No.4 Gosh

Information on Existing Water Sources (Tavush)

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

No.4 Community Gosh
District Idjevan
Marz Tavush

No	Water source	Latitude			Longitude			Atidute	Yeild(L/sec)		
		deg	min	sec	deg	min	sec	(m)	Min	Max	At site
1	Spring intake	40	42	14.0	44	58	7.7	1,425	10.5	11.0	6.0
2	Spring intake	40	42	28.1	44	58	53.4	1,352			5.0
3											
4											
5											
6											
7											
8											
9											
10											

Notes:

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

Users Acceptnce for water quality	Acceptable
Notes	
Alternative sources if any	There are springs upstream the Community. Through their capturing and connecting to the water main, water amount will increase by about 10l/sec.

No.4 Community Gosh
District Idjevan
Marz Tavush
Sampling date 03/Aug/2007

	Parameters analysed	Units	No.1 Kh-haki Khamhat	No.2 Qeghari dzori			Guidelines	
							WHO	Armenia
a	pH		8.0	7.9			6.5-8	6.0 - 9.0
b	Temperature	Deg.C	10.6	9.6				
c	TDS	Mg/L	262	283			1000	1000
1	Al:Aluminum	Mg/L	n.d.	n.d.			0.10	0.50
2	B:Boron	Mg/L	n.d.	n.d.			0.70	0.50
3	Cl:Chloride	Mg/L	5	7			250	350
4	Cr:Chrome	Mg/L	n.d.	<0.01			0.05	0.05
5	Cu:Copper	Mg/L	n.d.	n.d.			2	1
6	F:Fluoride	Mg/L	0.16	0.24			1.50	
7	Hardness	Mg/L	530	520			500	700
8	Fe:Iron	Mg/L	n.d.	n.d.			0.30	0.30
9	Mn:Manganese	Mg/L	n.d.	n.d.			0.40	0.10
10	Mo:Molibdenum	Mg/L	n.d.	n.d.			0.070	0.250
11	Ni:Nickel	Mg/L	n.d.	n.d.			0.020	0.100
12	Nitrate(NO3+)	Mg/L	2.2	2.2			50.0	45.0
13	SO4:Sulfate	Mg/L	13.0	11.0			250.0	500.0
14	Zn:Zink	Mg/L	n.d.	n.d.			3.0	5.0
15	As:Arsenic	Mg/L	n.d.	n.d.			0.0	0.1
16	Ba:Barium	Mg/L	<0.01	<0.01			0.70	0.10
17	Be:Berillium	Mg/L	n.d.	n.d.			NA	0.00020
18	Cd:Cadmium	Mg/L	n.d.	n.d.			0.0030	0.0010
19	Pb:Lead	Mg/L	0.001	0.001			0.010	0.030
20	Hg:Mercury	Mg/L	<0.0002	<0.0002			0.00100	0.00050
21	Se:Selenium	Mg/L	<0.001	<0.001			0.010	0.010
22	Sr:Strontium	Mg/L	<0.7	<0.7			NA	7.0
23	CN:Cyanide	Mg/L	n.d.	n.d.			0.070	0.035
24	Coli form bacteria	bacteria per 100 ml	<3				-	0
25	Thermo-tolerant coli form bacteria	bacteria per 100 ml	n.d				0	0
26	Total bacteria	bacteria per 1 ml	40				-	50

Information on Existing Water Sources
Existing Bacteriological Test

No.4 Community Gosh
District Ijevan
Marz Tavush

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	4	03	>100	24.0	Not Identified
2	6	13	36	4.3	Not Identified
3			19	2.3	Not Identified
4			35	4.3	Not Identified

No. **4** **Marz** Tavush **Community** Gosh

1. ACCESSIBILITY TO THE SITE

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

2. INTAKE STRUCTURE

No.	Water source	N	E	El. (m)	Year	Material	Volume (l/s)	Rehabilitation Necessity (Y/N)
1	Spring	40°42′14.0″	44°58′07.7″	1,425	1981	Concrete	6.0	Yes
2	Spring	40°42′28.1″	44°58′53.4″	1,352	2002	Concrete	5.0	No

3. TRANSMISSION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Flow rate (l/s)	Year	Leakage	Rehabilitation Necessity (Y/N)
1	4,000	100	Steel	5.0	1981	Little	Yes
2	5,000	100	Steel	6.0	2002	Little	Yes

4. RESERVOIR

No.	N	E	El. (m)	Material	Shape	Dimension (m)	Volume (m3)	Rehabilitation Necessity (Y/N)
1	40°43′38.3″	45°00′01.6″	1,267	Concrete	Circle	D=12, H=5	500	Yes
2	40°44′43.7″	45°01′28.5″	964	Concrete	Circle	D=5, H=8	150	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	8,000	100	Steel		Huge	Yes
2	3,000	50	Steel	1981	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)
No				0	

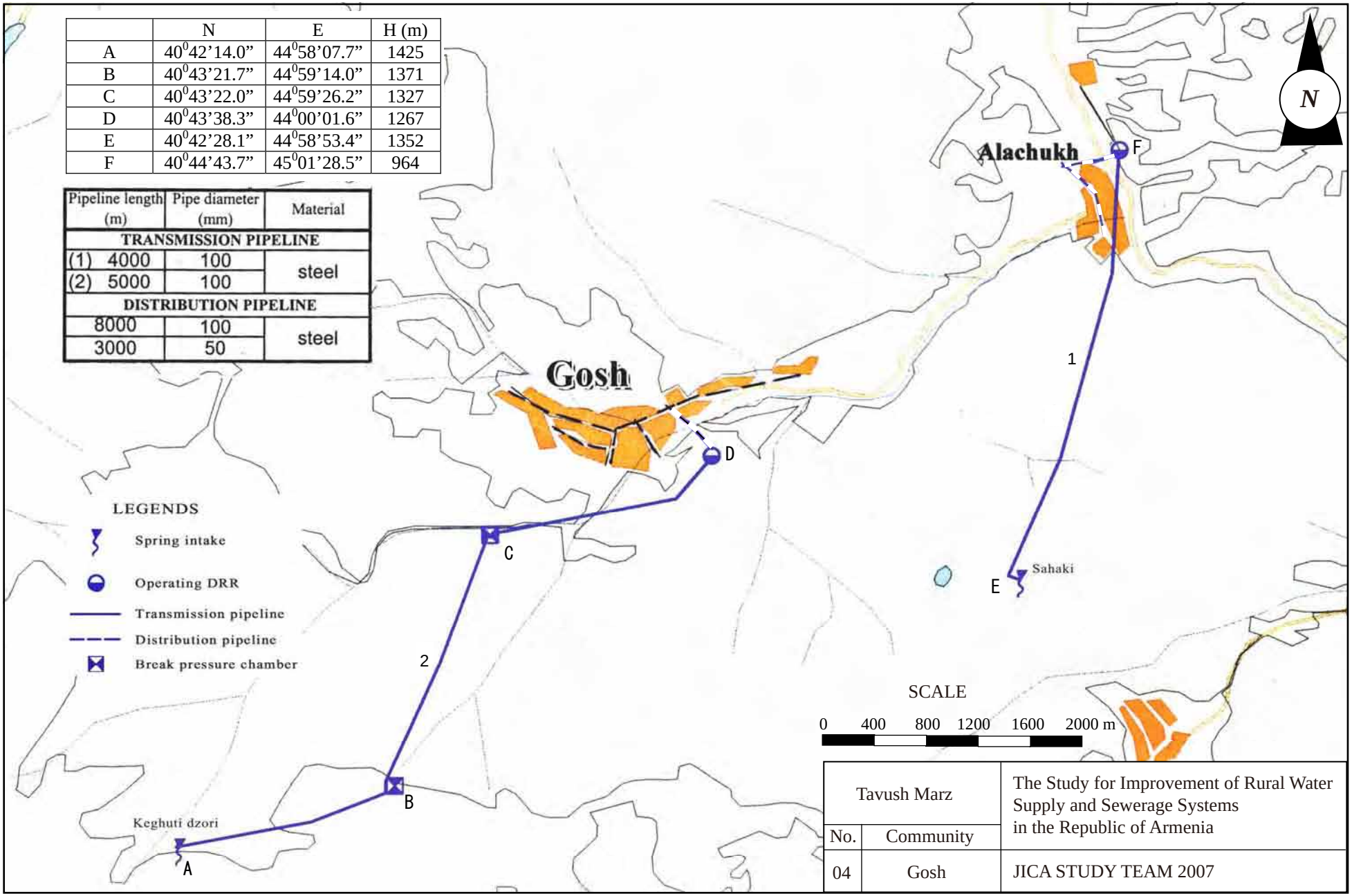
9. DRAINAGE SYSTEM

Existence	Rehabilitation	Remarks
No	Yes	

Questionnaire on Existing Water Supply Conditions by Socio-Economic Survey

Marz	**Tavush**
Number and Name of Community	**No.4 Gosh**
District	**Idejevan**

No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	1,190
A2	Actual population in 2007	1,200
A3	Number of households	399
A4.1	Elderly people	152
A4.2	Population in labor force (age from 16 to 62)	624
A4.3	Children	424
A5.1	Pensioners	197
A5.2	Unemployed	26
A5.3	Receiving benefits	75
A6	Average monthly income of household (AMD)	20,000
A7	Number of medical ambulance staion/first and health post	absent
A8	Number of beds in each medical ambulance staion	0
A9	Number of school	2
A10	Number of pupils	170
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	1,973
	Annual Budget of the community 2005, in thousand AMD	1,474
	Annual Budget of the community 2006, in thousand AMD	1,631
	Annual Budget of the community 2007, in thousand AMD	800
	Annual Budget of the community 2008, in thousand AMD	is not planned.
B2	Amount spent in drinking water sector 2004, in thousand AMD	1,720
	Amount spent in drinking water sector 2005, in thousand AMD	1,720
	Amount spent in drinking water sector 2006, in thousand AMD	1,720
	Amount spent in drinking water sector 2007, in thousand AMD	980
	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, agricultural. products
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	ongoing
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	200
D8	How many house connection household set the water meter	0
D9	Number of public taps	1
D10.1	How is the regime of water supply in your community in the dry season?	irregularly - 4hrs according to districts
D10.2	How is the regime of water supply in your community in the wet season?	regularly - 15hrs
D11	What time of day water is given?	08^{00}-10^{00}, 12^{00}-16^{00}, 08^{00}-21^{00}
D12	Are you pleased with duration of domestic water supply?	mainly displeased
D13	Are hours of water supply convenient?	mainly convenient
D14.1	How long the taps are open to provide the domestic water (cooking, washing, foodstuffs, dishes, Landry, bathing, etc) of each houshold a day?	-
D14.2	Estimate quantity of domestic water use of each household (litter per day)	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	difficult to answer
D16	Drinking water monthly water fee per household	100 dram/ capita/month
D17	How often do you usually pay water fees?	each month
D18	Water fee structure 1- Flate rate, 2- Having water tariff	flat rate
D19	Where do you acquire the irrigation water?	absent
D20	Are you satisfied with irrigation water supply volume?	absent
E: Present Operation and Maintenance Works		
E1	Name of responsible for water supply	Alikhanyan Mkhitar
E2	Position	pipeline worker
E3	Telephone	with the help of administration head
E4	Quantity and present condition of the water supply facilities: spring/ intake	5-deteriorated
E5	Quantity and present condition of the water supply facilities:	2-partially repaired
E6	Quantity and present condition of the water supply facilities: DRR(Daily Regulatory Reservoir)	2--partially repaired
E7	Quantity and present condition of the water supply facilities: net/distribution	deteriorated
E8	Quantity and present condition of the water supply facilities: public tap	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, hired specialist
E13	Who is in charge of the repair work in the community?	hired specialist from community (M.Alikhyan)
E14	How you prepare O&M costs?	community budget, donation from residents
E15	Please indicate the O&M cost breakdown per year for water supply	
	Electricity (AMD)	0
	Labor cost (AMD)	720,000
	Repair cost(AMD)	1,000,000
	Others(AMD)	0
	Total (AMD)	1,720,000
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.	present
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	present
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	$40^0$42’14.0”	$44^0$58’07.7”	1425
B	$40^0$43’21.7”	$44^0$59’14.0”	1371
C	$40^0$43’22.0”	$44^0$59’26.2”	1327
D	$40^0$43’38.3”	$44^0$00’01.6”	1267
E	$40^0$42’28.1”	$44^0$58’53.4”	1352
F	$40^0$44’43.7”	$45^0$01’28.5”	964

Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
(1) 4000	100	steel
(2) 5000	100	
DISTRIBUTION PIPELINE		
8000	100	steel
3000	50	

Tavush Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
04	Gosh	JICA STUDY TEAM 2007

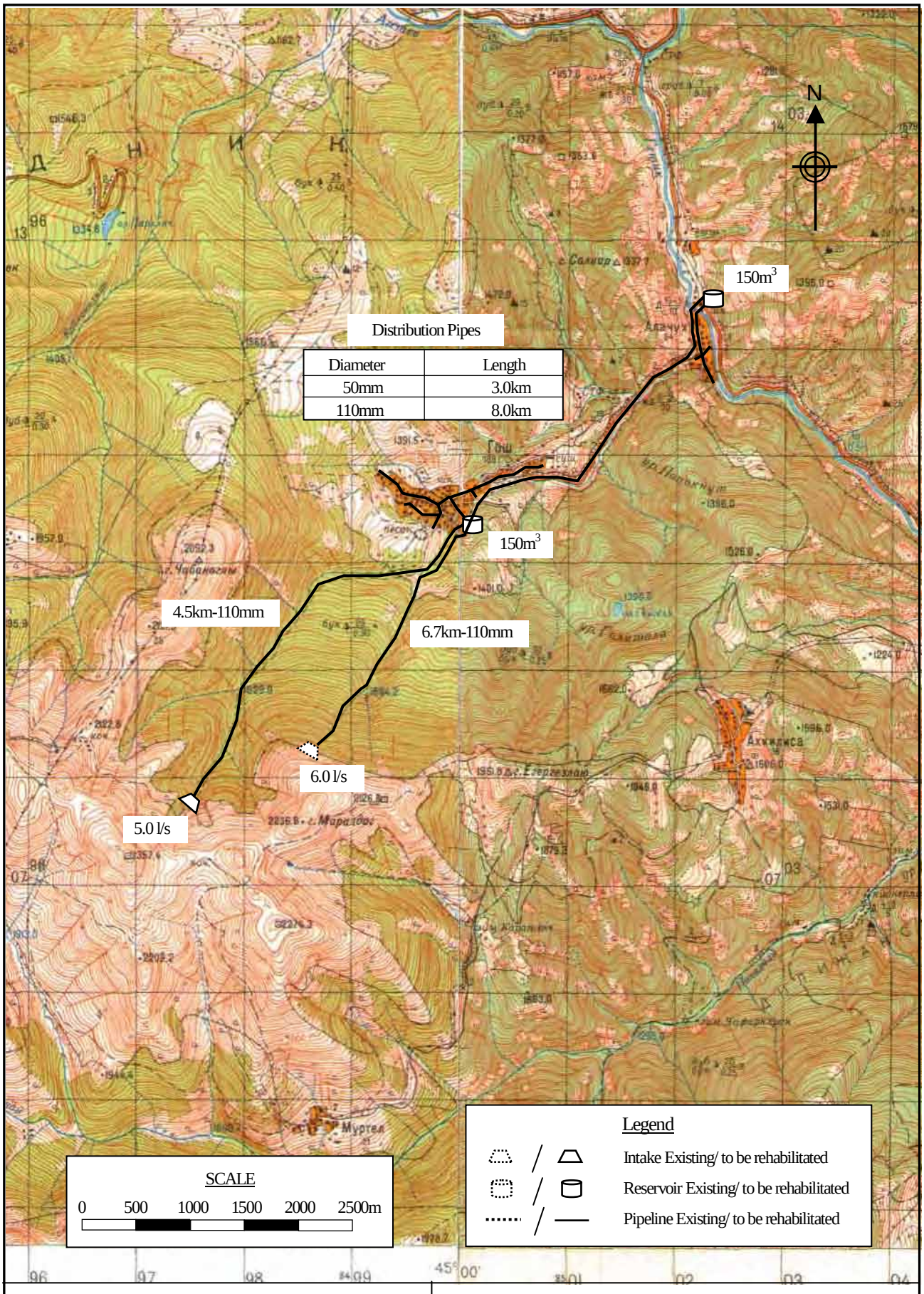
Marz : **Tavush** No.4
Name : **Gosh**

No.	Item	Quantity	Unit	Water demand (m3/d)	
A.	**WATER DEMAND**				
1	Population	1,200	persons	120.0	
2	Factory	-	nos	0.0	
3	School (pupils)	170	pupils	1.7	
4	Medical Ambulance Station	-	nos	-	
5	Policlinic	-	nos	-	
7	Livestocks (87lit/household)	399	household	34.7	
	Sub-total			156.4	
	Unaccouted for water (20%)			31.3	
1	Average Daily Water Demand			187.7	m3/day
2	Maximum Daily Water Demand			225.2	m3/day
3	Maximum Hourly Water Demand			24.4	m3/hr

B	**WATER SUPPLY PLAN**						
1	Water source type	Nr.	Total vol.				
a	Spring	2	11	lit/sec		950.4	m3/day
`	Total					950.4	m3/day
2	Required reservoir volume					293	m3

C WATER SUPPLY FACILITIES REHABILITATION PLAN

No	Item	Quantity	Unit
1	Intake		
	1m3	1	nos
	2m3		nos
	3m3		nos
	4m3		nos
2	Transmission pipe		
	50mm diameter		m
	75mm diameter		m
	90mm diameter		m
	110mm diameter	11,200	m
	150mm diameter		m
	200mm diameter		m
	250mm diameter		m
3	Reservoir		
	150m3 capacity	2	nos
4	Distribution pipe		
	50mm diameter	3,000	m
	75mm diameter		m
	90mm diameter		m
	110mm diameter	8,000	m
	150mm diameter		m
	200mm diameter		m
	250mm diameter		m
5	House connection	199	nos
6	Water meter installation	399	nos
7	Public tap	4	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	Tavush	
No. 04	Gosh	JICA STUDY TEAM

Marz : **Tavush**
No. : **4**
Name : **Gosh**

No	Item	Specification	Quantity	Unit	Unit Price	Total
1	Intake					
		1m3	1	nos	367,700	367,700
		2m3		nos	545,000	
		3m3		nos	669,100	
		4m3		nos	805,100	
	Sub-total					367,700
2	Transmission Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm		m	8,040	
		110mm	11,200	m	9,680	108,416,000
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					108,416,000
3	Reservoir					
		50m3		nos	8,363,900	
		100m3		nos	12,968,300	
		150m3	2	nos	18,804,500	37,609,000
		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					37,609,000
4	Distribution Pipe					
		50mm	3,000	m	5,520	16,560,000
		75mm		m	7,160	
		90mm		m	8,040	
		110mm	8,000	m	9,680	77,440,000
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					94,000,000
5	House Connection		199	nos	74,000	14,726,000
6	Water Meter Installation		399	nos	80,000	31,920,000
7	Public Tap		4	nos	90,000	360,000
8	Chlorilation Equipment		1	nos	500,000	500,000
9	Pump Replacement			nos	10,000,000	
10	Drainage and Sewerage	concrete surfa	4,400	m	3,600	15,840,000
	Total				AMD	303,738,700
					Equivalent to USD	994,170
					Equivalent to JPY	104,884,894
					AMD	USD
	Investment Cost per household		399	HH	761,250	2,492
	Investment Cost per person		1,200	persons	253,116	828

TAVUSH MARZ
Ijevan District
No 4 Gosh

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		57.1																																							
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		317.57	0.00	0.00	0.00	1.44	2.06	2.12	3.60	3.72	3.84	3.96	5.94	6.14	6.34	6.55	6.77	6.99	7.22	7.46	7.70	7.96	8.22	8.49	8.77	9.06	9.36	9.67	9.99	10.32	10.66	11.01	11.37	11.75	12.14	12.54	12.95	13.38	13.82	14.28	14.75	15.23
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				343																																				
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		14.88			0.00	0.15	0.22	0.23	0.23	0.24	0.25	0.26	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	0.55	0.56	0.58	0.60	0.62	0.64	0.66	0.68
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		51.44			0.00	0.51	0.75	0.77	0.80	0.82	0.85	0.88	0.91	0.94	0.97	1.00	1.03	1.07	1.10	1.14	1.18	1.22	1.26	1.30	1.34	1.38	1.43	1.48	1.53	1.58	1.63	1.68	1.74	1.79	1.85	1.92	1.98	2.04	2.11	2.18	2.25	2.33
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	0.51	0.75	0.77	0.80	0.82	0.85	0.88	0.91	0.94	0.97	1.00	1.03	1.07	1.10	1.14	1.18	1.22	1.26	1.30	1.34	1.38	1.43	1.48	1.53	1.58	1.63	1.68	1.74	1.79	1.85	1.92	1.98	2.04	2.11	2.18	2.25	2.33
5. Pump replacement		0.00																0.00															0.00									
Sub-total		84.02	0.00	0.00	0.24	0.91	1.23	1.26	1.30	1.34	1.39	1.44	1.49	1.54	1.58	1.63	1.68	1.75	1.80	1.86	1.93	2.00	2.06	2.12	2.19	2.26	2.34	2.42	2.50	2.58	2.67	2.75	2.85	2.94	3.04	3.14	3.24	3.34	3.45	3.57	3.68	3.81
C Gross Income (A-B)		234.25	0.00	0.00	-0.24	0.53	0.83	0.86	2.30	2.38	2.45	2.52	4.45	4.60	4.76	4.92	5.09	5.24	5.42	5.60	5.77	5.96	6.16	6.37	6.58	6.80	7.02	7.25	7.49	7.74	7.99	8.26	8.52	8.81	9.10	9.40	9.71	10.04	10.37	10.71	11.07	11.42
D Depreciation cost		288.40						8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24
E Interest paid		88.04	0.04	0.07	0.10	2.68	3.82	3.82	3.82	3.82	3.82	3.82	3.83	3.72	3.61	3.50	3.38	3.27	3.15	3.03	2.92	2.80	2.68	2.56	2.43	2.31	2.18	2.06	1.93	1.80	1.67	1.54	1.41	1.27	1.14	1.00	0.86	0.72	0.58	0.44	0.29	0.15
F Net Income		-142.19	-0.04	-0.07	-0.34	-2.15	-2.99	-11.20	-9.76	-9.68	-9.61	-9.54	-7.62	-7.36	-7.09	-6.82	-6.53	-6.27	-5.97	-5.67	-5.39	-5.08	-4.76	-4.43	-4.09	-3.75	-3.40	-3.05	-2.68	-2.30	-1.92	-1.52	-1.13	-0.70	-0.28	0.16	0.61	1.08	1.55	2.03	2.54	3.03
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		-142.19	-0.04	-0.07	-0.34	-2.15	-2.99	-11.20	-9.76	-9.68	-9.61	-9.54	-7.62	-7.36	-7.09	-6.82	-6.53	-6.27	-5.97	-5.67	-5.39	-5.08	-4.76	-4.43	-4.09	-3.75	-3.40	-3.05	-2.68	-2.30	-1.92	-1.52	-1.13	-0.70	-0.28	0.16	0.61	1.08	1.55	2.03	2.54	3.03
OM Cost Recovery Ratio (A/B)		378%	0%	0%	0%	159%	167%	168%	277%	278%	276%	275%	399%	399%	401%	402%	403%	399%	401%	401%	399%	398%	399%	400%	400%	401%	400%	400%	400%	400%	399%	400%	399%	400%	399%	399%	400%	401%	401%	400%	401%	400%

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	-142.19	-0.04	-0.07	-0.34	-2.15	-2.99	-11.20	-9.76	-9.68	-9.61	-9.54	-7.62	-7.36	-7.09	-6.82	-6.53	-6.27	-5.97	-5.67	-5.39	-5.08	-4.76	-4.43	-4.09	-3.75	-3.40	-3.05	-2.68	-2.30	-1.92	-1.52	-1.13	-0.70	-0.28	0.16	0.61	1.08	1.55	2.03	2.54	3.03
2. Depreciation cost	288.40	0.00	0.00	0.00	0.00	0.00	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24	8.24
3. Interest Paid	88.04	0.04	0.07	0.10	2.68	3.82	3.82	3.82	3.82	3.82	3.82	3.83	3.72	3.61	3.50	3.38	3.27	3.15	3.03	2.92	2.80	2.68	2.56	2.43	2.31	2.18	2.06	1.93	1.80	1.67	1.54	1.41	1.27	1.14	1.00	0.86	0.72	0.58	0.44	0.29	0.15
Sub-total	234.25	0.00	0.00	-0.24	0.53	0.83	0.86	2.30	2.38	2.45	2.52	4.45	4.60	4.76	4.92	5.09	5.24	5.42	5.60	5.77	5.96	6.16	6.37	6.58	6.80	7.02	7.25	7.49	7.74	7.99	8.26	8.52	8.81	9.10	9.40	9.71	10.04	10.37	10.71	11.07	11.42
B Finances																																									
1. Project Loan	382.87	3.91	2.79	3.72	257.65	113.77	0.58	0.45																																	
2. Local fund	132.01	1.29	0.91	1.25	87.95	40.48	0.07	0.06																																	
Sub-total	514.88	5.20	3.70	4.97	345.60	154.25	0.65	0.51																																	
C Subsidy from Government																																									
1. Subsidy for O&M cost	0.24	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	236.45	0.04	0.07	0.10	2.15	2.99	2.96	1.52	1.44	1.37	1.30	10.39	10.24	10.08	9.92	9.74	9.60	9.41	9.23	9.07	8.88	8.68	8.47	8.25	8.04	7.81	7.59	7.35	7.10	6.85	6.58	6.32	6.02	5.74	5.44	5.13	4.80	4.47	4.13	3.76	3.42
Sub-total	236.69	0.04	0.07	0.34	2.15	2.99	2.96	1.52	1.44	1.37	1.30	10.39	10.24	10.08	9.92	9.74	9.60	9.41	9.23	9.07	8.88	8.68	8.47	8.25	8.04	7.81	7.59	7.35	7.10	6.85	6.58	6.32	6.02	5.74	5.44	5.13	4.80	4.47	4.13	3.76	3.42
Total Cash Inflow	985.82	5.24	3.77	5.07	348.28	158.07	4.47	4.33	3.82	3.82	3.82	14.84	14.84	14.84	14.84	14.83	14.84	14.83	14.83	14.84	14.84	14.84	14.84	14.83	14.84	14.83	14.84	14.84	14.84	14.84	14.84	14.84	14.83	14.84	14.84	14.84	14.84	14.84	14.84	14.83	14.84
APPLICATION OF FUNDS																																								
D Project disbursement	514.88	5.20	3.70	4.97	345.60	154.25	0.65	0.51																																	
E Total debt services																																									
1. Loan repayment	382.90											11.01	11.12	11.23	11.34	11.45	11.57	11.68	11.80	11.92	12.04	12.16	12.28	12.40	12.53	12.65	12.78	12.91	13.04	13.17	13.30	13.43	13.56	13.70	13.84	13.98	14.12	14.26	14.40	14.54	14.69
2. Interest paid	88.04	0.04	0.07	0.10	2.68	3.82	3.82	3.82	3.82	3.82	3.82	3.83	3.72	3.61	3.50	3.38	3.27	3.15	3.03	2.92	2.80	2.68	2.56	2.43	2.31	2.18	2.06	1.93	1.80	1.67	1.54	1.41	1.27	1.14	1.00	0.86	0.72	0.58	0.44	0.29	0.15
Sub-total	470.94	0.04	0.07	0.10	2.68	3.82	3.82	3.82	3.82	3.82	3.82	14.84	14.84	14.84	14.84	14.83	14.84	14.83	14.83	14.84	14.84	14.84	14.84	14.83	14.84	14.83	14.84	14.84	14.84	14.84	14.84	14.84	14.83	14.84	14.84	14.84	14.84	14.84	14.84	14.83	14.84
Total Cash Outflow	985.82	5.24	3.77	5.07	348.28	158.07	4.47	4.33	3.82	3.82	3.82	14.84	14.84	14.84	14.84	14.83	14.84	14.83	14.83	14.84	14.84	14.84	14.84	14.83	14.84	14.83	14.84	14.84	14.84	14.84	14.84	14.84	14.83	14.84	14.84	14.84	14.84	14.84	14.84	14.83	14.84
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)	50%	0%	0%	0%	20%	22%	23%	60%	62%	64%	66%	30%	31%	32%	33%	34%	35%	37%	38%	39%	40%	42%	43%	44%	46%	47%	49%	50%	52%	54%	56%	57%	59%	61%	63%	65%	68%	70%	72%	75%	77%
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%

TAVUSH MARZ
Ijevan District
No 4 Gosh

FINANCIAL ANALYSIS

A COST RECOVERY ANALYSIS

	Item	Millon AMD	Rate
1	**Revenue**		
	Water fee revenue	317.57	57.3%
	Subsidy	236.69	42.7%
	Total	554.26	100.0%
2	**Expenditure**		
	OM cost	83.32	15.0%
	Loan repayment	382.90	69.1%
	Interest paid	88.04	15.9%
	Surplus cash	0.00	0.0%
	Total	554.26	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	336.42	3.82	2.73	3.51	227.83	97.58	0.53	0.42																																
2. Operation and Maintenance Cost																																								
Salary	9.12			0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Chlorine	7.71			0.00	0.15	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
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	25.69			0.00	0.49	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Pump replacement																	0.00															0.00									
Sub-total	42.52			0.24	0.88	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Total Outflow	378.94	3.82	2.73	3.75	228.71	98.73	1.68	1.57	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
B BENEFIT																																								
1. Water Tariff	198.94	0.00	0.00	0.00	1.44	2.06	2.12	3.60	3.72	3.84	3.96	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94	5.94
2. Subsidy	160.52	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.56	6.52	6.47	6.42	6.36	6.33	6.26	6.20	6.15	6.08	6.00	5.91	5.82	5.73	5.63	5.53	5.42	5.30	5.18	5.04	4.91	4.75	4.60	4.44	4.27	4.08	3.89	3.69	3.47	3.27
Total Inflow	359.46	0.00	0.00	0.24	1.44	2.06	2.12	3.60	3.72	3.84	3.96	12.50	12.46	12.41	12.36	12.30	12.27	12.20	12.14	12.09	12.02	11.94	11.85	11.76	11.67	11.57	11.47	11.36	11.24	11.12	10.98	10.85	10.69	10.54	10.38	10.21	10.02	9.83	9.63	9.41	9.21
NET BENEFIT	-19.48	-3.82	-2.73	-3.5	-227.3	-96.7	0.44	2.03	2.57	2.69	2.81	11.35	11.31	11.26	11.21	11.15	11.12	11.05	10.99	10.94	10.87	10.79	10.70	10.61	10.52	10.42	10.32	10.21	10.09	9.97	9.83	9.70	9.54	9.39	9.23	9.06	8.87	8.68	8.48	8.26	8.06
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	-132.30	-4.20	-3.00	-3.9	-250.1	-106.4	0.39	1.99	2.57	2.69	2.81	11.35	11.31	11.26	11.21	11.15	11.12	11.05	10.99	10.94	10.87	10.79	10.70	10.61	10.52	10.42	10.32	10.21	10.09	9.97	9.83	9.70	9.54	9.39	9.23	9.06	8.87	8.68	8.48	8.26	8.06
	2	Capital cost 20% up	-163.56	-4.58	-3.28	-4.2	-272.8	-116.2	0.33	1.95	2.57	2.69	2.81	11.35	11.31	11.26	11.21	11.15	11.12	11.05	10.99	10.94	10.87	10.79	10.70	10.61	10.52	10.42	10.32	10.21	10.09	9.97	9.83	9.70	9.54	9.39	9.23	9.06	8.87	8.68	8.48	8.26	8.06
2	1	OM cost 10% up	-104.00	-3.82	-2.73	-3.5	-227.4	-96.8	0.33	1.92	2.46	2.58	2.70	11.24	11.20	11.15	11.10	11.04	11.01	10.94	10.88	10.83	10.76	10.68	10.59	10.50	10.41	10.31	10.21	10.10	9.98	9.86	9.72	9.59	9.43	9.28	9.12	8.95	8.76	8.57	8.37	8.15	7.95
	2	OM cost 20% up	-106.95	-3.82	-2.73	-3.6	-227.4	-96.9	0.21	1.80	2.34	2.46	2.58	11.12	11.08	11.03	10.98	10.92	10.89	10.82	10.76	10.71	10.64	10.56	10.47	10.38	10.29	10.19	10.09	9.98	9.86	9.74	9.60	9.47	9.31	9.16	9.00	8.83	8.64	8.45	8.25	8.03	7.83
3	1	Revenue 10% down	-125.15	-3.82	-2.73	-3.5	-227.4	-96.9	0.23	1.67	2.20	2.31	2.41	10.10	10.06	10.02	9.97	9.92	9.89	9.83	9.78	9.73	9.67	9.60	9.52	9.43	9.35	9.26	9.17	9.07	8.97	8.86	8.73	8.62	8.47	8.34	8.19	8.04	7.87	7.70	7.52	7.32	7.14
	2	Revenue 20% down	-149.26	-3.82	-2.73	-3.6	-227.6	-97.1	0.02	1.31	1.83	1.92	2.02	8.85	8.82	8.78	8.74	8.69	8.67	8.61	8.56	8.52	8.47	8.40	8.33	8.26	8.19	8.11	8.03	7.94	7.84	7.75	7.63	7.53	7.40	7.28	7.15	7.02	6.87	6.71	6.55	6.38	6.22

No.		Description	FIRR		Sensitivity indicator	Swiching value
1	1	Capital cost 10% up	-0.77%		-6.10	-16.38%
	2	Capital cost 20% up	-1.19%		-7.48	-13.37%
2	1	OM cost 10% up	-0.37%		-1.82	-54.89%
	2	OM cost 20% up	-0.43%		-3.09	-32.36%
3	1	Revenue 10% down	-0.89%		-6.63	-15.08%
	2	Revenue 20% down	-1.54%		-8.05	-12.42%

No.5 Yenoqavan

Information on Existing Water Sources (Tavush)

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

No.5 Community Yenoqavan
District Idjevan
Marz Tavush

No	Water source	Latitude			Longitude			Atidute	Yeild(L/sec)		
		deg	min	sec	deg	min	sec	(m)	Min	Max	At site
1	spring intake	40	55	35.4	45	5	1.1	-	-	-	1.0
2	spring intake	40	55	10.1	45	4	39.3	-	-	-	2.0
3											
4											
5											
6											
7											
8											
9											
10											

Notes:

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

Users Acceptnce for water quality	Acceptable
Notes	The community has no irrigation water.
Alternative sources if any	At 500m distance from Yotaghbyur there are free springs, which can be captured and brought to the existing intake chamber.

No.5 Community Yenoqavan
District Idjevan
Marz Tavush
Sampling date 08/Sep/2007

	Parameters analysed	Units	No.1				Guidelines	
							WHO	Armenia
a	pH		7.9				6.5-8	6.0 - 9.0
b	Temperature	Deg.C	11.1					
c	TDS	Mg/L	298				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	0.21				1.50	
7	Hardness	Mg/L	650				500	700
8	Fe:Iron	Mg/L	n.d.				0.30	0.30
9	Mn:Manganese	Mg/L	0.10				0.40	0.10
10	Mo:Molibdenum	Mg/L	<0.02				0.070	0.250
11	Ni:Nickel	Mg/L	n.d.				0.020	0.100
12	Nitrate(NO3+)	Mg/L	0.9				50.0	45.0
13	SO4:Sulfate	Mg/L	9.0				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	5.0				NA	7.0
23	CN:Cyanide	Mg/L	n.d.				0.070	0.035
24	Coli form bacteria	bacteria per 100 ml	n.d				-	0
25	Thermo-tolerant coli form bacteria	bacteria per 100 ml	n.d				0	0
26	Total bacteria	bacteria per 1 ml	n.d				-	50

Information on Existing Water Sources
Existing Bacteriological Test

No.5 Community Yenoqavan
District Ijevan
Marz Tavush

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	4	.1	28	4.3	Not Identified
2	4	.1	31	9.0	Not Identified
3	8	23	45	4.3	Not Identified
4	8	23	25	2.3	Not Identified

No. 5 **Marz** Tavush **Community** Yenoqavan

1. ACCESSIBILITY TO THE SITE

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

2. INTAKE STRUCTURE

No.	Water source	N	E	El. (m)	Year	Material	Volume (l/s)	Rehabilitation Necessity (Y/N)
1	Spring	40°55′10.1″	45°04′39.3″	-	1960	Concrete	2.0	Yes
2	Spring	40°55′35.4″	45°05′01.1″	-	1965	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	2,500	200	Steel	3.0	1960	Little	Yes
	1,000	150	Steel		1970	Little	Yes
	2,000	100	Steel		1960	Little	Yes

4. RESERVOIR

No.	N	E	El. (m)	Material	Shape	Dimension (m)	Volume (m3)	Rehabilitation Necessity (Y/N)
1	40°54′54.3″	45°06′25.0″	1,204	Concrete	Rectangular	6x9x4	2x150	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	1,000	100	Steel	1960	Little	Yes
2	200	75	Steel			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)
No				0	

9. DRAINAGE SYSTEM

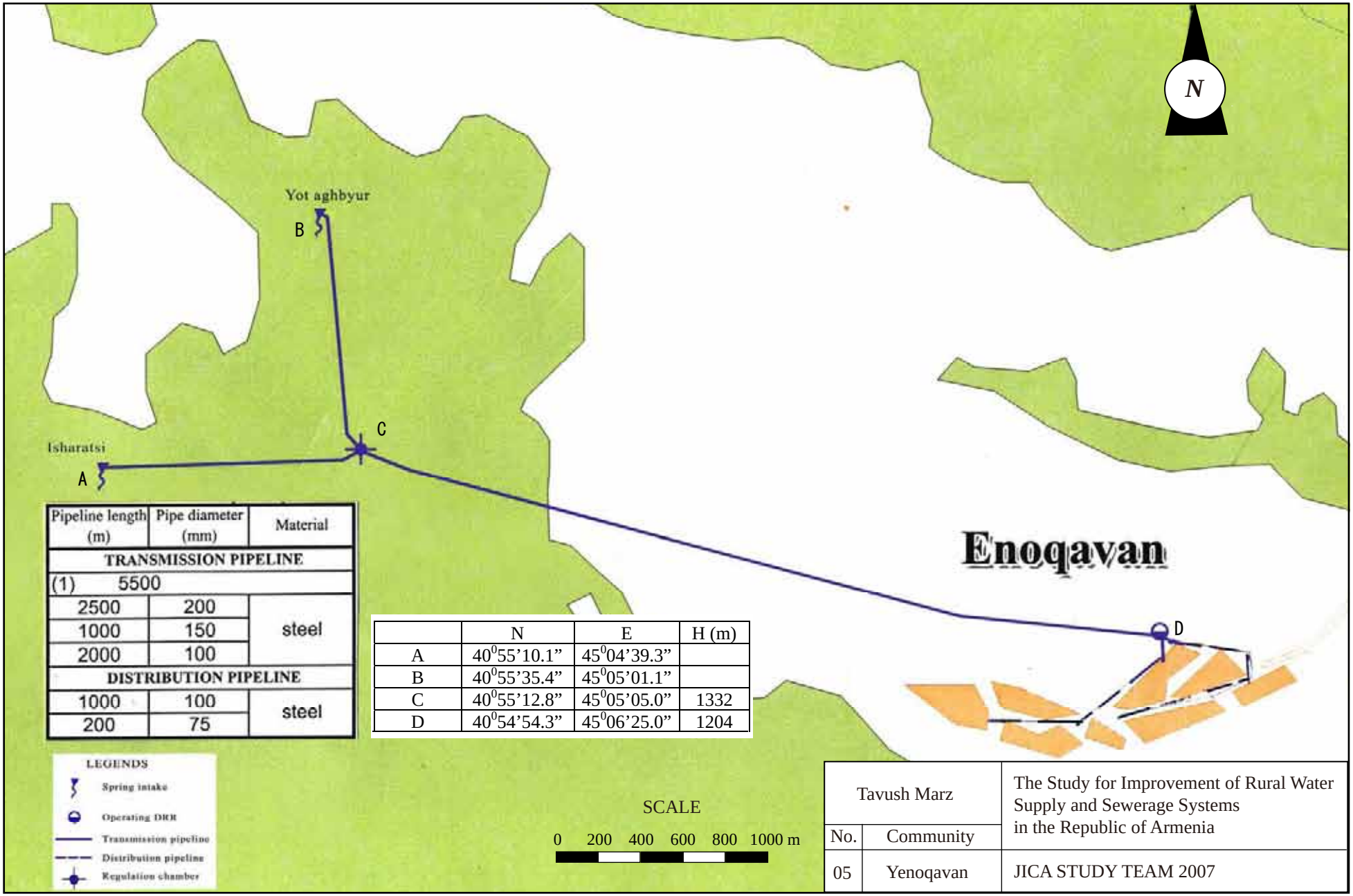
Existence	Rehabilitation	Remarks
Yes	Yes	

Questionnaire on Existing Water Supply Conditions by Socio-Economic Survey

Marz	**Tavush**
Number and Name of Community	**No.5 Yenoqavan**
District	**Idejevan**

No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	500
A2	Actual population in 2007	530
A3	Number of households	184
A4.1	Elderly people	125
A4.2	Population in labor force (age from 16 to 62)	263
A4.3	Children	141
A5.1	Pensioners	115
A5.2	Unemployed	0
A5.3	Receiving benefits	23
A6	Average monthly income of household (AMD)	27,000
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	93
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	5,700
	Annual Budget of the community 2005, in thousand AMD	8,000
	Annual Budget of the community 2006, in thousand AMD	6,000
	Annual Budget of the community 2007, in thousand AMD	4,800
	Annual Budget of the community 2008, in thousand AMD	is not planned.
B2	Amount spent in drinking water sector 2004, in thousand AMD	0
	Amount spent in drinking water sector 2005, in thousand AMD	0
	Amount spent in drinking water sector 2006, in thousand AMD	600
	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:	cereals, dairy, meat
C2	Is there any community activities carrying out by women? 1-Yes, 2-No	no
D: Water Usage and Water Demand Survey		
D1	Does the community hold water use permit? 1-Yes, 2-No	no
D2	Water use permit number	-
D3	Date of expiry of water use permit	-
D4	Planned date of obtaining water use permit	ongoing
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	154
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
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 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)	500
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	700
D16	Drinking water monthly water fee per household	0
D17	How often do you usually pay water fees?	-
D18	Water fee structure 1- Flate rate, 2- Having water tariff	-
D19	Where do you acquire the irrigation water?	absent
D20	Are you satisfied with irrigation water supply volume?	absent
E: Present Operation and Maintenance Works		
E1	Name of responsible for water supply	Ordinyan Hrayr
E2	Position	water distributor
E3	Telephone	with the help of administration head
E4	Quantity and present condition of the water supply facilities: spring/ intake	2-partially repaired
E5	Quantity and present condition of the water supply facilities:	2-partially repaired
E6	Quantity and present condition of the water supply facilities: DRR(Daily Regulatory Reservoir)	2-partially repaired
E7	Quantity and present condition of the water supply facilities: net/distribution	deteriorated
E8	Quantity and present condition of the water supply facilities: public tap	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?	by ourselves
E13	Who is in charge of the repair work in the community?	hired specialist from community (H. Ordinyan)
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)	40,000
	Repair cost(AMD)	60,000
	Others(AMD)	0
	Total (AMD)	100,000
E16	Do the residents participate in the O&M works?	no
E17	What kind of OM method is preferable to you?	resident participation, reduce 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

Tavush
No.5 Yenoqavan



Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
(1) 5500		
2500	200	steel
1000	150	
2000	100	
DISTRIBUTION PIPELINE		
1000	100	steel
200	75	

	N	E	H (m)
A	$40^0$55’10.1”	$45^0$04’39.3”	
B	$40^0$55’35.4”	$45^0$05’01.1”	
C	$40^0$55’12.8”	$45^0$05’05.0”	1332
D	$40^0$54’54.3”	$45^0$06’25.0”	1204

Tavush Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
05	Yenoqavan	JICA STUDY TEAM 2007

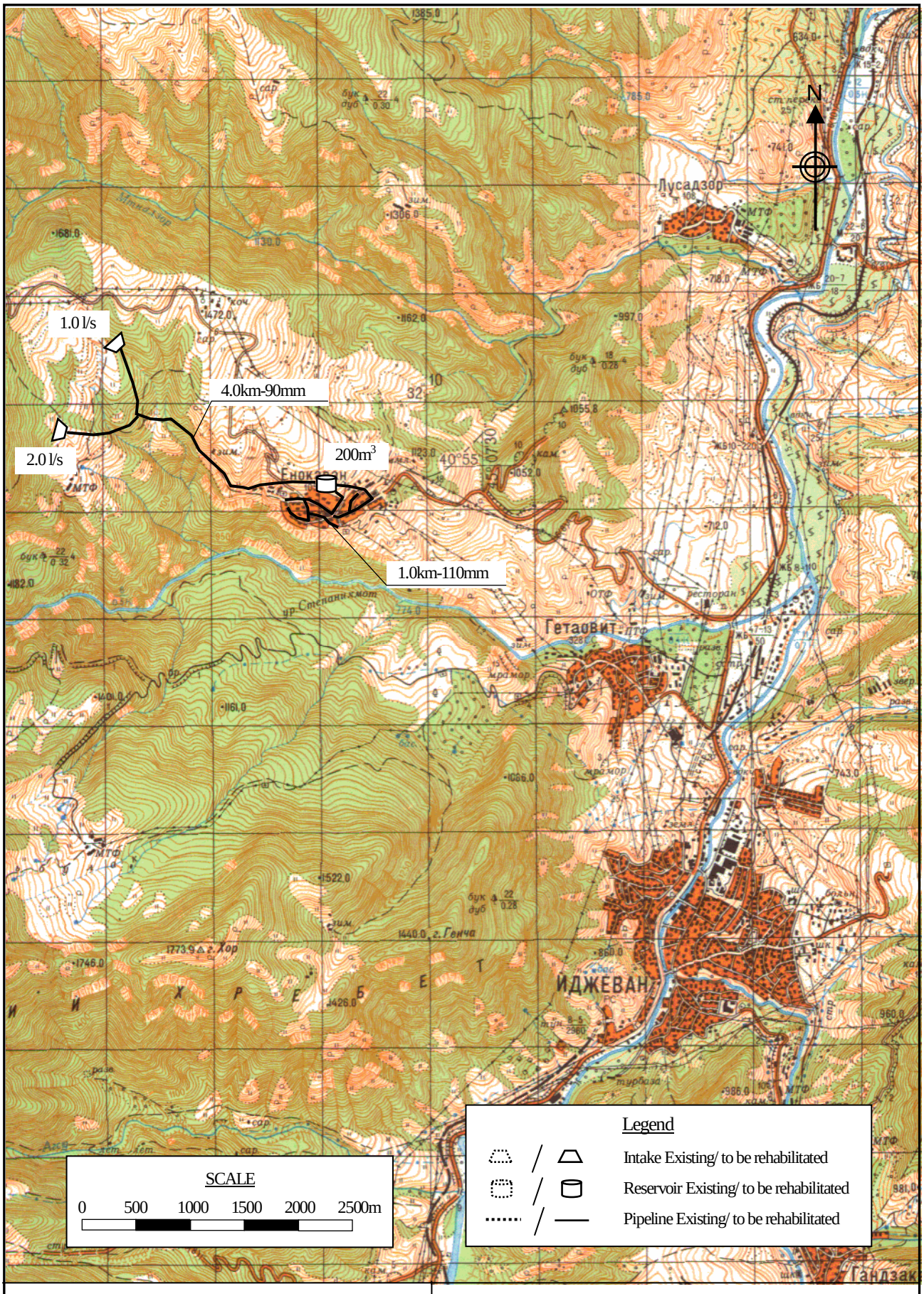
Marz : **Tavush** No.5
Name : **Yenoqavan**

No.	Item	Quantity	Unit	Water demand (m3/d)	
A.	**WATER DEMAND**				
	1 Population	530	persons	53.0	
	2 Factory	-	nos	0.0	
	3 School (pupils)	93	pupils	0.9	
	4 Medical Ambulance Station	-	nos	-	
	5 Policlinic	-	nos	-	
	7 Livestocks (87lit/household)	184	household	16	
	Sub-total			69.9	
	Unaccouted for water (20%)			14.0	
1	Average Daily Water Demand			83.9	m3/day
2	Maximum Daily Water Demand			100.7	m3/day
3	Maximum Hourly Water Demand			13.6	m3/hr

B	**WATER SUPPLY PLAN**						
	1 Water source type	Nr.	Total vol.				
	a Spring	2	3.0	lit/sec		259.2	m3/day
`	Total					259.2	m3/day
	2 Required reservoir volume					164	m3

C WATER SUPPLY FACILITIES REHABILITATION PLAN

No	Item	Quantity	Unit
1	Intake		
	1m3	2	nos
	2m3		nos
	3m3		nos
	4m3		nos
2	Transmission pipe		
	50mm diameter		m
	75mm diameter		m
	90mm diameter	4,000	m
	110mm diameter		m
	150mm diameter		m
	200mm diameter		m
	250mm diameter		m
3	Reservoir		
	200m3 capacity	1	nos
4	Distribution pipe		
	50mm diameter		m
	75mm diameter		m
	90mm diameter		m
	110mm diameter	1,000	m
	150mm diameter		m
	200mm diameter		m
	250mm diameter		m
5	House connection	30	nos
6	Water meter installation	184	nos
7	Public tap	2	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	Tavush	
No. 05	Yenoqavan	JICA STUDY TEAM

Marz : **Tavush**
No. : **5**
Name : **Yenoqavan**

No	Item	Specification	Quantity	Unit	Unit Price	Total
1	Intake					
		1m3	2	nos	367,700	735,400
		2m3		nos	545,000	
		3m3		nos	669,100	
		4m3		nos	805,100	
	Sub-total					735,400
2	Transmission Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm	4,000	m	8,040	32,160,000
		110mm		m	9,680	
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					32,160,000
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		m	5,520	
		75mm		m	7,160	
		90mm		m	8,040	
		110mm	1,000	m	9,680	9,680,000
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					9,680,000
5	House Connection		30	nos	74,000	2,220,000
6	Water Meter Installation		184	nos	80,000	14,720,000
7	Public Tap		2	nos	90,000	180,000
8	Chlorilation Equipment		1	nos	500,000	500,000
9	Pump Replacement			nos	10,000,000	
10	Drainage and Sewerage	concrete surfa	400	m	3,600	1,440,000
	Total				AMD	84,160,000
					Equivalent to USD	275,465
					Equivalent to JPY	29,061,534
					AMD	USD
	Investment Cost per household		184	HH	457,391	1,497
	Investment Cost per person		530	persons	158,792	520

TAVUSH MARZ
Ijevan District
No 5 Yenoqavan

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		25.5																																							
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		141.90	0.00	0.00	0.00	0.64	0.92	0.95	1.61	1.66	1.72	1.77	2.66	2.74	2.83	2.93	3.02	3.12	3.23	3.33	3.44	3.56	3.67	3.80	3.92	4.05	4.18	4.32	4.46	4.61	4.76	4.92	5.08	5.25	5.42	5.60	5.79	5.98	6.18	6.38	6.59	6.81
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				154																																				
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		6.71			0.00	0.07	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	0.19	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
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		17.62			0.00	0.17	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
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	0.17	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
5. Pump replacement		0.00																0.00															0.00									
Sub-total		42.03	0.00	0.00	0.24	0.49	0.62	0.62	0.65	0.67	0.69	0.72	0.74	0.76	0.79	0.81	0.84	0.88	0.91	0.93	0.96	1.00	1.03	1.05	1.10	1.12	1.17	1.21	1.24	1.29	1.33	1.38	1.43	1.48	1.52	1.57	1.62	1.67	1.72	1.79	1.84	1.91
C Gross Income (A-B)		100.11	0.00	0.00	-0.24	0.15	0.30	0.33	0.96	0.99	1.03	1.05	1.92	1.98	2.04	2.12	2.18	2.24	2.32	2.40	2.48	2.56	2.64	2.75	2.82	2.93	3.01	3.11	3.22	3.32	3.43	3.54	3.65	3.77	3.90	4.03	4.17	4.31	4.46	4.59	4.75	4.90
D Depreciation cost		79.80						2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28
E Interest paid		27.14	0.04	0.07	0.10	0.84	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.14	1.11	1.07	1.04	1.00	0.97	0.93	0.89	0.86	0.82	0.78	0.75	0.71	0.67	0.63	0.59	0.55	0.51	0.47	0.43	0.39	0.35	0.31	0.26	0.22	0.18	0.13	0.09	0.05
F Net Income		-6.83	-0.04	-0.07	-0.34	-0.69	-0.87	-3.12	-2.49	-2.46	-2.42	-2.40	-1.53	-1.44	-1.35	-1.23	-1.14	-1.04	-0.93	-0.81	-0.69	-0.58	-0.46	-0.31	-0.21	-0.06	0.06	0.20	0.35	0.49	0.64	0.79	0.94	1.10	1.27	1.44	1.63	1.81	2.00	2.18	2.38	2.57
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		-6.83	-0.04	-0.07	-0.34	-0.69	-0.87	-3.12	-2.49	-2.46	-2.42	-2.40	-1.53	-1.44	-1.35	-1.23	-1.14	-1.04	-0.93	-0.81	-0.69	-0.58	-0.46	-0.31	-0.21	-0.06	0.06	0.20	0.35	0.49	0.64	0.79	0.94	1.10	1.27	1.44	1.63	1.81	2.00	2.18	2.38	2.57
OM Cost Recovery Ratio (A/B)		338%	0%	0%	0%	131%	148%	153%	248%	248%	249%	246%	359%	361%	358%	362%	360%	355%	355%	358%	358%	356%	356%	362%	356%	362%	357%	357%	360%	357%	358%	357%	355%	355%	357%	357%	357%	358%	359%	356%	358%	357%

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	-6.83	-0.04	-0.07	-0.34	-0.69	-0.87	-3.12	-2.49	-2.46	-2.42	-2.40	-1.53	-1.44	-1.35	-1.23	-1.14	-1.04	-0.93	-0.81	-0.69	-0.58	-0.46	-0.31	-0.21	-0.06	0.06	0.20	0.35	0.49	0.64	0.79	0.94	1.10	1.27	1.44	1.63	1.81	2.00	2.18	2.38	2.57
2. Depreciation cost	79.80	0.00	0.00	0.00	0.00	0.00	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28
3. Interest Paid	27.14	0.04	0.07	0.10	0.84	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.14	1.11	1.07	1.04	1.00	0.97	0.93	0.89	0.86	0.82	0.78	0.75	0.71	0.67	0.63	0.59	0.55	0.51	0.47	0.43	0.39	0.35	0.31	0.26	0.22	0.18	0.13	0.09	0.05
Sub-total	100.11	0.00	0.00	-0.24	0.15	0.30	0.33	0.96	0.99	1.03	1.05	1.92	1.98	2.04	2.12	2.18	2.24	2.32	2.40	2.48	2.56	2.64	2.75	2.82	2.93	3.01	3.11	3.22	3.32	3.43	3.54	3.65	3.77	3.90	4.03	4.17	4.31	4.46	4.59	4.75	4.90
B Finances																																									
1. Project Loan	117.34	3.91	2.79	3.72	73.58	32.31	0.58	0.45																																	
2. Local fund	39.26	1.29	0.91	1.25	24.77	10.91	0.07	0.06																																	
Sub-total	156.60	5.20	3.70	4.97	98.35	43.22	0.65	0.51																																	
C Subsidy from Government																																									
1. Subsidy for O&M cost	0.24	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	44.75	0.04	0.07	0.10	0.69	0.87	0.84	0.21	0.18	0.14	0.12	2.62	2.57	2.51	2.43	2.37	2.31	2.23	2.15	2.06	1.99	1.91	1.79	1.73	1.62	1.54	1.44	1.33	1.22	1.11	1.01	0.90	0.78	0.65	0.52	0.37	0.24	0.09	0.00	0.00	0.00
Sub-total	44.99	0.04	0.07	0.34	0.69	0.87	0.84	0.21	0.18	0.14	0.12	2.62	2.57	2.51	2.43	2.37	2.31	2.23	2.15	2.06	1.99	1.91	1.79	1.73	1.62	1.54	1.44	1.33	1.22	1.11	1.01	0.90	0.78	0.65	0.52	0.37	0.24	0.09	0.00	0.00	0.00
Total Cash Inflow	301.70	5.24	3.77	5.07	99.19	44.39	1.82	1.68	1.17	1.17	1.17	4.54	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.54	4.55	4.55	4.54	4.55	4.55	4.55	4.55	4.55	4.54	4.54	4.55	4.55	4.55	4.55	4.54	4.55	4.55	4.59	4.75	4.90
APPLICATION OF FUNDS																																								
D Project disbursement	156.60	5.20	3.70	4.97	98.35	43.22	0.65	0.51																																	
E Total debt services																																								
1. Loan repayment	117.36											3.37	3.41	3.44	3.48	3.51	3.55	3.58	3.62	3.65	3.69	3.73	3.76	3.80	3.84	3.88	3.92	3.96	3.99	4.03	4.08	4.12	4.16	4.20	4.24	4.28	4.33	4.37	4.41	4.46	4.50
2. Interest paid	27.14	0.04	0.07	0.10	0.84	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.14	1.11	1.07	1.04	1.00	0.97	0.93	0.89	0.86	0.82	0.78	0.75	0.71	0.67	0.63	0.59	0.55	0.51	0.47	0.43	0.39	0.35	0.31	0.26	0.22	0.18	0.13	0.09	0.05
Sub-total	144.50	0.04	0.07	0.10	0.84	1.17	1.17	1.17	1.17	1.17	1.17	4.54	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.54	4.55	4.55	4.54	4.55	4.55	4.55	4.55	4.55	4.54	4.54	4.55	4.55	4.55	4.55	4.54	4.55	4.55	4.54	4.55	4.55	
Total Cash Outflow	301.10	5.24	3.77	5.07	99.19	44.39	1.82	1.68	1.17	1.17	1.17	4.54	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.54	4.55	4.55	4.54	4.55	4.55	4.55	4.55	4.55	4.54	4.54	4.55	4.55	4.55	4.55	4.54	4.55	4.55	4.54	4.55	4.55	
F Net Surplus Cash (A+C2)-E	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.20	0.35	
Project Cost Recovery Ratio (%)																																								
Cost recovery by water fee (A/E)	69%	0%	0%	0%	18%	26%	28%	82%	85%	88%	90%	42%	44%	45%	47%	48%	49%	51%	53%	55%	56%	58%	61%	62%	64%	66%	68%	71%	73%	76%	78%	80%	83%	86%	89%	92%	95%	98%	101%	104%	108%
Cost recovery by water fee + subsidy ((A+C2)/E)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	101%	104%	108%

TAVUSH MARZ
Ijevan District
No 5 Yenoqavan

FINANCIAL ANALYSIS

A COST RECOVERY ANALYSIS

	Item	Millon AMD	Rate
1	**Revenue**		
	Water fee revenue	141.90	75.9%
	Subsidy	44.99	24.1%
	Total	186.89	100.0%
2	**Expenditure**		
	OM cost	41.79	22.4%
	Loan repayment	117.36	62.8%
	Interest paid	27.14	14.5%
	Surplus cash	0.60	0.3%
	Total	186.89	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	103.84	3.82	2.73	3.51	65.12	27.71	0.53	0.42																																	
2. Operation and Maintenance Cost																																									
Salary	9.12			0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Chlorine	3.67			0.00	0.07	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
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	8.81			0.00	0.17	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
Pump replacement																	0.00															0.00										
Sub-total	21.60			0.24	0.48	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	0.58
Total Outflow	125.44	3.82	2.73	3.75	65.60	28.29	1.11	1.00	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	89.07	0.00	0.00	0.00	0.64	0.92	0.95	1.61	1.66	1.72	1.77	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66
2. Subsidy	23.02	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.45	1.43	1.40	1.36	1.33	1.31	1.26	1.22	1.17	1.13	1.09	1.01	0.98	0.91	0.87	0.81	0.74	0.67	0.60	0.54	0.47	0.39	0.30	0.21	0.11	0.02	0.00	0.00	0.00
Total Inflow	112.09	0.00	0.00	0.24	0.64	0.92	0.95	1.61	1.66	1.72	1.77	4.11	4.09	4.06	4.02	3.99	3.97	3.92	3.88	3.83	3.79	3.75	3.67	3.64	3.57	3.53	3.47	3.40	3.33	3.26	3.20	3.13	3.05	2.96	2.87	2.77	2.68	2.66	2.66	2.66
NET BENEFIT	-13.35	-3.82	-2.73	-3.5	-65.0	-27.4	-0.16	0.61	1.08	1.14	1.19	3.53	3.51	3.48	3.44	3.41	3.39	3.34	3.30	3.25	3.21	3.17	3.09	3.06	2.99	2.95	2.89	2.82	2.75	2.68	2.62	2.55	2.47	2.38	2.29	2.19	2.10	2.08	2.08	2.08

FIRR = -0.71%

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	-45.01	-4.20	-3.00	-3.9	-71.5	-30.1	-0.21	0.57	1.08	1.14	1.19	3.53	3.51	3.48	3.44	3.41	3.39	3.34	3.30	3.25	3.21	3.17	3.09	3.06	2.99	2.95	2.89	2.82	2.75	2.68	2.62	2.55	2.47	2.38	2.29	2.19	2.10	2.08	2.08	2.08
	2	Capital cost 20% up	-54.68	-4.58	-3.28	-4.2	-78.0	-32.9	-0.27	0.53	1.08	1.14	1.19	3.53	3.51	3.48	3.44	3.41	3.39	3.34	3.30	3.25	3.21	3.17	3.09	3.06	2.99	2.95	2.89	2.82	2.75	2.68	2.62	2.55	2.47	2.38	2.29	2.19	2.10	2.08	2.08	2.08
2	1	OM cost 10% up	-36.84	-3.82	-2.73	-3.5	-65.0	-27.4	-0.22	0.55	1.02	1.08	1.13	3.47	3.45	3.42	3.38	3.35	3.33	3.28	3.24	3.19	3.15	3.11	3.03	3.00	2.93	2.89	2.83	2.76	2.69	2.62	2.56	2.49	2.41	2.32	2.23	2.13	2.04	2.02	2.02	2.02
	2	OM cost 20% up	-38.34	-3.82	-2.73	-3.6	-65.1	-27.5	-0.28	0.49	0.96	1.02	1.07	3.41	3.39	3.36	3.32	3.29	3.27	3.22	3.18	3.13	3.09	3.05	2.97	2.94	2.87	2.83	2.77	2.70	2.63	2.56	2.50	2.43	2.35	2.26	2.17	2.07	1.98	1.96	1.96	1.96
3	1	Revenue 10% down	-42.98	-3.82	-2.73	-3.5	-65.0	-27.5	-0.26	0.45	0.91	0.97	1.01	3.12	3.10	3.07	3.04	3.01	2.99	2.95	2.91	2.87	2.83	2.80	2.72	2.70	2.63	2.60	2.54	2.48	2.42	2.35	2.30	2.24	2.17	2.08	2.00	1.91	1.83	1.81	1.81	1.81
	2	Revenue 20% down	-50.62	-3.82	-2.73	-3.6	-65.1	-27.6	-0.35	0.29	0.75	0.80	0.84	2.71	2.69	2.67	2.64	2.61	2.60	2.56	2.52	2.48	2.45	2.42	2.36	2.33	2.28	2.24	2.20	2.14	2.08	2.03	1.98	1.92	1.86	1.79	1.72	1.64	1.56	1.55	1.55	1.55

No.		Description	FIRR	Sensitivity indicator	Swiching value
1	1	Capital cost 10% up	-1.19%	-4.02	-24.89%
	2	Capital cost 20% up	-1.62%	-5.60	-17.87%
2	1	OM cost 10% up	-0.83%	-1.46	-68.72%
	2	OM cost 20% up	-0.96%	-2.56	-39.13%
3	1	Revenue 10% down	-1.37%	-4.81	-20.81%
	2	Revenue 20% down	-2.10%	-6.61	-15.12%

No.6 Teghut

Information on Existing Water Sources (Tavush)

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

No.6 Community Teghut
District Idjevan
Marz Tavush

No	Water source	Latitude			Longitude			Atidute	Yeild(L/sec)		
		deg	min	sec	deg	min	sec	(m)	Min	Max	At site
1	spring intake	40	48	44.0	44	53	9.0	1,500	3.0	4.0	4.0
2	River	-	-	-	-	-	-	-	-	-	2.0
3											
4											
5											
6											
7											
8											
9											
10											

Notes:

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

Users Acceptnce for water quality	Acceptable
Notes	I. Up to 70% leakage in water main and in the network. II.Transmission pipeline from river intake does not operate.
Alternative sources if any	Morut gorge's springs can be captured and brought to the community.

No.6 Community Teghut
District Idjevan
Marz Tavush
Sampling date 05/Sep/2007

	Parameters analysed	Units	No.1 Khach-kari	No.2 Maruta aghbyur			Guidelines	
							WHO	Armenia
a	pH		7.5	8.5			6.5-8	6.0 - 9.0
b	Temperature	Deg.C	15.6	17.7				
c	TDS	Mg/L	282	186			1000	1000
1	Al:Aluminum	Mg/L	n.d.	n.d.			0.10	0.50
2	B:Boron	Mg/L	n.d.	n.d.			0.70	0.50
3	Cl:Chloride	Mg/L	6	4			250	350
4	Cr:Chrome	Mg/L	<0.01	<0.01			0.05	0.05
5	Cu:Copper	Mg/L	n.d.	n.d.			2	1
6	F:Fluoride	Mg/L	0.03	0.10			1.50	
7	Hardness	Mg/L	590	370			500	700
8	Fe:Iron	Mg/L	n.d.	n.d.			0.30	0.30
9	Mn:Manganese	Mg/L	n.d.	n.d.			0.40	0.10
10	Mo:Molibdenum	Mg/L	0.020	<0.02			0.070	0.250
11	Ni:Nickel	Mg/L	<0.006	<0.006			0.020	0.100
12	Nitrate(NO3+)	Mg/L	1.8	0.9			50.0	45.0
13	SO4:Sulfate	Mg/L	8.0	5.0			250.0	500.0
14	Zn:Zink	Mg/L	n.d.	n.d.			3.0	5.0
15	As:Arsenic	Mg/L	n.d.	n.d.			0.0	0.1
16	Ba:Barium	Mg/L	<0.01	<0.01			0.70	0.10
17	Be:Berillium	Mg/L	0.00005	0.00005			NA	0.00020
18	Cd:Cadmium	Mg/L	n.d.	n.d.			0.0030	0.0010
19	Pb:Lead	Mg/L	0.001	0.001			0.010	0.030
20	Hg:Mercury	Mg/L	<0.0002	<0.0002			0.00100	0.00050
21	Se:Selenium	Mg/L	<0.001	<0.001			0.010	0.010
22	Sr:Strontium	Mg/L	<0.7	<0.7			NA	7.0
23	CN:Cyanide	Mg/L	n.d.	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.6 Community Teghut
District Ijevan
Marz Tavush

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	1	18	3	0.3	Not Identified
2	2	22	91	24.0	Not Identified
3	3	21	88	24.0	Not Identified
4	4	03	28	2.3	Not Identified
5	6	13	57	15.0	Not Identified
6	6	13	11	0.9	Not Identified

No. 6 **Marz** Tavush **Community** Teghut

1. ACCESSIBILITY TO THE SITE

No.	Structures	Access by vehicle	Machine construction	Remarks
1	Intake	Possible	Difficult	
	Intake	Difficult	Difficult	
2	Transmission pipeline	Possible	Difficult	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°48′44.0″	45°53′09.0″	1,500	1969	Concrete	4.0	Yes

3. TRANSMISSION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Flow rate (l/s)	Year	Leakage	Rehabilitation Necessity (Y/N)
1	7,000	150	Steel	4.0	1969	Little	Yes

4. RESERVOIR

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

5. CHLORINATION EQUIPMENT

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

6. DISTRIBUTION PIPELINE

No.	Pipeline length (m)	Pipe diameter	Material	Year	Leakage	Rehabilitation Necessity (Y/N)
1	3,000	150	Steel	1969	Huge	Yes
2	1,200	75	Steel		Huge	Yes
3	500	50	Steel		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)
No				0	

9. DRAINAGE SYSTEM

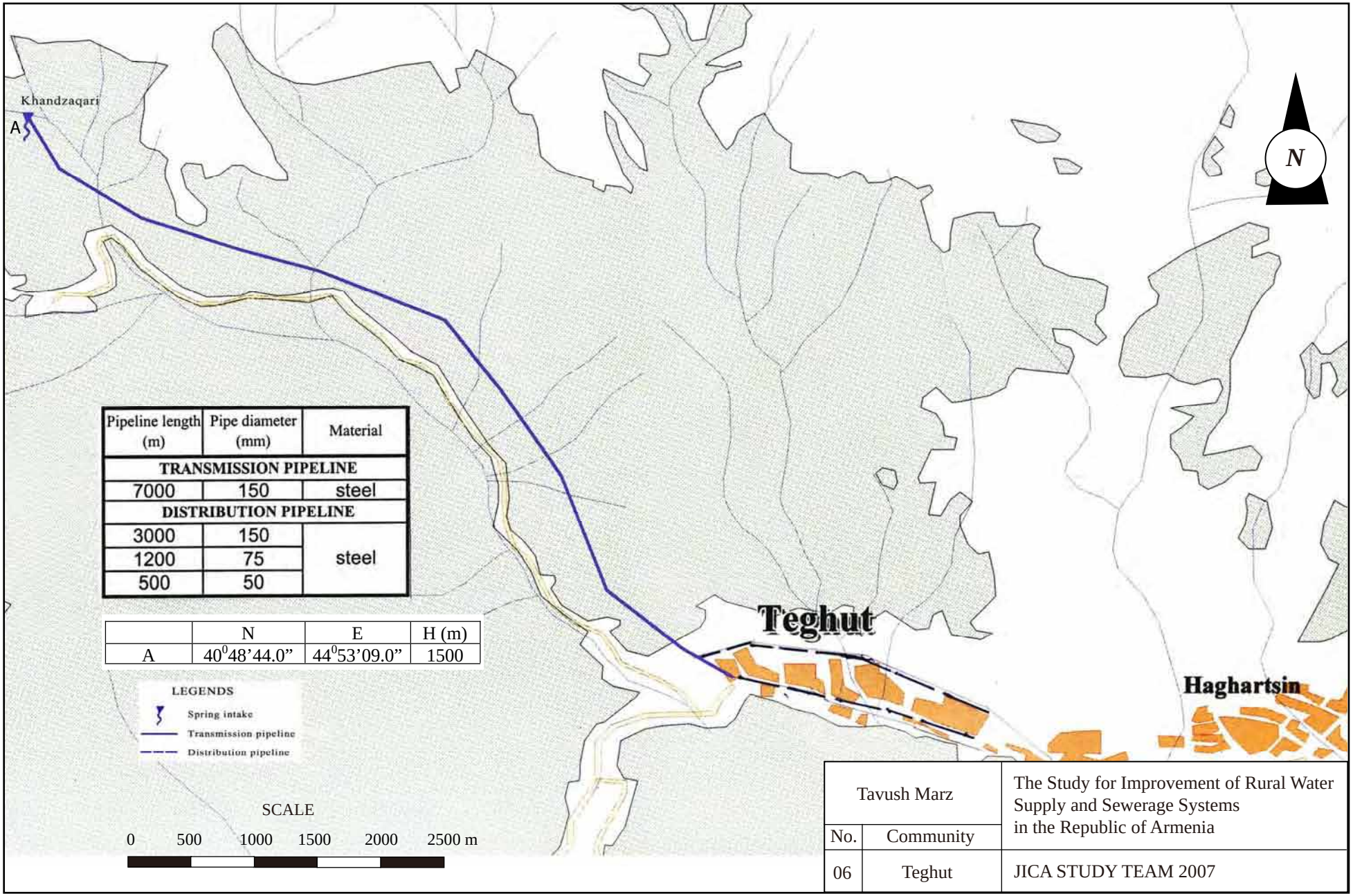
Existence	Rehabilitation	Remarks
Yes	Yes	Wastewater is discharged into river

Questionnaire on Existing Water Supply Conditions by Socio-Economic Survey

Marz	**Tavush**
Number and Name of Community	**No.6 Teghut**
District	**Idejevan**

No.	Question	Answer
A: Baseline Data		
A1	Actual population in 2001	1,605
A2	Actual population in 2007	1,605
A3	Number of households	398
A4.1	Elderly people	170
A4.2	Population in labor force (age from 16 to 62)	1,266
A4.3	Children	169
A5.1	Pensioners	190
A5.2	Unemployed	70
A5.3	Receiving benefits	70
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	240
B: Budget		
B1	Annual Budget of the community 2004, in thousand AMD	2,242
	Annual Budget of the community 2005, in thousand AMD	2,140
	Annual Budget of the community 2006, in thousand AMD	2,240
	Annual Budget of the community 2007, in thousand AMD	2,242
	Annual Budget of the community 2008, in thousand AMD	is not planned.
B2	Amount spent in drinking water sector 2004, in thousand AMD	70
	Amount spent in drinking water sector 2005, in thousand AMD	60
	Amount spent in drinking water sector 2006, in thousand AMD	100
	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:	cereals, dairy, meat
C2	Is there any community activities carrying out by women? 1-Yes, 2-No	no
D: Water Usage and Water Demand Survey		
D1	Does the community hold water use permit? 1-Yes, 2-No	no
D2	Water use permit number	-
D3	Date of expiry of water use permit	-
D4	Planned date of obtaining water use permit	ongoing
D5	Present condition of the water supply volume of Domestic use	sufficient
D6	Present condition of the water supply volume of Irrigation water	sufficient
D7	Number of house connection to drinking water system	398
D8	How many house connection household set the water meter	0
D9	Number of public taps	0
D10.1	How is the regime of water supply in your community in the dry season?	regularly - 5hrs
D10.2	How is the regime of water supply in your community in the wet season?	regularly - 5hrs
D11	What time of day water is given?	12^{00}-17^{00} - 30% 17^{00}-22^{00} - 30%, 40% don't have
D12	Are you pleased with duration of domestic water supply?	mainly displeased
D13	Are hours of water supply convenient?	mainly convenient
D14.1	How long the taps are open to provide the domestic water (cooking, washing, foodstuffs, dishes, Landry, bathing, etc) of each houshold a day?	-
D14.2	Estimate quantity of domestic water use of each household (litter per day)	500
D15.1	How long the taps are open to provide the each household for filling	-
D15.2	Estimate quantity of water for filling containers of each household (litter per	difficult to answer
D16	Drinking water monthly water fee per household	0
D17	How often do you usually pay water fees?	-
D18	Water fee structure 1- Flate rate, 2- Having water tariff	-
D19	Where do you acquire the irrigation water?	absent
D20	Are you satisfied with irrigation water supply volume?	absent
E: Present Operation and Maintenance Works		
E1	Name of responsible for water supply	Zaqaryan Vardan
E2	Position	water distributor
E3	Telephone	(093)089192
E4	Quantity and present condition of the water supply facilities: spring/ intake	1-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)	absent
E7	Quantity and present condition of the water supply facilities: net/distribution	deteriorated
E8	Quantity and present condition of the water supply facilities: public tap	absent
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, hired specialist
E13	Who is in charge of the repair work in the community?	administration head
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)	300,000
	Repair cost(AMD)	100,000
	Others(AMD)	0
	Total (AMD)	400,000
E16	Do the residents participate in the O&M works?	manpower
E17	What kind of OM method is preferable to you?	resident participation, reduce 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.	present
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	present
F1.8	Living areas of ethic, indigenous people or nomads who have a traditional lifestyle or special socially valuable areas	absent

Tavush
No.6 Teghut



Pipeline length (m)	Pipe diameter (mm)	Material
TRANSMISSION PIPELINE		
7000	150	steel
DISTRIBUTION PIPELINE		
3000	150	steel
1200	75	
500	50	

	N	E	H (m)
A	$40^0$48’44.0”	$44^0$53’09.0”	1500

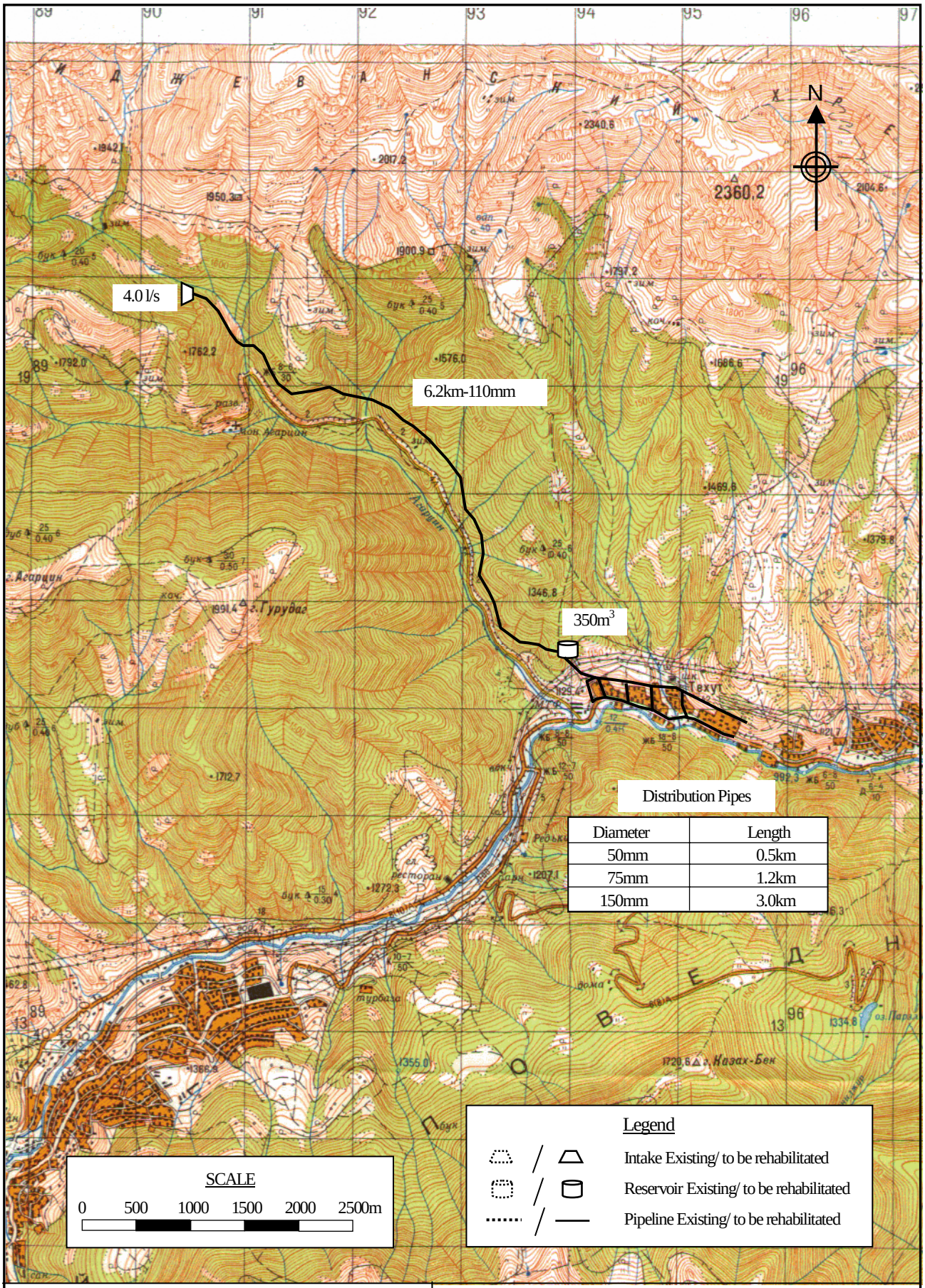
Tavush Marz		The Study for Improvement of Rural Water Supply and Sewerage Systems in the Republic of Armenia
No.	Community	
06	Teghut	JICA STUDY TEAM 2007

Marz : **Tavush** No.6
Name : **Teghut**

No.	Item	Quantity	Unit	Water demand (m3/d)	
A.	**WATER DEMAND**				
	1 Population	1,605	persons	160.5	
	2 Factory	-	nos	0.0	
	3 School (pupils)	240	pupils	2.4	
	4 Medical Ambulance Station	-	nos	-	
	5 Policlinic	-	nos	-	
	7 Livestocks (87lit/household)	398	household	34.6	
	Sub-total			197.5	
	Unaccouted for water (20%)			39.5	
1	Average Daily Water Demand			237.0	m3/day
2	Maximum Daily Water Demand			284.4	m3/day
3	Maximum Hourly Water Demand			27.7	m3/hr

B	**WATER SUPPLY PLAN**						
	1 Water source type	Nr.	Total vol.				
	a Spring	1	4.0	lit/sec		345.6	m3/day
	b River	1	0				
`	Total					345.6	m3/day
	2 Required reservoir volume					333	m3

C	**WATER SUPPLY FACILITIES REHABILITATION PLAN**		
	No Item	Quantity	Unit
	1 Intake		
	1m3	1	nos
	2m3		nos
	3m3		nos
	4m3		nos
	2 Transmission pipe		
	50mm diameter		m
	75mm diameter		m
	90mm diameter		m
	110mm diameter	6,200	m
	150mm diameter		m
	200mm diameter		m
	250mm diameter		m
	3 Reservoir		
	350m3 capacity	1	nos
	4 Distribution pipe		
	50mm diameter	500	m
	75mm diameter	1,200	m
	90mm diameter		m
	110mm diameter		m
	150mm diameter	3,000	m
	200mm diameter		m
	250mm diameter		m
	5 House connection	-	nos
	6 Water meter installation	398	nos
	7 Public tap	4	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	Tavush	
No. 06	Teghut	JICA STUDY TEAM

Marz : **Tavush**
No. : **6**
Name : **Teghut**

No	Item	Specification	Quantity	Unit	Unit Price	Total
1	Intake					
		1m3	1	nos	367,700	367,700
		2m3		nos	545,000	
		3m3		nos	669,100	
		4m3		nos	805,100	
	Sub-total					367,700
2	Transmission Pipe					
		50mm		m	5,520	
		75mm		m	7,160	
		90mm		m	8,040	
		110mm	6,200	m	9,680	60,016,000
		150mm		m	13,140	
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					60,016,000
3	Reservoir					
		50m3		nos	8,363,900	
		100m3		nos	12,968,300	
		150m3		nos	18,804,500	
		200m3		nos	22,524,600	
		250m3		nos	25,952,800	
		300m3		nos	29,630,400	
		350m3	1	nos	33,528,700	33,528,700
		400m3		nos	36,388,000	
		450m3		nos	39,392,500	
		500m3		nos	42,520,900	
	Sub-total					33,528,700
4	Distribution Pipe					
		50mm	500	m	5,520	2,760,000
		75mm	1,200	m	7,160	8,592,000
		90mm		m	8,040	
		110mm		m	9,680	
		150mm	3,000	m	13,140	39,420,000
		200mm		m	19,440	
		250mm		m	27,040	
	Sub-total					50,772,000
5	House Connection			nos	74,000	
6	Water Meter Installation		398	nos	80,000	31,840,000
7	Public Tap		4	nos	90,000	360,000
8	Chlorilation Equipment		1	nos	500,000	500,000
9	Pump Replacement			nos	10,000,000	
10	Drainage and Sewerage	concrete surface		m	3,600	
	Total				AMD	177,384,400
					Equivalent to USD	580,598
					Equivalent to JPY	61,253,123
					AMD	USD
	Investment Cost per household		398	HH	445,689	1,459
	Investment Cost per person		1,605	persons	110,520	362

TAVUSH MARZ
Ijevan District
No 6 Teghut

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		72.1																																							
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		401.02	0.00	0.00	0.00	1.82	2.60	2.68	4.54	4.69	4.85	5.01	7.50	7.75	8.01	8.27	8.54	8.83	9.12	9.42	9.73	10.05	10.38	10.72	11.08	11.44	11.82	12.21	12.61	13.03	13.46	13.90	14.36	14.84	15.33	15.83	16.36	16.90	17.45	18.03	18.62	19.24
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				433																																					
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		18.84			0.00	0.19	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	0.55	0.57	0.58	0.60	0.62	0.64	0.67	0.69	0.71	0.73	0.76	0.78	0.81	0.84	0.86
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		30.15			0.00	0.30	0.44	0.45	0.47	0.48	0.50	0.51	0.53	0.55	0.57	0.59	0.61	0.63	0.65	0.67	0.69	0.71	0.74	0.76	0.78	0.81	0.84	0.87	0.89	0.92	0.95	0.99	1.02	1.05	1.09	1.12	1.16	1.20	1.24	1.28	1.32	1.36
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	0.3	0.44	0.45	0.47	0.48	0.50	0.51	0.53	0.55	0.57	0.59	0.61	0.63	0.65	0.67	0.69	0.71	0.74	0.76	0.78	0.81	0.84	0.87	0.89	0.92	0.95	0.99	1.02	1.05	1.09	1.12	1.16	1.20	1.24	1.28	1.32	1.36
5. Pump replacement		0.00																0.00															0.00									
Sub-total		66.69	0.00	0.00	0.24	0.74	0.98	1.00	1.04	1.07	1.11	1.14	1.18	1.22	1.26	1.30	1.34	1.40	1.44	1.48	1.53	1.58	1.64	1.68	1.74	1.79	1.86	1.93	1.98	2.04	2.11	2.19	2.26	2.34	2.42	2.49	2.57	2.66	2.74	2.84	2.93	3.02
C Gross Income (A-B)		334.74	0.00	0.00	-0.24	1.08	1.62	1.68	3.50	3.62	3.74	3.87	6.32	6.53	6.75	6.97	7.20	7.43	7.68	7.94	8.20	8.47	8.74	9.04	9.34	9.65	9.96	10.28	10.63	10.99	11.35	11.71	12.10	12.50	12.91	13.34	13.79	14.24	14.71	15.19	15.69	16.22
D Depreciation cost		168.35						4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81
E Interest paid		53.09	0.04	0.07	0.10	1.62	2.30	2.30	2.30	2.30	2.30	2.30	2.31	2.24	2.17	2.10	2.04	1.97	1.90	1.83	1.76	1.68	1.61	1.54	1.46	1.39	1.31	1.24	1.16	1.08	1.01	0.93	0.85	0.77	0.68	0.60	0.52	0.43	0.35	0.26	0.18	0.09
F Net Income		113.30	-0.04	-0.07	-0.34	-0.54	-0.68	-5.43	-3.61	-3.49	-3.37	-3.24	-0.80	-0.52	-0.23	0.06	0.35	0.65	0.97	1.30	1.63	1.98	2.32	2.69	3.07	3.45	3.84	4.23	4.66	5.10	5.53	5.97	6.44	6.92	7.42	7.93	8.46	9.00	9.55	10.12	10.70	11.32
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		113.30	-0.04	-0.07	-0.34	-0.54	-0.68	-5.43	-3.61	-3.49	-3.37	-3.24	-0.80	-0.52	-0.23	0.06	0.35	0.65	0.97	1.30	1.63	1.98	2.32	2.69	3.07	3.45	3.84	4.23	4.66	5.10	5.53	5.97	6.44	6.92	7.42	7.93	8.46	9.00	9.55	10.12	10.70	11.32
OM Cost Recovery Ratio (A/B)		601%	0%	0%	0%	246%	265%	268%	437%	438%	437%	439%	636%	635%	636%	636%	637%	631%	633%	636%	636%	636%	633%	638%	637%	639%	635%	633%	637%	639%	638%	635%	635%	634%	633%	636%	637%	635%	637%	635%	635%	637%

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	113.30	-0.04	-0.07	-0.34	-0.54	-0.68	-5.43	-3.61	-3.49	-3.37	-3.24	-0.80	-0.52	-0.23	0.06	0.35	0.65	0.97	1.30	1.63	1.98	2.32	2.69	3.07	3.45	3.84	4.23	4.66	5.10	5.53	5.97	6.44	6.92	7.42	7.93	8.46	9.00	9.55	10.12	10.70	11.32
2. Depreciation cost	168.35	0.00	0.00	0.00	0.00	0.00	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81
3. Interest Paid	53.09	0.04	0.07	0.10	1.62	2.30	2.30	2.30	2.30	2.30	2.30	2.31	2.24	2.17	2.10	2.04	1.97	1.90	1.83	1.76	1.68	1.61	1.54	1.46	1.39	1.31	1.24	1.16	1.08	1.01	0.93	0.85	0.77	0.68	0.60	0.52	0.43	0.35	0.26	0.18	0.09
Sub-total	334.74	0.00	0.00	-0.24	1.08	1.62	1.68	3.50	3.62	3.74	3.87	6.32	6.53	6.75	6.97	7.20	7.43	7.68	7.94	8.20	8.47	8.74	9.04	9.34	9.65	9.96	10.28	10.63	10.99	11.35	11.71	12.10	12.50	12.91	13.34	13.79	14.24	14.71	15.19	15.69	16.22
B Finances																																									
1. Project Loan	230.55	3.91	2.79	3.72	151.91	67.19	0.58	0.45																																	
2. Local fund	78.91	1.29	0.91	1.25	52.33	23.00	0.07	0.06																																	
Sub-total	309.46	5.20	3.70	4.97	204.24	90.19	0.65	0.51																																	
C Subsidy from Government																																									
1. Subsidy for O&M cost	0.24	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	18.11	0.04	0.07	0.10	0.54	0.68	0.62	0.00	0.00	0.00	0.00	2.62	2.40	2.18	1.96	1.74	1.51	1.26	1.00	0.74	0.46	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total	18.35	0.04	0.07	0.34	0.54	0.68	0.62	0.00	0.00	0.00	0.00	2.62	2.40	2.18	1.96	1.74	1.51	1.26	1.00	0.74	0.46	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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 Cash Inflow	662.55	5.24	3.77	5.07	205.86	92.49	2.95	4.01	3.62	3.74	3.87	8.94	8.93	8.93	8.93	8.94	8.94	8.94	8.94	8.94	8.93	8.93	9.04	9.34	9.65	9.96	10.28	10.63	10.99	11.35	11.71	12.10	12.50	12.91	13.34	13.79	14.24	14.71	15.19	15.69	16.22
APPLICATION OF FUNDS																																									
D Project disbursement	309.46	5.20	3.70	4.97	204.24	90.19	0.65	0.51																																	
E Total debt services																																									
1. Loan repayment	230.56											6.63	6.69	6.76	6.83	6.90	6.97	7.04	7.11	7.18	7.25	7.32	7.39	7.47	7.54	7.62	7.69	7.77	7.85	7.93	8.01	8.09	8.17	8.25	8.33	8.42	8.50	8.58	8.67	8.76	8.84
2. Interest paid	53.09	0.04	0.07	0.10	1.62	2.30	2.30	2.30	2.30	2.30	2.30	2.31	2.24	2.17	2.10	2.04	1.97	1.90	1.83	1.76	1.68	1.61	1.54	1.46	1.39	1.31	1.24	1.16	1.08	1.01	0.93	0.85	0.77	0.68	0.60	0.52	0.43	0.35	0.26	0.18	0.09
Sub-total	283.65	0.04	0.07	0.10	1.62	2.30	2.30	2.30	2.30	2.30	2.30	8.94	8.93	8.93	8.93	8.94	8.94	8.94	8.94	8.94	8.93	8.93	8.93	8.93	8.93	8.93	8.93	8.93	8.93	8.94	8.94	8.94	8.94	8.93	8.93	8.94	8.93	8.93	8.93	8.94	8.93
Total Cash Outflow	593.11	5.24	3.77	5.07	205.86	92.49	2.95	2.81	2.30	2.30	2.30	8.94	8.93	8.93	8.93	8.94	8.94	8.94	8.94	8.94	8.93	8.93	8.93	8.93	8.93	8.93	8.93	8.93	8.93	8.94	8.94	8.94	8.94	8.93	8.93	8.94	8.93	8.93	8.93	8.94	8.93
F Net Surplus Cash (A+C2)-E	69.44	0.00	0.00	0.00	0.00	0.00	0.00	1.20	1.32	1.44	1.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.41	0.72	1.03	1.35	1.70	2.06	2.41	2.77	3.16	3.56	3.98	4.41	4.85	5.31	5.78	6.26	6.75	7.29
Project Cost Recovery Ratio (%)																																									
Cost recovery by water fee (A/E)	118%	0%	0%	0%	67%	70%	73%	152%	157%	163%	168%	71%	73%	76%	78%	81%	83%	86%	89%	92%	95%	98%	101%	105%	108%	112%	115%	119%	123%	127%	131%	135%	140%	145%	149%	154%	159%	165%	170%	176%	182%
Cost recovery by water fee + subsidy ((A+C2)/E)	124%	100%	100%	100%	100%	100%	100%	152%	157%	163%	168%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	101%	105%	108%	112%	115%	119%	123%	127%	131%	135%	140%	145%	149%	154%	159%	165%	170%	176%	182%

TAVUSH MARZ
Ijevan District
No 6 Teghut

FINANCIAL ANALYSIS

A COST RECOVERY ANALYSIS

Item	Millon AMD	Rate
1 Revenue		
Water fee revenue	401.02	95.6%
Subsidy	18.35	4.4%
Total	419.37	100.0%
2 Expenditure		
OM cost	66.28	15.8%
Loan repayment	230.56	55.0%
Interest paid	53.09	12.7%
Surplus cash	69.44	16.6%
Total	419.37	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	203.06	3.82	2.73	3.51	134.38	57.67	0.53	0.42																																
2. Operation and Maintenance Cost																																								
Salary	9.12			0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Chlorine	9.91			0.00	0.19	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
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	15.05			0.00	0.29	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41
Pump replacement																	0.00															0.00									
Sub-total	34.08			0.24	0.72	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Total Outflow	237.14	3.82	2.73	3.75	135.10	58.59	1.45	1.34	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
B BENEFIT																																								
1. Water Tariff	251.19	0.00	0.00	0.00	1.82	2.60	2.68	4.54	4.69	4.85	5.01	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50
2. Subsidy	0.72	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.16	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	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	251.91	0.00	0.00	0.24	1.82	2.60	2.68	4.54	4.69	4.85	5.01	7.81	7.66	7.51	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50
NET BENEFIT	14.77	-3.82	-2.73	-3.5	-133.3	-56.0	1.23	3.20	3.77	3.93	4.09	6.89	6.74	6.59	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58

FIRR = 0.36%

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	-61.60	-4.20	-3.00	-3.9	-146.7	-61.8	1.18	3.16	3.77	3.93	4.09	6.89	6.74	6.59	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58
	2	Capital cost 20% up	-80.49	-4.58	-3.28	-4.2	-160.2	-67.5	1.12	3.12	3.77	3.93	4.09	6.89	6.74	6.59	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58
2	1	OM cost 10% up	-45.09	-3.82	-2.73	-3.5	-133.3	-56.1	1.14	3.11	3.68	3.84	4.00	6.80	6.65	6.50	6.49	6.49	6.49	6.49	6.49	6.49	6.49	6.49	6.49	6.49	6.49	6.49	6.49	6.49	6.49	6.49	6.49	6.49	6.49	6.49	6.49	6.49	6.49	6.49	6.49	6.49
	2	OM cost 20% up	-47.46	-3.82	-2.73	-3.6	-133.4	-56.2	1.05	3.02	3.59	3.75	3.91	6.71	6.56	6.41	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40
3	1	Revenue 10% down	-59.70	-3.82	-2.73	-3.5	-133.5	-56.3	0.96	2.75	3.30	3.45	3.59	6.11	5.97	5.84	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.83
	2	Revenue 20% down	-76.68	-3.82	-2.73	-3.6	-133.6	-56.5	0.69	2.29	2.83	2.96	3.09	5.33	5.21	5.09	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08	5.08

No.		Description	FIRR	Sensitivity indicator	Swiching value
1	1	Capital cost 10% up	-0.13%	-38.40	-2.60%
	2	Capital cost 20% up	-0.56%	-16.43	-6.08%
2	1	OM cost 10% up	0.28%	2.95	33.94%
	2	OM cost 20% up	0.20%	8.41	11.88%
3	1	Revenue 10% down	-0.27%	-23.60	-4.24%
	2	Revenue 20% down	-0.95%	-13.80	-7.25%