No.53 Jamshlu

Information on Existing Water Sources (Aragatsotn)

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

No.53 Community Jamshlu
District Aragats
Marz Aragatsotn

No	Water source	Latitude			Longitude			Atidute	Yeild(L/sec)		
		deg	min	sec	deg	min	sec	(m)	Min	Max	At site
1	Spring	40	42	52.2	44	17	27.4	2,134	1.0	3.0	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	The system is in destroyed condition, the community does not receive water in winter :
Alternative sources if any	There is great water stock in the area of these springs.

No.53 Community Jamshlu
District Aragats
Marz Aragatsotn
Sampling date 11/Jul/2007

	Parameters analysed	Units	No.1				Guidelines	
							WHO	Armenia
a	pH		7.1				6.5-8	6.0 - 9.0
b	Temperature	Deg.C	8.4					
c	TDS	Mg/L	148				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	n.d				0.05	0.05
5	Cu:Copper	Mg/L	n.d				2	1
6	F:Fluoride	Mg/L	0.04				1.50	
7	Hardness	Mg/L	315				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	2.2				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	0.04				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	<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.53 Community Jamshlu
District Aragats
Marz Aragatsotn

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	3		4-23	Not Identified	Not Identified
2	4		5-20	Not Identified	Not Identified
3	6		4-23	Not Identified	Not Identified
4	7		3-20	Not Identified	Not Identified
5	8		4-23	Not Identified	Not Identified

No. 53 **Marz** Aragatsotn **Community** Jamshlu

1. ACCESSIBILITY TO THE SITE

No.	Structures	Access by vehicle	Machine construction	Remarks
1	Intake	Fair	Possible	
2	Transmission pipeline	Difficult	Difficult	Pipeline is mostly far from 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°42'52.2″	44°17'27.4″	2,134	1957	reinforced concrete	1.0	Yes

3. TRANSMISSION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Flow rate (l/s)	Year	Leakage	Rehabilitation Necessity (Y/N)
	2,500	250	AsbestosCement			Huge	Yes
1	2,000	150	AsbestosCement	1.0	1957	Huge	Yes

4. RESERVOIR

No.	N	E	El. (m)	Material	Shape	Dimension (m)	Volume (m3)	Rehabilitation Necessity (Y/N)
1	40°41'30.9″	44°16'20.6″	2,083	reinforced concrete	Rectangular	5×10×2.5	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	1,100	100	Steel	1957	Huge	Yes
2	1,200	50	Steel	1957	Huge	Yes
3	200	100	AsbestosCement	1957	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)
13	1957	1996	Yes	50	Yes

9. DRAINAGE SYSTEM

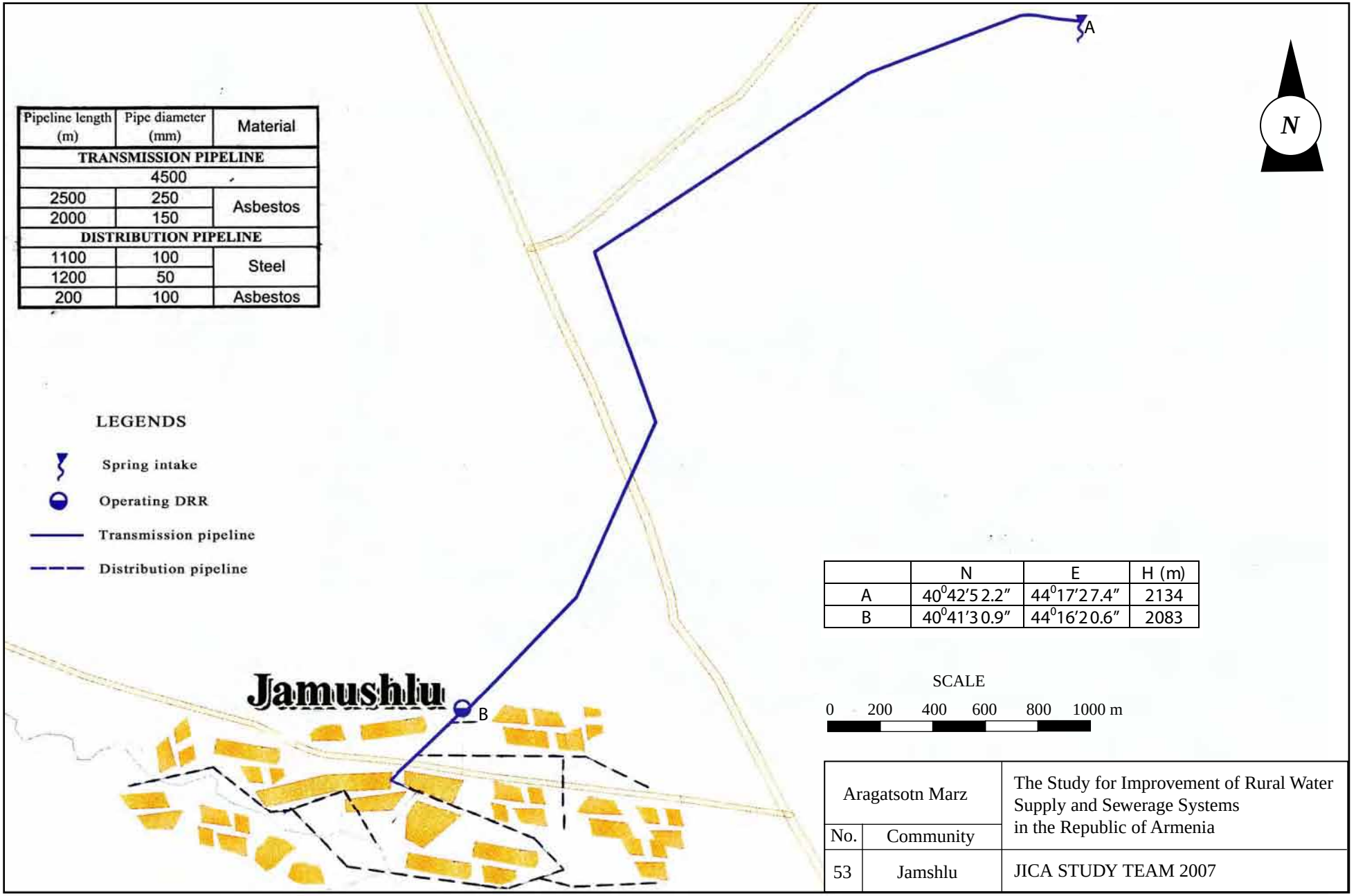
Existence (Y/N)	Rehabilitation Necessity	Remarks
No	Yes	

Questionnaire on Existing Water Supply Conditions by Socio-Economic Survey

Marz	**Aragatsotn**
Number and Name of Community	**No.53 Jamshlu**
District	**Aragats**

No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	283
A2	Actual population in 2007	137
A3	Number of households	75
A4.1	Elderly people	6
A4.2	Population in labor force (age from 16 to 62)	86
A4.3	Children	46
A5.1	Pensioners	17
A5.2	Unemployed	20
A5.3	Receiving benefits	7
A6	Average monthly income of household (AMD)	10,000
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	40
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	1,200
	Annual Budget of the community 2005, in thousand AMD	1,500
	Annual Budget of the community 2006, in thousand AMD	1,300
	Annual Budget of the community 2007, in thousand AMD	1,300
	Annual Budget of the community 2008, in thousand AMD	is not planned.
B2	Amount spent in drinking water sector 2004, in thousand AMD	700
	Amount spent in drinking water sector 2005, in thousand AMD	800
	Amount spent in drinking water sector 2006, in thousand AMD	800
	Amount spent in drinking water sector 2007, in thousand AMD	550
	Amount spent in drinking water sector 2008, in thousand AMD	is not planned.
C: Socio-Economic Survey		
C1	Major industries of the community:	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	2007
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	0
D8	How many house connection household set the water meter	0
D9	Number of public taps	12
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?	irregularly - 14 hrs
D11	What time of day water is given?	-
D12	Are you pleased with duration of domestic water supply?	mainly displeased
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	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?	absent
D20	Are you satisfied with irrigation water supply volume?	is not sufficient
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	absent
E5	Quantity and present condition of the water supply facilities:	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 pipes	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?	residents
E12	How do you repair the water supply facilities?	by ourselves
E13	Who is in charge of the repair work in the community?	volunteers from community
E14	How you prepare O&M costs?	residents
E15	Please indicate the O&M cost breakdown per year for water supply	
	Electricity (AMD)	0
	Labor cost (AMD)	0
	Repair cost(AMD)	800,000
	Others(AMD)	0
	Total (AMD)	800,000
E16	Do the residents participate in the O&M works?	earthwork, manpower
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	yes
F1.6	Remarkable desertification trend areas	yes
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	yes

Aragatsotn
No.53 Jamshlu



Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
4500		
2500	250	Asbestos
2000	150	
DISTRIBUTION PIPELINE		
1100	100	Steel
1200	50	
200	100	Asbestos

	N	E	H (m)
A	40°42′52.2″	44°17′27.4″	2134
B	40°41′30.9″	44°16′20.6″	2083

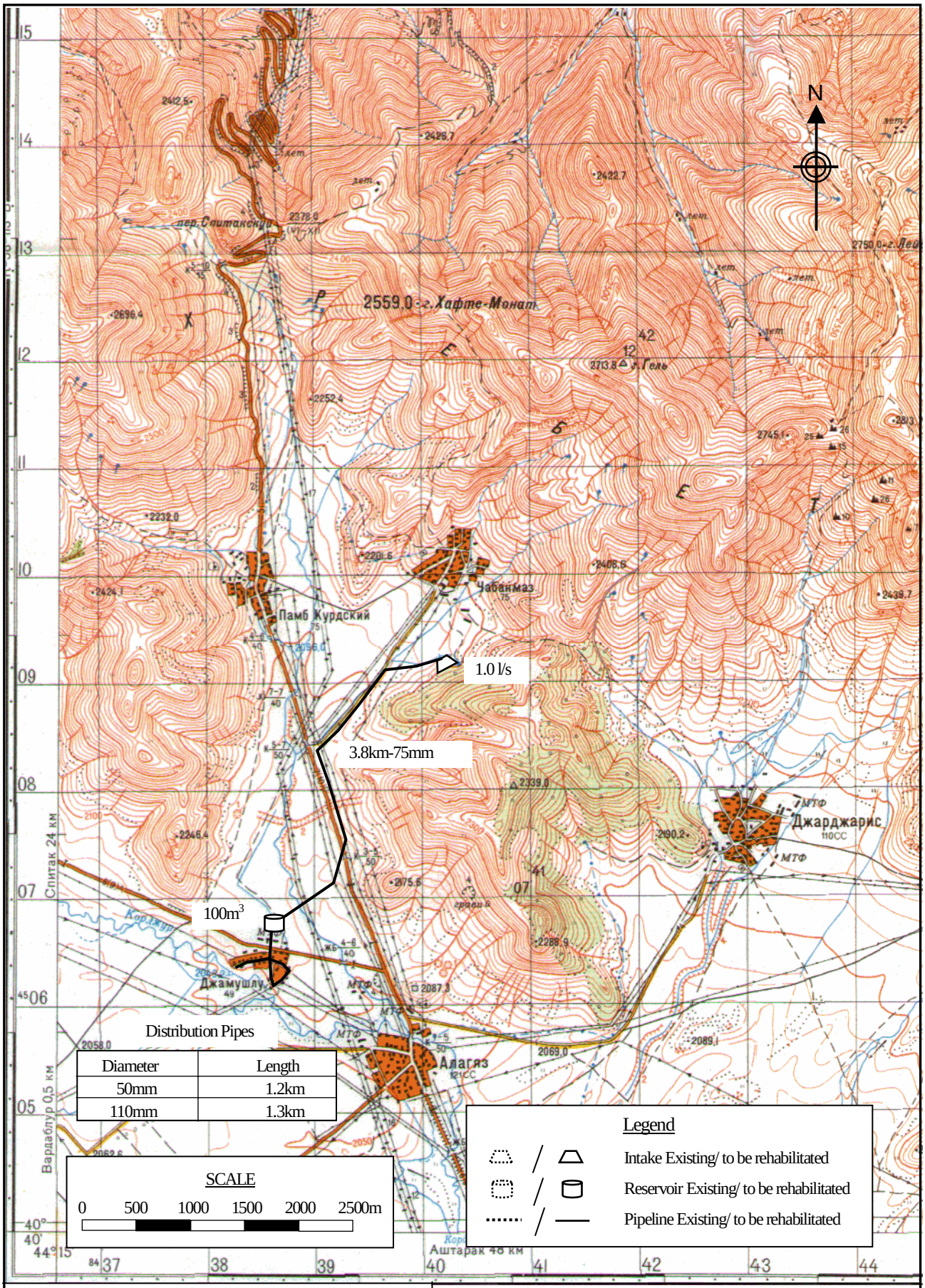
Aragatsotn Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
53	Jamshlu	JICA STUDY TEAM 2007

Marz : **Aragatsotn** No.53
Name : **Jamshlu**

No.	Item	Quantity	Unit	Water demand (m3/d)	
A.	**WATER DEMAND**				
	1 Population	137	persons	13.7	
	2 Factory	-	nos	0.0	
	3 School (pupils)	40	pupils	0.4	
	4 Medical Ambulance Station	-	nos	-	
	5 Policlinic	-	nos	-	
	6 Livestocks (87lit/household)	75	household	6.5	
	Sub-total			20.6	
	Unaccouted for water (20%)			4.1	
1	Average Daily Water Demand			24.7	m3/day
2	Maximum Daily Water Demand			29.7	m3/day
3	Maximum Hourly Water Demand			7.2	m3/hr

B	**WATER SUPPLY PLAN**						
	1 Water source type	Nr.	Total vol.				
	a Spring	1	1.0	lit/sec		86.4	m3/day
`	Total					86.4	m3/day
	2 Required reservoir volume					87	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	3,800	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	1,200	m
	75mm diameter		m
	90mm diameter		m
	110mm diameter	1,300	m
	150mm diameter		m
	200mm diameter		m
	250mm diameter		m
	5 House connection	75	nos
	6 Water meter installation	75	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	Aragatsotn	
No. 53	Jamshlu	JICA STUDY TEAM

Marz : **Aragatsotn**
No. : **53**
Name : **Jamshlu**

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	3,800	m	7,160	27,208,000
		90mm		m	8,040	
		110mm		m	9,680	
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					27,208,000
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	1,200	m	5,520	6,624,000
		75mm		m	7,160	
		90mm		m	8,040	
		110mm	1,300	m	9,680	12,584,000
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					19,208,000
5	House Connection		75	nos	74,000	5,550,000
6	Water Meter Installation		75	nos	80,000	6,000,000
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	1,000	m	3,600	3,600,000
	Total				AMD	75,492,000
					Equivalent to USD	247,093
					Equivalent to JPY	26,068,362
					AMD	USD
	Investment Cost per household		75	HH	1,006,560	3,295
	Investment Cost per person		137	persons	551,036	1,804

ARAGATSOTN MARZ
Aparan District
No 53 Jamshlu

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		7.5																																							
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		41.96	0.00	0.00	0.11	0.22	0.27	0.28	0.47	0.49	0.51	0.52	0.78	0.81	0.84	0.86	0.89	0.92	0.95	0.98	1.01	1.05	1.08	1.12	1.16	1.19	1.23	1.27	1.32	1.36	1.40	1.45	1.50	1.55	1.60	1.65	1.71	1.76	1.82	1.88	1.94	2.01
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				46																																					
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		2.01			0.01	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	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	0.08	0.08	0.08	0.08	0.09	0.09	0.09
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		18.20			0.10	0.21	0.27	0.28	0.28	0.29	0.30	0.31	0.32	0.33	0.35	0.36	0.37	0.38	0.39	0.41	0.42	0.43	0.45	0.46	0.48	0.49	0.51	0.53	0.54	0.56	0.58	0.60	0.62	0.64	0.66	0.68	0.71	0.73	0.75	0.78	0.80	0.83
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					0.1	0.21	0.27	0.28	0.28	0.29	0.30	0.31	0.32	0.33	0.35	0.36	0.37	0.38	0.39	0.41	0.42	0.43	0.45	0.46	0.48	0.49	0.51	0.53	0.54	0.56	0.58	0.60	0.62	0.64	0.66	0.68	0.71	0.73	0.75	0.78	0.80	0.83
5. Pump replacement		0.00																0.00															0.00									
Sub-total		37.91	0.00	0.00	0.35	0.48	0.56	0.57	0.58	0.60	0.62	0.64	0.67	0.69	0.72	0.74	0.76	0.79	0.81	0.84	0.87	0.90	0.93	0.95	0.99	1.01	1.06	1.10	1.12	1.16	1.20	1.25	1.29	1.33	1.37	1.42	1.47	1.51	1.55	1.62	1.66	1.72
C Gross Income (A-B)		4.05	0.00	0.00	-0.24	-0.26	-0.29	-0.29	-0.11	-0.11	-0.11	-0.12	0.11	0.12	0.12	0.12	0.13	0.13	0.14	0.14	0.14	0.15	0.15	0.17	0.17	0.18	0.17	0.17	0.20	0.20	0.20	0.20	0.21	0.22	0.23	0.23	0.24	0.25	0.27	0.26	0.28	0.29
D Depreciation cost		71.75						2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05
E Interest paid		23.46	0.02	0.04	0.42	0.81	0.98	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.94	0.91	0.88	0.85	0.82	0.79	0.76	0.73	0.70	0.66	0.63	0.60	0.57	0.53	0.50	0.47	0.43	0.40	0.37	0.33	0.30	0.26	0.22	0.19	0.15	0.11	0.08	0.04
F Net Income		-91.16	-0.02	-0.04	-0.66	-1.07	-1.27	-3.34	-3.16	-3.16	-3.16	-3.17	-2.94	-2.90	-2.87	-2.84	-2.80	-2.77	-2.73	-2.70	-2.67	-2.63	-2.60	-2.54	-2.51	-2.47	-2.45	-2.41	-2.35	-2.32	-2.28	-2.25	-2.21	-2.16	-2.12	-2.08	-2.03	-1.99	-1.93	-1.90	-1.85	-1.80
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		-91.16	-0.02	-0.04	-0.66	-1.07	-1.27	-3.34	-3.16	-3.16	-3.16	-3.17	-2.94	-2.90	-2.87	-2.84	-2.80	-2.77	-2.73	-2.70	-2.67	-2.63	-2.60	-2.54	-2.51	-2.47	-2.45	-2.41	-2.35	-2.32	-2.28	-2.25	-2.21	-2.16	-2.12	-2.08	-2.03	-1.99	-1.93	-1.90	-1.85	-1.80
OM Cost Recovery Ratio (A/B)		111%	0%	0%	31%	45%	48%	49%	81%	82%	82%	81%	116%	117%	117%	116%	117%	116%	117%	117%	116%	117%	116%	118%	117%	118%	116%	115%	118%	117%	117%	116%	116%	117%	117%	116%	116%	117%	117%	116%	117%	117%

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	-91.16	-0.02	-0.04	-0.66	-1.07	-1.27	-3.34	-3.16	-3.16	-3.16	-3.17	-2.94	-2.90	-2.87	-2.84	-2.80	-2.77	-2.73	-2.70	-2.67	-2.63	-2.60	-2.54	-2.51	-2.47	-2.45	-2.41	-2.35	-2.32	-2.28	-2.25	-2.21	-2.16	-2.12	-2.08	-2.03	-1.99	-1.93	-1.90	-1.85	-1.80
2. Depreciation cost	71.75	0.00	0.00	0.00	0.00	0.00	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05
3. Interest Paid	23.46	0.02	0.04	0.42	0.81	0.98	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.94	0.91	0.88	0.85	0.82	0.79	0.76	0.73	0.70	0.66	0.63	0.60	0.57	0.53	0.50	0.47	0.43	0.40	0.37	0.33	0.30	0.26	0.22	0.19	0.15	0.11	0.08	0.04
Sub-total	4.05	0.00	0.00	-0.24	-0.26	-0.29	-0.29	-0.11	-0.11	-0.11	-0.12	0.11	0.12	0.12	0.12	0.13	0.13	0.14	0.14	0.14	0.15	0.15	0.17	0.17	0.18	0.17	0.17	0.20	0.20	0.20	0.20	0.21	0.22	0.23	0.23	0.24	0.25	0.27	0.26	0.28	0.29
B Finances																																									
1. Project Loan	99.57	2.36	1.67	38.05	39.10	17.75	0.36	0.28																																	
2. Local fund	34.00	0.79	0.56	12.87	13.41	6.16	0.12	0.09																																	
Sub-total	133.57	3.15	2.23	50.92	52.51	23.91	0.48	0.37																																	
C Subsidy from Government																																									
1. Subsidy for O&M cost	1.54	0.00	0.00	0.24	0.26	0.29	0.29	0.11	0.11	0.11	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
2. Subsidy for debt services	117.44	0.02	0.04	0.42	0.81	0.98	1.00	1.00	1.00	1.00	1.00	3.75	3.74	3.74	3.74	3.73	3.73	3.72	3.72	3.72	3.71	3.71	3.68	3.69	3.68	3.69	3.68	3.66	3.66	3.65	3.66	3.65	3.64	3.63	3.63	3.61	3.61	3.59	3.60	3.58	3.57
Sub-total	118.98	0.02	0.04	0.66	1.07	1.27	1.29	1.11	1.11	1.11	1.12	3.75	3.74	3.74	3.74	3.73	3.73	3.72	3.72	3.72	3.71	3.71	3.68	3.69	3.68	3.69	3.68	3.66	3.66	3.65	3.66	3.65	3.64	3.63	3.63	3.61	3.61	3.59	3.60	3.58	3.57
Total Cash Inflow	256.60	3.17	2.27	51.34	53.32	24.89	1.48	1.37	1.00	1.00	1.00	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.85	3.86	3.86	3.86	3.85	3.86	3.86	3.85	3.86	3.86	3.86	3.86	3.86	3.85	3.86	3.86	3.86	3.86	3.86
APPLICATION OF FUNDS																																								
D Project disbursement	133.57	3.15	2.23	50.92	52.51	23.91	0.48	0.37																																	
E Total debt services																																									
1. Loan repayment	99.57											2.86	2.89	2.92	2.95	2.98	3.01	3.04	3.07	3.10	3.13	3.16	3.19	3.23	3.26	3.29	3.32	3.36	3.39	3.42	3.46	3.49	3.53	3.56	3.60	3.63	3.67	3.71	3.75	3.78	3.82
2. Interest paid	23.46	0.02	0.04	0.42	0.81	0.98	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.94	0.91	0.88	0.85	0.82	0.79	0.76	0.73	0.70	0.66	0.63	0.60	0.57	0.53	0.50	0.47	0.43	0.40	0.37	0.33	0.30	0.26	0.22	0.19	0.15	0.11	0.08	0.04
Sub-total	123.03	0.02	0.04	0.42	0.81	0.98	1.00	1.00	1.00	1.00	1.00	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.85	3.86	3.86	3.86	3.85	3.86	3.86	3.85	3.86	3.86	3.86	3.86	3.86	3.85	3.86	3.86	3.86	3.86	3.86
Total Cash Outflow	256.60	3.17	2.27	51.34	53.32	24.89	1.48	1.37	1.00	1.00	1.00	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.86	3.85	3.86	3.86	3.86	3.85	3.86	3.86	3.85	3.86	3.86	3.86	3.86	3.86	3.85	3.86	3.86	3.86	3.86	3.86
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
Project Cost Recovery Ratio (%)																																								
Cost recovery by water fee (A/E)	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%	4%	5%	4%	4%	5%	5%	5%	5%	5%	6%	6%	6%	6%	6%	7%	7%	7%	8%
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%

ARAGATSOTN MARZ
Aparan District
No 53 Jamshlu

FINANCIAL ANALYSIS

A COST RECOVERY ANALYSIS

	Item	Millon AMD	Rate
1	**Revenue**		
	Water fee revenue	41.96	26.1%
	Subsidy	118.98	73.9%
	Total	160.94	100.0%
2	**Expenditure**		
	OM cost	37.91	23.6%
	Loan repayment	99.57	61.9%
	Interest paid	23.46	14.6%
	Surplus cash	0.00	0.0%
	Total	160.94	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	89.21	2.30	1.64	34.77	34.64	15.27	0.33	0.26																																	
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	1.11			0.01	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
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	0.00
Mantenance cost	9.31			0.10	0.21	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Pump replacement																	0.00															0.00										
Sub-total	19.54			0.35	0.47	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52
Total Outflow	108.75	2.30	1.64	35.12	35.11	15.79	0.85	0.78	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52
B BENEFIT																																								
1. Water Tariff	26.27	0.00	0.00	0.11	0.22	0.27	0.28	0.47	0.49	0.51	0.52	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
2. Subsidy	95.52	0.00	0.00	0.24	0.26	0.29	0.29	0.11	0.11	0.11	0.12	2.75	2.77	2.80	2.83	2.85	2.88	2.90	2.93	2.96	2.98	3.01	3.02	3.06	3.08	3.12	3.15	3.16	3.19	3.22	3.26	3.28	3.31	3.33	3.37	3.39	3.42	3.44	3.49	3.50	3.53
Total Inflow	121.79	0.00	0.00	0.35	0.48	0.56	0.57	0.58	0.60	0.62	0.64	3.53	3.55	3.58	3.61	3.63	3.66	3.68	3.71	3.74	3.76	3.79	3.80	3.84	3.86	3.90	3.93	3.94	3.97	4.00	4.04	4.06	4.09	4.11	4.15	4.17	4.20	4.22	4.27	4.28	4.31
NET BENEFIT	13.04	-2.30	-1.64	-34.8	-34.6	-15.2	-0.28	-0.20	0.08	0.10	0.12	3.01	3.03	3.06	3.09	3.11	3.14	3.16	3.19	3.22	3.24	3.27	3.28	3.32	3.34	3.38	3.41	3.42	3.45	3.48	3.52	3.54	3.57	3.59	3.63	3.65	3.68	3.70	3.75	3.76	3.79

FIRR = **0.62%**

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	-26.21	-2.53	-1.80	-38.2	-38.1	-16.8	-0.31	-0.23	0.08	0.10	0.12	3.01	3.03	3.06	3.09	3.11	3.14	3.16	3.19	3.22	3.24	3.27	3.28	3.32	3.34	3.38	3.41	3.42	3.45	3.48	3.52	3.54	3.57	3.59	3.63	3.65	3.68	3.70	3.75	3.76	3.79
	2	Capital cost 20% up	-34.58	-2.76	-1.97	-41.7	-41.5	-18.3	-0.35	-0.25	0.08	0.10	0.12	3.01	3.03	3.06	3.09	3.11	3.14	3.16	3.19	3.22	3.24	3.27	3.28	3.32	3.34	3.38	3.41	3.42	3.45	3.48	3.52	3.54	3.57	3.59	3.63	3.65	3.68	3.70	3.75	3.76	3.79
2	1	OM cost 10% up	-19.20	-2.30	-1.64	-34.8	-34.7	-15.3	-0.33	-0.25	0.03	0.05	0.07	2.96	2.98	3.01	3.04	3.06	3.09	3.11	3.14	3.17	3.19	3.22	3.23	3.27	3.29	3.33	3.36	3.37	3.40	3.43	3.47	3.49	3.52	3.54	3.58	3.60	3.63	3.65	3.70	3.71	3.74
	2	OM cost 20% up	-20.57	-2.30	-1.64	-34.8	-34.7	-15.3	-0.38	-0.30	-0.02	0.00	0.02	2.91	2.93	2.96	2.99	3.01	3.04	3.06	3.09	3.12	3.14	3.17	3.18	3.22	3.24	3.28	3.31	3.32	3.35	3.38	3.42	3.44	3.47	3.49	3.53	3.55	3.58	3.60	3.65	3.66	3.69
3	1	Revenue 10% down	-25.79	-2.30	-1.64	-34.8	-34.7	-15.3	-0.34	-0.26	0.02	0.04	0.06	2.66	2.68	2.70	2.73	2.75	2.77	2.79	2.82	2.85	2.86	2.89	2.90	2.94	2.95	2.99	3.02	3.03	3.05	3.08	3.12	3.13	3.16	3.18	3.22	3.23	3.26	3.28	3.32	3.33	3.36
	2	Revenue 20% down	-33.74	-2.30	-1.64	-34.8	-34.7	-15.3	-0.39	-0.32	-0.04	-0.02	-0.01	2.30	2.32	2.34	2.37	2.38	2.41	2.42	2.45	2.47	2.49	2.51	2.52	2.55	2.57	2.60	2.62	2.63	2.66	2.68	2.71	2.73	2.75	2.77	2.80	2.82	2.84	2.86	2.90	2.90	2.93

No.		Description	FIRR	Sensitivity indicator	Swiching value
1	1	Capital cost 10% up	0.18%	23.50	4.26%
	2	Capital cost 20% up	-0.20%	-40.26	-2.48%
2	1	OM cost 10% up	0.53%	1.72	58.27%
	2	OM cost 20% up	0.44%	4.17	24.01%
3	1	Revenue 10% down	0.04%	134.45	0.74%
	2	Revenue 20% down	-0.59%	-20.42	-4.90%

No.54 Saralanj

Information on Existing Water Sources (Aragatsotn)

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

No.54 Community Saralanj
District Aparan
Marz Aragatsotn

No	Water source	Latitude			Longitude			Atidute	Yeild(L/sec)		
		deg	min	sec	deg	min	sec	(m)	Min	Max	At site
1	Karmir Pal spring	40	36	8.7	44	24	42.6	2,185	0.5	0.7	0.5
2	Zori spring	40	36	6.3	44	24	40.6	2,160	0.4	0.7	0.8
3	Morferi spring	40	36	0.6	44	24	39.8	2,197	0.2	0.5	0.3
4	Smbo spring	40	35	58.2	44	24	30.0	2,146	0.3	0.6	0.4
5	Aelanichni spring	40	35	50.2	44	24	5.8	2,070	0.3	7.0	0.4
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	The internal network is in most deteriorated condition, there are 40% leaks.
Alternative sources if any	At about 2km distance from Karmir Pal spring there is a 3l/sec prospective spring.

No.54 Community Saralanj
District Aparan
Marz Aragatsotn
Sampling date 03/Aug/2007

	Parameters analysed	Units	No.1				Guidelines	
							WHO	Armenia
a	pH		7.9				6.5-8	6.0 - 9.0
b	Temperature	Deg.C	16.5					
c	TDS	Mg/L	94				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	4				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	0.16				1.50	
7	Hardness	Mg/L	190				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	1.3				50.0	45.0
13	SO4:Sulfate	Mg/L	12.0				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	<0.0002				0.00100	0.00050
21	Se:Selenium	Mg/L	n.d				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.54 Community Saralanj
District Aparan
Marz Aragatsotn

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	2			4.3	Not Identified
2	3			0.9/2; 2.3/1; 4.3/2; 9/2	Not Identified
3	7			0.9	Not Identified

No. **54** **Marz** Aragatsotn **Community** Saralanj

1. ACCESSIBILITY TO THE SITE

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

2. INTAKE STRUCTURE

No.	Water source	N	E	El. (m)	Year	Material	Volume (l/s)	Rehabilitation Necessity (Y/N)
1	Spring	40°36'08,7″	44°24'42,6″	2,185	1996	Masonry	0.5	Yes
2	Spring	40°36'06,3″	44°24'40,6″	2,160		reinforced concrete	0.8	
3	Spring	40°36'00,6″	44°24'39,8″	2,197		reinforced concrete	0.3	
4	Spring	40°35'58,2″	44°24'30,0″	2,146	1976	Steel	0.4	
5	Spring	40°35'50,2″	44°24'05,8″	2,070		Concrete Steel	0.4	

3. TRANSMISSION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Flow rate (l/s)	Year	Leakage	Rehabilitation Necessity (Y/N)
1	100	32	Steel	2.0	1976	Little	Yes
2	210	50				Little	Yes
3	995	65				Little	Yes
4	50	100				Little	Yes

4. RESERVOIR

No.	N	E	El. (m)	Material	Shape	Dimension (m)	Volume (m3)	Rehabilitation Necessity (Y/N)
1	40°35'54,0″	44°23'46,3″	2,021	reinforced concrete	Rectangular	6×10×4	200	Yes

5. CHLORINATION

No.	Existence (Y/N)	Location	Chlorine type	Chlorine duration
1	Yes	Reservoir	Liquid	3times per year

6. DISTRIBUTION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Year	Leakage	Rehabilitation Necessity (Y/N)
1	1,250	100	Steel	1976	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)
3	1996		Yes	100	No

9. DRAINAGE SYSTEM

Existence (Y/N)	Rehabilitation Necessity (Y/N)	Remarks
Yes		DN250,L=1200m asbestos for school

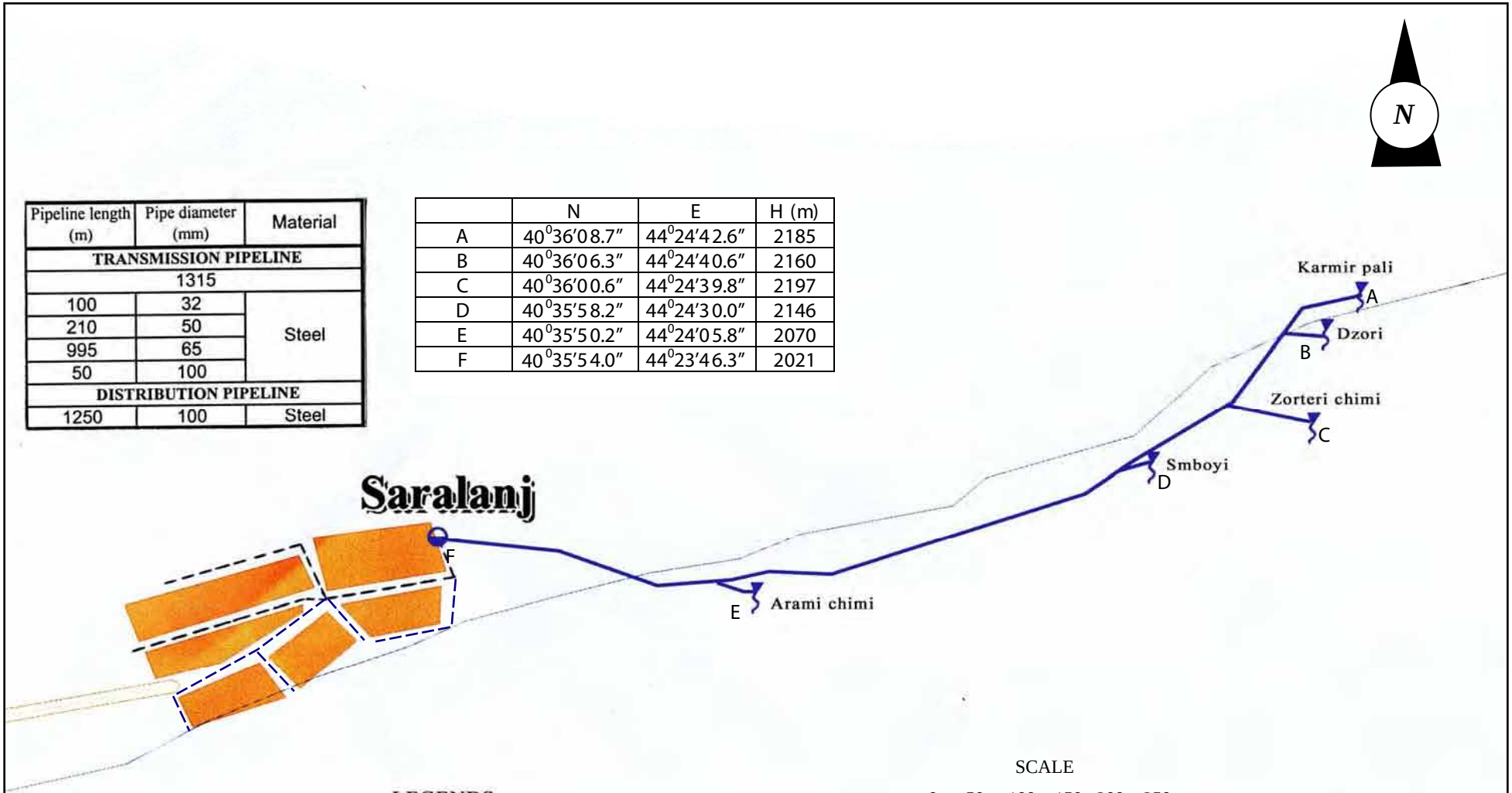
Questionnaire on Existing Water Supply Conditions by Socio-Economic Survey

Marz	**Aragatsotn**
Number and Name of Community	**No.54 Saralanj**
District	**Aparan**

No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	274
A2	Actual population in 2007	252
A3	Number of households	65
A4.1	Elderly people	56
A4.2	Population in labor force (age from 16 to 62)	121
A4.3	Children	75
A5.1	Pensioners	60
A5.2	Unemployed	0
A5.3	Receiving benefits	7
A6	Average monthly income of household (AMD)	25,000
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	21
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	300
	Annual Budget of the community 2005, in thousand AMD	230
	Annual Budget of the community 2006, in thousand AMD	150
	Annual Budget of the community 2007, in thousand AMD	250
	Annual Budget of the community 2008, in thousand AMD	is not planned.
B2	Amount spent in drinking water sector 2004, in thousand AMD	30
	Amount spent in drinking water sector 2005, in thousand AMD	40
	Amount spent in drinking water sector 2006, in thousand AMD	50
	Amount spent in drinking water sector 2007, in thousand AMD	150
	Amount spent in drinking water sector 2008, in thousand AMD	is not planned.
C: Socio-Economic Survey		
C1	Major industries of the community:	dairy, meat, cereals
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	sufficient
D6	Present condition of the water supply volume of Irrigation water	insufficient
D7	Number of house connection to drinking water system	44
D8	How many house connection household set the water meter	0
D9	Number of public taps	3
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)	400
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	400
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?	is not sufficient
E: Present Operation and Maintenance Works		
E1	Name of responsible for water supply	Galstyan Farad
E2	Position	administrtion head
E3	Telephone	(093)051552
E4	Quantity and present condition of the water supply facilities: spring/ intake	5 deteriorated
E5	Quantity and present condition of the water supply facilities:	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 pipes	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?	residents
E12	How do you repair the water supply facilities?	by ourselves
E13	Who is in charge of the repair work in the community?	administration head
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)	150,000
	Others(AMD)	
	Total (AMD)	150,000
E16	Do the residents participate in the O&M works?	manpower
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

Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
1315		
100	32	Steel
210	50	
995	65	
50	100	
DISTRIBUTION PIPELINE		
1250	100	Steel

	N	E	H (m)
A	40°36′08.7″	44°24′42.6″	2185
B	40°36′06.3″	44°24′40.6″	2160
C	40°36′00.6″	44°24′39.8″	2197
D	40°35′58.2″	44°24′30.0″	2146
E	40°35′50.2″	44°24′05.8″	2070
F	40°35′54.0″	44°23′46.3″	2021



Aragatsotn Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
54	Saralamj	JICA STUDY TEAM 2007

Marz : **Aragatsotn** No.54
Name : **Saralanj**

No.	Item	Quantity	Unit	Water demand (m3/d)	
A.	**WATER DEMAND**				
	1 Population	252	persons	25.2	
	2 Factory	-	nos	0.0	
	3 School (pupils)	21	pupils	0.2	
	4 Medical Ambulance Station	-	nos	-	
	5 Policlinic	-	nos	-	
	6 Livestocks (87lit/household)	65	household	5.7	
	Sub-total			31.1	
	Unaccouted for water (20%)			6.2	
1	Average Daily Water Demand			37.3	m3/day
2	Maximum Daily Water Demand			44.8	m3/day
3	Maximum Hourly Water Demand			9.7	m3/hr

B	**WATER SUPPLY PLAN**						
	1 Water source type	Nr.	Total vol.				
	a Spring	5	2.4	lit/sec		207.4	m3/day
`	Total					207.4	m3/day
	2 Required reservoir volume					116	m3

C	**WATER SUPPLY FACILITIES REHABILITATION PLAN**		
No	Item	Quantity	Unit
1	Intake		
	1m3	5	nos
	2m3		nos
	3m3		nos
	4m3		nos
2	Transmission pipe		
	50mm diameter		m
	75mm diameter		m
	90mm diameter	1,500	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		m
	110mm diameter	1,300	m
	150mm diameter		m
	200mm diameter		m
	250mm diameter		m
5	House connection	21	nos
6	Water meter installation	65	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	Aragatsotn	
No. 54	Saralanj	JICA STUDY TEAM

Marz : **Aragatsotn**
No. : **54**
Name : **Saralanj**

No	Item	Specification	Quantity	Unit	Unit Price	Total
1	Intake					
		1m3	5	nos	367,700	1,838,500
		2m3		nos	545,000	
		3m3		nos	669,100	
		4m3		nos	805,100	
	Sub-total					1,838,500
2	Transmission Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm	1,500	m	8,040	12,060,000
		110mm		m	9,680	
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					12,060,000
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		m	8,040	
		110mm	1,300	m	9,680	12,584,000
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					12,584,000
5	House Connection		21	nos	74,000	1,554,000
6	Water Meter Installation		65	nos	80,000	5,200,000
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	520	m	3,600	1,872,000
	Total				AMD	54,503,000
					Equivalent to USD	178,394
					Equivalent to JPY	18,820,589
					AMD	USD
	Investment Cost per household		65	HH	838,508	2,745
	Investment Cost per person		252	persons	216,282	708

ARAGATSOTN MARZ
Aparan District
No 54 Saralanj

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		11.4																																							
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		63.36	0.00	0.00	0.17	0.34	0.41	0.42	0.72	0.74	0.76	0.79	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	1.92	1.99	2.05	2.12	2.19	2.26	2.34	2.41	2.49	2.58	2.66	2.75	2.84	2.93	3.03
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				69																																				
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		3.02			0.02	0.03	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	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		6.58			0.04	0.08	0.10	0.10	0.10	0.11	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
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	0.08	0.10	0.10	0.10	0.11	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
5. Pump replacement		0.00																0.00															0.00									
Sub-total		27.30	0.00	0.00	0.30	0.36	0.40	0.41	0.42	0.44	0.45	0.46	0.48	0.50	0.51	0.53	0.54	0.57	0.59	0.61	0.62	0.65	0.66	0.69	0.71	0.73	0.75	0.79	0.81	0.83	0.87	0.90	0.92	0.96	0.99	1.02	1.05	1.08	1.11	1.16	1.19	1.24
C Gross Income (A-B)		36.06	0.00	0.00	-0.13	-0.02	0.01	0.01	0.30	0.30	0.31	0.33	0.70	0.72	0.75	0.77	0.81	0.82	0.85	0.87	0.91	0.93	0.97	1.00	1.03	1.07	1.11	1.13	1.18	1.22	1.25	1.29	1.34	1.38	1.42	1.47	1.53	1.58	1.64	1.68	1.74	1.79
D Depreciation cost		51.80						1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
E Interest paid		17.62	0.02	0.04	0.32	0.61	0.74	0.75	0.75	0.75	0.75	0.75	0.75	0.73	0.70	0.68	0.66	0.64	0.61	0.59	0.57	0.55	0.52	0.50	0.47	0.45	0.43	0.40	0.38	0.35	0.33	0.30	0.27	0.25	0.22	0.19	0.17	0.14	0.11	0.09	0.06	0.03
F Net Income		-33.36	-0.02	-0.04	-0.45	-0.63	-0.73	-2.22	-1.93	-1.93	-1.92	-1.90	-1.53	-1.49	-1.43	-1.39	-1.33	-1.30	-1.24	-1.20	-1.14	-1.10	-1.03	-0.98	-0.92	-0.86	-0.80	-0.75	-0.68	-0.61	-0.56	-0.49	-0.41	-0.35	-0.28	-0.20	-0.12	-0.04	0.05	0.11	0.20	0.28
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		-33.36	-0.02	-0.04	-0.45	-0.63	-0.73	-2.22	-1.93	-1.93	-1.92	-1.90	-1.53	-1.49	-1.43	-1.39	-1.33	-1.30	-1.24	-1.20	-1.14	-1.10	-1.03	-0.98	-0.92	-0.86	-0.80	-0.75	-0.68	-0.61	-0.56	-0.49	-0.41	-0.35	-0.28	-0.20	-0.12	-0.04	0.05	0.11	0.20	0.28
OM Cost Recovery Ratio (A/B)		232%	0%	0%	57%	94%	103%	102%	171%	168%	169%	172%	246%	244%	247%	245%	250%	244%	244%	243%	247%	243%	247%	245%	245%	247%	248%	243%	246%	247%	244%	243%	246%	244%	243%	244%	246%	246%	248%	245%	246%	244%

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	-33.36	-0.02	-0.04	-0.45	-0.63	-0.73	-2.22	-1.93	-1.93	-1.92	-1.90	-1.53	-1.49	-1.43	-1.39	-1.33	-1.30	-1.24	-1.20	-1.14	-1.10	-1.03	-0.98	-0.92	-0.86	-0.80	-0.75	-0.68	-0.61	-0.56	-0.49	-0.41	-0.35	-0.28	-0.20	-0.12	-0.04	0.05	0.11	0.20	0.28
2. Depreciation cost	51.80	0.00	0.00	0.00	0.00	0.00	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
3. Interest Paid	17.62	0.02	0.04	0.32	0.61	0.74	0.75	0.75	0.75	0.75	0.75	0.75	0.73	0.70	0.68	0.66	0.64	0.61	0.59	0.57	0.55	0.52	0.50	0.47	0.45	0.43	0.40	0.38	0.35	0.33	0.30	0.27	0.25	0.22	0.19	0.17	0.14	0.11	0.09	0.06	0.03
Sub-total	36.06	0.00	0.00	-0.13	-0.02	0.01	0.01	0.30	0.30	0.31	0.33	0.70	0.72	0.75	0.77	0.81	0.82	0.85	0.87	0.91	0.93	0.97	1.00	1.03	1.07	1.11	1.13	1.18	1.22	1.25	1.29	1.34	1.38	1.42	1.47	1.53	1.58	1.64	1.68	1.74	1.79
B Finances																																									
1. Project Loan	74.68	2.36	1.67	28.10	28.82	13.09	0.36	0.28																																	
2. Local fund	25.51	0.79	0.56	9.51	9.88	4.56	0.12	0.09																																	
Sub-total	100.19	3.15	2.23	37.61	38.70	17.65	0.48	0.37																																	
C Subsidy from Government																																									
1. Subsidy for O&M cost	0.15	0.00	0.00	0.13	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	56.08	0.02	0.04	0.32	0.61	0.73	0.74	0.45	0.45	0.44	0.42	2.20	2.18	2.14	2.12	2.08	2.08	2.04	2.02	1.98	1.97	1.92	1.89	1.86	1.82	1.79	1.76	1.72	1.67	1.65	1.60	1.55	1.52	1.47	1.42	1.37	1.31	1.25	1.22	1.16	1.10
Sub-total	56.23	0.02	0.04	0.45	0.63	0.73	0.74	0.45	0.45	0.44	0.42	2.20	2.18	2.14	2.12	2.08	2.08	2.04	2.02	1.98	1.97	1.92	1.89	1.86	1.82	1.79	1.76	1.72	1.67	1.65	1.60	1.55	1.52	1.47	1.42	1.37	1.31	1.25	1.22	1.16	1.10
Total Cash Inflow	192.48	3.17	2.27	37.93	39.31	18.39	1.23	1.12	0.75	0.75	0.75	2.90	2.90	2.89	2.89	2.89	2.90	2.89	2.89	2.89	2.90	2.89	2.89	2.89	2.89	2.90	2.89	2.90	2.89	2.90	2.89	2.89	2.90	2.89	2.89	2.90	2.89	2.89	2.90	2.90	2.89
APPLICATION OF FUNDS																																								
D Project disbursement	100.19	3.15	2.23	37.61	38.70	17.65	0.48	0.37																																	
E Total debt services																																								
1. Loan repayment	74.67											2.15	2.17	2.19	2.21	2.23	2.26	2.28	2.30	2.32	2.35	2.37	2.39	2.42	2.44	2.47	2.49	2.52	2.54	2.57	2.59	2.62	2.65	2.67	2.70	2.73	2.75	2.78	2.81	2.84	2.86
2. Interest paid	17.62	0.02	0.04	0.32	0.61	0.74	0.75	0.75	0.75	0.75	0.75	0.75	0.73	0.70	0.68	0.66	0.64	0.61	0.59	0.57	0.55	0.52	0.50	0.47	0.45	0.43	0.40	0.38	0.35	0.33	0.30	0.27	0.25	0.22	0.19	0.17	0.14	0.11	0.09	0.06	0.03
Sub-total	92.29	0.02	0.04	0.32	0.61	0.74	0.75	0.75	0.75	0.75	0.75	2.90	2.90	2.89	2.89	2.89	2.90	2.89	2.89	2.89	2.90	2.89	2.89	2.89	2.89	2.90	2.89	2.90	2.89	2.90	2.89	2.89	2.90	2.89	2.89	2.90	2.89	2.89	2.90	2.90	2.89
Total Cash Outflow	192.48	3.17	2.27	37.93	39.31	18.39	1.23	1.12	0.75	0.75	0.75	2.90	2.90	2.89	2.89	2.89	2.90	2.89	2.89	2.89	2.90	2.89	2.89	2.89	2.89	2.90	2.89	2.90	2.89	2.90	2.89	2.89	2.90	2.89	2.89	2.90	2.89	2.89	2.90	2.90	2.89
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
Project Cost Recovery Ratio (%)																																								
Cost recovery by water fee (A/E)	39%	0%	0%	0%	0%	1%	1%	40%	40%	41%	44%	24%	25%	26%	27%	28%	28%	29%	30%	31%	32%	34%	35%	36%	37%	38%	39%	41%	42%	43%	45%	46%	48%	49%	51%	53%	55%	57%	58%	60%	62%
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%

ARAGATSOTN MARZ
Aparan District
No 54 Saralanj

FINANCIAL ANALYSIS

A COST RECOVERY ANALYSIS

	Item	Millon AMD	Rate
1	**Revenue**		
	Water fee revenue	63.36	53.0%
	Subsidy	56.23	47.0%
	Total	119.59	100.0%
2	**Expenditure**		
	OM cost	27.30	22.8%
	Loan repayment	74.67	62.4%
	Interest paid	17.62	14.7%
	Surplus cash	0.00	0.0%
	Total	119.59	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	67.04	2.30	1.64	25.69	25.55	11.27	0.33	0.26																																	
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	1.50			0.02	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	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	0.00
Mantenance cost	3.35			0.04	0.07	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Pump replacement																	0.00															0.00										
Sub-total	13.97			0.30	0.35	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
Total Outflow	81.01	2.30	1.64	25.99	25.90	11.64	0.70	0.63	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
B BENEFIT																																								
1. Water Tariff	39.75	0.00	0.00	0.17	0.34	0.41	0.42	0.72	0.74	0.76	0.79	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
2. Subsidy	39.87	0.00	0.00	0.13	0.02	0.00	0.00	0.00	0.00	0.00	0.00	1.45	1.45	1.44	1.44	1.42	1.44	1.43	1.43	1.41	1.42	1.40	1.39	1.39	1.37	1.36	1.36	1.34	1.32	1.32	1.30	1.28	1.27	1.25	1.23	1.20	1.17	1.14	1.13	1.10	1.07
Total Inflow	79.62	0.00	0.00	0.30	0.36	0.41	0.42	0.72	0.74	0.76	0.79	2.63	2.63	2.62	2.62	2.60	2.62	2.61	2.61	2.59	2.60	2.58	2.57	2.57	2.55	2.54	2.54	2.52	2.50	2.50	2.48	2.46	2.45	2.43	2.41	2.38	2.35	2.32	2.31	2.28	2.25
NET BENEFIT	-1.39	-2.30	-1.64	-25.7	-25.5	-11.2	-0.28	0.09	0.37	0.39	0.42	2.26	2.26	2.25	2.25	2.23	2.25	2.24	2.24	2.22	2.23	2.21	2.20	2.20	2.18	2.17	2.17	2.15	2.13	2.13	2.11	2.09	2.08	2.06	2.04	2.01	1.98	1.95	1.94	1.91	1.88

FIRR = -0.10%

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	-25.91	-2.53	-1.80	-28.3	-28.1	-12.4	-0.31	0.06	0.37	0.39	0.42	2.26	2.26	2.25	2.25	2.23	2.25	2.24	2.24	2.22	2.23	2.21	2.20	2.20	2.18	2.17	2.17	2.15	2.13	2.13	2.11	2.09	2.08	2.06	2.04	2.01	1.98	1.95	1.94	1.91	1.88
	2	Capital cost 20% up	-32.20	-2.76	-1.97	-30.8	-30.7	-13.5	-0.35	0.04	0.37	0.39	0.42	2.26	2.26	2.25	2.25	2.23	2.25	2.24	2.24	2.22	2.23	2.21	2.20	2.20	2.18	2.17	2.17	2.15	2.13	2.13	2.11	2.09	2.08	2.06	2.04	2.01	1.98	1.95	1.94	1.91	1.88
2	1	OM cost 10% up	-20.59	-2.30	-1.64	-25.7	-25.6	-11.3	-0.32	0.05	0.33	0.35	0.38	2.22	2.22	2.21	2.21	2.19	2.21	2.20	2.20	2.18	2.19	2.17	2.16	2.16	2.14	2.13	2.13	2.11	2.09	2.09	2.07	2.05	2.04	2.02	2.00	1.97	1.94	1.91	1.90	1.87	1.84
	2	OM cost 20% up	-21.57	-2.30	-1.64	-25.7	-25.6	-11.3	-0.35	0.02	0.30	0.32	0.35	2.19	2.19	2.18	2.18	2.16	2.18	2.17	2.17	2.15	2.16	2.14	2.13	2.13	2.11	2.10	2.10	2.08	2.06	2.06	2.04	2.02	2.01	1.99	1.97	1.94	1.91	1.88	1.87	1.84	1.81
3	1	Revenue 10% down	-24.92	-2.30	-1.64	-25.7	-25.6	-11.3	-0.32	0.02	0.30	0.31	0.34	2.00	2.00	1.99	1.99	1.97	1.99	1.98	1.98	1.96	1.97	1.95	1.94	1.94	1.93	1.92	1.92	1.90	1.88	1.88	1.86	1.84	1.84	1.82	1.80	1.77	1.75	1.72	1.71	1.68	1.66
	2	Revenue 20% down	-30.23	-2.30	-1.64	-25.7	-25.6	-11.3	-0.36	-0.05	0.22	0.24	0.26	1.73	1.73	1.73	1.73	1.71	1.73	1.72	1.72	1.70	1.71	1.69	1.69	1.69	1.67	1.66	1.66	1.65	1.63	1.63	1.61	1.60	1.59	1.57	1.56	1.53	1.51	1.49	1.48	1.45	1.43

No.		Description	FIRR	Sensitivity indicator	Swiching value
1	1	Capital cost 10% up	-0.55%	-8.18	-12.23%
	2	Capital cost 20% up	-0.95%	-8.95	-11.18%
2	1	OM cost 10% up	-0.20%	-5.04	-19.85%
	2	OM cost 20% up	-0.30%	-6.71	-14.90%
3	1	Revenue 10% down	-0.70%	-8.58	-11.65%
	2	Revenue 20% down	-1.37%	-9.27	-10.79%

No.55 Sipan

Information on Existing Water Sources (Aragatsotn)

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

No.55 Community Sipan
District Aragats
Marz Aragatsotn

No	Water source	Latitude			Longitude			Atidute	Yeild(L/sec)		
		deg	min	sec	deg	min	sec	(m)	Min	Max	At site
1	Spring	40	44	43.1	44	16	15.3	2,229	3.0	4.0	4.0
2	2 springs	40	44	8.7	44	16	14.4	2,204	0.5	1.0	1.0
3	a spring	40	43	55.5	44	16	14.1	2,192	0.5	1.0	1.0
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	Mainly water intakes need repair in Sipan.
Alternative sources if any	There is a 5l/sec capacity spring at 1,7km distance from these springs.

No.55 Community Sipan
District Aragats
Marz Aragatsotn
Sampling date 01/Aug/2007

	Parameters analysed	Units	No.1				Guidelines	
							WHO	Armenia
a	pH		6.7				6.5-8	6.0 - 9.0
b	Temperature	Deg.C	9.7					
c	TDS	Mg/L	121				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	0.04				1.50	
7	Hardness	Mg/L	290				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	3.5				50.0	45.0
13	SO4:Sulfate	Mg/L	7.0				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	<0.0002				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.55 Community Sipan
District Aragats
Marz Aragatsotn

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	3		4-23	Not Identified	Not Identified
2	4		3-20	Not Identified	Not Identified
3	6		4-23	Not Identified	Not Identified
4	7		4-21	Not Identified	Not Identified
5	8		3-20	Not Identified	Not Identified

No. 55 **Marz** Aragatsotn **Community** Sipan

1. ACCESSIBILITY TO THE SITE

No.	Structures	Access by vehicle	Machine construction	Remarks
1	Intake	Possible	Possible	
2	Transmission pipeline	Possible	Possible	Pipeline is mostly far from the road
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°44'43.1″	44°16'15.3″	2,229	1963	reinforced concrete	4.0	Yes
2	Spring	40°44'08.7″	44°16'14.4″	2,204	2002	reinforced concrete	1.0	Yes
3	Spring	40°43'55.5″	44°16'14.1″	2,192	2002	reinforced 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	3,100	100	Steel	3.8	1991	Little	Yes

4. RESERVOIR

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

5. CHLORINATION

No.	Existence (Y/N)	Location	Chlorine type	Chlorine duration
1	Yes	Intake	Powder	Once a year

6. DISTRIBUTION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Year	Leakage	Rehabilitation Necessity (Y/N)
1	500	100	Steel	1991	Little	Yes
2	200	50	Steel	1991	Little	Yes
3	800	50	Polyethylene	2002	Little	No

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)
8	1961	1963	Yes	100	Yes

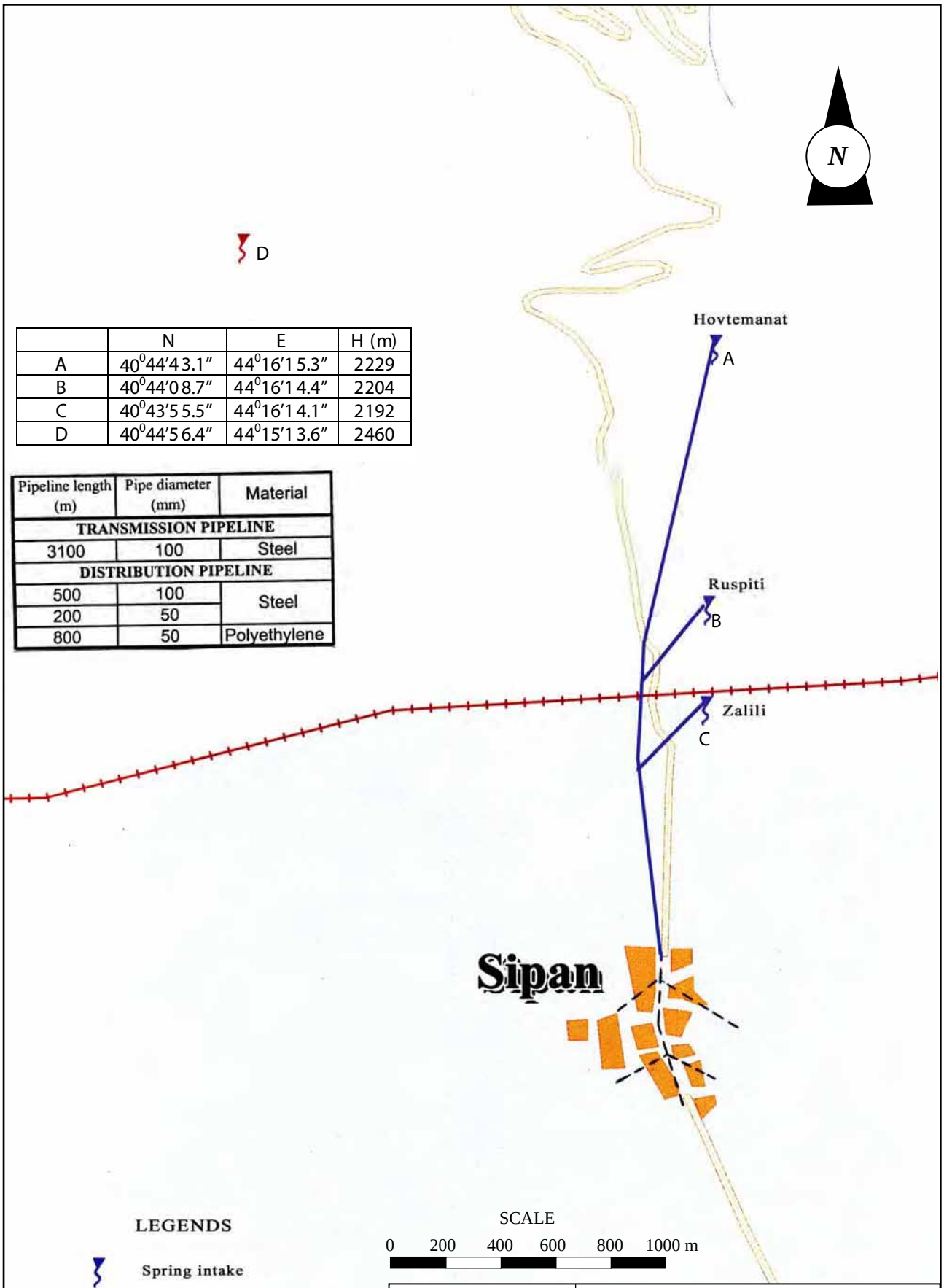
9. DRAINAGE SYSTEM

Existence (Y/N)	Rehabilitation Necessity (Y/N)	Remarks
No	Yes	

Questionnaire on Existing Water Supply Conditions by Socio-Economic Survey

Marz	**Aragatsotn**
Number and Name of Community	**No.55 Sipan**
District	**Aragats**

No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	385
A2	Actual population in 2007	325
A3	Number of households	85
A4.1	Elderly people	45
A4.2	Population in labor force (age from 16 to 62)	194
A4.3	Children	86
A5.1	Pensioners	21
A5.2	Unemployed	15
A5.3	Receiving benefits	21
A6	Average monthly income of household (AMD)	21,000
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	69
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	3,100
	Annual Budget of the community 2005, in thousand AMD	3,500
	Annual Budget of the community 2006, in thousand AMD	3,500
	Annual Budget of the community 2007, in thousand AMD	4,000
	Annual Budget of the community 2008, in thousand AMD	is not planned.
B2	Amount spent in drinking water sector 2004, in thousand AMD	240
	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:	dairy, meat, cereals
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	1313
D3	Date of expiry of water use permit	2007-2010
D4	Planned date of obtaining water use permit	-
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	60
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?	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?	very 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	-
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?	from spring water
D20	Are you satisfied with irrigation water supply volume?	is not sufficient
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	3 deteriorated
E5	Quantity and present condition of the water supply facilities:	1 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 pipes	partially repaired
E8	Quantity and present condition of the water supply facilities: public tap	partially repaired
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?	inviting a specialist
E13	Who is in charge of the repair work in the community?	specialist in the community with fee
E14	How you prepare O&M costs?	community budget
E15	Please indicate the O&M cost breakdown per year for water supply	
	Electricity (AMD)	0
	Labor cost (AMD)	0
	Repair cost(AMD)	240,000
	Others(AMD)	0
	Total (AMD)	240,000
E16	Do the residents participate in the O&M works?	manpower
E17	What kind of OM method is preferable to you?	resident participation
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



	N	E	H (m)
A	40°44'43.1"	44°16'15.3"	2229
B	40°44'08.7"	44°16'14.4"	2204
C	40°43'55.5"	44°16'14.1"	2192
D	40°44'56.4"	44°15'13.6"	2460

Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
3100	100	Steel
DISTRIBUTION PIPELINE		
500	100	Steel
200	50	
800	50	Polyethylene

LEGENDS

- Spring intake
- Newly constructed spring
- Transmission pipeline
- Distribution pipeline

SCALE

0 200 400 600 800 1000 m

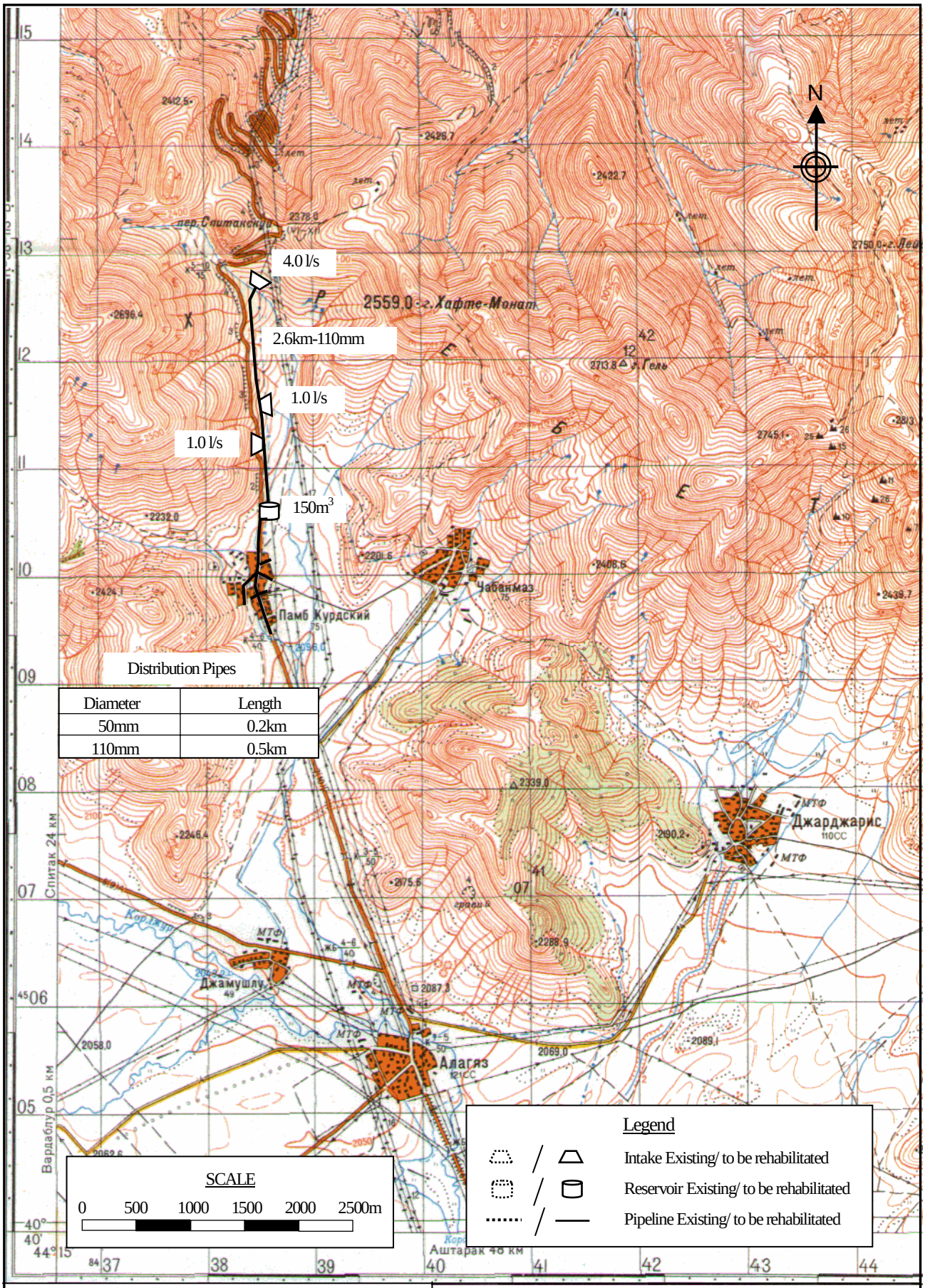
Aragatsotn Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
55	Sipan	JICA STUDY TEAM 2007

Marz : **Aragatsotn** No.55
Name : **Sipan**

No.	Item	Quantity	Unit	Water demand (m3/d)	
A.	**WATER DEMAND**				
	1 Population	325	persons	32.5	
	2 Factory	-	nos	0.0	
	3 School (pupils)	69	pupils	0.7	
	4 Medical Ambulance Station	-	nos	-	
	5 Policlinic	-	nos	-	
	6 Livestocks (87lit/household)	85	household	7.4	
	Sub-total			40.6	
	Unaccouted for water (20%)			8.1	
1	Average Daily Water Demand			48.7	m3/day
2	Maximum Daily Water Demand			58.5	m3/day
3	Maximum Hourly Water Demand			11.1	m3/hr

B	**WATER SUPPLY PLAN**						
	1 Water source type	Nr.	Total vol.				
	a Spring	3	6.0	lit/sec		518.4	m3/day
`	Total					518.4	m3/day
	2 Required reservoir volume					133	m3

C	**WATER SUPPLY FACILITIES REHABILITATION PLAN**		
No	Item	Quantity	Unit
1	Intake		
	1m3	3	nos
	2m3		nos
	3m3		nos
	4m3		nos
2	Transmission pipe		
	50mm diameter		m
	75mm diameter		m
	90mm diameter		m
	110mm diameter	2,600	m
	150mm diameter		m
	200mm diameter		m
	250mm diameter		m
3	Reservoir		
	150m3 capacity	1	nos
4	Distribution pipe		
	50mm diameter	200	m
	75mm diameter		m
	90mm diameter		m
	110mm diameter	500	m
	150mm diameter		m
	200mm diameter		m
	250mm diameter		m
5	House connection	25	nos
6	Water meter installation	85	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	Aragatsotn	
No. 55	Sipan	JICA STUDY TEAM

Marz : **Aragatsotn**
No. : **55**
Name : **Sipan**

No	Item	Specification	Quantity	Unit	Unit Price	Total
1	Intake					
		1m3	3	nos	367,700	1,103,100
		2m3		nos	545,000	
		3m3		nos	669,100	
		4m3		nos	805,100	
	Sub-total					1,103,100
2	Transmission Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm		m	8,040	
		110mm	2,600	m	9,680	25,168,000
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					25,168,000
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	200	m	5,520	1,104,000
		75mm		m	7,160	
		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					5,944,000
5	House Connection		25	nos	74,000	1,850,000
6	Water Meter Installation		85	nos	80,000	6,800,000
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	280	m	3,600	1,008,000
	Total				AMD	61,267,600
					Equivalent to USD	200,535
					Equivalent to JPY	21,156,493
					AMD	USD
	Investment Cost per household		85	HH	720,795	2,359
	Investment Cost per person		325	persons	188,516	617

ARAGATSOTN MARZ
Aparan District
No 55 Sipan

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		14.8																																							
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		82.70	0.00	0.00	0.22	0.44	0.53	0.55	0.93	0.96	1.00	1.03	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	2.95	3.05	3.15	3.25	3.36	3.47	3.59	3.71	3.83	3.95
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				89																																				
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		3.91			0.02	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	0.10	0.10	0.10	0.11	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
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		33.30	0.00	0.00	0.33	0.44	0.49	0.50	0.51	0.53	0.54	0.57	0.59	0.60	0.62	0.65	0.67	0.69	0.71	0.74	0.76	0.79	0.82	0.84	0.87	0.90	0.93	0.96	0.99	1.02	1.05	1.09	1.13	1.17	1.20	1.25	1.28	1.33	1.36	1.42	1.45	1.51
C Gross Income (A-B)		49.40	0.00	0.00	-0.11	0.00	0.04	0.05	0.42	0.43	0.46	0.46	0.95	0.99	1.03	1.05	1.09	1.12	1.16	1.20	1.24	1.28	1.31	1.36	1.41	1.45	1.50	1.55	1.60	1.66	1.72	1.77	1.82	1.88	1.95	2.00	2.08	2.14	2.23	2.29	2.38	2.44
D Depreciation cost		58.10						1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66
E Interest paid		19.49	0.02	0.04	0.35	0.67	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.80	0.78	0.75	0.73	0.71	0.68	0.66	0.63	0.60	0.58	0.55	0.53	0.50	0.47	0.44	0.42	0.39	0.36	0.33	0.30	0.27	0.25	0.22	0.19	0.16	0.13	0.09	0.06	0.03
F Net Income		-28.19	-0.02	-0.04	-0.46	-0.67	-0.78	-2.44	-2.07	-2.06	-2.03	-2.03	-1.54	-1.47	-1.41	-1.36	-1.30	-1.25	-1.18	-1.12	-1.05	-0.98	-0.93	-0.85	-0.78	-0.71	-0.63	-0.55	-0.48	-0.39	-0.30	-0.22	-0.14	-0.05	0.04	0.12	0.23	0.32	0.44	0.54	0.66	0.75
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		-28.19	-0.02	-0.04	-0.46	-0.67	-0.78	-2.44	-2.07	-2.06	-2.03	-2.03	-1.54	-1.47	-1.41	-1.36	-1.30	-1.25	-1.18	-1.12	-1.05	-0.98	-0.93	-0.85	-0.78	-0.71	-0.63	-0.55	-0.48	-0.39	-0.30	-0.22	-0.14	-0.05	0.04	0.12	0.23	0.32	0.44	0.54	0.66	0.75
OM Cost Recovery Ratio (A/B)		248%	0%	0%	67%	100%	108%	110%	182%	181%	185%	181%	261%	265%	266%	262%	263%	262%	263%	262%	263%	262%	260%	262%	262%	261%	261%	261%	262%	263%	264%	262%	261%	261%	263%	260%	263%	261%	264%	261%	264%	262%

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	-28.19	-0.02	-0.04	-0.46	-0.67	-0.78	-2.44	-2.07	-2.06	-2.03	-2.03	-1.54	-1.47	-1.41	-1.36	-1.30	-1.25	-1.18	-1.12	-1.05	-0.98	-0.93	-0.85	-0.78	-0.71	-0.63	-0.55	-0.48	-0.39	-0.30	-0.22	-0.14	-0.05	0.04	0.12	0.23	0.32	0.44	0.54	0.66	0.75
2. Depreciation cost	58.10	0.00	0.00	0.00	0.00	0.00	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66
3. Interest Paid	19.49	0.02	0.04	0.35	0.67	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.80	0.78	0.75	0.73	0.71	0.68	0.66	0.63	0.60	0.58	0.55	0.53	0.50	0.47	0.44	0.42	0.39	0.36	0.33	0.30	0.27	0.25	0.22	0.19	0.16	0.13	0.09	0.06	0.03
Sub-total	49.40	0.00	0.00	-0.11	0.00	0.04	0.05	0.42	0.43	0.46	0.46	0.95	0.99	1.03	1.05	1.09	1.12	1.16	1.20	1.24	1.28	1.31	1.36	1.41	1.45	1.50	1.55	1.60	1.66	1.72	1.77	1.82	1.88	1.95	2.00	2.08	2.14	2.23	2.29	2.38	2.44
B Finances																																									
1. Project Loan	82.69	2.36	1.67	31.30	32.13	14.59	0.36	0.28																																	
2. Local fund	28.23	0.79	0.56	10.59	11.02	5.06	0.12	0.09																																	
Sub-total	110.92	3.15	2.23	41.89	43.15	19.65	0.48	0.37																																	
C Subsidy from Government																																									
1. Subsidy for O&M cost	0.11	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	52.68	0.02	0.04	0.35	0.67	0.78	0.78	0.41	0.40	0.37	0.37	2.26	2.21	2.18	2.15	2.11	2.09	2.04	2.01	1.96	1.92	1.90	1.84	1.80	1.76	1.70	1.65	1.61	1.55	1.48	1.43	1.38	1.32	1.26	1.21	1.13	1.07	0.98	0.91	0.82	0.76
Sub-total	52.79	0.02	0.04	0.46	0.67	0.78	0.78	0.41	0.40	0.37	0.37	2.26	2.21	2.18	2.15	2.11	2.09	2.04	2.01	1.96	1.92	1.90	1.84	1.80	1.76	1.70	1.65	1.61	1.55	1.48	1.43	1.38	1.32	1.26	1.21	1.13	1.07	0.98	0.91	0.82	0.76
Total Cash Inflow	213.11	3.17	2.27	42.24	43.82	20.47	1.31	1.20	0.83	0.83	0.83	3.21	3.20	3.21	3.20	3.20	3.21	3.20	3.21	3.20	3.20	3.21	3.20	3.21	3.21	3.20	3.20	3.21	3.21	3.20	3.20	3.20	3.20	3.21	3.21	3.21	3.21	3.21	3.20	3.20	3.20
APPLICATION OF FUNDS																																								
D Project disbursement	110.92	3.15	2.23	41.89	43.15	19.65	0.48	0.37																																	
E Total debt services																																								
1. Loan repayment	82.70											2.38	2.40	2.43	2.45	2.47	2.50	2.52	2.55	2.57	2.60	2.63	2.65	2.68	2.71	2.73	2.76	2.79	2.82	2.84	2.87	2.90	2.93	2.96	2.99	3.02	3.05	3.08	3.11	3.14	3.17
2. Interest paid	19.49	0.02	0.04	0.35	0.67	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.80	0.78	0.75	0.73	0.71	0.68	0.66	0.63	0.60	0.58	0.55	0.53	0.50	0.47	0.44	0.42	0.39	0.36	0.33	0.30	0.27	0.25	0.22	0.19	0.16	0.13	0.09	0.06	0.03
Sub-total	102.19	0.02	0.04	0.35	0.67	0.82	0.83	0.83	0.83	0.83	0.83	3.21	3.20	3.21	3.20	3.20	3.21	3.20	3.21	3.20	3.20	3.21	3.20	3.21	3.21	3.20	3.20	3.21	3.21	3.20	3.20	3.20	3.20	3.21	3.21	3.21	3.21	3.21	3.20	3.20	3.20
Total Cash Outflow	213.11	3.17	2.27	42.24	43.82	20.47	1.31	1.20	0.83	0.83	0.83	3.21	3.20	3.21	3.20	3.20	3.21	3.20	3.21	3.20	3.20	3.21	3.20	3.21	3.21	3.20	3.20	3.21	3.21	3.20	3.20	3.20	3.20	3.21	3.21	3.21	3.21	3.21	3.20	3.20	3.20
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
Project Cost Recovery Ratio (%)																																								
Cost recovery by water fee (A/E)	48%	0%	0%	0%	0%	5%	6%	51%	52%	55%	55%	30%	31%	32%	33%	34%	35%	36%	37%	39%	40%	41%	43%	44%	45%	47%	48%	50%	52%	54%	55%	57%	59%	61%	62%	65%	67%	69%	72%	74%	76%
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%

ARAGATSOTN MARZ
Aparan District
No 55 Sipan

FINANCIAL ANALYSIS

A COST RECOVERY ANALYSIS

	Item	Millon AMD	Rate
1	**Revenue**		
	Water fee revenue	82.70	61.0%
	Subsidy	52.79	39.0%
	Total	135.49	100.0%
2	**Expenditure**		
	OM cost	33.30	24.6%
	Loan repayment	82.70	61.0%
	Interest paid	19.49	14.4%
	Surplus cash	0.00	0.0%
	Total	135.49	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	74.18	2.30	1.64	28.61	28.48	12.56	0.33	0.26																																	
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	2.23			0.02	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
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	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	0.16
Pump replacement																	0.00															0.00										
Sub-total	17.31			0.33	0.42	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Total Outflow	91.49	2.30	1.64	28.94	28.90	13.02	0.79	0.72	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
B BENEFIT																																								
1. Water Tariff	51.86	0.00	0.00	0.22	0.44	0.53	0.55	0.93	0.96	1.00	1.03	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54
2. Subsidy	35.16	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.43	1.41	1.40	1.40	1.38	1.38	1.36	1.35	1.33	1.32	1.32	1.29	1.27	1.26	1.23	1.21	1.19	1.16	1.12	1.10	1.08	1.05	1.01	0.99	0.94	0.91	0.85	0.82	0.76	0.73
Total Inflow	87.02	0.00	0.00	0.33	0.44	0.53	0.55	0.93	0.96	1.00	1.03	2.97	2.95	2.94	2.94	2.92	2.92	2.90	2.89	2.87	2.86	2.86	2.83	2.81	2.80	2.77	2.75	2.73	2.70	2.66	2.64	2.62	2.59	2.55	2.53	2.48	2.45	2.39	2.36	2.30	2.27
NET BENEFIT	-4.47	-2.30	-1.64	-28.6	-28.5	-12.5	-0.24	0.21	0.50	0.54	0.57	2.51	2.49	2.48	2.48	2.46	2.46	2.44	2.43	2.41	2.40	2.40	2.37	2.35	2.34	2.31	2.29	2.27	2.24	2.20	2.18	2.16	2.13	2.09	2.07	2.02	1.99	1.93	1.90	1.84	1.81

FIRR = **-0.30%**

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	-30.22	-2.53	-1.80	-31.5	-31.3	-13.7	-0.27	0.18	0.50	0.54	0.57	2.51	2.49	2.48	2.48	2.46	2.46	2.44	2.43	2.41	2.40	2.40	2.37	2.35	2.34	2.31	2.29	2.27	2.24	2.20	2.18	2.16	2.13	2.09	2.07	2.02	1.99	1.93	1.90	1.84	1.81
	2	Capital cost 20% up	-37.18	-2.76	-1.97	-34.3	-34.2	-15.0	-0.31	0.16	0.50	0.54	0.57	2.51	2.49	2.48	2.48	2.46	2.46	2.44	2.43	2.41	2.40	2.40	2.37	2.35	2.34	2.31	2.29	2.27	2.24	2.20	2.18	2.16	2.13	2.09	2.07	2.02	1.99	1.93	1.90	1.84	1.81
2	1	OM cost 10% up	-24.47	-2.30	-1.64	-28.6	-28.5	-12.5	-0.29	0.16	0.45	0.49	0.52	2.46	2.44	2.43	2.43	2.41	2.41	2.39	2.38	2.36	2.35	2.35	2.32	2.30	2.29	2.26	2.24	2.22	2.19	2.15	2.13	2.11	2.08	2.04	2.02	1.97	1.94	1.88	1.85	1.79	1.76
	2	OM cost 20% up	-25.68	-2.30	-1.64	-28.7	-28.5	-12.6	-0.33	0.12	0.41	0.45	0.48	2.42	2.40	2.39	2.39	2.37	2.37	2.35	2.34	2.32	2.31	2.31	2.28	2.26	2.25	2.22	2.20	2.18	2.15	2.11	2.09	2.07	2.04	2.00	1.98	1.93	1.90	1.84	1.81	1.75	1.72
3	1	Revenue 10% down	-29.10	-2.30	-1.64	-28.6	-28.5	-12.5	-0.30	0.12	0.40	0.44	0.47	2.21	2.20	2.19	2.19	2.17	2.17	2.15	2.14	2.12	2.11	2.11	2.09	2.07	2.06	2.03	2.02	2.00	1.97	1.93	1.92	1.90	1.87	1.84	1.82	1.77	1.75	1.69	1.66	1.61	1.58
	2	Revenue 20% down	-34.95	-2.30	-1.64	-28.7	-28.5	-12.6	-0.35	0.02	0.31	0.34	0.36	1.92	1.90	1.89	1.89	1.88	1.88	1.86	1.85	1.84	1.83	1.83	1.80	1.79	1.78	1.76	1.74	1.72	1.70	1.67	1.65	1.64	1.61	1.58	1.56	1.52	1.50	1.45	1.43	1.38	1.36

No.		Description	FIRR	Sensitivity indicator	Swiching value
1	1	Capital cost 10% up	-0.75%	-6.01	-16.64%
	2	Capital cost 20% up	-1.16%	-7.40	-13.51%
2	1	OM cost 10% up	-0.42%	-2.84	-35.23%
	2	OM cost 20% up	-0.54%	-4.44	-22.53%
3	1	Revenue 10% down	-0.93%	-6.76	-14.79%
	2	Revenue 20% down	-1.63%	-8.15	-12.27%

No.56 Vardenis

Information on Existing Water Sources (Aragatsotn)

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

No.56 Community Vardenis
District Aparan
Marz Aragatsotn

No	Water source	Latitude			Longitude			Atidute	Yeild(L/sec)		
		deg	min	sec	deg	min	sec	(m)	Min	Max	At site
1	Siroyi spring	40	33	36.8	44	24	24.0	1,851	1.5	2.0	2.0
2	Yot verki spring	40	33	43.3	44	24	24.5	1,860	0.8	1.0	1.0
3	Krpni spring	40	33	43.1	44	24	17.4	1,863	1.0	1.5	1.5
4	Lusaghbyur spring	40	33	59.3	44	24	12.4	1,866	1.5	2.0	2.0
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	The springs are in the Communitys. There is estimated 30% leakage in the internal network.
Alternative sources if any	There is a 0.5l/sec capacity spring in the area of "Miroi" spring.

No.56 Community Vardenis
District Aparan
Marz Aragatsotn
Sampling date 23/Jul/2007

	Parameters analysed	Units	No.1 Lusaghbyur	No.2 Verq	No.3Krtniagh bjyur	No.4 Siro aghbyur	Guidelines	
							WHO	Armenia
a	pH		7.2	6.8	7.3	7.3	6.5-8	6.0 - 9.0
b	Temperature	Deg.C	6.8	6.7	6.9	6.8		
c	TDS	Mg/L	68	74	74	73	1000	1000
1	Al:Aluminum	Mg/L	n.d	n.d	n.d	n.d	0.10	0.50
2	B:Boron	Mg/L	n.d	n.d	n.d	n.d	0.70	0.50
3	Cl:Chloride	Mg/L	6	6	6	5	250	350
4	Cr:Chrome	Mg/L	<0.01	<0.01	<0.01	<0.01	0.05	0.05
5	Cu:Copper	Mg/L	n.d	n.d	n.d	n.d	2	1
6	F:Fluoride	Mg/L	0.03	0.04	0.04	0.04	1.50	
7	Hardness	Mg/L	125	125	120	120	500	700
8	Fe:Iron	Mg/L	n.d	n.d	n.d	n.d	0.30	0.30
9	Mn:Manganese	Mg/L	n.d	n.d	n.d	n.d	0.40	0.10
10	Mo:Molibdenum	Mg/L	n.d	n.d	n.d	n.d	0.070	0.250
11	Ni:Nickel	Mg/L	n.d	n.d	n.d	n.d	0.020	0.100
12	Nitrate(NO3+)	Mg/L	3.1	4.0	4.0	2.2	50.0	45.0
13	SO4:Sulfate	Mg/L	4.0	7.0	5.0	5.0	250.0	500.0
14	Zn:Zink	Mg/L	n.d	n.d	n.d	n.d	3.0	5.0
15	As:Arsenic	Mg/L	n.d	n.d	n.d	n.d	0.0	0.1
16	Ba:Barium	Mg/L	<0.01	<0.01	<0.01	<0.01	0.70	0.10
17	Be:Berillium	Mg/L	n.d	n.d	n.d	n.d	NA	0.00020
18	Cd:Cadmium	Mg/L	n.d	n.d	n.d	n.d	0.0030	0.0010
19	Pb:Lead	Mg/L	<0.001	<0.001	<0.001	<0.001	0.010	0.030
20	Hg:Mercury	Mg/L	<0.0002	<0.0002	<0.0002	<0.0002	0.00100	0.00050
21	Se:Selenium	Mg/L	<0.001	<0.001	<0.001	<0.001	0.010	0.010
22	Sr:Strontium	Mg/L	n.d	n.d	n.d	n.d	NA	7.0
23	CN:Cyanide	Mg/L	n.d	n.d	n.d	n.d	0.070	0.035
24	Coli form bacteria	bacteria per 100 ml			n.d	<3	-	0
25	Thermo-tolerant coli form bacteria	bacteria per 100 ml			n.d	n.d	0	0
26	Total bacteria	bacteria per 1 ml			10	3	-	50

Information on Existing Water Sources
Existing Bacteriological Test

No.56 Community Vardenis
District Aparan
Marz Aragatsotn

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	2			0.0	Not Identified
2	3			0.4/2	Not Identified
3	5			0.1/1; 0.9/2	Not Identified
4	6			0.3/1; 0.7/1; 1.1/1	Not Identified

No. 56 **Marz** Aragatsotn **Community** Vardenis

1. ACCESSIBILITY TO THE SITE

No.	Structures	Access by vehicle	Machine construction	Remarks
1	Intake	Fair	Possible	
2	Intake	Fair	Possible	
3	Intake	Fair	Possible	
4	Intake	Fair	Possible	
5	Transmission pipeline			no transmission pipeline
6	Reservoir			no reservoir

Water main

2. INTAKE STRUCTURE

No.	Water source	N	E	El. (m)	Year	Material	Volume (l/s)	Rehabilitation Necessity (Y/N)
1	Spring	40°33'36.8″	44°24'24.0″	1,851	1998	reinforced concrete	2.0	Yes
2	Spring	40°33'43.3″	44°24'24.5″	1,860	1998	reinforced concrete	1.0	Yes
3	Spring	40°33'43.1″	44°24'17.4″	1,863	1998	reinforced concrete	1.5	Yes
4	Spring	40°33'59.3″	44°24'12.4″	1,866	1998	reinforced concrete	2.0	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

No.	Existence (Y/N)	Location	Chlorine type	Chlorine duration
1	Yes	Intake	Powder	2times per month

6. DISTRIBUTION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Year	Leakage	Rehabilitation Necessity (Y/N)
1	3,500	100	Steel	1997	Medium	Yes
2	1,500	100	Steel	1997	Little	Yes
3	500	100	cast iron	1997	Little	Yes
4	500	50	Steel	1997	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)
2	1997		No	0	Yes

9. DRAINAGE SYSTEM

Existence	Rehabilitation	Remarks
No	Yes	

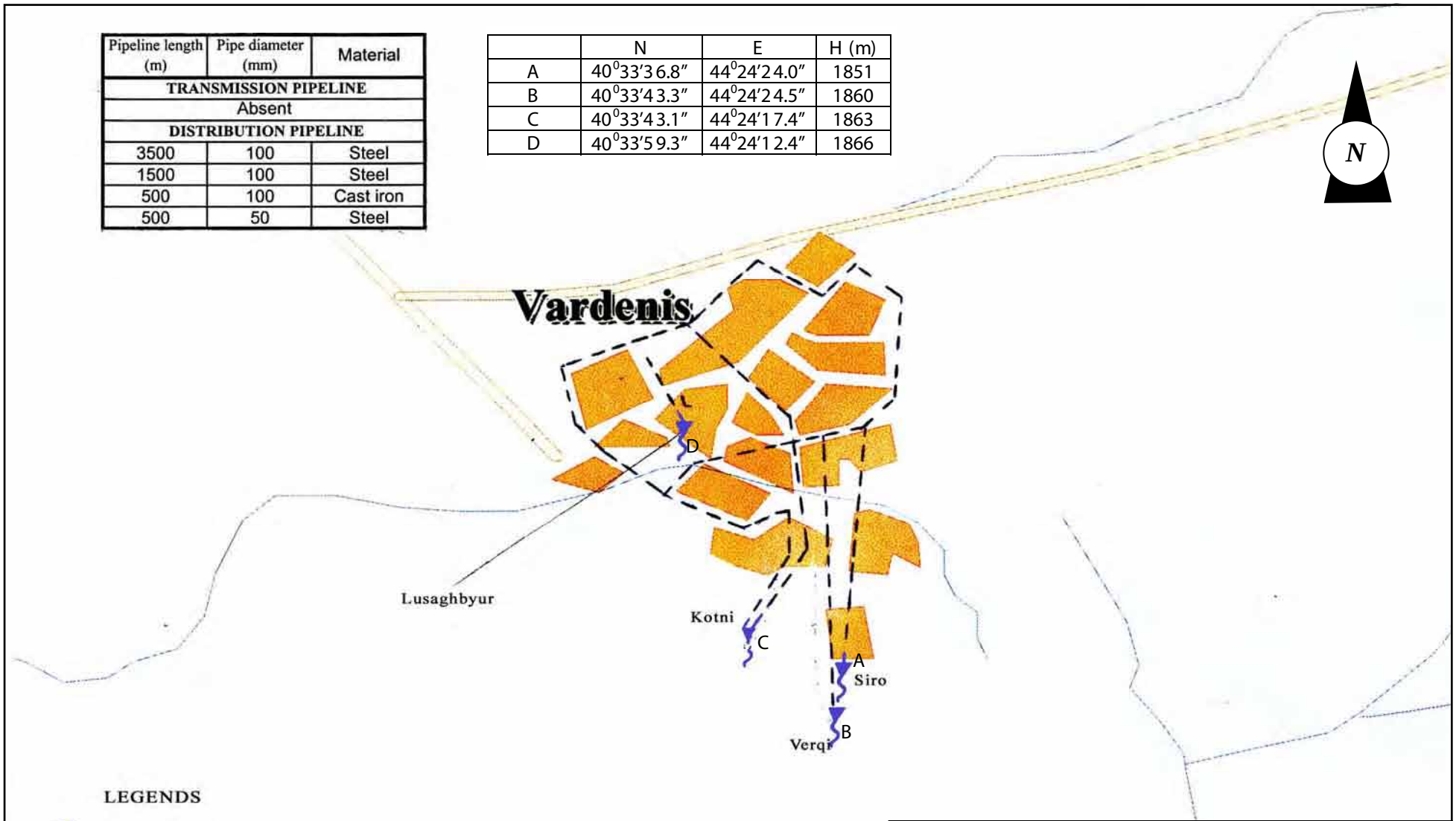
Questionnaire on Existing Water Supply Conditions by Socio-Economic Survey

Marz	**Aragatsotn**
Number and Name of Community	**No.56 Vardenis**
District	**Aparan**

No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	720
A2	Actual population in 2007	750
A3	Number of households	228
A4.1	Elderly people	55
A4.2	Population in labor force (age from 16 to 62)	532
A4.3	Children	163
A5.1	Pensioners	90
A5.2	Unemployed	0
A5.3	Receiving benefits	21
A6	Average monthly income of household (AMD)	40,000
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	147
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	2,228
	Annual Budget of the community 2005, in thousand AMD	1,333
	Annual Budget of the community 2006, in thousand AMD	1,885
	Annual Budget of the community 2007, in thousand AMD	673
	Annual Budget of the community 2008, in thousand AMD	is not planned.
B2	Amount spent in drinking water sector 2004, in thousand AMD	100
	Amount spent in drinking water sector 2005, in thousand AMD	150
	Amount spent in drinking water sector 2006, in thousand AMD	170
	Amount spent in drinking water sector 2007, in thousand AMD	100
	Amount spent in drinking water sector 2008, in thousand AMD	is not planned.
C: Socio-Economic Survey		
C1	Major industries of the community:	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	2007
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-40 for houses
D7	Number of house connection to drinking water system	228
D8	How many house connection household set the water meter	0
D9	Number of public taps	2
D10.1	How is the regime of water supply in your community in the dry season?	24 hrs, in winter 40%- do not have water because of irrigation
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?	mainly displeased summers.
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	-
D15.2	Estimate quantity of water for filling containers of each household (litter per	500
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 Qasakh river for 40 HHs
D20	Are you satisfied with irrigation water supply volume?	is not sufficient
E: Present Operation and Maintenance Works		
E1	Name of responsible for water supply	Asatryan Jivan
E2	Position	administrtion head
E3	Telephone	(093)248320
E4	Quantity and present condition of the water supply facilities: spring/ intake	4 partially repaired
E5	Quantity and present condition of the water supply facilities:	4 partially repaired
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 pipes	deteriorated
E8	Quantity and present condition of the water supply facilities: public tap	partially repaired
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 and residents
E12	How do you repair the water supply facilities?	by ourselves
E13	Who is in charge of the repair work in the community?	volunteers from community
E14	How you prepare O&M costs?	community budget
E15	Please indicate the O&M cost breakdown per year for water supply	
	Electricity (AMD)	0
	Labor cost (AMD)	0
	Repair cost(AMD)	150,000
	Others(AMD)	0
	Total (AMD)	150,000
E16	Do the residents participate in the O&M works?	manpower
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

Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
Absent		
DISTRIBUTION PIPELINE		
3500	100	Steel
1500	100	Steel
500	100	Cast iron
500	50	Steel

	N	E	H (m)
A	40°33′36.8″	44°24′24.0″	1851
B	40°33′43.3″	44°24′24.5″	1860
C	40°33′43.1″	44°24′17.4″	1863
D	40°33′59.3″	44°24′12.4″	1866



LEGENDS

Spring intake

Distribution pipeline

SCALE

0 100 200 300 400 500 m

Aragatsotn Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
56	Vardenis	JICA STUDY TEAM 2007

Marz : **Aragatsotn** No.56
Name : **Vardenis**

No.	Item	Quantity	Unit	Water demand (m3/d)	
A.	**WATER DEMAND**				
	1 Population	750	persons	75.0	
	2 Factory	-	nos	0.0	
	3 School (pupils)	147	pupils	1.5	
	4 Medical Ambulance Station	-	nos	-	
	5 Policlinic	-	nos	-	
	6 Livestocks (87lit/household)	228	household	19.8	
	Sub-total			96.3	
	Unaccouted for water (20%)			19.3	
1	Average Daily Water Demand			115.6	m3/day
2	Maximum Daily Water Demand			138.7	m3/day
3	Maximum Hourly Water Demand			16.5	m3/hr

B	**WATER SUPPLY PLAN**						
	1 Water source type	Nr.	Total vol.				
	a Spring	4	6.5	lit/sec		561.6	m3/day
`	Total					561.6	m3/day
	2 Required reservoir volume					198	m3

C WATER SUPPLY FACILITIES REHABILITATION PLAN

No	Item	Quantity	Unit
1	Intake		
	1m3	4	nos
	2m3		nos
	3m3		nos
	4m3		nos
2	Transmission pipe		
	50mm diameter		m
	75mm diameter	300	m
	90mm diameter	400	m
	110mm diameter		m
	150mm diameter		m
	200mm diameter		m
	250mm diameter		m
3	Reservoir		
	200m3 capacity	1	nos
4	Distribution pipe		
	50mm diameter	500	m
	75mm diameter		m
	90mm diameter		m
	110mm diameter	4,800	m
	150mm diameter		m
	200mm diameter		m
	250mm diameter		m
5	House connection	-	nos
6	Water meter installation	228	nos
7	Public tap	3	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	Aragatsotn	
No. 56	Vardenis	JICA STUDY TEAM

Marz : **Aragatsotn**
No. : **56**
Name : **Vardenis**

No	Item	Specification	Quantity	Unit	Unit Price	Total
1	Intake					
		1m3	4	nos	367,700	1,470,800
		2m3		nos	545,000	
		3m3		nos	669,100	
		4m3		nos	805,100	
	Sub-total					1,470,800
2	Transmission Pipe					
		50mm		m	5,520	
		75mm	300	m	7,160	2,148,000
		90mm	400	m	8,040	3,216,000
		110mm		m	9,680	
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					5,364,000
3	Reservoir					
		50m3		nos	8,363,900	
		100m3		nos	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					22,524,600
4	Distribution Pipe					
		50mm	500	m	5,520	2,760,000
		75mm		m	7,160	
		90mm		m	8,040	
		110mm	4,800	m	9,680	46,464,000
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					49,224,000
5	House Connection			nos	74,000	
6	Water Meter Installation		228	nos	80,000	18,240,000
7	Public Tap		3	nos	90,000	270,000
8	Chlorilation Equipment		1	nos	500,000	500,000
9	Pump Replacement			nos	10,000,000	
10	Drainage and Sewerage	concrete surfa	2,120	m	3,600	7,632,000
	Total				AMD	105,225,400
					Equivalent to USD	344,414
					Equivalent to JPY	36,335,689
					AMD	USD
	Investment Cost per household		228	HH	461,515	1,511
	Investment Cost per person		750	persons	140,301	459

ARAGATSOTN MARZ
Aparan District
No 56 Vardenis

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		35.1																																							
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		196.17	0.00	0.00	0.52	1.04	1.27	1.31	2.21	2.29	2.36	2.44	3.66	3.78	3.90	4.03	4.17	4.30	4.45	4.59	4.74	4.90	5.06	5.23	5.40	5.58	5.76	5.95	6.15	6.35	6.56	6.78	7.00	7.23	7.47	7.72	7.97	8.24	8.51	8.79	9.08	9.38
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				211																																				
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		9.24			0.05	0.11	0.14	0.14	0.14	0.15	0.15	0.16	0.16	0.17	0.18	0.18	0.19	0.19	0.20	0.21	0.21	0.22	0.23	0.23	0.24	0.25	0.26	0.27	0.28	0.29	0.29	0.30	0.31	0.32	0.34	0.35	0.36	0.37	0.38	0.39	0.41	0.42
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		15.31			0.09	0.18	0.22	0.23	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	0.36	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
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					0.09	0.18	0.22	0.23	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	0.36	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
5. Pump replacement		0.00																0.00															0.00									
Sub-total		42.25	0.00	0.00	0.38	0.54	0.62	0.63	0.65	0.68	0.70	0.72	0.74	0.77	0.80	0.82	0.85	0.88	0.91	0.94	0.96	1.00	1.04	1.06	1.10	1.14	1.18	1.22	1.26	1.30	1.34	1.38	1.43	1.48	1.54	1.58	1.63	1.68	1.73	1.79	1.86	1.92
C Gross Income (A-B)		153.92	0.00	0.00	0.14	0.50	0.65	0.68	1.56	1.61	1.66	1.72	2.92	3.01	3.10	3.21	3.32	3.42	3.54	3.65	3.78	3.90	4.02	4.17	4.30	4.44	4.58	4.73	4.89	5.05	5.22	5.40	5.57	5.75	5.93	6.14	6.34	6.56	6.78	7.00	7.22	7.46
D Depreciation cost		100.10						2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86
E Interest paid		31.70	0.02	0.04	0.56	1.10	1.34	1.35	1.35	1.35	1.35	1.35	1.35	1.31	1.27	1.23	1.19	1.15	1.11	1.07	1.03	0.99	0.94	0.90	0.86	0.81	0.77	0.72	0.68	0.63	0.59	0.54	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10	0.05
F Net Income		22.12	-0.02	-0.04	-0.42	-0.60	-0.69	-3.53	-2.65	-2.60	-2.55	-2.49	-1.29	-1.16	-1.03	-0.88	-0.73	-0.59	-0.43	-0.28	-0.11	0.05	0.22	0.41	0.58	0.77	0.95	1.15	1.35	1.56	1.77	2.00	2.21	2.44	2.67	2.93	3.18	3.45	3.72	3.99	4.26	4.55
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		22.12	-0.02	-0.04	-0.42	-0.60	-0.69	-3.53	-2.65	-2.60	-2.55	-2.49	-1.29	-1.16	-1.03	-0.88	-0.73	-0.59	-0.43	-0.28	-0.11	0.05	0.22	0.41	0.58	0.77	0.95	1.15	1.35	1.56	1.77	2.00	2.21	2.44	2.67	2.93	3.18	3.45	3.72	3.99	4.26	4.55
OM Cost Recovery Ratio (A/B)		464%	0%	0%	136%	194%	205%	208%	340%	337%	337%	339%	495%	491%	488%	491%	491%	489%	489%	488%	494%	490%	487%	493%	491%	489%	488%	488%	488%	488%	490%	491%	490%	489%	485%	489%	489%	490%	492%	491%	488%	489%

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	22.12	-0.02	-0.04	-0.42	-0.60	-0.69	-3.53	-2.65	-2.60	-2.55	-2.49	-1.29	-1.16	-1.03	-0.88	-0.73	-0.59	-0.43	-0.28	-0.11	0.05	0.22	0.41	0.58	0.77	0.95	1.15	1.35	1.56	1.77	2.00	2.21	2.44	2.67	2.93	3.18	3.45	3.72	3.99	4.26	4.55
2. Depreciation cost	100.10	0.00	0.00	0.00	0.00	0.00	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86	2.86
3. Interest Paid	31.70	0.02	0.04	0.56	1.10	1.34	1.35	1.35	1.35	1.35	1.35	1.35	1.31	1.27	1.23	1.19	1.15	1.11	1.07	1.03	0.99	0.94	0.90	0.86	0.81	0.77	0.72	0.68	0.63	0.59	0.54	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10	0.05
Sub-total	153.92	0.00	0.00	0.14	0.50	0.65	0.68	1.56	1.61	1.66	1.72	2.92	3.01	3.10	3.21	3.32	3.42	3.54	3.65	3.78	3.90	4.02	4.17	4.30	4.44	4.58	4.73	4.89	5.05	5.22	5.40	5.57	5.75	5.93	6.14	6.34	6.56	6.78	7.00	7.22	7.46
B Finances																																									
1. Project Loan	134.87	2.36	1.67	52.16	53.69	24.35	0.36	0.28																																	
2. Local fund	46.09	0.79	0.56	17.65	18.42	8.46	0.12	0.09																																	
Sub-total	180.96	3.15	2.23	69.81	72.11	32.81	0.48	0.37																																	
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	26.52	0.02	0.04	0.42	0.60	0.69	0.67	0.00	0.00	0.00	0.00	2.31	2.22	2.13	2.02	1.91	1.81	1.69	1.58	1.45	1.33	1.20	1.06	0.93	0.78	0.65	0.49	0.34	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total	26.52	0.02	0.04	0.42	0.60	0.69	0.67	0.00	0.00	0.00	0.00	2.31	2.22	2.13	2.02	1.91	1.81	1.69	1.58	1.45	1.33	1.20	1.06	0.93	0.78	0.65	0.49	0.34	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Cash Inflow	361.40	3.17	2.27	70.37	73.21	34.15	1.83	1.93	1.61	1.66	1.72	5.23	5.23	5.23	5.23	5.23	5.23	5.23	5.23	5.23	5.23	5.22	5.23	5.23	5.22	5.23	5.22	5.23	5.22	5.23	5.40	5.57	5.75	5.93	6.14	6.34	6.56	6.78	7.00	7.22	7.46
APPLICATION OF FUNDS																																									
D Project disbursement	180.96	3.15	2.23	69.81	72.11	32.81	0.48	0.37																																	
E Total debt services																																									
1. Loan repayment	134.89											3.88	3.92	3.96	4.00	4.04	4.08	4.12	4.16	4.20	4.24	4.28	4.33	4.37	4.41	4.46	4.50	4.55	4.59	4.64	4.68	4.73	4.78	4.83	4.87	4.92	4.97	5.02	5.07	5.12	5.17
2. Interest paid	31.70	0.02	0.04	0.56	1.10	1.34	1.35	1.35	1.35	1.35	1.35	1.35	1.31	1.27	1.23	1.19	1.15	1.11	1.07	1.03	0.99	0.94	0.90	0.86	0.81	0.77	0.72	0.68	0.63	0.59	0.54	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10	0.05
Sub-total	166.59	0.02	0.04	0.56	1.10	1.34	1.35	1.35	1.35	1.35	1.35	5.23	5.23	5.23	5.23	5.23	5.23	5.23	5.23	5.23	5.23	5.22	5.23	5.23	5.22	5.23	5.22	5.23	5.22	5.23	5.22	5.23	5.23	5.23	5.22	5.22	5.22	5.22	5.22	5.22	5.22
Total Cash Outflow	347.55	3.17	2.27	70.37	73.21	34.15	1.83	1.72	1.35	1.35	1.35	5.23	5.23	5.23	5.23	5.23	5.23	5.23	5.23	5.23	5.23	5.22	5.23	5.23	5.22	5.23	5.22	5.23	5.22	5.23	5.22	5.23	5.23	5.23	5.22	5.22	5.22	5.22	5.22	5.22	5.22
F Net Surplus Cash (A+C2)-E	13.85	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.26	0.31	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.34	0.52	0.70	0.92	1.12	1.34	1.56	1.78	2.00	2.24
Project Cost Recovery Ratio (%)																																									
Cost recovery by water fee (A/E)	92%	0%	0%	24%	46%	49%	50%	116%	119%	123%	127%	56%	58%	59%	61%	63%	65%	68%	70%	72%	75%	77%	80%	82%	85%	88%	91%	93%	97%	100%	103%	107%	110%	113%	118%	121%	126%	130%	134%	138%	143%
Cost recovery by water fee + subsidy ((A+C2)/E)	108%	100%	100%	100%	100%	100%	100%	116%	119%	123%	127%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	103%	107%	110%	113%	118%	121%	126%	130%	134%	138%	143%

ARAGATSOTN MARZ
Aparan District
No 56 Vardenis

FINANCIAL ANALYSIS

A COST RECOVERY ANALYSIS

	Item	Millon AMD	Rate
1	**Revenue**		
	Water fee revenue	196.17	88.1%
	Subsidy	26.52	11.9%
	Total	222.69	100.0%
2	**Expenditure**		
	OM cost	42.25	19.0%
	Loan repayment	134.89	60.6%
	Interest paid	31.70	14.2%
	Surplus cash	13.85	6.2%
	Total	222.69	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	120.62	2.30	1.64	47.63	47.53	20.93	0.33	0.26																																
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	4.84			0.05	0.11	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
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	7.82			0.09	0.17	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Pump replacement																	0.00															0.00									
Sub-total	21.79			0.38	0.52	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
Total Outflow	142.41	2.30	1.64	48.01	48.05	21.51	0.91	0.84	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
B BENEFIT																																								
1. Water Tariff	123.24	0.00	0.00	0.52	1.04	1.27	1.31	2.21	2.29	2.36	2.44	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66
2. Subsidy	7.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	0.91	0.86	0.79	0.72	0.66	0.58	0.51	0.42	0.34	0.26	0.16	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Inflow	130.48	0.00	0.00	0.52	1.04	1.27	1.31	2.21	2.29	2.36	2.44	4.62	4.57	4.52	4.45	4.38	4.32	4.24	4.17	4.08	4.00	3.92	3.82	3.73	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66
NET BENEFIT	-11.93	-2.30	-1.64	-47.5	-47.0	-20.2	0.40	1.37	1.71	1.78	1.86	4.04	3.99	3.94	3.87	3.80	3.74	3.66	3.59	3.50	3.42	3.34	3.24	3.15	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08

FIRR = -0.52%

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	-50.90	-2.53	-1.80	-52.3	-51.8	-22.3	0.37	1.34	1.71	1.78	1.86	4.04	3.99	3.94	3.87	3.80	3.74	3.66	3.59	3.50	3.42	3.34	3.24	3.15	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08
	2	Capital cost 20% up	-62.21	-2.76	-1.97	-57.0	-56.5	-24.4	0.33	1.32	1.71	1.78	1.86	4.04	3.99	3.94	3.87	3.80	3.74	3.66	3.59	3.50	3.42	3.34	3.24	3.15	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08
2	1	OM cost 10% up	-41.10	-2.30	-1.64	-47.5	-47.1	-20.3	0.34	1.31	1.65	1.72	1.80	3.98	3.93	3.88	3.81	3.74	3.68	3.60	3.53	3.44	3.36	3.28	3.18	3.09	3.02	3.02	3.02	3.02	3.02	3.02	3.02	3.02	3.02	3.02	3.02	3.02	3.02	3.02	3.02	3.02
	2	OM cost 20% up	-42.63	-2.30	-1.64	-47.6	-47.1	-20.4	0.28	1.25	1.59	1.66	1.74	3.92	3.87	3.82	3.75	3.68	3.62	3.54	3.47	3.38	3.30	3.22	3.12	3.03	2.96	2.96	2.96	2.96	2.96	2.96	2.96	2.96	2.96	2.96	2.96	2.96	2.96	2.96	2.96	2.96
3	1	Revenue 10% down	-48.46	-2.30	-1.64	-47.5	-47.1	-20.4	0.27	1.15	1.48	1.54	1.62	3.58	3.53	3.49	3.43	3.36	3.31	3.24	3.17	3.09	3.02	2.95	2.86	2.78	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71
	2	Revenue 20% down	-57.33	-2.30	-1.64	-47.6	-47.2	-20.5	0.14	0.93	1.25	1.31	1.37	3.12	3.08	3.04	2.98	2.92	2.88	2.81	2.76	2.68	2.62	2.56	2.48	2.40	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35

No.		Description	FIRR	Sensitivity indicator	Swiching value
1	1	Capital cost 10% up	-0.99%	-4.71	-21.23%
	2	Capital cost 20% up	-1.40%	-6.27	-15.94%
2	1	OM cost 10% up	-0.62%	-1.59	-62.84%
	2	OM cost 20% up	-0.72%	-2.76	-36.27%
3	1	Revenue 10% down	-1.14%	-5.43	-18.43%
	2	Revenue 20% down	-1.83%	-7.14	-14.01%