APPENDIX-5 Electrical Aspect Inventory



Superviser fee

Contingency

Fixed cost

Photovoltaic Aspects

Tizi Oussem P-01 Scheme Name Scheme No. Administrative Division Tizi Oussem 10 Douar Asni Cercle Ouirgane C.R. Location 1,800 (m) Altitude W 7 33" · 7' Longitude 58' N 31 Latitude Size of Residential Area Access Households and Population 13.0 (km) Pist Fragments Yr 2000 Yr 1996 Path 3.5 (km) E-W 200 75 (m) Households 72 16.5 (km) 150 (m) Total N-S 444 461 Population Capacity of Photovoltaic (Wp) 10,225 20.96 (kWh/day) Installed capacity Power demand **Facility Description** >Battery >PV module Portable lead clad Sillcon Type Туре (Ah) 100 Capacity 75 55 (Wp) Panel output 12 12 (V) Voltage Voltage Numbers of Battery 99 160 Numbers of Panel Total Capacity_ 9,900 10,225 (Wp) Total Capacity >Connecting Cable and Switch >Controller Single phase switch Type of Switch Туре Battery charge Single phase CV Type of Cable Capacity (lot) Numbers of System 99 Numbers of Controller Preliminary Cost Estimate and Project Evaluation 83,346 (US \$) 68,099 (US\$) Variable cost(O M cost) PV module 13,599 (US \$) Delivery of PV module 243,719 (US \$) 8,980 (US \$) Total Cost 8,910 (US \$) Controller equipment Economic/Financial evaluation 25,740 (US \$) Installation cost 8,726 (USS) EIRR ---(%)

12,533 (US \$)

13,786 (US\$)

160,373 (US\$)

0.50

*Initial investment 0%, Discount Rate 6%

B/C'

Monthly payment per H.H.*

Photovoltaic Aspects

Scheme No.	P-02	:	•	Scheme Nar	me		ld Alssa]	
Administrative Div	i					1				
Douar	20			Issa			T .			
C.R.	11	<u> </u>	Quli	gane		Cercle	1	1	Asni	
Location										
	N 31	8'	43"	Longitude	W 7	58'	47"	Altitude	1,740	(m)
Latitude	ו או		43	Trongitode	<u> </u>			TANGOO .	1 132 10	.Y.Z.
Households and Po	opulation			Size of Re	sidential A	rea		Access		
Troosericius ariuv	Yr 1996	Yr 2000]	Fragments	1	1]	Pist	13.0	(km)
Households	44	46	1	E-W	250	1	l	Path	I -	(km)
Population	180	187		N-S	200	1		Total		(km)
	J		•				•			
Capacity of Photov	roitaic									
Power demand		12.98	(kWh/day)	Installed c	apacity		6,515	(Wp)	
Facility Description	n									:
>PV module	,		· · · · · · · · · · · · · · · · · · ·		>Battery				7	
Туре	Silicor	туре			Туре		Portable le	ad clad		
Panel output	75	55	(Wp)		Capacity		100	(Ah)		
Voltage	12	12	(A)		Voltage		12	(A)		
Numbers of Panel	15	98			Numbers		64			
Total Capacity	<u> </u>	6,515	_((₩ p)		Total Cap	acity	6,400	(Ah)	J	
					0	5 0-bl- o	and Countries			
>Controller			···	1	Type of St	ting Cable a	Single pha	ea cuiteb]	
Type		Sattery char	1		Type of C		Single pha			
Capacity		1			Numbers		64			
Numbers of Control	· e i	64	(kit)	J	Humbers	or System	1 04	IIVIA	J	
Preliminary Cost E	stimate and F	zolect Eval	uation						· · ·	
PV module				43,390	(US \$)	Variable co	st(O M cost)		52,560	เบร
Delivery of PV mode				1	(US \$)	73				,
Battery				1	(US \$)	Total Cost			155,167	(ปร
Controller equipmen	 nt		· · ·	100	(US \$)					
Installation cost					(US \$)	Economic/I	Financial eval	vation		
Тах				1	(US \$)		EIRR			(%)

8,015 (US\$)

102,607 (US \$)

Monthly payment per H.H.*

Photovoltaic Aspects

Scheme No.	P-03		5	Scheme Nam	18	Tas	ssa Ouirg	ane		
Administrative Div	delon									
Douar	30		Tassa (Duirgane						
C.R.	11			gane		Cercle	1		Asni	
<u> </u>	<u></u>									
Location										₁
Latitude	N 31	10'	66"	Longitude	W 8	1'	50"	Altitude	1,190	(m)
						•				
Households and F		<u></u>	1	Size of Res		rea	1	Access	60	(km)
	Yr 1996	Yr 2000		Fragments	<u>1</u>			Pist	·	(km)
Households	55	57 · <u>·</u> -		E-W	800			Path		(km)
Population	375	389)	N-S	500	!(m)	j	Total	<u> </u>	((A)19
								٠.	-	÷
Capacity of Photo	YOURSIC	15.75	(kWh/day		Installed c	anacity		7,650	(Wp))
Power demand	·	15.75	Hanisha	L	motanes e	ориол				•
Facility Description	on									
>PV module				 -1	>Battery				1	
Туре	Silicon	Туре	1		Туре		Portable I	ad clad		
Panel output	75	55	(Wp)	• .	Capacity		100	(Ah)		
Voltage	12	12	<u>w</u>		Vo!tage		12	. ¦₩		
Numbers of Panel	14	120			Numbers	of Battery	74		ļ	ē
Total Capacity		7,650	(Wp)	j :	Total Cap	acity	7,400	(Ah)]	•
Controller					>Conneci	ting Cable a	nd Switch			
>Controller		Battery char	 ле] .	Type of S			se switch	}	
Type Capacity	· -	500	(w)	1	Type of C		Single pha			•
Numbers of Contro		74	(kit)		Numbers		74	(kit)	J	
Hombers of Contro	,,, <u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>	·		-,						
Preliminary Cost	Estimate and P	roject Eval	uation					· · · · · · · · · · · · · · · · · · ·		· · ·
PV module				50,949	(US \$)	Variable co	st(OM cost)		62,952	(US \$)
Delivery of PV mod	dule			10,175	(US \$)					
Battery				6,760	(US \$)	Total Cost			182,962	(US \$)
Controller equipme	ent			6,660	(US \$)					ļ !
Installation cost				19,240	(US \$)	Economic/I	Financia! eva	aluation	<u> </u>	
Тах			.	6,532	(US \$)		EIRR			(%)
Superviser fee				9,378	(US \$)		B/C'		0.57	1
Contingency				10,316	(US \$)	Monthly pa	yment per H			(US \$
Fixed cost				120,010	(US \$)	J	∗ Initial i	nvestment 0%	, Discount R	ale 6%

Photovoltaic Aspects

Scheme No. P-04 Scheme Name *lgrem* Administrative Division Igrem C.R. Imgdal Cercle Asni Lecation Latitude N 31 37" Longitude W 8 50" Altitude 1,750 (m) Households and Population Size of Residential Area Access Yr 1996 Yr 2000 Fragments Pist 15.0 (km) Households 28 E-W 500 (m) Path 0.5 (km) Population 130 135 N-S 150 (m) Total 15.5 (km) Capacity of Photovoltaic

Installed capacity

Facility Description

Power demand

>PV module			
Туре	Silico	n Type	
Panel output	75	55	(Wρ)
Voltage	12	12	(V)
Numbers of Panel	<u> 8</u>	62	
Total Capacity		4,010	(Wp)

8.01

(kWh/day)

>Battery		·
Туре	Portable I	ead clad
Capacity	100	(Ah)
Voltage	12	<u>(v)</u>
Numbers of Battery	39	
Total Capacity	3,900	(Ah)

4,010

(Wp)

>Controller	·	
Туре	Battery cha	orge
Capacity	500	(w)
Numbers of Controller	39	(kit)

>Connecting Cable and Switch							
Type of Switch Single phase switch							
Type of Cable	Single phase CV	- 1					
Numbers of System	39 (kit)						

Preliminary Cost Estimate and Project Evaluation					· <u>, ·</u>
PV module	26,707	(US.\$)	Variable cost(O M cost)	32,118	(US \$)
Delivery of PV module	5,333	(US \$)		<u> </u>	·
Battery :	3,480	(US \$)	Total Cost	95,040	(US \$)
Controller equipment	3,510	(US \$)			
Installation cost	10,140	(US \$)	Economic/Financial evaluation		
Tax	3,426	(US \$)	EIRR		(%)
Superviser fee	4,917	(US \$)	B/C'	0.81	
Contingency	5,409	(US \$)	Monthly payment per H.H.*	4.3	(US \$)
Fixed cost	62,922	(US \$)	* Initial investment 0	%, Discount R	ate 6%

Photovoltaic Aspects

Scheme No.	P-05		s	cheme Nam	10		Aghelia	yn taefa. 30 yn y bait 100pc aco		-
									:	
Administrative Divi		<u> </u>				ı			-	
Douar	80			ella		Carala	! 1	<u> </u>	Asni	
C.R.	15]	<u> </u>	hil		Cercle	` -	1	HSIII	
Lacation										
Location	N 31	0'	15"	Longitudə	W 8	22'	51"	Altitude	2,050	(m)
Latitude	1 1 31									
Households and Po	opulation		-	Size of Res	idential A	rea	•	Access		
	Yr 1996	Yr 2000]	Fragments	1	<u> </u>	İ	Pist	10.0	(km)
Households	64	66] .	E-W	600	(m) :		Path	15.5	(k <u>m</u>)
Population	394	409	j	N-S	250	(m)	.]	Total	25.5	(km)
Capacity of Photos	voitale		·							ì
Power demand		18.13	(kWh/day)	}	installed o	apacity		8,715	(Wp)	j
>PV module			T	1	>Battery		in debte to			
Туре	1	1 Type			Туре	· · · · · · · ·	Portable le	7		
Panel output	75	55	(Wp)		Capacity	·	100	(Ah) (V)	1	
Voltage	12	12	<u>(v)</u>		Voltage		12 84	. 102		
Numbers of Panel	15	133			Numbers Total Cap		8,400	(Ah)		
Total Capacity	<u> </u>	8,715	(Wp)	j	[Total Gap	acity	0,500	11	J	
>Controller				-	>Connec	ting Cable a	ind Switch		_	
Туре		Battery char	œ]	Type of S		Single pha	se switch	j	
Capacity			(W)_		Type of C	able	Single pha	se CV		
Numbers of Control	ller ·	84	(kit)]	Numbers	of System	84	(kit)]	
Preliminary Cost E	Estimate and I	Project Eval	uation				· .	·		<u> </u>
PV module				58,042	(US \$)	Variable o	ost(O M cost)		72,168	(US \$
Delivery of PV mod	lule			1	(US \$)					
Battery	. ,			1	(กิล ฮิ)	Total Cost			208,763	(US \$
Controller equipme	<u>nt</u>			1	(US S)					
Installation cost					(US \$)	Economic/	Financial eva	livation	1	1063
Tax				- 7	(US S)		EIRR		0.55	(%)
louis a deside a				10.675	(US SU	1	B/C'		į 0.00	1

136,595 (USS)

Photovoltaic Aspects

Scheme No.	P-06]	(Scheme Nar	ne	and the state of t	lkiss]	
Administrative Di	hdelan									
Douar	\$0	1	Ik	iss	 -	1				
C.R.	16	1		hbar		Cercle	1	T	Asni	
0.114	<u>-4</u>	<u>!</u>		100.		100:0.0			Aoin	
Location							-			
Latitude	N 30	55'	55"	Longitude	W 8	23'	54"	Altitude	1,700	(m)_
			. ————							****
Households and F	opulation		_	Size of Res	sidential A	rea	-	Access	-	
-	Yr 1996	Yr 2000]	Fragments	1		.]	Pist	16.5	(km)
Households	68	71		E-W	1,000	(m)		Path		(km)
Population	389	403		N-S	900	(m)	_	Total	1	(km)
Capacity of Photo	voltaic	т	·i							-1
Power demand		19.13	(kWh/day))	Installed c	apacity		9,155	(Wp)	J
Facility Description >PV modula	·n		 	·	>Battery				٦.	
Туре	Silicon			-	Туре		Portable le	. 1		
Panel output	75	55	(Wp)		Capacity		100	(Ah)		
Voltage	12	. 12	(V)		Voltage		12	(Y)	ļ	
Numbers of Panel	15	148			Numbers o		88			
Total Capacity		9,155	(Wp)]	Total Capa	acity	8,800	(Ah)] .	
>Controller					- Canage	ling Cable a	and Curitals			
Туре		Battery char		1	Type of Sy		Single phas	na cuátah	1	_
Capacity		1	(W)		Type of Ca		Single phas			•
Numbers of Control	iller	88	(kit)	i '	Numbers of		88	(kit)		
Name and a second		1 	You	,	11000000	л оделе	1 00	Triel	į	
Preliminary Cost 6	Estimate and P	roject Evalu	uation		-		• .			
PV module				60,972	(US \$)	Variable co	st(O M cost)		76,176	rus \$
Delivery of PV mod	Jule			12,176)
Battery					(US \$)	Total Cost			219,591	(US \$
Controller equipme	nt				(US \$)					
Installation cost				22,880	i	Economic/F	inancial evalu	uation		
Tax				7,788	(US \$)	Ī	EIRR		***	(%)
Superviser fee			I	11,209	(US \$)	1	8/C*		0.54	

12,330 (US \$)

143,415 (US\$)

Monthly payment per H.H.*

Superviser fee

Fixed cost

Contingency

Photovoltaic Aspects

Tinerhouhrine P-07 Scheme Name Scheme No. Administrative Division Tinerhouhrine Douar 120 Cercle Asni Asni C.R. Location 15" 2,000 (m) Altitude Longitude W 7 Latitude N 31 Size of Residential Area Access Households and Population Pist 10.0 (km) Fragments Yr 1996 Yr 2000 Path 3.5 (km) E-W 150 (m) 30 31 Households 13.5 (km) Total N-S 150 (m) Population Capacity of Photovoltaic (Wp) Instailed capacity 4,380 8.72 (kWh/day) Power demand **Facility Description** >PV module >Battery Portable lead clad Silicon Type Туре 100 (Ah) Capacity (Wp) Panel output (V) 12 Voltage Voltage Numbers of Battery 43 Numbers of Panel 4,300 (Wp) Total Capacity Total Capacity 4,380 >Connecting Cable and Switch >Controller Single phase switch Type of Switch Туре Battery charge Single phase CV Type of Cable 500 (W) Capacity Numbers of Controller Numbers of System (kit) Preliminary Cost Estimate and Project Evaluation 35,370 (US \$) 29,171 (USS) Variable cost(O M cost) 5,825 (US S) Delivery of PV module 104,322 (US \$) 3,820 (USS) Battery 3,870 (US \$) Controller equipment 11,180 (US \$) Economic/Financial evaluation Installation cost

3,774 (USS)

5,387 (US \$)

5,925 (US \$)

68,952 (USS)

EIRR . B/C'

Monthly payment per H.H.*

--- (%)

4.3 (US \$)

0.77

Contingency

Fixed cost

Photovoltaic Aspects

Scheme No. P-08 Scheme Name Tacheddirt Administrative Division Douar 170 Tacheddirt C.R. 17 Asni Cercle Asni Location Latitude N 31 30" Longitude W 7 50 48" Altitude 2,180 (m) Households and Population Size of Residential Area Access Yr 1996 Yr 2000 Fragments Pist 10.0 (km) Households 62 E-W 250 (m) Path 2.0 (km) Population 373 250 (m) N-S Total 12.0 (km) Capacity of Photovoltaic Power demand 17.50 (kWh/day) installed capacity **Facility Description** >PV module >Battery Туре Silicon Type Туре Portable lead clad Panel output 75 55 (Wp) Capacity 100 (Ah) Voltage 12 Voltage 12 (V) (V) Numbers of Panel 132 Numbers of Battery Total Capacity 8,760 (Wp) Total Capacity >Controller >Connecting Cable and Switch Type Battery charge Type of Switch Single phase switch Capacity 500 (W) Type of Cable Single phase CV Numbers of Controller (kit) Numbers of System 86 Preliminary Cost Estimate and Project Evaluation PV module 58,342 (US \$) Variable cost(O M cost) 70,728 (US \$) Delivery of PV module 11,651 (US \$) Battery 7,640 (US \$) Total Cost *208,633* (US \$) Controller equipment 7,740 (US \$) Installation cost 22,360 (US \$) Economic/Financial evaluation 7,548 (USS) EIRR --- (%) Superviser fee 10,773 (US S) 8/C* 0.53

11,851 (US S)

137,905 (US \$)

Monthly payment per H.H.*

4.2 (US \$)

Superviser fee

Contingency

Fixed cost

Photovoltaic Aspects

Sqour P-09 Scheme Nama Scheme No. Administrative Division Sqour Douar 180 Ourika Tahanaout Cercle 21 Ç.R. Location 32" 1,200 (m) Altitude W 7 20' 39" Longitude Latitude N 31 Access Size of Residential Area Households and Population 0.0 (km) Fragments Yr 1996 Yr 2000 5.0 (km) Path E-W 120 (m) 47 Households 5.0 (km) Total N-S 300 (m) 360 Population Capacity of Photovoltaic 4,280 (Wp) Installed capacity (kWh/day) 12.85 Power demand **Facility Description** >Battery >PV module Portable lead clad Silicon Type 100 (Ah) Capacity Voitage 12 Voltage Numbers of Battery Numbers of Panel 6,000 (Ah) Total Capacity____ Total Capacity 4,280 >Connecting Cable and Switch >Controller Single phase switch Type of Switch Battery charge Туре Single phase CV Type of Cable 500 (W) Capacity Numbers of System Numbers of Controller Preliminary Cost Estimate and Project Evaluation 51,156 (US\$) 28,505 (US \$) Variable cost(O M cost) PV module 5,692 (US\$) Delivery of PV module 129,871 (US \$) 5,480 (US \$) Total Cost Battery 5,400 (US \$) Controller equipment Economic/Financial evaluation 15,600 (US \$) Installation cost --- (%) 5,296 (US \$) EIRR Tax

6,068 (US \$)

6,674 (US\$)

78,715 (US\$)

0.76

*Initial investment 0%, Discount Rate 6%

4.1 (US \$)

B/C

Monthly payment per H.H.*

Photovoltaic Aspects

P-10 Amagdour Scheme No. Scheme Name

Administrative Division

Douar	190	Amagdour			
C.R.	21	Ourika	Cercle	2	Tahanaout

Location Latitude N 31 . 20' 58" W 7 43' 9 Altitude 1,150 (m) Longitude

Households and Population Yr 1996 Yr 2000 Households 22 23 150 158 Population

Size of Residential Area							
Fragments	<u>_1</u> _	·					
E-W	900	(m)					
N-S	900	(m)					

Access	· ·	
Pist	0.0	(km)
Path	6.0	(km)
Total	6.0	(km)

Capacity of Photovoltale (kWh/day) Power demand 6.23 Installed capacity 2,075

Facility Description

>PV module

21 0 11100010			·
Туре	Silico		
Panel output	75	55	(Wp)
Voltage	12	12	(V)
Numbers of Panel	24	5	
Total Capacity		2,075	(Wp)

> Date	G6 9	
Туре		
_		

Туре	Portable tead clad				
Capacity	100	(Ah)			
Voltage	12	(v)			
Numbers of Battery	29				
Total Capacity	2,900	(Ah)			

>Controller

Туре	attery cha	ergo	
Capacity	500	(W)	-
Numbers of Controller	29	(kit)	

>Conne	ectina	Cable	and	Switch

Type of Switch	Single phase switch				
Type of Cable	Single phase CV				
Numbers of System	29	(kit)			

Preliminary Cost Estimate and Project Evaluation

PV module	13,820	(US \$)	Variable cost(O M cost)	24,978	(US \$)
Delivery of PV module	2,760	(US \$)			ļ
Battery	2,680	(US \$)	Total Cost	63,130	(US S)
Controller equipment	2,610	(US \$)			
Installation cost	7,540	(US \$)	Economic/Financial evaluation	í 	
Tax	2,566	(US \$)	EIRA	15	(%)
Superviser fee	2,941	(US \$)	8/C'	1.13	
Contingency	3,235	(US \$)	Monthly payment per H.H.*	4.1	(US S)
Fixed cost	38,152	(US \$)	* Initial investment 0%, Discount Rate 69		ate 6%

Controller equipment

Superviser fee

Contingency

Photovoltaic Aspects

Scheme No.	P-11		S	cheme Nam	10		Tamateric]	
Administrative Div	islon	,				1			-	
Douar	200		Tama	terto		·	т	·		
C.R.	22	<u></u>	Settif	adma		Cercie	2	76	ahanaout	
Location	_,			_F				 	1	
Latitude	N 31	12'	5"	Longitude	W 7	42'	43"	Altitude	1,600	(m) _
				0'1 D	ه اداددداد			Access -		
Households and P			1	Size of Res		rea	1	Pist	0.0	(km)
	Yr 1996	Yr 2000	┨ .	Fragments	200	(m)	1	Path		(km)
Households	40	41	•	E-M		(m)	1 .	Total		(km)
Population	240	249	J	N-S	130	<u> 1909 </u>	J	1 Otal	1	IV. A
Capacity of Photo	voltale							·		
Power demand		11.91	(kWh/day)	Installed o	apacity		6,000	(Wp)]
Facility Description	ers.				>Battery					
Туре	Silicon	туре	T]	Туре		Portable le	ad clad]	
Panel output	75	55	(Wp)		Capacity		100	(Ah)		
Voltage	12	12	(v)		Voltage		12	(V)		٠.
Numbers of Panel	14	90			Numbers	of Battery	59			
Total Capacity		6,000	(Wp)]	Total Cap	acity	5,900	(Ah)	J	
•										
>Controller					>Connec	ting Cable a	nd Switch		٠.	
Туре		Battery cha	rge		Type of S	witch	Single pha	se switch		
Capacity		500	(W)		Type of C	able	Single pha	se CV	-	
Numbers of Contro	ller	59	(kit)]	Numbers	of System	59	(kit)		
							_	3		
Preliminary Cost	Estimate and I	Project Eval	uation	1 4	410.0	Tu			40.446	ale e
PV module	·			1	(US \$)	variable of	et(O M cost)		49,146	lings
Delivery of PV mod	Jule		. .		(US \$)	Table 0: 1			143,884	1110 0
Battery			-	5,400	(US \$)	Total Cost			143,004	11022

5,310 (US\$)

15,340 (US\$)

7,399 (US \$)

8,139 (US \$)

94,738 (US \$)

5,210 (US\$)

Economic/Financial evaluation

EIRR

Monthly payment per H.H.*

0.63

Fixed cost

Photovoltaic Aspects

Scheme No. P-12 Awin Mazouz Scheme Name Administrative Division Douar 261 Awin Mazouz C.R. Tamesioht Cercle Tahanaout Location 0" N 31 Latitude 32' Longitude 52'' W 8 Altitude 500 (m) Households and Population Size of Residential Area Access Yr 1936 Yr 2000 Fragments 3 Pist 0.3 (km) Households 67 69 E-W 300 (m) Path 0.0 (km) Population N-S 420 436 600 (m) Total 0.3 (km) Capacity of Photovoitale Power demand 18.97 (kWh/day) Installed capacity 6,335 (Wp) **Facility Description** >PV module >Battery Silicon Type Type Portable lead clad Panel output Capacity 55 (Wp) 100 (Ah) Voltage 12 12 Voltage Numbers of Panel 17 Numbers of Battery Total Capacity 6,335 Total Capacity 8,900 >Controller >Connecting Cable and Switch Туре **Battery charge** Type of Switch Single phase switch Capacity (W) Type of Cable Single phase CV Numbers of Controller Numbers of System Preliminary Cost Estimate and Project Evaluation PV module 42,191 (US\$) Variable cost(O M cost) 76,110 (US \$) Delivery of PV module 8,426 (US \$) 8,160 (US \$) 192,784 (US \$) **Total Cost** Controller equipment 8,010 (US \$) Economic/Financial evaluation Installation cost 23,140 (US\$) Tax 7,862 (US \$) EIRR (%) Superviser lee 8,993 (US \$) B/C' Contingency 9,692 (USS) Monthly payment per H.H.* 4.f (US \$)

116,674 (USS)

Photovoltaic Aspects

Scheme No.

P-13

Scheme Name

Bouchiha Bon Omar

Douar	262		Bouchih.	a Bon Omar			,	-;	
C.R.	24		Tan	esioht		Cercle	2	Tah	anaout -
Location Latitude	N 31	32'	44"	Longitude	W 8	6'	28"	Altitude	<i>500</i> (m)
Households an	d Population			Size of Res	idential A	rea		Access	
-	Yr 1996	Yr 2000		Fragments	. 1	 . -		Pist	1.0 (km)
		t	1		ممم ا			lous I	00 /60
Households	66	68		E-W	800	(m)		Path	0.0 (km

Capacity of Photovoltaic		·		
Power demand	18.76	(kWh/day)	Installed capacity	6,315 (Wp)

Facility Description

>PV module			
Туре	Silicor	Type	
Panel output	75	55	(Wp)
Voltage	12	12	(v)
Numbers of Panel	71	18	
Total Capacity	· · ·	6,315	(Wp)

>Battery		
Туре	Portable I	ead clad
Capacity	100	(Ah)
Voltage	12	_ (v)
Numbers of Battery	89	
Total Capacity	8,900	(Ah)

Туре			Battery cha	arga
Capacity			500	(w)
Numbers of C	ontroller	•	89	(kit)

>Connecting Cable :	ano Switch	
Type of Switch	Single ph	ase switch
Type of Cable	Single ph	ase CV
Numbers of System	89	(kit)

Preliminary Cost Estimate	and Project Evaluation	·				
PV module		42,058	(US \$)	Variable cost(O M cost)	75,258	(US \$)
Delivery of PV module		8,399	(US \$)			
Battery		8,060	(US \$)	Total Cost	191,597	(US \$)
Controller equipment		8,010	(US \$)		-	
Installation cost		23,140	(US \$)	Economic/Financial evaluation		ļ
Tax		7,842	(US \$)	EIRR		(%)
Superviser fee		8,967	(US \$)	B/C'	0.63	
Contingency		9,863	(US \$)	Monthly payment per H.H.*	4.1	(US \$)
Fixed cost		116,339	(US \$)	* Initial investment	0%, Discount R	ate 6%

Contingency

Fixed cost

Photovoltaic Aspects

P-14 Scheme No. Scheme Name Bel Abbas Administrative Division Douar Bel Abbas C.R. 25 Tahanaout Cercle Tahanaout Location Latitude 21" N 31 27' Longitude Altitude 660 (m) Households and Population Size of Residential Area Access Yr 1996 Yr 2000 Fragments 3 Pist 5.5 (km) Households 140 145 E-W 1,000 (m) Path 0.0 (km) Population 900 933 1,000 (m) N-S Total 5.5 (km) Capacity of Photovoltaic Power demand 39.72 (kWh/day) Installed capacity 13,195 (Wp) **Facility Description** >PV module >Battery Туре Silicon Type Portable fead clad Type Panel output 75 (Wp) Capacity 100 (Ah) Voltage 12 12 Voltage (v) Numbers of Panel Numbers of Battery 185 Total Capacity Total Capacity 18,500 >Controller >Connecting Cable and Switch Туре Battery charge Single phase switch Type of Switch Capacity 500 (W) Type of Cable Single phase CV Numbers of Controller 185 (kit) Numbers of System 185 Preliminary Cost Estimate and Project Evaluation PV module 87,879 (US \$) Variable cost(O M cost) 158,442 (US \$) Delivery of PV module 17,549 (US \$) 16,960 (US \$) Total Cost 401,221 (US \$) Controller equipment 16,650 (US \$) Installation cost 48,100 (US \$) Economic/Financial evaluation Tax 16,342 (US \$) EIRR --- (%) Superviser fee 18,714 (USS) B/C*

20,585 (US \$)

242,779 (US \$)

Monthly payment per H.H.*

0.63

*Initial investment 0%, Discount Rate 6%

4.1 (US \$)

Superviser lee

Fixed cost

Contingency

Photovoltaic Aspects

Derb Chem's Scheme No. P-15 Scheme Name Administrative Division Derb Chem's Douar 320 Tahanaout Cercle 25 Tahanaout C.R. Location N 31 21' 48" Longitude W 7 *57*° 41" Altitude 900 (m) Latitude Size of Residential Area Access Households and Population 0.0 (km) Yr 2000 Pist Yr 1996 Fragments 0.0 (km) 300 (m) E-W Path Households 60 62 0.0 (km) N-S 400 (m) Total Population 369 383 Capacity of Photovoltaic 5,700 (Wp) (kWh/day) Installed capacity Power demand 17.07 **Facility Description** >Battery >PV module Portable lead clad Silicon Type Type Туре 55 100 (Ah) (Wp) Capacity Panel output 12 12 (V) (V) Voltage Numbers of Battery 80 15 Numbers of Panel 8,000 (Ah) Total Capacity 5,700 (Wp) Total Capacity >Connecting Cable and Switch >Controller Single phase switch Туре Battery charge Type of Switch Single phase CV Type of Cable Capacity 80 Numbers of Controller Numbers of System Preliminary Cost Estimate and Project Evaluation 68,268 (US \$) Variable cost(O M cost) PV module 37,962 (USS) 7,561 (US \$) Delivery of PV module 173,176 (US\$) 7,320 (US \$) 7,200 (US \$) Controller equipment 20,800 (US S) Economic/Financial evaluation Installation cost

A	s	Đ-	1	5

7,064 (US S)

8,086 (US \$)

8,895 (US \$)

104,908 (US S)

EIRR

Monthly payment per H.H.*

8/C'

--- (%)

0.48

Photovoltaic Aspects

Scheme No. P-16 Scheme Name Alt Ouzkri **Administrative Division** Douar 430 Ait Ouzkri C.R. 31 Anougal Cercle Amizmiz Location Latitude N 31 11' Longitude W 8 14' 56" Altitude 1,100 (m) Households and Population Size of Residential Area Access Yr 1996 Yr 2000 Fragments Pist 3.0 (km) E-W Path 0.0 (km) Households 40 41 250 (m) 150 (m) Total 3.0 (km) Population | 250 259 N-S Capacity of Photovoltaic Power demand 11.43 (kWh/day) Installed capacity 3,740 (Wp) **Facility Description** >PV module >Battery Portable lead clad Туре Silicon Type 100 (Ah) Panel output 75 55 **(W**p) Capacity Voltage 12 i(v) Voltage 12 (V) Numbers of Panel 8 Numbers of Battery 52 Total Capacity Total Capacity 5,200 3,740

>Controller		
Туре	Battery charge	: :.
Capacity	. 500 (W)	<i>-</i>
Numbers of Controller	52 (kit)	

>Connecting Cable and Switch									
Type of Switch	Single ph	ase switch							
Type of Cable	Single ph	ase CV							
Numbers of System	52	(kit)							

Preliminary Cost Estimate and Project Evaluation					
PV modute	24,908	(US \$)	Variable cost(O M cost)	45,156	(US \$)
Delivery of PV module	4,974	(US \$)			
Battery	4,840	(US \$)	Total Cost	113,799	(US \$)
Controller equipment	4,680	(US \$)		ļ	
Installation cost	13,520	(US \$)	Economic/Financial evaluation	1.	
Tax	4,608	(US \$)	EIRR	•••	(%)
Superviser fee	5,292	(US \$)	B/C'	0.82	
Contingency	5,821	(US §)	Monthly payment per H.H.*	4.1	(US S)
Fixed cost	68,643	(US \$)	*Initial investment 0%	, Discount R	ale 6%

Fixed cost

Photovoltaic Aspects

mrentory conce	mod on							a sad an armanda		
Scheme No.	P-17		\$	cheme Nam	10		All Hmad			
·										
Administrative Divi						1				
Douar	440		Ait H						nsis noi s	
C.R.	31	<u> </u>	Ano	ugal		Cercle	3	. А	mizmiz	
Location						·		1	· 1	
Latitude	N 31	10'	25"	Longitude	W 8	14'	45"	Altitude	1,400	(m)
				Size of Res	idantial A	***		Access		
Households and Po			}		HUEINIAI A	l	}	Pist	5.5	(km)
-	Yr 1936	Yr 2000	{	Fragments	500	(m)		Path	I · · ·	(km)
Households	50	52		E-W	500 300			Total		(km)
Population	300	311	j	N-S	300	itină	j	100	1	TANKE .
Capacity of Photov	roltalc									,
Power demand		14.12	(kWh/day)	1	Installed c	apacity		4,655	(Wp)	
>PV module					>Battery		<u></u>		1	
Туре	Silicon	Туре			Туре		Portable le	ad clad	:	
Panel output	75	55	(Wp)		Capacity		100	(Ah)		
Voltage	12	- 12	(V)		Voltage		12	(⊻)		
Numbers of Panel	54	- 11		;	Numbers	of Battery	65			
Total Capacity	<u> </u>	4,655	(Wp)	J	Total Cap	acity	6,500	(Ah))	
			1		-Cooneci	ting Cable a	nd Switch			
>Controller		lattery char]	Type of S		Single pha	se switch]	
Type		500	(W)		Type of C		Single pha			
Capacity Numbers of Control		65	(kit)		Numbers		65	(kit)		
Numbers or Consol		1	769	J		<u> </u>			_	
Preliminary Cost E	stimate and P	roject Eval	uation			<u>.</u>				
PV module				31,002	(US \$)	Variable co	st(O M cost)		56,154	(US §
Delivery of PV mod	ule			7	(US \$)					
Battery				6,000	(US_\$)	Total Cost			141,695	(បន \$
Controller equipmen	าไ			5,850	(US \$)					
Installation cost				16,900	(US \$)	Economic/I	Financial eval	uation	!	<u> </u>

5,750 (USS)

6,594 (USS) 7,254 (USS)

85,541 (USS)

Monthly payment per H.H.*

0.73

Photovoltaic Aspects

Scheme No.	P-18] .	:	Scheme Nar	าาอ		Tizgui)	
Administrative Div	ī	T	·			ו			•	
Douar	450	<u> </u>		zgul		 	1	· · · · · · · · · · · · · · · · · · ·		
C.R.	31	l	And	ougaí		Cercle	3		Amizmiz	
Location										
Latitude	N 31	10'	47"	Longitude	W 8	15'	11"	Altitude	1,180	(m)
	1 1 1 1 1	<u></u>		120.3.000	1			prinado		
Households and P	opulation		_	Size of Res	sidential A	rea		Access		
	Yr 1996	Yr 2000]	Fragments]	Pist	4.5	(km)
Households	60	62		E-W	800	(m)		Path	l	(km)
Population	250	259]	N-S	1,000	(m)		Total	1	(km)
Capacity of Photor	voltalc	,	,		1~······				<u> </u>	
Power demand		17.02	{kWh/day	<u>}</u>	Installed c	apacity		5,645	(Wp)]
>PV modute	0.00			1	>Battery		Ī		1	
Type Denet or fout	Silicon		A45-3		Туре		Portable le]	1	
Panel output	75	55	(Wp)		Capacity		100	(Ah)		
Voltage Numbers of Panel	65	12 14	(V)	· ·	Voltage Numbers o	of Dations	12	(<u>v)</u>		
Total Capacity	i _ &		(Wp)		Total Capa		79 7,900	(Ah)		
Total Oapachy	<u>:</u>	3,043	<u> </u>	.]	Tota: Cape	sury	7,900	1007	J	
>Controller				-	>Connect	ing Cable a	nd Switch			
Туре		attery char	Je]	Type of Sv		Single phas	e switch		-
Capacity		500	(w)		Type of Ca	able	Single phas	e CV		-
Numbers of Control	er	79	(kit)	<u> </u>	Numbers o	of System	79	(kit)	J	
Preliminary Cost E	stimate and P	roject Evalu	ation			<u>-</u>	- 1 No. 1	· · · · · · · · · · · · · · · · · · ·	· · ·	· .
PV module				37,598		Variable co	st(O M cost)		67,938	(US \$
Delivery of PV mode	ນໂອ			1	(US \$)					
Battery				Į.	(US \$)	Total Cost			171,785	(US S
Controller equipmen	it	-		1	(US \$)	<u> </u>				-
Installation cost				1	(US \$)	Economic/F	inancial evalu	Jation		
Tax Supervisor too				0,860	(US \$)		EIRR			(%)

103,827 (US \$)

8,804 (US\$) Monthly payment per H.H.*

Photovoltaic Aspects

Scheme No.	P-19		8	Scheme Nam	e l		Anermi		J
Administrative Divis	slon								,
Douar	490	<u> </u>	And	ermi				1	<u></u>
C.R.	32		Aze	jour		Cercle	3	A	mizmiz
Location				· - · · · · · · · · · · · · · · · · · ·				т	1 .
Latitude	N 31	7'	15"	Longitude	W 8	19'	5"	Altitude	1,700 (m)
Households and Po	pulation		_	Size of Res	idential A	rea	•	Access	
	Yr 1996	Yr 2000]	Fragments				Pist	0.0 (km)
Households	90	93		E-W	500	(m)		Path	2.5 (km)
Population	540	560]	N-S	500	(m)		Total	2.5 (km)
Capacity of Photov	oltaic								· · · ·
Power demand	0,1310	25.63	(kWh/day)	Installed c	apacity		12,430	(Wp)
	· Cillan	n Tunn		1	>Battery Type		Portable le	ad clad]
>PV module	r			1	r		To]
Туре		n Type	DAIrA		Capacity		100	(Ah)	
Panel output	75	55	(V)		Voltage		12	(V)	
Voltage	22	196	\(\frac{1}{2} - \cdot \)	- :		of Battery	120	11-1	
Numbers of Panel		12,840	(Wp)		Total Cap		12,000	(Ah)	
Total Capacity	<u> </u>	12,040	1(4,6)	.J	TOTAL DEP				•
>Controller		· ·		.		ting Cable a	1		1
Туре		Battery chai			Type of S		Single pha		
Capacity		500](W)	-	1	able	Single pha	i i	
Numbers of Control	er	120	(kit)		[Numbers	of System	120	(kit))
Preliminary Cost E	stimate and	Project Eval	uation		······································	· · · · ·	<u> </u>		·. · · .
				85,514	(US \$)	Variable co	st(O M cost)	 -	102,432 (US
PV module .				17,077	(US \$)				
PV module Delivery of PV modu	<u> </u>				(US \$)	Total Cost			301,269 (US
						1			1 1
Delivery of PV modu				40.000	(US \$)				
Delivery of PV modu Battery	at		·	10,800	1		Financial eva	luation	
Delivery of PV modu Battery Controller equipmer				10,800	(US \$)		EIRR	luation	(%)
Delivery of PV modu Battery Controller equipment Installation cost	n			10,800 31,200	(US S)			luation	0.46
Delivery of PV modu Battery Controller equipmer Installation cost Tax	nt			10,800 31,200 10,596 15,557	(US S)		EIRR B/C' yment per H	H.*	

Photovoltaic Aspects

P-20 Scheme No. Scheme Name Talat Ait Ihla Administrative Division Douar 510 Talat Ait Ihla C.R. 32 Azgour Cercle Location Latitude N 31 Longitude W 8 20' 59" Altitude 1,760 (m) Households and Population Size of Residential Area Access Yr 1996 Yr 2000 Fragments Pist 0.0 (km) Households 73 E-W 500 (m) Path 0.0 (km) Population 2f0 218 N-S 450 (m) Total 0.0 (km) Capacity of Photovoltale Power demand 19.48 (kWh/day) Installed capacity 9,340 (Wp) **Facility Description** >PV module >Battery Silicon Type Portable lead clad Туре Panel output (Wp) Capacity 100 (Ah) 12 12 Voltage (V) 12 148 Numbers of Panel Numbers of Battery Total Capacity 9,340 (Wp) Total Capacity 9,000 >Controller >Connecting Cable and Switch Туре Battery charge Type of Switch Single phase switch Capacity 500 (W) Type of Cable Single phase CV Numbers of Controller Numbers of System

Preliminary Cost Estimate and Project Evaluation	.				
PV module	62,204	(US \$)	Variable cost(O M cost)	78,050	(US S)
Delivery of PV module	12,422	(US \$)			
Battery	8,320	(US \$)	Total Cost	224,504	(US S)
Controller equipment	8,100	(US \$)			
Installation cost	23,400	(US \$)	Economic/Financial evaluation	-	
Тах	7,954	(US \$)	EIRR		(%)
Superviser fee	11,445	(US;\$)	8/C'	0.53	
Contingency	12,589	(US \$)	Monthly payment per H.H.*	4.0	(US \$)
Fixed cost	146,444	(US \$)	* Initial investment 0%	Discount R	ate 6%

Photovoltaic Aspects

Scheme No.	P-21	Scheme Name	Adghouss
	the street of the second		

			Distant	
Adm	INISI	rative	UIVIS	Offi

Douar	530	Adghouss		,	
C.R.	32	Azgour	Cercle	3	Amizmiz

Location							<u></u>	_
Latitude	H 31	11'	12"	Longitude W 8	19'	18"	Altitude	1,770 (m)

Households and	d Population	
L	Yr 1996	Yr 2000
Households	50	52
Population	200	207

Size of Residential Area				
Fragments	<u>1</u>			
E-W	150	(m)		
พ-ร	150	(m)		

Access		
Pist	2.0	(km)
Path	3.5	(km)
Total	5.5	(km)

Capacity of Photovoltaic						1
Power demand	14.30	(kWh/day)	Installed capacity	<u> </u>	6,875 (Wp)	J

Facility Description

•	P	v	modula
,,	•		111000010

Туре	Silico		
Panel output	75	- 55	(Wp)
Voltage	12	12	(7)
Numbers of Panel	11	110	
Total Capacity		6,875	(Wp)

>	Ba	tte	eri	4

Туре	Portable lead clad		
Capacity	100	(Ah)	
Voltage	12	(V)	
Numbers of Battery	66		
Total Capacity	6,600	(Ah)	

>C	ontroller	

Туре		 Battery cha	rge	
Capacity		 500	(W)	
Numbers of 0	Controller	66	(kit)	

>Connecting (cable at	nd Switch

Type of Switch	Single phase switch				
Type of Cable	Single pha	se CV			
Numbers of System	66	(kit)			

Preliminary Cost Estimate and Project E	valuation	,. <u></u>			
PV module	45,788	(US \$)	Variable cost(O M cost)	56,724	(US S)
Delivery of PV module	9,144	(US \$)			
Battery	6,080	(US \$)	Total Cost	164,335	(US \$)
Controller equipment	5,940	(US \$)	-		
Installation cost	17,160	(US \$)	Economic/Financial evaluation		<u> </u>
Тах	5,836	(US \$)	EIRR		(%)
Superviser fee	8,411	(US \$)	B/C'	0.61	
Contingency	9,252	(US \$)	Monthly payment per H.H.*	4.1	(US \$)
Fixed cost	107,611	(US \$)	* Initial investment	0%, Discount R	ale 6%

Photovoltaic Aspects

P-22 Scheme No. Scheme Name Tagadirt Administrative Division Douar 560 Tagadirt C.R. 32 Azgour Cercte Amizmiz Location Latitude N 31 11' Altitude Longitude W 8 54" 1,610 (m) 23" Households and Population Size of Residential Area Access Yr 1996 Yr 2000 Fragments Pist 2.5 (km) Households E-W 150 (m) Path 4.5 (km) Population 140 145 150 (m) Total 7.0 (km) Capacity of Photovoltale Power demand 13.89 (kWh/day) Installed capacity 6,580 (Wp) **Facility Description** >PV module >Battery Туре Silicon Type Portable lead clad Туре Panel output 55 (Wp)_ Capacity 100 (Ah) Voltage 12 12 (V) Voltage Numbers of Panel 106 Numbers of Battery 63 Total Capacity 6,580 (Wp) Total Capacity 6,300 >Controller >Connecting Cable and Switch Туре Battery charge Type of Switch Single phase switch

Capacity	500	(w)		Type of C	able	Single ph	ase CV	
Numbers of Controller	63	(kit)	=	Numbers	of System	63	(kit)	
Preliminary Cost Estimate a	nd Project Eva	ในสข้อก		·				
PV module			43,823	(US \$)	Variable co	ost(O M cost)	55,2
Delivery of PV module			8,751	(US \$)				-
a					Į.			1

PV module	43,823	(US \$)	Variable cost(O M cost)	55,254	(US \$)
Delivery of PV module	8,751	(US \$)		- .	
Battery	5,880	(US \$)	Total Cost	158,249	(US \$)
Controller equipment	5,670	(US \$)			
Installation cost	16,380	(US \$)	Economic/Financial evaluation		
Tax	5,586	(US \$)	EIRR		(%)
Superviser fee	8,050	(US \$)	B/C'	0.63	
Contingency	8,855	(US \$)	Monthly payment per H.H.*	4.0	(US S)
Fixed cost	102,995	(US \$)	* Initial Investment 0	%. Discount R	ata 6%

inventory conc	erned on	Phote	ovoita	ic Asp	ects	. •				
Scheme No.	P-23]	;	Scheme Nan	ne		Tifirt	e an de verte en]	
Administrative Div	rision	<u> </u>				1				
Douar	570			ifid				 	_ .	
C.R.	32		Az	gour		Cercle	3	<u> </u>	4mizmiz	-
Location				_				1		
Latitude	N 31	10'	43"	Longitude	W 8	24'	28"	Altitude	1,580	(m)
Households and F	opulation			Size of Res	sidential A	rea		Access		
	Yr 1996	Yr 2000]	Fragments	1]	Pist	2.5	(km)
Households	90	93	1	E-W	600	(m)	_	Path	3.5	(km)
Population	150	156		N-S	400	(m)		Total	6.0	(<u>km</u>)
Capacity of Photo Power demand		25.44	(kWh/da)	d	Installed c	apacity	· · · · · · · · · · · · · · · · · · ·	12,245	(Wp)	}
Facility Description	ก									
Facility Description	<u> </u>		Ţ	 1	>Battery		-		1	
>PV module	Silko	п Туре	ļ]	Туре		Portable le		-	
>PV module Type Panel output	Silico 75	55	(Wp)		Type Capacity		100	(Ah)	-	
>PV module Type Panel output Voltage	Silico 75	55 12	(V)		Type Capacity Voltage		100		-	
>PV module Type Panel output Voltage Numbers of Panel	Silico 75	55 12 194	(Y)		Type Capacity Voltage Numbers	of Battery	100 12 118	(Ah) (V)	-	
>PV module Type Panel output Voltage	Silico 75	55 12	1		Type Capacity Voltage	of Battery	100	(Ah)		
>PV module Type Panel output Voltage Numbers of Panel	Silico 75	55 12 194	(Y)		Type Capacity Voltage Numbers Total Caps	of Baltery acity	100 12 118 11,800	(Ah) (V) (Ah)		
>PV module Type Panel output Voltage Numbers of Panel Total Capacity	Silleo 75 12 21	55 12 194	(V) (Wp)		Type Capacity Voltage Numbers Total Capacity >Connect Type of Sy	of Battery acity ing Cable a	100 12 118 11,800 and Switch Single pha	(Ah) (V) (Ah)		
>PV module Type Panel output Voltage Numbers of Panel Total Capacity >Controller	Silleo 75 12 21	55 12 194 12,245	(V) (Wp)		Type Capacity Voltage Numbers Total Caps	of Battery acity ling Cable a witch	100 12 118 11,800	(Ah) (V) (Ah)		

Preliminary Cost Estimate and Project Evaluation	n			·	· ·
PV module	81,552	(US \$)	Variable cost(O M cost)	101,532	(US \$)
Delivery of PV module	16,286	(US \$)			
Battery	10,860	(US \$)	Total Cost	293,462	(US \$)
Controller equipment	10,620	(US \$)		·	.
Installation cost	30,680	(US \$)	Economic/Financial evaluation		
Tax	10,432	(US \$)	EIRR		(%)
Superviser fee	15,000	(បន \$)	B/C'	0.47	
Contingency	16,600	(US \$)	Monthly payment per H.H.*	4.1	(US \$)
Fixed cost	191,930	(US \$)	*Initial investment (0%, Discount R	ate 6%

Photovoltaic Aspects

Scheme No.	P-24]	;	Scheme Na	me		Anfrioun	9]	
Administrative Div	vision							-		
Douar	580		Anfi	loune]				
C.R.	32		Az	gour		Cercle	3	T	Amizmiz	
Location					 	·			<u>-</u>	
Latitude	N 31	11'	25"	Longitude	W 8	22'	17"	Altitude	1,720	(m)
Households and F	opulation			Size of Re	sidential A	rea		Access		
	Yr 1996	Yr 2000]	Fragments	Ţ		1	Pist	2.5	(km)
Households	60	62	1	E-W		(m)		Path		(km)
Population	120	124		N-S		(m)	1	Total	l .	(km)
			-				_			
Capacity of Photo	voltaic	, - · · - · · · · · · · · · · · · · · · 	*		_					
Power demand		17.02	(kWh/day)	Installed o	apacity		8,200	(Wp)]
>PV module	1	Tuna		1	>Battery		la		1	
Type Panel output	Silicon	I	(Wp)		Туре		Portable le	. i		
Voltage	75	12	(A)	•	Capacity Voltage		100	(Ah) (V)		
Numbers of Panel	14	130	(V)		Numbers	of Rattery	79	1527		
Total Capacity		8,200	(Wp)		Total Cap		7,900	(Ah)		
Total Copacity	<u> </u>	0,200	11.17	J	Total Oup	dony	1,500	17217	J	
>Controller		<u> </u>			>Connect	ling Cable a	nd Switch			
Туре		lattery char	ge		Type of St	witch	Single pha	se switch		
Capacity		500	(W)		Type of C	able	Single pha	se CV		
Numbers of Control	ler	79	(kit)	j .	Numbers	of System	79	(kit)	J	-
Preliminary Cost 6	stimate and P	roject Evalı	ıation							
PV module	- CALLAGO CALGA	101001 12 10.		54.612	(US \$)	Variable co	st(O M cost)		67,938	0188
Delivery of PV mod	ule			10,906		Tunaore co	ailo ili coad		07,300	(03.0
Battery	F:T = .= =				(US \$)	Total Cost			196,466	OS S
Controller equipmer	nt				(US \$)			-		1
Installation cost				20,540		 Economic/F	inancial eval	uation		-
Tax				1	(US \$)		EIRR			(%)
Superviser fee			•	10,045	!		B/C*		0.56	
Contingency		:		11,049	1	Monthly pay	ment per H.I	⊀.*		(US\$
Fixed cost				128,528	(US \$)]	* Initial in	vestment 0%	•	

Photovoltaic Aspects

Tifratine P-25 Scheme No. Scheme Name Administrative Division Tifratine Douar 600 Amizmiz Dar Jamaa Cercle C.R. Location 46" Altitude 810 (m) W 8 20' N 31 17' Longitude Latitude Size of Residential Area Access Households and Population 3.6 (km) Pist Yr 1996 Yr 2000 Fragments 0.0 (km) 3,000 (m) Path E-W Households 80 83 3.6 (km) Total 2,000 (m) 600 622 N S Population Capacity of Photovoltale 7,550 (Wp) (kWh/day) Installed capacity Power demand 22.67 **Facility Description** >Battery >PV module Portable lead clad Silicon Type Туре 100 (Ah) Panel output_ 75 55 (Wp) (V) 12 12 Voltage 106 20 Numbers of Battery Numbers of Panel (Wp) Total Capacity 10,500 Total Capacity >Connecting Cable and Switch >Controller Type of Switch Single phase switch Туре Battery charge Single phase CV Type of Cable Capacity 106 Numbers of System 106 Numbers of Controller

Preliminary Cost Estimate and Project Evaluation					
PV module	72,994	(US \$)	Variable cost(O M cost)	90,624	(បន្ទន)
Delivery of PV module	14,577	(US \$)			
Battery	9,700	(US \$)	Total Cost	262,573	(US \$)
Controller equipment	9,540	(US \$)		-	
Installation cost	27,560	(US S)	Economic/Financial evaluation	<u> </u>	Ĺ
Tax :	9,350	(USS)	EIRR		(%)
Superviser fee	13,437	(US S)	B/C'	0.49	
Contingency	14,781	(us s)	Monthly payment per H.H.*	4.1	(US \$)
Fixed cost	171,949	(US \$)	★ in itial investment 0*	%, Discount R	ale 6%

Fixed cost

Photovoltaic Aspects

P-26 Scheme No. Scheme Name Aguenze Administrative Division Douar 610 Aguenze C.R. 33 Dar Jamaa Cercle Amizmiz Location 14" 820 (m) Latitude Longitude W S 22' 3" Altitude N 31 17 Households and Population Size of Residential Area Access Yr 1996 Yr 2000 3.7 (km) Fragments Pist E-W Path 0.0 (km) 20 21 300 (m) Households N-S 3.7 (km) 207 250 (m) Total Population 200 Capacity of Photovoltaic Power demand 5.88 (kWh/day) Installed capacity 1.945 (Wp) **Facility Description** >PV module >Battery Туре Silicon Type Type Portable lead clad Panel output 75 55 (Wp) Capacity 100 12 (V) Voltage Voltage Numbers of Battery Numbers of Panel Total Capacity 1,945 Total Capacity 2,700 >Controller >Connecting Cable and Switch Type of Switch Single phase switch Туре **Battery charge** 500 Type of Cable Single phase CV Capacity Numbers of System 27 (kit) Numbers of Controller (kit) Preliminary Cost Estimate and Project Evaluation 12,954 (US\$) Variable cost(O M cost) 23,142 (US \$) Delivery of PV module 2,587 (US \$) Battery 2,500 (USS) **Total Cost** 57,796 (US \$) Controller equipment 2,430 (US \$) Installation cost 7,020 (US \$) Economic/Financial evaluation 2,390 (US \$) **EIRR** 20 (%) Superviser fee 1,749 (US\$) B/C' Contingency 3,024 (US\$) Monthly payment per H.H.* 4.2 (USS)

34,654 (US\$)

Photovoltaic Aspects

Scheme No. P-27 Scheme Name Ilit Baragha

Administrative Division

Douar	620	llit Baragha		,	
C.R.	33	Dar Jamaa	Cercle	3	Amizmiz

 Location
 Latitude
 N 31
 15'
 57"
 Longitude
 W 8
 20'
 57"
 Altitude
 850 (m)

Households and Population						
	Yr 1996	Yr 2000				
Households	35	36				
Population	250	259				

Size of Residential Area				
Fragments	. <u>1</u>	· · · · - ·		
E-W	1,150	(m)		
N-S	1,150	(m)		

Access		:
Pist	1.7	(km)
Path	0.3	(km)
Total	2.0	(km)

Capacity of Photovoltaic		,			·
Power demand	9.98	(kWh/day)	Installed capacity	3,290	(Wp)

Facility Description

>PV	module

DE L'ENOGOIG			·
Туре	Silicon Type		
Panel output	75	55	(Wp)
Voltage	12	12	(v)
Numbers of Panel	38	8	
Total Capacity		3,290	(Wp)

>	8	at	l٤	ry	

> Dallely				
Туре	Portable lead clad			
Capacity	100	(Ah)		
Voltage	12	(v)		
Numbers of Battery	46			
Total Capacity	4,600	(Ah)		

>Controller

7 9 9 110 9 110 1			····
Туре	Battery charge		
Capacity		500	(w)
Numbers of Contro	oller ·	46	(kit)

>Connecting	Cable and	Switch

Type of Switch	Single phase switch		
Type of Cable	Single phase CV		
Numbers of System	46 (kit)		

Preliminary Cost Estimate and Project Evaluation

PV modula	21,911	(US \$)	Variable cost(O M cost)	39,588	(US S)
Delivery of PV module	4,376	(US \$)			ļ
Battery	4,240	(US \$)	Total Cost	100,075	(US S)
Controller equipment	4,140	(US \$)			
Installation cost	11,960	(US \$)	Economic/Financial evaluation	<u> </u>	ļ
Tax	4,068	(US \$)	EIRR		(%)
Superviser fee	4,663	(US \$)	B/C'	0.87	
Contingency	5,129	(US \$)_	Monthly payment per H.H.*	4.0	(US \$)
Fixed cost	69,487	(US \$)	* Initial investment 0	%, Discount R	ate 6%

Photovoltaic Aspects Inventory concerned on P-28 Scheme No. Scheme Name Agadir Baragha Administrative Division Dogar 630 Agadir Baragha C.R. 33 Dar Jamaa Amizmiz Cercle Location Latitude N 31 Longitude W 8 20" 28" Altitude 1,070 (m) Households and Population Size of Residential Area Yr 1996 Yr 2000 Fragments Pist 2.0 (km) E-W Households 40 41 400 (13) Path 0.0 (km) Population 300 311 2.0 (km) 800 (m) Total Capacity of Photovoltale Power demand 11.43 (kWh/day) Installed capacity Facility Description

Туре	Silicon	n Type	
Panel output	75	55	(Wp)
Voltage	12	12	(V)
Numbers of Panel	44	8	. l .
Total Capacity	-	3,740	(Wp)

D11

Туре	Portable lead cla			
Capacity	100	(Ah)		
Voltage	12	(V)		
Numbers of Battery	52			
Total Capacity	5,200	(Ah)		

>Controller	
Туре	Battery charge
Capacity	500 (W)
Numbers of Controller	52 (kit)

>Connecting Cable a	nd Switch	 			
Type of Switch	Single ph	ase switch			
Type of Cable Single phase CV					
Numbers of System	52	(kit)			

Preliminary Cost Estimate and Project Evaluation PV module 24,908 (US \$) Variable cost(O M cost) 45,156 (USS) Delivery of PV module 4,974 (US \$) 4,840 (US\$) **Total Cost** Controller equipment 4,680 (US \$) Installation cost 13,520 (US \$) Economic/Financial evaluation Tax 4,608 (US \$) EIRR --- .(%) Superviser fee 5,292 (USS) B/C' 0.82 Contingency 5,821 (USS) Monthly payment per H.H.* Fixed cost 68,643 (US \$) * Initial investment 0%, Discount Rate 6%

Fixed cost

Photovoltaic Aspects

Adar Baragha P-29 Scheme Name Scheme No. Administrative Division Adar Baragha Douar 650 Cercle Amizmiz Dar Jamaa C.R. Location 1,070 (m) 22" Altitude 20' 13' Longitude W 8 Latitude N 31 Size of Residential Area Access Households and Population Fragments Pist 2.5 (km) Yr 1996 Yr 2000 1.5 (km) Path E-W 500 (m) Households 11 4.0 (km) Total 250 (m) N-S Population Capacity of Photovoltaic 1.085 (Wp) (kWh/day) Installed capacity 3.33 Power demand **Facility Description** >PV module >Battery Portable lead clad Silicon Type Туре 100 (Ah) 75 55 Panel output (V) 12 Voltage Numbers of Battery 15 2 Numbers of Panel Total Capacity 1,500 1,085 Total Capacity >Connecting Cable and Switch >Controller Type of Switch Single phase switch Battery charge Туре Single phase CV 500 (W) Type of Cable Capacity 15 Numbers of System Numbers of Controller Preliminary Cost Estimate and Project Evaluation 12,894 (US \$) 72,226 (US S) Variable cost(O M cost) 1,443 (US \$) Delivery of PV module 1,400 (US \$) 97,760 **Total Cost** Battery 1,350 (US \$) Controller equipment Economic/Financial evaluation 3,900 (US \$) installation cost (%) 1,330 (US \$) >100 EIRR 8/C* 1,532 (US \$) Superviser fee Monthly payment per H.H.* 1,685 (USS) Contingency

84,866 (USS)

Photovoltaic Aspects

Scheme No. P-30 Scheme Name Tadchert

2		47	Dist.	a a I a
AUM	inistra	JUYU	DIVE	SIUIL

Douar	660	Tadchert			
C.R.	33	Dar Jamaa	Cercle	3	Amizmiz

Location

	41 01	411		247.0	20'	401	Altitude	1.100 (m)
	N 31		I Longitude - I					i <i>1.100</i> (m) l
Latitude				l Wa	20			

Households and Population

	Yr 1996	Yr 2000
Households	30	31
Population	200	207

Size of Residential Area					
Fragments	f	-			
E-W	600	(m)	_		
N-S	400	(m)			

Access		
Pist	2.5	(km)
Path	0.0	(km)
Total	2.5	(km)

Capacity of Photovoltaic

	4	1	1		
1		•			2 a
1					1 ~
Power demand	8.39	(kWh/day)	IInstalled capacity	2,785	(Wn)
TEUNELUCIDADU	0.00	:1011110011	HUSKETOS CODOCIT		
				<u> </u>	

Facility Description

>PV module

PF THOUGH			
Туре	Silico		
Panel output	75	55	(Wp)
Voltage	12	12	(v)
Numbers of Panel	32	7	1
Total Capacity		2,785	(Wp)

	Ba	tta	n
_	~~	***	, 1

, , , , , , , , , , , , , , , , , , , ,				
Туре	Portable lead clad			
Capacity	100	(Ah)		
Voltage	12	(v)		
Numbers of Battery	39			
Total Capacity	3,900	(Ah)		

-Controller

Soundones	
Type	Battery charge
Capacity	500 (W)
Numbers of Controller	39 (kit)

>Connecting Cable and Switch

Type of Switch Single phase switch		
Type of Cable	Single phas	e CV
Numbers of System	39	(kit)

Preliminary Cost Estimate and Project Evaluation

DU + 1-		(110.0)	Wastable and OH and	42.570	(110.0)
PV module	18,548	ໄດ້ວ່ ວ່າ	Variable cost(O M cost)	33,570	(no s)
Delivery of PV module	3,704	(US \$)			
Battery	3,580	(US \$)	Total Cost	84,789	(US \$)
Controller equipment	3,510	(US \$)		 	-
Installation cost	10,140	(US \$)	Economic/Financial evaluation	ļ 	1
Tax	3,446	(US \$)	EIRR	4	(%)
Superviser fee	3,948	(US \$)	B/C*	0.97	
Contingency	4,343	(US \$)	Monthly payment per H.H.*	4.1	(US \$)
Fixed cost	51.219	(USS)	* Initial investment	0% Discount R	ate 6%

Contingency

Fixed cost

Photovoltaic Aspects

Tamsoult P-31 Scheme Name Scheme No. Administrative Division Tamsoult Douar Cercle Amizmiz Dar Jamaa C.R. Location 960 (m) 25" Altitude 20' Longitude W 8 N 31 14' Latitude Size of Residential Area Access Households and Population 2.5 (km) Pist Fragments Yr 1996 Yr 2000 0.0 (km) 500 (m) Path E-W 5_ Households 2.5 (km) Total 500 (m) พ-ร Population Capacity of Photovoltaic (Wp) 430 (kWh/day) Installed capacity 1.32 Power demand **Facility Description** >Battery »PV module Portable lead clad Silicon Type 100 (Ah) (Wp) (V) Voltage Numbers of Battery Numbers of Panel 600 (Ah) Total Capacity Total Capacity >Connecting Cable and Switch >Controller Type of Switch Single phase switch Battery charge Туре Single phase CV Type of Cable (W) Capacity Numbers of System Numbers of Controller Preliminary Cost Estimate and Project Evaluation 5,340 (US\$) 2,864 (US \$) Variable cost(O M cost) 572 (US \$) Delivery of PV module 13,249 (US \$) 560 (US S) Battery ____ 540 (US \$) Controller equipment Economic/Financial evaluation 1,560 (US S) Installation cost --- (%) 532 (US \$) EIRR Tax 3.98 B/C' 610 (US S) Superviser fee

671 (US \$)

7,909 (US \$)

Monthly payment per H.H.

4.0 (US \$)

Photovoltaic Aspects

Scheme No.

P-32

Scheme Name

Dar Jamaa Ait Ali

Administrative Division

Douar	680	Dar Jamaa Alt Ali			
C.R.	33	Dar Jamaa	Cercle	3	Amizmiz

Location

	11.04	58				59"		
				14/0	221			970 (m)
Habbida	1 N SI		Trocomore :	1 12 7			LAITIDINGO	1 970 (m) 1
					22			

Households and Population

	Yr 1996	Yr 2000
Households	60	62
Population	220	228

Size of Residential Area					
Fragments	1				
E-W	400	(m)			
N-S	300	(m) ·			

Access		
Pist	1.0	(km)
Path	0.0	(km)_
Total	1.0	(km)

Capacity of Photovoltaic

1			 		1	(
Power demand	17.22	(kWh/day)	Installed capacity		5.755	(Wo)
				·		

Facility Description

>PV module

Туре	Silico		
Panel output	75	55	(Wp)
Voltage	12	12	_ (V)
Numbers of Panel	65	16	
Total Capacity		5,755	(Wp)

>	Bat	tery

Туре	Portable lead clad		
Capacity	100	(Ah)	
Voltage	12	[(V)	
Numbers of Battery	81		
Total Capacity	8,100	(Ah)	

>Controller

Туре	Battery charge
Capacity	500 (W)
Numbers of Controller	81 (kit)

>Connecting Cable and Switch

Type of Switch	Single phase switch
Type of Cable	Single phase CV
Numbers of System	81 (kit)

Preliminary Cost Estimate and Project Evaluation

PV module	38,328	(US \$)	Variable cost(O M cost)	68,839	(US S
Delivery of PV module	7,654	(US \$)			
Battery	7,400	(US S)	Total Cost	174,885	(US S
Controller equipment	7,290	(US S)			
Installation cost	21,060	(US S)	Economic/Financial evaluation	<u>'</u>	i i
Tax	7,150	(US S)	EIRA		(%)
Superviser fee	8,173	(US S)	B/C'	0.65	
Contingency	8,991	(US \$)	Monthly payment per H.H.*	4.1	(US \$)
Fixed cost	106,046	(US S)	* Initial investment 0%		

Superviser lee

Fixed cost

Contingency

Photovoltaic Aspects

Agadir Ait Brahim P-33 Scheme Name Scheme No. Administrative Division Agadir Alt Brahim Douar 690 Amizmiz Cercle Dar Jamaa C.R. Location 980 (m) Altitude Longitude W 8 22' 14 Latitude N 31 Access Size of Residential Area Households and Population 1.0 (km) Pist Yr 2000 Fragments Yr 1996 0.0 (km) Path E-W 500 (m) 28 29 Households 1.0 (km) 300 (m) Total 124 Population Capacity of Photovoltaic (Wp) 2.560 Installed capacity (kWh/day) Power demand 7.71 **Facility Description** >Battery »PV module Portable lead clad Silicon Type Туре Type 100 (Ah) 55 Capacity Panel output Voltage 12 12 Voltage Numbers of Battery Numbers of Panel Total Capacity 3,600 Total Capacity >Connecting Cable and Switch >Controller Type of Switch Single phase switch Battery charge Type Type of Cable Single phase CV 500 (W) Capacity Numbers of System 36 (kit) Numbers of Controller Preliminary Cost Estimate and Project Evaluation 31,044 (US \$) 17,050 (US \$) Variable cost(O M cost) PV module 3,405 (US \$) Delivery of PV module 78,213 (US \$) 3,300 (US \$) 3,240 (US\$) Controller equipment 9,360 (US \$) Economic/Financial evaluation Installation cost 6 (%) EIRR 3,180 (US \$)

3,635 (US \$)

3,999 (US \$)

47,169 (US\$)

8/C'

Monthly payment per H.H.*

1.00

* Initial investment 0%, Discount Rate 6%

4.0 (US \$)

Photovoltaic Aspects

Scheme No.	P-34	Scheme Name	louraghan

Douar	700	louraghan			
C.R.	33	Dar Jamaa	Cercle	3	Amizmiz

Location

	At 04	39"		W 8	201	Diff	Altitude	950 (m)	
	N 31		Lloggitude I					! 950 (m) l	

·	Yr 1996	Yr 2000
Households	18	. 19
Population	80	83

Size	of Re	sidential	Area
-			Ī

Fragments	1	
E-W	300	(m)
N-S	200	(m)

Access		
Pist	3.0	(km)
Path	0.0	(km)

Capacity of Photovoltaic

r-1	,		
Power demand	5.18 (kWh/day)	Installed capacity	1.720 (Wp)

Facility Description

>P\	mot	fu!e

Туре	Silico		
Panel output	75	55	(VVp)
Voltage	12	12	(V)
Numbers of Panel	20	4	
Total Capacity		1,720	(Wp)

:	٠Ē	at	te	n

Туре	Portable lead clad			
Capacity	100	(Ah)		
Voltage	12	(v)		
Numbers of Battery	24			
Total Capacity	2,400	(Ah)		

>Controller

Туре	Battery charge		
Capacity	500 (W)		
Numbers of Controller	24 (kit)		

>Connecting Cable and Switch

Type of Switch Single phase switch				
Type of Cable	Single phase CV			
Numbers of System	24	(kit)		

Preliminary Cost Estimate and Project Evaluation

PV module	11,455	(US \$)	Variable cost(O M cost)	20,640	(US S)
Delivery of PV module	2,288	(US \$)			
Battery	2,220	(US \$)_	Total Cost	52,243	(US S)
Controller equipment	2,160	(US \$)			
Installation cost	6,240	(US \$)	Economic/Financial evaluation		
Tax	2,124	(US \$)	EIRR	37	(%)
Superviser fee	2,436	(US \$)	B/C'	1.29	
Contingency	2,630	(US §)	Monthly payment per H.H.*	4.1	(US \$)
Fixed cost	31,603	(US \$)	*Initial investment 0%, Discount Rate 6%		

Contingency

Fixed cost

Photovoltaic Aspects

lmikl Scheme Name Scheme No. P-35 Administrative Division 710 lmiki Douar Amizmiz Dar Jamaa 33 C.R. Location 43" Altitude 880 (m) Longitude W 8 23' 15' Latitude Size of Residential Area Access Households and Population Pist 0.7 (km) Yr 2000 Fragments Yr 1996 0.0 (km) Path E-W 400 (ന) 52 Households 50 0.7 (km) 300 (m) Tota! N-S 500 Population Capacity of Photovoltalo 4,635 (Wp) Installed capacity (kWh/day) 13.99 Power demand **Facility Description** >Battery >PV module Portable lead clad Type Silicon Type Туре 160 (Ah) Panel output (Wp) Voltage 12 12 (V) Voltage _ Numbers of Battery Numbers of Panel 12 Total Capacity 6,500 Total Capacity >Connecting Cable and Switch >Controller Single phase switch Type of Switch Battery charge Single phase CV Type of Cable (W) Capacity Numbers of System Numbers of Controller Preliminary Cost Estimate and Project Evaluation 55,914 (US \$) 30,869 (US \$) Variable cost(O M cost) PV module 6,165 (USS) Delivery of PV module 141,206 (US \$) *5,960* (US \$) Total Cost 5,850 (US \$) Controller equipment 18,900 (US \$) Economic/Financial evaluation Installation cost (%) 5,742 (US\$) **EIRR** B/C' 0.73 6,574 (USS) Superviser fee

7,232 (US \$)

85,292 (US \$)

Monthly payment per H.H.

* Initial investment 0%, Discount Rate 6%

Photovoltaic Aspects

Scheme No.

P-36

Scheme Name

Ilit Alt Alla

Administrative Division

Douar	720	lfit Ait Alla			
C.R.	33	Dar Jamaa	Cercle	3	Amizmiz

Location

Latitude N 31 - 15' 25" Longitude W 8 24' 16" Altitude 900 (m)	[
		N 31	. 15'	Longitude	W 8	24'	16"	Altitude	<i>900</i> (m)

Households and Population

	Yr 1996	Yr 2000
Households	22	23
Population	200	207

Size of Residential Area						
Fragments	1					
E-W	1,000	(m)				

500 (m)

Access		
Pist	1.2	(km)
Path	0.0	(km)
Tota!	1.2	(km)

Capacity of Photovoltaic

	ł .	!		
Power demand	6.28	(kWh/day)	Installed capacity	2,130 (Wp)

Facility Description

>PV module

Туре	Silico		
Panel output	75	55	(Wp)
Voltage	12	12	(٧)
Numbers of Panel	24	8	
Total Capacity	٠.	2,130	(Wp)

>	В	a	tł	ē	n

250((C))					
Туре	Portable lead clad				
Capacity	100	(Ah)			
Voltage	12	(V)			
Numbers of Battery	30				
Total Capacity	3.000	(Ah)			

>Controller

700/110/101	
Туре	Battery charge
Capacity	500 (W)
Numbers of Controller	30 (kit)

>Connecting Cable and Switch

Type of Switch	Single phase switch
Type of Cable	Single phase CV
Numbers of System	<i>30</i> (kit)

Tremmery cost contracts and respect	11000014	т			
PV module	14,186	(US S)	Variable cost(O M cost)	25,308	(US\$
Delivery of PV module	2,833	(US \$)			
Battery -	2,720	(US \$)	Total Cost	64,541	(US \$
Controller equipment	2,700	(US \$)		-	i
Installation cost	7,800	(US \$)	Economic/Financial evaluation		ļ .
Tax	2,644	(US \$)	EIRR	13	(%)
Superviser fee	3,024	(US \$)	8/C'	1.11	
Contingency	3,326	(US \$)	Monthly payment per H.H.*	4.2	(US S)
Fixed cost	39.233	เบรรา	*Initial investment 0	% Discount B	ata 694

Superviser fee

Fixed cost

Contingency

Photovoltaic Aspects

Boukhelf P-37 Scheme Name Scheme No. Administrative Division Boukhelf Douar 730 Amizmiz Cercle Dar Jamaa C.R. 33 Location 950 (m) Altitude Longitude W 8 57" 14 Latitude N 31 Access Size of Residential Area Households and Population 3.0 (km) Pist Fragments Yr 2000 Yr 1996 0.0 (km) Path 1,000 (m) E-W 85 88 Households 3.0 (km) Total N-S 500 (m) 441 425 Population Capacity of Photovoltaic installed capacity 8,110 (Wp) (kWh/day) 24.20 Power demand **Facility Description** >Battery >PV module Portable lead clad Silicon Type Type 100 (Ah) Capacity Panel output (V) Voitage Voltage 12 114 Numbers of Battery Numbers of Panel 11,400 Total Capacity Total Capacity >Connecting Cable and Switch >Controller Single phase switch Type of Switch Battery charge Туре Single phase CV Type of Cable 500 (W) 114 114 (kit) Numbers of System Numbers of Controller Preliminary Cost Estimate and Project Evaluation 96,852 (US \$) 54,013 (US \$) Variable cost(O M cost) 10,786 (US \$) Delivery of PV module 246,154 (US \$) 10,380 (US \$) Total Cost 10,260 (US \$) Controller equipment Economic/Financial evaluation 29,640 (USS) Installation cost --- (%) 10,056 (US \$) EIRR 0.57 B/C' 11,508 (US \$)

12,659 (US S)

149,302 (US \$)

Monthly payment per H.H.*

4.1 (US \$)

* Initial investment 0%, Discount Rate 6%

Photovoltaic Aspects

Scheme No. P-38 Scheme Name Addar Ait All Administrative Division Douar Addər Alt Ali C.R. 33 Dar Jamaa Cercle Amizmiz Location Latitude N 31 14" 26" Longitude W 8 23' 27" Altitude 1,030 (m) Households and Population Size of Residential Area Access Yr 1996 Yr 2000 Fragments Pist 2.5 (km) Households 22 23 E-W 400 (m) Path 0.0 (km) Population 150 156 N-S 300 (m) Total 2.5 (km) Capacity of Photovoltale Power demand (kWh/day) 6.46 installed capacity 2,205 (Wp) **Facility Description** >PV module >Battery Туре Silicon Type Туре Portable lead clad Panel output 75 _ 55 (Wp) Capacity 100 (Ah) Voltage 12 12 Voltage 12 Numbers of Panel Numbers of Battery 31 Total Capacity Total Capacity 3,100 >Controller >Connecting Cable and Switch Туре Battery charge Type of Switch Single phase switch Capacity 500 Type of Cable (W) Single phase CV Numbers of Controller 31 (kit) Numbers of System 31 (kit)

Preliminary Cost Estimate and Project Evaluation					
PV module	14,685	(US \$)	Variable cost(O M cost)	25,878	(บรร)
Delivery of PV module	2,933	(US \$)			1
Battery	2,800	(US \$)	Total Cost	66,442	(US S)
Controller equipment	2,790	(US \$)	_		
Installation cost	8,060	(US \$)	Economic/Financial evaluation		
Tax	2,730	(US \$)	EIRR	11	(%)
Superviser fee	3,127	(US S)	B/C*	1.08	E-1
Contingency	3,439	(US \$)	Monthly payment per H.H.*	-	(US \$)
Fixed cost	40,564	(US \$)	* Initial investment 09		

Photovoltaic Aspects

Ait M'Barek P-39 Scheme Name Scheme No. Administrative Division Ail M'Barek Douar Amizmiz Cercle Dar Jamaa C.R. Location 56" Altitude 1,060 (m) 21' 42" W 8 13' Longitude N 31 Latitude Size of Residential Area Access Households and Population 3.5 (km) Fragments Pist Yr 1996 Yr 2000 0.4 (km) É-W 300 (m) Path 30 31 -Households 3.9 (km) 200 (m) Total 120 N-S Population Capacity of Photovoltaic 2,785 (Wp) Installed capacity (kWh/day) 8.39 Power demand **Facility Description**

>PV module			,
Туре	Silico	туре	
Panel output	75	55	(M5)
Voltage	12	12	(<u>v</u>)
Numbers of Panel	32	7	
Total Capacity		2,785	(Wp)

Туре	Portable le	ead clad
Capacity	100	(Ah)
Voltage	12	(V)
Numbers of Battery	39	
Total Capacity	3,900	(Ah)

>Controller	
Туре	Battery charge
Capacity	500 (W)
Numbers of Controller	39 (kit)

>Connecting Cable a	and Switch	
Type of Switch	Single ph	ase switch
Type of Cable	Single ph	ase CV
Numbers of System	39	(kit)

Preliminary Cost Estimate and Project Evaluation					
PV module	18,548	(US \$)	Variable cost(O M cost)	33,570	(US \$)
Delivery of PV module	3,704	(US <u>\$)</u>			
8attery	3,580	(US \$)	Total Cost	84,789	(US \$)
Controller equipment	3,510	(US \$)			
Installation cost	10,140	(US \$)	Economic/Financial evaluation	<u> </u>	ļ. ·
Tax	3,445	(US \$)	EIRR	4	(%)
Superviser fee	3,948	(US \$)	B/C'	0.97	
Contingency	4,343	(US \$)	Monthly payment per H.H.*	4.1	(US \$)
Fixed cost	51,219	(US \$)	* Initial investment (0%, Discount R	ate 6%

Photovoltaic Aspects

Scheme No.

P-40

Scheme Name

Agadir Ait Bourd

Administrative Division

Douar	780	Agadir Alt Bourd			
C.R.	33	Dar Jamaa	Cercle	3	Amizmiz

Location

				1					T
Latitude	N 31	13'	14"	Longitude	W 8	22'	31"	Altitude	1,190 (m)

Households and Population

	Yr 1996	Yr 2000
Households	60	62
Population	400	415

	identi	

Fragments	1	-
E-W	500	(m) -
N-S	300	(m)

Δ	ccess	
~	CCG33	

Pist	3.5	(km)
Path	1.5	(km)
Total	5.0	(km)

Capacity of Photovoltaic

Total designs 10.04 (Killings) Installed capacity 3,070 (Mp)	Power demand		(kWh/day)	Installed capacity	5,570	(Wp)
--	--------------	--	-----------	--------------------	-------	------

Facility Description

>PV module

	·		
Туре	Silicon Type		
Panel output	75	55	(Wp)
Voitage	12	12	_(<u>v)</u>
Numbers of Panel	64	14	_
Total Capacity		5,570	(Wρ)

>	8a	tten	

Туре	Portable lead clad		
Capacity	100	(Ah)	
Voltage	12	(v)	
Numbers of Battery	78		
Total Capacity	7,800 (Ah)		

>Controller

Type Battery charge				
Capacity	500	(W)		
Numbers of Controller	78	(kit)		

>Connecting Cable and Switch

Type of Switch	Single phase switch		
Type of Cable	Single phase CV		
Numbers of System	78	(kit)	

The state of the s	<u> </u>				
PV module	36,730	(US \$)	Variable cost(O M cost)	67,038	(US \$
Delivery of PV module	7,335	(US \$)			l
Battery	7,160	(US \$)	Total Cost	168,451	(US \$)
Controller equipment	6,930	(US \$)			
Installation cost	20,020	(US \$)	Economic/Financial evaluation		<u> </u>
Tax	6,822	(US \$)	EIRR		(%)
Superviser fee	7,817	(US \$)	B/C'	0.68]
Contingency	8,599	(US \$)	Monthly payment per H.H.*	4.0	(US \$)
Fixed cost	101,413	(US \$)	*Initial investment 0%, Discount Rate		ate 6%

Photovoltaic Aspects

Afella Quassif P-41 Scheme Name Scheme No. **Administrative Division** Afella Quassif Douar 790 Amizmiz 33 Dar Jamaa C.R. Location 10" 22' 8" Altitude 1,110 (m) Longitude W 8 13' Latitude N 31 Households and Population Size of Residential Area Access 3.5 (km) Pist Yr 1996 Yr 2000 Fragments 0.9 (km) Path 26 E-W 700 (m) Households Total N-S 400 (m) Population 120 124 Capacity of Photovoltaic (Wp) 2,225 (kWh/day) Installed capacity Power demand 6.86 **Facility Description** >Battery >PV module Туре Portable lead clad Silicon Type Type 100 (Ah) 55 Capacity Panel output (V) 12 12 Voltage 31 Numbers of Battery Numbers of Panel 3,100 (Ah) Total Capacity 2,225 (Wp) **Total Capacity**

>Controller			
Туре	Battery cha	rge	
Capacity	500	(w)	
Numbers of Controller	31	(kit)	

>Connecting Cable 8	and Switch			
Type of Switch Single phase switch				
Type of Cable	Single phase CV			
Numbers of System	31	(kit)		

Pretiminary Cost Estimate and Project Evaluation 27,366 (US \$) 14,819 (US\$) Variable cost(O M cost) PV module 2,959 (US \$) Delivery of PV module 68,265 (US \$) 2,900 (US \$) 2,790 (US \$) Controller equipment Economic/Financial evaluation 8,060 (US S) Installation cost **EIRR** 12 (%) 2,750 (US\$) Tax B/C. 1.09 3,153 (US\$) Superviser fee 4.0 (US S) 3,468 (US \$) Monthly payment per H.H. Contingency 40,899 (US \$) * Initial investment 0%, Discount Rate 6% Fixed cost

Photovoltaic Aspects

P-42 Afella ighil Scheme No. Scheme Name **Administrative Division** Douar 810 Afella Ighil C.R. 34 Ameghrass Cercle Amizmiz Location 14" Latitude 12' Longitude W 8 10' 49" Altitude 1,033 (m) N 31 Size of Residential Area Households and Population Access Yr 1996 Yr 2000 Fragments Pist 1.5 (km) Path Households 10 10 E-W 150 (m) 0.5 (km) 150 (m) 2.0 (km) Population 70 73 N-S Total Capacity of Photovoltaic Installed capacity 935 (Wp) Power demand 2.80 (kWh/day)

Facility Description

>PV module			· · · · · · · · · · · · · · · · · · ·
Туре	Sitico	туре	
Panel output	75	55	(Wp)
Voltage	12	12	(<u>v</u>)
Numbers of Panel	11	2	1
Total Capacity		935	(Wp)

>Battery				
Туре	Portable lead clad			
Capacity	100	(Ah)		
Voltage	12	(v)		
Numbers of Battery	13			
Total Capacity	1,300	(Ah)		

>Controller		
Туре	Battery ch	arge
Capacity	500	(W)
Numbers of Controller	13	(kit)

>Connecting Cable a	and Switch	
Type of Switch	Single ph	ase switch
Type of Cable	Single ph	ase CV
Numbers of System	13	(kột)

Preliminary Cost Estimate and Project Ex	/aluation	· · · · · · · · · · · · · · · · · · ·	<u> </u>		
PV module	6,227	(US \$)	Variable cost(O M cost)	11,238	(US \$)
Delivery of PV module	1,244	(US \$)			
Battery	1,200	(US \$)	Total Cost	28,385	(US \$)
Controller equipment	1,170	(US \$)]
Installation cost	3,380	(US \$)	Economic/Financial evaluation		
Тах	1,150	(US \$)	EIRR	>100	(%)
Superviser fee	1,322	(US \$)	B/C*	2.05	
Contingency	1,454	(US \$)	Monthly payment per H.H.*	4.2	(US \$)
Fixed cost	17,147	(US S)	★Initial investment (ጋ%, Discount R	ate 6%

Installation cost

Superviser fee

Fixed cost

Contingency

Photovoltaic Aspects

Anfeg P-43 Scheme Name Scheme No. Administrative Division Anteg Douar 831 Cercle Amizmiz Ameghrass C.R. Location Altitude 1,020 (m) Longitude W 8 12' N 31 Latitude Access Size of Residential Area Households and Population Pist 1.5 (km) Fragments Yr 1996 Yr 2000 Path 0.0 (km) E-W 150 (m) 16 15 Households 1.5 (km) Total N-S 200 (m) Population Capacity of Photovoltaic (Wp) Installed capacity 1.440 (kWh/day) 4.38 Power demand Facility Description >Battery elubom V9< Portable lead clad Type Silicon Type 100 (Ab) Capacity 75 55 (Wp) (V) Voltage 12 (V) Voltage____ Numbers of Battery 20 17 3 Numbers of Panel 2,000 Total Capacity 1,440 Total Capacity >Connecting Cable and Switch >Controller Single phase switch Type of Switch Battery charge Type Type of Cable Single phase CV 500 (W) (kit) Numbers of System (kit) Numbers of Controller Preliminary Cost Estimate and Project Evaluation 17,268 (US \$) Variable cost(O M cost) 9,590 (USS) PV module 1,915 (US \$) Delivery of PV module 43,682 (US S) 1,860 (US\$) **Total Cost** Battery 1,800 (US\$) Controller equipment

Asp-	43
------	----

5,200 (US \$)

1,772 (US \$)

2,037 (US\$)

2,240 (US \$)

26,414 (US\$)

Economic/Financial evaluation

EIRR B/C'

Monthly payment per H.H.*

>100 (%)

* Initial investment 0%, Discount Rate 6%

Photovoltaic Aspects

Scheme No.

P-44

Scheme Name

Aguersouak

Administrative Division

Douar	832	Aguersouak			
C.R.	34	Ameghrass	Cercle	3	Amizmiz

Location

	,			r — — — — — — — — — — — — — — — — — — —				T	·
Latitude	N 31	12'	32"	Longitude	W 8	10'	25"	Altitude	970 (m)

Households and Population

	Yr 1996	Yr 2000
Households	20	21
Population	100	104

Size of Residential Area						
Fragments	<u>f</u>					
Ė-M	200	(m)				
N-S	100	(m)				

Access		
Pist	0.0	(km)_
Path	0.4	{km}
Total	0.4	(km)

Capacity of Photovoltale

Facility Description

>PV module

Туре	Silicor	l	
Panel output	75	55	(Wp)
Voltage	12	12	_(v)
Numbers of Panel	23	4	
Total Capacity		1,945	(Wp)

;	·Β	att	en	ľ

Туре	Portable lead clad					
Capacity	100	(Ah)				
Voltage	12	(⊻)				
Numbers of Battery	27					
Total Capacity	2,700	(Ah)				

>Controller

Туре	Battery charge
Capacity	500 (W)
Numbers of Controller	27 (kit)

>Connecting Cable and Switch

Type of Switch	Single phas	e switch
Type of Cable	Single phas	e CV
Numbers of System	27	(kit)

Preliminary Cost Estimate and Project Evaluation

Preaminary Cost Estimate and Project Evaluation	,				
PV module	12,954	(US \$)	Variable cost(O M cost)	23,142	(US \$
Delivery of PV module	2,587	(US \$)			
Battery	2,500	(US \$)	Total Cost	58,796	(US\$
Controller equipment	2,430	(US S)			,
Installation cost	7,020	(US \$)	Economic/Financial evaluation		
Tax	2,390	(US \$)	EIRR	20	(%)
Superviser fee	2,749	(US \$)	B/C'	1.19	
Contingency	3,024	(US \$)	Monthly payment per H.H.*	4.2	(US \$
Fixed cost	35,654	(US \$)	* Initial investment 09	6, Discount Ra	ate 6%

Asp-44

Photovoltaic Aspects

Scheme No.	P-45]	Scheme Name			Oumast	الله القديد الله المستخدمة الله الله الله الله الله الله الله الل]		
Administrative Div	/Islon					1				
Douar	851		Qun	nast				· · · · · · · · · · · · · · · · · · ·		
C.R.	34		Ameg	hrass		Cercle	3		ln:lzmlz	
Location									<u> </u>	· ·
Latitude	N 31	13'	3f"	Longitude	W 8	10'	36"	Altitude	310	(m)
Households and F	Population			Size of Res	idential A	rea	-	Access		
	Yr 1996	Yr 2000]	Fragments	1			Pist	1.2	(km)
Households	35	36		E-W	250	(m)		Path	0.0	(kṛṇ)
Population	180	187]	N-S	200	(m)] .	Total	1.2	(km)
Power demand Facility Description		10.11	(kWh/day	<u> </u>	Installed c	apacity		3,310	(Wp)]
>PV module					>Battery				_	
Туре	Silico	n Type	i]	Туре		Portable le	ad clad		-
Panel output	75	55	(Wp)		Capacity		100	(Ah)		
Voltage	12	12	(v)		Voltage		12	(V)		
Numbers of Panel	39	7	.		Numbers	of Battery_	46			
Total Capacity		3,310	(Wp)	J	Total Cap	acity	4,600	(Ah)	j	-
>Controller				3	>Connec	ting Cable a	ind Switch		7	÷
Туре		Battery chai	rge		Type of S	witch	Single pha	se switch		
Capacity		500](w)		Type of C	able	Single pha	1	İ	
Numbers of Contro	oller	46	(kit)		Numbers	of System	46	(kit)	J .	
Pretiminary Cost	Estimate and	Project Evai	uation							
PV module			·	22,045	(US \$)	Variable co	st(O M cost)		39,828	(US \$

Preliminary Cost Estimate and Project	Evaluation			- ,	
PV module	22,045	(US \$)	Variable cost(O M cost)	39,828	(US §)
Delivery of PV module	4,402	(US S)			
Battery	4,280	(US \$)	Total Cost	142,765	(US \$)
Controller equipment	4,140	(US \$)		_	- :
Installation cost	11,960	(US S)	Economic/Financial evaluation		ļ <u>.</u>
Tax	4,076	(US \$)	EIRR		(%)
Superviser fee	46,883	(US \$)	B/C'	0.87	
Contingency	5,151	(US S)	Monthly payment per H.H.*	4.1	(US \$)
Fixed cost	102,937	(US \$)	*Initial investment (0%, Discount R	ate 6%

Photovoltaic Aspects

inventory conc	emed on	1 1100	OVOIL	ic Ash	COG		•		
Scheme No.	P-46]	Scheme Name			Ait Zitou	7)]	
Administrative Di	ulsiaa								
Douar	852	Ī	Ait 2	itoun]			
C.B.	34		Ameg	t:rass		Cercle	3		mizmiz
Location				····	·			1	
Latitude	N 31	13'	13"	Longitude	W 8	10'	28"	Altitude	1,000 (m)
								•	
Households and I		14,0000	-1	Size of Re	sidential A	rea 	7	Access	00//
	Yr 1996 35	Yr 2000		Fragments E-W	200	(m)		Pist Path	0.8 (km 0.0 (km
Population	180	36 187		N-S	200	1		Total	0.8 (km
Population	100	107	J	[14-0	200	17:17	J	Total	v.o į(kiti
Capacity of Photo	voltale								
Power demand	<u> </u>	9.77	(kWh/day)	 -	installed c	apacity		3,160	(Wp)
Facility Description	on								
-						-			
PV module	 			, . ·	>Battery				· · · · · · · · · · · · · · · · · · ·
Гуре	Silicor	Туре	.		Туре		Portable I	ead clad	
Panel output	75	55	(Wp)		Capacity		100	(Ah)	
Voltage	12	. 12	(y)	·	Voltage		12	(x)	
Numbers of Panel	37	7	ļ	ł	1	of Battery	44		
Total Capacity		3,160	(Wp)	J	Total Cap	acity	4,400	(Ah)	J
					_				
Controller]			and Switch]
Туре		Sattery chai	dè · · ·		Type of St	witcu	Single ph	sse switch	

Туре В	attery cha	rge
Capacity	500	(W)
Numbers of Controller	44	(kit)

>Connecting Cable a	ınd Switch
Type of Switch	Single phase switch
Type of Cable	Single phase CV
Numbers of System	44 (kit)

Preliminary Cost Estimate and Project Evaluation		, .	<u> </u>		
PV module	21,046	(US \$)	Variable cost(O M cost)	38,688	(US \$)
Delivery of PV module	4,203	(US \$)			
Battery	4,120	(US S)	Total Cost	96,763	(US \$)
Controller equipment	3,960	(US \$)			_
Installation cost	11,440	(US S)	Economic/Financial evaluation		
Tax	3,904	(US \$)	EIRR	1	(%)
Superviser fee	4,477	(US \$)	B/C'	0.90	
Contingency	4,925	(US \$)	Monthly payment per H.H.*	4.0	(US \$)
Fixed cost	58,075	(US S)	* Initial investment 0%	Discount R	ate 6%

Superviser fee

Fixed cost

Contingency

Photovoltaic Aspects

Tagadirt (Ait Boulmzgan) P-47 Scheme Name Scheme No. Administrative Division Tagadirt (Alt Boulmzgan) 860 Douar Amizmiz Ameghrass Cercle C.R. Location 8' 25" Altitude 1,150 (m) Longitude W 8 14 Latitude N 31 Access Households and Population Size of Residential Area 2.8 (km) Pist Yr 1996 Yr 2000 Fragments 2.2 (km) 200 (m) Path E-W Households 5.0 (km) 200 (m) Total N-S 137 Population 142 Capacity of Photovoltale (Wp) 2,505 (kWh/day) Installed capacity Power demand 7.66 **Facility Description** >Battery >PV module Portable lead clad Туре Silicon Type Type 100 (Ah) Capacity 55 Panel output 12 (V) Voltage Voltage Numbers of Battery 35 Numbers of Panel 3,500 **Total Capacity** 2.505 Total Capacity >Connecting Cable and Switch >Controller Single phase switch Type of Switch **Battery charge** Single phase CV Type of Cable (W) 500 35 Numbers of System Numbers of Controller Preliminary Cost Estimate and Project Evaluation 30,714 (US \$) 16,683 (US S) Variable cost(O M cost) PV module 3,332 (US S) Delivery of PV module 76,801 (US \$) 3,260 (US \$) Battery 3,150 (US \$) Controller equipment Economic/Financial evaluation 9,100 (US S) Installation cost

3,102 (US S)

3,652 (US \$)

3,908 (US \$)

46,097 (US \$)

EIRR

8/C*

Monthly payment per H.H.*

7 (%)

4.0 (US S)

1.02

*Initial investment 0%, Discount Rate 6%

Photovoltaic Aspects

Zaouit Schema No. P-48 Scheme Name Administrative Division Douar 871 Zaovit Amizmiz C.R. 34 Ameghrass Cercle Location 11' Longitude W 8 11" 48" Aitilude 1,160 (m) Latitude N 31 Households and Population Size of Residential Area Access Yr 1996 Pist 2.8 (km) Yr 2000 Fragments E-W Path 2.0 (km) 200 (m) Households 9 Total Population 62 N-S 200 (m) 4.8 (km) Capacity of Photovoltaic (kWh/day) 860 (Wp) Power demand 2.54 Installed capacity **Facility Description** >PV module >Battery Portable lead clad Type Silicon Type Туре (Wp) 100 (Ah) Panel output 75 **5**5 Capacity Voltage 12 io. Voltage 12 (V) 12 Numbers of Panel 10 2 Numbers of Battery 12 1,200 Total Capacity 860 (Wp) Total Capacity >Connecting Cable and Switch >Controller Type of Switch Single phase switch Туре **Battery charge** Capacity 500 (W) Type of Cable Single phase CV Numbers of Controller (kit) Numbers of System

Preliminary Cost Estimate and Project I	Evaluation				:
PV module	5,728	(US \$)	Variable cost(O M cost)	10,272	(US \$)
Delivery of PV module	1,144	(US \$)			
Battery	1,100	(US \$)	Total Cost	26,060	(US \$)
Controller equipment	1,080	(US \$)			
Installation cost	3,120	(US \$)	Economic/Financial evaluation		
Tax	1,060	(US \$)	EIRR	>100	(%)
Superviser fee	1,217	(US \$)	8/C'	2.19	<u> </u>
Contingency	1,339	(US \$)	Monthly payment per H.H.*	4.3	(US \$)
Fixed cost	15,788	(US \$)	* Initial investment 05	%, Discount R	ate 6%

Photovoltaic Aspects

Scheme No.

P-49

Scheme Name

Izalaghan (Dar Brahlm Ou Ali)

Douar	872	Izala	Izalaghan (Dar Brahim Ou Ali) Ameghrass				7			
C.R.	34	_				Cercle	3	Amizmi z		
Location								· T · · · · · · · · · · · · · · · · · ·	·	
Latitude	N 31	12'	44"	Longitude	W 8	12'	24"	Altitude	1,020	(m)
Households an	d Population		_	Size of Resi	dential A	rea	,	Access	· ,	r
	Yr 1996	Yr 2000		Fragments	1			Pist	1.3	(<u>k</u> n
Households	12	12		E-W_	250	(m)		Path	0.0	(kn
Population	62	64	ŀ	N-S	200	(m)		Total	1.3	ßел

Installed capacity

Facility Description

Power demand

>PV module			
Туре	Silicon	Туре	
Panel output	75	55	(Wp)
Voltage	12	12	(V)
	· · · - · · · · · · · · · · · · · · ·		

3.59

(kWh/day)

Туре	Silico	.]	
Panel output	75	55	(Wp)
Voltage	12	12	(V)
Numbers of Panel	14	3	
Total Capacity		1,215	(Wp)

>Controller				
Туре	8	attery cha	erge	
Capacity		500	(W)	
Numbers of Control	er ·	17	(kit)	

>Battery		
Туре	Portable i	ead clad
Capacity	160	(Ab)
Voltage	12	(V)
Numbers of Battery	17	
Total Capacity	1,700	(Ah)

1,215

>Connecting Cable and Switch				
Type of Switch	Single phase switch			
Type of Cable	Single phase CV			
Numbers of System	17	(kit)		

Pretiminary Cost Estimate and Projec	t Evaluation				
PV modute	8,092	(US \$)	Variable cost(O M cost)	14,334	(US \$)
Delivery of PV module	1,616	(US \$)			
Battery	1,560	(US \$)	Total Cost	36,670	(US \$
Controller equipment	1,530	(US \$)			
Installation cost	4,420	(US \$)	Economic/Financial evaluation		ļ
Tax .	1,502	(US \$)	EIRR	>100	(%)
Superviser fee	1,722	(US \$)	B/C'	1.65	
Contingency	1,894	(US \$)	Monthly payment per H.H.*	4.2	(USS
Fixed cost	22,336	(US \$)	*Initial investment 0%, Discount Rate 6%		

Photovoltaic Aspects

Scheme No.

P-50

Scheme Name

Tigouder (Ben sald, Zyoubt)

Administrative Division

Douar	880	Tigouder (Ben seld, Zyoubt)	1		
C.R.	34	Ameghrass	Cercle	3	Amizmiz

Location

								T	1
Latitude	N 3f	11'	22"	Longitude	W 8	11'	25"	Altitude	1.240 (m)
									7-14

Households and Population

	Yr 1996	Yr 2000
Households	24	25
Population	130	135

Size of res	Nuentiat Al	lea .
Fragments	1	:
E-W	200	(m)

Access		
Pist_	2.8	(<u>km)</u>
Path	2.5	(<u>km</u>)
Total	5.3	(km)

Capacity of Photovoltaic

Power demand	6.96	(kWh/day)	Installed capacity	 2,300	(Wp)

Facility Description

>PV module

Туре	Silicon		
Panel output	75	55	(Wp)
Voltage	. 12_	12	(v)
Numbers of Panel	27	5	
Total Capacity		2,300	(Wp)

>	Ba	tte	гу

Туре	Portable lead clad			
Capacity	100 (Ah)			
Voltage	12	(V)		
Numbers of Battery	32			
Total Capacity	3,200	(Ah)		

Controller

Туре	Battery charge
Capacity	500 (W)
Numbers of Controller	<i>32</i> (kit)

>Connecting Cable and Switch

Type of Switch	Single phase switch			
Type of Cable	Single phase CV			
Numbers of System	32 (kit)			

Tronsmitted of Control of Control of Control	O.GOLION				
PV module	15,318	(US S)	Variable cost(O M cost)	27,492	(បន ទ
Delivery of PV module	3,059	(US \$)			
Battery	2,960	(US \$)	Total Cost	101,914	(US S)
Controller equipment	2,830	(US S)			İ
Installation cost	8,320	(US \$)	Economic/Financial evaluation	_ <u>i</u>	
Tax	2,832	(US \$)	EIRR	10	(%)
Superviser fee	3,254	(US \$)	8/C'	1.07	
Contingency	35,799	(US S)	Monthly payment per H.H.*	4.2	(US \$)
Fixed cost	74,422	(US \$)	*Initial investment 0% Discount Rate 69		ale 6%

Photovoltaic Aspects

Scheme No.	P-51]	-	Scheme Nan	n 9	Capital Acid Con al Patri	Amezi]	
Administrative Oiv	ision									
Douar	890		A	mezl	···		,			
C.R.	34		Ame	ghrass		Cercle	3		lmizmiz	·
Location										
Latitude	N 31	11'	53"	Longitude	W 8	12'	19"	Altitude	1,180	(m)
Households and P	opulation			Size of Re	sidential A	rea	- -	Access		
	Yr 1996	Yr 2000		Fragments	1]		Pist	2.8	(km)
Households	36	37		E-W	500	(m)		Path	0.5	(km)
Population	161	188		N-S	200	(m)	_}	Total	3.3	(km)
OIb of Dhodos	·· altala									
Capacity of Photo	VOICE	10.37	(kWh/da	y)	installed o	apacity		3,440	(Wp)]
Facility Description	n				Dotton					
>PV module	T 0		T	٠ ٦	>Battery		Portable le	ad clad	7	
Туре	. i	п Туре	04/03	-	Type Capacity		100	(Ah)	•	
Panel output	75	55	(Wp)		Voltage		12	(A)		
Voltage	12	8	_ (₹)	-	1	of Battery	48	32/		
Numbers of Panel Total Capacity		3,440	(Wp)		Total Cap		4,800	(Ah)		

>Controller			
Туре	Battery	cha	rge
Capacity	50	ю	(W)
Numbers of Controller	4	8	(kit)

>Connecting Cable	and Switch			
Type of Switch	Single phase switch			
Type of Cable	Single phase CV			
Numbers of System	48	(kit)		

Preliminary Cost Estimate and Project PV module	22,910	(US \$)	Variable cost(O M cost)	41,280	(US \$)
Delivery of PV module	4,575	(US \$)			
Battery	4,440	(US.\$)	Total Cost	104,486	(US \$)
Controller equipment	4,320	(US \$)			
Installation cost	12,480	(US \$)	Economic/Financial evaluation		<u> </u>
Tax	4,248	(US \$)	EIRR		(%)
Superviser fee	4,873	(US \$)	8/C*	0.85	
Contingency	5,360	(US \$)	Monthly payment per H.H.*	4.1	(US \$)
Fixed cost	63,206	(US \$)	* Initial investment 0%, Discount Rate 6%		

Photovoltaic Aspects

Scheme No.

P-52

Scheme Name

Agouni

Admir	nistra	tive D	ivision

Douar	900	Agouni]		
C.R.	34	Ameahrass	Cercie	3	Amizmiz

Location

						·····			
Latitude	N 31	12'	11"	Longitude	W 8	12'	7"	Altitude	1,100 (m)

Households and Population

	Yr 1996	Yr 2000
Households	30	31
Population	172	178

Size of Residential Area	Size	of	Residential	Area
--------------------------	------	----	-------------	------

Fragments	1_	
E-W	100	(m)
N-S	300	(m)

Δ	00000
м	CC035

Pist	2.8	(km)
Path	0.0	(km)
Total	2.8	(km)

Capacity of Photovoltaic

	1	1		· · · · · · ·	1	
Power demand	8.52	(kWh/day)	 Installed capacity	:	2,805	(Wp)

Facility Description

>PV module

Туре	Silico		
Panel output	75	55	(Wp)
Voltage	12	12	(V)
Numbers of Panel	33	6	
Total Capacity	·	2,805	(Wp)

>Battery

Туре	Portable lead clad			
Capacity	100	(Ah)		
Voltage	12	(V)		
Numbers of Battery	39	_		
Total Capacity	3,900	(Ah)		

Cantralian

Туре	Battery charge
Capacity	500 (W)
Numbers of Controller	39 (kit)

>Connecting Cable and Switch

Type of Switch	Single phase switch				
Type of Cable	Single ph	ase CV			
Numbers of System	39	(kit)			

Tromming Coot Eddingto one Troject Evaluat	OII				
PV module	18,681	(US S)	Variable cost(O M cost) 33,81		(បនន
Delivery of PV module	3,731	(US \$)			
Battery	3,620	(US \$)	Total Cost	85,279	(បនន
Controller equipment	3,510	(US \$)			
Installation cost	10,140	(US \$)	Economic/Financial evaluation		
Tax	3,454	(US S)	EIRR	4	(%)
Superviser fee	3,968	(US \$)	B/C'	0.97	-
Contingency	4,365	(US \$)	Monthly payment per H.H.*	4.1	(US \$
Fixed cost	51,469	เบรรา	*Initial investment 0% Discount Rate		ato 6%

Photovoltaic Aspects

Scheme No.

P-53

Scheme Name

Chaabat Tarik (Talet N'Tghharast)

Administrative	Division
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Douar	910	Chaabat Tarik (Talet N'Tghharast)	<u> </u>		
C.R.	34	Ameghrass	Cercle	3	Amizmiz

Location

		7//		W 8	44"	Altitude	830 (m	
						latitide		
			Longitude					
ILatitude	1 N 31							

Households and Population

-	Yr 1996	Yr 2000
Households	53	55
Population	254	263

Size of Res	idential A	ea
Fragments		
E-W	250	(m)
N-S	300	(m)

Access	-	
Pist	5.0	(<u>km)</u>
Path	0.0	(km)_
Total	5.0	(km)

Capacity of Photovoltalc

	1	1	į		- 1
Power demand	15.38	(kWh/day)	Installed capacity	5.140 (Wp)	- 1
LOMEL OCHIGING	1	1 ALIGIN COLLY			

Facility Description

>PV module

Туре	Silico		
Panel output	75	55	(Wp)
Voltage	12	12	(V)
Numbers of Panel	59	13	
Total Capacity		5,140	(Wp)

	8	a	H	6	n
,	υ	а	ш	Ç	١,

Туре	Portable lead clad		
Capacity	100	(Ah)	
Voltage	: 12	(V)	
Numbers of Battery	72		
Total Capacity	7,200	(Ah)	

>Controller

70011801101	
Туре	Battery charge
Capacity	500 (W)
Numbers of Controller	72 (kit)

>Connecting Cable and Switch

Type of Switch	Single phase switch		
Type of Cable	Single phas	e CV	
Numbers of System	72	(kit)	

PV module	34,232	(US \$)	Variable cost(O M cost)	61,116	(US \$)
Delivery of PV module	6,836	(US \$)			
Battery	6,580	(US \$)	Total Cost	155,618	(US \$)
Controller equipment	6,480	(US \$)			
Installation cost	18,720	(US \$)	Economic/Financial evaluation		
Тах	6,358	(US \$)	EIRR		(%)
Superviser fee	7,285	(US \$)	B/C	0.69	
Contingency	8,013	(US \$)	Monthly payment per H.H.*	4.1	(US \$)
Fixed cost	94,502	(US \$)	* Initial investment 0%, Discount Rate 6%		

Contingency Fixed cost

Photovoltaic Aspects

Ighii Sdidene (Draa Rkik) Scheme No. P-54 Scheme Name Administrative Division Ighii Sdidene (Draa Rkik) Douar 920 Amizmiz C.R. Cercle Ameghrass Location 14' 16" Longitude W 8 10' A!titude 900 (m) Latitude Size of Residential Area Households and Population Access 3.0 (km) Yr 1996 Fragments Yr 2000 Pist 0.0 (km) E-W 300 (m) Path Households 15 Population N-S 500 (m) Total 3.0 (km) Capacity of Photovoltaic 4.12 (kWh/day) Installed capacity 1,365 Power demand Facility Description >PV module >Battery Portable lead clad Silicon Type Туре 100 (Ah) 75 Panel output (Wp) Voltage Voltage 12 12 (V) Numbers of Panel 3 Numbers of Battery 19 Total Capacity 1,365 Total Capacity 1,900 (Ah) >Connecting Cable and Switch >Controller Single phase switch Туре Type of Switch **Battery charge** 500 (W) Type of Cable Single phase CV Capacity Numbers of Controller Numbers of System Preliminary Cost Estimate and Project Evaluation PV modute 9,091 (USS) Variable cost(O M cost) 16,278 (US \$) Delivery of PV module 1,815 (US \$) Battery 1,760 (US \$) 41,333 (US \$) 1,710 (US\$) Controller equipment 4,940 (USS) Economic/Financial evaluation Installation cost 1,682 (US S) EIRR >100 Tax 1,932 (US \$) B/C* 1.52 Superviser fee

2,125 (US \$)

25,055 (US \$)

Monthly payment per H.H.*

* Initiat investment 0%, Discount Rate 6%

Photovoltaic Aspects

Tizi Scheme No. P-55 Scheme Name

Administrative Division

	T		1		
Douar	930	Tizl	<u> </u>	- -	,
C.R.	34	Ameghrass	Cercle	3	Amizmiz

Location 13" Altitude 930 (m) 10' W 8 13' Longitude N 31 Latitude

Households and Population Yr 1996 Yr 2000 59 Households 295 Population

Size of Residential Area					
Fragments					
E-W	500	(m)	:		
N-S	500	(m)			

Access		
Pist	2.2	(km)
Path	0.0	(km)
Total	2.2	(km)

Capacity of Photovoltalc	 				7
Power demand	16.76	(kWh/day)	Installed capacity	5,515 (Wp)	_]

Facility Description

>PA woons	· · · · · · · · · · · · · · · · · · ·		
Туре	Silicon	Тура	
Panel output	75	55	(Wp)
Voltage	12	12 .	(A)
		_	

Туре	Silico		
Panel output	75	55	(Wp)
Voltage	12	12	<u>. (v) </u>
Numbers of Panel	64	13	
Total Capacity		5,515	(Wp)

>Controller	:	
Туре	Battery cha	arde
Capacity	500	(w)
Numbers of Controller	77	(kit)

>Battery		
Туре	Portable I	ead clad
Capacity	100	(Ah)
Voltage	12	(<u>V</u>)
Numbers of Battery	77	
Total Capacity	7,700	(Ah)

>Connecting Cable and Switch Type of Switch Single phase switch Single phase CV Type of Cable Numbers of System

PV module	38,730	(US \$)	Variable cost(O M cost)	66,534	(US \$)
Delivery of PV module	7,335	(US \$)			
Battery	7,120	(US S)_	Total Cost	167,891	(US \$)
Controller equipment	6,930	(US \$)			
Installation cost	20,020	(US \$)	Economic/Financial evaluation	<u> </u>	<u> </u>
Tax	6,814	(US S)	EIRR	ļ ·· •	(%)
Superviser fee	7,813	(US \$)	B/C'	0.67	
Contingency	8,595	(US S)	Monthly payment per H.H.*	4.1	(US \$)
Fixed cost	101,357	(US \$)	* Initial investment 0%, Discount Rate 6%		

Photovoltaic Aspects

Scheme No. P-56 Scheme Name Aghbalou Aghbalou

			Ph. 1	
MUIL	inistra	51. V U	UIV	SIUII

Douar	940	Aghbalou]		
C.R.	34	Ameghrass	Cercle	3	Amizmiz

Location

Labitude N 31 13' 53" Longitude W 8 9' 1" Altitude 850 (m		 					_ ```	₁
	N 31	ეკ	Longitude	WB	9.	,		850 (m)

Households and Population

	Yr 1996	Yr 2000
Households	90	93
Population	472	490

Size of Res	idential A	rea
Fragments	1	
E-W	400	(m)
N-S	500	(m)

Access		,
Pist	0.0	(km)
Path	0.0	(km)
Total	0.0	(km)

Capacity of Photovoltaic

i	ł	i			
Power demand	25.44	(kWh/day)	Installed capacity	8,430	(Wo)
		i (i i i i i i i i i i i i i i i i i i	1 in claired capacity	1 0,300	ין עייוי

Facility Description

>PV module

Туре	Silico		
Panel output	75	55	(Wρ)
Voltage	1,2	12	(V)
Numbers of Panel	97	21	
Total Capacity		8,430	(Wp)

>	Ba	it.	'n
•			_
•			

Туре	Portable lead clad				
Capacity	100	(Ah)			
Voltage	12	(2)			
Numbers of Battery	118				
Total Capacity	11,800	(Ah)			

-Controller

>001titioner	
Туре	Battery charge
Capacity	500 (W)
Numbers of Controller	118 (kit)

_	^~~~		Cabla	4	Carle a b
~	COMMI	scong.	Cania	arru	Switch

Type of Switch	Single phas	e switch
Type of Cable	Single phas	e CV
Numbers of System	118	(kit)

Premimiary Cost Esumate and Project Evaluation					
PV module	56,144	(US \$)	Variable cost(O M cost)	101,532	(US S)
Delivery of PV module	11,212	(US \$)			
Battery	10,850	(US \$)	Total Cost	256,579	(US \$)
Controller equipment	10,620	(US \$)			j
Installation cost	30,680	(US \$)	Economic/Financial evaluation		<u> </u>
Tax	10,432	(US \$)	EIRR		(%)
Superviser fee	11,952	(US \$)	B/C*	0.56	
Contingency	13,147	(US S)	Monthly payment per H.H.*	4.1	(US \$)
Fixed cost	155,047	(US \$)	* Initial Investment 0%, Discount Rate 6		

Photovoltaic Aspects

Scheme No. P-57 Scheme Name All Hsaln

A	dmir	istra	tîve	Divis	slon
м	CIT I I I I	113 LIG		W171	71 V I I

Douar	950	Ait Hsaln			
C.R.	34	Ameghrass	Cercle	3	Amizmiz

 Location
 N 31
 12'
 21"
 Longitude
 W 8
 9'
 9"
 Altitude
 1,080 (m)

Households and Population						
	Yr 1996	Yr 2000				
Househelds	13	13				
Population	75	78				

Size of Residential Area					
Fragments					
E-W	200	(m)			
N-S	200	(m)			

Access		
Pist	2.5	(km)
Path	0.3	(km)
Total	2.8	(km)

Capacity of Photovoitaic				<u> </u>	
Power demand	3.91	(kWh/day)	Installed capacity	1,345	(Wp)

Facility Description

>PV	nodule
-----	--------

Туре	Silicon		
Panel output	75	55	(Wp)
Voltage	12	12	_(y)
Numbers of Panel	15	4.	
Total Capacity		1,345	(WP)

>Battery				
Туре	Portable lead clad			
Capacity	100	(Ah)		
Voltage	12	(v)		
Numbers of Battery	19			
Total Capacity	1,900	(Ab)		

>Controller			
Туре	Battery charge		
Capacity ·	500 (W)		
Numbers of Controller	10 (km		

>Connecting Capie a	na Switch			
Type of Switch	Single phase switch			
Type of Cable	Single phase CV			
Numbers of System	19	(kit)		

Premimary Cost Esumate and Project E	101000011				
PV modula	8,958	(US \$)	Variable cost(O M cost)	15,630	(US \$)
Delivery of PV module	1,789	(US \$)	<u> </u>		
Battery	1,700	(US \$)	Total Cost	40,408	(US \$)
Controller equipment	1,710	(US \$)			
Installation cost	4,940	(US \$)	Economic/Financial evaluation		<u> </u>
Tax	1,670	(US \$)	EIRR	>100	(%)
Superviser fee	1,910	(US \$)	B/C'	1.53	
Contingency	2,101	(US \$)	Monthly payment per H.H.*	4.2	(US \$)
Fixed cost	24,778	(US \$)	*Initial investment 0%, Discount Rate 6%		

Contingency

Fixed cost

Photovoltaic Aspects

Ait Boubker P-58 Scheme No. Scheme Name Administrative Division Douar 950 Ail Boubker Cercle Amizmiz C.R. 34 Ameghrass Location 24" Altitude 1,160 (m) Lattude N 31 12" Longitude W 8 Households and Population Size of Residential Area Access Yr 1996 Yr 2000 Fragments Pist 2.5 (km) 1 Path 300 (m) 1.2 (km) E-W Households 14 15 83 N-S 600 (m) Total 3.7 (km) Population Capacity of Photovoltale Installed capacity 1,440 (Wp) Power demand 4.30 (kWh/day) **Facility Description** >PV module >Battery Portable lead clad Туре Silicon Type Туре (Ah) 100 Panel output 55 Capacity 12 Voltage Voltage Numbers of Battery Numbers of Panel 20 Total Capacity Total Capacity 2,000 >Controller >Connecting Cable and Switch Type of Switch Single phase switch Туре **Battery charge** Type of Cable ... 500 (W) Single phase CV Capacity Numbers of System (kit) Numbers of Controller 20 Preliminary Cost Estimate and Project Evaluation 9,590 (US \$) Variable cost(O M cost) 16,848 (US S) Delivery of PV module 1,915 (US \$) 1,840 (US \$) Total Cost 43,234 (US \$) 1,800 (US \$) Controller equipment Installation cost 5,200 (US \$) Economic/Financial evaluation Tax 1,768 (US \$) EIRR >100 (%) 2,035 (US \$) 8/C* Superviser fee 1.47

2,238 (US \$)

26,386 (US \$)

Monthly payment per H.H.*

*Initial Investment 0%, Discount Rate 6%

Photovoltaic Aspects

P-59

Scheme Name

Tazatourt

Administrative Division

Douar	970	Tazatourt			
C.R.	34	Ameghrass	Cercle	3	Amizmiz

Location

LOCOCOLI									
Latitude	N 31	12'	26"	Longitude	W 8	8'	8"	Altitude	1,050 (m)

Households and Population

	Yr 1996	Yr 2000
Households	33	34
Population	152	158

	Size of Residential Area					
	Fragments	1.				
1	E-W	200	(m)			

300 (m)

Access		,
Pist	2.5	(km)
Path	2.5	(km) _
Total	5.0	(km)

Capacity of Photovoltaic

Copacity of the total control					1
			1	3.195 (Wp)	ļ
Power demand	9.50	¦(kWh/day)	linstalled capacity	3,195 (Wp)	J

Facility Description

>PV module

>F T IIIOOUIO			γ
Тура	Silicon Type		
Panel output	75	55	(Wp)
Voltage	12	12	_(v)
Numbers of Panel	38	9	
Total Capacity	-	3,195	(Wp)

>	Ва	tt	er	١

Туре	Portable lead clad		
Capacity	100	(Ah)	
Voltage	12	(Y)	
Numbers of Battery	45		
Total Capacity	4,500	(Ah)	

>Controller

Туре В	attery charg	<u>19</u>
Capacity	500	(W)
Numbers of Controller	45	(kit)

>Connecting Cable and Switch

Type of Switch	Single ph	ase switch
Type of Cable	Single ph	ase CV
Numbers of System	45	(kit)

PV module	21,279	(US \$)	Variable cost(O M cost)	37,950	(US \$)
Delivery of PV module	4,249	(US \$)			
Battery	4,080	(US \$)	Total Cost	98,799	(US \$)
Controller equipment	4,050	(US \$)	_		ļ .
Installation cost	11,700	(US \$)	Economic/Financial evaluation		<u> </u>
Tax	3,966	(US \$)	EIRR		(%)_
Superviser fee	4,536	(US \$)	B/C'	0.88	
Contingency	4,989	(US \$)	Monthly payment per H.H.*	4.1	(US \$)
Fixed cost	58,849	(US S)	*Initial investment 0%, Discount Rate 6		

Contingency

Fixed cost

Photovoltaic Aspects

P-60 Tamsoulte Scheme No. Scheme Name **Administrative Division** Douar 980 Tamsoulte C.R. Cercle Amizmiz 34 **Ameghrass** Location 34" Longitude W 8 18" Altitude 1,050 (m) Latitude N 31 12" Households and Population Size of Residential Area Access Yr 1996 Yr 2000 Fragments Pist 2.5 (km) Households 33 E-W 200 (m) Path 0.0 (km) 34 320 332 N-S 200 (m) Total 2.5 (km) Population **Capacity of Photovoltaic** Power demand (kWh/day) Installed capacity 3,160 9.58 (Wp) Facility Description >PV module >Battery Silicon Type Portable lead clad Туре Туре 100 (Ah) Panel output 75 55 (Wp) Capacity Voltage 12 (V) Voltage 12 12 Numbers of Battery Numbers of Panel Total Capacity 3,160 Total Capacity 4,400 >Controller >Connecting Cable and Switch Туре Battery charge Type of Switch Single phase switch 500 (W) Type of Cable Single phase CV Capacity Numbers of Controller Numbers of System Preliminary Cost Estimate and Project Evaluation 21,046 (US \$) 37,860 (US \$) Variable cost(O M cost) Delivery of PV module 4,203 (US S) Battery 4,080 (US \$) Total Cost 95,878 (US \$) 3,960 (US \$) Controller equipment Installation cost 11,440 (US \$) Economic/Financial evaluation Tax 3,896 (US S) EIRR --- (%) B/C* Superviser fee 4,473 (USS) 0.83

4,920 (US \$)

58,018 (US S)

Monthly payment per H.H.*

*Initial investment 0%, Discount Rate 6%

Numbers of Controller

Photovoltaic Aspects

Tizgui Scheme No. P-61 Scheme Name Administrative Division Tizgul 990 Douar Ameghrass Cercle 3 Amizmiz lc.r. Location 42" 1,220 (m) 10" Altitude W 8 10" 11' Longitude Latitude N 31 Size of Residential Area Access Households and Population Fragments Pist 1.5 (km) Yr 1996 Yr 2000 1.7 (km) E-W 300 (m) Path 50 52 Households 3.2 (km) Total 250 (m) พ-ร 360 Population Capacity of Photovoltale 4,655 (Wp) (kWh/day) Installed capacity 14.12 Power demand **Facility Description** >PV module >Battery Portable lead clad Silicon Type Туре 100 (Ah) 75 (Wp) Panel output 12 (V) 12 Voltage Voltage Numbers of Battery 65 Numbers of Panel 6,500 (Ah) Total Capacity Total Capacity >Connecting Cable and Switch >Controller Single phase switch Type of Switch **Battery charge** Type Single phase CV 500 Type of Cable (W) Capacity

PV module	31,002	(US \$)	Variable cost(O M cost)	56,154	(US \$)
Delivery of PV module	6,191	(US \$)			
Battery	6,000	(US \$)	Total Cost	141,695	(US \$)
Controller equipment	5,850	(US \$)			
Installation cost	16,900	(US \$)	Economic/Financial evaluation		
Tax	5,750	(US \$)	EIRR		(%)
Superviser fee	6,594	(US \$)	B/C'	0.73	_
Contingency	7,254	(US \$)	Monthly payment per H.H.*	4.1	(US \$)
Fixed cost	85,541	(US \$)	*Initial investment 0%, Discount Rate 6%		

65

(kit)

Numbers of System

(kit)

65

Photovoltaic Aspects Inventory concerned on P-62 Ait Tirghit Scheme No. Scheme Name **Administrative Division** Ait Tirghit Douar 1000 C.R. Ameghrass Cercle Amizmiz Location Latitude 10" 39" N 31 Longitude W 8 11' Altitude 1,480 (m) Households and Population Size of Residential Area Access Yr 1996 Yr 2000 Fragments Pist 11.5 (km) Households E-W 50 52 400 (m) Path 0.0 (km) Population 600 622 N-S 600 (m) Total 11.5 (km) Capacity of Photovoltaic Power demand 14.07 (kWh/day) Installed capacity **Facility Description** >PV module >Battery Туре Silicon Type Туре Portable lead clad Panel output 75 (Wp) Capacity 100 Voltage 12 (V) Voltage 12 Numbers of Panel 10 Numbers of Battery 64 Total Capacity 4,600 (Wp) Total Capacity 6,400 >Controller >Connecting Cable and Switch Туре Battery charge Type of Switch Single phase switch 500 Capacity (W) Type of Cable Single phase CV (kit) Numbers of Controller (kit) Numbers of System 64

Preliminary Cost Estimate and Project Evaluation			
PV module	30,636	(US \$)	Variable cost(O M cost)
Delivery of PV module	6,118	(US \$)	
Battery	5,960	(US S)	Total Cost
Controller equipment	E 760	(110 C)	

 Battery
 5,960 (US \$)
 Total Cost
 140,284 (US \$)

 Controller equipment
 5,760 (US \$)
 US \$)

 Installation cost
 16,640 (US \$)
 Economic/Financial evaluation

 Tax
 5,672 (US \$)
 EIRR
 ... (%)

 Superviser fee
 6,511 (US \$)
 B / C*
 0.74

 Contingency
 7,163 (US \$)
 Monthly payment per H.H.*
 4.1 (US \$)

55,824 (USS)

Numbers of Controller

Fixed cost

Photovoltaic Aspects

Tachbibt Kabli P-63 Scheme Name Scheme No. Administrative Division Tachbibt Kabli 1010 Douar Amizmiz 35 Sidi Badhaj Cercle C.R. Location 11" Altitude 850 (m) 48" 12' Longitude W 8 N 31 15' Latitude Size of Residential Area Households and Population 2.5 (km) Fragments Yr 1996 Yr 2000 0.5 (km) 500 (m) Path E-W 31 Households 30 1,000 (m) 3.0 (km) Total N-S 220 228 Population Capacity of Photovoltaic (Wp) Installed capacity 2,915 8.60 (kWh/day) Power demand **Facility Description** >PV module >Battery Portable lead clad Silicon Type Туре 100 (Ah) (Wp) 75 55 Panel output 12 Voltage 41 Numbers of Battery 8 Numbers of Panel 4,100 Total Capacity 2,915 Total Capacity >Connecting Cable and Switch >Controller Type of Switch Single phase switch Battery charge Туре Single phase CV 500 (W) Type of Cable

Preliminary Cost Estimate and Project	Evaluation				·
PV module	19,414	(US \$)	Variable cost(O M cost)	34,470	(US \$)
Delivery of PV module	3,877	(US S)			- :
Battery	3,700	(US \$)	Total Cost	88,102	(US S)
Controller equipment	3,690	(US \$)			
Installation cost	10,660	(US \$)	Economic/Financial evaluation	<u> </u>	ļ
Tax	3,610	(US \$)	EIRR	2	(%)
Superviser fee	4,134	(US \$)	B/C'	0.93	1
Contingency	4,547	(US \$)	Monthly payment per H.H.*	4.2	(US S

53,632 (USS)

(kit)

Numbers of System

41

* Initial investment 0%, Discount Rate 6%

Photovoltaic Aspects

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Scheme No.	P-64]	;	Scheme Na	กอ	Tac	hbibt Ech	atoui]	
Administrative Di		<u> </u>		·······		ר				
Douar	1020	<u> </u>		Echaloui		- 				
C.R.	35	<u> </u>	Sidi E	Badhaj		Cercle	3	<u> </u>	Amizmiz	
Location	·· ····			·						
Latitude	H 31	16'	6"	Longitude	W 8	12'	11"	Altitude	850	(m)
Households and I	Denuistion			Size of Re	nidanilai A			Ansana :		
nousenoids and i	Yr 1996	Yr 2000	1		1	1	7	Access	1 05	
Hausahalda		T	1	Fragments E-W		1		Pist		(km)
Households Population	150	31 156		N-S	1,500	(m)		Path	i .	(km)
Population	1 130	1 190	J	(14-2	1,500	3(0)		Total	2.5	(km)
Capacity of Photo	voltale								e.	
Power demand		8.62	(kWh/day)	installed o	capacity		2,915	(Wp)	
Type		туре	44.5]	>Battery Type		Portable la	T :		
Туре	Silicon	туре			Туре		Portable la	ad clad		
Panel output	75	55	(Wρ)	ŀ	Capacity		100	(Ah)		
Voltage	12	12	(V)		Voltage		12	<u>(V)</u>		
Numbers of Panel	. 33	8				of Battery	41		-	
Total Capacity	·	2,915	(Wp)	j	Total Cap	аску	4,100	(Ah)	J	
>Controller		· · · · · · · · · · · · · · · · · · ·	·	<u>.</u>	>Connec	ting Cable a	nd Switch		_	
Туре	8	Battery char	ge		Type of S	witch	Single pha	se switch	.]	
Capacity		500	(w)		Type of C	able	Single pha	se CV		
Numbers of Contro	oller	41	(kit)	J	Numbers	of System	41	(kit)	j .	
Preliminary Cost				10.444	(110.0)	N. 2.84				1. 10.0
PV module				1	(US \$)	Vanable co	st(O M cost)		34,470	(08.8)
Delivery of PV mod				1	(US \$)	 Talal Oast	•		20.400	
Battery Controller equipme				1	(ne e) (ne e)	Total Cost			88,102	(08.8)
Installation cost	*K			1	(US S)	Foonamia 1	inancial eval			
-				l .	(US S)	Economic/F			2	(%)
Tax Superviser fee				Į.	į.		EIRR		ł	(%)
a .:				4,134]	Monthly no		<u></u> .	0.94	1
				1	(US \$)	монону раз	yment per H.I			(US \$)
Fixed cost				53,632	1(02.2)	J	* Initial in	vestment 0%	, Discount R	ate 6%

Photovoltaic Aspects

Scheme No.	P-65		· s	cheme Nam	10		Asgoune	COLUMN CONTRACTOR CONT]	
Administrative Div	T									
Douar	1030	<u> </u>		oune				!	lmizm/z	
C.R.	35		Sidi B	ladha <u>l</u>		Cercle	3	1	(IIIIZHIZ	
Location		· ····································			r	·		- -	T	
Latitude	N 31	16'	49"	Longitude	W 8	11'	15"	Altitude	820	<u>(m)</u>
Households and F	Population		_	Size of Res	Idential A	rea		Access	·	
	Yr 1996	Yr 2000]	Fragments	1			Pist	5.0	(km)
Households	30	31	1	E-W	1,000	(m)		Path	0.0	(km)
Population	270	260]	N-S	400	(m)	j	Total	5.0	(km)
								-		
Capacity of Photo	voltaic		1		Installed c			2,840	(Wp)	1
Power demand		8.44	(kWh/day	<i>L</i>	Interaction of	<u> </u>		- -		•
>PV module	on 			,	>Battery				٦	÷
Туре	Silicor	ı Type			Туре		Portable la	bslo be		
Panel output	75	55	(Wp)		Capacity		100	(Ah)		
Voltage	12	12	(2)		Voltage		12	(<u>(</u> V)	·	
Numbers of Panel	32	8			Numbers	of Battery	40			
Total Capacity		2,840	(Wp)]	Total Cap	acity	4,000	(Ah)]	
>Controller			-		>Connec	ting Cable s	nd Switch			
Туре		Battery char	rge]	Type of S	witch	Single pha	ise switch		
Capacity		500	(W)	1 :	Type of C	able	Single pha	se CV		
Numbers of Contro	oller	40	(kit)	j	Numbers	of System	. 40	(kit)] .	
Preliminary Cost	Estimate and i	Project Eval		10044	(US \$)	Variable co	st(O M cost)		33,900	้เบรร
PV module				1	(US \$)	y a racic co	Silo in cool		FREE	1
Delivery of PV mo				1. 7	(US \$)	Total Cost			86,200	(US S
Battery		•		1	(US \$)	10.00			!	
Controller equipme				1	(US \$)	Economic//	Financial eva	luation		
Installation cost				1	(US \$)		EIRR		3	(%)
Tax				1	(US \$)		B/C		0.95	1
		· · ·			(US \$)	Monthly pa	yment per H	.н.:	1	(បន
Contingency					(US \$)			nvestment 0%		
Fixed cost	<u>·</u>			,,	11 71					

Photovoltaic Aspects

Scheme No.	P-66			Scheme Na	me	Alt	Aamara L	oued]	
Administrative D	ivision									
Douar	1040	1	Alt Aam	ara Loued]				
C.R.	35		Sidi	Badhaj		Cercle	3	-	Amizmiz	
Location Latitude	N 31	<u> </u>	27"	Longitude	W 8	9'	55"	Altitude	750	· (m)
Latitude	i Noi			Longidoe	1 17 0			TAURENCE	730	(m)
Households and i	Population			Size of Re	sidentiai A	rea		Access		
-	Yr 1996	Yr 2000	7	Fragments	1	T	7	Pist	8.0	(km)
Households	80	83	1	E-W	1,000	1	٠.	Path	ı	(km)
Population	420	436		N-S		(m)		Total		(km)
							_			
Capacity of Photo	ovoltale			J	•				•	
Power demand		22.83	(kWh/day	1	Installed o	apacity		7,625	(Wp)] .
>PV module					>Battery					
					>Battery					
Туре	Silico	n Type]	>Battery Type	·	Portable le	esd clad	.]	•
Panel output	Silico 75		(Wp)				Portable le	ead clad		
Panel output			(Wρ) (Y)		Туре		·	- I : : :		
Panel output Voltage Numbers of Panel	75 12	55			Type Capacity		100	(Ah)		·
Panel output Voltage Numbers of Panel	75 12	55 12			Type Capacity Voltage	of Battery	100 12	(Ah)		
Panel output Voltage Numbers of Panel Total Capacity	75 12	55 12 20	(X)		Type Capacity Voltage Numbers of Total Capa	of Battery	100 12 107 10,700	(Ah) (V)		
Voltage	75 12 87	55 12 20	(V) (Wp)		Type Capacity Voltage Numbers of Total Capa	of Battery acity ling Cable a	100 12 107 10,700	(Ah) (V) (Ah)		
Panel output Voltage Numbers of Panel Total Capacity >Controller Type	75 12 87	55 12 20 7,625 Battery cha	(V) (Wp)		Type Capacity Voltage Numbers Total Capa >Connect Type of Sy	of Battery acity ting Cabte a witch	100 12 107 10,700 nd Switch	(Ah) (V) (Ah)		
Panel output Voltage Numbers of Panel Total Capacity Controller Type Capacity	75 12 87	55 12 20 7,625	(V) (Wp)		Type Capacity Voltage Numbers of Total Capacity >Connect	of Battery acity ting Cable a witch	100 12 107 10,700	(Ah) (V) (Ah)		
Panel output Voltage Numbers of Panel Total Capacity Controller Type Capacity Numbers of Control	75 12 87	55 12 20 7,625 Battery cha 500 107	(V) (Wρ) rge (W) (kit)		Type Capacity Voltage Numbers of Total Capa >Connect Type of Sy Type of Ca	of Battery acity ting Cable a witch	100 12 107 10,700 nd Switch Single pha	(Ah) (Ah) (Ah)		
Panel output Voltage Numbers of Panel Total Capacity >Controller Type Capacity Numbers of Control Preliminary Cost	75 12 87 Oller	55 12 20 7,625 Battery cha 500 107	(V) (Wp) rge (W) (kit)	1	Type Capacity Voltage Numbers of Total Capacity >Connect Type of Softy Type of Capacity Numbers of	of Battery acity ling Cable a witch able of System	100 12 107 10,700 nd Switch Single pha Single pha	(Ah) (Ah) (Ah) (Se switch (Se CV (kit)	A1 104	alo ev
Panel output Voltage Numbers of Panel Total Capacity Controller Type Capacity Numbers of Control Preliminary Cost	75 12 87 biller	55 12 20 7,625 Battery cha 500 107	(V) (Wp) rge (W) (kit)	50,783	Type Capacity Voltage Numbers Total Capa Connect Type of Sa Type of Ca Numbers of US S)	of Battery acity ling Cable a witch able of System	100 12 107 10,700 nd Switch Single pha 107	(Ah) (Ah) (Ah) se switch se CV (kit)	91,194	(ភិខិខ)
Panel output Voltage Numbers of Panel Total Capacity Controller Type Capacity Numbers of Control Preliminary Cost PV module Delivery of PV mod	75 12 87 Oller	55 12 20 7,625 Battery cha 500 107	(V) (Wp) rge (W) (kit)	50,783 10,141	Type Capacity Voltage Numbers of Total Capacity Connect Type of St Type of Ca Numbers of (US \$) (US \$)	of Battery acity ting Cable a witch able of System	100 12 107 10,700 nd Switch Single pha Single pha	(Ah) (Ah) (Ah) se switch se CV (kit)		
Panel output Voltage Numbers of Panel Total Capacity Controller Type Capacity Numbers of Control Preliminary Cost PV module Delivery of PV mox Battery	75 12 87 biller Estimate and I	55 12 20 7,625 Battery cha 500 107	(V) (Wp) rge (W) (kit)	50,783 10,141 9,780	Type Capacity Voltage Numbers of Total Capacity Connect Type of St Type of Capacity (US \$) (US \$) (US \$)	of Battery acity ling Cable a witch able of System	100 12 107 10,700 nd Switch Single pha 107	(Ah) (Ah) (Ah) se switch se CV (kit)	91,194	
Panel output Voltage Numbers of Panel Total Capacity Controller Type Capacity Numbers of Control Preliminary Cost PV module Delivery of PV module Battery Controller equipme	75 12 87 Diller Estimate and I	55 12 20 7,625 Battery cha 500 107	(V) (Wp) rge (W) (kit)	50,783 10,141 9,780 9,610	Type Capacity Voltage Numbers of Total Capacity >Connect Type of Sa Type of Ca Numbers of (US S) (US S) (US S) (US S)	of Battery acity ling Cable a witch able of System Variable co	100 12 107 10,700 nd Switch Single pha 107 st(O M cost)	(Ah) (Ah) (Ah) (Se switch (Se) CV (kit)		
Panel output Voltage Numbers of Panel Total Capacity Controller Type Capacity Numbers of Control Preliminary Cost PV module Delivery of PV module Battery Controller equipments	75 12 87 Diller Estimate and I	55 12 20 7,625 Battery cha 500 107	(V) (Wp) rge (W) (kit)	50,783 10,141 9,780 9,610 27,820	Type Capacity Voltage Numbers of Total Capacity Connect Type of Solution Type of Capacity (US S) (US S) (US S) (US S) (US S)	of Battery acity ling Cable a witch able of System Variable co	100 12 107 10,700 nd Switch Single pha 107 st(O M cost)	(Ah) (Ah) (Ah) (Se switch (Se) CV (kit)	231,486	(US \$)
Panel output Voltage Numbers of Panel Total Capacity Controller Type Capacity Numbers of Control Preliminary Cost PV module Delivery of PV mod Battery Controller equipme Installation cost Tax	75 12 87 Diller Estimate and I	55 12 20 7,625 Battery cha 500 107	(V) (Wp) rge (W) (kit)	50,783 10,141 9,780 9,610 27,820 9,446	Type Capacity Voltage Numbers of Total Capacity Connect Type of Sv Type of Capacity (US S) (US S) (US S) (US S) (US S) (US S)	of Battery acity ling Cable a witch able of System Variable co	100 12 107 10,700 nd Switch Single pha 107 st(O M cost)	(Ah) (Ah) (Ah) (Se switch (Se) CV (kit)	231,486	(US \$)
Panel output Voltage Numbers of Panel Total Capacity Controller Type Capacity Numbers of Control Preliminary Cost PV module Delivery of PV mod Battery Controller equipments of the cost	75 12 87 Diller Estimate and I	55 12 20 7,625 Battery cha 500 107	(V) (Wp) rge (W) (kit)	50,783 10,141 9,780 9,610 27,820 9,446	Type Capacity Voltage Numbers of Total Capacity Connect Type of St Type of Ca Numbers of (US S) (US S) (US S) (US S) (US S) (US S) (US S)	of Battery acity ling Cable a witch able of System Variable co Total Cost	100 12 107 10,700 nd Switch Single pha 107 st(O M cost)	(Ah) (V) (Ah) see switch see CV (kit)	231,486	(US \$)

Photovoltaic Aspects

Scheme No.

P-67

Scheme Name

Lakaarna

Adm	intel	rativa	Divis	ion
AUII	H B 3 G	0 5 6 0	CITIO	1011

Douar	1060	Lakaama			
C.R.	35	Sidl Badhaj	Cercle	3	Amizmiz

Location

	 			3	1			5	
i .	1			1		461	0"	Altitude	<i>930</i> (m)
	N 31	4.4"	A7"	Soutionall	W 8	16'	9	IRRECUE	
Lancoe	1 11 21	3.4		reoriginooc _	, ,, ,,		-		

Households and Population

Tiouseriolas aria v	· · · · · · · · · · · · · · · · · · ·	Yr 2000		
Households	30	31		
Population	185	192		

-	Size of Residential Area								
	Fragments	1							
ı	C 181	200	tml						

Access	 	
Pist	 3.0	(km)
Path	 	(km)
Total	3.0	(km)

Capacity of Photovoltale

	 				1	1	
Power demand	8.34	(kWlvdav)	Installed capacity	•	2,730	(Wp)	1
reower bemand	Ų, Ų 1	; (') + 1 4 U(4)	The state of the s		 		_

Facility Description

. 01/		
>>	modu	JI (

,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			- i
Туре	Silico		
Panel output	75	55	(Wp)
Voltage	12	12	_ (Y)
Numbers of Panel	32	6	1
Total Capacity		2,730	(Wp)

>	Ва	tte	n

Туре	Portable le	Portable lead clad				
Capacity	100	(Ah)				
Voltage	12	(Y)				
Numbers of Battery	38					
Total Capacity	3,800	(Ah)				

>Controller

Туре	Battery charge	_
Capacity	500 (W)	_
Numbers of Controller	38 (kit)	

>Conne	cting (Cable a	nd S	witch_

Type of Switch	Single phas	e switch
Type of Cable	Single phas	e CV
Numbers of System	38	(kit)

Preliminary Cost Estimate and Project Evaluation	40.400	aic ex	Variable cost(O M cost)	33,240	aus si
PV module	18,182	(102 a)	Assisting costs in costs	. 00,040	ارمَمَ مُر
Delivery of PV module	3,631	(US \$)			:
Battery	3,540	(US \$)	Total Cost	83,378	(US \$)
Controller equipment	3,420	(<u>US</u> \$)		ļ +	
Installation cost	9,880	(US \$)	Economic/Financial evaluation	<u> </u>	<u> </u>
Tax	3,368	(US \$)	EIRR		(%)
Superviser fee	3,865	(US \$)	B/C'	0.98	
Contingency	4,252	(US \$)	Monthly payment per H.H.*	4.1	(บรร
Fixed cost	50,138	(US \$)	# Initial investment 0	%, Discount R	ate 6%

Inventory conc	erned on	Phot	ovolta	ic Asp	ects		1.			
Scheme No.	P-68]	:	Scheme Nai	m 9	EVEL MACCANETTE SON SON STATES	Tarast]	
Administrative Div	rision	, ,				•			-	
Douar	1131	<u> </u>	Ta	rast						
C.R.	41	<u> </u>	Alt	Aadel		Cercle	4		lit Ourir	
Location										
Latitude	N 31	33'	44"	Longitude	W 7	12'	22"	Altitude	1,210	(m)
Households and P	opulation			Size of Re	sidential A	rea		Access		
	Yr 1996	Yr 2000]	Fragments	T		· [Pist	28.0	(km)
Households	45	47]	E-W	800	(m)		Path		(km)
Population	417	433		N-S	500	(m)	<u>]</u> -,	Total		(km)
Capacity of Photos	voltalc	T			r					1
Power demand		13.11	(kWh/day)	Installed c	apacity		4,465	(Wp)	J
Facility Description	n									
>PV module				_	>Battery					
Туре	Silicor	туре		ļ	Туре		Portable le	ad clad]	
Panel output	75	55	(Wp)	•	Capacity		160	(Ah)		
Voltage	12	12	(v)		Voltage		12	(v)		
Numbers of Panel	50	13		1	Numbers o		63	·	ĺ	
Total Capacity	<u> </u>	4,465	(Wp)	1	Total Capa	city	6,300	(Ah)	J	-
>Controller			<u>.</u>		>Connecti	ing Cable a	nd Switch		_	
Туре	E	attery char	ge		Type of Sv		Single pha	se switch		•
Capacity		500	(W)		Type of Ca	ble	Single pha	se CV		

Preliminary Cost Estimate and Project Evalu	ation			• . •	
PV module	29,737	(US \$)	Variable cost(O M cost)	52,866	(US \$)
Delivery of PV module	5,938	(US \$)			
Battery	5,720	(US §)	Total Cost	135,189	(US \$)
Controller equipment	5,670	(US \$)			
Installation cost	16,380	(US \$)	Economic/Financial evaluation		
Tax :	5,554	(US \$)	EIRR		(%)
Superviser fee	6,345	(US \$)	B/C'	0.74	
Contingency	6,979	(US \$)	Monthly payment per H.H.*	4.2	(US \$)
Fixed cost	82,323	(US \$)	* Initial investment 0%, Discount Rate 6%		

Photovoltaic Aspects

miremory com	oonica on			•					_	
Scheme No.	P-69		S	ichemə N <i>a</i> n	19		Assaka]	
Administrative D	ivision			<u>,</u>		1				
Douar	1132		Ass	aka						
C.R.	41	<u> </u>	Alt A	adel		Cercle	4	<u> </u>	tit Ourir	
Location								4504 45	4 200	/m\
Latitude	N 31	32'	25"	Longitude	W 7	12'	53"	Altitude	1,200	7m1
				Oles of Box	الم امتد عليا.			Access		
Households and			1	Size of Res	SIGERDAL AL	l ea	1	Pist	28.0	(km)
	Yr 1996	Yr 2000	ł	Fragments	700	(m)		Path		(km)
Households	45	47		E-W N-S	500		1	Total		(km)
Population	387	401	j	[14-0	300	3111/	J	<u> </u>	1	U. I.
Capacity of Pho	tovoitaic									
Power demand	·	12.82	(kWh/day)	Installed o	apacity		4,370	(Wp)]
TOWER COMMENT		<u> </u>		<u> </u>						
Facility Descript	ilon									
>PV module			···	1	>Battery		<u> </u>		7	
Туре	Silico	п Туре	.	-	Туре		Portable id	1		
Panel output	75	55	(Wp)		Capacity	·	100	(<u>(A</u> h)		
Voltage	12	12	(A)		Voltage		12	_{(V)		
Numbers of Pane	48	14			Numbers		62		-	
Total Capacity		4,370	(Wp)]	Total Cap	acity	6,200	(Ah)	.]	=
		_			0	ting Cable a	ad Suetob			
>Controller				1	Type of S		i -	se switch	<u> </u>	
Туре	.i	Battery char	1		Type of C		Single pha	-		
Capacity		500](W)		I -	of System	62	(kit)		
Numbers of Cont	roller	62	(kit) ·	. i	Hombers	OI Oystean				
Preliminary Cos	. Cationala and i	Declart Evel	notica				-		÷	
	SI ESTIMATA AND I	FICIOCIEVA	QGUON	29 104	(US \$)	Variable co	st(O M cost))	51,576	(บร ร
Py module	 .cdulo			1	(US \$)					
Delivery of PV m				1	(US \$)	Total Cost			132,205	(บร
	ment				(US \$)					
					(US \$)	Economic/I	Financial eva	aluation		
1					(US S)		EIRR			(%)
Tax Superviser fee					(US \$)	· · · · · · · · · · · · · · · · · · ·	B/C*	- 	0.74	i
LOSIDELVISEL INC.						· · · · · · · · · · · · · · · · · · ·				

6,835 (US \$)

80,629 (US S)

Monthly payment per H.H.*

*Initial investment 0%, Discount Rate 6%

Photovoltaic Aspects

Scheme No.

P-70

Scheme Name

Ansa

Administrative Division

			1		
Douar	1170	Ansa	i		
C.R.	44	Tighdouine	Cercle	4	Ait Ourir

Location

	,								
1	b			i i				i .	1 - 1
Latitude	N 24	241	4 457	1 0000	141 7	441	£20	Farana s	
	N 31	24	14	Longitude	W /	28'	55"	Altitude	1.880 (m)
				L				1. 44.14.4	

Households and Population

	Yr 1996	Yr 2000
Households	59	61
Population	300	311

Size of Res	idential A	rea
I Eraamanta		i

Fragments	<u></u>	
E-W	300	(m)
N-S	800	(m)

Access		
Pist	0.0	(km)
Path	11.0	(km)
Total	11.0	(km)

Capacity of Photovoltaic

	Į.	i		1	· · · · · · · · · · · · · · · · · · ·
Power demand	17.02	(kWh/day)	Installed capacity	8,275	(Wp)

Facility Description

>PV module

Туре	Silico		
Panel output	75	55	(Wp)
Voltage	12	12	(V)
Numbers of Panel	15	130	
Total Capacity		8,275	(Wp)

	b				_
>	D	a	п	е	n

> Dattery					
Туре	Portable lead clad				
Capacity	100	(Ah)			
Voltage	12	(V)			
Numbers of Battery	80				
Total Capacity	8,000	(Ah)			

Туре	Ва	attery charge		
Capacity		500	(W)	_
Numbers of Controller		80	(kit)	

>Connecting Cable and Switch

Type of Switch	Single phase switch		
Type of Cable	Single phase CV		
Numbers of System	80	(kit)	

PV module	55,112	(US \$)	Variable cost(O M cost)	67,764	(US\$
Delivery of PV module	11,006	(US \$)			
Battery	7,280	(US \$)	Total Cost	197,512	(US S
Controller equipment	7,200	(US \$)			<u> </u>
Installation cost	20,800	(US \$)	Economic/Financial evaluation	1	-
Tax	7,056	(US \$)	EIRR		(%)
Superviser fee	10,140	(US \$)	B/C'	0.55	
Contingency	11,154	(US \$)	Monthly payment per H.H.*	4.1	(US \$)
Fixed cost	129 748	การรง	* Initial ignostment 0% Discount Date (

Photovoltaic Aspects

Ezzaoulte Scheme Name P-71 Scheme No. Administrative Division Ezzaoulte 1200 Douar . Ait Oudr Cercle 44 Tighdouine C.R. Location 24" W 7 31' **5**5" Altitude 1,690 (m) 21' Longitude N 31 Latitude Access Households and Population Size of Residential Area 0.0 (km) Pist Yr 2000 Yr 1996 Fragments 18.0 (km) 200 (m) Path E-W 17 Households 18.0 (km) 400 (m) Total N-S 128 Population 121 Capacity of Photovoltale 2,760 (Wp) (kWh/day) Installed capacity 5.30 Power demand **Facility Description** >Battery >PV module Portable lead clad Type Silicon Type Туре (Ah) Capacity $(W\rho)$ Panel output Voltage 12 (V) Voltage Numbers of Battery 27 Numbers of Panel 42 2,700 (Ah) Total Capacity 2,760 (Wp) Total Capacity

>Controller			
Туре	Battery charge		
Capacity	500	(w)	
Numbers of Controller	27	(kit)	

>Connecting Cable	and Switch	
Type of Switch	Single pha	se switch
Type of Cable	Single pha	se CV
Numbers of System	27	(kit)

Preliminary Cost Estimate and Project Evaluation 20,922 (US \$) Variable cost(O M cost) 18,382 (US \$) 0 (US \$) Delivery of PV module 0 (US \$) 2,320 (US \$) Battery 2,430 (US \$) Controller equipment Economic/Financial evaluation 7,020 (US S) instaliation cost 2,354 (US \$) EIRR (%) 8/C* 0.99 3,382 (US \$) Superviser fee 4.6 (US \$) Monthly payment per H.H.* 3,720 (US \$) Contingency * Initial investment 0%, Discount Rate 6% 43,279 (US \$) Fixed cost

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