No.37 Shatvan

Information on Existing Water Sources (Gegharkunik)

Study for Improvement of Rural Water Supply and Sewage Systems in RA

No.37 Community Shatvan
District Vardenis
Marz Gegharkunik

No	Water source	Latitude			Longitude			Atidute	Yeild(L/sec)		
		deg	min	sec	deg	min	sec	(m)	Min	Max	At site
1	Springs	40	10	4.8	45	51	38.0	2,105	2.0	4.0	4.0
2	Water main	40	10	27.5	45	47	25.5	2,044	11.0	11.0	11.0
3											
4											
5											
6											
7											
8											
9											
10											

Notes:

Latitude, Longitude, Atitude:	*Measured at site*
Yield (Min, Max):	*Interviewed to the Community*
Yield (at site):	*Measured / estimated at site in summer of 2007*

Users Acceptnce for water quality	Acceptable
Notes	
Alternative sources if any	

No.37 Community Shatvan
District Vardenis
Marz Gegharkunik
Sampling date 28/Aug/2007

	Parameters analysed	Units	No.1 Avazi aghbyur	No.2 Shatjreq reservoir			Guidelines	
							WHO	Armenia
a	pH		7.8	7.8			6.5-8	6.0 - 9.0
b	Temperature	Deg.C	14.4	10.8				
c	TDS	Mg/L	32	145			1000	1000
1	Al:Aluminum	Mg/L	n.d.	n.d.			0.10	0.50
2	B:Boron	Mg/L	n.d.	n.d.			0.70	0.50
3	Cl:Chloride	Mg/L	5	7			250	350
4	Cr:Chrome	Mg/L	0.01	<0,01			0.05	0.05
5	Cu:Copper	Mg/L	n.d.	n.d.			2	1
6	F:Fluoride	Mg/L	0.02	0.11			1.50	
7	Hardness	Mg/L	50	260			500	700
8	Fe:Iron	Mg/L	0.02	n.d.			0.30	0.30
9	Mn:Manganese	Mg/L	0.10	0.10			0.40	0.10
10	Mo:Molibdenum	Mg/L	0.050	n.d.			0.070	0.250
11	Ni:Nickel	Mg/L	0.009	<0,006			0.020	0.100
12	Nitrate(NO3+)	Mg/L	1.8	3.6			50.0	45.0
13	SO4:Sulfate	Mg/L	2.0	2.0			250.0	500.0
14	Zn:Zink	Mg/L	n.d.	n.d.			3.0	5.0
15	As:Arsenic	Mg/L	n.d.	n.d.			0.0	0.1
16	Ba:Barium	Mg/L	<0.01	<0.01			0.70	0.10
17	Be:Berillium	Mg/L	n.d.	n.d.			NA	0.00020
18	Cd:Cadmium	Mg/L	0.0001	0.0001			0.0030	0.0010
19	Pb:Lead	Mg/L	0.001	0.001			0.010	0.030
20	Hg:Mercury	Mg/L	<0.0002	n.d.			0.00100	0.00050
21	Se:Selenium	Mg/L	<0.001	<0.001			0.010	0.010
22	Sr:Strontium	Mg/L	n.d.	0.1			NA	7.0
23	CN:Cyanide	Mg/L	n.d.	n.d.			0.070	0.035
24	Coli form bacteria	bacteria per 100 ml	nd				-	0
25	Thermo-tolerant coli form bacteria	bacteria per 100 ml	nd				0	0
26	Total bacteria	bacteria per 1 ml	20				-	50

Information on Existing Water Sources
Existing Bacteriological Test

No.37 Community Shatvan
District Vardenis
Marz Gegharkunik

No.	Month	Date	Total amount of bacteria	Total amount of coliform bacteria	Coliform bacteria tolerant to heat
			nos/1mL	MPN/100mL	nos/100 mL
			Less than 50nos/1mL	Not identified	Not identified
1	01	16	20	0.3	Not identified
2	02	22	20	0.3	Not identified
3	03	22	22	0.3	Not identified
4	04	19	22	0.3	Not identified
5	05	24	18	0.3	Not identified
6	06	21	22	0.3	Not identified
7	07	16	20	0.3	Not identified
8	08	27	20	0.3	Not identified

No. 37 **Marz** Gegharkunik **Community** Shatvan

1. ACCESSIBILITY TO THE SITE

No.	Structures	Access by vehicle	Machine construction	Remarks
1	Intake	Possible	Possible	
	Intake	Fair	Possible	
2	Transmission pipeline	Possible	Possible	Pipeline is generally along or close to the road
3	Reservoir	Possible	Possible	

2. INTAKE STRUCTURE

No.	Water source	N	E	El. (m)	Year	Material	Volume (l/s)	Rehabilitation Necessity (Y/N)
1	Spring	40°10′04.8″	45°51′38.0″	2,105	1970	Steel	4.0	Yes
2	Spring	40°09′27.5″	45°47′25.5″	2,044	2000	Concrete	11.0	No

3. TRANSMISSION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Flow rate (l/s)	Year	Leakage	Rehabilitation Necessity (Y/N)
1	1,700	150	Polyethylene	11.0	2006		No
2	17,000	100	AsbestosCement	4.0	1960	Huge	Yes

4. RESERVOIR

No.	N	E	El. (m)	Material	Shape	Dimension (m)	Volume (m3)	Rehabilitation Necessity (Y/N)
1	40°10′36.6″	45°49′44.8″	2,004	Concrete	Rectangular	7x8x1.8	100	Yes

5. CHLORINATION EQUIPMENT

No.	Existence (Y/N)	Location	Chlorine type	Chlorine duration
1	No			

6. DISTRIBUTION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Year	Leakage	Rehabilitation Necessity (Y/N)
1	3,000	150	Steel	1960	Medium	Yes

7. PUMP STATION

Existence (Y/N)	Power source	Type	Capacity (l/s)	Pump head (m)	Tank cap. (m3)	House size (m)	Rehabilitation Necessity (Y/N)
No							

8. PUBLIC TAPS

No. of taps	Old one (year)	New one (year)	Valves (Y/N)	Valve rate (%)	Rehabilitation Necessity (Y/N)
10	2006		No	0	Yes

9. DRAINAGE SYSTEM

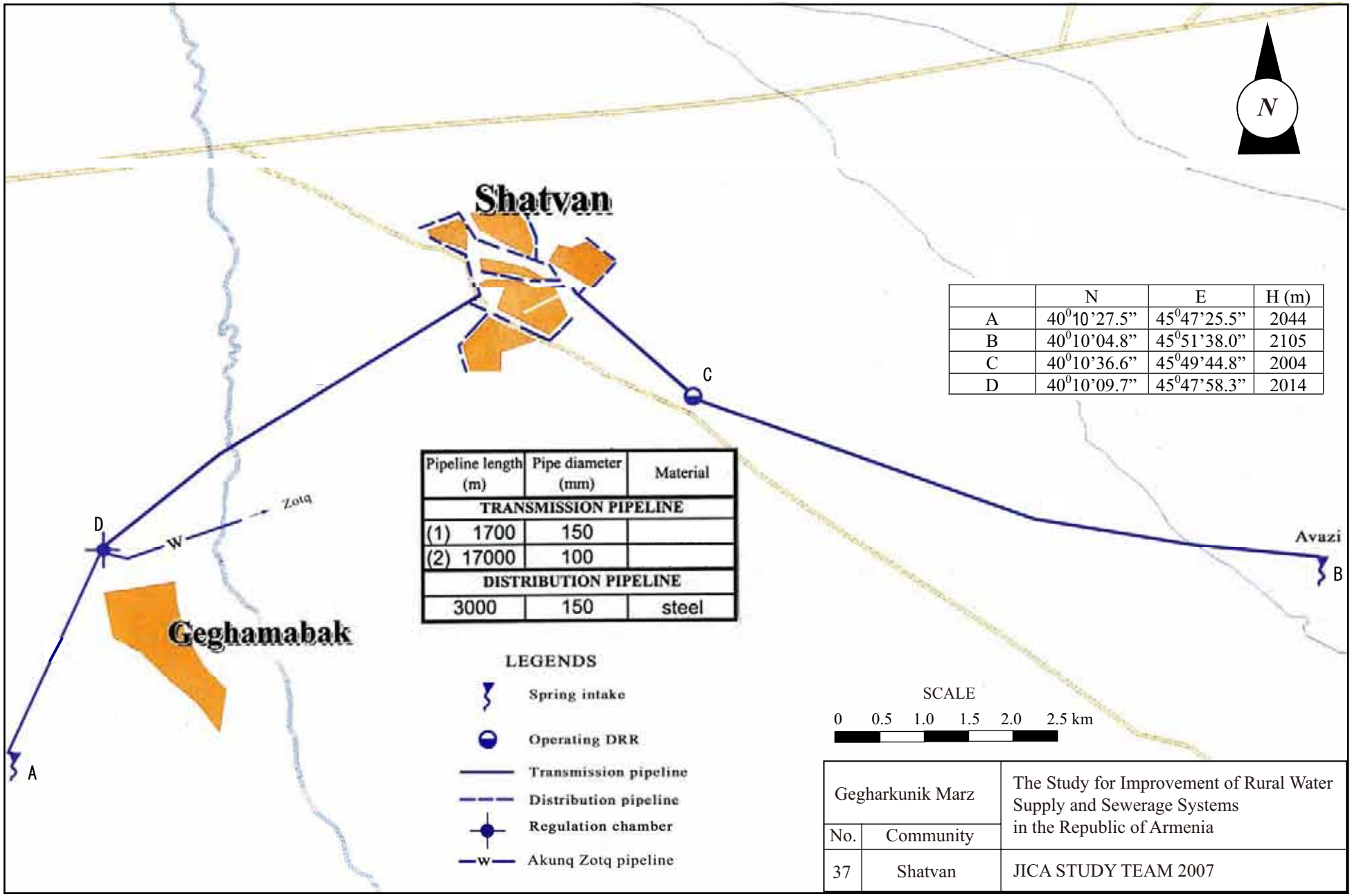
Existence	Rehabilitation	Remarks
No	Yes	

Questionnaire on Existing Water Supply Conditions by Socio-Economic Survey

Marz	**Gegharkunik**
Number and Name of Community	**No.37 Shatvan**
District	**Vardenis**

No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	574
A2	Actual population in 2007	983
A3	Number of households	350
A4.1	Elderly people	133
A4.2	Population in labor force (age from 16 to 62)	644
A4.3	Children	165
A5.1	Pensioners	160
A5.2	Unemployed	573
A5.3	Receiving benefits	17
A6	Average monthly income of household (AMD)	20,000
A7	Number of medical ambulance staion/first and health post	absent
A8	Number of beds in each medical ambulance staion	0
A9	Number of school	1
A10	Number of pupils	102
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	9,000
	Annual Budget of the community 2005, in thousand AMD	9,200
	Annual Budget of the community 2006, in thousand AMD	9,376
	Annual Budget of the community 2007, in thousand AMD	4,500
	Annual Budget of the community 2008, in thousand AMD	is not planned
B2	Amount spent in drinking water sector 2004, in thousand AMD	0
	Amount spent in drinking water sector 2005, in thousand AMD	0
	Amount spent in drinking water sector 2006, in thousand AMD	0
	Amount spent in drinking water sector 2007, in thousand AMD	0
	Amount spent in drinking water sector 2008, in thousand AMD	is not planned
C: Socio-Economic Survey		
C1	Major industries of the community:	potatoes, ceraels
C2	Is there any community activities carrying out by women? 1-Yes, 2-No	no
D: Water Usage and Water Demand Survey		
D1	Does the community hold water use permit? 1.Yes 2.No	yes
D2	Water use permit number	10005
D3	Date of expiry of water use permit	02.06.06-02.06.09
D4	Planned date of obtaining water use permit	-
D5	Present condition of the water supply volume of Domestic use	almost sufficient
D6	Present condition of the water supply volume of Irrigation water	insufficient
D7	Number of house connection to drinking water system	15
D8	How many house connection household set the water meter	0
D9	Number of public taps	20
D10.1	How is the regime of water supply in your community in the dry season?	24 hrs
D10.2	How is the regime of water supply in your community in the wet season?	24 hrs
D11	What time of day water is given?	-
D12	Are you pleased with duration of domestic water supply?	-
D13	Are hours of water supply convenient?	-
D14.1	How long the taps are open to provide the domestic water (cooking, washing, foodstuffs, dishes, Landry, bathing, etc) of each houshold a day?	-
D14.2	Estimate quantity of domestic water use of each household (litter per day)	according to the supplied water
D15.1	How long the taps are open to provide the each household for filling	-
D15.2	Estimate quantity of water for filling containers of each household (litter per	difficult to answer
D16	Drinking water monthly water fee per household	0
D17	How often do you usually pay water fees?	-
D18	Water fee structure 1Flate rate, 2 Having water tariff	-
D19	Where do you acquire the irrigation water?	from the river, deep well
D20	Are you satisfied with irrigation water supply volume?	insufficient.
E: Present Operation and Maintenance Works		
E1	Name of responsible for water supply	Abrahamyan lyova
E2	Position	administration head
E3	Telephone	(093)394550
E4	Quantity and present condition of the water supply facilities: spring/ intake	1-partially rehabilitated
E5	Quantity and present condition of the water supply facilities: pipeline/transmission	1-partially rehabilitated
E6	Quantity and present condition of the water supply facilities: DRR(Daily Regulatory Reservoir)	1-partially rehabilitated
E7	Quantity and present condition of the water supply facilities: net/distribution	deteriorated
E8	Quantity and present condition of the water supply facilities: public tap	20-partially rehabilitated
E9	Quantity and present condition of the water supply facilities: pump	absent
E10	Who is the owner of the water supply facilities?	WUA
E11	Who is engaged in the water supply facilities repairing works?	WUA
E12	How do you repair the water supply facilities?	by ourselves
E13	Who is in charge of the repair work in the community?	WUA
E14	How you prepare O&M costs?	donation from residents
E15	Please indicate the O&M cost breakdown per year for water supply	
	Electricity (AMD)	0
	Labor cost (AMD)	0
	Repair cost(AMD)	0
	Others(AMD)	0
	Total (AMD)	0
E16	Do the residents participate in the O&M works?	manpower
E17	What kind of OM method is preferable to you?	difficult to answer
F: Initial Environmental Examination (IEE)		
F1	Are any of the following areas located inside or around the project site?	
F1.1	National park, protected area designated by the government (coast line, water lands, reserved are for ethnic or indigenous people, cultural heritage), and areas being considered for national parks or proposed areas.	absent
F1.2	Virgin forests, tropical forests	absent
F1.3	Ecological improvement habits areas (coral reef, mangrove wetland, tidal	absent
F1.4	Habit of valuable species protected by domestic laws or international treaties	absent
F1.5	Likely salts cumulus or soil erosion areas on a massive scale	absent
F1.6	Remarkable desertification trend areas	absent
F1.7	Archaeological historical or cultural valuable areas	absent
F1.8	Living areas of ethic, indigenous people or nomads who have a traditional lifestyle or special socially valuable areas	absent

Gegharkunik
No.37 Shatvan



	N	E	H (m)
A	40°10'27.5"	45°47'25.5"	2044
B	40°10'04.8"	45°51'38.0"	2105
C	40°10'36.6"	45°49'44.8"	2004
D	40°10'09.7"	45°47'58.3"	2014

Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
(1) 1700	150	
(2) 17000	100	
DISTRIBUTION PIPELINE		
3000	150	steel

LEGENDS

- Spring intake
- Operating DRR
- Transmission pipeline
- Distribution pipeline
- Regulation chamber
- W — Akunq Zotq pipeline

SCALE

0 0.5 1.0 1.5 2.0 2.5 km

Gegharkunik Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
37	Shatvan	JICA STUDY TEAM 2007

Marz : **Gegharkunik** No.37
Name : **Shatvan**

No.	Item	Quantity	Unit	Water demand (m3/d)	
A.	**WATER DEMAND**				
	1 Population	983	persons	98.3	
	2 Factory	-	nos	0.0	
	3 School (pupils)	102	pupils	1.0	
	4 Medical Ambulance Station	-	nos	-	
	5 Policlinic	-	nos	-	
	6 Livestocks (87lit/household)	350	household	30.5	
	Sub-total			129.8	
	Unaccouted for water (20%)			26.0	
1	Average Daily Water Demand			155.8	m3/day
2	Maximum Daily Water Demand			186.9	m3/day
3	Maximum Hourly Water Demand			22.3	m3/hr

B	**WATER SUPPLY PLAN**						
	1 Water source type	Nr.	Total vol.				
	a Spring	1	4.0	lit/sec	345.6	m3/day	
	b Existing pipeline	1	11.0	lit/sec	950.4	m3/day	
`	Total				1,296.0	m3/day	
	2 Required reservoir volume				267	m3	

C WATER SUPPLY FACILITIES REHABILITATION PLAN

No	Item	Quantity	Unit
1	Intake		
	1m3	1	nos
	2m3		nos
	3m3		nos
	4m3		nos
2	Transmission pipe		
	50mm diameter		m
	75mm diameter		m
	90mm diameter		m
	110mm diameter	3,000	m
	150mm diameter		m
	200mm diameter		m
	250mm diameter		m
3	Reservoir		
	100m3 capacity	1	nos
	200m3 capacity	1	nos
4	Distribution pipe		
	50mm diameter		m
	75mm diameter		m
	90mm diameter		m
	110mm diameter		m
	150mm diameter	3,000	m
	200mm diameter		m
	250mm diameter		m
5	House connection	335	nos
6	Water meter installation	350	nos
7	Public tap	4	nos
8	Chlorination	2	nos
9	Pumps	-	nos

Water Supply Facilities Rehabilitation Plan		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
Marz	Gegharkunik	
No. 37	Shatvan	JICA STUDY TEAM

Marz : **Gegharkunik**
No. : **37**
Name : **Shatvan**

No	Item	Specification	Quantity	Unit	Unit Price	Total
1	Intake					
		1m3	1	nos	367,700	367,700
		2m3		nos	545,000	
		3m3		nos	669,100	
		4m3		nos	805,100	
	Sub-total					367,700
2	Transmission Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm		m	8,040	
		110mm	3,000	m	9,680	29,040,000
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					29,040,000
3	Reservoir					
		50m3		nos	8,363,900	
		100m3	1	nos	12,968,300	12,968,300
		150m3		nos	18,804,500	
		200m3	1	nos	22,524,600	22,524,600
		250m3		nos	25,952,800	
		300m3		nos	29,630,400	
		350m3		nos	33,528,700	
		400m3		nos	36,388,000	
		450m3		nos	39,392,500	
		500m3		nos	42,520,900	
	Sub-total					35,492,900
4	Distribution Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm		m	8,040	
		110mm		m	9,680	
		150mm	3,000	m	13,140	39,420,000
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					39,420,000
5	House Connection		335	nos	74,000	24,790,000
6	Water Meter Installation		350	nos	80,000	28,000,000
7	Public Tap		4	nos	90,000	360,000
8	Chlorilation Equipment		2	nos	500,000	1,000,000
9	Pump Replacement			nos	10,000,000	
10	Drainage and Sewerage	concrete surfa	1,200	m	3,600	4,320,000
	Total				AMD	162,790,600
					Equivalent to USD	532,831
					Equivalent to JPY	56,213,696
					AMD	USD
	Investment Cost per household		350	HH	465,116	1,522
	Investment Cost per person		983	persons	165,606	542

GEGHARKUNIK MARZ
Marutuni District
No 37 Shatvan

PROJECTED INCOME STATEMENT **Unit: million AMD**

Description	Unit	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A Water Sales Revenue																																										
Consumption water volume	1000m3/yr		47.4																																							
Unit rate	AMD/m3				40.00	40.00	40.00	41.32	70.00	72.31	74.70	77.16	115.65	119.47	123.41	127.48	131.69	136.03	140.52	145.16	149.95	154.90	160.01	165.29	170.75	176.38	182.20	188.21	194.42	200.84	207.47	214.31	221.39	228.69	236.24	244.04	252.09	260.41	269.00	277.88	287.05	296.52
Sub-total		264.45	0.00	0.00	0.70	1.40	1.71	1.76	2.98	3.08	3.19	3.29	4.93	5.09	5.26	5.44	5.62	5.80	5.99	6.19	6.39	6.60	6.82	7.05	7.28	7.52	7.77	8.03	8.29	8.56	8.85	9.14	9.44	9.75	10.07	10.41	10.75	11.10	11.47	11.85	12.24	12.64
B Operating Costs																																									
1. Staff salary																																									
Inspectors	person				1																																				
Pump operators	person				0																																				
Base Salary	AMD/m/p				20,000	20,660	21,342	22,046	22,774	23,525	24,301	25,103	25,932	26,788	27,672	28,585	29,528	30,502	31,509	32,549	33,623	34,732	35,879	37,063	38,286	39,549	40,854	42,202	43,595	45,034	46,520	48,055	49,641	51,279	52,971	54,719	56,525	58,390	60,317	62,308	64,364	66,488
Sub-total		17.70			0.24	0.25	0.26	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.37	0.38	0.39	0.40	0.42	0.43	0.44	0.46	0.47	0.49	0.51	0.52	0.54	0.56	0.58	0.60	0.62	0.64	0.66	0.68	0.70	0.72	0.75	0.77	0.80
2. Chlorine																																									
Pouring volume	kg/yr				285																																				
Unit rate	AMD/kg				600	620	640	661	683	706	729	753	778	804	830	858	886	915	945	976	1009	1042	1076	1112	1149	1186	1226	1266	1308	1351	1396	1442	1489	1538	1589	1642	1696	1752	1810	1869	1931	1995
Sub-total		12.49			0.07	0.15	0.18	0.19	0.19	0.20	0.21	0.21	0.22	0.23	0.24	0.24	0.25	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.36	0.37	0.39	0.40	0.41	0.42	0.44	0.45	0.47	0.48	0.50	0.52	0.53	0.55	0.57
3. Electricity (for pump)		0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Maintenance cost		55.48			0.31	0.64	0.81	0.84	0.87	0.89	0.92	0.95	0.99	1.02	1.05	1.09	1.12	1.16	1.20	1.24	1.28	1.32	1.36	1.41	1.45	1.50	1.55	1.60	1.66	1.71	1.77	1.83	1.89	1.95	2.01	2.08	2.15	2.22	2.29	2.37	2.45	2.53
Pump repair					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pipe repair					0.31	0.64	0.81	0.84	0.87	0.89	0.92	0.95	0.99	1.02	1.05	1.09	1.12	1.16	1.20	1.24	1.28	1.32	1.36	1.41	1.45	1.50	1.55	1.60	1.66	1.71	1.77	1.83	1.89	1.95	2.01	2.08	2.15	2.22	2.29	2.37	2.45	2.53
5. Pump replacement		0.00																0.00															0.00									
Sub-total		85.67	0.00	0.00	0.62	1.04	1.25	1.29	1.33	1.37	1.42	1.46	1.52	1.57	1.62	1.67	1.72	1.79	1.85	1.91	1.97	2.04	2.10	2.17	2.24	2.31	2.39	2.47	2.55	2.64	2.73	2.82	2.91	3.01	3.10	3.21	3.31	3.42	3.53	3.65	3.77	3.90
C Gross Income (A-B)		178.78	0.00	0.00	0.08	0.36	0.46	0.47	1.65	1.71	1.77	1.83	3.41	3.52	3.64	3.77	3.90	4.01	4.14	4.28	4.42	4.56	4.72	4.88	5.04	5.21	5.38	5.56	5.74	5.92	6.12	6.32	6.53	6.74	6.97	7.20	7.44	7.68	7.94	8.20	8.47	8.74
D Depreciation cost		154.70						4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42
E Interest paid		49.45	0.04	0.07	0.88	1.71	2.09	2.10	2.10	2.10	2.10	2.10	2.10	2.04	1.98	1.92	1.86	1.79	1.73	1.67	1.60	1.54	1.47	1.40	1.34	1.27	1.20	1.13	1.06	0.99	0.92	0.84	0.77	0.70	0.62	0.55	0.47	0.40	0.32	0.24	0.16	0.08
F Net Income		-25.37	-0.04	-0.07	-0.80	-1.35	-1.63	-6.05	-4.87	-4.81	-4.75	-4.69	-3.11	-2.94	-2.76	-2.57	-2.38	-2.20	-2.01	-1.81	-1.60	-1.40	-1.17	-0.94	-0.72	-0.48	-0.24	0.01	0.26	0.51	0.78	1.06	1.34	1.62	1.93	2.23	2.55	2.86	3.20	3.54	3.89	4.24
G Tax and duties		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H Net Income after deduction of TAX		-25.37	-0.04	-0.07	-0.80	-1.35	-1.63	-6.05	-4.87	-4.81	-4.75	-4.69	-3.11	-2.94	-2.76	-2.57	-2.38	-2.20	-2.01	-1.81	-1.60	-1.40	-1.17	-0.94	-0.72	-0.48	-0.24	0.01	0.26	0.51	0.78	1.06	1.34	1.62	1.93	2.23	2.55	2.86	3.20	3.54	3.89	4.24
OM Cost Recovery Ratio (A/B)		309%	0%	0%	113%	135%	137%	136%	224%	225%	225%	225%	324%	324%	325%	326%	327%	324%	324%	324%	324%	324%	325%	325%	325%	326%	325%	325%	325%	324%	324%	324%	324%	324%	325%	324%	325%	325%	325%	325%	325%	324%

PROJECTED CASH FLOW STATEMENT **Unit: million AMD**

Description	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
SOURCES OF FUNDS																																									
A Internal Cash Generation																																									
1. Net Income	-25.37	-0.04	-0.07	-0.80	-1.35	-1.63	-6.05	-4.87	-4.81	-4.75	-4.69	-3.11	-2.94	-2.76	-2.57	-2.38	-2.20	-2.01	-1.81	-1.60	-1.40	-1.17	-0.94	-0.72	-0.48	-0.24	0.01	0.26	0.51	0.78	1.06	1.34	1.62	1.93	2.23	2.55	2.86	3.20	3.54	3.89	4.24
2. Depreciation cost	154.70	0.00	0.00	0.00	0.00	0.00	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42
3. Interest Paid	49.45	0.04	0.07	0.88	1.71	2.09	2.10	2.10	2.10	2.10	2.10	2.10	2.04	1.98	1.92	1.86	1.79	1.73	1.67	1.60	1.54	1.47	1.40	1.34	1.27	1.20	1.13	1.06	0.99	0.92	0.84	0.77	0.70	0.62	0.55	0.47	0.40	0.32	0.24	0.16	0.08
Sub-total	178.78	0.00	0.00	0.08	0.36	0.46	0.47	1.65	1.71	1.77	1.83	3.41	3.52	3.64	3.77	3.90	4.01	4.14	4.28	4.42	4.56	4.72	4.88	5.04	5.21	5.38	5.56	5.74	5.92	6.12	6.32	6.53	6.74	6.97	7.20	7.44	7.68	7.94	8.20	8.47	8.74
B Finances																																									
1. Project Loan	210.25	3.91	2.79	80.95	83.50	38.07	0.58	0.45																																	
2. Local fund	70.43	1.29	0.91	27.42	28.10	12.58	0.07	0.06																																	
Sub-total	280.68	5.20	3.70	108.37	111.60	50.65	0.65	0.51																																	
C Subsidy from Government																																									
1. Subsidy for O&M cost	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Subsidy for debt services	81.90	0.04	0.07	0.80	1.35	1.63	1.63	0.45	0.39	0.33	0.27	4.73	4.62	4.51	4.38	4.25	4.13	4.01	3.87	3.73	3.59	3.43	3.26	3.11	2.94	2.77	2.59	2.41	2.23	2.03	1.82	1.62	1.41	1.17	0.95	0.70	0.47	0.21	0.00	0.00	0.00
Sub-total	81.90	0.04	0.07	0.80	1.35	1.63	1.63	0.45	0.39	0.33	0.27	4.73	4.62	4.51	4.38	4.25	4.13	4.01	3.87	3.73	3.59	3.43	3.26	3.11	2.94	2.77	2.59	2.41	2.23	2.03	1.82	1.62	1.41	1.17	0.95	0.70	0.47	0.21	0.00	0.00	0.00
Total Cash Inflow	541.36	5.24	3.77	109.25	113.31	52.74	2.75	2.61	2.10	2.10	2.10	8.14	8.14	8.15	8.15	8.15	8.14	8.15	8.15	8.15	8.15	8.15	8.14	8.15	8.15	8.15	8.15	8.15	8.15	8.15	8.14	8.15	8.15	8.14	8.15	8.14	8.15	8.15	8.20	8.47	8.74
APPLICATION OF FUNDS																																								
D Project disbursement	280.68	5.20	3.70	108.37	111.60	50.65	0.65	0.51																																	
E Total debt services																																									
1. Loan repayment	210.27											6.04	6.10	6.17	6.23	6.29	6.35	6.42	6.48	6.55	6.61	6.68	6.74	6.81	6.88	6.95	7.02	7.09	7.16	7.23	7.30	7.38	7.45	7.52	7.60	7.67	7.75	7.83	7.91	7.99	8.07
2. Interest paid	49.45	0.04	0.07	0.88	1.71	2.09	2.10	2.10	2.10	2.10	2.10	2.10	2.04	1.98	1.92	1.86	1.79	1.73	1.67	1.60	1.54	1.47	1.40	1.34	1.27	1.20	1.13	1.06	0.99	0.92	0.84	0.77	0.70	0.62	0.55	0.47	0.40	0.32	0.24	0.16	0.08
Sub-total	259.72	0.04	0.07	0.88	1.71	2.09	2.10	2.10	2.10	2.10	2.10	8.14	8.14	8.15	8.15	8.15	8.14	8.15	8.15	8.15	8.15	8.15	8.14	8.15	8.15	8.15	8.15	8.15	8.15	8.15	8.14	8.15	8.15	8.14	8.15	8.14	8.15	8.15	8.15	8.15	8.15
Total Cash Outflow	540.40	5.24	3.77	109.25	113.31	52.74	2.75	2.61	2.10	2.10	2.10	8.14	8.14	8.15	8.15	8.15	8.14	8.15	8.15	8.15	8.15	8.15	8.14	8.15	8.15	8.15	8.15	8.15	8.15	8.15	8.14	8.15	8.15	8.14	8.15	8.14	8.15	8.15	8.15	8.15	8.15
F Net Surplus Cash (A+C2)-E	0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.32	0.59
Investment Cost Recovery Ratio (%)																																								
Cost recovery by water fee (A/E)	69%	0%	0%	9%	21%	22%	22%	79%	81%	84%	87%	42%	43%	45%	46%	48%	49%	51%	53%	54%	56%	58%	60%	62%	64%	66%	68%	70%	73%	75%	78%	80%	83%	86%	88%	91%	94%	97%	101%	104%	107%
Cost recovery by water fee + subsidy ((A+C2)/E)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	101%	104%	107%

GEGHARKUNIK MARZ
Marutuni District
No 37 Shatvan

FINANCIAL ANALYSIS

A COST RECOVERY ANALYSIS

	Item	Millon AMD	Rate
1	**Revenue**		
	Water fee revenue	264.45	76.4%
	Subsidy	81.90	23.6%
	Total	346.35	100.0%
2	**Expenditure**		
	OM cost	85.67	24.7%
	Loan repayment	210.27	60.7%
	Interest paid	49.45	14.3%
	Surplus cash	0.96	0.3%
	Total	346.35	100.0%

B. FIRR CALCULATION **Unit: million AMD**

Description	Total	Year																																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A COST																																								
1. Investment Cost	188.14	3.82	2.73	73.93	73.95	32.76	0.53	0.42																																
2. Operation and Maintenance Cost																																								
Salary	9.12			0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Chlorine	6.69			0.07	0.14	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Electricity	0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mantenance cost	28.29			0.31	0.62	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Pump replacement	0.00																0.00															0.00								
Sub-total	44.10			0.62	1.00	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18
Total Outflow	232.24	3.82	2.73	74.55	74.95	33.94	1.71	1.60	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18
B BENEFIT																																							
1. Water Tariff	166.01	0.00	0.00	0.70	1.40	1.71	1.76	2.98	3.08	3.19	3.29	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93	4.93
2. Subsidy	41.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.63	2.58	2.53	2.46	2.39	2.34	2.28	2.20	2.13	2.05	1.96	1.86	1.77	1.67	1.57	1.46	1.35	1.24	1.11	0.98	0.85	0.71	0.55	0.40	0.23	0.07	0.00	0.00	0.00
Total Inflow	207.38	0.00	0.00	0.70	1.40	1.71	1.76	2.98	3.08	3.19	3.29	7.56	7.51	7.46	7.39	7.32	7.27	7.21	7.13	7.06	6.98	6.89	6.79	6.70	6.60	6.50	6.39	6.28	6.17	6.04	5.91	5.78	5.64	5.48	5.33	5.16	5.00	4.93	4.93	4.93	4.93
NET BENEFIT	-24.86	-3.82	-2.73	-73.8	-73.6	-32.2	0.05	1.38	1.90	2.01	2.11	6.38	6.33	6.28	6.21	6.14	6.09	6.03	5.95	5.88	5.80	5.71	5.61	5.52	5.42	5.32	5.21	5.10	4.99	4.86	4.73	4.60	4.46	4.30	4.15	3.98	3.82	3.75	3.75	3.75	3.75

FIRR = **-0.72%**

C. SENSITIVITY ANALYSIS

No.		Description	PV 1.75%	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	1	Capital cost 10% up	-83.35	-4.20	-3.00	-81.2	-80.9	-35.5	0.00	1.34	1.90	2.01	2.11	6.38	6.33	6.28	6.21	6.14	6.09	6.03	5.95	5.88	5.80	5.71	5.61	5.52	5.42	5.32	5.21	5.10	4.99	4.86	4.73	4.60	4.46	4.30	4.15	3.98	3.82	3.75	3.75	3.75	3.75
	2	Capital cost 20% up	-101.00	-4.58	-3.28	-88.6	-88.3	-38.8	-0.06	1.30	1.90	2.01	2.11	6.38	6.33	6.28	6.21	6.14	6.09	6.03	5.95	5.88	5.80	5.71	5.61	5.52	5.42	5.32	5.21	5.10	4.99	4.86	4.73	4.60	4.46	4.30	4.15	3.98	3.82	3.75	3.75	3.75	3.75
2	1	OM cost 10% up	-68.78	-3.82	-2.73	-73.9	-73.7	-32.3	-0.07	1.26	1.78	1.89	1.99	6.26	6.21	6.16	6.09	6.02	5.97	5.91	5.83	5.76	5.68	5.59	5.49	5.40	5.30	5.20	5.09	4.98	4.87	4.74	4.61	4.48	4.34	4.18	4.03	3.86	3.70	3.63	3.63	3.63	3.63
	2	OM cost 20% up	-71.86	-3.82	-2.73	-74.0	-73.8	-32.5	-0.19	1.14	1.66	1.77	1.87	6.14	6.09	6.04	5.97	5.90	5.85	5.79	5.71	5.64	5.56	5.47	5.37	5.28	5.18	5.08	4.97	4.86	4.75	4.62	4.49	4.36	4.22	4.06	3.91	3.74	3.58	3.51	3.51	3.51	3.51
3	1	Revenue 10% down	-79.86	-3.82	-2.73	-73.9	-73.7	-32.4	-0.13	1.08	1.59	1.69	1.78	5.62	5.58	5.53	5.47	5.41	5.36	5.31	5.24	5.17	5.10	5.02	4.93	4.85	4.76	4.67	4.57	4.47	4.37	4.26	4.14	4.02	3.90	3.75	3.62	3.46	3.32	3.26	3.26	3.26	3.26
	2	Revenue 20% down	-94.01	-3.82	-2.73	-74.0	-73.8	-32.6	-0.30	0.78	1.28	1.37	1.45	4.87	4.83	4.79	4.73	4.68	4.64	4.59	4.52	4.47	4.40	4.33	4.25	4.18	4.10	4.02	3.93	3.84	3.76	3.65	3.55	3.44	3.33	3.20	3.08	2.95	2.82	2.76	2.76	2.76	2.76

No.		Description	FIRR	Sensitivity indicator	Swiching value
1	1	Capital cost 10% up	-1.19%	-3.95	-25.33%
	2	Capital cost 20% up	-1.60%	-5.53	-18.10%
2	1	OM cost 10% up	-0.85%	-1.58	-63.42%
	2	OM cost 20% up	-0.99%	-2.74	-36.47%
3	1	Revenue 10% down	-1.38%	-4.80	-20.84%
	2	Revenue 20% down	-2.12%	-6.61	-15.13%

No.38 Shorzha

Information on Existing Water Sources (Gegharkunik)

Study for Improvement of Rural Water Supply and Sewage Systems in RA

No.38 Community Shorzha
District Krasnoselsk
Marz Gegharkunik

No	Water source	Latitude			Longitude			Atidute	Yeild(L/sec)		
		deg	min	sec	deg	min	sec	(m)	Min	Max	At site
1	Springs	40	31	4.0	45	17	59.4	2,072	2.5	7.0	7.0
2	bore hole	40	30	17.6	45	16	12.2	1,952	-	-	4.5
3	springs	40	30	57.8	45	18	3.4	2,056	-	-	3.0
4											
5											
6											
7											
8											
9											
10											

Notes:

Latitude, Longitude, Atitude:	*Measured at site*
Yield (Min, Max):	*Interviewed to the Community*
Yield (at site):	*Measured / estimated at site in summer of 2007*

Users Acceptnce for water quality	Acceptable
Notes	
Alternative sources if any	

No.38 Community Shorzha
District Krasnoselsk
Marz Gegharkunik
Sampling date 27/Jul/2007

	Parameters analysed	Units	No.1 Gurgenents aghbyur				Guidelines	
							WHO	Armenia
a	pH		8.2				6.5-8	6.0 - 9.0
b	Temperature	Deg.C	18.2					
c	TDS	Mg/L	206				1000	1000
1	Al:Aluminum	Mg/L	n.d.				0.10	0.50
2	B:Boron	Mg/L	n.d.				0.70	0.50
3	Cl:Chloride	Mg/L	5				250	350
4	Cr:Chrome	Mg/L	0.01				0.05	0.05
5	Cu:Copper	Mg/L	n.d.				2	1
6	F:Fluoride	Mg/L	0.12				1.50	
7	Hardness	Mg/L	405				500	700
8	Fe:Iron	Mg/L	n.d.				0.30	0.30
9	Mn:Manganese	Mg/L	n.d.				0.40	0.10
10	Mo:Molibdenum	Mg/L	<0.02				0.070	0.250
11	Ni:Nickel	Mg/L	0.006				0.020	0.100
12	Nitrate(NO3+)	Mg/L	1.3				50.0	45.0
13	SO4:Sulfate	Mg/L	8.0				250.0	500.0
14	Zn:Zink	Mg/L	n.d.				3.0	5.0
15	As:Arsenic	Mg/L	n.d.				0.0	0.1
16	Ba:Barium	Mg/L	0.01				0.70	0.10
17	Be:Berillium	Mg/L	0.00005				NA	0.00020
18	Cd:Cadmium	Mg/L	0.0001				0.0030	0.0010
19	Pb:Lead	Mg/L	<0.001				0.010	0.030
20	Hg:Mercury	Mg/L	n.d.				0.00100	0.00050
21	Se:Selenium	Mg/L	<0.001				0.010	0.010
22	Sr:Strontium	Mg/L	<0.7				NA	7.0
23	CN:Cyanide	Mg/L	n.d.				0.070	0.035
24	Coli form bacteria	bacteria per 100 ml					-	0
25	Thermo-tolerant coli form bacteria	bacteria per 100 ml					0	0
26	Total bacteria	bacteria per 1 ml					-	50

Information on Existing Water Sources
Existing Bacteriological Test

No.38 Community Shorzha
District Krasnoselsk
Marz Gegharkunik

No.	Month	Date	Total amount of bacteria	Total amount of coliform bacteria	Coliform bacteria tolerant to heat
			nos/1mL	MPN/100mL	nos/100 mL
			Less than 50nos/1mL	Not identified	Not identified
1	02	22	45	-	Not identified
2	02	22	45	-	Not identified
3	03	23	35	-	Not identified
4	03	23	35	-	Not identified
5	04	25	45	-	Not identified
6	04	25	45	-	Not identified
7	05	22	40	-	Not identified
8	05	22	40	-	Not identified
9	06	26	35	-	Not identified
10	06	26	35	-	Not identified
11	07	17	40	-	Not identified
12	07	17	40	-	Not identified
13	08	03	45	-	Not identified
14	08	03	45	-	Not identified

No. 38 **Marz** Gegharkunik **Community** Shorzha

1. ACCESSIBILITY TO THE SITE

No.	Structures	Access by vehicle	Machine construction	Remarks
1	Intake	Difficult	Difficult	
	Intake	Possible	Difficult	
2	Transmission pipeline	Possible	Possible	Pipeline is generally along or close to the road
3	Reservoir	Possible	Possible	

2. INTAKE STRUCTURE

No.	Water source	N	E	El. (m)	Year	Material	Volume (l/s)	Rehabilitation Necessity (Y/N)
1	Spring	40°31′04.0″	45°17′59.4″	2,072	1960	Concrete	7.0	Yes
2	Spring	40°30′57.8″	45°18′03.4″	2,056	1960	Concrete	3.0	No
3	Groundwater	40°30′17.6″	45°16′12.2″	1,952	1997	Concrete	4.5	No

3. TRANSMISSION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Flow rate (l/s)	Year	Leakage	Rehabilitation Necessity (Y/N)
1	1,000	100	Steel	5.0	1960	Medium	Yes
2	4,000	75	Steel				
3	5,000	100	Steel	2.0	1960	Huge	Yes
4	1,000	100	Steel	4.5	1997	Little	No

4. RESERVOIR

No.	N	E	El. (m)	Material	Shape	Dimension (m)	Volume (m3)	Rehabilitation Necessity (Y/N)
1	40°30′12.8″	45°16′27.8″	1,965	Concrete	Rectangular	4x6x4	75	Yes
2	40°30′13.1″	45°16′19.4″	1,951	Steel	Elevated type	-	25	No
3	40°30′06.3″	45°16′05.7″	1,956	Concrete	Rectangular	12x18x4	700	No

5. CHLORINATION EQUIPMENT

No.	Existence (Y/N)	Location	Chlorine type	Chlorine duration
1	No			

6. DISTRIBUTION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Year	Leakage	Rehabilitation Necessity (Y/N)
1	700	50	Steel	1960	Medium	Yes
2	2,600	65	Steel		Medium	Yes
3	1,200	75	Steel		Medium	Yes
4	500	100	Steel		Medium	Yes

7. PUMP STATION

Existence (Y/N)	Power source	Type	Capacity (l/s)	Pump head (m)	Tank cap. (m3)	House size (m)	Rehabilitation Necessity (Y/N)
Yes (1nos)	Commercial	Centrifugal	-	-	-	-	No

8, PUBLIC TAPS

No. of taps	Old one (year)	New one (year)	Valves (Y/N)	Valve rate (%)	Rehabilitation Necessity (Y/N)
7	1960		Yes	100	No

9. DRAINAGE SYSTEM

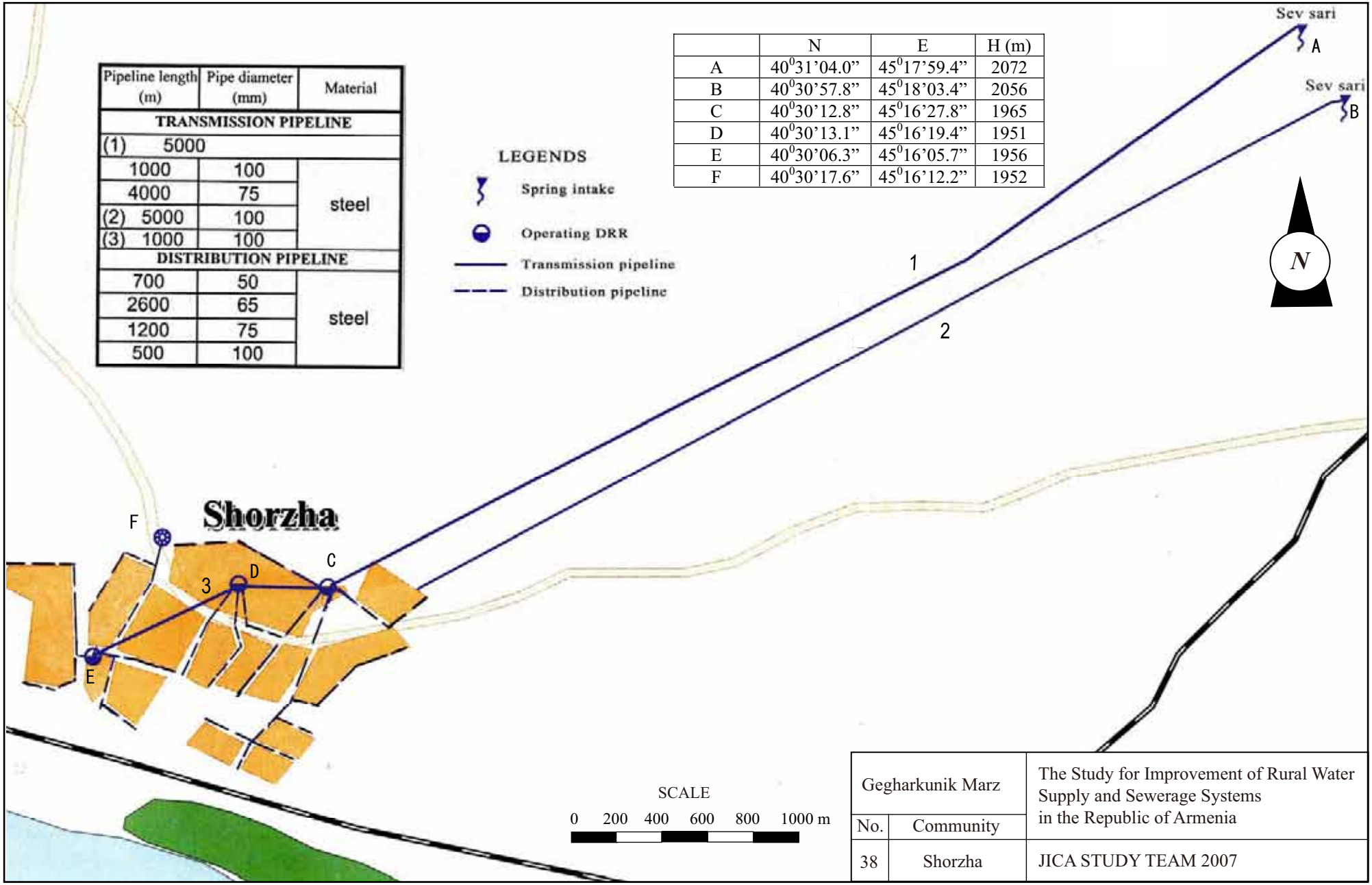
Existence	Rehabilitation	Remarks
No	No	

Questionnaire on Existing Water Supply Conditions by Socio-Economic Survey

Marz	**Gegharkunik**
Number and Name of Community	**No.38 Shorzha**
District	**Kranoseisk**

No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	475
A2	Actual population in 2007	570
A3	Number of households	290
A4.1	Elderly people	110
A4.2	Population in labor force (age from 16 to 62)	325
A4.3	Children	135
A5.1	Pensioners	116
A5.2	Unemployed	12
A5.3	Receiving benefits	84
A6	Average monthly income of household (AMD)	30,000
A7	Number of medical ambulance staion/first and health post	absent
A8	Number of beds in each medical ambulance staion	0
A9	Number of school	1
A10	Number of pupils	87
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	11,400
	Annual Budget of the community 2005, in thousand AMD	17,200
	Annual Budget of the community 2006, in thousand AMD	29,500
	Annual Budget of the community 2007, in thousand AMD	36,100
	Annual Budget of the community 2008, in thousand AMD	is not planned
B2	Amount spent in drinking water sector 2004, in thousand AMD	250
	Amount spent in drinking water sector 2005, in thousand AMD	470
	Amount spent in drinking water sector 2006, in thousand AMD	750
	Amount spent in drinking water sector 2007, in thousand AMD	1,350
	Amount spent in drinking water sector 2008, in thousand AMD	is not planned
C: Socio-Economic Survey		
C1	Major industries of the community:	potatoes, meat, eggs, ceraels, dairy
C2	Is there any community activities carrying out by women? 1-Yes, 2-No	no
D: Water Usage and Water Demand Survey		
D1	Does the community hold water use permit? 1.Yes 2.No	no
D2	Water use permit number	-
D3	Date of expiry of water use permit	-
D4	Planned date of obtaining water use permit	2007
D5	Present condition of the water supply volume of Domestic use	insufficient
D6	Present condition of the water supply volume of Irrigation water	insufficient
D7	Number of house connection to drinking water system	160
D8	How many house connection household set the water meter	0
D9	Number of public taps	8
D10.1	How is the regime of water supply in your community in the dry season?	regularly - 6hrs
D10.2	How is the regime of water supply in your community in the wet season?	regularly - 8hrs
D11	What time of day water is given?	06^{00}-10^{00}, 13^{00}-15^{00}, 08^{00}-11^{00}, 15^{00}-18^{00}, 20^{00}-22^{00}
D12	Are you pleased with duration of domestic water supply?	mainly satis.
D13	Are hours of water supply convenient?	mainly convenient
D14.1	How long the taps are open to provide the domestic water (cooking, washing, foodstuffs, dishes, Landry, bathing, etc) of each houshold a day?	-
D14.2	Estimate quantity of domestic water use of each household (litter per day)	800
D15.1	How long the taps are open to provide the each household for filling	-
D15.2	Estimate quantity of water for filling containers of each household (litter per	800
D16	Drinking water monthly water fee per household	0
D17	How often do you usually pay water fees?	-
D18	Water fee structure 1Flate rate, 2 Having water tariff	-
D19	Where do you acquire the irrigation water?	deep well
D20	Are you satisfied with irrigation water supply volume?	insufficient.
E: Present Operation and Maintenance Works		
E1	Name of responsible for water supply	Iskandaryan Anatoly
E2	Position	administration deputy head
E3	Telephone	with the help of administ. head
E4	Quantity and present condition of the water supply facilities: spring/ intake	7-deteriorated
E5	Quantity and present condition of the water supply facilities: pipeline/transmission	2-deteriorated
E6	Quantity and present condition of the water supply facilities: DRR(Daily Regulatory Reservoir)	3-partially rehabilitated
E7	Quantity and present condition of the water supply facilities: net/distribution	partially rehabilitated
E8	Quantity and present condition of the water supply facilities: public tap	partially rehabilitated
E9	Quantity and present condition of the water supply facilities: pump	2-rehabilitated
E10	Who is the owner of the water supply facilities?	community
E11	Who is engaged in the water supply facilities repairing works?	community
E12	How do you repair the water supply facilities?	by ourselves
E13	Who is in charge of the repair work in the community?	hired specialist fromcommunity
E14	How you prepare O&M costs?	community budget
E15	Please indicate the O&M cost breakdown per year for water supply	
	Electricity (AMD)	350,000
	Labor cost (AMD)	300,000
	Repair cost(AMD)	700,000
	Others(AMD)	0
	Total (AMD)	1,350,000
E16	Do the residents participate in the O&M works?	absent
E17	What kind of OM method is preferable to you?	water fee
F: Initial Environmental Examination (IEE)		
F1	Are any of the following areas located inside or around the project site?	
F1.1	National park, protected area designated by the government (coast line, water lands, reserved are for ethnic or indigenous people, cultural heritage), and areas being considered for national parks or proposed areas.	absent
F1.2	Virgin forests, tropical forests	absent
F1.3	Ecological improvement habits areas (coral reef, mangrove wetland, tidal	absent
F1.4	Habit of valuable species protected by domestic laws or international treaties	absent
F1.5	Likely salts cumulus or soil erosion areas on a massive scale	absent
F1.6	Remarkable desertification trend areas	absent
F1.7	Archaeological historical or cultural valuable areas	absent
F1.8	Living areas of ethic, indigenous people or nomads who have a traditional lifestyle or special socially valuable areas	absent

Gegharkunik
No.38Shorzha



Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
(1) 5000		
1000	100	steel
4000	75	
(2) 5000	100	
(3) 1000	100	
DISTRIBUTION PIPELINE		
700	50	steel
2600	65	
1200	75	
500	100	

	N	E	H (m)
A	$40^0$31'04.0"	$45^0$17'59.4"	2072
B	$40^0$30'57.8"	$45^0$18'03.4"	2056
C	$40^0$30'12.8"	$45^0$16'27.8"	1965
D	$40^0$30'13.1"	$45^0$16'19.4"	1951
E	$40^0$30'06.3"	$45^0$16'05.7"	1956
F	$40^0$30'17.6"	$45^0$16'12.2"	1952

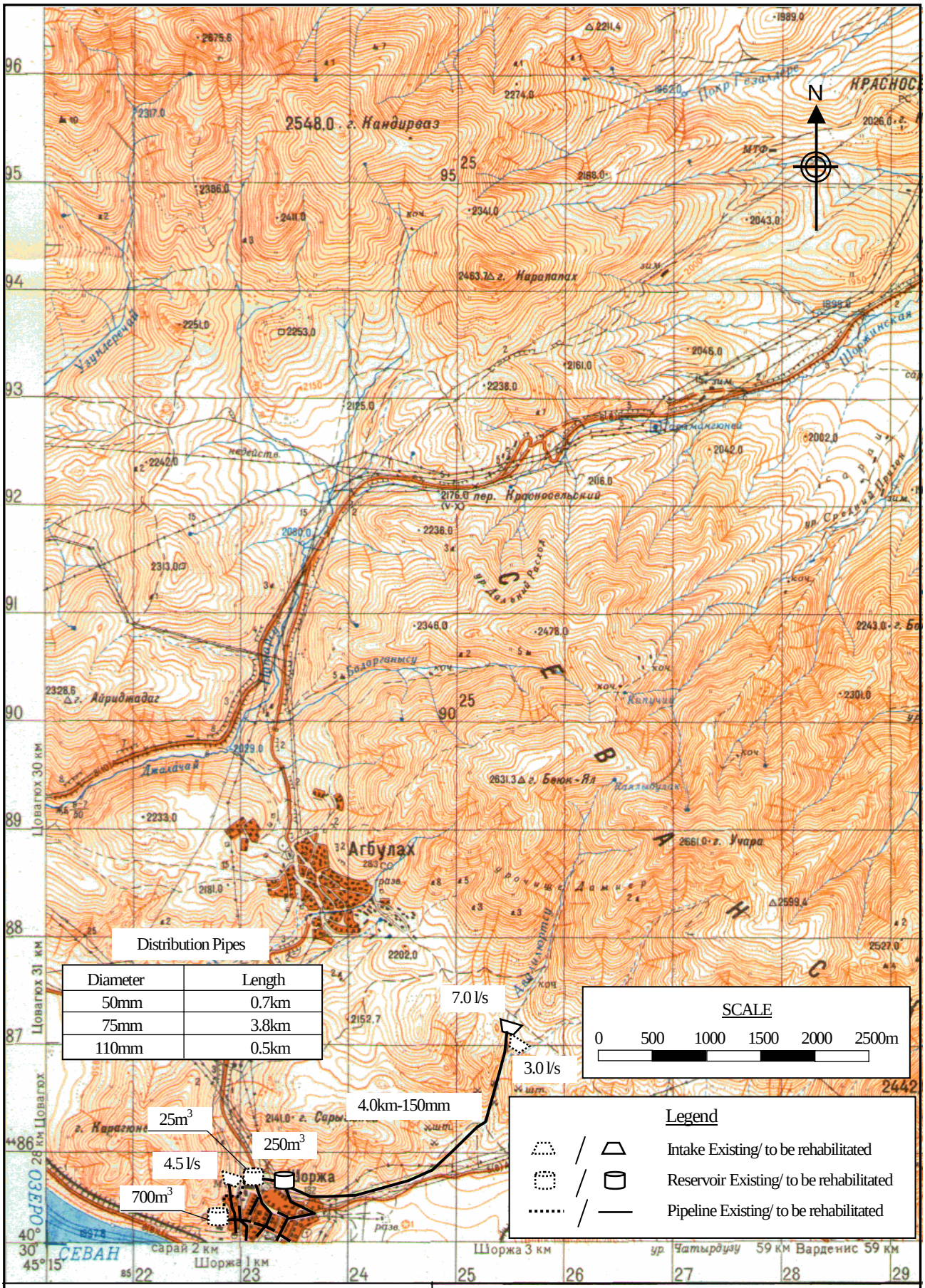
Gegharkunik Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
38	Shorzha	JICA STUDY TEAM 2007

Marz : **Gegharkunik** No.38
Name : **Shorzha**

No.	Item	Quantity	Unit	Water demand (m3/d)	
A.	**WATER DEMAND**				
	1 Population	570	persons	57.0	
	2 Factory	-	nos	0.0	
	3 School (pupils)	87	pupils	0.9	
	4 Medical Ambulance Station	-	nos	-	
	5 Policlinic	-	nos	-	
	6 Livestocks (87lit/household)	290	household	25.2	
	Sub-total			83.1	
	Unaccouted for water (20%)			16.6	
1	Average Daily Water Demand			99.7	m3/day
2	Maximum Daily Water Demand			119.7	m3/day
3	Maximum Hourly Water Demand			16.2	m3/hr

B	**WATER SUPPLY PLAN**						
	1 Water source type	Nr.	Total vol.				
	a Spring	1	7.0	lit/sec		604.8	m3/day
	b Spring	1	3.0	lit/sec		259.2	m3/day
	c Groundwater	1	4.5	lit/sec		388.8	m3/day
`	Total					1,252.8	m3/day
	2 Required reservoir volume					194	m3

C	**WATER SUPPLY FACILITIES REHABILITATION PLAN**			
No	Item	Quantity	Unit	
1	Intake			
	1m3	1	nos	
	2m3		nos	
	3m3		nos	
	4m3		nos	
2	Transmission pipe			
	50mm diameter		m	
	75mm diameter		m	
	90mm diameter		m	
	110mm diameter		m	
	150mm diameter	4,000	m	
	200mm diameter		m	
	250mm diameter		m	
3	Reservoir			
	250m3 capacity	1	nos	For route 2
4	Distribution pipe			
	50mm diameter	700	m	
	75mm diameter	3,800	m	
	90mm diameter		m	
	110mm diameter	500	m	
	150mm diameter		m	
	200mm diameter		m	
	250mm diameter		m	
5	House connection	130	nos	
6	Water meter installation	290	nos	
7	Public tap	3	nos	
8	Chlorination	2	nos	
9	Pumps	-	nos	



Water Supply Facilities Rehabilitation Plan		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
Marz	Gegharkunik	
No. 38	Sharzha	JICA STUDY TEAM

Marz : **Gegharkunik**
No. : **38**
Name : **Shorzha**

No	Item	Specification	Quantity	Unit	Unit Price	Total
1	Intake					
		1m3	1	nos	367,700	367,700
		2m3		nos	545,000	
		3m3		nos	669,100	
		4m3		nos	805,100	
	Sub-total					367,700
2	Transmission Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm		m	8,040	
		110mm		m	9,680	
		150mm	4,000	m	13,140	52,560,000
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					52,560,000
3	Reservoir					
		50m3		nos	8,363,900	
		100m3		nos	12,968,300	
		150m3		nos	18,804,500	
		200m3		nos	22,524,600	
		250m3	1	nos	25,952,800	25,952,800
		300m3		nos	29,630,400	
		350m3		nos	33,528,700	
		400m3		nos	36,388,000	
		450m3		nos	39,392,500	
		500m3		nos	42,520,900	
	Sub-total					25,952,800
4	Distribution Pipe					
		50mm	700	m	5,520	3,864,000
		75mm	3,800	m	7,160	27,208,000
		90mm		m	8,040	
		110mm	500	m	9,680	4,840,000
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					35,912,000
5	House Connection		130	nos	74,000	9,620,000
6	Water Meter Installation		290	nos	80,000	23,200,000
7	Public Tap		3	nos	90,000	270,000
8	Chlorilation Equipment		2	nos	500,000	1,000,000
9	Pump Replacement			nos	10,000,000	
10	Drainage and Sewerage	concrete surface		m	3,600	
	Total				AMD	148,882,500
					Equivalent to USD	487,309
					Equivalent to JPY	51,411,049
					AMD	USD
	Investment Cost per household		290	HH	513,388	1,680
	Investment Cost per person		570	persons	261,197	855

GEGHARKUNIK MARZ
Sevan District
No 38 Shorzha

PROJECTED INCOME STATEMENT **Unit: million AMD**

Description	Unit	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A Water Sales Revenue																																										
Consumption water volume	1000m3/yr		30.3																																							
Unit rate	AMD/m3				120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	120.00	123.96	128.05	132.28	136.64	141.15	145.81	150.62	155.59	160.73	166.03	171.51	177.17	183.01	189.05	195.29	201.74	208.39	215.27	222.38	229.71	237.29	245.13	253.21	261.57	270.20	279.12	288.33	297.84	307.67
Sub-total		189.90	0.00	0.00	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.38	3.50	3.61	3.73	3.85	3.98	4.11	4.25	4.39	4.53	4.68	4.84	5.00	5.16	5.33	5.51	5.69	5.88	6.07	6.27	6.48	6.69	6.91	7.14	7.38	7.62	7.87	8.13	8.40
B Operating Costs																																										
1. Staff salary																																										
Inspectors	person				1																																					
Pump operators	person				1																																					
Base Salary	AMD/m/p				20,000	20,660	21,342	22,046	22,774	23,525	24,301	25,103	25,932	26,788	27,672	28,585	29,528	30,502	31,509	32,549	33,623	34,732	35,879	37,063	38,286	39,549	40,854	42,202	43,595	45,034	46,520	48,055	49,641	51,279	52,971	54,719	56,525	58,390	60,317	62,308	64,364	66,488
Sub-total		35.40			0.48	0.50	0.51	0.53	0.55	0.56	0.58	0.60	0.62	0.64	0.66	0.69	0.71	0.73	0.76	0.78	0.81	0.83	0.86	0.89	0.92	0.95	0.98	1.01	1.05	1.08	1.12	1.15	1.19	1.23	1.27	1.31	1.36	1.40	1.45	1.50	1.54	1.60
2. Chlorine																																										
Pouring volume	kg/yr				182																																					
Unit rate	AMD/kg				600	620	640	661	683	706	729	753	778	804	830	858	886	915	945	976	1009	1042	1076	1112	1149	1186	1226	1266	1308	1351	1396	1442	1489	1538	1589	1642	1696	1752	1810	1869	1931	1995
Sub-total		8.06			0.11	0.11	0.12	0.12	0.12	0.13	0.13	0.14	0.14	0.15	0.15	0.16	0.16	0.17	0.17	0.18	0.18	0.19	0.20	0.20	0.21	0.22	0.22	0.23	0.24	0.25	0.25	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.36
3. Electricity (for pump)		55.78			0.76	0.78	0.81	0.83	0.86	0.89	0.92	0.95	0.98	1.01	1.05	1.08	1.12	1.15	1.19	1.23	1.27	1.31	1.36	1.40	1.45	1.49	1.54	1.60	1.65	1.70	1.76	1.82	1.88	1.94	2.00	2.07	2.14	2.21	2.28	2.36	2.43	2.51
4. Maintenance cost		63.42			0.86	0.89	0.92	0.95	0.98	1.01	1.04	1.08	1.12	1.15	1.19	1.23	1.27	1.31	1.35	1.40	1.45	1.49	1.54	1.59	1.65	1.70	1.76	1.81	1.87	1.94	2.00	2.07	2.13	2.20	2.28	2.35	2.43	2.51	2.59	2.68	2.77	2.86
Pump repair					0.30	0.31	0.32	0.33	0.34	0.35	0.36	0.38	0.39	0.40	0.42	0.43	0.44	0.46	0.47	0.49	0.50	0.52	0.54	0.56	0.57	0.59	0.61	0.63	0.65	0.68	0.70	0.72	0.74	0.77	0.79	0.82	0.85	0.88	0.90	0.93	0.97	1.00
Pipe repair					0.56	0.58	0.60	0.62	0.64	0.66	0.68	0.70	0.73	0.75	0.77	0.80	0.83	0.85	0.88	0.91	0.94	0.97	1.00	1.04	1.07	1.11	1.14	1.18	1.22	1.26	1.30	1.35	1.39	1.44	1.48	1.53	1.58	1.63	1.69	1.74	1.80	1.86
5. Pump replacement		25.65																9.76															15.89									
Sub-total		188.31	0.00	0.00	2.21	2.28	2.36	2.43	2.51	2.59	2.67	2.77	2.86	2.95	3.05	3.16	3.26	13.12	3.47	3.59	3.71	3.82	3.96	4.08	4.23	4.36	4.50	4.65	4.81	4.97	5.13	5.30	21.36	5.65	5.84	6.03	6.24	6.44	6.65	6.88	7.09	7.33
C Gross Income (A-B)		1.59	0.00	0.00	1.07	1.00	0.92	0.85	0.77	0.69	0.61	0.51	0.42	0.43	0.45	0.45	0.47	-9.27	0.51	0.52	0.54	0.57	0.57	0.60	0.61	0.64	0.66	0.68	0.70	0.72	0.75	0.77	-15.09	0.83	0.85	0.88	0.90	0.94	0.97	0.99	1.04	1.07
D Depreciation cost		141.40						4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04
E Interest paid		45.75	0.04	0.07	1.83	1.86	1.88	1.88	1.88	1.88	1.88	1.88	1.89	1.83	1.78	1.72	1.67	1.61	1.55	1.50	1.44	1.38	1.32	1.26	1.20	1.14	1.08	1.01	0.95	0.89	0.82	0.76	0.69	0.63	0.56	0.49	0.42	0.36	0.29	0.22	0.14	0.07
F Net Income		-185.56	-0.04	-0.07	-0.76	-0.86	-0.96	-5.07	-5.15	-5.23	-5.31	-5.41	-5.51	-5.44	-5.37	-5.31	-5.24	-14.92	-5.08	-5.02	-4.94	-4.85	-4.79	-4.70	-4.63	-4.54	-4.46	-4.37	-4.29	-4.21	-4.11	-4.03	-19.82	-3.84	-3.75	-3.65	-3.56	-3.46	-3.36	-3.27	-3.14	-3.04
G Tax and duties		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H Net Income after deduction of TAX		-185.56	-0.04	-0.07	-0.76	-0.86	-0.96	-5.07	-5.15	-5.23	-5.31	-5.41	-5.51	-5.44	-5.37	-5.31	-5.24	-14.92	-5.08	-5.02	-4.94	-4.85	-4.79	-4.70	-4.63	-4.54	-4.46	-4.37	-4.29	-4.21	-4.11	-4.03	-19.82	-3.84	-3.75	-3.65	-3.56	-3.46	-3.36	-3.27	-3.14	-3.04
OM Cost Recovery Ratio (A/B)		101%	0%	0%	149%	144%	139%	135%	131%	127%	123%	118%	115%	115%	115%	114%	114%	29%	115%	114%	115%	115%	114%	115%	114%	115%	115%	115%	115%	114%	115%	115%	29%	115%	115%	115%	114%	115%	115%	114%	115%	115%

PROJECTED CASH FLOW STATEMENT **Unit: million AMD**

Description	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
SOURCES OF FUNDS																																									
A Internal Cash Generation																																									
1. Net Income	-185.56	-0.04	-0.07	-0.76	-0.86	-0.96	-5.07	-5.15	-5.23	-5.31	-5.41	-5.51	-5.44	-5.37	-5.31	-5.24	-14.92	-5.08	-5.02	-4.94	-4.85	-4.79	-4.70	-4.63	-4.54	-4.46	-4.37	-4.29	-4.21	-4.11	-4.03	-19.82	-3.84	-3.75	-3.65	-3.56	-3.46	-3.36	-3.27	-3.14	-3.04
2. Depreciation cost	141.40	0.00	0.00	0.00	0.00	0.00	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04	4.04
3. Interest Paid	45.75	0.04	0.07	1.83	1.86	1.88	1.88	1.88	1.88	1.88	1.88	1.89	1.83	1.78	1.72	1.67	1.61	1.55	1.50	1.44	1.38	1.32	1.26	1.20	1.14	1.08	1.01	0.95	0.89	0.82	0.76	0.69	0.63	0.56	0.49	0.42	0.36	0.29	0.22	0.14	0.07
Sub-total	1.59	0.00	0.00	1.07	1.00	0.92	0.85	0.77	0.69	0.61	0.51	0.42	0.43	0.45	0.45	0.47	-9.27	0.51	0.52	0.54	0.57	0.57	0.60	0.61	0.64	0.66	0.68	0.70	0.72	0.75	0.77	-15.09	0.83	0.85	0.88	0.90	0.94	0.97	0.99	1.04	1.07
B Finances																																									
1. Project Loan	188.80	3.91	2.79	175.98	3.48	1.61	0.58	0.45																																	
2. Local fund	63.41	1.29	0.91	59.62	1.16	0.30	0.07	0.06																																	
Sub-total	252.21	5.20	3.70	235.60	4.64	1.91	0.65	0.51																																	
C Subsidy from Government																																									
1. Subsidy for O&M cost	24.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Subsidy for debt services	208.61	0.04	0.07	0.76	0.86	0.96	1.03	1.11	1.19	1.27	1.37	6.90	6.88	6.87	6.86	6.85	7.31	6.80	6.80	6.78	6.75	6.75	6.72	6.71	6.68	6.66	6.63	6.61	6.60	6.56	6.55	7.31	6.49	6.47	6.43	6.41	6.38	6.35	6.33	6.27	6.24
Sub-total	232.97	0.04	0.07	0.76	0.86	0.96	1.03	1.11	1.19	1.27	1.37	6.90	6.88	6.87	6.86	6.85	16.58	6.80	6.80	6.78	6.75	6.75	6.72	6.71	6.68	6.66	6.63	6.61	6.60	6.56	6.55	22.40	6.49	6.47	6.43	6.41	6.38	6.35	6.33	6.27	6.24
Total Cash Inflow	486.77	5.24	3.77	237.43	6.50	3.79	2.53	2.39	1.88	1.88	1.88	7.32	7.31	7.32	7.31	7.32	7.31	7.31	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.31	7.31	7.32	7.31	7.32	7.31	7.32	7.32	7.31	7.31	7.32	7.32	7.32	7.31	7.31
APPLICATION OF FUNDS																																								
D Project disbursement	252.21	5.20	3.70	235.60	4.64	1.91	0.65	0.51																																	
E Total debt services																																									
1. Loan repayment	188.81											5.43	5.48	5.54	5.59	5.65	5.70	5.76	5.82	5.88	5.94	6.00	6.06	6.12	6.18	6.24	6.30	6.36	6.43	6.49	6.56	6.62	6.69	6.76	6.82	6.89	6.96	7.03	7.10	7.17	7.24
2. Interest paid	45.75	0.04	0.07	1.83	1.86	1.88	1.88	1.88	1.88	1.88	1.88	1.89	1.83	1.78	1.72	1.67	1.61	1.55	1.50	1.44	1.38	1.32	1.26	1.20	1.14	1.08	1.01	0.95	0.89	0.82	0.76	0.69	0.63	0.56	0.49	0.42	0.36	0.29	0.22	0.14	0.07
Sub-total	234.56	0.04	0.07	1.83	1.86	1.88	1.88	1.88	1.88	1.88	1.88	7.32	7.31	7.32	7.31	7.32	7.31	7.31	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.31	7.31	7.32	7.31	7.32	7.31	7.32	7.32	7.31	7.31	7.32	7.32	7.32	7.31	7.31
Total Cash Outflow	486.77	5.24	3.77	237.43	6.50	3.79	2.53	2.39	1.88	1.88	1.88	7.32	7.31	7.32	7.31	7.32	7.31	7.31	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.32	7.31	7.31	7.32	7.31	7.32	7.31	7.32	7.32	7.31	7.31	7.32	7.32	7.32	7.31	7.31
F Net Surplus Cash (A+C2)-E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Investment Cost Recovery Ratio (%)																																								
Cost recovery by water fee (A/E)	1%	0%	0%	59%	54%	49%	45%	41%	37%	32%	27%	6%	6%	6%	6%	6%	0%	7%	7%	7%	8%	8%	8%	8%	9%	9%	9%	10%	10%	10%	11%	0%	11%	12%	12%	12%	13%	13%	14%	14%	15%
Cost recovery by water fee + subsidy ((A+C2)/E)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

GEGHARKUNIK MARZ
Sevan District
No 38 Shorzha

FINANCIAL ANALYSIS

A COST RECOVERY ANALYSIS

	Item	Millon AMD	Rate
1	**Revenue**		
	Water fee revenue	189.90	44.9%
	Subsidy	232.97	55.1%
	Total	422.87	100.0%
2	**Expenditure**		
	OM cost	188.31	44.5%
	Loan repayment	188.81	44.7%
	Interest paid	45.75	10.8%
	Surplus cash	0.00	0.0%
	Total	422.87	100.0%

B. FIRR CALCULATION **Unit: million AMD**

Description	Total	Year																																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A COST																																								
1. Investment Cost	172.76	3.82	2.73	160.59	3.21	1.46	0.53	0.42																																
2. Operation and Maintenance Cost																																								
Salary	18.24			0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Chlorine	4.18			0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Electricity	28.88			0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Mantenance cost	32.68			0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Pump replacement	12.00																6.00															6.00								
Sub-total	95.98			2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	8.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	8.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21
Total Outflow	268.74	3.82	2.73	162.80	5.42	3.67	2.74	2.63	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	8.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	8.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21
B BENEFIT																																							
1. Water Tariff	124.64	0.00	0.00	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28
2. Subsidy	193.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.01	5.05	5.09	5.14	5.18	14.97	5.25	5.30	5.34	5.37	5.43	5.46	5.51	5.54	5.58	5.62	5.66	5.71	5.74	5.79	21.71	5.86	5.91	5.94	5.99	6.02	6.06	6.11	6.13	6.17
Total Inflow	318.28	0.00	0.00	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	8.29	8.33	8.37	8.42	8.46	18.25	8.53	8.58	8.62	8.65	8.71	8.74	8.79	8.82	8.86	8.90	8.94	8.99	9.02	9.07	24.99	9.14	9.19	9.22	9.27	9.30	9.34	9.39	9.41	9.45
NET BENEFIT	49.54	-3.82	-2.73	-159.5	-2.1	-0.4	0.54	0.65	1.07	1.07	1.07	6.08	6.12	6.16	6.21	6.25	10.04	6.32	6.37	6.41	6.44	6.50	6.53	6.58	6.61	6.65	6.69	6.73	6.78	6.81	6.86	16.78	6.93	6.98	7.01	7.06	7.09	7.13	7.18	7.20	7.24
FIRR =	**1.16%**																																							

C. SENSITIVITY ANALYSIS

No.		Description	PV 1.75%	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	1	Capital cost 10% up	-35.15	-4.20	-3.00	-175.6	-2.5	-0.5	0.49	0.61	1.07	1.07	1.07	6.08	6.12	6.16	6.21	6.25	10.04	6.32	6.37	6.41	6.44	6.50	6.53	6.58	6.61	6.65	6.69	6.73	6.78	6.81	6.86	16.78	6.93	6.98	7.01	7.06	7.09	7.13	7.18	7.20	7.24
	2	Capital cost 20% up	-51.55	-4.58	-3.28	-191.6	-2.8	-0.7	0.43	0.57	1.07	1.07	1.07	6.08	6.12	6.16	6.21	6.25	10.04	6.32	6.37	6.41	6.44	6.50	6.53	6.58	6.61	6.65	6.69	6.73	6.78	6.81	6.86	16.78	6.93	6.98	7.01	7.06	7.09	7.13	7.18	7.20	7.24
2	1	OM cost 10% up	-25.44	-3.82	-2.73	-159.7	-2.4	-0.6	0.32	0.43	0.85	0.85	0.85	5.86	5.90	5.94	5.99	6.03	9.22	6.10	6.15	6.19	6.22	6.28	6.31	6.36	6.39	6.43	6.47	6.51	6.56	6.59	6.64	15.96	6.71	6.76	6.79	6.84	6.87	6.91	6.96	6.98	7.02
	2	OM cost 20% up	-32.13	-3.82	-2.73	-160.0	-2.6	-0.8	0.10	0.21	0.63	0.63	0.63	5.64	5.68	5.72	5.77	5.81	8.40	5.88	5.93	5.97	6.00	6.06	6.09	6.14	6.17	6.21	6.25	6.29	6.34	6.37	6.42	15.14	6.49	6.54	6.57	6.62	6.65	6.69	6.74	6.76	6.80
3	1	Revenue 10% down	-39.96	-3.82	-2.73	-159.8	-2.5	-0.7	0.21	0.32	0.74	0.74	0.74	5.25	5.29	5.32	5.37	5.40	8.22	5.47	5.51	5.55	5.58	5.63	5.66	5.70	5.73	5.76	5.80	5.84	5.88	5.91	5.95	14.28	6.02	6.06	6.09	6.13	6.16	6.20	6.24	6.26	6.30
	2	Revenue 20% down	-61.19	-3.82	-2.73	-160.2	-2.8	-1.0	-0.12	-0.01	0.41	0.41	0.41	4.42	4.45	4.49	4.53	4.56	6.39	4.61	4.65	4.69	4.71	4.76	4.78	4.82	4.85	4.88	4.91	4.94	4.98	5.01	5.05	11.78	5.10	5.14	5.17	5.21	5.23	5.26	5.30	5.32	5.35

No.		Description	FIRR		Sensitivity indicator	Swiching value
1	1	Capital cost 10% up	0.72%		6.25	15.99%
	2	Capital cost 20% up	0.32%		26.86	3.72%
2	1	OM cost 10% up	0.95%		2.28	43.89%
	2	OM cost 20% up	0.73%		5.99	16.68%
3	1	Revenue 10% down	0.44%		16.50	6.06%
	2	Revenue 20% down	-0.37%		-41.27	-2.42%

No.39 Jaghatzadzor

Information on Existing Water Sources (Gegharkunik)

Study for Improvement of Rural Water Supply and Sewage Systems in RA

No.39 Community Jaghatzadzor
District Vardenis
Marz Gegharkunik

No	Water source	Latitude			Longitude			Atidute	Yeild(L/sec)		
		deg	min	sec	deg	min	sec	(m)	Min	Max	At site
1	Spring								-	-	1.0
2											
3											
4											
5											
6											
7											
8											
9											
10											

Notes:

Latitude, Longitude, Atitude:	*Measured at site*
Yield (Min, Max):	*Interviewed to the Community*
Yield (at site):	*Measured / estimated at site in summer of 2007*

Users Acceptnce for water quality	Acceptable
Notes	
Alternative sources if any	No alternative sources are available.

No.39 Community Jaghatzadzor
District Vardenis
Marz Gegharkunik
Sampling date 24/Aug/2007

	Parameters analysed	Units	No.1				Guidelines	
							WHO	Armenia
a	pH		8.4				6.5-8	6.0 - 9.0
b	Temperature	Deg.C	13.1					
c	TDS	Mg/L	67				1000	1000
1	Al:Aluminum	Mg/L	n.d				0.10	0.50
2	B:Boron	Mg/L	n.d				0.70	0.50
3	Cl:Chloride	Mg/L	3				250	350
4	Cr:Chrome	Mg/L	<0.01				0.05	0.05
5	Cu:Copper	Mg/L	n.d				2	1
6	F:Fluoride	Mg/L	0.05				1.50	
7	Hardness	Mg/L	130				500	700
8	Fe:Iron	Mg/L	n.d				0.30	0.30
9	Mn:Manganese	Mg/L	n.d				0.40	0.10
10	Mo:Molibdenum	Mg/L	n.d				0.070	0.250
11	Ni:Nickel	Mg/L	n.d				0.020	0.100
12	Nitrate(NO3+)	Mg/L	2.7				50.0	45.0
13	SO4:Sulfate	Mg/L	3.0				250.0	500.0
14	Zn:Zink	Mg/L	n.d				3.0	5.0
15	As:Arsenic	Mg/L	n.d				0.0	0.1
16	Ba:Barium	Mg/L	<0.01				0.70	0.10
17	Be:Berillium	Mg/L	0.00010				NA	0.00020
18	Cd:Cadmium	Mg/L	n.d				0.0030	0.0010
19	Pb:Lead	Mg/L	0.001				0.010	0.030
20	Hg:Mercury	Mg/L	n.d				0.00100	0.00050
21	Se:Selenium	Mg/L	0.001				0.010	0.010
22	Sr:Strontium	Mg/L	<0.7				NA	7.0
23	CN:Cyanide	Mg/L	n.d				0.070	0.035
24	Coli form bacteria	bacteria per 100 ml					-	0
25	Thermo-tolerant coli form bacteria	bacteria per 100 ml					0	0
26	Total bacteria	bacteria per 1 ml					-	50

Information on Existing Water Sources
Existing Bacteriological Test

No.39 Community Jaghatzadzor
District Vardenis
Marz Gegharkunik

No.	Month	Date	Total amount of bacteria	Total amount of coliform bacteria	Coliform bacteria tolerant to heat
			nos/1mL	MPN/100mL	nos/100 mL
			Less than 50nos/1mL	Not identified	Not identified
1	01	16	20	0.3	Not identified
2	02	22	20	0.3	Not identified
3	03	22	24	0.3	Not identified
4	04	19	24	0.3	Not identified
5	05	29	24	0.3	Not identified
6	06	21	26	0.3	Not identified
7	07	16	20	0.3	Not identified
8	07	25	30	0.4	Not identified
9	08	27	20	0.3	Not identified

No. 39 **Marz** Gegharkunik **Community** Jaghatzadzor

1. ACCESSIBILITY TO THE SITE

No.	Structures	Access by vehicle	Machine construction	Remarks
1	Intake	Possible	Possible	
2	Transmission pipeline	Possible	Possible	Pipeline is generally along or close to the road
3	Reservoir	Possible	Possible	

2. INTAKE STRUCTURE

No.	Water source	N	E	El. (m)	Year	Material	Volume (l/s)	Rehabilitation Necessity (Y/N)
1	Spring			-	1960	Concrete	1.0	Yes

3. TRANSMISSION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Flow rate (l/s)	Year	Leakage	Rehabilitation Necessity (Y/N)
1	4,500	100	Steel	1.0	1950	Little	Yes

4. RESERVOIR

No.	N	E	El. (m)	Material	Shape	Dimension (m)	Volume (m3)	Rehabilitation Necessity (Y/N)
1	40°08′45.4″	45°48′39.1″	2,120	Concrete	Rectangular	5x6x2	60	Yes

5. CHLORINATION EQUIPMENT

No.	Existence (Y/N)	Location	Chlorine type	Chlorine duration
1	No			

6. DISTRIBUTION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Year	Leakage	Rehabilitation Necessity (Y/N)
1	150	50	Steel	1960	Huge	Yes

7. PUMP STATION

Existence (Y/N)	Power source	Type	Capacity (l/s)	Pump head (m)	Tank cap. (m3)	House size (m)	Rehabilitation Necessity (Y/N)
No							

8. PUBLIC TAPS

No. of taps	Old one (year)	New one (year)	Valves (Y/N)	Valve rate (%)	Rehabilitation Necessity (Y/N)
6			No	0	Yes

9. DRAINAGE SYSTEM

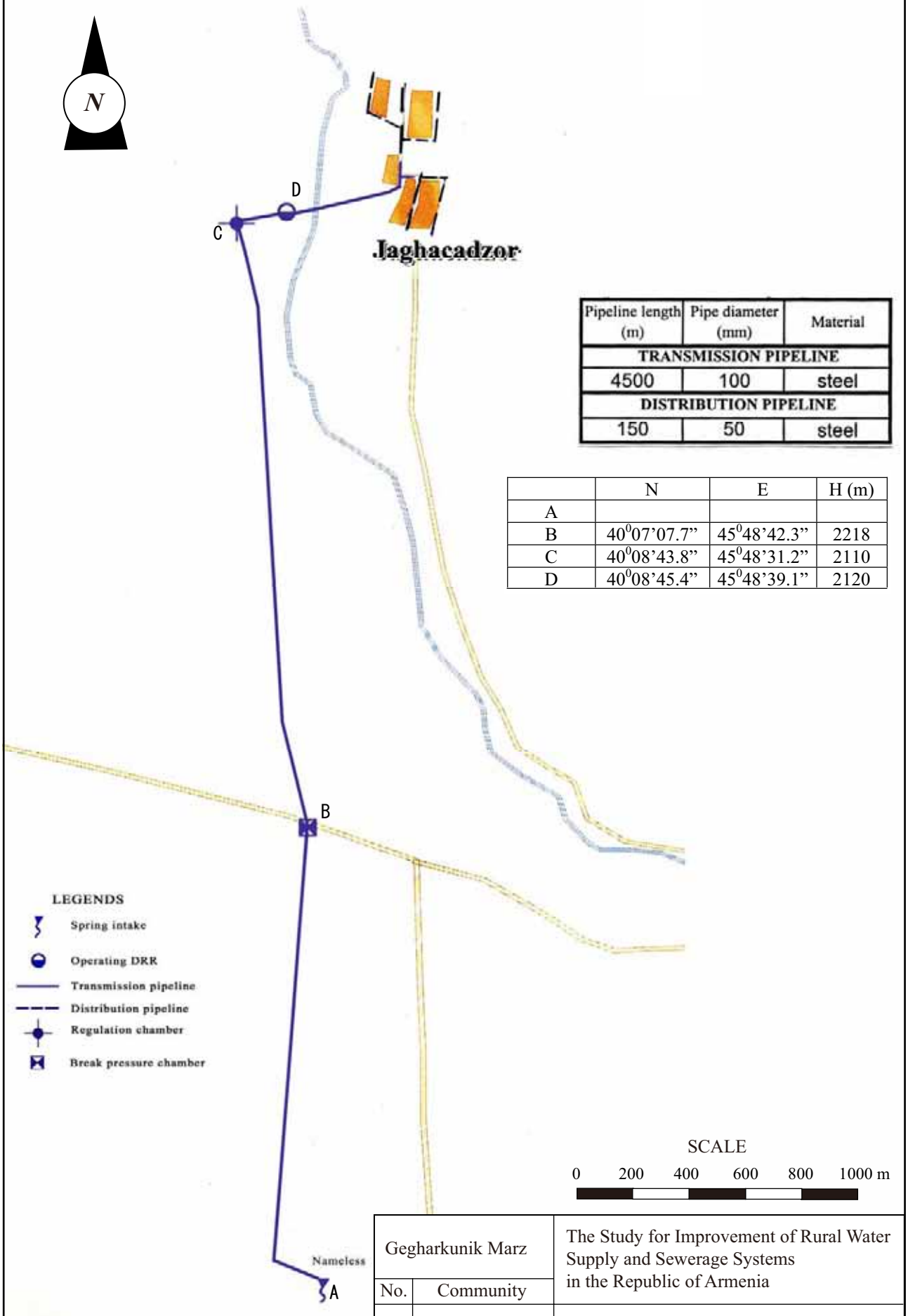
Existence	Rehabilitation	Remarks
No	Yes	

Questionnaire on Existing Water Supply Conditions by Socio-Economic Survey

Marz	**Gegharkunik**
Number and Name of Community	**No.39 Jaghatzadzor**
District	**Vardenis**

No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	196
A2	Actual population in 2007	187
A3	Number of households	87
A4.1	Elderly people	37
A4.2	Population in labor force (age from 16 to 62)	112
A4.3	Children	19
A5.1	Pensioners	19
A5.2	Unemployed	102
A5.3	Receiving benefits	5
A6	Average monthly income of household (AMD)	50,000
A7	Number of medical ambulance staion/first and health post	absent
A8	Number of beds in each medical ambulance staion	0
A9	Number of school	1
A10	Number of pupils	26
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	6,000
	Annual Budget of the community 2005, in thousand AMD	8,300
	Annual Budget of the community 2006, in thousand AMD	8,300
	Annual Budget of the community 2007, in thousand AMD	9,500
	Annual Budget of the community 2008, in thousand AMD	is not planned
B2	Amount spent in drinking water sector 2004, in thousand AMD	0
	Amount spent in drinking water sector 2005, in thousand AMD	0
	Amount spent in drinking water sector 2006, in thousand AMD	0
	Amount spent in drinking water sector 2007, in thousand AMD	0
	Amount spent in drinking water sector 2008, in thousand AMD	is not planned
C: Socio-Economic Survey		
C1	Major industries of the community:	potatoes,cereals, dairy, meat
C2	Is there any community activities carrying out by women? 1-Yes, 2-No	no
D: Water Usage and Water Demand Survey		
D1	Does the community hold water use permit? 1.Yes 2.No	no
D2	Water use permit number	-
D3	Date of expiry of water use permit	-
D4	Planned date of obtaining water use permit	unknown
D5	Present condition of the water supply volume of Domestic use	insufficient
D6	Present condition of the water supply volume of Irrigation water	insufficient
D7	Number of house connection to drinking water system	0
D8	How many house connection household set the water meter	0
D9	Number of public taps	6
D10.1	How is the regime of water supply in your community in the dry season?	24 hrs, sometimes irregularly
D10.2	How is the regime of water supply in your community in the wet season?	24 hrs, sometimes irregularly
D11	What time of day water is given?	-
D12	Are you pleased with duration of domestic water supply?	pleased
D13	Are hours of water supply convenient?	-
D14.1	How long the taps are open to provide the domestic water (cooking, washing, foodstuffs, dishes, Landry, bathing, etc) of each houshold a day?	-
D14.2	Estimate quantity of domestic water use of each household (litter per day)	300
D15.1	How long the taps are open to provide the each household for filling	1 hour
D15.2	Estimate quantity of water for filling containers of each household (litter per	-
D16	Drinking water monthly water fee per household	0
D17	How often do you usually pay water fees?	-
D18	Water fee structure 1Flate rate, 2 Having water tariff	-
D19	Where do you acquire the irrigation water?	from river
D20	Are you satisfied with irrigation water supply volume?	insufficient.
E: Present Operation and Maintenance Works		
E1	Name of responsible for water supply	nobody
E2	Position	
E3	Telephone	
E4	Quantity and present condition of the water supply facilities: spring/ intake	2-deteriorated
E5	Quantity and present condition of the water supply facilities: pipeline/transmission	1-deteriorated
E6	Quantity and present condition of the water supply facilities: DRR(Daily Regulatory Reservoir)	1-deteriorated
E7	Quantity and present condition of the water supply facilities: net/distribution	deteriorated
E8	Quantity and present condition of the water supply facilities: public tap	deteriorated
E9	Quantity and present condition of the water supply facilities: pump	absent
E10	Who is the owner of the water supply facilities?	community
E11	Who is engaged in the water supply facilities repairing works?	community
E12	How do you repair the water supply facilities?	by ourselves
E13	Who is in charge of the repair work in the community?	specialist from community
E14	How you prepare O&M costs?	not collect
E15	Please indicate the O&M cost breakdown per year for water supply	
	Electricity (AMD)	0
	Labor cost (AMD)	0
	Repair cost(AMD)	0
	Others(AMD)	0
	Total (AMD)	0
E16	Do the residents participate in the O&M works?	manpower
E17	What kind of OM method is preferable to you?	residents participation, water fee reduction
F: Initial Environmental Examination (IEE)		
F1	Are any of the following areas located inside or around the project site?	
F1.1	National park, protected area designated by the government (coast line, water lands, reserved are for ethnic or indigenous people, cultural heritage), and areas being considered for national parks or proposed areas.	absent
F1.2	Virgin forests, tropical forests	absent
F1.3	Ecological improvement habits areas (coral reef, mangrove wetland, tidal	absent
F1.4	Habit of valuable species protected by domestic laws or international treaties	absent
F1.5	Likely salts cumulus or soil erosion areas on a massive scale	absent
F1.6	Remarkable desertification trend areas	absent
F1.7	Archaeological historical or cultural valuable areas	absent
F1.8	Living areas of ethic, indigenous people or nomads who have a traditional lifestyle or special socially valuable areas	absent

Gegharkunik
No.39 Jaghatzadzor



Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
4500	100	steel
DISTRIBUTION PIPELINE		
150	50	steel

	N	E	H (m)
A			
B	$40^0$07'07.7"	$45^0$48'42.3"	2218
C	$40^0$08'43.8"	$45^0$48'31.2"	2110
D	$40^0$08'45.4"	$45^0$48'39.1"	2120

SCALE

0 200 400 600 800 1000 m

Gegharkunik Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
39	Jaghacadzor	JICA STUDY TEAM 2007

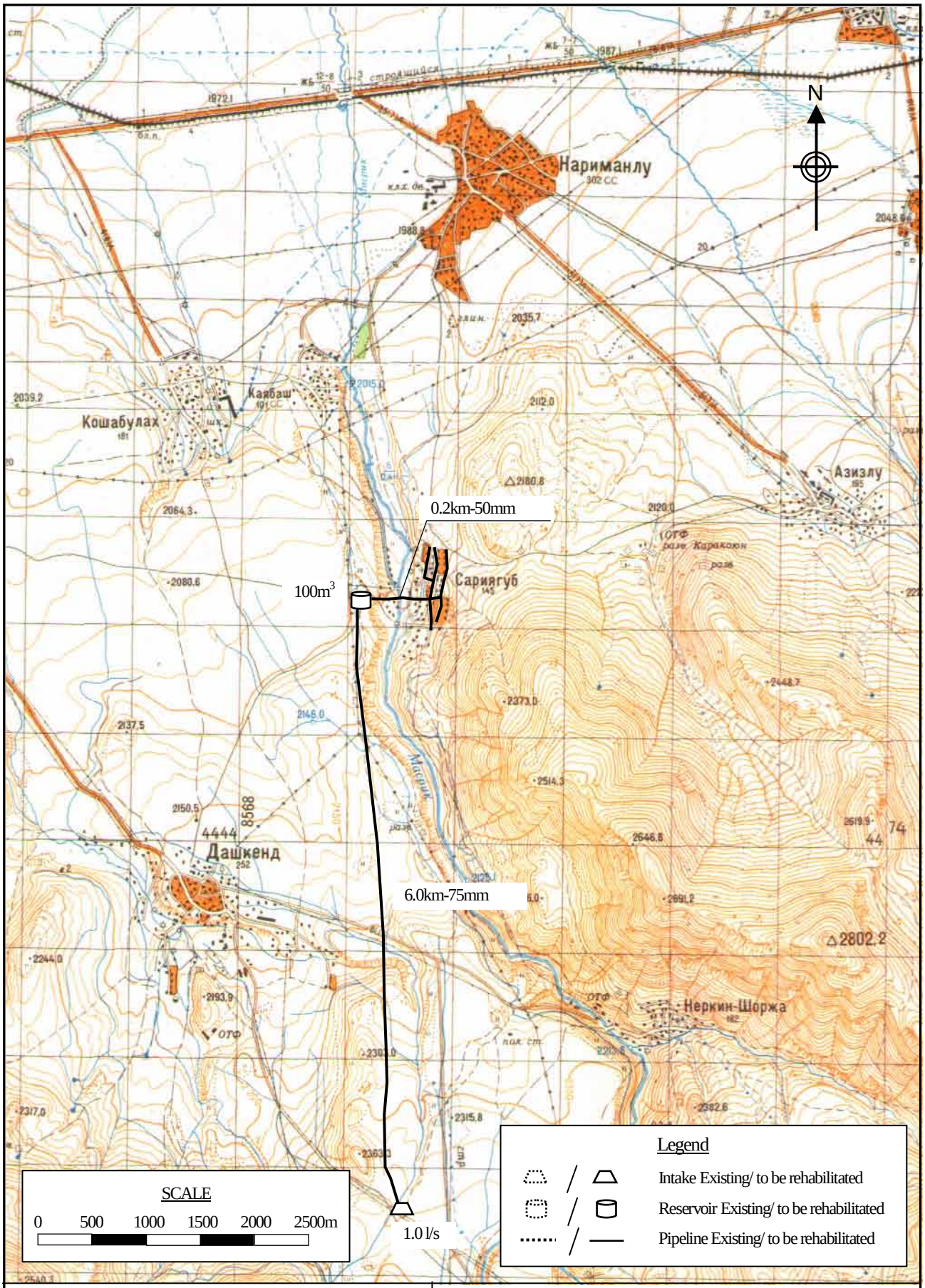
Marz : **Gegharkunik** No.39
Name : **Jaghatzadzor**

No.	Item	Quantity	Unit	Water demand (m3/d)	
A.	**WATER DEMAND**				
	1 Population	187	persons	18.7	
	2 Factory	-	nos	0.0	
	3 School (pupils)	26	pupils	0.3	
	4 Medical Ambulance Station	-	nos	-	
	5 Policlinic	-	nos	-	
	6 Livestocks (87lit/household)	87	household	7.6	
	Sub-total			26.6	
	Unaccouted for water (20%)			5.3	
1	Average Daily Water Demand			31.9	m3/day
2	Maximum Daily Water Demand			38.3	m3/day
3	Maximum Hourly Water Demand			9.3	m3/hr

B	**WATER SUPPLY PLAN**						
	1 Water source type	Nr.	Total vol.				
	a Existing pipeline	1	1.0	lit/sec		86.4	m3/day
`	Total					86.4	m3/day
	2 Required reservoir volume					112	m3

C WATER SUPPLY FACILITIES REHABILITATION PLAN

No	Item	Quantity	Unit
	1 Intake		
	1m3	1	nos
	2m3		nos
	3m3		nos
	4m3		nos
	2 Transmission pipe		
	50mm diameter		m
	75mm diameter	6,000	m
	90mm diameter		m
	110mm diameter		m
	150mm diameter		m
	200mm diameter		m
	250mm diameter		m
	3 Reservoir		
	100m3 capacity	1	nos
	4 Distribution pipe		
	50mm diameter	200	m
	75mm diameter		m
	90mm diameter		m
	110mm diameter		m
	150mm diameter		m
	200mm diameter		m
	250mm diameter		m
	5 House connection	87	nos
	6 Water meter installation	87	nos
	7 Public tap	1	nos
	8 Chlorination	1	nos
	9 Pumps	-	nos



Water Supply Facilities Rehabilitation Plan		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
Marz	Gegharkunik	
No. 39	Jaghatzadzor	JICA STUDY TEAM

Marz : **Gegharkunik**
No. : **39**
Name : **Jaghatzadzor**

No	Item	Specification	Quantity	Unit	Unit Price	Total
1	Intake					
		1m3	1	nos	367,700	367,700
		2m3		nos	545,000	
		3m3		nos	669,100	
		4m3		nos	805,100	
	Sub-total					367,700
2	Transmission Pipe					
		50mm		m	5,520	
		75mm	6,000	m	7,160	42,960,000
		90mm		m	8,040	
		110mm		m	9,680	
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					42,960,000
3	Reservoir					
		50m3		nos	8,363,900	
		100m3	1	nos	12,968,300	12,968,300
		150m3		nos	18,804,500	
		200m3		nos	22,524,600	
		250m3		nos	25,952,800	
		300m3		nos	29,630,400	
		350m3		nos	33,528,700	
		400m3		nos	36,388,000	
		450m3		nos	39,392,500	
		500m3		nos	42,520,900	
	Sub-total					12,968,300
4	Distribution Pipe					
		50mm	200	m	5,520	1,104,000
		75mm		m	7,160	
		90mm		m	8,040	
		110mm		m	9,680	
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					1,104,000
5	House Connection		87	nos	74,000	6,438,000
6	Water Meter Installation		87	nos	80,000	6,960,000
7	Public Tap		1	nos	90,000	90,000
8	Chlorilation Equipment		1	nos	500,000	500,000
9	Pump Replacement			nos	10,000,000	
10	Drainage and Sewerage	concrete surfa	80	m	3,600	288,000
	Total				AMD	71,676,000
					Equivalent to USD	234,603
					Equivalent to JPY	24,750,648
					AMD	USD
	Investment Cost per household		87	HH	823,862	2,697
	Investment Cost per person		187	persons	383,294	1,255

GEGHARKUNIK MARZ
Marutuni District
No 39 Jaghatzadzor

PROJECTED INCOME STATEMENT **Unit: million AMD**

Description	Unit	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A Water Sales Revenue																																										
Consumption water volume	1000m3/yr		9.7																																							
Unit rate	AMD/m3				40.00	40.00	40.00	41.32	70.00	72.31	74.70	77.16	115.65	119.47	123.41	127.48	131.69	136.03	140.52	145.16	149.95	154.90	160.01	165.29	170.75	176.38	182.20	188.21	194.42	200.84	207.47	214.31	221.39	228.69	236.24	244.04	252.09	260.41	269.00	277.88	287.05	296.52
Sub-total		54.15	0.00	0.00	0.14	0.29	0.35	0.36	0.61	0.63	0.65	0.67	1.01	1.04	1.08	1.11	1.15	1.19	1.23	1.27	1.31	1.35	1.40	1.44	1.49	1.54	1.59	1.64	1.70	1.75	1.81	1.87	1.93	2.00	2.06	2.13	2.20	2.28	2.35	2.43	2.51	2.59
B Operating Costs																																									
1. Staff salary																																									
Inspectors	person				1																																				
Pump operators	person				0																																				
Base Salary	AMD/m/p				20,000	20,660	21,342	22,046	22,774	23,525	24,301	25,103	25,932	26,788	27,672	28,585	29,528	30,502	31,509	32,549	33,623	34,732	35,879	37,063	38,286	39,549	40,854	42,202	43,595	45,034	46,520	48,055	49,641	51,279	52,971	54,719	56,525	58,390	60,317	62,308	64,364	66,488
Sub-total		17.70			0.24	0.25	0.26	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.37	0.38	0.39	0.40	0.42	0.43	0.44	0.46	0.47	0.49	0.51	0.52	0.54	0.56	0.58	0.60	0.62	0.64	0.66	0.68	0.70	0.72	0.75	0.77	0.80
2. Chlorine																																									
Pouring volume	kg/yr				59																																				
Unit rate	AMD/kg				600	620	640	661	683	706	729	753	778	804	830	858	886	915	945	976	1009	1042	1076	1112	1149	1186	1226	1266	1308	1351	1396	1442	1489	1538	1589	1642	1696	1752	1810	1869	1931	1995
Sub-total		2.59			0.02	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.11	0.11	0.11	0.12
3. Electricity (for pump)		0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Maintenance cost		11.69			0.07	0.14	0.17	0.18	0.18	0.19	0.19	0.20	0.21	0.21	0.22	0.23	0.24	0.24	0.25	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.36	0.37	0.38	0.40	0.41	0.42	0.44	0.45	0.47	0.48	0.50	0.51	0.53
Pump repair					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pipe repair					0.07	0.14	0.17	0.18	0.18	0.19	0.19	0.20	0.21	0.21	0.22	0.23	0.24	0.24	0.25	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.36	0.37	0.38	0.40	0.41	0.42	0.44	0.45	0.47	0.48	0.50	0.51	0.53
5. Pump replacement		0.00																0.00															0.00										
Sub-total		31.98	0.00	0.00	0.33	0.42	0.47	0.48	0.49	0.51	0.52	0.54	0.57	0.58	0.60	0.62	0.64	0.66	0.69	0.71	0.73	0.76	0.78	0.81	0.84	0.86	0.89	0.92	0.95	0.98	1.01	1.05	1.09	1.12	1.15	1.20	1.23	1.27	1.31	1.36	1.39	1.45
C Gross Income (A-B)		22.17	0.00	0.00	-0.19	-0.13	-0.12	-0.12	0.12	0.12	0.13	0.13	0.44	0.46	0.48	0.49	0.51	0.53	0.54	0.56	0.58	0.59	0.62	0.63	0.65	0.68	0.70	0.72	0.75	0.77	0.80	0.82	0.84	0.88	0.91	0.93	0.97	1.01	1.04	1.07	1.12	1.14
D Depreciation cost		68.25						1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95
E Interest paid		24.08	0.04	0.07	0.44	0.83	1.01	1.02	1.02	1.02	1.02	1.02	1.02	0.99	0.96	0.93	0.90	0.87	0.84	0.81	0.78	0.75	0.71	0.68	0.65	0.62	0.58	0.55	0.51	0.48	0.45	0.41	0.38	0.34	0.30	0.27	0.23	0.19	0.15	0.12	0.08	0.04
F Net Income		-70.16	-0.04	-0.07	-0.63	-0.96	-1.13	-3.09	-2.85	-2.85	-2.84	-2.84	-2.53	-2.48	-2.43	-2.39	-2.34	-2.29	-2.25	-2.20	-2.15	-2.11	-2.04	-2.00	-1.95	-1.89	-1.83	-1.78	-1.71	-1.66	-1.60	-1.54	-1.49	-1.41	-1.34	-1.29	-1.21	-1.13	-1.06	-1.00	-0.91	-0.85
G Tax and duties		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H Net Income after deduction of TAX		-70.16	-0.04	-0.07	-0.63	-0.96	-1.13	-3.09	-2.85	-2.85	-2.84	-2.84	-2.53	-2.48	-2.43	-2.39	-2.34	-2.29	-2.25	-2.20	-2.15	-2.11	-2.04	-2.00	-1.95	-1.89	-1.83	-1.78	-1.71	-1.66	-1.60	-1.54	-1.49	-1.41	-1.34	-1.29	-1.21	-1.13	-1.06	-1.00	-0.91	-0.85
OM Cost Recovery Ratio (A/B)		169%	0%	0%	43%	69%	74%	75%	124%	124%	125%	124%	177%	179%	180%	179%	180%	180%	178%	179%	179%	178%	179%	178%	177%	179%	179%	178%	179%	179%	179%	178%	177%	179%	179%	178%	179%	180%	179%	179%	181%	179%

PROJECTED CASH FLOW STATEMENT **Unit: million AMD**

Description	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
SOURCES OF FUNDS																																									
A Internal Cash Generation																																									
1. Net Income	-70.16	-0.04	-0.07	-0.63	-0.96	-1.13	-3.09	-2.85	-2.85	-2.84	-2.84	-2.53	-2.48	-2.43	-2.39	-2.34	-2.29	-2.25	-2.20	-2.15	-2.11	-2.04	-2.00	-1.95	-1.89	-1.83	-1.78	-1.71	-1.66	-1.60	-1.54	-1.49	-1.41	-1.34	-1.29	-1.21	-1.13	-1.06	-1.00	-0.91	-0.85
2. Depreciation cost	68.25	0.00	0.00	0.00	0.00	0.00	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95
3. Interest Paid	24.08	0.04	0.07	0.44	0.83	1.01	1.02	1.02	1.02	1.02	1.02	1.02	0.99	0.96	0.93	0.90	0.87	0.84	0.81	0.78	0.75	0.71	0.68	0.65	0.62	0.58	0.55	0.51	0.48	0.45	0.41	0.38	0.34	0.30	0.27	0.23	0.19	0.15	0.12	0.08	0.04
Sub-total	22.17	0.00	0.00	-0.19	-0.13	-0.12	-0.12	0.12	0.12	0.13	0.13	0.44	0.46	0.48	0.49	0.51	0.53	0.54	0.56	0.58	0.59	0.62	0.63	0.65	0.68	0.70	0.72	0.75	0.77	0.80	0.82	0.84	0.88	0.91	0.93	0.97	1.01	1.04	1.07	1.12	1.14
B Finances																																									
1. Project Loan	102.19	3.91	2.79	37.73	38.95	17.78	0.58	0.45																																	
2. Local fund	34.42	1.29	0.91	12.78	13.12	6.19	0.07	0.06																																	
Sub-total	136.61	5.20	3.70	50.51	52.07	23.97	0.65	0.51																																	
C Subsidy from Government																																									
1. Subsidy for O&M cost	0.56	0.00	0.00	0.19	0.13	0.12	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Subsidy for debt services	103.56	0.04	0.07	0.44	0.83	1.01	1.02	0.90	0.90	0.89	0.89	3.52	3.50	3.48	3.47	3.45	3.43	3.42	3.40	3.38	3.37	3.34	3.33	3.31	3.28	3.26	3.24	3.21	3.19	3.16	3.14	3.12	3.08	3.05	3.03	2.99	2.95	2.92	2.89	2.84	2.82
Sub-total	104.12	0.04	0.07	0.63	0.96	1.13	1.14	0.90	0.90	0.89	0.89	3.52	3.50	3.48	3.47	3.45	3.43	3.42	3.40	3.38	3.37	3.34	3.33	3.31	3.28	3.26	3.24	3.21	3.19	3.16	3.14	3.12	3.08	3.05	3.03	2.99	2.95	2.92	2.89	2.84	2.82
Total Cash Inflow	262.90	5.24	3.77	50.95	52.90	24.98	1.67	1.53	1.02	1.02	1.02	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96
APPLICATION OF FUNDS																																								
D Project disbursement	136.61	5.20	3.70	50.51	52.07	23.97	0.65	0.51																																	
E Total debt services																																								
1. Loan repayment	102.21											2.94	2.97	3.00	3.03	3.06	3.09	3.12	3.15	3.18	3.21	3.25	3.28	3.31	3.34	3.38	3.41	3.45	3.48	3.51	3.55	3.58	3.62	3.66	3.69	3.73	3.77	3.81	3.84	3.88	3.92
2. Interest paid	24.08	0.04	0.07	0.44	0.83	1.01	1.02	1.02	1.02	1.02	1.02	1.02	0.99	0.96	0.93	0.90	0.87	0.84	0.81	0.78	0.75	0.71	0.68	0.65	0.62	0.58	0.55	0.51	0.48	0.45	0.41	0.38	0.34	0.30	0.27	0.23	0.19	0.15	0.12	0.08	0.04
Sub-total	126.29	0.04	0.07	0.44	0.83	1.01	1.02	1.02	1.02	1.02	1.02	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96
Total Cash Outflow	262.90	5.24	3.77	50.95	52.90	24.98	1.67	1.53	1.02	1.02	1.02	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96	3.96
F Net Surplus Cash (A+C2)-E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Investment Cost Recovery Ratio (%)																																								
Cost recovery by water fee (A/E)	18%	0%	0%	0%	0%	0%	0%	12%	12%	13%	13%	11%	12%	12%	12%	13%	13%	14%	14%	15%	15%	16%	16%	16%	17%	18%	18%	19%	19%	20%	21%	21%	22%	23%	23%	24%	26%	26%	27%	28%	29%
Cost recovery by water fee + subsidy ((A+C2)/E)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

GEGHARKUNIK MARZ
Marutuni District
No 39 Jaghatzadzor

FINANCIAL ANALYSIS

A COST RECOVERY ANALYSIS

	Item	Millon AMD	Rate
1	**Revenue**		
	Water fee revenue	54.15	34.3%
	Subsidy	103.56	65.7%
	Total	157.71	100.0%
2	**Expenditure**		
	OM cost	31.98	20.3%
	Loan repayment	102.21	64.8%
	Interest paid	24.08	15.3%
	Surplus cash	0.00	0.0%
	Total	158.27	100.0%

B. FIRR CALCULATION **Unit: million AMD**

Description	Total	Year																																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A COST																																								
1. Investment Cost	91.98	3.82	2.73	34.52	34.60	15.36	0.53	0.42																																
2. Operation and Maintenance Cost																																								
Salary	9.12			0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Chlorine	1.49			0.02	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Electricity	0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mantenance cost	5.96			0.07	0.13	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Pump replacement	0.00																0.00															0.00									
Sub-total	16.57			0.33	0.40	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
Total Outflow	108.55	3.82	2.73	34.85	35.00	15.80	0.97	0.86	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
B BENEFIT																																								
1. Water Tariff	34.00	0.00	0.00	0.14	0.29	0.35	0.36	0.61	0.63	0.65	0.67	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
2. Subsidy	80.54	0.00	0.00	0.19	0.13	0.12	0.12	0.00	0.00	0.00	0.00	2.50	2.51	2.52	2.54	2.55	2.56	2.58	2.59	2.60	2.62	2.63	2.65	2.66	2.66	2.68	2.69	2.70	2.71	2.71	2.73	2.74	2.74	2.75	2.76	2.76	2.76	2.77	2.77	2.76	2.78
Total Inflow	114.54	0.00	0.00	0.33	0.42	0.47	0.48	0.61	0.63	0.65	0.67	3.51	3.52	3.53	3.55	3.56	3.57	3.59	3.60	3.61	3.63	3.64	3.66	3.67	3.67	3.69	3.70	3.71	3.72	3.72	3.74	3.75	3.75	3.76	3.77	3.77	3.77	3.78	3.78	3.77	3.79
NET BENEFIT	5.99	-3.82	-2.73	-34.5	-34.6	-15.3	-0.49	-0.25	0.19	0.21	0.23	3.07	3.08	3.09	3.11	3.12	3.13	3.15	3.16	3.17	3.19	3.20	3.22	3.23	3.23	3.25	3.26	3.27	3.28	3.28	3.30	3.31	3.31	3.32	3.33	3.33	3.33	3.34	3.34	3.33	3.35

FIRR = **0.29%**

C. SENSITIVITY ANALYSIS

No.		Description	PV 1.75%	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	1	Capital cost 10% up	-31.41	-4.20	-3.00	-38.0	-38.0	-16.9	-0.54	-0.29	0.19	0.21	0.23	3.07	3.08	3.09	3.11	3.12	3.13	3.15	3.16	3.17	3.19	3.20	3.22	3.23	3.23	3.25	3.26	3.27	3.28	3.28	3.30	3.31	3.31	3.32	3.33	3.33	3.33	3.34	3.34	3.33	3.35
	2	Capital cost 20% up	-40.05	-4.58	-3.28	-41.4	-41.5	-18.4	-0.60	-0.33	0.19	0.21	0.23	3.07	3.08	3.09	3.11	3.12	3.13	3.15	3.16	3.17	3.19	3.20	3.22	3.23	3.23	3.25	3.26	3.27	3.28	3.28	3.30	3.31	3.31	3.32	3.33	3.33	3.33	3.34	3.34	3.33	3.35
2	1	OM cost 10% up	-23.94	-3.82	-2.73	-34.6	-34.6	-15.4	-0.53	-0.29	0.15	0.17	0.19	3.03	3.04	3.05	3.07	3.08	3.09	3.11	3.12	3.13	3.15	3.16	3.18	3.19	3.19	3.21	3.22	3.23	3.24	3.24	3.26	3.27	3.27	3.28	3.29	3.29	3.29	3.30	3.30	3.29	3.31
	2	OM cost 20% up	-25.09	-3.82	-2.73	-34.6	-34.7	-15.4	-0.58	-0.34	0.10	0.12	0.14	2.98	2.99	3.00	3.02	3.03	3.04	3.06	3.07	3.08	3.10	3.11	3.13	3.14	3.14	3.16	3.17	3.18	3.19	3.19	3.21	3.22	3.22	3.23	3.24	3.24	3.24	3.25	3.25	3.24	3.26
3	1	Revenue 10% down	-30.30	-3.82	-2.73	-34.6	-34.6	-15.4	-0.54	-0.31	0.13	0.15	0.16	2.72	2.73	2.74	2.76	2.76	2.77	2.79	2.80	2.81	2.83	2.84	2.85	2.86	2.86	2.88	2.89	2.90	2.91	2.91	2.93	2.94	2.94	2.94	2.95	2.95	2.95	2.96	2.96	2.95	2.97
	2	Revenue 20% down	-37.81	-3.82	-2.73	-34.6	-34.7	-15.4	-0.59	-0.37	0.06	0.08	0.10	2.37	2.38	2.38	2.40	2.41	2.42	2.43	2.44	2.45	2.46	2.47	2.49	2.50	2.50	2.51	2.52	2.53	2.54	2.54	2.55	2.56	2.56	2.57	2.58	2.58	2.58	2.58	2.58	2.58	2.59

No.		Description	FIRR	Sensitivity indicator	Swiching value
1	1	Capital cost 10% up	-0.15%	-29.79	-3.36%
	2	Capital cost 20% up	-0.54%	-15.39	-6.50%
2	1	OM cost 10% up	0.21%	3.77	26.52%
	2	OM cost 20% up	0.13%	12.21	8.19%
3	1	Revenue 10% down	-0.28%	-20.47	-4.88%
	2	Revenue 20% down	-0.90%	-13.21	-7.57%

No.40 Semyonovka

Information on Existing Water Sources (Gegharkunik)

Study for Improvement of Rural Water Supply and Sewage Systems in RA

No.40 Community Semyonovka
District Sevan
Marz Gegharkunik

No	Water source	Latitude			Longitude			Atidute	Yeild(L/sec)		
		deg	min	sec	deg	min	sec	(m)	Min	Max	At site
1	Spring	40	39	30.6	44	54	12.0	2,107	-	-	5.0
2											
3											
4											
5											
6											
7											
8											
9											
10											

Notes:

Latitude, Longitude, Atitude: *Measured at site*

Yield (Min, Max): *Interviewed to the Community*

Yield (at site): *Measured / estimated at site in summer of 2007*

Users Acceptnce for water quality	Acceptable
Notes	Springs are located in the center of the community. Internal network is in unsatisfactory condition
Alternative sources if any	There are some free springs at 5km distance from the village.

No.40 Community Semyonovka
District Sevan
Marz Gegharkunik
Sampling date 17/Jul/2007

	Parameters analysed	Units	No.1				Guidelines	
							WHO	Armenia
a	pH		7.29				6.5-8	6.0 - 9.0
b	Temperature	Deg.C	10.8					
c	TDS	Mg/L	98				1000	1000
1	Al:Aluminum	Mg/L	n.d				0.10	0.50
2	B:Boron	Mg/L	n.d				0.70	0.50
3	Cl:Chloride	Mg/L	6				250	350
4	Cr:Chrome	Mg/L	0.01				0.05	0.05
5	Cu:Copper	Mg/L	n.d				2	1
6	F:Fluoride	Mg/L	0.20				1.50	
7	Hardness	Mg/L	175				500	700
8	Fe:Iron	Mg/L	n.d				0.30	0.30
9	Mn:Manganese	Mg/L	n.d				0.40	0.10
10	Mo:Molibdenum	Mg/L	n.d				0.070	0.250
11	Ni:Nickel	Mg/L	n.d				0.020	0.100
12	Nitrate(NO3+)	Mg/L	4.0				50.0	45.0
13	SO4:Sulfate	Mg/L	2.0				250.0	500.0
14	Zn:Zink	Mg/L	n.d				3.0	5.0
15	As:Arsenic	Mg/L	n.d				0.0	0.1
16	Ba:Barium	Mg/L	0.01				0.70	0.10
17	Be:Berillium	Mg/L	n.d				NA	0.00020
18	Cd:Cadmium	Mg/L	n.d				0.0030	0.0010
19	Pb:Lead	Mg/L	0.001				0.010	0.030
20	Hg:Mercury	Mg/L	n.d				0.00100	0.00050
21	Se:Selenium	Mg/L	<0.001				0.010	0.010
22	Sr:Strontium	Mg/L	n.d				NA	7.0
23	CN:Cyanide	Mg/L	n.d				0.070	0.035
24	Coli form bacteria	bacteria per 100 ml					-	0
25	Thermo-tolerant coli form bacteria	bacteria per 100 ml					0	0
26	Total bacteria	bacteria per 1 ml					-	50

Information on Existing Water Sources
Existing Bacteriological Test

No.40 Community Semyunovka
District Sevan
Marz Gegharkunik

No.	Month	Date	Total amount of bacteria	Total amount of coliform bacteria	Coliform bacteria tolerant to heat
			nos/1mL	MPN/100mL	nos/100 mL
			Less than 50nos/1mL	Not identified	Not identified
1	01	08	40	-	Not identified
2	02	13	40	-	Not identified
3	03	27	45	-	Not identified
4	04	17	45	-	Not identified
5	05	15	45	-	Not identified
6	06	13	45	-	Not identified
7	07	24	45	-	Not identified
8	08	14	45	-	Not identified

No. **40** **Marz** Gegharkunik **Community** Semyonovka

1. ACCESSIBILITY TO THE SITE

No.	Structures	Access by vehicle	Machine construction	Remarks
1	Intake	Fair	Possible	
2	Transmission pipeline			There is no pipeline
3	Reservoir			No reservoir

2. INTAKE STRUCTURE

No.	Water source	N	E	El. (m)	Year	Material	Volume (l/s)	Rehabilitation Necessity (Y/N)
1	Spring	40°39′30.6″	44°54′12.0″	2,107	1950	Concrete	5.0	Yes

3. TRANSMISSION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Flow rate (l/s)	Year	Leakage	Rehabilitation Necessity (Y/N)
1	No						

4. RESERVOIR

No.	N	E	El. (m)	Material	Shape	Dimension (m)	Volume (m3)	Rehabilitation Necessity (Y/N)
1	No							

5. CHLORINATION EQUIPMENT

No.	Existence (Y/N)	Location	Chlorine type	Chlorine duration
1	No			

6. DISTRIBUTION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Year	Leakage	Rehabilitation Necessity (Y/N)
1	1,000	80	Steel	1988	Medium	Yes

7. PUMP STATION

Existence (Y/N)	Power source	Type	Capacity (l/s)	Pump head (m)	Tank cap. (m3)	House size (m)	Rehabilitation Necessity (Y/N)
No							

8, PUBLIC TAPS

No. of taps	Old one (year)	New one (year)	Valves (Y/N)	Valve rate (%)	Rehabilitation Necessity (Y/N)
1	1988		No	0	No

9. DRAINAGE SYSTEM

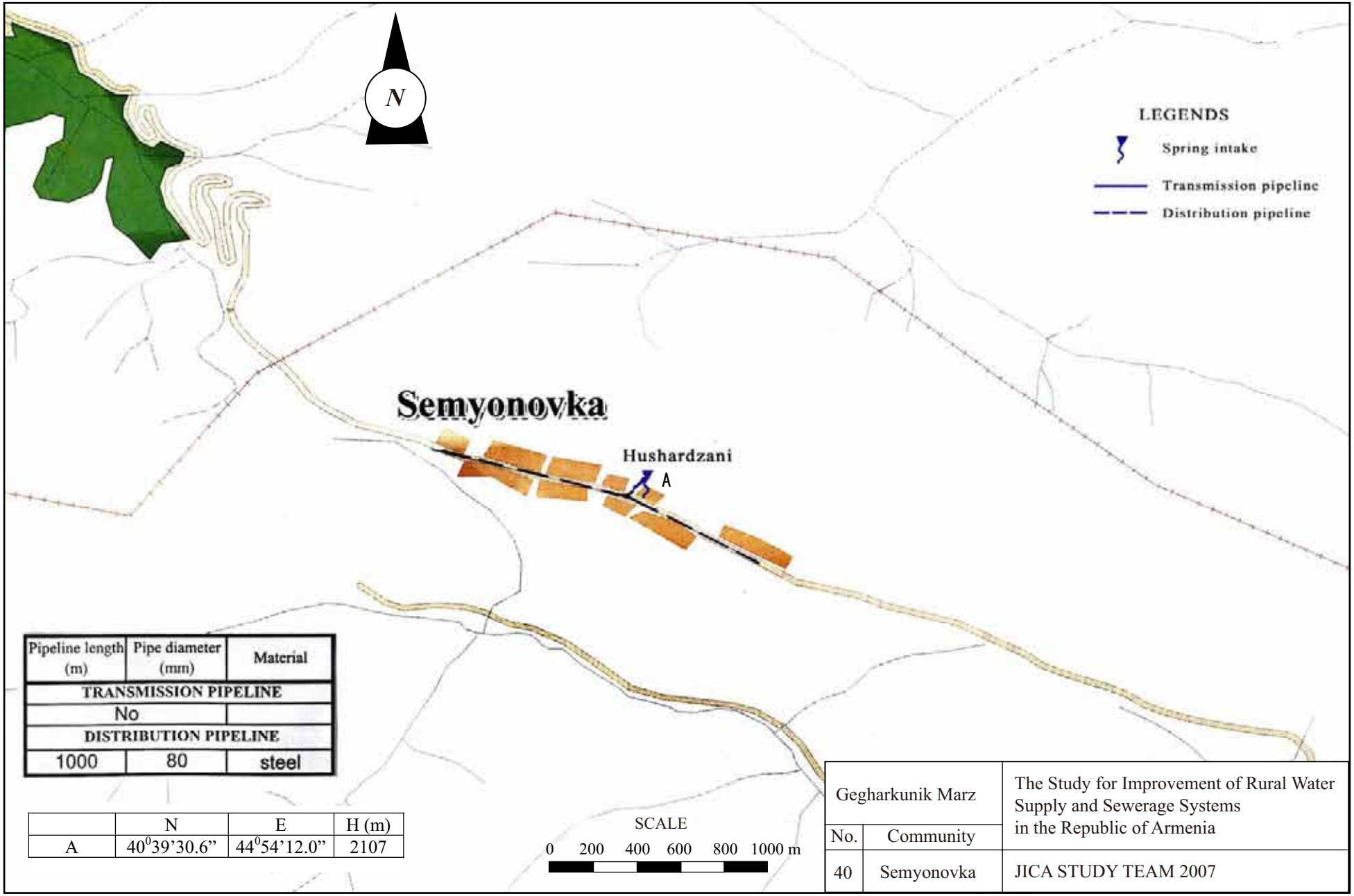
Existence	Rehabilitation	Remarks
No	Yes	

Questionnaire on Existing Water Supply Conditions by Socio-Economic Survey

Marz	**Gegharkunik**
Number and Name of Community	**No.40 Semyonovka**
District	**Sevan**

No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	287
A2	Actual population in 2007	243
A3	Number of households	68
A4.1	Elderly people	38
A4.2	Population in labor force (age from 16 to 62)	126
A4.3	Children	75
A5.1	Pensioners	42
A5.2	Unemployed	0
A5.3	Receiving benefits	5
A6	Average monthly income of household (AMD)	50,000
A7	Number of medical ambulance staion/first and health post	absent
A8	Number of beds in each medical ambulance staion	0
A9	Number of school	1
A10	Number of pupils	36
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	931
	Annual Budget of the community 2005, in thousand AMD	567
	Annual Budget of the community 2006, in thousand AMD	792
	Annual Budget of the community 2007, in thousand AMD	150
	Annual Budget of the community 2008, in thousand AMD	is not planned
B2	Amount spent in drinking water sector 2004, in thousand AMD	1,000
	Amount spent in drinking water sector 2005, in thousand AMD	0
	Amount spent in drinking water sector 2006, in thousand AMD	2,000
	Amount spent in drinking water sector 2007, in thousand AMD	0
	Amount spent in drinking water sector 2008, in thousand AMD	is not planned
C: Socio-Economic Survey		
C1	Major industries of the community:	potatoes, dairy, meat
C2	Is there any community activities carrying out by women? 1-Yes, 2-No	no
D: Water Usage and Water Demand Survey		
D1	Does the community hold water use permit? 1.Yes 2.No	no
D2	Water use permit number	-
D3	Date of expiry of water use permit	-
D4	Planned date of obtaining water use permit	is not planned
D5	Present condition of the water supply volume of Domestic use	insufficient
D6	Present condition of the water supply volume of Irrigation water	absent
D7	Number of house connection to drinking water system	36
D8	How many house connection household set the water meter	0
D9	Number of public taps	1
D10.1	How is the regime of water supply in your community in the dry season?	24 hrs
D10.2	How is the regime of water supply in your community in the wet season?	24 hrs
D11	What time of day water is given?	-
D12	Are you pleased with duration of domestic water supply?	pleased
D13	Are hours of water supply convenient?	-
D14.1	How long the taps are open to provide the domestic water (cooking, washing, foodstuffs, dishes, Landry, bathing, etc) of each houshold a day?	-
D14.2	Estimate quantity of domestic water use of each household (litter per day)	200
D15.1	How long the taps are open to provide the each household for filling	-
D15.2	Estimate quantity of water for filling containers of each household (litter per	300
D16	Drinking water monthly water fee per household	0
D17	How often do you usually pay water fees?	-
D18	Water fee structure 1Flate rate, 2 Having water tariff	-
D19	Where do you acquire the irrigation water?	no irrigation water
D20	Are you satisfied with irrigation water supply volume?	insufficient.
E: Present Operation and Maintenance Works		
E1	Name of responsible for water supply	Vardanyan Aramayis
E2	Position	administration head
E3	Telephone	(093)317535
E4	Quantity and present condition of the water supply facilities: spring/ intake	6-rehabilitated
E5	Quantity and present condition of the water supply facilities: pipeline/transmission	1-partially rehabilitated
E6	Quantity and present condition of the water supply facilities: DRR(Daily Regulatory Reservoir)	absent
E7	Quantity and present condition of the water supply facilities: net/distribution	partially rehabilitated
E8	Quantity and present condition of the water supply facilities: public tap	partially rehabilitated
E9	Quantity and present condition of the water supply facilities: pump	1-deteriorated
E10	Who is the owner of the water supply facilities?	community
E11	Who is engaged in the water supply facilities repairing works?	NGOs
E12	How do you repair the water supply facilities?	by ourselves
E13	Who is in charge of the repair work in the community?	hired specialist fromcommunity
E14	How you prepare O&M costs?	NGOs
E15	Please indicate the O&M cost breakdown per year for water supply	
	Electricity (AMD)	0
	Labor cost (AMD)	0
	Repair cost(AMD)	0
	Others(AMD)	0
	Total (AMD)	0
E16	Do the residents participate in the O&M works?	absent
E17	What kind of OM method is preferable to you?	residents participation, water fee reduction
F: Initial Environmental Examination (IEE)		
F1	Are any of the following areas located inside or around the project site?	
F1.1	National park, protected area designated by the government (coast line, water lands, reserved are for ethnic or indigenous people, cultural heritage), and areas being considered for national parks or proposed areas.	absent
F1.2	Virgin forests, tropical forests	absent
F1.3	Ecological improvement habits areas (coral reef, mangrove wetland, tidal	absent
F1.4	Habit of valuable species protected by domestic laws or international treaties	absent
F1.5	Likely salts cumulus or soil erosion areas on a massive scale	absent
F1.6	Remarkable desertification trend areas	absent
F1.7	Archaeological historical or cultural valuable areas	absent
F1.8	Living areas of ethic, indigenous people or nomads who have a traditional lifestyle or special socially valuable areas	absent

Gegharkunik
No.40Semyonovka



Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
No		
DISTRIBUTION PIPELINE		
1000	80	steel

	N	E	H (m)
A	$40^0$39'30.6"	$44^0$54'12.0"	2107

Gegharkunik Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
40	Semyonovka	JICA STUDY TEAM 2007

Marz : **Gegharkunik** No.40
Name : **Semyonovka**

No.	Item	Quantity	Unit	Water demand (m3/d)	
A.	**WATER DEMAND**				
1	Population	243	persons	24.3	
2	Factory	-	nos	0.0	
3	School (pupils)	36	pupils	0.4	
4	Medical Ambulance Station	-	nos	-	
5	Policlinic	-	nos	-	
6	Livestocks (87lit/household)	68	household	5.9	
	Sub-total			30.6	
	Unaccouted for water (20%)			6.1	
1	Average Daily Water Demand			36.7	m3/day
2	Maximum Daily Water Demand			44.1	m3/day
3	Maximum Hourly Water Demand			9.5	m3/hr

B	**WATER SUPPLY PLAN**						
1	Water source type	Nr.	Total vol.				
a	Spring	1	5.0	lit/sec		432.0	m3/day
`	Total					432.0	m3/day
2	Required reservoir volume					115	m3

C	**WATER SUPPLY FACILITIES REHABILITATION PLAN**		
No	Item	Quantity	Unit
1	Intake		
	1m3	1	nos
	2m3		nos
	3m3		nos
	4m3		nos
2	Transmission pipe		
	50mm diameter		m
	75mm diameter		m
	90mm diameter		m
	110mm diameter		m
	150mm diameter		m
	200mm diameter		m
	250mm diameter		m
3	Reservoir		
	150m3 capacity	1	nos
4	Distribution pipe		
	50mm diameter		m
	75mm diameter		m
	90mm diameter	1,000	m
	110mm diameter		m
	150mm diameter		m
	200mm diameter		m
	250mm diameter		m
5	House connection	32	nos
6	Water meter installation	68	nos
7	Public tap	1	nos
8	Chlorination	1	nos
9	Pumps	-	nos

Water Supply Facilities Rehabilitation Plan		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
Marz	Gegharkunik	
No. 40	Semyonovka	JICA STUDY TEAM

Marz : **Gegharkunik**
No. : **40**
Name : **Semyonovka**

No	Item	Specification	Quantity	Unit	Unit Price	Total
1	Intake					
		1m3	1	nos	367,700	367,700
		2m3		nos	545,000	
		3m3		nos	669,100	
		4m3		nos	805,100	
	Sub-total					367,700
2	Transmission Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm		m	8,040	
		110mm		m	9,680	
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					
3	Reservoir					
		50m3		nos	8,363,900	
		100m3		nos	12,968,300	
		150m3	1	nos	18,804,500	18,804,500
		200m3		nos	22,524,600	
		250m3		nos	25,952,800	
		300m3		nos	29,630,400	
		350m3		nos	33,528,700	
		400m3		nos	36,388,000	
		450m3		nos	39,392,500	
		500m3		nos	42,520,900	
	Sub-total					18,804,500
4	Distribution Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm	1,000	m	8,040	8,040,000
		110mm		m	9,680	
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					8,040,000
5	House Connection		32	nos	74,000	2,368,000
6	Water Meter Installation		68	nos	80,000	5,440,000
7	Public Tap		1	nos	90,000	90,000
8	Chlorilation Equipment		1	nos	500,000	500,000
9	Pump Replacement			nos	10,000,000	
10	Drainage and Sewerage	concrete surfa	400	m	3,600	1,440,000
	Total				AMD	37,050,200
					Equivalent to USD	121,269
					Equivalent to JPY	12,793,912
					AMD	USD
	Investment Cost per household		68	HH	544,856	1,783
	Investment Cost per person		243	persons	152,470	499

GEGHARKUNIK MARZ
Sevan District
No 40 Semyonovka

PROJECTED INCOME STATEMENT **Unit: million AMD**

Description	Unit	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A Water Sales Revenue																																										
Consumption water volume	1000m3/yr		11.2																																							
Unit rate	AMD/m3				40.00	40.00	40.00	41.32	70.00	72.31	74.70	77.16	115.65	119.47	123.41	127.48	131.69	136.03	140.52	145.16	149.95	154.90	160.01	165.29	170.75	176.38	182.20	188.21	194.42	200.84	207.47	214.31	221.39	228.69	236.24	244.04	252.09	260.41	269.00	277.88	287.05	296.52
Sub-total		62.64	0.00	0.00	0.40	0.40	0.40	0.42	0.70	0.73	0.75	0.78	1.16	1.20	1.24	1.28	1.32	1.37	1.41	1.46	1.51	1.56	1.61	1.66	1.72	1.77	1.83	1.89	1.95	2.02	2.09	2.15	2.23	2.30	2.37	2.45	2.53	2.62	2.70	2.79	2.89	2.98
B Operating Costs																																									
1. Staff salary																																									
Inspectors	person				1																																				
Pump operators	person				0																																				
Base Salary	AMD/m/p				20,000	20,660	21,342	22,046	22,774	23,525	24,301	25,103	25,932	26,788	27,672	28,585	29,528	30,502	31,509	32,549	33,623	34,732	35,879	37,063	38,286	39,549	40,854	42,202	43,595	45,034	46,520	48,055	49,641	51,279	52,971	54,719	56,525	58,390	60,317	62,308	64,364	66,488
Sub-total		17.70			0.24	0.25	0.26	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.35	0.37	0.38	0.39	0.40	0.42	0.43	0.44	0.46	0.47	0.49	0.51	0.52	0.54	0.56	0.58	0.60	0.62	0.64	0.66	0.68	0.70	0.72	0.75	0.77	0.80
2. Chlorine																																									
Pouring volume	kg/yr				68																																				
Unit rate	AMD/kg				600	620	640	661	683	706	729	753	778	804	830	858	886	915	945	976	1009	1042	1076	1112	1149	1186	1226	1266	1308	1351	1396	1442	1489	1538	1589	1642	1696	1752	1810	1869	1931	1995
Sub-total		3.00			0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.11	0.11	0.12	0.12	0.12	0.13	0.13	0.14
3. Electricity (for pump)		0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4. Maintenance cost		2.95			0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.10	0.10	0.10	0.11	0.11	0.11	0.12	0.12	0.12	0.13	0.13
Pump repair					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pipe repair					0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.10	0.10	0.10	0.11	0.11	0.11	0.12	0.12	0.12	0.13	0.13
5. Pump replacement		0.00																0.00															0.00									
Sub-total		23.65	0.00	0.00	0.32	0.33	0.34	0.34	0.37	0.38	0.39	0.40	0.41	0.42	0.45	0.46	0.47	0.49	0.50	0.53	0.54	0.56	0.57	0.59	0.62	0.63	0.65	0.68	0.70	0.72	0.74	0.78	0.80	0.82	0.86	0.88	0.91	0.94	0.96	1.00	1.03	1.07
C Gross Income (A-B)		38.99	0.00	0.00	0.08	0.07	0.06	0.08	0.33	0.35	0.36	0.38	0.75	0.78	0.79	0.82	0.85	0.88	0.91	0.93	0.97	1.00	1.04	1.07	1.10	1.14	1.18	1.21	1.25	1.30	1.35	1.37	1.43	1.48	1.51	1.57	1.62	1.68	1.74	1.79	1.86	1.91
D Depreciation cost		35.35						1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
E Interest paid		14.41	0.04	0.07	0.53	0.57	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.58	0.56	0.54	0.52	0.51	0.49	0.47	0.45	0.43	0.42	0.40	0.38	0.36	0.34	0.32	0.30	0.28	0.26	0.24	0.22	0.20	0.18	0.15	0.13	0.11	0.09	0.07	0.05	0.02
F Net Income		-10.77	-0.04	-0.07	-0.45	-0.50	-0.53	-1.52	-1.27	-1.25	-1.24	-1.22	-0.85	-0.81	-0.78	-0.73	-0.68	-0.64	-0.59	-0.55	-0.49	-0.44	-0.39	-0.34	-0.29	-0.23	-0.17	-0.12	-0.06	0.01	0.08	0.12	0.20	0.27	0.32	0.41	0.48	0.56	0.64	0.71	0.80	0.88
G Tax and duties		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H Net Income after deduction of TAX		-10.77	-0.04	-0.07	-0.45	-0.50	-0.53	-1.52	-1.27	-1.25	-1.24	-1.22	-0.85	-0.81	-0.78	-0.73	-0.68	-0.64	-0.59	-0.55	-0.49	-0.44	-0.39	-0.34	-0.29	-0.23	-0.17	-0.12	-0.06	0.01	0.08	0.12	0.20	0.27	0.32	0.41	0.48	0.56	0.64	0.71	0.80	0.88
OM Cost Recovery Ratio (A/B)		265%	0%	0%	125%	121%	118%	124%	189%	192%	192%	195%	283%	286%	276%	278%	281%	280%	282%	275%	280%	279%	282%	281%	277%	281%	282%	278%	279%	281%	282%	276%	279%	280%	276%	278%	278%	279%	281%	279%	281%	279%

PROJECTED CASH FLOW STATEMENT **Unit: million AMD**

Description	Total	Year 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
SOURCES OF FUNDS																																									
A Internal Cash Generation																																									
1. Net Income	-10.77	-0.04	-0.07	-0.45	-0.50	-0.53	-1.52	-1.27	-1.25	-1.24	-1.22	-0.85	-0.81	-0.78	-0.73	-0.68	-0.64	-0.59	-0.55	-0.49	-0.44	-0.39	-0.34	-0.29	-0.23	-0.17	-0.12	-0.06	0.01	0.08	0.12	0.20	0.27	0.32	0.41	0.48	0.56	0.64	0.71	0.80	0.88
2. Depreciation cost	35.35	0.00	0.00	0.00	0.00	0.00	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
3. Interest Paid	14.41	0.04	0.07	0.53	0.57	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.58	0.56	0.54	0.52	0.51	0.49	0.47	0.45	0.43	0.42	0.40	0.38	0.36	0.34	0.32	0.30	0.28	0.26	0.24	0.22	0.20	0.18	0.15	0.13	0.11	0.09	0.07	0.05	0.02
Sub-total	38.99	0.00	0.00	0.08	0.07	0.06	0.08	0.33	0.35	0.36	0.38	0.75	0.78	0.79	0.82	0.85	0.88	0.91	0.93	0.97	1.00	1.04	1.07	1.10	1.14	1.18	1.21	1.25	1.30	1.35	1.37	1.43	1.48	1.51	1.57	1.62	1.68	1.74	1.79	1.86	1.91
B Finances																																									
1. Project Loan	59.41	3.91	2.79	46.59	3.48	1.61	0.58	0.45																																	
2. Local fund	19.56	1.29	0.91	15.77	1.16	0.30	0.07	0.06																																	
Sub-total	78.97	5.20	3.70	62.36	4.64	1.91	0.65	0.51																																	
C Subsidy from Government																																									
1. Subsidy for O&M cost	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Subsidy for debt services	34.82	0.04	0.07	0.45	0.50	0.53	0.51	0.26	0.24	0.23	0.21	1.55	1.53	1.51	1.48	1.45	1.43	1.39	1.37	1.33	1.30	1.27	1.24	1.20	1.16	1.12	1.09	1.05	1.00	0.95	0.93	0.87	0.82	0.80	0.73	0.68	0.62	0.56	0.51	0.45	0.39
Sub-total	34.82	0.04	0.07	0.45	0.50	0.53	0.51	0.26	0.24	0.23	0.21	1.55	1.53	1.51	1.48	1.45	1.43	1.39	1.37	1.33	1.30	1.27	1.24	1.20	1.16	1.12	1.09	1.05	1.00	0.95	0.93	0.87	0.82	0.80	0.73	0.68	0.62	0.56	0.51	0.45	0.39
Total Cash Inflow	152.78	5.24	3.77	62.89	5.21	2.50	1.24	1.10	0.59	0.59	0.59	2.30	2.31	2.30	2.30	2.30	2.31	2.30	2.30	2.30	2.30	2.31	2.31	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.31	2.30	2.30	2.30	2.30	2.30	2.31	2.30
APPLICATION OF FUNDS																																								
D Project disbursement	78.97	5.20	3.70	62.36	4.64	1.91	0.65	0.51																																	
E Total debt services																																								
1. Loan repayment	59.40											1.71	1.73	1.74	1.76	1.78	1.80	1.81	1.83	1.85	1.87	1.89	1.91	1.92	1.94	1.96	1.98	2.00	2.02	2.04	2.06	2.08	2.10	2.13	2.15	2.17	2.19	2.21	2.23	2.26	2.28
2. Interest paid	14.41	0.04	0.07	0.53	0.57	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.58	0.56	0.54	0.52	0.51	0.49	0.47	0.45	0.43	0.42	0.40	0.38	0.36	0.34	0.32	0.30	0.28	0.26	0.24	0.22	0.20	0.18	0.15	0.13	0.11	0.09	0.07	0.05	0.02
Sub-total	73.81	0.04	0.07	0.53	0.57	0.59	0.59	0.59	0.59	0.59	0.59	2.30	2.31	2.30	2.30	2.30	2.31	2.30	2.30	2.30	2.30	2.31	2.31	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.31	2.30	2.30	2.30	2.30	2.30	2.31	2.30
Total Cash Outflow	152.78	5.24	3.77	62.89	5.21	2.50	1.24	1.10	0.59	0.59	0.59	2.30	2.31	2.30	2.30	2.30	2.31	2.30	2.30	2.30	2.30	2.31	2.31	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.31	2.30	2.30	2.30	2.30	2.30	2.31	2.30
F Net Surplus Cash (A+C2)-E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Investment Cost Recovery Ratio (%)																																								
Cost recovery by water fee (A/E)	53%	0%	0%	15%	12%	10%	14%	56%	59%	61%	64%	33%	34%	34%	36%	37%	38%	40%	40%	42%	43%	45%	46%	48%	50%	51%	53%	54%	57%	59%	60%	62%	64%	65%	68%	70%	73%	76%	78%	81%	83%
Cost recovery by water fee + subsidy ((A+C2)/E)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

GEGHARKUNIK MARZ
Sevan District
No 40 Semyonovka

FINANCIAL ANALYSIS

A COST RECOVERY ANALYSIS

	Item	Millon AMD	Rate
1	**Revenue**		
	Water fee revenue	62.64	64.3%
	Subsidy	34.82	35.7%
	Total	97.46	100.0%
2	**Expenditure**		
	OM cost	23.65	24.3%
	Loan repayment	59.40	60.9%
	Interest paid	14.41	14.8%
	Surplus cash	0.00	0.0%
	Total	97.46	100.0%

B. FIRR CALCULATION **Unit: million AMD**

Description	Total	Year																																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
A COST																																								
1. Investment Cost	54.77	3.82	2.73	42.60	3.21	1.46	0.53	0.42																																
2. Operation and Maintenance Cost																																								
Salary	9.12			0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Chlorine	1.52			0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Electricity	0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mantenance cost	1.52			0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Pump replacement	0.00																0.00															0.00								
Sub-total	12.16			0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
Total Outflow	66.93	3.82	2.73	42.92	3.53	1.78	0.85	0.74	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
B BENEFIT																																								
1. Water Tariff	39.38	0.00	0.00	0.40	0.40	0.40	0.42	0.70	0.73	0.75	0.78	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16
2. Subsidy	22.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	0.95	0.95	0.94	0.93	0.92	0.90	0.90	0.88	0.87	0.85	0.84	0.82	0.80	0.78	0.77	0.75	0.72	0.69	0.69	0.65	0.62	0.62	0.58	0.55	0.51	0.47	0.44	0.40	0.37
Total Inflow	61.50	0.00	0.00	0.40	0.40	0.40	0.42	0.70	0.73	0.75	0.78	2.12	2.11	2.11	2.10	2.09	2.08	2.06	2.06	2.04	2.03	2.01	2.00	1.98	1.96	1.94	1.93	1.91	1.88	1.85	1.85	1.81	1.78	1.78	1.74	1.71	1.67	1.63	1.60	1.56	1.53
NET BENEFIT	-5.43	-3.82	-2.73	-42.5	-3.1	-1.4	-0.43	-0.04	0.41	0.43	0.46	1.80	1.79	1.79	1.78	1.77	1.76	1.74	1.74	1.72	1.71	1.69	1.68	1.66	1.64	1.62	1.61	1.59	1.56	1.53	1.53	1.49	1.46	1.46	1.42	1.39	1.35	1.31	1.28	1.24	1.21

FIRR = -0.49%

C. SENSITIVITY ANALYSIS

No.		Description	PV 1.75%	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	1	Capital cost 10% up	-24.21	-4.20	-3.00	-46.8	-3.5	-1.5	-0.48	-0.08	0.41	0.43	0.46	1.80	1.79	1.79	1.78	1.77	1.76	1.74	1.74	1.72	1.71	1.69	1.68	1.66	1.64	1.62	1.61	1.59	1.56	1.53	1.53	1.49	1.46	1.46	1.42	1.39	1.35	1.31	1.28	1.24	1.21
	2	Capital cost 20% up	-29.41	-4.58	-3.28	-51.0	-3.8	-1.7	-0.54	-0.12	0.41	0.43	0.46	1.80	1.79	1.79	1.78	1.77	1.76	1.74	1.74	1.72	1.71	1.69	1.68	1.66	1.64	1.62	1.61	1.59	1.56	1.53	1.53	1.49	1.46	1.46	1.42	1.39	1.35	1.31	1.28	1.24	1.21
2	1	OM cost 10% up	-19.86	-3.82	-2.73	-42.6	-3.2	-1.4	-0.46	-0.07	0.38	0.40	0.43	1.77	1.76	1.76	1.75	1.74	1.73	1.71	1.71	1.69	1.68	1.66	1.65	1.63	1.61	1.59	1.58	1.56	1.53	1.50	1.50	1.46	1.43	1.43	1.39	1.36	1.32	1.28	1.25	1.21	1.18
	2	OM cost 20% up	-20.71	-3.82	-2.73	-42.6	-3.2	-1.4	-0.49	-0.10	0.35	0.37	0.40	1.74	1.73	1.73	1.72	1.71	1.70	1.68	1.68	1.66	1.65	1.63	1.62	1.60	1.58	1.56	1.55	1.53	1.50	1.47	1.47	1.43	1.40	1.40	1.36	1.33	1.29	1.25	1.22	1.18	1.15
3	1	Revenue 10% down	-23.16	-3.82	-2.73	-42.6	-3.2	-1.4	-0.47	-0.11	0.34	0.36	0.38	1.59	1.58	1.58	1.57	1.56	1.55	1.53	1.53	1.52	1.51	1.49	1.48	1.46	1.44	1.43	1.42	1.40	1.37	1.35	1.35	1.31	1.28	1.28	1.25	1.22	1.18	1.15	1.12	1.08	1.06
	2	Revenue 20% down	-27.31	-3.82	-2.73	-42.6	-3.2	-1.5	-0.51	-0.18	0.26	0.28	0.30	1.38	1.37	1.37	1.36	1.35	1.34	1.33	1.33	1.31	1.30	1.29	1.28	1.26	1.25	1.23	1.22	1.21	1.18	1.16	1.16	1.13	1.10	1.10	1.07	1.05	1.02	0.98	0.96	0.93	0.90

No.		Description	FIRR	Sensitivity indicator	Swiching value
1	1	Capital cost 10% up	-0.93%	-4.72	-21.20%
	2	Capital cost 20% up	-1.33%	-6.28	-15.91%
2	1	OM cost 10% up	-0.61%	-1.89	-53.05%
	2	OM cost 20% up	-0.73%	-3.19	-31.37%
3	1	Revenue 10% down	-1.10%	-5.53	-18.09%
	2	Revenue 20% down	-1.78%	-7.23	-13.83%