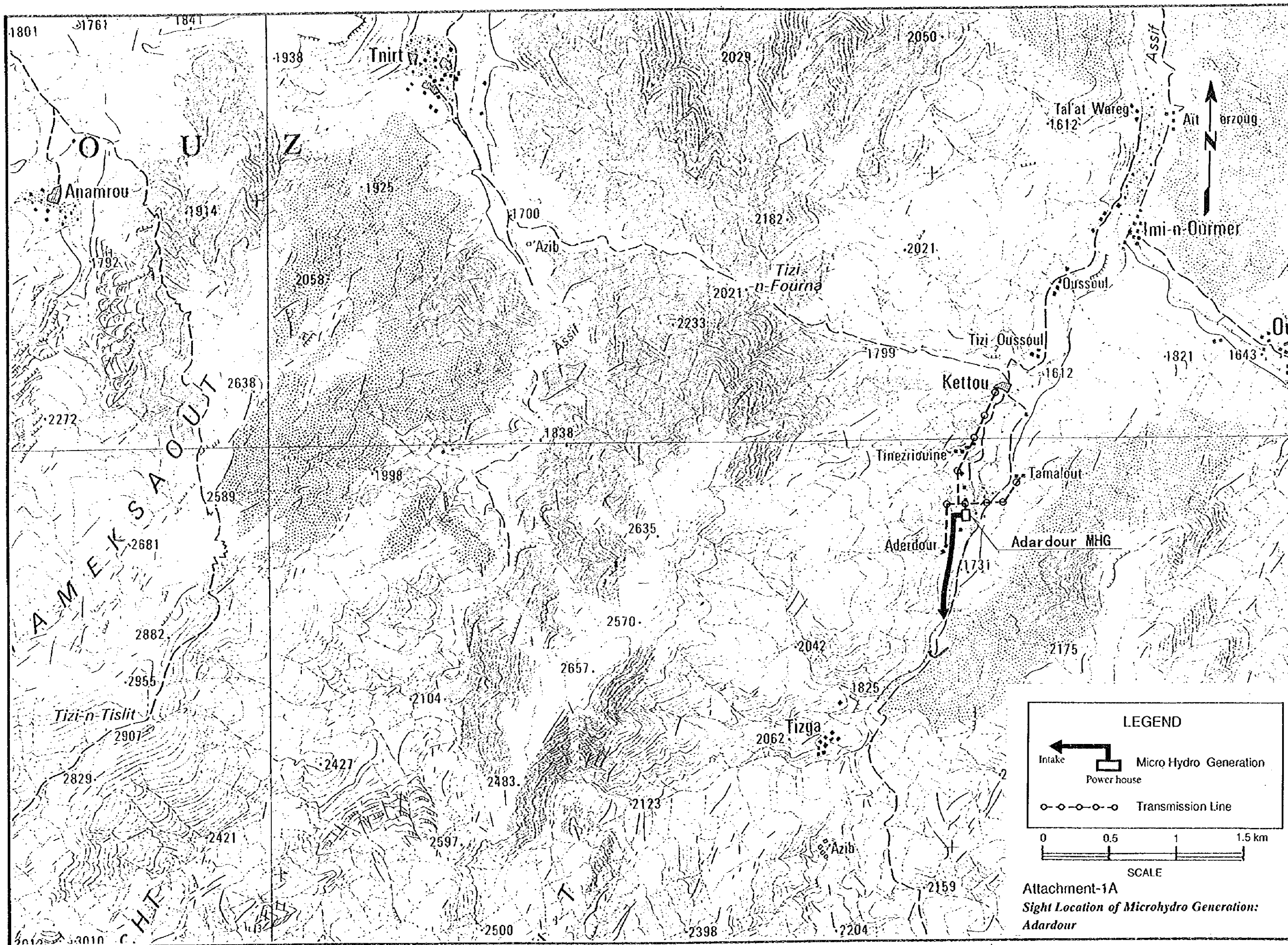


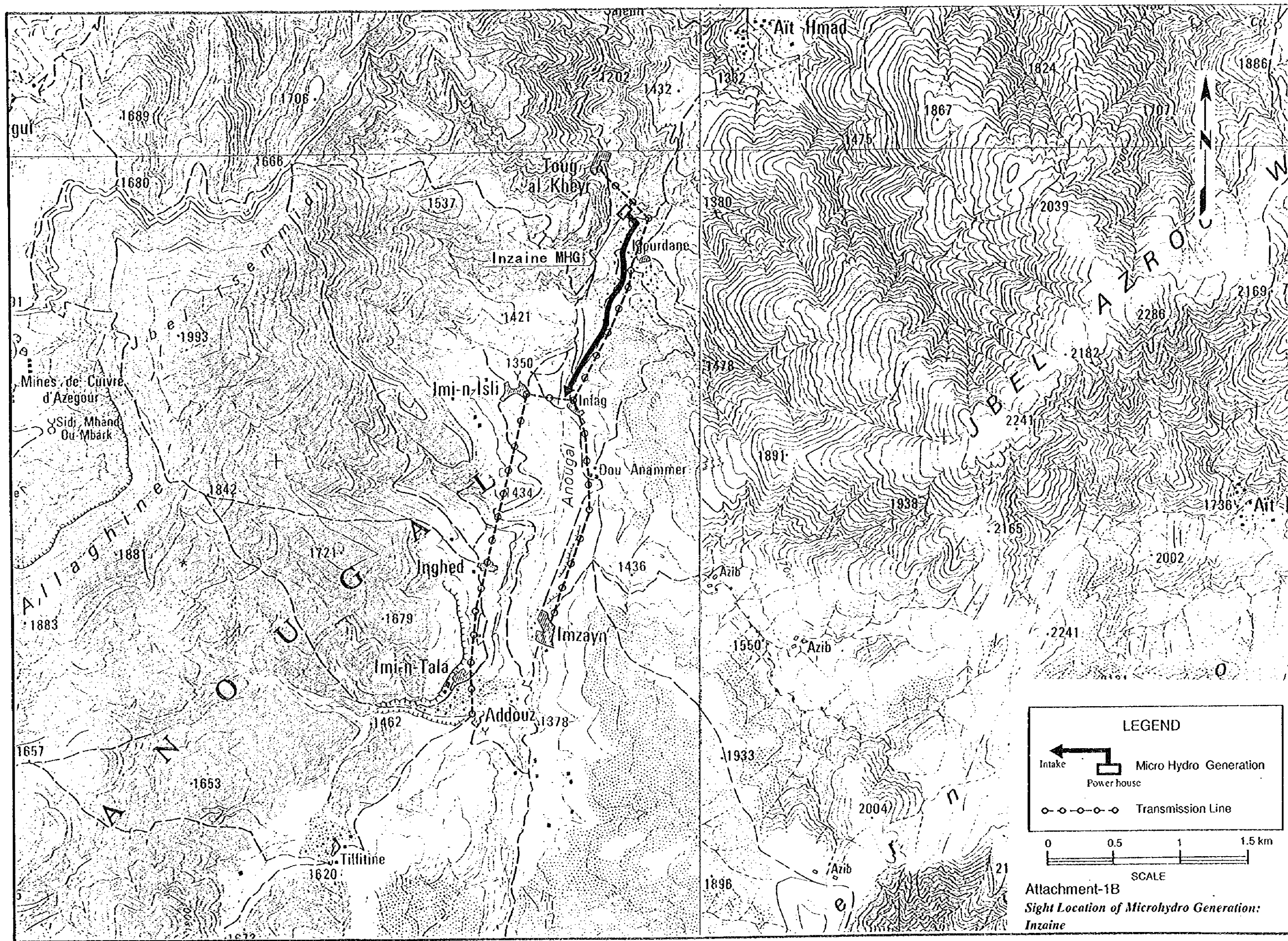
# ***ATTACHMENTS***



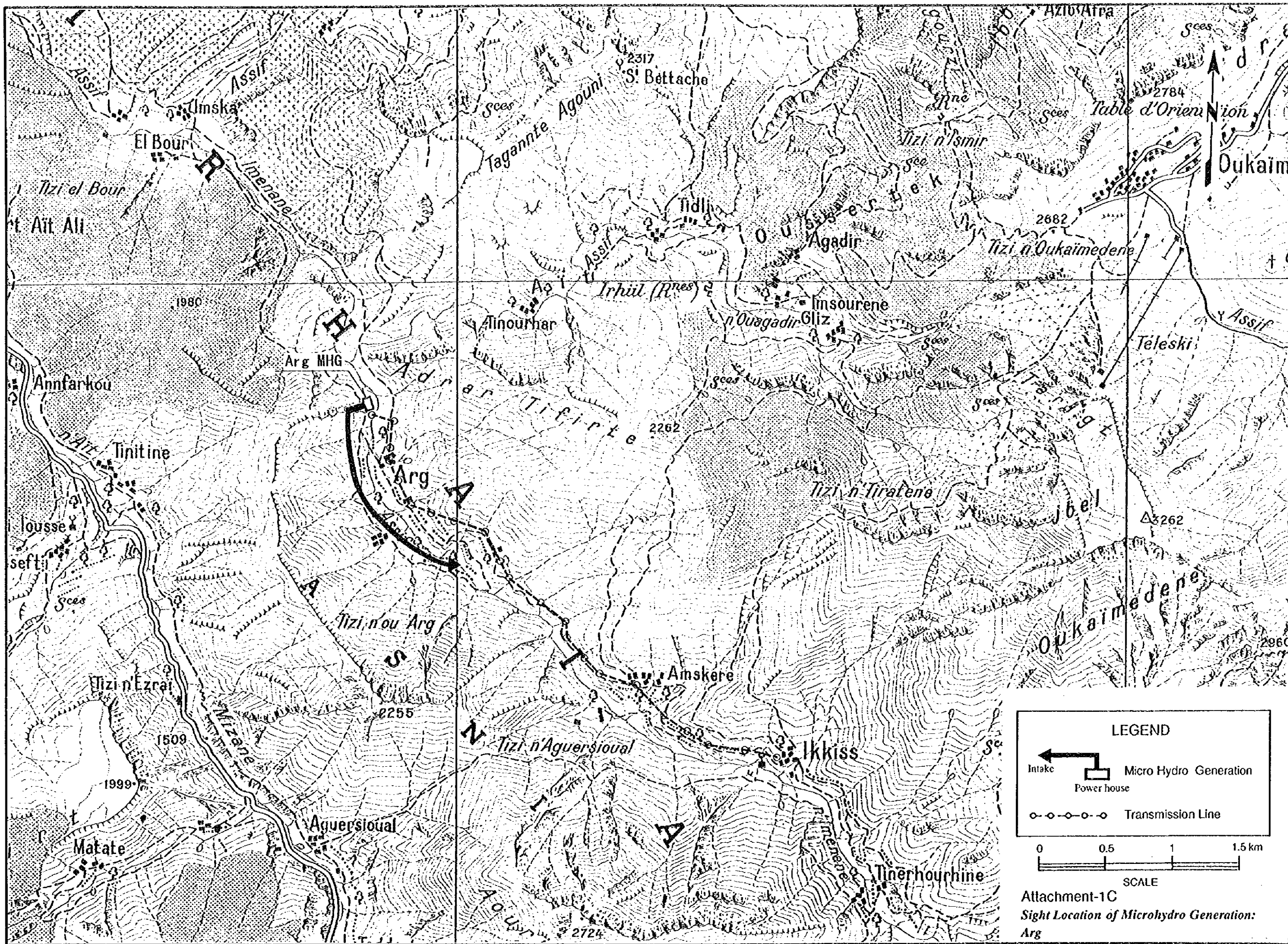
***ATTACHMENT-1***

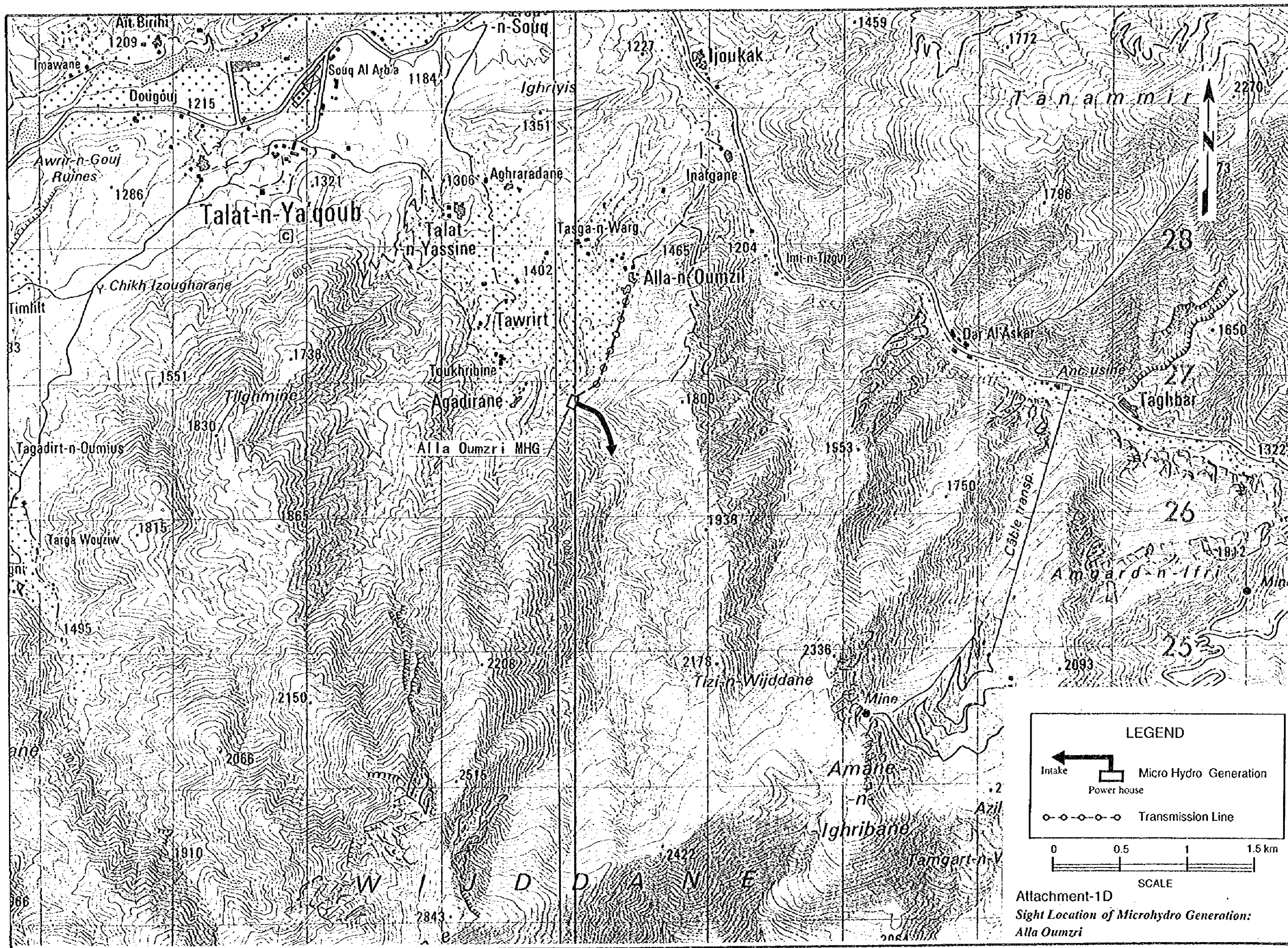
***Site Location of  
Microhydro Generation***



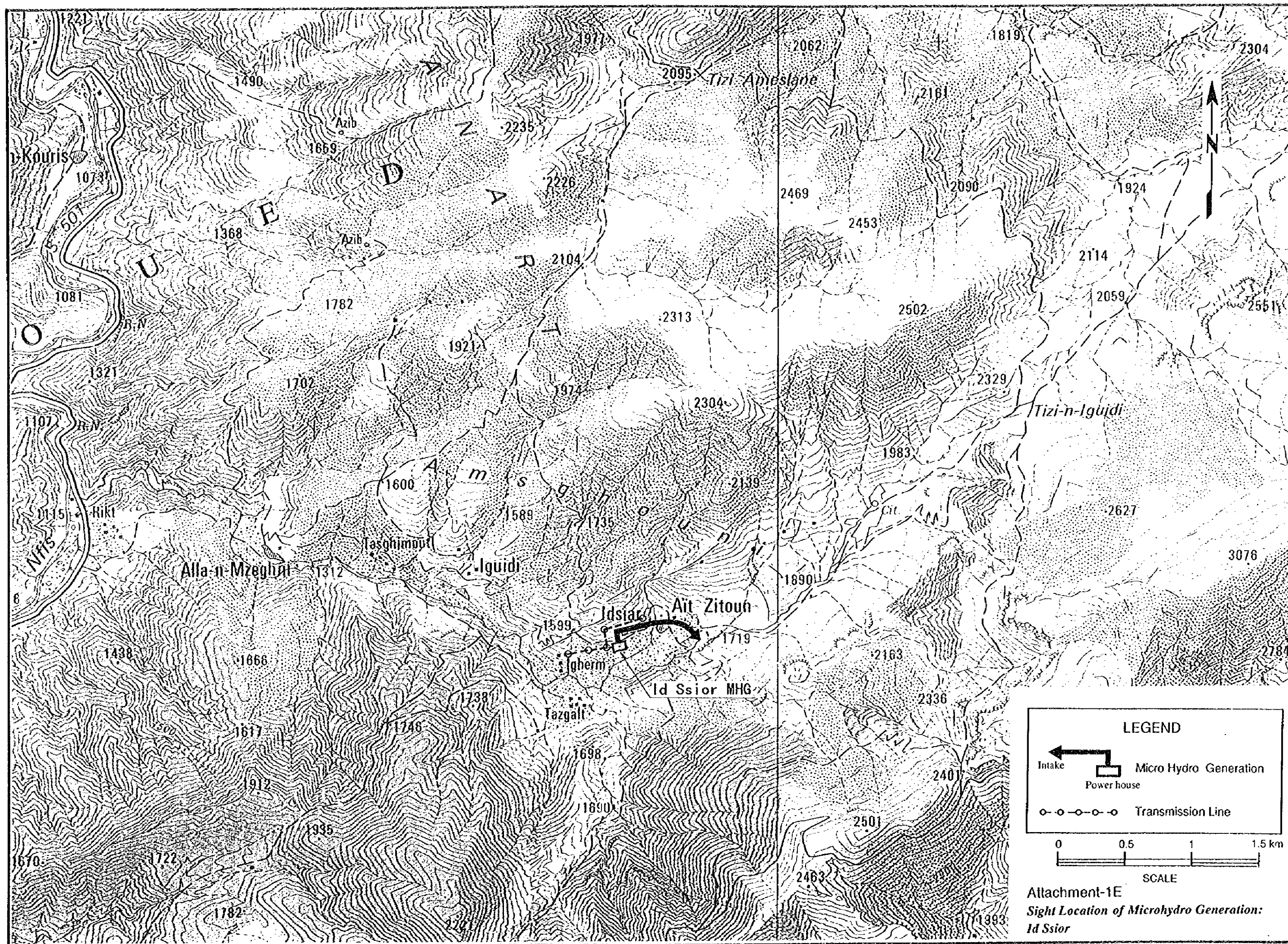




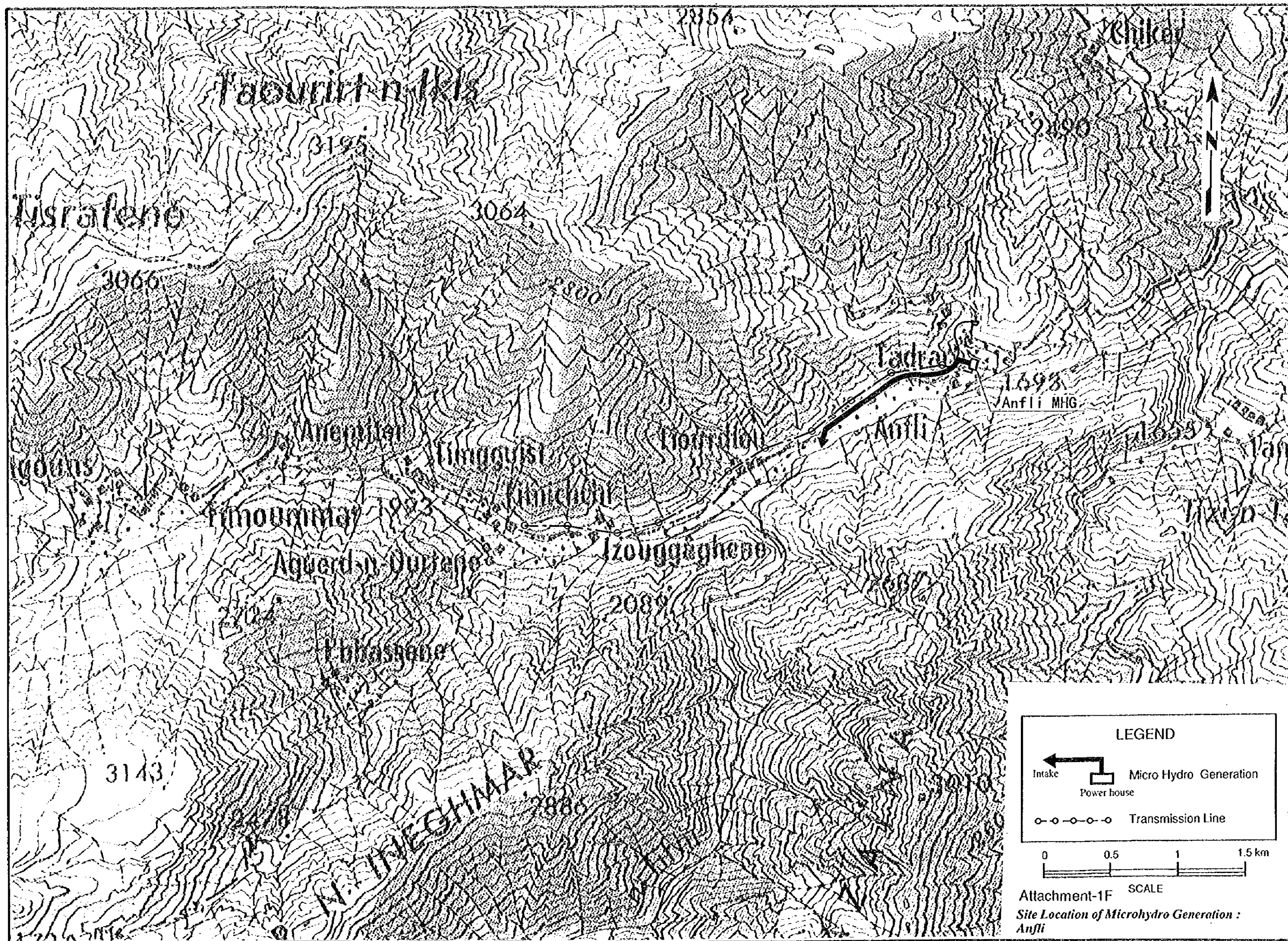


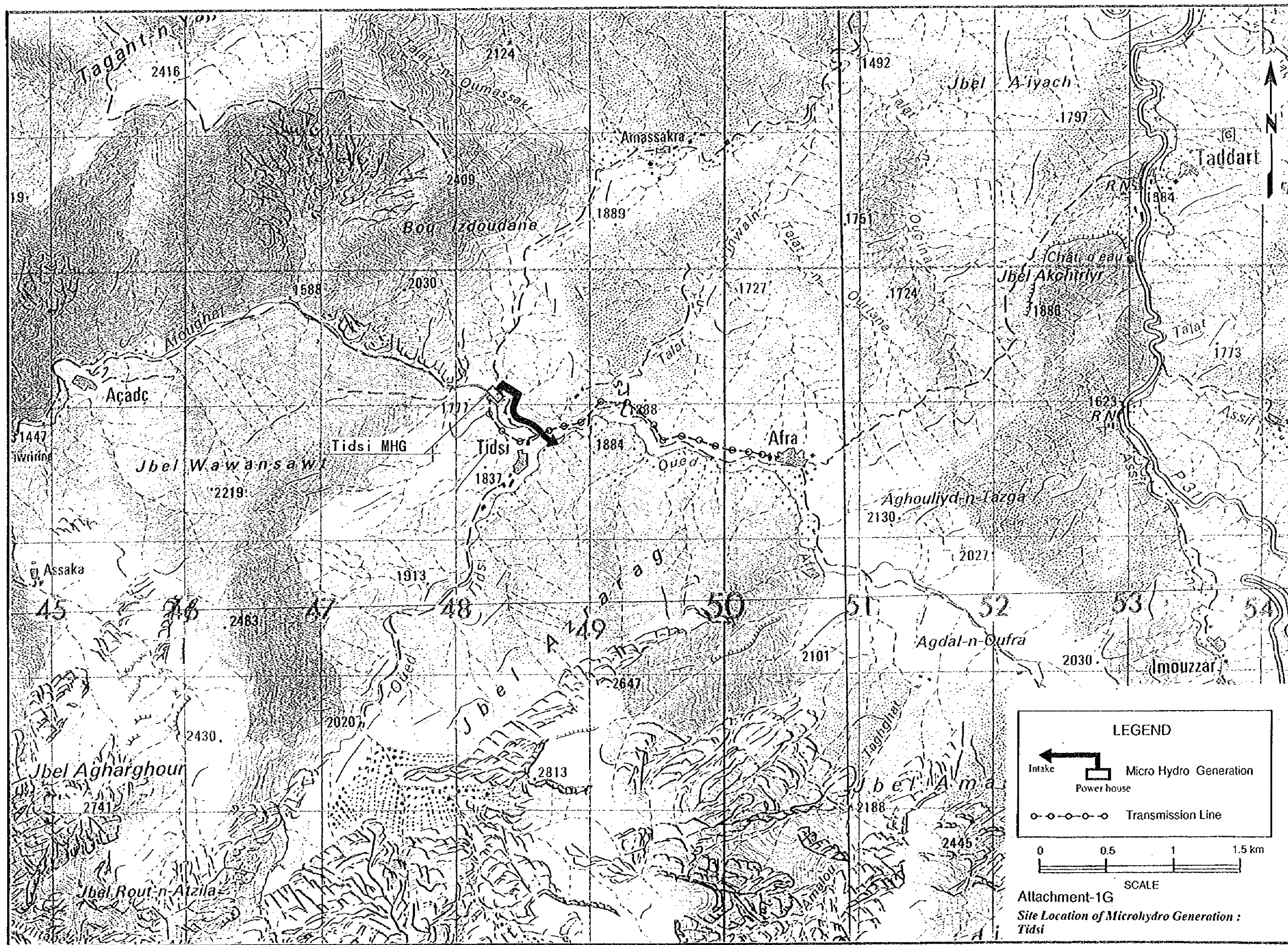












***ATTACHMENT-2***

***Data Sheet of  
Village-wise Financial and  
Economic Evaluation***

# Village-wise Total Cost of PV Generation (1/2)

No.	Douar	H.H. M. 2000 or P	Cal'd Capacity 2000	Instal capacity 2000	Capacity of battery	Cost of PV module	Cost of PV module delivery	Cost of Battery	Number of Systems installed 2000	Cost of Battery controller	Installation cost	Tax	Supervise fee	Contingency	Fixed cost at 2000	Variable cost	Total
			W/p	W/p	Ah	US\$/Wp	US\$/Wp	US\$/Ah		US\$/kit	US\$/kit	260	20%	10%	10%	Varicost	Total
1	0 Tizi Oussems	76	1.5	7,045	10,225	8,980	68,099	13,599	99	8,910	25,740	90	8,726	12,533	160,373	83,346	243,719
2	0 Id Aissa	46	1.5	4,500	6,515	5,700	43,390	8,665	64	5,760	16,640	90	5,620	8,015	102,607	52,560	155,167
3	0 Tassa Ourigane	58	1.5	5,270	7,650	6,760	50,949	10,175	74	6,660	19,240	90	6,532	9,378	120,010	62,952	182,962
4	0 Igrem	28	1.5	2,765	4,010	3,480	26,707	5,333	39	3,510	10,140	90	3,426	4,917	62,922	32,118	95,040
8	0 Aghella	67	1.5	6,000	8,715	7,720	58,042	11,591	84	7,560	21,840	90	7,424	10,675	136,595	72,168	208,763
9	0 Ikiss	71	1.5	6,300	9,155	8,140	60,972	12,176	88	7,920	22,880	90	7,788	11,209	143,415	76,176	219,591
12	0 Tinemouchrine	31	1.5	3,025	4,380	3,820	29,171	5,825	43	3,870	11,180	90	3,774	5,387	68,952	35,370	104,322
17	0 Tacheddirt	63	1.5	6,050	8,760	7,640	58,342	11,651	86	7,740	22,360	90	7,548	10,773	137,904	70,728	208,632
18	0 Sqour	47	1.0	4,280	2,075	5,480	28,505	5,692	60	5,400	15,600	90	5,296	6,068	78,715	51,156	129,871
19	0 Amagdur	23	1.0	2,075	2,075	2,680	13,820	2,760	29	2,610	7,540	90	2,566	2,941	38,151	24,978	63,129
20	0 Tamaterre	42	1.5	4,145	6,000	5,400	39,960	7,980	59	5,310	15,340	90	5,210	7,399	94,738	49,146	143,884
26	1 Awin Mazouz	70	1.0	6,335	6,335	8,160	42,191	8,426	89	8,010	23,140	90	7,862	8,993	116,673	76,110	192,783
26	2 Bouchiha Bon Omar	69	1.0	6,315	6,315	8,060	42,058	8,399	89	8,010	23,140	90	7,842	8,967	116,639	75,258	191,897
30	0 Bel Abbas	147	1.0	13,195	13,195	16,960	87,879	17,549	185	16,650	48,100	90	16,342	18,714	242,779	158,442	401,221
32	0 Derb Chem's	63	1.0	5,700	5,700	7,320	37,962	7,531	80	7,200	20,800	90	7,064	8,086	104,908	68,268	173,176
43	0 Ait Ourkri	42	1.0	3,740	3,740	4,840	24,908	4,974	52	4,680	13,520	90	4,608	5,292	68,644	45,156	113,800
44	0 Ait Hmad	52	1.0	4,655	4,655	6,000	31,002	6,191	65	5,850	16,900	90	5,750	6,594	85,542	56,154	141,696
45	0 Tizgui	63	1.0	5,645	5,645	7,280	37,596	7,508	79	7,110	20,540	90	6,986	8,003	103,827	67,938	171,765
49	0 Anermi	94	1.5	8,560	12,840	10,980	85,514	17,077	120	10,800	31,200	90	10,596	15,557	198,838	102,432	301,270
51	0 Talat Ait Ihla	73	1.5	6,430	9,340	8,320	62,204	12,422	90	8,100	23,400	90	7,964	11,445	146,444	78,060	224,504
53	0 Adghouss	52	1.5	4,730	6,875	6,080	45,788	9,144	66	5,940	17,160	90	5,836	8,411	107,611	56,724	164,335
56	0 Tagadirt	52	1.5	4,525	6,580	5,880	43,823	8,751	63	5,670	16,380	90	5,586	8,050	102,996	55,254	158,250
57	0 Tifrit	94	1.5	8,430	12,245	10,860	81,552	16,286	118	10,620	30,680	90	10,432	15,000	191,929	101,532	293,461
58	0 Anfrionne	63	1.5	5,645	8,200	7,280	54,612	10,906	79	7,110	20,540	90	6,986	10,045	128,528	67,938	196,466
60	0 Tifratine	84	1.0	7,550	10,960	9,700	72,994	14,577	106	9,540	27,560	90	9,360	13,437	171,948	90,624	262,572
61	0 Aguenze	21	1.0	1,945	1,945	2,500	12,954	2,587	27	2,430	7,020	90	2,390	2,749	35,654	23,142	58,796
62	0 Ifrit Baragha	37	1.0	3,290	3,290	4,240	21,911	4,376	46	4,140	11,960	90	4,068	4,663	60,487	39,588	100,075
63	0 Agadir Baragha	42	1.0	3,740	3,740	4,840	24,908	4,974	52	4,680	13,520	90	4,608	5,292	68,644	45,156	113,800
65	0 Adar Baragha	12	1.0	1,085	1,085	1,400	7,226	1,443	15	1,350	3,900	90	1,330	1,532	19,866	12,594	32,760
66	0 Tadchert	31	1.0	2,785	2,785	3,580	18,548	3,704	39	3,510	10,140	90	3,446	3,948	51,219	33,570	84,789
67	0 Tamsout	5	1.0	430	430	560	2,864	572	6	540	1,560	90	532	610	7,908	5,340	13,248
68	0 Dar Jamaa Ait Ali	63	1.0	5,755	5,755	7,400	38,328	7,654	81	7,290	21,060	90	7,180	8,173	106,046	68,838	174,884
69	0 Agadir Ait Brahim	29	1.0	2,560	2,560	3,300	17,050	3,405	36	3,240	9,360	90	3,180	3,635	47,169	31,044	78,213
70	0 Iouraghan	19	1.0	1,720	1,720	2,220	11,455	2,288	24	2,160	6,240	90	2,124	2,436	31,603	20,640	52,243
71	0 Iniki	52	1.0	4,635	4,635	5,960	30,869	6,165	65	5,850	16,900	90	5,742	6,574	85,292	55,914	141,206



**Village-wise Total Cost of PV Generation (2/2)**

No.	Douar	H.H 2000	M or P	Cu'd Capacity 2000	Initial capacity 2000	Capacity of battery	Cost of PV module	Cost of PV module delivery	Cost of Battery	Number of Systems installed 2000	Cost of Battery controller	Installation cost	Tax	Supervisor fee	Contingency	Fixed cost at 2000	Variable cost	Total
				Wp	Wp	Ah	US\$/Wp	US\$/Wp	US\$/Ah		US\$/kit	US\$/kit	260	20%	10%	10%	Var. cost	Total
72	01/Iti Ait Alla	23	1.0	2,130	2,130	2,720	14,186	2,833	2,720	30	2,700	7,800	2,644	3,024	3,326	39,233	25,308	64,541
73	01/Boukhelf	89	1.0	8,110	8,110	10,380	54,013	10,786	10,380	114	10,260	29,640	10,056	11,508	12,659	149,301	96,852	246,153
74	01/Adrar Ait Ali	23	1.0	2,205	2,205	2,800	14,085	2,933	2,800	31	2,790	8,060	2,730	3,127	3,439	40,564	25,878	66,442
77	01/Ait M'Barek	31	1.0	2,785	2,785	3,580	18,548	3,704	3,580	39	3,510	10,140	3,444	3,948	4,343	51,219	33,570	84,789
78	01/Agadir Ait Bourd	63	1.0	5,515	5,515	7,160	36,730	7,335	7,160	77	6,930	20,020	6,822	7,817	8,599	101,414	67,038	168,452
79	01/Atella Ouassif	26	1.0	2,225	2,225	2,900	14,319	2,959	2,900	31	2,790	8,060	2,750	3,153	3,468	40,899	27,366	68,265
81	01/Atella Ighil	10	1.0	935	935	1,200	6,227	1,244	1,200	13	1,170	3,380	1,150	1,322	1,454	17,147	11,238	28,385
83	1/Anfeg	16	1.0	1,440	1,440	1,860	9,590	1,915	1,860	20	1,800	5,200	1,772	2,037	2,240	26,414	17,268	43,682
83	2/Agoussouak	21	1.0	1,945	1,945	2,500	12,954	2,587	2,500	27	2,430	7,020	2,390	2,749	3,024	35,654	23,142	58,796
85	1/Oumast	37	1.0	3,310	3,310	4,280	22,045	4,402	4,280	46	4,140	11,960	4,076	4,683	5,151	60,737	39,828	100,565
85	2/Ait Zitoun	37	1.0	3,160	3,160	4,120	21,046	4,203	4,120	44	3,960	11,440	3,904	4,477	4,925	58,074	38,688	96,762
86	01/Tagadirt (Ait Bouimzgan)	29	1.0	2,505	2,505	3,260	16,683	3,332	3,260	35	3,150	9,100	3,102	3,552	3,908	46,087	30,714	76,801
87	1/Zaout	9	1.0	860	860	1,100	5,728	1,144	1,100	12	1,080	3,120	1,060	1,217	1,339	15,787	10,272	26,059
87	2/Izalaghan (Dar Brahim O)	13	1.0	1,215	1,215	1,560	8,092	1,616	1,560	17	1,530	4,420	1,502	1,722	1,894	22,336	14,334	36,670
88	01/Tigoudet (Ben suid, Zyou)	25	1.0	2,300	2,300	2,960	15,318	3,059	2,960	32	2,880	8,320	2,832	3,254	3,579	42,202	27,492	69,694
89	01/Amezi	38	1.0	3,440	3,440	4,440	22,910	4,575	4,440	48	4,320	12,480	4,248	4,873	5,360	63,206	41,280	104,486
90	01/Agouni	31	1.0	2,805	2,805	3,620	18,681	3,731	3,620	39	3,510	10,140	3,454	3,968	4,365	51,469	33,810	85,279
91	01/Chaabat Tarik (Talet NTg)	56	1.0	5,140	5,140	6,580	34,232	6,836	6,580	72	6,480	18,720	6,356	7,285	8,013	94,503	61,116	155,619
92	01/Ighil Sidjene (Draa Rkik)	15	1.0	1,365	1,365	1,760	9,091	1,815	1,760	19	1,710	4,940	1,682	1,932	2,125	25,055	16,278	41,333
93	01/Tizi	62	1.0	5,515	5,515	7,120	36,730	7,335	7,120	77	6,930	20,020	6,814	7,813	8,595	101,357	66,534	167,891
94	01/Aghbalou	94	1.0	8,430	8,430	10,860	56,144	11,212	10,860	118	10,620	30,680	10,432	11,952	13,147	155,046	101,532	256,578
95	01/Ait Hsain	14	1.0	1,345	1,345	1,700	8,958	1,789	1,700	19	1,710	4,940	1,670	1,910	2,101	24,777	15,630	40,407
96	01/Ait Doubker	15	1.0	1,440	1,440	1,840	9,590	1,915	1,840	20	1,800	5,200	1,768	2,035	2,238	26,386	16,848	43,234
97	01/Tazatoun	35	1.0	3,195	3,195	4,080	21,279	4,249	4,080	45	4,050	11,700	3,966	4,536	4,989	58,849	37,950	96,799
98	01/Tamsoulte	35	1.0	3,160	3,160	4,080	21,046	4,203	4,080	44	3,960	11,440	3,896	4,473	4,920	58,017	37,860	95,877
99	01/Tizgui	52	1.0	4,655	4,655	6,000	31,002	6,191	6,000	65	5,850	16,900	5,750	6,594	7,254	85,542	56,154	141,696
100	01/Ait Tighit	52	1.0	4,600	4,600	5,960	30,636	6,118	5,960	64	5,760	16,640	5,672	6,511	7,163	84,460	55,824	140,284
101	01/Tachibit Kabil	31	1.0	2,915	2,915	3,700	19,414	3,877	3,700	41	3,690	10,660	3,610	4,134	4,547	53,632	34,470	88,102
102	01/Tachibit Echatalou	31	1.0	2,915	2,915	3,700	19,414	3,877	3,700	41	3,690	10,660	3,610	4,134	4,547	53,632	34,470	88,102
103	01/Asgoune	31	1.0	2,840	2,840	3,620	18,914	3,777	3,620	40	3,400	10,400	3,524	4,031	4,434	52,301	33,900	86,201
104	01/Ait Aamara Loued	84	1.0	7,625	7,625	9,780	50,783	10,141	9,780	107	9,630	27,820	9,446	10,815	11,897	140,312	91,194	231,506
106	01/Lakama	31	1.0	2,730	2,730	3,540	18,182	3,631	3,540	38	3,420	9,880	3,368	3,865	4,252	50,138	33,240	83,378
113	1/Tarast	47	1.0	4,465	4,465	5,720	29,737	5,938	5,720	63	5,670	16,380	5,554	6,345	6,979	82,323	52,866	135,189
113	2/Assaka	47	1.0	4,370	4,370	5,520	29,104	5,812	5,520	62	5,580	16,120	5,444	6,214	6,835	80,629	51,576	132,205
117	01/Ansa	62	1.5	5,700	8,275	7,280	55,112	11,004	7,280	80	7,200	20,800	7,056	10,140	11,154	129,747	67,764	197,511
120	01/Ezzaouite	17	1.5	1,905	2,760	2,320	18,382	3,671	2,320	27	2,430	7,070	2,354	3,382	3,720	43,279	20,922	64,201
	Photovoltaics total	3213	80	292,050	336,96	375,120	2,244,154	448,157	375,120	4,094	368,460	1,064,440	361,604	450,033	495,036	5,807,004	3,496,920	9,303,924

*Village-wise Total Cost of Diesel Generation*

No.	Douar	H.H 2000	Peak Capacity kW	Peak Capacity x1.2 kW	Inst all capa kW	Cost Turbine/ Gener	Civil cost	Distr/Tr ans cost	Connecti on cost US\$/H.H	Tax	Supervis er fee	Conting ency	Fixed cost at 2000	Fuel Cost	Variable Cost	Total Cost
			kW	kW	kW	US\$/vill	US\$/vill	US\$/vill	US\$/H.H	20%	10%	10%		US\$/kWh		
23	0 Agouns	110	8.9	10.7	11	9,424	3,165	16,080	28,600	9,569	5,727	6,300	78,865	0.20	51,904	130,769
47	0 Lemdinat	168	13.4	16.1	14	9,623	3,165	27,365	43,680	14,842	8,383	9,222	116,280	0.20	64,019	180,299
48	0 Thirt	242	19.2	23.0	22	11,724	3,165	38,870	62,920	20,991	11,668	12,835	162,173	0.18	75,455	237,628
50	0 Ansmrou	168	13.3	16.0	14	9,623	3,165	26,910	43,680	14,751	8,338	9,172	115,639	0.20	63,888	179,527
52	0 Toulkine	200	15.9	19.1	14	9,623	3,165	32,825	52,000	17,598	9,761	10,737	135,709	0.20	70,935	206,644
54	0 Douzrou	231	18.2	21.8	22	11,724	3,165	36,855	60,060	20,016	11,180	12,298	155,298	0.18	73,133	228,431
55	0 Ait Outmane	158	12.5	15.0	11	9,424	3,165	25,610	41,080	13,971	7,928	8,721	109,899	0.20	61,731	171,630
59	0 Ait Smil	158	12.7	15.2	14	9,623	3,165	26,520	41,080	14,153	8,039	8,843	111,423	0.20	62,035	173,458
76	0 Ait Bourd	105	8.4	10.1	8	9,224	3,165	15,960	27,300	9,285	5,565	6,121	76,620	0.21	51,875	128,495
84	0 Ait Bouzid	125	9.9	11.9	9.6	9,224	3,165	18,360	32,500	10,805	6,325	6,957	87,336	0.21	56,066	143,402
114	0 Abadou	116	9.6	11.5	9.6	9,224	3,165	18,480	30,160	10,361	6,103	6,713	84,206	0.21	54,776	138,982
119	0 Ait Atmane	109	8.9	10.7	8	9,224	3,165	17,400	28,340	9,781	5,813	6,394	80,117	0.21	53,322	133,439
	Diesel total	1890	151	181.17	157	117,684	37,980	301,235	491,400	166,123	94,830	104,313	1,313,565		739,142	2,052,707

**Village-wise Total Cost of Micro-hydropower Generation**

Donar	H.H 2000	Peak Capacity kW	Peak Capacity x1.5 kW	Instal capacity kW	Cost Turbine/G ener	Civil cost (domestic) US\$/vill	Civil Cost (Foreign) US\$/vill	Distri/Tran s cost US\$/Village	Tax 20%	Supervise r fee 10%	contingen cy 10%	Fixed cost at 2000 US\$/Village	Variable cost Total(30year s)	Total
Alla Oumzri	42	3.3	5.0	10	72,000	220,000	25,000	39,000	51,800	35,600	39,160	482,560	62,280	544,840
Id Ssior	70	5.6	8.4	16	72,000	232,000	26,000	46,000	55,600	37,600	41,360	510,560	65,400	575,960
Arg	206	16.9	25.4	30	89,000	401,000	47,000	176,000	115,400	71,300	78,430	956,980	85,580	1,042,560
Anfli	130	10.7	16.1	20	88,000	305,000	35,000	118,000	84,600	54,600	60,060	731,160	76,960	808,120
Inzaine	431	35.1	52.6	62	124,000	617,000	74,000	353,000	194,000	116,801	128,480	1,563,570	121,040	1,684,610
Adardour	168	13.5	20.3	26	150,000	339,000	38,000	116,000	91,000	64,300	70,730	869,030	99,720	968,750
Tidisi	111	8.7	13.1	15	115,000	272,000	31,000	89,000	72,200	50,700	55,770	677,210	82,980	760,190
MicroHydro total	1,158	94	141	179	710,000	2,386,000	276,000	937,000	664,600	430,902	473,990	5,791,070	593,960	6,385,030

# Village-wise Monthly Payment of PV Generation (1/2)

No.	Douar	H.H 2000	Initial Invest 100%						Initial Invest 75%						Initial Invest 50%						Initial Invest 25%						Initial Invest 0%					
			Monthly payment per H.H						Monthly payment per H.H						Monthly payment per H.H						Monthly payment per H.H						Monthly payment per H.H					
			0%	3%	6%	9%	0%	3%	6%	9%	0%	3%	6%	9%	0%	3%	6%	9%	0%	3%	6%	9%	0%	3%	6%	9%						
1	0	Tizi Oussems	76	13.4	15.3	18.2	21.4	11.2	12.6	14.7	17.0	9.0	9.8	11.2	12.7	6.8	7.0	7.7	8.4	4.6	4.3	4.1	4.0	4.6	4.3	4.1	4.0					
2	0	Id Aissa	46	14.1	16.1	19.2	22.5	11.7	13.2	15.5	18.0	9.4	10.3	11.8	13.4	7.1	7.4	8.0	8.8	4.8	4.4	4.3	4.2	4.8	4.4	4.3	4.2					
3	0	Tassa Ourgane	58	13.1	15.1	17.9	21.0	11.0	12.4	14.5	16.7	8.8	9.6	11.0	12.5	6.7	6.9	7.6	8.2	4.5	4.2	4.1	4.0	4.5	4.2	4.1	4.0					
4	0	Igrem	28	14.1	16.2	19.4	22.7	11.8	13.3	15.6	18.1	9.5	10.3	11.8	13.4	7.1	7.4	8.1	8.8	4.8	4.5	4.3	4.2	4.8	4.5	4.3	4.2					
8	0	Aghella	67	13.0	14.9	17.7	20.7	10.9	12.2	14.3	16.5	8.7	9.5	10.9	12.3	6.6	6.9	7.5	8.1	4.5	4.2	4.1	3.9	4.5	4.2	4.1	3.9					
9	0	Ikiss	71	12.9	14.8	17.6	20.6	10.8	12.1	14.2	16.4	8.7	9.5	10.8	12.2	6.6	6.8	7.4	8.1	4.5	4.2	4.1	3.9	4.5	4.2	4.1	3.9					
12	0	Tinehouhine	31	14.0	16.1	19.2	22.5	11.7	13.2	15.5	17.9	9.4	10.3	11.7	13.3	7.1	7.3	8.0	8.8	4.8	4.4	4.3	4.2	4.8	4.4	4.3	4.2					
17	0	Tacheddirt	63	13.8	15.8	18.9	22.1	11.5	13.0	15.2	17.6	9.2	10.1	11.6	13.1	7.0	7.2	7.9	8.6	4.7	4.4	4.2	4.1	4.7	4.4	4.2	4.1					
18	0	Sqour	47	11.5	13.0	15.3	17.8	9.8	10.8	12.5	14.3	8.0	8.6	9.7	10.9	6.3	6.4	6.9	7.4	4.5	4.2	4.1	4.0	4.5	4.2	4.1	4.0					
19	0	Amagdouz	23	11.4	12.9	15.2	17.6	9.7	10.7	12.4	14.2	8.0	8.6	9.6	10.8	6.3	6.4	6.9	7.4	4.5	4.2	4.1	4.0	4.5	4.2	4.1	4.0					
20	0	Tamatente	42	14.3	16.4	19.5	22.8	11.9	13.4	15.7	18.2	9.6	10.5	12.0	13.6	7.2	7.5	8.2	8.9	4.9	4.5	4.4	4.3	4.9	4.5	4.4	4.3					
26	1	Awin Mazouz	70	11.5	13.0	15.2	17.7	9.7	10.8	12.5	14.3	8.0	8.6	9.7	10.8	6.3	6.4	6.9	7.4	4.5	4.2	4.1	4.0	4.5	4.2	4.1	4.0					
26	2	Bouchiha Bon Omar	69	11.6	13.1	15.4	17.9	9.8	10.9	12.6	14.4	8.1	8.7	9.8	10.9	6.3	6.4	6.9	7.5	4.5	4.2	4.1	4.0	4.5	4.2	4.1	4.0					
30		Bel Abbas	147	11.4	12.9	15.1	17.5	9.7	10.7	12.3	14.1	7.9	8.5	9.6	10.7	6.2	6.4	6.8	7.3	4.5	4.2	4.1	4.0	4.5	4.2	4.1	4.0					
32	0	Derb Chem's	63	11.5	12.9	15.2	17.7	9.7	10.8	12.4	14.2	8.0	8.6	9.7	10.8	6.2	6.4	6.9	7.4	4.5	4.2	4.1	4.0	4.5	4.2	4.1	4.0					
43	0	Ait Ouzkri	42	11.3	12.8	15.0	17.4	9.6	10.6	12.3	14.0	7.9	8.5	9.5	10.7	6.2	6.3	6.8	7.3	4.5	4.2	4.1	3.9	4.5	4.2	4.1	4.0					
44	0	Ait Hmad	52	11.4	12.8	15.1	17.5	9.6	10.7	12.3	14.1	7.9	8.5	9.6	10.7	6.2	6.3	6.8	7.3	4.5	4.2	4.1	4.0	4.5	4.2	4.1	4.0					
45	0	Tizgui	63	11.4	12.8	15.1	17.5	9.6	10.7	12.3	14.1	7.9	8.5	9.6	10.7	6.2	6.3	6.8	7.3	4.5	4.2	4.1	4.0	4.5	4.2	4.1	4.0					
49	0	Anermi	94	13.4	15.3	18.3	21.4	11.2	12.6	14.7	17.0	8.9	9.8	11.2	12.7	6.7	7.0	7.7	8.3	4.5	4.2	4.1	4.0	4.5	4.2	4.1	4.0					
51	0	Talat Ait Ihla	73	12.8	14.7	17.4	20.4	10.7	12.0	14.1	16.3	8.6	9.4	10.7	12.2	6.5	6.8	7.4	8.0	4.5	4.1	4.0	3.9	4.5	4.2	4.1	4.0					
53	0	Adghouss	52	13.2	15.1	18.0	21.0	11.0	12.4	14.5	16.8	8.9	9.7	11.0	12.5	6.7	6.9	7.6	8.3	4.5	4.2	4.1	4.0	4.5	4.2	4.1	4.0					
56	0	Tagadirt	52	12.7	14.5	17.3	20.2	10.6	11.9	13.9	16.1	8.6	9.3	10.6	12.0	6.5	6.7	7.3	8.0	4.4	4.1	4.0	3.9	4.5	4.2	4.1	4.0					
57	0	Tifirt	94	13.0	14.9	17.7	20.8	10.9	12.2	14.3	16.6	8.8	9.6	10.9	12.4	6.6	6.9	7.5	8.2	4.5	4.2	4.1	4.0	4.5	4.2	4.1	4.0					
58	0	Anfrroune	63	13.0	14.9	17.7	20.7	10.9	12.2	14.3	16.5	8.7	9.5	10.9	12.3	6.6	6.9	7.5	8.1	4.5	4.2	4.1	4.0	4.5	4.2	4.1	4.0					
60	0	Tifratine	84	13.0	14.9	17.8	20.8	10.9	12.2	14.3	16.6	8.8	9.6	10.9	12.4	6.6	6.9	7.5	8.2	4.5	4.2	4.1	4.0	4.5	4.2	4.1	4.0					
61	0	Aguenze	21	11.7	13.2	15.5	18.0	9.9	11.0	12.7	14.5	8.1	8.7	9.8	11.0	6.4	6.5	7.0	7.5	4.6	4.3	4.2	4.0	4.5	4.2	4.0	3.9					
62	0	Ilfit Baragha	37	11.3	12.7	15.0	17.4	9.6	10.6	12.2	14.0	7.9	8.4	9.5	10.6	6.2	6.3	6.8	7.3	4.5	4.2	4.0	3.9	4.5	4.2	4.0	3.9					
63	0	Agadir Baragha	42	11.3	12.8	15.0	17.4	9.6	10.6	12.3	14.0	7.9	8.5	9.5	10.7	6.2	6.3	6.8	7.3	4.5	4.2	4.1	3.9	4.5	4.2	4.1	3.9					
65	0	Adar Baragha	12	11.4	12.9	15.1	17.6	9.7	10.7	12.4	14.2	7.9	8.5	9.6	10.8	6.2	6.3	6.8	7.3	4.5	4.2	4.1	4.0	4.5	4.2	4.1	4.0					
66	0	Tadchert	31	11.4	12.9	15.1	17.6	9.7	10.7	12.4	14.2	7.9	8.5	9.6	10.8	6.2	6.3	6.8	7.3	4.5	4.2	4.1	4.0	4.5	4.2	4.1	3.9					
67	0	Tamsoult	5	11.0	12.4	14.6	16.9	9.4	10.4	12.0	13.7	7.7	8.3	9.3	10.4	6.1	6.2	6.7	7.2	4.5	4.2	4.1	4.0	4.5	4.2	4.1	3.9					
68	0	Dar Jamaa Ait Ali	63	11.6	13.1	15.4	17.9	9.8	10.9	12.6	14.4	8.1	8.7	9.8	10.9	6.3	6.4	6.9	7.5	4.6	4.2	4.1	4.0	4.5	4.2	4.1	4.0					
69	0	Agadir Ait Brahim	29	11.2	12.7	14.9	17.3	9.5	10.6	12.2	14.0	7.8	8.4	9.5	10.6	6.2	6.3	6.8	7.3	4.5	4.2	4.0	3.9	4.5	4.2	4.0	3.9					
70	0	Jouraghan	19	11.5	12.9	15.2	17.7	9.7	10.8	12.4	14.2	8.0	8.6	9.7	10.8	6.3	6.4	6.9	7.4	4.5	4.2	4.1	4.0	4.5	4.2	4.1	4.0					
71	0	Imiki	52	11.3	12.8	15.0	17.4	9.6	10.6	12.3	14.1	7.9	8.5	9.5	10.7	6.2	6.3	6.8	7.3	4.5	4.2	4.1	3.9	4.5	4.2	4.1	3.9					



**Village-wise Monthly Payment of PV Generation (2/2)**

No.	Douar	H.H 2000	Initial Invest 100% Monthly payment per H.H Discount Rate	Initial Invest 75% Monthly payment per H.H Discount Rate	Initial Invest 50% Monthly payment per H.H Discount Rate	Initial Invest 25% Monthly payment per H.H Discount Rate	Initial Invest 0% Monthly payment per H.H Discount Rate
72	0 Ifit Ait Alla	23	11.7 13.2 15.6 18.1	9.9 11.0 12.7 14.6	8.1 8.7 9.9 11.0	6.4 6.5 7.0 7.5	4.6 4.3 4.2 4.0
73	0 Boukhelf	89	11.5 13.0 15.3 17.8	9.8 10.8 12.5 14.3	8.0 8.6 9.7 10.9	6.3 6.4 6.9 7.4	4.5 4.2 4.1 4.0
74	0 Addar Ait Ali	23	12.0 13.6 16.0 18.6	10.2 11.3 13.1 15.0	8.4 9.0 10.1 11.4	6.5 6.7 7.2 7.8	4.7 4.4 4.3 4.1
77	0 Ait Mbarek	31	11.4 12.9 15.1 17.6	9.7 10.7 12.4 14.2	8.0 8.5 9.6 10.8	6.2 6.4 6.9 7.4	4.5 4.2 4.1 4.0
78	0 Agadir Ait Bourd	63	11.1 12.6 14.8 17.1	9.5 10.5 12.1 13.8	7.8 8.4 9.4 10.5	6.1 6.2 6.7 7.2	4.4 4.1 4.0 3.9
79	0 Afella Ouassif	26	10.9 12.3 14.5 16.8	9.3 10.3 11.9 13.6	7.7 8.2 9.2 10.3	6.0 6.1 6.6 7.1	4.4 4.1 4.0 3.9
81	0 Afella Ighil	10	11.8 13.4 15.7 18.2	10.0 11.1 12.8 14.7	8.3 8.9 10.0 11.2	6.5 6.6 7.1 7.6	4.7 4.4 4.2 4.1
83	0 Anfeg	16	11.4 12.9 15.1 17.5	9.7 10.7 12.4 14.1	7.9 8.5 9.6 10.7	6.2 6.4 6.8 7.4	4.5 4.2 4.1 4.0
83	2 Aguersouak	21	11.7 13.2 15.5 18.0	9.9 11.0 12.7 14.5	8.1 8.7 9.8 11.0	6.4 6.5 7.0 7.5	4.6 4.3 4.2 4.0
85	1 Oumast	37	11.3 12.8 15.0 17.5	9.6 10.6 12.3 14.1	7.9 8.5 9.6 10.7	6.2 6.3 6.8 7.3	4.5 4.2 4.1 3.9
85	2 Ait Zitoun	37	10.9 12.3 14.4 16.7	9.3 10.2 11.8 13.5	7.6 8.2 9.2 10.3	6.0 6.1 6.6 7.1	4.4 4.1 4.0 3.8
86	0 Tagadirt (Ait Bouimzgan	29	11.0 12.5 14.6 17.0	9.4 10.4 12.0 13.7	7.7 8.3 9.3 10.4	6.1 6.2 6.7 7.2	4.4 4.1 4.0 3.9
87	1 Zaouit	9	12.1 13.6 16.0 18.6	10.2 11.3 13.1 15.0	8.4 9.0 10.2 11.4	6.6 6.7 7.2 7.8	4.8 4.4 4.3 4.2
87	2 Izalaghan (Dar Brahim O	13	11.8 13.3 15.6 18.2	10.0 11.0 12.8 14.6	8.2 8.8 9.9 11.1	6.4 6.5 7.0 7.6	4.6 4.3 4.2 4.0
88	0 Tigoudet (Ben said, Zyau	25	11.6 13.1 15.4 17.9	9.9 10.9 12.6 14.4	8.1 8.7 9.8 11.0	6.3 6.5 7.0 7.5	4.6 4.3 4.2 4.0
89	0 Amezi	38	11.5 12.9 15.2 17.7	9.7 10.8 12.4 14.2	8.0 8.6 9.7 10.8	6.3 6.4 6.9 7.4	4.5 4.2 4.1 4.0
90	0 Agouni	31	11.5 12.9 15.2 17.7	9.7 10.8 12.4 14.2	8.0 8.6 9.7 10.8	6.3 6.4 6.9 7.4	4.5 4.2 4.1 4.0
91	0 Chaabat Tanik (Talet NTg	56	11.6 13.1 15.4 17.9	9.8 10.9 12.6 14.4	8.1 8.7 9.8 10.9	6.3 6.4 6.9 7.4	4.5 4.2 4.1 4.0
92	0 Ighil Solidene (Draa Rkik	15	11.5 13.0 15.3 17.7	9.7 10.8 12.5 14.3	8.0 8.6 9.7 10.8	6.3 6.4 6.9 7.4	4.5 4.2 4.1 4.0
93	0 Tizi	62	11.3 12.7 15.0 17.4	9.6 10.6 12.2 14.0	7.9 8.5 9.5 10.7	6.2 6.3 6.8 7.3	4.5 4.2 4.1 3.9
94	0 Aghbalou	94	11.4 12.8 15.1 17.5	9.7 10.7 12.3 14.1	7.9 8.5 9.6 10.7	6.2 6.4 6.8 7.4	4.5 4.2 4.1 4.0
95	0 Ait Hsain	14	12.0 13.6 16.0 18.7	10.2 11.3 13.1 15.0	8.3 9.0 10.1 11.4	6.5 6.7 7.2 7.7	4.7 4.4 4.2 4.1
96	0 Ait Boubker	15	12.0 13.6 16.0 18.6	10.2 11.3 13.1 15.0	8.3 9.0 10.1 11.4	6.5 6.7 7.2 7.7	4.7 4.4 4.2 4.1
97	0 Tazaout	35	11.5 13.0 15.3 17.8	9.8 10.8 12.5 14.3	8.0 8.6 9.7 10.9	6.3 6.4 6.9 7.4	4.5 4.2 4.1 4.0
98	0 Tamsoulte	35	11.4 12.9 15.2 17.6	9.7 10.7 12.4 14.2	8.0 8.5 9.6 10.8	6.2 6.4 6.9 7.4	4.5 4.2 4.1 4.0
99	0 Tizgui	52	11.4 12.8 15.1 17.5	9.6 10.7 12.3 14.1	7.9 8.5 9.6 10.7	6.2 6.3 6.8 7.3	4.5 4.2 4.1 4.0
100	0 Ait Tirghit	52	11.2 12.7 14.9 17.3	9.5 10.6 12.2 14.0	7.9 8.4 9.5 10.6	6.2 6.3 6.8 7.3	4.5 4.2 4.1 3.9
101	0 Tachibit Kabli	31	11.8 13.4 15.8 18.3	10.0 11.1 12.9 14.8	8.2 8.9 10.0 11.2	6.4 6.6 7.1 7.6	4.6 4.3 4.2 4.1
102	0 Tachibit Echataoui	31	11.8 13.4 15.8 18.3	10.0 11.1 12.9 14.8	8.2 8.9 10.0 11.2	6.4 6.6 7.1 7.6	4.6 4.3 4.2 4.1
103	0 Asgoune	31	11.6 13.1 15.4 17.9	9.8 10.9 12.6 14.4	8.1 8.7 9.8 10.9	6.3 6.5 6.9 7.5	4.6 4.2 4.1 4.0
104	0 Ait Amara Loued	84	11.5 13.0 15.3 17.7	9.7 10.8 12.5 14.3	8.0 8.6 9.7 10.9	6.3 6.4 6.9 7.4	4.5 4.2 4.1 4.0
106	0 Lakaama	31	11.2 12.7 14.9 17.2	9.5 10.5 12.2 13.9	7.8 8.4 9.5 10.6	6.2 6.3 6.8 7.3	4.5 4.2 4.1 3.9
113	1 Tarast	47	12.0 13.6 16.0 18.5	10.2 11.3 13.0 14.9	8.3 9.0 10.1 11.3	6.5 6.7 7.2 7.7	4.7 4.4 4.2 4.1
113	2 Assaka	47	11.7 13.3 15.6 18.1	9.9 11.0 12.7 14.6	8.1 8.8 9.9 11.1	6.4 6.5 7.0 7.5	4.6 4.3 4.1 4.0
117	0 Ansa	62	13.3 15.2 18.1 21.2	11.1 12.5 14.6 16.9	8.9 9.7 11.1 12.6	6.7 7.0 7.6 8.3	4.6 4.2 4.1 4.0
120	0 Fzaouite	17	15.7 18.1 21.7 25.5	13.1 14.8 17.4 20.2	10.4 11.5 13.2 15.0	7.8 8.1 8.9 9.7	5.1 4.8 4.6 4.5
	Photovoltaics	3213	12.1 13.7 16.2 18.9	10.2 11.3 13.2 15.1	8.3 9.0 10.2 11.4	6.4 6.6 7.1 7.7	4.5 4.2 4.1 4.0

**Village-wise Monthly Payment of Diesel Generation**

No.	Douar	Diesel Generation life 10 years																													
		Initial Invest 100% Monthly payment per H.H Discount Rate						Initial Invest 75% Monthly payment per H.H Discount Rate						Initial Invest 50% Monthly payment per H.H Discount Rate						Initial Invest 25% Monthly payment per H.H Discount Rate						Initial Invest 0% Monthly payment per H.H Discount Rate					
		0%	3%	6%	9%	0%	3%	6%	9%	0%	3%	6%	9%	0%	3%	6%	9%	0%	3%	6%	9%	0%	3%	6%	9%						
23	0 Agouns	9.2	10.2	11.3	12.4	7.8	8.6	9.4	10.2	6.4	6.9	7.5	8.1	5.1	5.3	5.6	5.9	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7						
47	0 Lemdinat	8.3	9.3	10.3	11.4	7.0	7.7	8.5	9.3	5.6	6.1	6.6	7.2	4.3	4.5	4.8	5.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0						
48	0 Thirt	7.6	8.6	9.6	10.6	6.3	7.0	7.8	8.6	5.0	5.5	6.0	6.5	3.7	4.0	4.2	4.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4						
50	0 Ansmrou	8.3	9.2	10.3	11.4	7.0	7.7	8.4	9.3	5.6	6.1	6.6	7.2	4.3	4.5	4.8	5.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0						
52	0 Toulkine	8.0	9.0	10.0	11.1	6.7	7.4	8.2	9.0	5.4	5.9	6.4	6.9	4.1	4.3	4.6	4.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8						
54	0 Douzrou	7.7	8.6	9.6	10.7	6.4	7.1	7.8	8.6	5.1	5.5	6.0	6.6	3.8	4.0	4.3	4.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5						
55	0 Ait Outmane	8.5	9.4	10.5	11.6	7.1	7.8	8.6	9.4	5.8	6.2	6.8	7.3	4.4	4.6	4.9	5.2	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1						
59	0 Ait Smil	8.5	9.5	10.6	11.7	7.2	7.9	8.7	9.5	5.8	6.3	6.8	7.4	4.4	4.7	4.9	5.2	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1						
76	0 Ait Bourd	9.5	10.5	11.6	12.8	8.1	8.8	9.7	10.5	6.7	7.2	7.7	8.3	5.3	5.5	5.8	6.1	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.9						
84	0 Ait Bouzid	8.9	9.9	10.9	12.0	7.6	8.3	9.1	9.9	6.2	6.7	7.2	7.8	4.8	5.1	5.3	5.6	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5						
114	0 Abadou	9.3	10.3	11.4	12.5	7.9	8.6	9.5	10.3	6.5	7.0	7.5	8.1	5.1	5.3	5.6	5.9	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7						
119	0 Ait Atmane	9.5	10.5	11.6	12.8	8.1	8.8	9.7	10.5	6.7	7.2	7.7	8.3	5.2	5.5	5.8	6.1	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8						
	Diesel total	8.4	9.4	10.4	11.5	7.1	7.8	8.6	9.4	5.7	6.2	6.7	7.3	4.4	4.6	4.9	5.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.1						

*Village-wise Monthly Payment of Micro-hydropower Generation*

Douar	H.H 2000																					
		Initial Invest 100% Monthly payment per H.H				Initial Invest 75% Monthly payment per H.H				Initial Invest 50% Monthly payment per H.H				Initial Invest 25% Monthly payment per H.H				Initial Invest 0% Monthly payment per H.H				
		Discount Rate				Discount Rate				Discount Rate				Discount Rate				Discount Rate				
		0%	3%	6%	9%	0%	3%	6%	9%	0%	3%	6%	9%	0%	3%	6%	9%	0%	3%	6%	9%	
		29.8	45.0	64.1	86.5	23.2	34.6	49.0	65.8	16.6	24.2	33.8	45.1	10.0	13.9	18.7	24.4	3.4	3.5	3.6	3.6	
		70	19.1	28.8	41.1	55.4	14.9	22.2	31.4	42.1	10.6	15.5	21.7	28.9	6.4	8.9	12.0	15.6	2.2	2.2	2.3	2.3
		206	11.7	17.9	25.6	34.7	9.0	13.6	19.5	26.3	6.3	9.4	13.3	17.8	3.6	5.2	7.1	9.4	1.0	1.0	1.0	1.0
		130	14.4	21.8	31.2	42.2	11.1	16.7	23.8	32.0	7.9	11.6	16.3	21.8	4.6	6.5	8.9	11.6	1.4	1.4	1.4	1.5
		431	9.1	13.9	19.9	27.0	7.0	10.6	15.1	20.5	4.9	7.3	10.3	13.9	2.8	4.0	5.5	7.3	0.7	0.7	0.7	0.7
		168	13.3	20.1	28.7	38.7	10.3	15.4	21.9	29.4	7.3	10.7	15.0	20.1	4.3	6.1	8.2	10.8	1.4	1.4	1.4	1.4
		111	15.8	23.9	34.2	46.1	12.3	18.4	26.1	35.0	8.8	12.9	18.0	24.0	5.3	7.3	9.9	12.9	1.7	1.8	1.8	1.8
		1,158	12.8	19.4	27.7	37.5	9.9	14.8	21.1	28.4	7.0	10.3	14.5	19.4	4.1	5.8	7.9	10.3	1.2	1.2	1.2	1.3

*Village-wise Economic Analysis of PV (for Diesel) (I/2)*

Name of Village	Number HH	Cost of Electrification	Benefit of Electrification (Diesel Generation)	Ratio of Benefit/Cost	EIRR	
Tizi Oussems	76	175,466	152,097	146,470	138,454	0.48
Id Aissa	46	111,741	100,750	93,391	88,316	0.58
Tassa Ourigane	58	131,691	118,594	109,828	103,784	0.54
Igrem	28	68,446	61,732	57,238	54,138	0.76
Aghella	67	150,219	135,234	125,204	118,289	0.52
Ikiss	71	158,011	142,205	131,627	124,335	0.51
Tinerhouhrine	31	75,092	67,706	62,761	59,351	0.72
Tacheddirt	63	150,178	135,407	125,518	118,699	0.50
Sqour	47	93,003	82,371	75,254	70,348	0.72
Amagdour	23	45,227	40,035	36,561	34,165	1.08
Tamaterte	42	103,794	93,484	86,582	81,822	0.59
Awin Mazouz	70	138,075	122,254	111,666	104,365	0.60
Bouchiha Bon Omar	69	137,175	121,524	111,049	103,826	0.60
Bel Abbas	147	288,087	255,088	233,002	217,776	0.46
Derb Chem's	63	124,031	109,838	100,338	93,789	0.63
Ait Ouzkri	42	81,533	72,155	65,879	61,553	0.78
Ait Hmad	52	101,462	89,808	82,009	76,632	0.70
Tizgui	63	123,029	108,914	99,467	92,954	0.63
Anermi	94	216,910	195,618	181,366	171,540	0.43
Talat Ait Ihla	73	161,496	145,312	134,480	127,013	0.50
Adghouss	52	118,285	106,497	98,609	93,170	0.58
Tagadirt	52	113,840	102,397	94,740	89,461	0.59
Tifirt	94	211,167	190,085	175,976	166,248	0.45
Anfrioune	63	141,402	127,287	117,840	111,327	0.53
Tifratine	84	188,932	170,102	157,500	148,811	0.46
Aguenze	21	42,161	37,340	34,113	31,888	1.13
Ift Baragha	37	71,677	63,453	57,950	54,156	0.83
Agadir Baragha	42	81,533	72,155	65,879	61,553	0.78
Adar Baragha	12	23,510	20,821	19,022	17,781	1.73
Tadchert	31	60,693	53,728	49,068	45,854	>100%
Tamsoult	5	9,467	8,366	7,630	7,122	4%
Dar Jamaa Ait Ali	63	125,285	110,959	101,370	94,758	3.80
Agadir Ait Brahim	29	55,959	49,527	45,221	42,253	0.62
Iouraghan	19	37,440	33,147	30,274	28,292	0.95
Imiki	52	101,066	89,468	81,705	76,353	1.23
						0.70



*Village-wise Economic Analysis of PV (for Diesel) (2/2)*

Name of Village	Number HH	Cost of Electrification				Benefit of Electrification (Diesel Generation)				Ratio of Benefit/Cost				EIRR
Ift Ait Alla	23	46,229	40,959	37,432	35,000	58,438	48,264	41,495	36,847	1.26	1.18	1.11	1.05	13%
Boukhelf	89	176,271	156,132	142,652	133,358	112,568	93,416	80,671	71,926	0.64	0.60	0.57	0.54	
Addar Ait Ali	23	47,627	42,224	38,607	36,113	59,045	48,740	41,882	37,173	1.24	1.15	1.08	1.03	11%
Ait M'Barek	31	60,693	53,728	49,068	45,854	66,087	54,905	47,464	42,356	1.09	1.02	0.97	0.92	4%
Agadir Ait Bourd	63	121,631	107,649	98,292	91,840	92,383	76,378	65,729	58,423	0.76	0.71	0.67	0.64	
Afella Ouassif	26	48,844	43,188	39,402	36,793	60,753	50,159	43,112	38,275	1.24	1.16	1.09	1.04	12%
Afella Ighil	10	20,325	17,994	16,434	15,359	47,185	39,108	33,734	30,043	2.32	2.17	2.05	1.96	>100%
Anfeg	16	31,315	27,722	25,318	23,660	51,925	42,996	37,054	32,973	1.66	1.55	1.46	1.39	>100%
Aguersouak	21	42,161	37,340	34,113	31,888	57,198	47,242	40,619	36,071	1.36	1.27	1.19	1.13	20%
Oumast	37	72,073	63,794	58,253	54,434	71,041	58,963	50,927	45,411	0.99	0.92	0.87	0.83	-1%
Ait Zitoun	37	69,277	61,265	55,903	52,207	70,111	58,239	50,342	44,921	1.01	0.95	0.90	0.86	1%
Tagadirt (Ait Bouimzga)	29	54,957	48,602	44,350	41,418	63,632	52,495	45,085	39,999	1.16	1.08	1.02	0.97	7%
Zaouit	9	18,663	16,530	15,102	14,117	46,292	38,382	33,118	29,503	2.48	2.32	2.19	2.09	>100%
Izalaghan (Dar Brahim)	13	26,312	23,316	21,311	19,928	49,253	40,821	35,211	31,359	1.87	1.75	1.65	1.57	>100%
Tigoudert (Ben said, Zy)	25	49,954	44,233	40,404	37,764	61,142	50,443	43,323	38,434	1.22	1.14	1.07	1.02	10%
Amezi	38	74,880	66,295	60,548	56,586	71,935	59,687	51,537	45,941	0.96	0.90	0.85	0.81	-2%
Agouni	31	61,088	54,069	49,371	46,133	66,551	55,271	47,764	42,610	1.09	1.02	0.97	0.92	4%
Chaabat Tarik (Talet N)	56	111,511	98,784	90,266	84,393	87,351	72,247	62,197	55,299	0.78	0.73	0.69	0.66	
Ighil Sdidene (Draa Rki)	15	29,641	26,249	23,979	22,413	51,081	42,308	36,470	32,461	1.72	1.61	1.52	1.45	>100%
Tizi	62	120,245	106,430	97,184	90,811	92,040	76,084	65,467	58,181	0.77	0.71	0.67	0.64	
Aghbalou	94	183,733	162,652	148,542	138,815	116,629	96,746	83,514	74,435	0.63	0.59	0.56	0.54	
Ait Hsain	14	28,975	25,704	23,514	22,004	50,316	41,671	35,920	31,971	1.74	1.62	1.53	1.45	>100%
Ait Boubker	15	31,039	27,514	25,154	23,527	51,688	42,784	36,858	32,787	1.67	1.55	1.47	1.39	>100%
Tazatourt	35	69,337	61,436	56,147	52,500	68,827	57,173	49,419	44,096	0.99	0.93	0.88	0.84	0%
Tamsoulte	35	69,733	61,776	56,450	52,778	69,291	57,539	49,719	44,350	0.99	0.93	0.88	0.84	0%
Tizgui	52	101,462	89,808	82,009	76,632	84,205	69,670	59,998	53,360	0.83	0.78	0.73	0.70	
Ait Tirghit	52	100,460	88,884	81,137	75,797	84,106	69,594	59,938	53,311	0.84	0.78	0.74	0.70	
Tachbibt Kabli	31	63,092	55,917	51,114	47,803	66,553	55,263	47,750	42,592	1.05	0.99	0.93	0.89	2%
Tachbibt Echatooui	31	63,092	55,917	51,114	47,803	66,751	55,423	47,885	42,709	1.06	0.99	0.94	0.89	3%
Asgoune	31	61,694	54,653	49,939	46,689	66,187	54,981	47,525	42,405	1.07	1.01	0.95	0.91	3%
Ait Aamara Loued	84	165,808	146,846	134,154	125,403	108,370	89,983	77,747	69,351	0.65	0.61	0.58	0.55	
Lakaarna	31	59,691	52,804	48,196	45,020	65,987	54,829	47,404	42,307	1.11	1.04	0.98	0.94	5%
Tarast	47	96,909	85,877	78,492	73,400	80,989	67,002	57,693	51,303	0.84	0.78	0.74	0.70	
Assaka	47	94,611	83,879	76,694	71,739	79,662	65,970	56,858	50,605	0.84	0.79	0.74	0.71	
Ansa	62	142,164	128,059	118,619	112,110	91,086	75,818	65,657	58,684	0.64	0.59	0.55	0.52	
Erzaouite	17	46,318	41,897	38,935	36,892	54,560	45,053	38,727	34,383	1.18	1.08	0.99	0.93	6%
Photovoltaics total		6,678,896	5,951,585	5,464,785	5,129,156	5,490,483	4,552,972	3,929,130	3,500,935	0.82	0.77	0.72	0.68	

### Village-wise Economic Analysis of Diesel (for PV)

Name of Village	Number HH	Cost of Electrification			Benefit of Electrification (Diesel Generation)			Ratio of Benefit/Cost			EIRR	
		DR=0%	3%	6%	DR=0%	3%	6%	DR=0%	3%	6%	9%	%
Agouns	110	164,160	141,757	126,827	194,624	172,064	156,959	1.19	1.21	1.24	1.26	
Lemdinat	168	224,941	196,347	177,331	299,120	264,572	241,439	1.33	1.35	1.36	1.37	
Tnirt	242	294,424	259,590	236,429	429,245	379,536	346,254	1.46	1.46	1.46	1.47	
Ansmrou	168	224,064	195,530	176,554	297,722	263,308	240,264	1.33	1.35	1.36	1.37	
Toulkine	200	257,521	225,460	204,155	362,467	320,793	292,885	1.41	1.42	1.43	1.44	
Douzrou	231	283,193	249,502	227,098	408,548	361,309	329,679	1.44	1.45	1.45	1.45	
Ait Outmane	158	213,939	186,579	168,377	280,630	248,216	226,513	1.31	1.33	1.35	1.36	
Ait Smil	158	216,190	188,639	170,309	284,031	251,329	229,431	1.31	1.33	1.35	1.36	
Ait Bourd	105	161,663	139,330	124,448	198,529	166,812	152,269	1.17	1.20	1.22	1.25	
Ait Bouzid	125	180,445	155,973	139,680	221,141	195,551	178,418	1.23	1.25	1.28	1.30	
Abadou	116	174,760	150,976	135,136	212,135	187,627	171,217	1.21	1.24	1.27	1.29	
Ait Atmane	109	167,873	144,830	129,478	202,855	179,633	164,081	1.21	1.24	1.27	1.29	
Diesel total		2,563,173	2,234,515	2,015,823	3,865,812	(For Diesel Generation reference is PV)						

*Village-wise Economic Analysis of Micro-hydropower (for Diesel)*

Name of Village	Number HH	Cost of Electrification					Benefit of Electrification (Diesel Generation)					Ratio of Benefit/Cost					EIRR
Alla Qumzri	42	285,403	274,159	267,860	264,099	264,099	75,056	62,232	53,700	47,845	0.26	0.23	0.20	0.18			
Id Ssior	69	299,728	287,928	281,179	277,153	277,153	96,371	80,166	69,381	61,980	0.32	0.28	0.25	0.22			
Amsakrou	58						0	0	0	0	0						
Arg	79						0	0	0	0	0						
Ikiss	68						0	0	0	0	0						
Arg total	205	543,665	527,135	517,602	511,941	511,941	140,868	128,681	120,464	114,769	0.26	0.24	0.23	0.22			
Anfli	66						0	0	0	0	0						
Timichi	63						0	0	0	0	0						
Anfli total	129	425,494	410,747	402,522	397,630	397,630	104,785	94,186	87,053	82,115	0.25	0.23	0.22	0.21			
Imin Tala	73						0	0	0	0	0						
Addouz	52						0	0	0	0	0						
Ain Ghad	45						0	0	0	0	0						
Inzaine	73						0	0	0	0	0						
Imi N'isly	90						0	0	0	0	0						
Dou Anamer	37						0	0	0	0	0						
Igoundem	14						0	0	0	0	0						
Toug Lkheif	42						0	0	0	0	0						
Inzaine total	426	879,890	852,354	838,144	829,731	829,731	282,433	263,995	251,501	242,816	0.32	0.31	0.30	0.29			
Adardour	168	515,973	496,847	486,169	479,813	479,813	168,599	140,532	121,858	109,050	0.33	0.28	0.25	0.23			
Tidsi	42						0	0	0	0	0						
Afra	68						0	0	0	0	0						
Tidsi total	110	409,910	394,300	385,583	380,392	380,392	93,788	84,267	77,866	73,438	0.23	0.21	0.20	0.19			
MicroHydro total		3,360,063	3,243,470	3,179,059	3,140,760	3,140,760	961,899	854,060	781,824	732,013	0.29	0.26	0.25	0.23			

Village income, Investment for Electrification and calculated cost(Return:100%,Discount:0%)

\* P:Photovoltaic, D:Diesel Generation, M:Microhydro Generation

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	Douar	Income DH	Fixed cost US\$	Accumulated US\$	percentage	Cost US\$
p	Agouni	8,173	51,469	51,469	0.4%	11.5
p	Tamsoulte	8,247	58,017	109,487	0.8%	11.4
p	Ighil Sdidene (Draa Rkik)	9,195	25,055	134,541	1.0%	11.5
p	Tadchert	9,664	51,219	185,761	1.4%	11.4
p	Tigouder (Ben said, Zyoubt)	9,859	42,202	227,962	1.8%	11.6
p	Afella Ouassif	9,917	40,899	268,861	2.1%	10.9
p	Oumast	9,998	60,737	329,598	2.6%	11.3
d	Agouns	10,288	78,865	408,463	3.2%	9.4
p	Zaouit	10,759	15,787	424,250	3.3%	12.1
p	Agadir Ait Brahim	10,971	47,169	471,419	3.7%	11.2
p	Dar Jamaa Ait Ali	11,952	106,046	577,465	4.5%	11.6
p	Anfeg	12,405	26,414	603,879	4.7%	11.4
p	Amezi	12,881	63,206	667,085	5.2%	11.5
p	Tagadirt	12,999	102,996	770,082	6.0%	12.7
p	Chaabat Tarik (Talet NTghharast)	13,491	94,503	864,584	6.7%	11.6
p	Anfrioune	14,070	128,528	993,112	7.7%	13.0
p	Iouraghan	14,237	31,603	1,024,715	7.9%	11.5
p	Tizi	14,360	101,357	1,126,073	8.7%	11.3
p	Izalaghan (Dar Brahim Ou Ali)	14,437	22,336	1,148,408	8.9%	11.8
p	Amagdour	15,412	38,151	1,186,559	9.2%	11.4
p	Aguersouak	15,518	35,654	1,222,213	9.5%	11.7
p	Addar Ait Ali	16,356	40,564	1,262,777	9.8%	12.0
p	Tamaterte	16,768	94,738	1,357,515	10.5%	14.3
m	Alla Oumzri	17,539	482,560	1,840,075	14.3%	29.8
p	Aghbalou	17,655	155,046	1,995,121	15.5%	11.4
p	Agadir Ait Bourd	18,194	101,414	2,096,535	16.2%	11.1
m	Anfli	18,614	731,160	2,827,695	21.9%	14.4
p	Tazatourt	19,005	58,849	2,886,544	22.4%	11.5
d	Abadou	19,146	84,206	2,970,750	23.0%	9.3
p	Tifirt	19,550	191,929	3,162,679	24.5%	13.0
p	Ait Hmad	19,934	85,542	3,248,220	25.2%	11.4
p	Tizgui	20,082	103,827	3,352,047	26.0%	11.4
d	Ait Smil	20,467	111,423	3,463,470	26.8%	8.5
p	Ezzaouite	20,476	43,279	3,506,749	27.2%	15.7
p	Ait Ouzkri	20,773	68,644	3,575,394	27.7%	11.3
d	Ait Bourd	20,792	76,620	3,652,014	28.3%	9.5
p	Adghouss	21,178	107,611	3,759,624	29.1%	13.2
p	Derb Chen's	21,208	104,908	3,864,532	29.9%	11.5
p	Ikiss	21,489	143,415	4,007,947	31.0%	12.9
p	Ait Hsain	21,723	24,777	4,032,724	31.2%	12.0
p	Tifratine	22,443	171,948	4,204,672	32.6%	13.0
p	Tizgui	22,475	85,542	4,290,214	33.2%	11.4
p	Ait Boubker	22,476	26,386	4,316,600	33.4%	12.0
p	Ansa	22,910	129,747	4,446,347	34.4%	13.3
p	Tinerhouhrine	23,036	68,952	4,515,299	35.0%	14.0
p	Ait Zitoun	23,220	58,074	4,573,373	35.4%	10.9



Village income, Investment for Electrification and calculated cost(Return:100%,Discount:0%)

\* P:Photovoltaic, D:Diesel Generation, M:Microhydro Generation

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P. H. Houtoumane, D. Diesel Generation, M. M. Houtoumane, M. M. Houtoumane							
*	Douar		Income	Fixed cost	Accumulated	percentage	Cost
			DH	US\$	US\$		US\$
p	Adar Baragha		23,362	19,866	5,103,799	39.5%	11.4
d	Douzrou		23,449	155,298	5,259,097	40.7%	7.7
d	Toulkine		23,742	135,709	5,394,806	41.8%	8.0
p	Tamsoult		24,220	7,908	5,402,714	41.8%	11.0
p	Agadir Baragha		24,673	68,644	5,471,358	42.4%	11.3
d	Ait Outmane		24,918	109,899	5,581,257	43.2%	8.5
p	Ifit Ait Alla		25,119	39,233	5,620,490	43.5%	11.7
p	Assaka		25,203	80,629	5,701,119	44.2%	11.7
p	Bouchiha Bon Omar		25,547	116,339	5,817,458	45.1%	11.6
p	Sqour		25,614	78,715	5,896,173	45.7%	11.5
p	Boukhelf		26,110	149,301	6,045,475	46.8%	11.5
p	Tacheddirt		26,151	137,904	6,183,379	47.9%	13.8
d	Ait Bouzid		26,368	87,336	6,270,715	48.6%	8.9
p	Tachibit Kabli		26,406	53,632	6,324,347	49.0%	11.8
p	Awin Mazouz		26,770	116,673	6,441,020	49.9%	11.5
p	Tarast		27,537	82,323	6,523,343	50.5%	12.0
p	Aguenze		27,732	35,654	6,558,997	50.8%	11.7
p	Ait Tirghit		27,815	84,460	6,643,457	51.5%	11.2
p	Bel Abbas		28,494	242,779	6,886,236	53.3%	11.4
p	Ait M'Barek		29,668	51,219	6,937,455	53.7%	11.4
p	Aghella		30,230	136,595	7,074,050	54.8%	13.0
d	Ait Atmane		31,688	80,117	7,154,167	55.4%	9.5
p	Imiki		31,829	85,292	7,239,459	56.1%	11.3
p	Tagadirt (Ait Bouimzgan)		32,643	46,087	7,285,546	56.4%	11.0
p	Afella Ighil		33,452	17,147	7,302,693	56.6%	11.8
p	Ait Aamara Loued		34,604	140,312	7,443,005	57.6%	11.5
p	Tachibit Echadou		35,571	53,632	7,496,638	58.1%	11.8
m	Inzaine	426	36,250	1,563,570	9,060,208	70.2%	9.1
p	Ifit Baragha		36,770	60,487	9,120,694	70.6%	11.3
m	Adardour	168	38,651	869,030	9,989,724	77.4%	13.3
m	Arg	206	39,848	956,980	10,946,704	84.8%	11.7
p	Asgoune		41,619	52,301	10,999,005	85.2%	11.6
p	Lakaarna		43,005	50,138	11,049,143	85.6%	11.2
d	Tnirt		43,039	162,173	11,211,316	86.8%	7.6
p	Tassa Ouirgane		44,693	120,010	11,331,326	87.8%	13.1
d	Ansmrou		47,945	115,639	11,446,965	88.7%	8.3
p	Anermi		51,135	198,838	11,645,803	90.2%	13.4
m	Tidsi	110	62,646	677,210	12,323,013	95.4%	15.8
p	Id Aissa		70,251	102,607	12,425,620	96.2%	14.1
p	Igrem		73,168	62,922	12,488,542	96.7%	14.1
p	Tizi Ousse		80,138	160,373	12,648,914	98.0%	13.4
p	Talat Ait Ihla		80,368	146,444	12,795,359	99.1%	12.8
d	Lemdinat		88,562	116,280	12,911,639	100.0%	8.3

## Re-arranged by Cost(Return:100%, Discount:0%)

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*	Douar		Income	Fixed cost	Accumulated	percentage	Cost
			DH	US\$	US\$		US\$
m	Alla Oumzri	42	17,539	482,560	482,560	3.7%	29.8
m	Id Ssior	69	23,233	510,560	993,120	7.7%	19.1
m	Tidsi	110	62,646	677,210	1,670,330	12.9%	15.8
p	Ezzaouite		20,476	43,279	1,713,609	13.3%	15.7
m	Anfli	129	18,614	731,160	2,444,769	18.9%	14.4
p	Tamaterte		16,768	94,738	2,539,507	19.7%	14.3
p	Igrem		73,168	62,922	2,602,429	20.2%	14.1
p	Id Aissa		70,251	102,607	2,705,036	21.0%	14.1
p	Tinerhouhrine		23,036	68,952	2,773,988	21.5%	14.0
p	Tacheddirt		26,151	137,904	2,911,892	22.6%	13.8
p	Tizi Oussem		80,138	160,373	3,072,265	23.8%	13.4
p	Anermi		51,135	198,838	3,271,102	25.3%	13.4
p	Ansa		22,910	129,747	3,400,849	26.3%	13.3
m	Adardour	168	38,651	869,030	4,269,879	33.1%	13.3
p	Adghouss		21,178	107,611	4,377,490	33.9%	13.2
p	Tassa Ouirgane		44,693	120,010	4,497,500	34.8%	13.1
p	Tifratine		22,443	171,948	4,669,448	36.2%	13.0
p	Tifirt		19,550	191,929	4,861,377	37.7%	13.0
p	Anfrioune		14,070	128,528	4,989,905	38.6%	13.0
p	Aghella		30,230	136,595	5,126,500	39.7%	13.0
p	Ikiss		21,489	143,415	5,269,915	40.8%	12.9
p	Talat Ait Ihla		80,368	146,444	5,416,359	41.9%	12.8
p	Tagadirt		12,999	102,996	5,519,356	42.7%	12.7
p	Zaouit		10,759	15,787	5,535,143	42.9%	12.1
p	Addar Ait Ali		16,356	40,564	5,575,707	43.2%	12.0
p	Ait Hsain		21,723	24,777	5,600,484	43.4%	12.0
p	Ait Boubker		22,476	26,386	5,626,870	43.6%	12.0
p	Tarast		27,537	82,323	5,709,193	44.2%	12.0
p	Tachbibt Kabli		26,406	53,632	5,762,825	44.6%	11.8
p	Tachbibt Echadou		35,571	53,632	5,816,458	45.0%	11.8
p	Afella Ighil		33,452	17,147	5,833,605	45.2%	11.8
p	Izalaghan (Dar Brahim Ou Ali)		14,437	22,336	5,855,940	45.4%	11.8
p	Assaka		25,203	80,629	5,936,569	46.0%	11.7
m	Arg	206	39,848	956,980	6,893,549	53.4%	11.7
p	Ifit Ait Alla		25,119	39,233	6,932,782	53.7%	11.7
p	Aguersouak		15,518	35,654	6,968,436	54.0%	11.7
p	Aguenze		27,732	35,654	7,004,089	54.2%	11.7
p	Tigouder (Ben said, Zyoubt)		9,859	42,202	7,046,291	54.6%	11.6
p	Asgoune		41,619	52,301	7,098,592	55.0%	11.6
p	Chaabat Tarik (Talet N'Tghharast)		13,491	94,503	7,193,095	55.7%	11.6
p	Bouchiha Bon Omar		25,547	116,339	7,309,434	56.6%	11.6
p	Dar Jamaa Ait Ali		11,952	106,046	7,415,480	57.4%	11.6
p	Boukhelf		26,110	149,301	7,564,782	58.6%	11.5
p	Tazatourt		19,005	58,849	7,623,631	59.0%	11.5
p	Sqour		25,614	78,715	7,702,346	59.7%	11.5

*	Douar	Income	Fixed cost	Accumulated	percentage	Cost
		DH	US\$	US\$		US\$
p	Ait Aamara Loued	34,604	140,312	7,842,658	60.7%	11.5
p	Ighil Sdidene (Draa Rkik)	9,195	25,055	7,867,713	60.9%	11.5
p	Awin Mazouz	26,770	116,673	7,984,386	61.8%	11.5
p	Agouni	8,173	51,469	8,035,855	62.2%	11.5
p	Amezi	12,881	63,206	8,099,061	62.7%	11.5
p	Iouraghan	14,237	31,603	8,130,664	63.0%	11.5
p	Derb Chem's	21,208	104,908	8,235,573	63.8%	11.5
p	Amagdour	15,412	38,151	8,273,724	64.1%	11.4
p	Tamsoulte	8,247	58,017	8,331,741	64.5%	11.4
p	Tadchert	9,664	51,219	8,382,961	64.9%	11.4
p	Ait M'Barek	29,668	51,219	8,434,180	65.3%	11.4
p	Anfeg	12,405	26,414	8,460,594	65.5%	11.4
p	Adar Baragha	23,362	19,866	8,480,461	65.7%	11.4
p	Aghbalou	17,655	155,046	8,635,507	66.9%	11.4
p	Bel Abbas	28,494	242,779	8,878,286	68.8%	11.4
p	Tizgui	20,082	103,827	8,982,112	69.6%	11.4
p	Ait Hmad	19,934	85,542	9,067,654	70.2%	11.4
p	Tizgui	22,475	85,542	9,153,195	70.9%	11.4
p	Oumast	9,998	60,737	9,213,932	71.4%	11.3
p	Imiki	31,829	85,292	9,299,224	72.0%	11.3
p	Ait Ouzkri	20,773	68,644	9,367,868	72.6%	11.3
p	Agadir Baragha	24,673	68,644	9,436,512	73.1%	11.3
p	Tizi	14,360	101,357	9,537,870	73.9%	11.3
p	Ifit Baragha	36,770	60,487	9,598,356	74.3%	11.3
p	Ait Tirghit	27,815	84,460	9,682,816	75.0%	11.2
p	Agadir Ait Brahim	10,971	47,169	9,729,985	75.4%	11.2
p	Lakaarna	43,005	50,138	9,780,123	75.7%	11.2
p	Agadir Ait Bourd	18,194	101,414	9,881,536	76.5%	11.1
p	Tamsoult	24,220	7,908	9,889,444	76.6%	11.0
p	Tagadirt (Ait Bouimzgan)	32,643	46,087	9,935,531	77.0%	11.0
p	Afella Ouassif	9,917	40,899	9,976,430	77.3%	10.9
p	Ait Zitoun	23,220	58,074	10,034,504	77.7%	10.9
d	Ait Atmane	31,688	80,117	10,114,621	78.3%	9.5
d	Ait Bourd	20,792	76,620	10,191,241	78.9%	9.5
d	Agouns	10,288	78,865	10,270,106	79.5%	9.4
d	Abadou	19,146	84,206	10,354,312	80.2%	9.3
m	Inzaine	36,250	1,563,570	11,917,882	92.3%	9.1
d	Ait Bouzid	26,368	87,336	12,005,218	93.0%	8.9
d	Ait Smil	20,467	111,423	12,116,641	93.8%	8.5
d	Ait Outmane	24,918	109,899	12,226,540	94.7%	8.5
d	Lemdinat	88,562	116,280	12,342,820	95.6%	8.3
d	Ansmrou	47,945	115,639	12,458,459	96.5%	8.3
d	Toulkine	23,742	135,709	12,594,168	97.5%	8.0
d	Douzrou	23,449	155,298	12,749,466	98.7%	7.7
d	Tnirt	43,039	162,173	12,911,639	100.0%	7.6









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