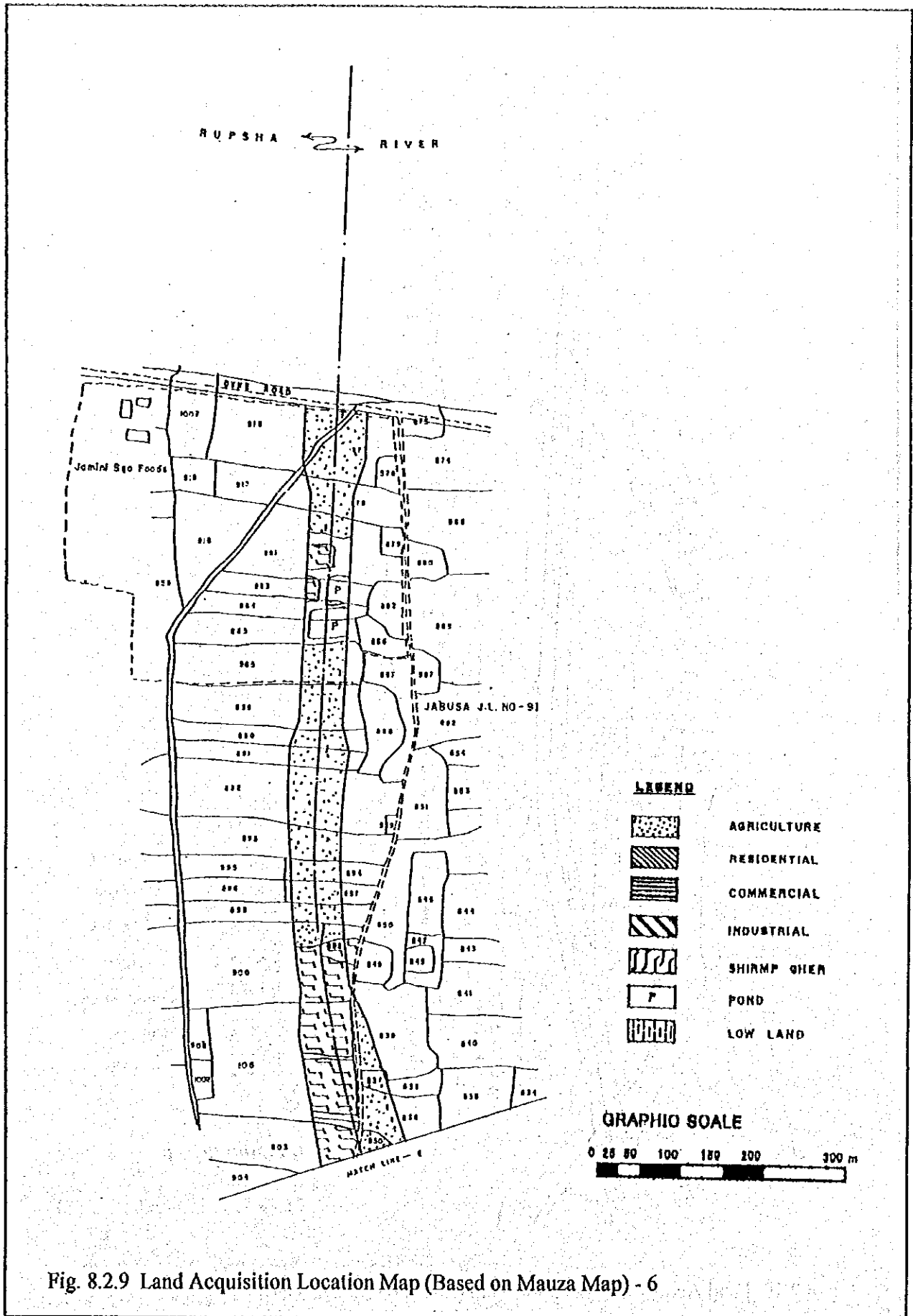


Fig. 8.2.9 Land Acquisition Location Map (Based on Mauza Map) - 6

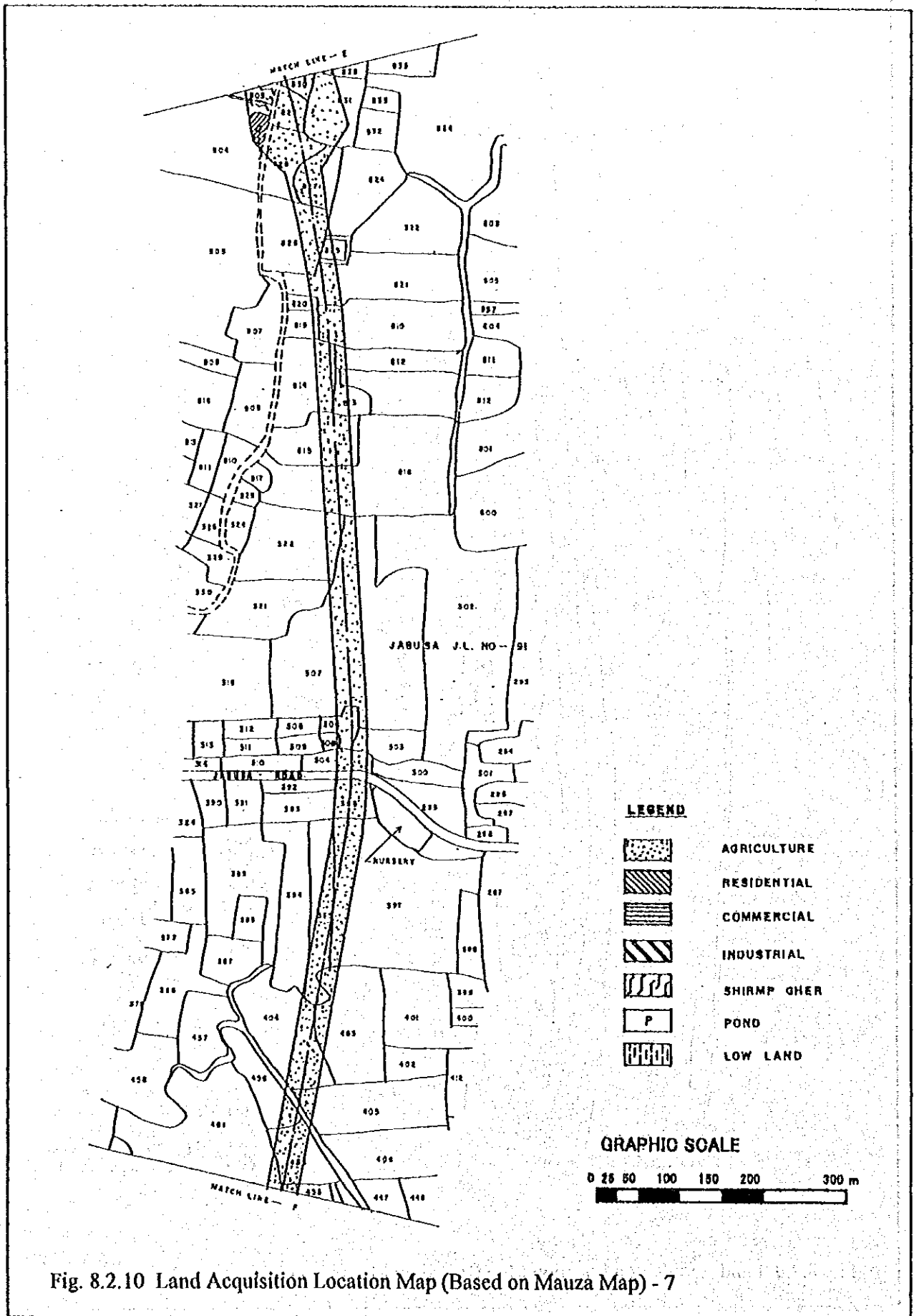


Fig. 8.2.10 Land Acquisition Location Map (Based on Mauza Map) - 7



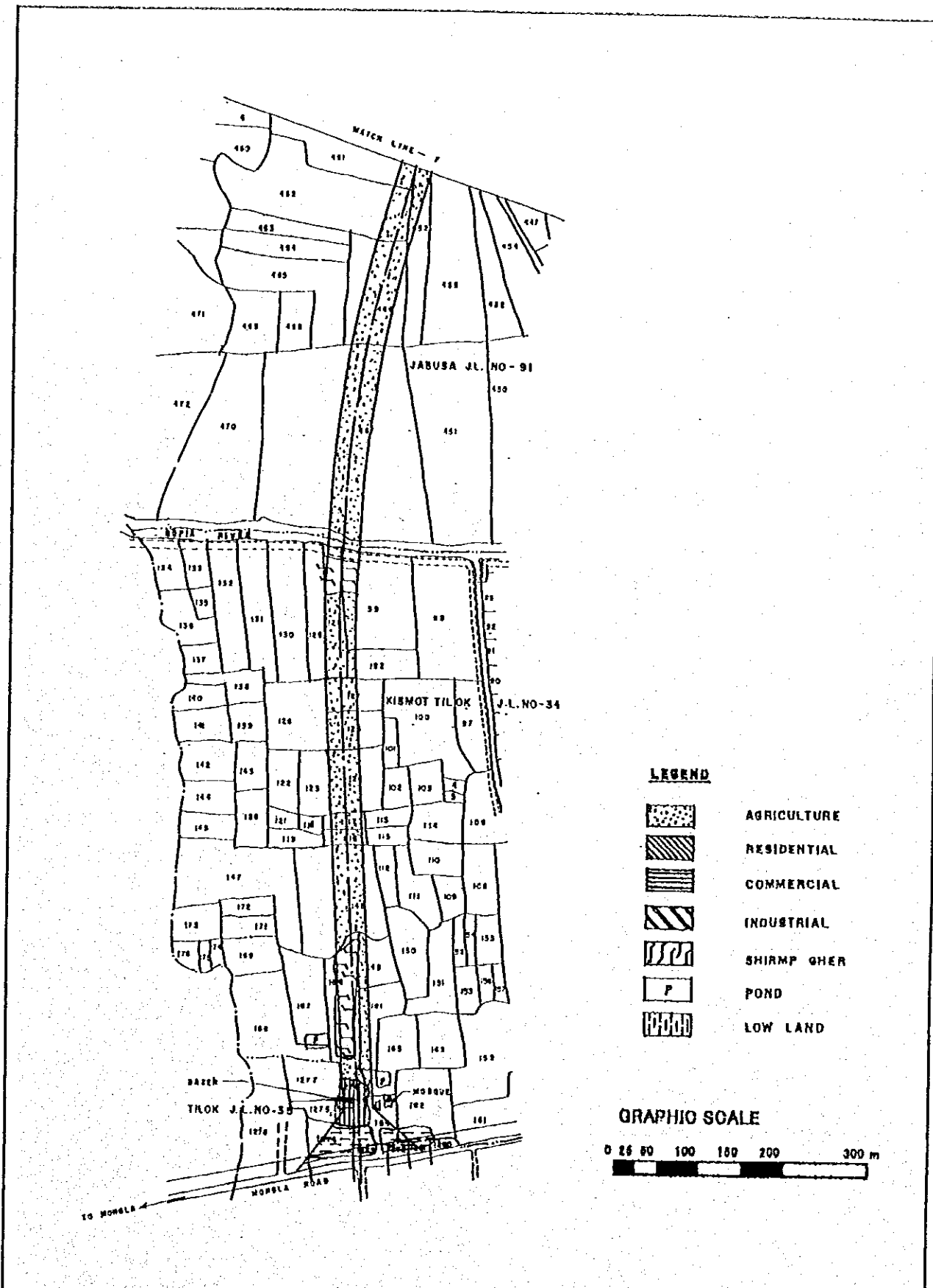


Fig. 8.2.11 Land Acquisition Location Map (Based on Mauza Map) - 8

## **APPENDIX TO CHAPTER 9**

### **Economic and Financial Analysis**

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RUPSA BRIDGE ON KHULNA-MONGLA HIGHWAY  
 CASHFLOW ANALYSIS  
 BASE CASE: ASSUMING 15% OF TOTAL TTC  
 RECOMMENDED ALTERNATIVE

Tk.in million

Serial	Year	Capital Cost	Maint. Cost	Total Cost	VOC Benefit	TTC Benefit	Total Benefit	Net Benefit
1	2000	137.0		137.0	0.0	0	0.0	(137.0)
2	2001	454.0		454.0	0.0	0	0.0	(454.0)
3	2002	986.1		986.1	0.0	0	0.0	(986.1)
4	2003	1,144.6		1,144.6	0.0	0	0.0	(1,144.6)
5	2004	827.6		827.6	0.0	0.0	0.0	(827.6)
6	2005		7.7	7.7	752.3	368.0	1120.3	1,112.6
7	2006		7.7	7.7	797.9	388.3	1186.2	1,178.5
8	2007		7.7	7.7	846.3	409.6	1256.0	1,248.3
9	2008		7.7	7.7	897.7	432.2	1329.9	1,322.2
10	2009		7.7	7.7	952.3	455.9	1408.2	1,400.5
11	2010		7.7	7.7	1010.2	481.0	1491.2	1,483.5
12	2011		20.9	20.9	1070.8	509.9	1580.6	1,559.7
13	2012		7.7	7.7	1135.0	540.4	1675.5	1,667.8
14	2013		7.7	7.7	1203.1	572.9	1776.0	1,768.3
15	2014		7.7	7.7	1275.3	607.2	1882.5	1,874.8
16	2015		7.7	7.7	1351.8	643.7	1995.5	1,987.8
17	2016		7.7	7.7	1351.8	643.7	1995.5	1,987.8
18	2017		7.7	7.7	1351.8	643.7	1995.5	1,987.8
19	2018		20.9	20.9	1351.8	643.7	1995.5	1,974.6
20	2019		7.7	7.7	1351.8	643.7	1995.5	1,987.8
21	2020		7.7	7.7	1351.8	643.7	1995.5	1,987.8
NPV@12%				Tk.2,418.54			Tk.5,968.98	

EIRR= 26.2%

NPV= Tk.3,550.44

B/C= 2.47

RUPSA BRIDGE ON KHULNA-MONGLA HIGHWAY  
 CASHFLOW ANALYSIS  
 TEST-1 VOC BENEFIT ONLY  
 RECOMMENDED ALTERNATIVE

Tk.in million

Serial	Year	Capital Cost	Maint. Cost	Total Cost	VOC Benefit	TTC Benefit	Total Benefit	Net Benefit
1	2000	137.0		137.0				(137.0)
2	2001	454.0		454.0				(454.0)
3	2002	986.1		986.1				(986.1)
4	2003	1,144.6		1,144.6				(1,144.6)
5	2004	827.6		827.6				(827.6)
6	2005		7.7	7.7	752.3		752.3	744.6
7	2006		7.7	7.7	797.9		797.9	790.2
8	2007		7.7	7.7	846.3		846.3	838.6
9	2008		7.7	7.7	897.7		897.7	890.0
10	2009		7.7	7.7	952.3		952.3	944.6
11	2010		7.7	7.7	1010.2		1010.2	1,002.5
12	2011		20.9	20.9	1070.8		1070.8	1,049.9
13	2012		7.7	7.7	1135.0		1135.0	1,127.3
14	2013		7.7	7.7	1203.1		1203.1	1,195.4
15	2014		7.7	7.7	1275.3		1275.3	1,267.6
16	2015		7.7	7.7	1351.8		1351.8	1,344.1
17	2016		7.7	7.7	1351.8		1351.8	1,344.1
18	2017		7.7	7.7	1351.8		1351.8	1,344.1
19	2018		20.9	20.9	1351.8		1351.8	1,330.9
20	2019		7.7	7.7	1351.8		1351.8	1,344.1
21	2020		7.7	7.7	1351.8		1351.8	1,344.1

EIRR= 19.4%

RUPSA BRIDGE ON KHULNA-MONGLA HIGHWAY  
 CASHFLOW ANALYSIS  
 TEST-2 COSTS INCREASED BY 10%  
 RECOMMENDED ALTERNATIVE

Tk.in million

Serial	Year	Capital Cost	Maint. Cost	Total Cost	VOC Benefit	TTC Benefit	Total Benefit	Net Benefit
1	2000	150.8		150.8				(150.8)
2	2001	499.4		499.4				(499.4)
3	2002	1,084.7		1,084.7				(1,084.7)
4	2003	1,259.0		1,259.0				(1,259.0)
5	2004	910.4		910.4				(910.4)
6	2005		8.5	8.5	752.3	368.0	1120.3	1,111.9
7	2006		8.5	8.5	797.9	388.3	1186.2	1,177.7
8	2007		8.5	8.5	846.3	409.6	1256.0	1,247.5
9	2008		8.5	8.5	897.7	432.2	1329.9	1,321.4
10	2009		8.5	8.5	952.3	455.9	1408.2	1,399.7
11	2010		8.5	8.5	1010.2	481.0	1491.2	1,482.7
12	2011		23.0	23.0	1070.8	509.9	1580.6	1,557.6
13	2012		8.5	8.5	1135.0	540.4	1675.5	1,667.0
14	2013		8.5	8.5	1203.1	572.9	1776.0	1,767.5
15	2014		8.5	8.5	1275.3	607.2	1882.5	1,874.1
16	2015		8.5	8.5	1351.8	643.7	1995.5	1,987.0
17	2016		8.5	8.5	1351.8	643.7	1995.5	1,987.0
18	2017		8.5	8.5	1351.8	643.7	1995.5	1,987.0
19	2018		23.0	23.0	1351.8	643.7	1995.5	1,972.5
20	2019		8.5	8.5	1351.8	643.7	1995.5	1,987.0
21	2020		8.5	8.5	1351.8	643.7	1995.5	1,987.0

EIRR= 24.4%

RUPSA BRIDGE ON KHULNA-MONGLA HIGHWAY  
 CASHFLOW ANALYSIS  
 TEST-3 BENEFITS DECREASED BY 10%  
 RECOMMENDED ALTERNATIVE

Tk.in million

Serial	Year	Capital Cost	Maint. Cost	Total Cost	VOC Benefit	TTC Benefit	Total Benefit	Net Benefit
1	2000	137.0		137.0				(137.0)
2	2001	454.0		454.0				(454.0)
3	2002	986.1		986.1				(986.1)
4	2003	1,144.6		1,144.6				(1,144.6)
5	2004	827.6		827.6				(827.6)
6	2005		7.7	7.7	677.1	331.2	1008.3	1,000.6
7	2006		7.7	7.7	718.1	349.4	1067.6	1,059.9
8	2007		7.7	7.7	761.7	368.7	1130.4	1,122.7
9	2008		7.7	7.7	808.0	388.9	1196.9	1,189.2
10	2009		7.7	7.7	857.0	410.3	1267.4	1,259.7
11	2010		7.7	7.7	909.2	432.9	1342.1	1,334.4
12	2011		20.9	20.9	963.7	458.9	1422.6	1,401.7
13	2012		7.7	7.7	1021.5	486.4	1507.9	1,500.2
14	2013		7.7	7.7	1082.8	515.6	1598.4	1,590.7
15	2014		7.7	7.7	1147.8	546.5	1694.3	1,686.6
16	2015		7.7	7.7	1216.6	579.3	1795.9	1,788.2
17	2016		7.7	7.7	1216.6	579.3	1795.9	1,788.2
18	2017		7.7	7.7	1216.6	579.3	1795.9	1,788.2
19	2018		20.9	20.9	1216.6	579.3	1795.9	1,775.0
20	2019		7.7	7.7	1216.6	579.3	1795.9	1,788.2
21	2020		7.7	7.7	1216.6	579.3	1795.9	1,788.2

EIRR= 24.2%

RUPSA BRIDGE ON KHULNA-MONGLA HIGHWAY  
CASHFLOW ANALYSIS

TEST-4 COSTS INCREASED BY 10% AND BENEFITS DECREASED BY 10%  
RECOMMENDED ALTERNATIVE

Tk.in million

Serial	Year	Capital Cost	Maint. Cost	Total Cost	VOC Benefit	TTC Benefit	Total Benefit	Net Benefit
1	2000	150.8		150.8				(150.8)
2	2001	499.4		499.4				(499.4)
3	2002	1,084.7		1,084.7				(1,084.7)
4	2003	1,259.0		1,259.0				(1,259.0)
5	2004	910.4		910.4				(910.4)
6	2005		8.5	8.5	677.1	331.2	1008.3	999.8
7	2006		8.5	8.5	718.1	349.4	1067.6	1,059.1
8	2007		8.5	8.5	761.7	368.7	1130.4	1,121.9
9	2008		8.5	8.5	808.0	388.9	1196.9	1,188.4
10	2009		8.5	8.5	857.0	410.3	1267.4	1,258.9
11	2010		8.5	8.5	909.2	432.9	1342.1	1,333.6
12	2011		23.0	23.0	963.7	458.9	1422.6	1,399.6
13	2012		8.5	8.5	1021.5	486.4	1507.9	1,499.5
14	2013		8.5	8.5	1082.8	515.6	1598.4	1,589.9
15	2014		8.5	8.5	1147.8	546.5	1694.3	1,685.8
16	2015		8.5	8.5	1216.6	579.3	1795.9	1,787.5
17	2016		8.5	8.5	1216.6	579.3	1795.9	1,787.5
18	2017		8.5	8.5	1216.6	579.3	1795.9	1,787.5
19	2018		23.0	23.0	1216.6	579.3	1795.9	1,772.9
20	2019		8.5	8.5	1216.6	579.3	1795.9	1,787.5
21	2020		8.5	8.5	1216.6	579.3	1795.9	1,787.5

EIRR= 22.6%



## Economic Capital Cost

### RECOMMENDED ALTERNATIVE

AT AUG. 1999 PRICES

Description	Economic Cost (Million Taka)
1. Direct Construction Cost	2881.3
1) Highway	1022.6
2) Bridge	1858.7
3) Toll Facilities	0.0
2. Physical Contingency (10% of 1)	288.1
3. Construction Cost (total of 1&2)	3169.5
4. Land Acquisition and Compensation	203.6
5. Engineering Services	48.1
6. Supervisory Services	128.2
<b>Total</b>	<b>3549.3</b>

### Capital Cost Tk. Million

2000	137.0
2001	454.0
2002	986.1
2003	1,144.6
2004	827.6
<b>Total</b>	<b>3,549.3</b>

### O/M Tk. Million

Routine	Periodic
7.7 (annual)	13.2 (every 7 years)

**vehicle\* Kms/day**

Year	Without Rupsa Bridge					With Rupsa Bridge					Total
	M.cycle	A.rickshaw	Car	Bus	Truck	M.cycle	A.rickshaw	Car	Bus	Truck	
2005	160096.3	236713.8	176105.9	324995.5	406514.7	139131.3	199548.6	155522.1	274222.1	350592.1	1119016.2
2006	168901.1	249732.4	185791.2	342869.3	434171.4	146783.1	210523.2	164075.4	289303.5	374444.1	1185129.3
2007	178190.2	263466.9	196009.2	361726.0	463709.7	154855.7	222101.3	173099.0	305214.3	399919.0	1255189.3
2008	187990.1	277956.8	206789.1	381619.9	495257.7	163372.3	234316.2	182618.9	322000.2	427127.0	1329434.6
2009	198329.0	292243.6	218161.9	402607.8	528951.9	172357.3	247202.9	192662.4	339709.2	456186.0	1408117.9
2010	209236.5	309371.1	230160.1	424750.0	564938.5	181836.5	260798.3	203258.3	358392.2	487222.1	1491507.3
2011	221789.8	327932.0	243968.8	450233.2	598832.4	192745.9	276445.1	215452.9	379894.2	516453.3	1580991.4
2012	235096.2	347606.6	258605.8	477245.3	634759.8	204309.8	293030.6	228379.2	402686.2	547438.3	1675844.2
2013	249201.0	368461.5	274121.1	505878.0	672842.7	216567.5	310611.2	242081.0	426845.7	580282.3	1776387.8
2014	264152.0	390567.6	290567.2	536228.6	713210.4	229560.7	329246.6	256604.8	452454.6	615096.8	1882963.5
2015	280000.0	414000.0	308000.0	568400.0	756000.0	243333.3	349000.0	272000.0	479600.0	652000.0	1995933.3
2016	280000.0	414000.0	308000.0	568400.0	756000.0	243333.3	349000.0	272000.0	479600.0	652000.0	1995933.3
2017	280000.0	414000.0	308000.0	568400.0	756000.0	243333.3	349000.0	272000.0	479600.0	652000.0	1995933.3
2018	280000.0	414000.0	308000.0	568400.0	756000.0	243333.3	349000.0	272000.0	479600.0	652000.0	1995933.3
2019	280000.0	414000.0	308000.0	568400.0	756000.0	243333.3	349000.0	272000.0	479600.0	652000.0	1995933.3
2020	280000.0	414000.0	308000.0	568400.0	756000.0	243333.3	349000.0	272000.0	479600.0	652000.0	1995933.3

VOC Tk/Km		IRI 4
Motor Cycle		1.79
Auto Rickshaw		3.59
Car		5.80
Bus		14.17
Truck		11.58

VOC Tk/Km		IRI 3
Motor Cycle		1.71
Auto Rickshaw		3.43
Car		5.50
Bus		13.92
Truck		10.88

vehicle\*hours/day

Year	Without Rupsa Bridge				With Rupsa Bridge				Total			
	M.cycle	A.rickshaw	Car	Bus	Truck	Total	M.cycle	A.rickshaw		Car	Bus	Truck
2005	7623.6	13150.8	6861.3	17153.2	16131.5	60920.4	3811.8	5146.0	4002.4	6632.6	8603.5	28196.2
2006	8042.9	13874.0	7238.6	18096.5	17229.0	64481.1	4021.5	5429.0	4222.5	6997.3	9188.8	29859.1
2007	8485.2	14637.0	7636.7	19091.8	18401.2	68252.0	4242.6	5727.5	4454.8	7382.2	9814.0	31621.0
2008	8931.9	15442.0	8056.7	20141.8	19653.1	72245.5	4476.0	6042.5	4699.8	7788.2	10481.6	33488.0
2009	9444.2	16291.3	8499.8	21249.5	20990.2	76475.0	4722.1	6374.9	4958.2	8216.5	11194.7	35466.4
2010	9963.6	17187.3	8967.3	22418.2	22418.2	80954.6	4981.8	6725.5	5230.9	8668.4	11956.4	37562.9
2011	10561.4	18218.4	9505.3	23763.2	23763.2	85811.5	5280.7	7129.0	5544.7	9188.4	12673.7	39816.5
2012	11195.1	19311.5	10075.6	25188.9	25188.9	90959.8	5597.5	7556.7	5877.4	9739.7	13434.1	42205.4
2013	11866.7	20470.1	10680.0	26700.1	26700.1	96417.1	5933.4	8010.0	6230.0	10324.0	14240.1	44737.5
2014	12578.7	21698.2	11320.8	28302.0	28302.0	102201.7	6289.3	8490.6	6603.8	10943.4	15094.4	47421.6
2015	13333.3	23000.0	12000.0	30000.0	30000.0	108333.3	6666.7	9000.0	7000.0	11600.0	16000.0	50266.7
2016	13333.3	23000.0	12000.0	30000.0	30000.0	108333.3	6666.7	9000.0	7000.0	11600.0	16000.0	50266.7
2017	13333.3	23000.0	12000.0	30000.0	30000.0	108333.3	6666.7	9000.0	7000.0	11600.0	16000.0	50266.7
2018	13333.3	23000.0	12000.0	30000.0	30000.0	108333.3	6666.7	9000.0	7000.0	11600.0	16000.0	50266.7
2019	13333.3	23000.0	12000.0	30000.0	30000.0	108333.3	6666.7	9000.0	7000.0	11600.0	16000.0	50266.7
2020	13333.3	23000.0	12000.0	30000.0	30000.0	108333.3	6666.7	9000.0	7000.0	11600.0	16000.0	50266.7

TTC		Tk./Hour
Motor Cycle		18.80
Auto Rickshaw		25.00
Car		90.20
Bus		588.60

**Traffic Volumes Passing Rupsa Bridge in year 2015**

	pcu/day	vehicle/day
M.cycle	349	1,163
A.rickshaw	2,466	2,466
Car	1,097	1,097
Bus	9,016	3,606
Truck	5,524	2,762
<b>Total</b>	<b>18,452</b>	<b>11,094</b>

**Traffic Growth Rate**

Year	M.cycle	A.rickshaw	Car	Bus	Truck
1998	1.00	1.00	1.00	1.00	1.00
1999	1.09	1.09	1.09	1.09	1.11
2000	1.18	1.18	1.18	1.18	1.23
2001	1.26	1.26	1.26	1.26	1.31
2002	1.34	1.34	1.34	1.34	1.39
2003	1.42	1.42	1.42	1.42	1.48
2004	1.51	1.51	1.51	1.51	1.58
2005	1.60	1.60	1.60	1.60	1.68
2006	1.69	1.69	1.69	1.69	1.79
2007	1.78	1.78	1.78	1.78	1.92
2008	1.88	1.88	1.88	1.88	2.05
2009	1.99	1.99	1.99	1.99	2.19
2010	2.10	2.10	2.10	2.10	2.33
2011	2.22	2.22	2.22	2.22	2.47
2012	2.36	2.36	2.36	2.36	2.62
2013	2.50	2.50	2.50	2.50	2.78
2014	2.65	2.65	2.65	2.65	2.95
2015	2.81	2.81	2.81	2.81	3.13
2016	2.81	2.81	2.81	2.81	3.13
2017	2.81	2.81	2.81	2.81	3.13
2018	2.81	2.81	2.81	2.81	3.13
2019	2.81	2.81	2.81	2.81	3.13
2020	2.81	2.81	2.81	2.81	3.13

**VOC Benefit (Taka Million)**

Year	M-Cycle	Auto-Rick.	Car	Bus	Truck	Total
2005	17.8	60.4	60.6	287.6	325.9	752.3
2006	18.7	63.7	63.9	303.4	348.1	797.9
2007	19.8	67.2	67.5	320.1	371.8	846.3
2008	20.9	70.9	71.2	337.7	397.1	897.7
2009	22.0	74.8	75.1	356.3	424.1	952.3
2010	23.2	78.9	79.2	375.9	453.0	1010.2
2011	24.6	83.6	84.0	398.5	480.1	1070.8
2012	26.1	88.6	89.0	422.4	509.0	1135.0
2013	27.6	93.9	94.3	447.7	539.5	1203.1
2014	29.3	99.6	100.0	474.6	571.9	1275.3
2015	31.1	105.6	106.0	503.0	606.2	1351.8
2016	31.1	105.6	106.0	503.0	606.2	1351.8
2017	31.1	105.6	106.0	503.0	606.2	1351.8
2018	31.1	105.6	106.0	503.0	606.2	1351.8
2019	31.1	105.6	106.0	503.0	606.2	1351.8
2020	31.1	105.6	106.0	503.0	606.2	1351.8

### TTC Benefit (Taka Million)

Year	M-Cycle	Auto-Rick.	Car	Bus	Total	15%
2005	26.2	73.0	94.1	2260.2	2453.6	368.0
2006	27.6	77.1	99.3	2384.5	2588.5	388.3
2007	29.1	81.3	104.8	2515.7	2730.9	409.6
2008	30.7	85.8	110.5	2654.0	2881.0	432.2
2009	32.4	90.5	116.6	2800.0	3039.5	455.9
2010	34.2	95.5	123.0	2954.0	3206.7	481.0
2011	36.2	101.2	130.4	3131.2	3399.0	509.9
2012	38.4	107.3	138.2	3319.1	3603.0	540.4
2013	40.7	113.7	146.5	3518.2	3819.1	572.9
2014	43.2	120.5	155.3	3729.3	4048.3	607.2
2015	45.7	127.8	164.6	3953.0	4291.1	643.7
2016	45.7	127.8	164.6	3953.0	4291.1	643.7
2017	45.7	127.8	164.6	3953.0	4291.1	643.7
2018	45.7	127.8	164.6	3953.0	4291.1	643.7
2019	45.7	127.8	164.6	3953.0	4291.1	643.7
2020	45.7	127.8	164.6	3953.0	4291.1	643.7

**Toll Bridge Case (Recommended Alternative) : Financial IRR**

(Taka in million)

Year	Capital expenditure	O & M	Total Costs	Total revenue	Net cash flow
2000	84.6		84.6		-84.6
2001	298.5		298.5		-298.5
2002	665.4		665.4		-665.4
2003	772.4		772.4		-772.4
2004	558.4		558.4		-558.4
2005		6.0	6.0	88.0	82.0
2006		6.0	6.0	93.5	87.5
2007		6.0	6.0	99.3	93.3
2008		6.0	6.0	105.4	99.4
2009		6.0	6.0	112.0	106.0
2010		6.0	6.0	118.9	112.9
2011		16.2	16.2	126.1	109.9
2012		6.0	6.0	133.6	127.6
2013		6.0	6.0	141.7	135.7
2014		6.0	6.0	150.2	144.2
2015		6.0	6.0	159.3	153.3
2016		6.0	6.0	159.3	153.3
2017		6.0	6.0	159.3	153.3
2018		16.2	16.2	159.3	143.1
2019		6.0	6.0	159.3	153.3
2020		6.0	6.0	159.3	153.3
2021		6.0	6.0	159.3	153.3
2022		6.0	6.0	159.3	153.3
2023		6.0	6.0	159.3	153.3
2024		6.0	6.0	159.3	153.3
2025		16.2	16.2	159.3	143.1
2026		6.0	6.0	159.3	153.3
2027		6.0	6.0	159.3	153.3
2028		6.0	6.0	159.3	153.3
2029		6.0	6.0	159.3	153.3

FIRR= 2.4%

### Vehicles Crossing Bridge (Per day)

Year	M-cycle	Auto Rickshaw	Car	Bus	Truck	Total
2005	684	1,409	627	2,060	1,484	6,243
2006	701	1,486	661	2,173	1,585	6,606
2007	739	1,568	697	2,293	1,693	6,990
2008	780	1,654	736	2,419	1,808	7,396
2009	823	1,745	776	2,552	1,931	7,827
2010	868	1,841	819	2,692	2,062	8,282
2011	920	1,951	868	2,854	2,186	8,779
2012	976	2,069	920	3,025	2,317	9,306
2013	1,034	2,193	975	3,206	2,456	9,864
2014	1,096	2,324	1,034	3,399	2,603	10,456
2015	1,163	2,466	1,097	3,606	2,762	11,094
2016	1,163	2,466	1,097	3,606	2,762	11,094
2017	1,163	2,466	1,097	3,606	2,762	11,094
2018	1,163	2,466	1,097	3,606	2,762	11,094
2019	1,163	2,466	1,097	3,606	2,762	11,094
2020	1,163	2,466	1,097	3,606	2,762	11,094
2021	1,163	2,466	1,097	3,606	2,762	11,094
2022	1,163	2,466	1,097	3,606	2,762	11,094
2023	1,163	2,466	1,097	3,606	2,762	11,094
2024	1,163	2,466	1,097	3,606	2,762	11,094
2025	1,163	2,466	1,097	3,606	2,762	11,094
2026	1,163	2,466	1,097	3,606	2,762	11,094
2027	1,163	2,466	1,097	3,606	2,762	11,094
2028	1,163	2,466	1,097	3,606	2,762	11,094
2029	1,163	2,466	1,097	3,606	2,762	11,094



**Toll Revenue (Tk. Million)**

Year	M. Cycle	Auto-Rick.	Car	Bus	Truck	Total Revenue
2005	0.73	6.68	4.35	28.57	47.67	87.99
2006	0.77	7.05	4.58	30.14	50.91	93.45
2007	0.81	7.44	4.84	31.80	54.37	99.25
2008	0.85	7.85	5.10	33.55	58.07	105.42
2009	0.90	8.28	5.38	35.39	62.01	111.97
2010	0.95	8.74	5.68	37.34	66.23	118.94
2011	1.01	9.26	6.02	39.58	70.20	126.07
2012	1.07	9.82	6.38	41.95	74.42	133.64
2013	1.13	10.40	6.76	44.47	78.88	141.65
2014	1.20	11.03	7.17	47.14	83.61	150.15
2015	1.27	11.70	7.61	50.02	88.72	159.31
2016	1.27	11.70	7.61	50.02	88.72	159.31
2017	1.27	11.70	7.61	50.02	88.72	159.31
2018	1.27	11.70	7.61	50.02	88.72	159.31
2019	1.27	11.70	7.61	50.02	88.72	159.31
2020	1.27	11.70	7.61	50.02	88.72	159.31
2021	1.27	11.70	7.61	50.02	88.72	159.31
2022	1.27	11.70	7.61	50.02	88.72	159.31
2023	1.27	11.70	7.61	50.02	88.72	159.31
2024	1.27	11.70	7.61	50.02	88.72	159.31
2025	1.27	11.70	7.61	50.02	88.72	159.31
2026	1.27	11.70	7.61	50.02	88.72	159.31
2027	1.27	11.70	7.61	50.02	88.72	159.31
2028	1.27	11.70	7.61	50.02	88.72	159.31
2029	1.27	11.70	7.61	50.02	88.72	159.31
Tariff Tk.	3	13	19	38	88	

## Financial Capital Cost

### Recommended Alternative

AT MID 1999 PRICES

Description	Financial Cost (Million Taka)		Remarks
	Total Project	Bridge Only	
1. Direct Construction Cost	3243.9	2038.0	63%
1) Highway	1205.9	0.0	
2) Bridge	2027.0	2027.0	
3) Toll Facilities	11.0	11.0	
2. Physical Contingency (10% of 1)	324.4	203.8	
3. Construction Cost (total of 1&2)	3568.3	2241.8	
4. Land Acquisition and Compensation	203.6	14.3	
5. Engineering Services	53.5	33.6	
6. Supervisory Services	142.7	89.7	
Total	3968.1	2379.3	

#### Capital Cost Bridge Only Tk. Million

2000	84.6
2001	298.5
2002	665.4
2003	772.4
2004	558.4
Total	2,379.3

#### Capital Cost Total Project Tk. Million

2000	141.1
2001	497.9
2002	1,109.7
2003	1,288.1
2004	931.3
Total	3,968.1

#### O/M Bridge Only Tk. Million

Routine	Periodic
6.0	10.2
(annual)	(every 7 years)

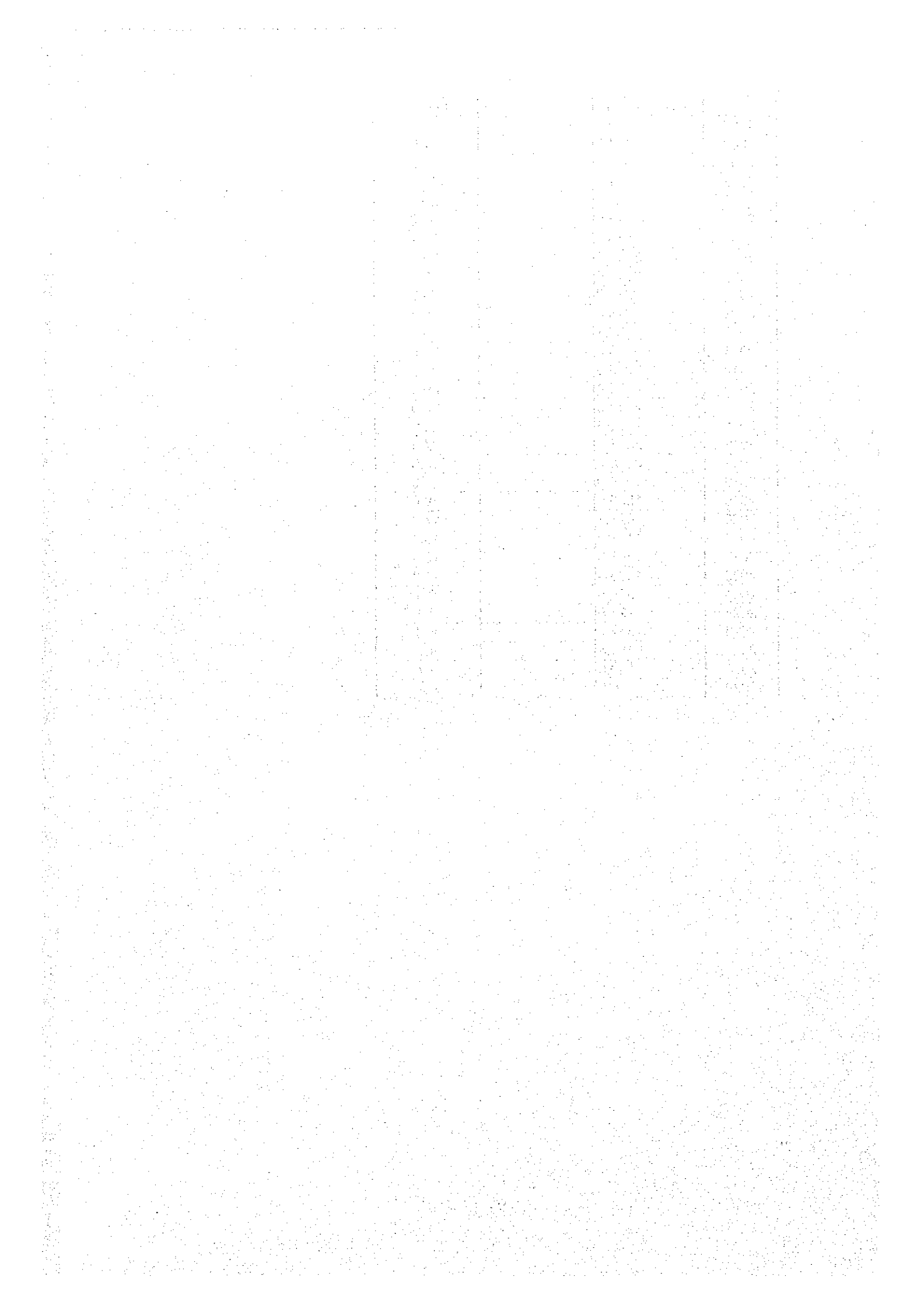
#### O/M Total Project Tk. Million

Routine	Periodic
9.6	16.5
(annual)	(every 7 years)

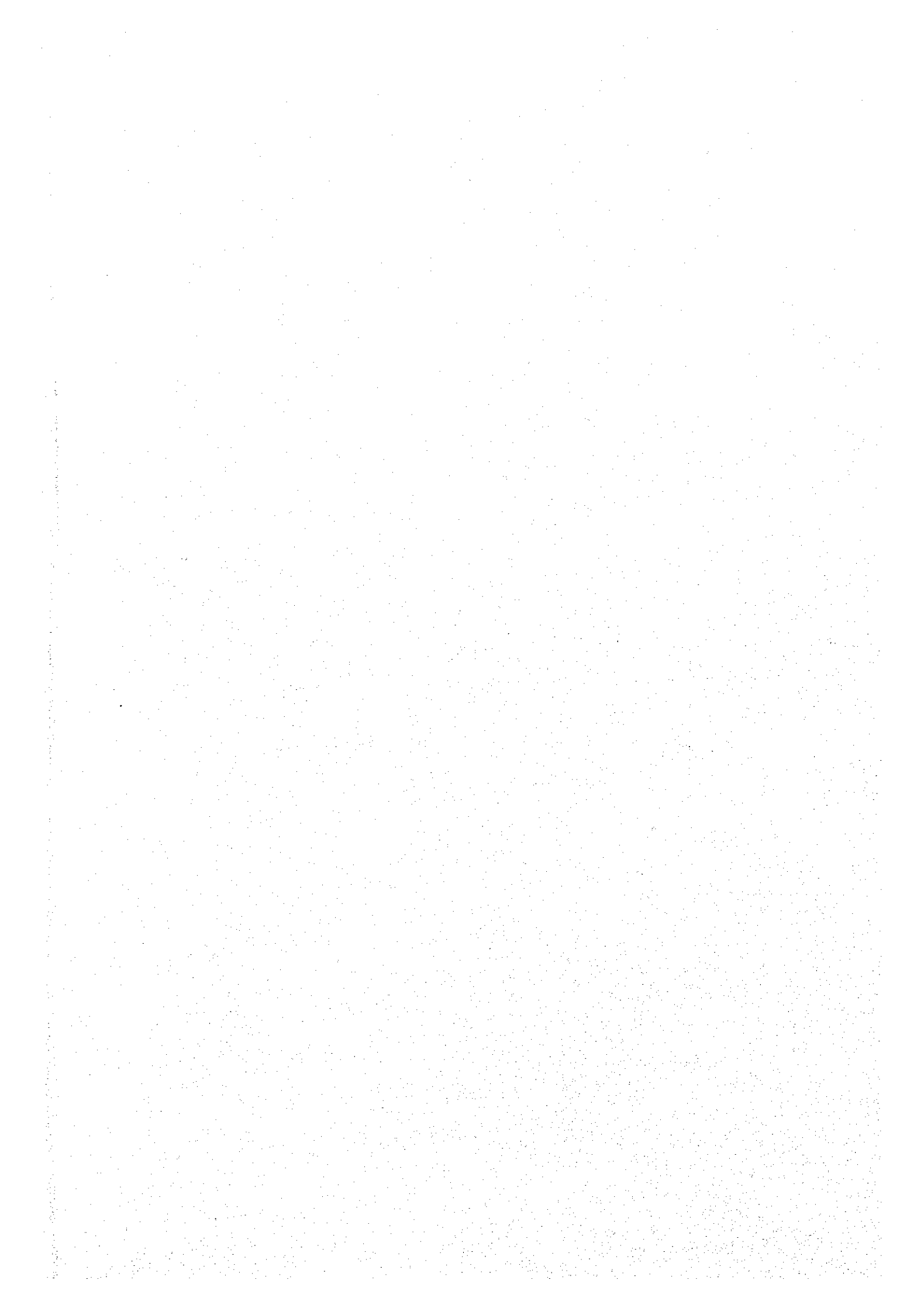
CASH FLOW (Taka million)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total 2000-2029			
<b>SOURCES</b>																																		
OEFC loan	119.9	423.2	943.3	1094.9	791.6																													
Govt contribution	21.2	74.7	186.5	193.2	139.7																													
Total revenue	88.0	82.5	99.8	105.4	112.0	116.9	126.1	133.6	141.7	150.2	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	3556.2	
Total Sources	141.1	497.9	1109.7	1288.1	931.3	88.0	93.5	99.9	105.4	112.0	116.9	126.1	133.6	141.7	150.2	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3	159.3		
<b>APPLICATIONS</b>																																		
Loan repayment																																		
Interest expense	0.6	3.3	10.1	20.3	29.8	33.7	33.7	33.7	33.7	33.7	32.9	31.2	28.5	27.6	26.1	24.5	22.8	21.1	19.4	17.7	16.0	14.3	12.6	11.0	9.3	7.6	5.9	4.2	2.5	0.8			3372.9	
O/M expense						9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	289.5
Capital expenditure	141.1	497.9	1109.7	1288.1	931.3																													
Total Applications	141.7	501.2	1119.9	1308.5	961.1	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	
Cash surplus for year	-0.6	-3.3	-10.1	-20.3	-29.8	44.7	50.1	55.9	62.1	68.6	65.2	49.9	-74.1	-64.4	-54.2	-43.4	-31.7	-20.0	-8.4	-3.6	-3.0	-3.3	-3.6	-3.9	-4.0	-4.3	-4.6	-4.9	-5.2	-5.5	-5.8	-6.1	-6.4	-19.8
Cash 1 January	0.0	-0.6	-3.9	-14.1	-34.4	-64.2	-119.5	-195.5	-306.5	-448.6	-617.3	-812.1	-1025.2	-1252.7	-1494.8	-1751.3	-2022.4	-2308.0	-2608.3	-2923.4	-3254.1	-3600.4	-3963.5	-4344.5	-4743.4	-5160.2	-5594.9	-6047.2	-6517.3	-7005.0	-7510.3	-8033.3	-8574.3	
Cash 31 December	-0.6	-3.9	-14.1	-34.4	-64.2	-119.5	-200.6	-306.5	-448.6	-617.3	-812.1	-1025.2	-1252.7	-1494.8	-1751.3	-2022.4	-2308.0	-2608.3	-2923.4	-3254.1	-3600.4	-3963.5	-4344.5	-4743.4	-5160.2	-5594.9	-6047.2	-6517.3	-7005.0	-7510.3	-8033.3	-8574.3		

	OECF Loan		Interest
1999	0.0		
2000	144.2		0.7
2001	532.5		3.4
2002	1561.0		10.5
2003	2589.5		20.8
2004	3618.0		31.0
2005	3618.0		36.2
2006	3618.0		36.2
2007	3618.0		36.2
2008	3618.0		36.2
2009	3618.0		36.2
2010	3437.1		35.3
2011	3256.2		33.5
2012	3075.3		31.7
2013	2894.4		29.8
2014	2713.5		28.0
2015	2532.6		26.2
2016	2351.7		24.4
2017	2170.8		22.6
2018	1989.9		20.8
2019	1809.0		19.0
2020	1628.1		17.2
2021	1447.2		15.4
2022	1266.3		13.6
2023	1085.4		11.8
2024	904.5		9.9
2025	723.6		8.1
2026	542.7		6.3
2027	361.8		4.5
2028	180.9		2.7
2029	0.0		0.9











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