

**Table E.2.2 SUMMARY OF ANSWERS TO QUESTIONNAIRE FOR THE SOCIAL STUDY
AND PUBLIC AWARENESS OF NATURAL DISASTER (PART 1)**

(2/6)

Item	C.R. My Brahimi		C.R. Ourika					
	My Brahimi	Average	Timalizen	Asguine	Taourirt	Anrar	Tiguemmi	Average
Family members								
1 – 5	2	2	1	2	2	2	5	12
6 – 9	3	3	4	4	6	7	4	25
10 – 14	2	2	6	5	4	3	3	21
15 – 19	1	1	1	1	0	0	0	2
>20	0	0	0	0	0	0	0	0
Ave. annual income (Dh)	23,090	23,090	45,110	19,820	24,280	20,210	14,420	24,770
Agriculture (Dh)	8,600	8,600	34,430	15,860	20,370	13,860	6,480	18,200
Non-agriculture (Dh)	14,490	14,490	10,680	3,960	3,910	6,350	7,940	6,570
Ave. annual expenditure (Dh)	22,440	22,440	42,370	19,550	22,400	20,410	13,240	23,600
Food (Dh)	16,540	16,540	30,070	12,990	16,220	14,880	9,530	16,740
Others (Dh)	5,900	5,900	12,300	6,560	6,180	5,530	3,710	6,860
Ave. years of life in Douar	39	39	55	61	54	55	48	55
Average number of livestock								
Cattle	1	1	2	2	3	2	1	2
Sheep	0	0	0	0	1	1	1	1
Goat	0	0	0	1	0	3	0	2
Mule/donkey	0	0	1	0	1	1	0	1
Average land area (m ²)	10,670	10,670	19,370	14,190	20,160	14,370	6,490	14,920
Rain-fed (m ²)	5,000	5,000	3,860	2,930	6,750	1,690	1,250	3,296
Irrigated (m ²)	5,630	5,630	15,300	10,950	13,070	12,390	5,000	11,342
Plantation (m ²)	5,630	5,630	13,700	10,230	10,480	7,770	4,170	9,270

Note: Figures are expressed in the average of 8 samples for My Brahimi and 12 samples for other Douars.
In the item of family members, the total number is given in each column.

**Table E.2.2 SUMMARY OF ANSWERS TO QUESTIONNAIRE FOR THE SOCIAL STUDY
AND PUBLIC AWARENESS OF NATURAL DISASTER (PART 1)**

(3/6)

Item	C.R. Setti Fadma									
	Aghbalou	Irghef	Tazitounte	Imintadart	El kri	Asgaour	Anfli	Tioudiouine	Timichli	Average
Family members										
1 - 5	1	3	2	2	0	7	4	2	4	25
6 - 9	8	7	6	5	7	5	7	6	2	53
10 - 14	1	1	4	3	4	0	1	4	4	22
15 - 19	1	1	0	2	0	0	0	0	2	6
>20	1	0	0	0	1	0	0	0	0	2
Ave. annual income (Dh)	22,870	15,820	18,740	20,500	23,340	16,480	12,460	16,010	16,150	18,040
Agriculture (Dh)	10,070	6,420	8,620	10,070	17,130	8,880	7,530	11,140	9,570	9,940
Non-agriculture (Dh)	12,800	9,400	10,120	10,430	6,210	7,600	4,930	4,870	6,580	8,100
Ave. annual expenditure (Dh)	22,870	15,400	18,710	20,210	23,330	16,770	12,410	16,010	16,150	17,980
Food (Dh)	16,410	11,680	13,430	15,280	16,860	12,230	9,150	12,560	12,200	13,310
Others (Dh)	6,460	3,720	5,280	4,930	6,470	4,540	3,260	3,450	3,950	4,670
Ave. years of life in Douar	45	45	48	52	51	50	46	49	52	49
Average number of livestock										
Cattle	2	1	1	1	2	1	1	2	1	1
Sheep	1	0	3	1	4	0	1	5	4	2
Goat	0	0	2	5	9	0	8	43	15	4
Mule/donkey	0	0	1	0	0	0	0	1	1	0
Average land area (m ²)	7,220	2,810	4,790	1,880	5,250	2,870	3,430	4,980	6,730	4,440
Rain-fed (m ²)	260	900	1,510	583	467	550	1,120	0	0	600
Irrigated (m ²)	6,590	1,770	2,960	1,200	4,670	2,190	2,210	4,800	6,560	3,660
Plantation (m ²)	3,730	1,710	1,190	1,020	4,340	2,190	567	1,580	4,360	2,330

Note: Figures are expressed in the average of 12 samples collected in each Douar through questionnaire, except those given in the item of family members, which show the total number of families.

Table E.2.2 **SUMMARY OF ANSWERS TO QUESTIONNAIRE FOR THE SOCIAL STUDY AND PUBLIC AWARENESS OF NATURAL DISASTER (PART 1)**

(4/6)

Item	C.R. Asni					C.R. Ouirgane		
	Imtil	Tachdirte	Tansgharte	Centre Asni	Average	Tororte	Tassaouirgane	Average
Family members								
1-5	2	1	2	0	5	3	2	5
6-9	7	8	9	8	32	9	7	16
10-14	1	3	2	3	9	4	3	7
15-19	0	2	0	2	4	0	0	0
>20	2	0	0	0	2	0	0	0
Ave. annual income (Dh)	23,370	18,060	25,270	44,100	27,700	16,460	19,160	17,820
Agriculture (Dh)	9,580	9,460	15,850	41,920	19,200	10,160	13,250	11,710
Non-agriculture (Dh)	13,790	8,600	9,420	2,180	8,500	6,300	5,910	6,110
Ave. annual expenditure (Dh)	23,370	16,780	25,270	36,080	25,370	16,460	18,680	17,580
Food (Dh)	16,230	12,790	18,900	27,090	18,750	11,400	13,430	12,420
Others (Dh)	7,140	3,990	6,370	8,990	6,620	5,060	5,250	5,160
Ave. years of life in Douar	50	42	51	48	48	52	45	49
Average number of livestock								
Cattle	1	3	1	2	2	1	1	1
Sheep	0	11	1	1	3	3	2	3
Goat	0	13	0	0	3	0	0	0
Mule/donkey	1	1	1	1	1	1	0	1
Average land area (m ²)	2,490	15,770	26,620	21,950	16,710	12,780	11,760	12,270
Rain-fed (m ²)	0	1,250	11,510	2,510	3,820	3,480	208	1,840
Irrigated (m ²)	2,390	14,410	14,980	19,310	12,770	9,160	11,403	10,300
Plantation (m ²)	2,350	9,740	14,150	17,100	10,840	6,740	10,770	8,760

Note: Figures are expressed in the average of 12 samples for Imilil and Tassauirgane, 13 samples for Tansgharte and Centre Asni, 14 samples for Tachdirte, and 16 samples for Tororte. In the item of family members, the total number is given in each column.

Table E.2.2 SUMMARY OF ANSWERS TO QUESTIONNAIRE FOR THE SOCIAL STUDY
AND PUBLIC AWARENESS OF NATURAL DISASTER (PART 1)

(5/6)

Item	C.R. Imgdal			C.R. Ijoukak		C.R. Talat N'Yakoub		
	Tizgui	Targua	Average	Ouathkerri	Average	Dougouj	Talat N'Yakoub	Average
Family members								
1 - 5	2	4	6	1	1	4	4	8
6 - 9	3	8	11	7	7	4	7	11
10 - 14	8	1	9	2	2	1	0	1
15 - 19	0	0	0	1	1	1	1	2
>20	0	0	0	0	0	0	0	0
Ave. annual income (Dh)	19,720	21,660	20,690	18,340	18,340	14,950	18,990	16,970
Agriculture (Dh)	9,640	10,730	10,190	10,280	10,280	6,810	11,990	9,400
Non-agriculture (Dh)	10,080	10,930	10,500	8,060	8,060	8,140	7,000	7,570
Ave. annual expenditure (Dh)	19,420	18,160	18,160	17,700	17,700	14,950	18,470	16,710
Food (Dh)	15,790	13,090	13,090	13,270	13,270	12,110	14,330	13,220
Others (Dh)	3,630	5,070	5,070	4,430	4,430	2,840	4,140	3,490
Ave. years of life in Douar	51	54	53	41	41	39	38	39
Average number of livestock								
Cattle	2	1	2	2	2	1	2	2
Sheep	9	0	5	2	2	3	8	6
Goat	17	4	11	7	7	0	26	13
Mule/donkey	1	0	1	0	0	1	1	1
Average land area (m ²)	4,940	2,450	3,700	23,220	23,220	4,600	10,760	7,680
Rain-fed (m ²)	50	40	50	6,340	6,340	1,000	2,750	1,880
Irrigated (m ²)	4,790	2,220	3,510	16,730	16,730	3,480	7,900	5,690
Plantation (m ²)	3,160	1,300	2,230	14,370	14,370	1,000	5,780	3,390

Note: Figures are expressed in the average of 13 samples for Tizgui and Targua, 11 samples for Ouathkerri, 10 samples for Dougouj, and 12 samples for Talat N'Yakoub. In the item of family members, the total number is given in each column.

Table E.2.2 **SUMMARY OF ANSWERS TO QUESTIONNAIRE FOR THE SOCIAL STUDY**
AND PUBLIC AWARENESS OF NATURAL DISASTER (PART 1)

(9/9)

Item	Sidi Youssef Ben Ali								
	Sidi Y.B.Ali	Average							
Family members									
1 – 5	3	3							
6 – 9	5	5							
10 – 14	4	4							
15 – 19	0	0							
>20	0	0							
Ave. annual income (Dh)	17,337	17,337							
Agriculture (Dh)	0	0							
Non-agriculture (Dh)	17,337	17,337							
Ave. annual expenditure (Dh)	17,337	17,337							
Food (Dh)	5,202	5,202							
Others (Dh)	12,135	12,135							
Ave. years of life in Douar	38	38							
Average number of livestock									
Cattle	0	0							
Sheep	0	0							
Goat	0	0							
Mule/donkey	0	0							
Average land area (m ²)	60	60							
Rain-fed (m ²)	0	0							
Irrigated (m ²)	0	0							
Plantation (m ²)	0	0							

Note: Figures are expressed in the average of 12 samples collected by questionnaire in the Municipality of Sidi Youssef Ben Ali. In the item of family members, the total number is given in each column.

Table E.2.3 SUMMARY OF ANSWERS TO QUESTIONNAIRE FOR THE SOCIAL STUDY AND PUBLIC AWARENESS (PART 2)

Question		Answer	Year (1995)	Year (1999)
1	Did you perceive possible attack of disaster ahead of time?	1. Yes 2. No If no No.6	1. 365 2. 91	1. 349 2. 64
2	How did you perceive or get informed ?	1. by weather forecast of TV 2. by weather forecast of radio 3. by prediction from the past experience 4. by the sound from upstream 5. by people's shout from upstream 6. by information given by chief of village 7. others (specify)	1. 2 2. 4 3. 192 4. 140 5. 43 6. 6 7. 3	1. 5 2. 4 3. 297 4. 82 5. 30 6. 7 7. 0
3	When did you perceive or get informed ?	1. more than 1 hour before the disaster 2. 30min.-1 hour before the disaster 3. 15-30min before the disaster. 4. 5-15min before the disaster. 5. just before the disaster struck	1. 177 2. 64 3. 45 4. 55 5. 18	1. 251 2. 36 3. 24 4. 27 5. 5
4	Did you take some action to prepare for evacuation ?	1. Yes 2. No If no No.6	1. 140 2. 158	1. 151 2. 186
5	What action did you take for the preparation of evacuation?	1. nothing 2. to pack household goods 3. to take money with you 4. to let livestock evacuate 5. to communicate with family 6. to inform neighbors 7. to inform villagers in the downstream	1. 71 2. 11 3. 15 4. 39 5. 73 6. 46 7. 9	1. 46 2. 14 3. 14 4. 31 5. 57 6. 39 7. 10
6	How high was the water level in the river as compared to the ordinary level ?		< 3 37 3 - 5m 164 5 - 6m 61 >6m 119	<3m 69 3 - 5m 168 5 - 6m 42 >6m 71
7	How fast was the water flow in the river as compared to normal discharge ?	1. same as normal flow 2. a little bit faster 3. fast 4. very fast	1. 1 2. 4 3. 64 4. 331	1. 2 2. 4 3. 116 4. 262
8	Was a flood occurred ?	1. Yes 2. No If no No. 10	1. 384 2. 2	1. 399 2. 2
9	Duration of flood		<1h 103 1 - 3h 213 3 - 5h 38 >5h 83	<1h 10 1 - 6h 134 6 - 12h 48 12-24h 76 >24h 144
10	Was a debris flow occurred ?	1. Yes 2. No If no No. 12	1. 409 2. 15	1. 357 2. 23
11	Duration of debris flow		<1h 96 1 - 3h 175 3 - 5h 51 >5h 62	<1h 15 1 - 6h 140 6 - 12h 42 12- 24h 141

12	Was a landslide occurred ?	1. Yes 2. No	1. 342 2. 96	1. 301 2. 97
13	Did you evacuate ?	1. Yes 2. No If no No. 20	1. 163 2. 285	1. 89 2. 314
14	When did you evacuate ?	1. immediately after noticing or getting advanced information 2. within 5 min. after having noticed 3. within 10 min. after having noticed 4. within 20 min. after having noticed 5. within 30 min. after having noticed 6. within 1 hour after having noticed 7. after the occurrence of disaster	1. 60 2. 15 3. 9 4. 7 5. 10 6. 8 7. 54	1. 34 2. 5 3. 6 4. 2 5. 6 6. 9 7. 27
15	With whom did you evacuate ?	1. alone 2. with family 3. with neighbors 4. with livestock 5. others (tourists, etc)	1. 31 2. 113 3. 74 4. 35 5. 7	1. 12 2. 62 3. 38 4. 23 5. 5
16	Where did you evacuate ?	1. evacuation area 2. on the roof 3. higher location nearby 4. on a hill 5. others (other village, family's house, mosque)	1. 2 2. 12 3. 63 4. 29 5. 75	1. 1 2. 6 3. 43 4. 17 5. 37
17	How did you evacuate ?	1. walk 2. run 3. by car 4. by motorbike 5. by bicycle 6. by donkey 7. others	1. 53 2. 107 3. 2 4. 1 5. 0 6. 0 7. 0	1. 34 2. 55 3. 0 4. 0 5. 0 6. 0 7. 0
18	What did you carry with you when you evacuated ?	1. nothing 2. money 3. livestock 4. electric products 5. others (blanket, personal effects, etc)	1. 108 2. 28 3. 42 4. 7 5. 15	1. 54 2. 13 3. 24 4. 8 5. 12
19	When did you return home from the evacuation area ?	1. just after the disaster 2. within 1 hour after the disaster 3. 1-6 hours after the disaster 4. 6-12 hours after the disaster 5. 12-24 hours after the disaster 6. more than one day 7. no longer return	1. 9 2. 14 3. 53 4. 18 5. 33 6. 16 7. 8	1. 3 2. 1 3. 23 4. 6 5. 12 6. 5 7. 3
20	Did you give the warning or information to somebody else ?	1. Yes 2. No If no No. 24	1. 221 2. 172	1. 152 2. 172
21	When did you give the warning or information ?	1. immediately after noticing danger 2. at the time of the disaster 3. during evacuation 4. after evacuation	1. 176 2. 49 3. 9 4. 1	1. 138 2. 28 3. 4 4. 1
22	To whom did you give the warning or information ?	1. to family 2. to neighbors 3. to the chief of village 4. to villages located downstream 5. to the tourists	1. 162 2. 179 3. 0 4. 24 5. 55	1. 132 2. 143 3. 0 4. 22 5. 21

23	How did you give the warning or information ?	1. shout loudly 2. visit neighbors 3. whistle 4. ring a bell 5. others	1. 169 2. 32 3. 1 4. 0 5. 0	1. 166 2. 28 3. 1 4. 0 5. 0
24	Did you participate in any activities about flood-fighting or rescue operation ?	1. Yes 2. No If no No. 26	1. 142 2. 241	1. 94 2. 247
25	What kinds of activities did you participate ?	1. guide to evacuation 2. rescue people 3. others (protection of land)	1. 73 2. 81 3. 25	1. 47 2. 48 3. 11
26	Damage situation for your family	year and month	1995/8	1999/10
		number of victims	6	0
		number of the injured	9	0
		damage of house (a) all damaged (b) partially damaged	(a) 15 (b) 51	(a) 3 (b) 10
		damage of cultivated land	342	266
		damage of livestock	14	3
		others (shop, restaurant equipment, water mill, motorcycle, etc)	51	5
27	Did you take some measures later to mitigate damage?	1. Yes 2. No If no No. 29	1. 144 2. 266	
28	What kinds of measures did you take ?	1. packing things to get ready for evacuation 2. securing route and place for evacuation 3. making an evacuation plan with neighbors 4. others	1. 24 2. 149 3. 2 4. 7	
29	Do you always prepare for evacuation ?	1. Yes 2. No If no No. 31	1. 236 2. 152	
30	What do you prepare for evacuation ?	1. packing things for evacuation 2. securing route and place for evacuation 3. others	1. 45 2. 232 3. 5	
31	Do you always fear the disaster?	1. Yes 2. No	1. 409 2. 1	
32	Are you always cautious about natural disaster ?	1. Yes 2. No	1. 405 2. 18	
33	Did you know that your place is vulnerable to disaster prior to your immigration ?	1. Yes 2. No 3. I have been living here since I was born	1. 15 2. 26 3. 371	
34	Do you wish to relocate your house to the safe place?	1. Yes 2. No	1. 135 2. 273	

35	Why don't you relocate ?	1. due to financial problem 2. due to land problem 3. due to the relationship with community 4. others	1. 255 2. 256 3. 137 4. 12
36	Did you participate in restoration work ?	1. Yes 2. No If no No. 38	1. 397 2. 64
37	What type of restoration work did you do ?	1. restoration of my house 2. restoration of neighbor's house 3. restoration of road 4. restoration of public facilities (school, hospital, etc.) 5. others (farmland, irrigation canal, water intake, etc)	1. 65 2. 101 3. 314 4. 25 5. 179
38	If evacuation drill is planned in your village, do you want to participate in it ?	1. Yes 2. No	1. 341 2. 69
39	Is flood forecast and warning system (FFWS) necessary for your village ?	1. Yes 2. No If no No. 42	1. 465 2. 13
40	Can you contribute something to the operation and maintenance of FFWS ?	1. Yes 2. No If no No. 42	1. 380 2. 47
41	What type of contribution can you offer ?	1. to keep watch communication equipment 2. to be voluntarily engaged in radio communication during flood period 3. others (any possible work if required)	1. 244 2. 278 3. 45
42	What do you want as a preventive measure against disaster ?	1. accurate forecasting 2. warning and information in advance 3. evacuation drill 4. place of evacuation 5. education 6. others	1. 389 2. 289 3. 164 4. 128 5. 75 6. 3
43	Please indicate which one you need the most for your family and village	1. safety 2. water 3. school 4. hospital 5. public transportation service 6. relocation land 7. farmland 8. livestock 9. electricity 10. others (mosque, bridge, road improvement, bridge, telephone, etc)	1. 208 2. 162 3. 59 4. 248 5. 90 6. 100 7. 78 8. 93 9. 178 10. 116

Table E.2.4 LIST OF DAMAGE IN SELECTED DOUARS BY THE 1995 DISASTER (1/2)

R.C / Douar	Human		House		Livestock				Agricultural land (ha)		Tourist facility		Others
	Dead	Injured	> 50%	< 50%	Cattle	Sheep	Goat	Mule	Cultivated	Plantation	Hotel	Restaurant/ café	
R.C. Zerkten	0	0	0	3	0	0	0	0	1.8	0.2	0	0	1 water mill, 3 water intakes
Tazlida-Ait Moussa	0	1	1	0	0	0	0	0	2.0	0.0	0	4	-
Tazlida-Tabahgate	0	0	0	0	0	0	0	0	2.0	0.0	0	0	1 bridge
R.C. Tighedouine	0	0	0	0	0	0	0	0	1.9	0.1	0	0	-
Quayfirt	0	0	0	0	0	0	0	0	3.0	1.0	0	0	-
Tazourte	0	0	0	0	0	0	0	0	120.0	30.0	0	0	irrigation canal
Anammer	0	0	0	0	0	0	0	0	0.5	1.5	0	0	irrigation canal
Arba Tighedouine	0	0	0	0	0	10	12	0	0	0	0	0	0
R.C. My Brahmi	5	0	0	0	0	0	0	0	1.0	1.5	0	0	200 chairs of coffee shop
R.C. Ourika	0	0	1	1	0	0	0	0	3.0	0.5	0	0	-
Timalizen	1	0	0	0	0	0	0	0	4.0	4.0	0	0	1 water mill
Asguine	0	0	0	0	0	0	0	0	6.0	2.0	0	0	-
Taurirte	0	0	0	0	0	0	0	0	0.5	0.5	0	0	-
Anrar	0	0	0	0	0	0	0	0	2.5	0.5	0	0	1 water mill, 1 water intake
Tiguemmi	0	0	0	10	0	0	0	0	0	0	0	0	0
R.C. Setti Fadma	13	0	21	15	0	0	0	0	14.0	6.0	0	1	1 water mill, 10 cars
Aghbalou	100	0	10	4	2	0	0	0	14.0	6.0	0	1	about 50 cars
Irghef (Oulmes)	10	0	6	5	4	5	0	0	0.5	0.5	0	2	3 mills, 3 cars
Tazitounte	0	0	0	7	0	0	0	0	2.0	1.0	0	0	-
Imintadart	2	0	0	0	0	0	0	0	0.5	2.5	0	1	1 car
El kri	7	0	2	0	0	0	0	0	0.0	1.0	0	0	about 100 tourist cars
Asgaour	0	25	0	1	0	0	50	0	1.0	1.0	0	0	4 water mills
Anfli	0	0	8	0	0	20	70	0	13.0	2.0	0	0	-
Tiourdiouine	0	0	3	1	0	0	0	0	6.0	1.0	0	0	-
Timichi	0	0	0	0	0	0	0	0	0	0	0	0	-

Table E.2.4 LIST OF DAMAGE IN SELECTED DOUARS BY THE 1995 DISASTER (2/2)

R.C / Douar	Human		House		Livestock				Agricultural land (ha)		Tourist facility		Others
	Dead	Injured	> 50%	< 50%	Cattle	Sheep	Goat	Mule	Cultivated	Plantation	Hotel	Restaurant/ café	
R.C. Asni													
Imlil	2	0	0	2	0	0	0	0	0.0	3.0	1	1	3 water mills, 30 cars
Tachdirte	0	0	0	8	0	4	0	0	5.0	1.0	0	0	irrigation canal, access road
Tansgharte	0	0	0	0	0	0	0	0	0.0	5.0	0	0	-
Centre Asni	0	0	0	0	0	0	0	0	20.0	20.0	0	1	2 ovens
R.C. Ouirgane													
Tororte	0	0	0	0	0	0	0	0	9.0	6.0	0	0	-
Tassaouirgane	0	0	0	0	0	0	0	0	5.0	10.0	0	0	-
R.C. Imgdal													
Tizgui	6	2	1	1	2	100	200	1	9.0	2.0	0	0	-
Targua	1	0	0	0	0	0	0	0	0.4	0.1	0	0	-
R.C. Ijoukak													
Ouathkerri	0	0	0	0	0	0	0	0	2.0	1.0	0	0	-
R.C. Talat N'Yakoub													
Dougouj	0	0	0	0	0	0	0	0	1.0	0.0	0	0	-
Talat N'Yakoub	0	0	0	0	0	0	0	0	4.0	1.0	0	0	15 water intake facilities
Total	147	28	53	58	8	139	332	1	254.6	111.9	1	11	
Pre. Sidi Youssef Ben Ali													
Municipality of Sidi Youssef Ben Ali	0	15	6	19	0	30	0	0	0	0	0	0	15 bicycles

Note: According to information provided by the chief of each village through the interview

Sidi Youssef Ben Ali was not struck by the 1995 disaster, therefore damage information given above is based on the 1982 disaster.

Table E.2.5 LIST OF DAMAGE IN SELECTED DOUARS BY THE 1999 DISASTER (1/2)

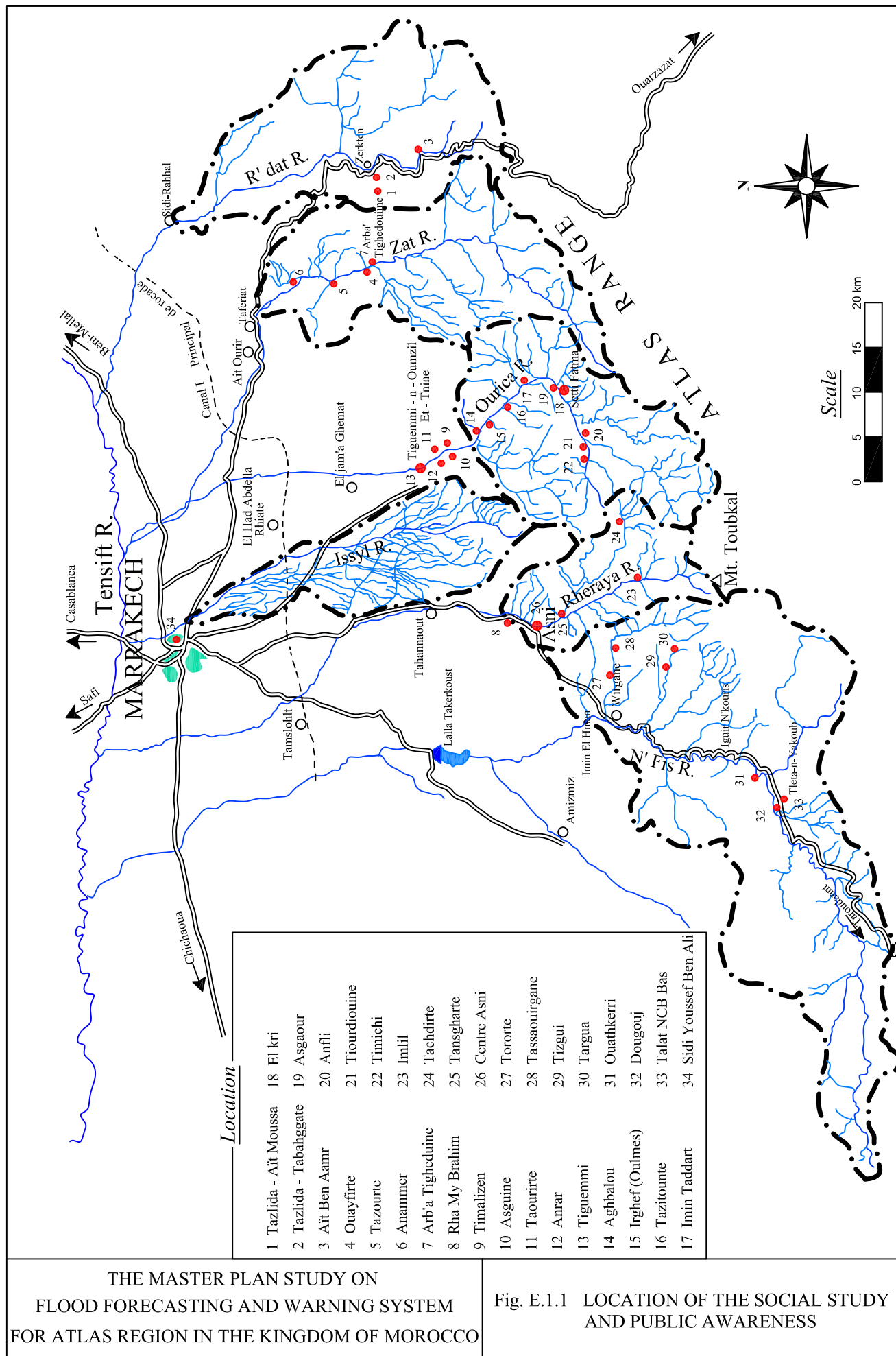
R.C / Douar	Human		House		Livestock				Agricultural land (ha)		Tourist facility		Others
	Dead	Injured	> 50%	< 50%	Cattle	Sheep	Goat	Mule	Cultivated	Plantation	Hotel	Restaurant/ café	
R.C. Zerkten	0	0	0	0	0	0	0	0	1.5	0.5	0	0	-
Tazlida-Ait Moussa	0	0	0	0	0	0	0	0	0.0	0.0	0	0	-
Tazlida-Tabahgate	0	0	0	0	0	0	0	0	2.0	0.0	0	0	1 bridge
Ait Ben Aamr	0	0	0	0	0	0	0	0	2.5	0.5	0	0	irrigation canal
R.C. Tighedouine	0	0	0	0	0	0	0	0	4.5	1.0	0	0	-
Quayfirt	0	0	0	0	0	0	0	0	120.0	30.0	0	0	irrigation canal
Tazourte	0	0	0	0	0	0	0	0	0.5	1.5	0	0	1 bridge
Anammer	0	0	0	0	0	10	12	0	0	0	0	0	0
Arba Tighedouine	0	0	0	0	0	0	0	0	1.0	2.0	0	0	0
R.C. My Brahmi	0	0	0	0	0	0	0	0	2.0	0.5	0	0	0
Rha My Brahmi	0	0	0	0	0	0	0	0	6.0	4.0	0	0	1 water mill, 1 well
R.C. Ourika	0	0	1	1	0	0	0	0	1.0	1.0	0	0	-
Timalizen	0	0	0	0	0	0	0	0	0.5	0.0	0	0	1 water mill
Asguine	0	0	0	0	0	0	0	0	0.0	0.0	0	0	-
Taurirte	0	0	0	0	0	0	0	0	14.0	6.0	0	0	2 water mills
Anrar	0	0	1	0	0	0	0	0	20.0	6.0	0	1	-
Tiguemmi	0	0	0	0	0	0	0	0	0.5	0.5	0	0	-
R.C. Setti Fadma	0	0	0	0	0	0	0	0	0.0	0.0	0	0	-
Aghbalou	0	0	0	0	0	0	0	0	14.0	6.0	0	0	2 water mills
Irghef (Oulmes)	0	0	3	0	0	0	0	0	20.0	6.0	0	1	-
Tazitounte	0	0	0	0	0	0	0	0	0.5	0.5	0	0	-
Imintadart	0	0	0	0	0	0	0	0	1.0	1.0	0	0	-
El kri	0	0	0	0	0	0	0	0	0.0	3.0	0	1	-
Asgaour	0	0	0	0	0	0	0	0	0.0	1.0	0	0	-
Anfli	0	15	0	4	0	0	0	0	3.0	3.0	0	0	1 water mill
Tiourdiouine	0	0	0	0	0	0	0	0	13.0	2.0	0	0	2 water mills
Timiehi	0	0	0	0	0	0	0	0	12.0	2.0	0	0	-

Table E.2.5 LIST OF DAMAGE IN SELECTED DOUARS BY THE 1999 DISASTER (2/2)

R.C / Douar	Human		House		Livestock				Agricultural land (ha)		Tourist facility		Others
	Dead	Injured	> 50%	< 50%	Cattle	Sheep	Goat	Mule	Cultivated	Plantation	Hotel	Restaurant/ café	
R.C. Asni													
Imfil	0	0	0	0	0	0	0	0	0.0	3.0	0	0	-
Tachdirte	0	0	0	0	0	0	0	0	0.0	0.0	0	0	irrigation canal, access road
Tangharte	0	0	0	0	0	0	0	0	0.0	5.0	0	0	-
Centre Asni	0	0	0	0	0	0	0	0	0.0	0.0	0	0	-
R.C. Ouirgane													
Tororte	0	0	0	0	0	0	0	0	0.0	0.0	0	0	-
Tassaouirgane	0	0	0	0	0	0	0	0	1.0	3.0	0	0	-
R.C. Imgdal													
Tizgui	0	0	1	0	0	0	0	0	5.0	1.0	0	0	-
Targua	0	0	0	0	0	0	0	0	0.5	0.1	0	0	-
R.C. Ijoukak													
Ouathkerri	0	0	0	0	0	0	0	0	7.0	3.0	0	0	2 water mills
R.C. Talat N'Yakoub													
Dougouj	0	0	0	0	0	0	0	0	1.0	0.0	0	0	1 well
Talat N'Yakoub	0	0	0	0	0	0	0	0	3.0	1.0	0	0	-
Total	0	15	6	5	0	10	12	0	222.5	82.1	0	2	
Pre. Sidi Youssef Ben Ali													
Municipality of Sidi Youssef Ben Ali	0	0	0	0	0	0	0	0	0	0	0	0	-

Note: According to information provided by the chief of each village through the interview
Sidi Youssef Ben Ali was not struck by the 1999 disaster, and even by the 1994 flood there was no outstanding damage.

FIGURES



APPENDIX F

TOURISM

**THE MASTER PLAN STUDY ON
FLOOD FORECASTING AND WARNING SYSTEM
FOR ATLAS REGION IN THE KINGDOM OF MOROCCO**

APPENDIX F TOURISM

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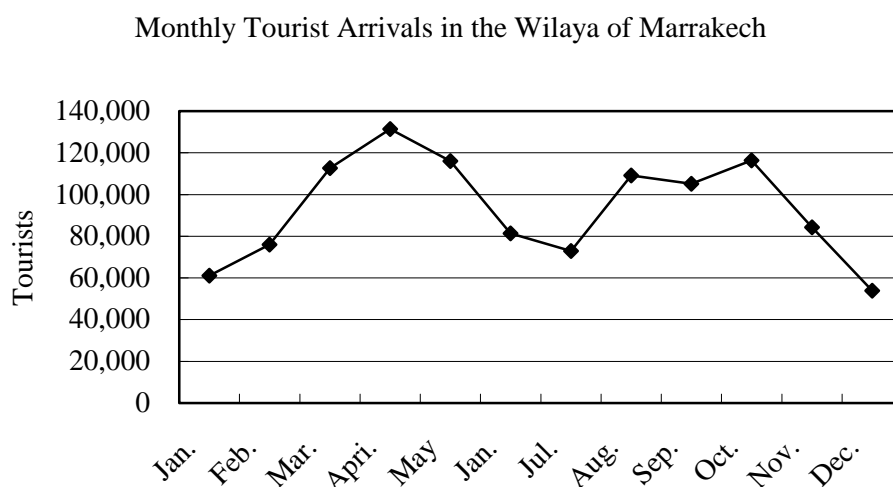
CHAPTER 1. GENERAL

1.1 Tourism in the Kingdom

Tourism is one of the most important industries in Morocco. It contributes to the Moroccan economy. According to a World Bank Report “*Morocco Sustainable Coastal Tourism Development Project*”, tourism generates more than 15 percent of the country’s foreign exchange earnings, and in 1999 it came first, outpacing the remittances of Moroccans residing abroad. Its value added to GDP amounts to 7.7 percent (4.7 direct and 2 indirect), that is about half of what tourism contributes in major comparator countries, like Greece, Turkey, and Tunisia. It generates 7.5 percent of total employment (3 percent indirect, mostly in retail and construction).

The number of foreign tourists in 1998 is approximate 2,010,000 in whole kingdom. Proportion of foreign tourists is French of 31 %, German of 12%, Spanish of 11%, Italy of 6%, and European of 82 % respectively. Peak season is July and August that shares 25.7%.

Many tourists spend their holidays and travel all over the country. The most attractive to tourists in the kingdom is the city of Marrakech. 1,120,000 tourists visited the Wilaya of Marrakech in 1999; among them, the French accounted for 47.3 % and Moroccans for 15.6 %. March, April, May and August, September, and October are considered as high season.



1.2 Tourism in the Study Area

The Study Area is located at the immediate south of Marrakech. It includes the High Atlas represented by Mt. Toubkal culminating at an altitude of 4,165m above sea level. Nature and exceptional landscapes of the High Atlas are of equal attractiveness, which creates very important tourist sites that attract many holidaymakers of both Morocco and foreign countries.

The main attractions are mountain climbing, trekking, skiing, and playing in rivers and streams, in addition to its being considered as a summer resort escaping from the heat. Mt. Toubkal is known for mountain climbing, and Oukaïmeden for trekking and skiing. Moulay Brahim is a very famous spot especially for Moroccan women, where there are many hotels and shops (Souk) that provide necessary facilities for tourists.

Moreover, there are four major tourist spots on the objective rivers of the Study. These are Iraghf(Oulmes) and Setti Fadma on the Ourika River, and Imlil and R'ha Moulay Brahim on the Rheraya River. Many tourists gather at these locations, especially in summer. On the other hand, the tourist spots are vulnerable to floods and debris flows, and it is unforgettable that the catastrophic disaster in 1995 killed hundreds of people there.

CHAPTER 2. TOURISM SURVEY

2.1 Objectives

In this Study, a tourism survey was conducted for tourist spots in early August, 2000 to collect information on the tourism that are hardly available in statistics and study reports.

The survey aims to make clear the following aspects:

- (1) number of tourists,
- (2) number of vehicles,
- (3) traffic,
- (4) characteristics of tourism,
- (5) awareness on flood, and
- (6) others.

2.2 Survey Methodology

The survey consists of four (4) components:

- (1) counting tourists and vehicles at tourist spots,
- (2) counting traffic at fixed point,
- (3) questionnaire
- (4) interview, and
- (5) others(observations)

They were conducted on 2nd Wednesday, and 3rd Thursday, as a weekday, and 5th Saturday, and 6th Sunday as a weekend in August which is high season of summer vacation. Additional survey was also conducted on 2nd Wednesday September 2000.

2.2.1 Selection of Objective Area

Objective areas were selected for each component in the following table, which are as tourism spots.

Objective Area	
Components	Objective Area
(1) Tourists and Vehicles Counting	Setti Fadma Iraghf(Oulmes) and whole stretch from Agbalou to Setti Fadma on the Ourika River R'ha Moulay Brahim and Asni Market on the Rheraya River
(2) Traffic Counting	Agbalou on Ourika River
(3) Questionnaire	Setti Fadma, Iraghf(Oulmes) on the Ourika River R'ha Moulay Brahim on the Rheraya River
(4) Interview	Setti Fadma, Iraghf(Oulmes) on the Ourika River R'ha Moulay Brahim and Imlil on the Rheraya River
(5) Others(Observations)	Whole stretch of both Ourika and the Rheraya River

Tourists were observed at both the Ourika River and the Rheraya River in the preliminary survey. Then the both two (2) rivers are considered as a tourism spot in the Study Area. As for the Ourika River, tourists were observed at whole stretch from Agbalou to Setti Fadma, mainly the areas of Setti Fadma and Iraghf (Oulmes). While the Rheraya River, they were observed in Imlil and R'ha Moulay Brahim. In

addition to these two (2) spots, many people were observed at Asni Market where is located near the river, who were not tourists but local people. Even though many tourists were observed in Imlil, very few tourists were observed along the river

From the observation of the preliminary survey, the four (4) areas of Setti Fadma and Iraghf (Oulmes) on the Ourika River, and Imlil and R'ha Moulay Brahim on the Rheraya River were considered as a main tourist spot.

On the Ourika River, tourists were observed at not only the above two (2) areas but also whole stretch of the river from Aghbalou to Setti Fadma. While on the Rheraya River, tourists were observed in only the above two (2) areas.

As for the counting number of tourists and vehicle, the survey was conducted at the above three spots except for Imlil, because there are very few people around river, and the zone of whole stretch of the Ourika River from Aghbalou to Setti Fadma except for Setti Fadma and Iraghf (Oulmes) in addition to the three spots. In other words, whole stretch consists of two (2) zones, from Aghbalou to before Iraghf (Oulmes), after Iraghf to before Setti Fadma is added to the above three spots as the counting survey.

In addition to the above areas, the survey of counting not tourists but people and vehicles number was conducted at Asni Market on Saturday when it is held on.

Selected areas for each component are shown in the following table.

The methodology of the survey is summarized in Table F.2.1 and the locations of the survey spots are presented in Fig. F.2.1. The survey results are also summarized in Fig. F.2.2 and Table F.2.2.

2.2.2 Tourists and Vehicles Counting

Number of tourists and vehicles were counted by surveyors at the above objective areas around every two (2) hours in daytime. As for the counting for whole stretch on the Ourika River, a surveyor counted vehicles and tourists from in a car driving from Aghbalou to Setti Fadma.

River	Objective Area	Date	Remarks
The Ourika River	Setti Fadma	3 rd Thursday August 2000(weekday)	
	Iraghf(Oulmes)	6 th Sunday August 2000 (weekend)	
	Whole stretch from Aghbalou to Setti Fadma		Except for Setti Fadma and Iraghf(Oulmes)
The Rheraya River	R'ha Moulay Brahim	2 nd Wednesday August 2000(weekday)	
		5 th Saturday August 2000 (weekend)	
	Asni Market	5 th August 2000 (weekend)	Only Saturday open

Results of the counting survey are shown in Fig.F.2.3.

2.2.3 Traffic Counting

Traffic, which is the accumulated number of vehicles going in and out of Ourika at Aghbalou as a fixed point, was counted every an hour in a daytime on both 3rd Thursday and 6th Sunday August 2000.

Vehicles were counted by three (3) classified types of car and mini-bus, bus, bicycle and motorcycle.

Results of counting survey are shown in Fig.F.2.4.

2.2.4 Questionnaire

The questionnaire survey was conducted to tourists in Setti Fadma, Iraghf(Oulmes), and Rheraya. Surveyor selected sample tourists at random without bias/intention. Sample size is shown in the following table.

River	Objective Area	Date	Sample Size
The Ourika River	Setti Fadma	3 rd August 2000(weekday)	100
	Iraghf(Oulmes)	6 th August 2000 (weekend)	76
The Rheraya River	R'ha Moulay Brahim	2 nd August 2000(weekday)	140
		5 th August 2000 (weekend)	
Total			316

Questionnaire Form is shown in Fig.F.2.3. Results of counting survey are shown in Table F.2.2.

2.2.5 Interview

The interview survey was conducted to owners of cafe/restaurant and hotel at five (5) main spots of Setti Fadma, Iraghf (Oulmes), Imlil, R'ha Moulay Brahim, and Asni Market. Surveyors selected samples at random without bias/intention. Sample size is shown in the following table.

River	Objective Area	Date	Sample Size
The Ourika River	Setti Fadma	3 rd Thursday August 2000(weekday)	2+4
	Iraghf(Oulmes)	6 th Sunday August 2000 (weekend)	2+4
The Rheraya River	Imlil	2 nd Wednesday August 2000(weekday)	8
	R'ha Moulay Brahim	5 th Saturday August 2000 (weekend)	4
	Asni Market		1
Total			25

The trend of tourist number through a year and a week, and countermeasure against past floods, etc. were interviewed.

Additional interviews were also conducted to four (4) interviewees in Setti Fadma and four (4) in Iraghf (Oulmes), consisted of five (5) tourists and 3 owners of cafe/restaurant on 2nd September 2000. Awareness on flood, ideas for evacuation, and opinions about “*Park and Ride*” which is explained later were interviewed.

CHAPTER 3. TOURISM ANALYSIS

3.1 Characteristics of Tourist Spot

(1) The Ourika River

Tourist spots on the Ourika River are not limited to Iraghf (Oulmes) and Setti Fadma. In summer the whole stretch of the Ourika River from Aghbalou to Setti Fadma is crowded with tourists.

Peak Number of Tourists on the Ourika River

Date of Survey	Iraghf	Setti Fadma	Others	Total*
Thursday, August 3	1,170	868	422	2,193*
Sunday, August 6	2,628	2,487	1,221	5,728*

* This total number for the whole stretch is less than the total of the three peak numbers because the peak-time is different from place to place.

The maximum 5,728 tourists and 1,185 vehicles were counted on the whole stretch at 3:00 p.m. on Sunday, August 6, 2000, about 5.5 times as many tourists and vehicles on Thursday, August 3, 2000.

Many cafe/restaurants, hotels, and shops including surveyor shops are located along the river. Especially in Setti Fadma and Iraghf (Oulmes), many cafe/restaurants are located at just riverside.

(a) Setti Fadma

Setti Fadma is the end of the coated roadway for traffic. Only 4WD-cars can go further upstream. The nature is beautiful, namely clean water, green trees, fine landscapes, and huge rocks. Many tourist facilities such as accommodations, cafe-restaurants and shops are available.

Most of the tourists head towards this area in July and August to spend their summer vacations. They swim and enjoy themselves in the river. The road is exceedingly jammed up, especially on weekends because a lot of cars and buses are parked on the road. Sometimes it takes more than fifteen minutes for a car to go through the jam.



Traffic Jam in Setti Fadma on Sunday

There were 2,478 tourists and 260 vehicles at the peak time, 1:00 p.m. on Sunday, August 6, 2000, about 2.7 times as many as that on Thursday, August 3, 2000.

(b) Iraghf (Oulmes)

Iraghf is widely famous as "Oulmes". This spot comprises a variety of tourist facilities including accommodations, cafe-restaurants and shops. Most of the tourists head for this spot in July and August to spend their summer vacations, like Setti Fadma. Therefore, almost all tourist facilities open during this period only. The road is also exceedingly jammed up, especially on weekends. There is only one small parking lot in Iraghf (Oulmes). Thus, a 1 km long line of cars is formed on the road on weekends.



Traffic Jam in Iraghf on Sunday

2,628 tourists and 182 vehicles were counted at the peak time between 3:00 and 5:00 p.m. on Sunday, August 6, 2000, about 2 times as many as that on Thursday, August 3, 2000. It is noted that the peak time is later and more visitors stay there late in the evening than those at Setti Fadma. It is probably because Iraghf is closer to their homes in Marrakech, Casablanca, etc.

(2) The Rheraya River

It is difficult to find people on and around the Rheraya River except at R'ha Moulay Brahim and Asni. R'ha Moulay Brahim is the only place where tourists enjoy the river. Imlil is a base point for trekking and mountain skiing. There are many tourists seen at hotels, cafe-restaurants, and shops in Imlil but few of them enter the river. 4,556 tourists and 578 vehicles were counted at the peak time; 11:00 a.m. on Saturday, August 5, 2000 in the zone from R'ha Moulay Brahim to the Asni Market.

The Asni Market (Souk) that opens every Saturday is located just beside the Rheraya River. It is not a tourist spot but many local people go shopping there. 3,873 people were counted there at 11:00 a.m. on Saturday, August 5, 2000.

Peak Number of Tourists on the Rheraya River

Date of Survey	R'ha Moulay Brahim	Asni Market	Others	Total*
Wednesday, August 2	883	-	124	910*
Saturday, August 5	1,360	3,873	155	4,556*

* This total number for the whole stretch is less than the total of the three peak numbers because the peak-time is different from place to place.

(a) Imlil

There are hotels, cafe-restaurants, shops and a mountain guide office in Imlil. Tourists stop there for taking a rest or preparation of activities in the mountains, and then go deep into the mountains or go home.

The peak season is summer for trekking, and the second peak is in March and April when mountain skiing is available. The majority of tourists are foreigners and they dare visit Imlil despite knowing the 1995 disaster through a popular guidebook: "*Lonely Planet*".

(b) R'ha Moulay Brahim

R'ha Moulay Brahim is located just under Moulay Brahim, 10 minute drive or 30minute walk. A pool in the river has been made temporarily by stones for children to swim. There are seen several camels and mules waiting for customers to ride. The road was not congested because a parking space is secured at the opposite side of the restaurants even on Sunday.



R'ha Moulay Brahim on Saturday

1,360 tourists and 63 vehicles were counted at 4:00 p.m. on Saturday, 2000, about 1.5 times as many tourists and vehicles as those on Wednesday. More than 90 % of tourists that were interviewed there visited Moulay Brahim, too.

3.2 Characteristics of Tourists

(1) Nationality and Language

The majority of tourists are Moroccans except in Imlil where almost all tourists are foreigners. Their purpose is to play in and around the river (94%). Arabic is the most available language among the tourists, and ninety four (94) % can speak and listen to Arabic. French is also spoken and listened to by seventy one (71) %. However, the local language, Berber is far less understood among the tourists who gather from all over the kingdom.

Available Languages

Language	Reading & Writing	Speaking & listening
French	68 %	71 %
Arabic	88 %	94 %
Berber	11 %	30 %
English	27 %	24 %

(2) Seasonal and Daily Pattern

According to the interviews to the owners of hotels or cafe/restaurants, the peak season is concentrated in July and August. While only in Imlil, second peak appears in spring because of mountain skiing. In summer, the places are more crowded on Saturday and Sunday, followed by Friday.

The peak time for the traffic coming into the Ourika Valley was between 12:00 and 13:00 p.m., and for that going out from the Ourika Valley was 18:00 p.m.

Sixty five (65) % of the tourists in Ourika come and return in one day, while the remaining thirty five (35) % stay for several nights. On the other hand, one-day's visitors are the minority in R'ha Moulay Brahim. Seventy two (72) % spend several nights at the adjoining tourist site, Moulay Brahim. As a means of transportation, thirty nine (39) % use their private cars, forty four (44) % taxis and sixteen (16) % buses.

(3) Awareness over Disaster

Ninety two (92) % of the interviewees know about the 1995 disaster and Sixty one (61) % expressed their fear against a flood. Questioned about an evacuation place, Eighty one (81) % answered that they would evacuate to higher places, Twelve (12) % to their cars, which corresponds to twenty four (24) % of the interviewees who came by their own cars. Almost all the interviewees expressed the necessity of an alarm facility and a guide to help them evacuate in case of a flood.

Regarding the owners of hotels and cafe-restaurants, they have never taken any concrete measures against a flood, though they feel threaten by it. They are just keeping careful and prepared to evacuate as soon as they detect a flood.

An in-depth interview survey with five tourists and three restaurant owners was made in the Ourika Valley on 2nd August 2000, in addition to the above survey. Asked which is more important, longer time for evacuation or accuracy of warning/information, all the interviewees preferred longer time for evacuation. The three restaurant owners showed their willingness to help tourists to evacuate during a flood and to have training for it. It is also interesting that six of the nine interviewees expressed their support to an idea of so called “Park and Ride” under which private cars are controlled at the entrance of the valley and the car passengers are transported to the tourist spots by a shuttle bus.

3.3 Conclusion and Recommendations

3.3.1 Necessity of special consideration to tourism

It is still remembered a strong flood occurred in 1995. Most of the victims of 1995 flood were tourists.

It is considered that special considerations to the tourists are very important because it is same the high tourism season as the season when the flood occurs by thunder storm. There are many tourists and many vehicles at the flood potential areas in that season.

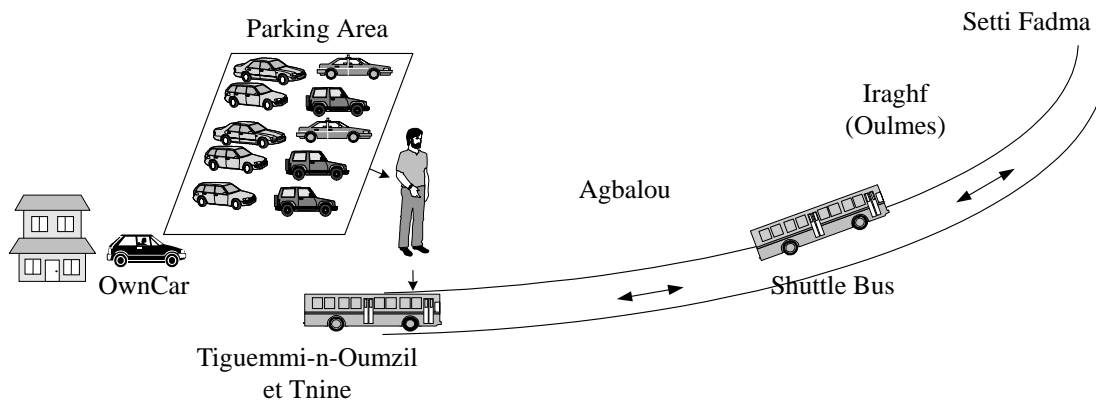
If a flood occurs when there are many tourists and vehicles in the peak season, they are likely to panic and many tourists and many vehicles are to be damaged. Because evacuation space is not enough and road width for evacuation is also not enough due to many parking cars along the roadside.

Under these circumstances, it is difficult to evacuate for tourists and vehicles when a flood occurs, even though proposed Flood Forecasting and Warning System (FFWS) is operated well.

Following ideas are recommended in the above situations.

3.3.2 Park and Ride

Traffic control is recommended idea in the Ourika River. The following figure shows its concept.

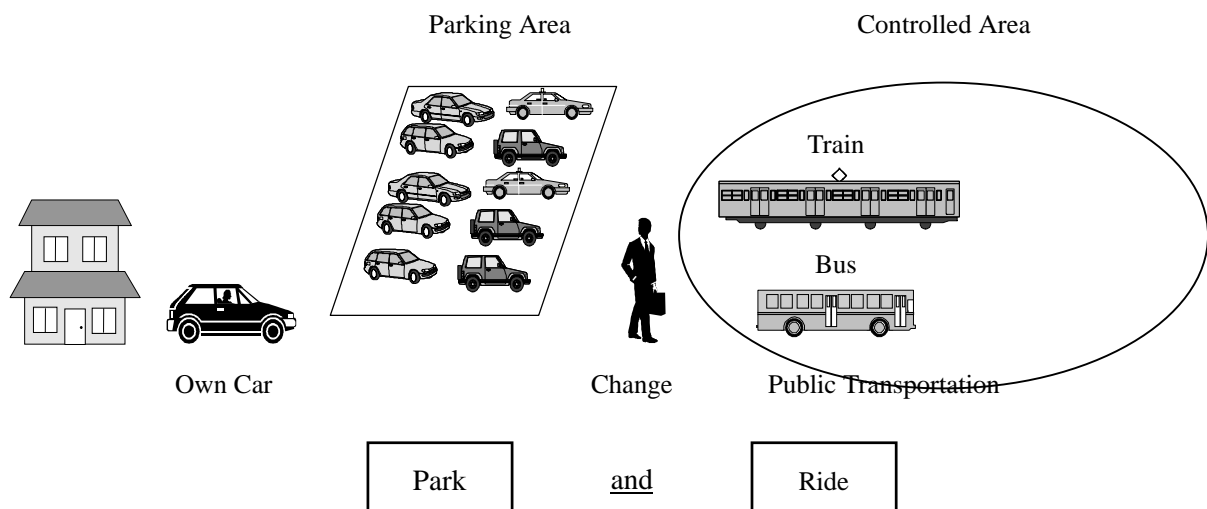


Concept of Traffic Control In the Ourika River

When tourists go to the Ourika River by their own cars, they drive until entrance of the valley where the plan area near Ourika Caid Office, then park them at a parking space there. After that, they change to ride a shuttle bus for Settee Fadma. This idea of traffic control is called “*Park and Ride*”. This system has been already applied in Japan.

It has been applied to mountain resort of Kamikochi in Japan. Kamikochi is a one of the famous mountain resort with beautiful nature. Before the application, tourists used to enter the place by their own cars. People park them at all over the resort area because there is little parking space. Unfortunately it is difficult to secure an enough parking space in the mountain valley. In addition to the above issue of the parking space, air pollution by gas emission from cars becomes a serious problem also. Under these circumstances, Park and Ride system is applied there.

“*Park and Ride*” has been applied not only in Japan but some countries. Originally Park and Ride is measures against traffic jams in a center city. It is applied to control a heavy traffic jams caused people going to work in a center city by their own car. Its concept is shown in the following figure.



Park and Ride System

When people go to work, they drive their own cars until the boarder of conjunction area of center city, and they park there, and ride a bus or train as a public transportation. This is Park and Ride system.

Ourika Valley is a quite same situation as Kamikochi due to traffic jam and no more parking space. Then Park and Ride is recommended as one of the solution ideas for the Ourika River area.

From additional interview survey in section 2.2.5, six (6) interviewees agreed with application of Park and Ride there if it helps them from disasters. Some wish the application because it can advertise Ourika is safe and fine place, though many people consider Ourika is dangerous now.

While two (2) of them opposed it because it is difficult to evacuate by shuttle bus, and it is difficult for old people to change to ride a bus.

As for the application, more considerations are necessary.

3.3.3 Trail improvement and maintenance

There is no enough place to evacuate for tourists even though too much traffic is controlled well by Park and Ride. Due to mountain valley, it is difficult to secure a large evacuation place. Even if a large evacuation place is secured in Ourika, it is also difficult for them to evacuate there because they are spread over the area not only Iraghf (Oulmes) or Setti Fadma. Thus, it is recommended that existing trails improvement and maintenance for evacuation please is useful. There are many trails up to villages (douars) along the river.

3.3.4 Evacuation System

Even if Park and Ride is applied and trails are improved and maintained, tourists don't know how and where to evacuate, and they are likely to panic when a flood occurs. For smooth evacuation, guides, training/drill, information like signboard and map, and evacuation route are necessary.

From additional interview, most of them don't know information/situation of the areas because they don't live there. And most of them don't have experiences of disasters. Therefore they want information about evacuation. They cannot take an action without information.

An evacuation guide from local people can help them to guide to evacuation areas safely and quickly. He also helps them to get away from panic. Fortunately all of three (3) restaurant owners of interviewees answered that they welcome to be an evacuation guide and also to participate training/drill for evacuation.

References

Project Appraisal Document on a Proposed Loan in the Amount of EURO 2.4 Million to the Kingdom of Morocco for a Sustainable Coastal Tourism Development Project June 16, 2000

Document of the World Bank Infrastructure Development Group Middle East and North Africa Region

Le Secteur Touristique STATISTIQUES 1998

STATISTIQUES TOURISTIQUES WILAYA DE MARRAKECH TOUYAME DU MOROC MINISTERE DU TOURISME DELEGATION REGIONALE TENSIFT-MARRAKECH

TABLES

Table F.2.1 TOURISM SURVEY METHODOLOGY

Survey Items	Number of tourists and vehicles (counting tourists and vehicles in each area)		
	Characteristics of tourism (attribute of tourists, behavior, language capability etc.)		
	Awareness on flood (fear of flood, where to evacuate, necessity of alarm or guide)		
	Traffic (counting vehicles going in and out of Ourika at Aghbalou)		
	Others		
Survey Methodology	Questionnaire/ Interview (Setti Fadma, Iraghf, R'ha Moulay Brahim and Imlil)		
	Counting tourists and vehicles		
	Traffic counting (counting vehicles at fixed point)		
Interviewees	Tourists (Moroccans and foreigners)		
	Owners of cafe-restaurants and hotels (Setti Fadma, Iraghf, R'ha Moulay Brahim, Imlil)		
Date	Weekday	Wed. 2nd Aug. 2000	Rheraya (R'ha Moulay Brahim, Imlil)
		Thu. 3rd Aug. 2000	Ourika (Setti Fadma, Iraghf, Whole Ourika, Aghbalou)
	Weekend	Sat. 5th Aug. 2000	Rheraya (R'ha Moulay Brahim, Asni market)
		Sun. 6th Aug. 2000	Ourika (Setti Fadma, Iraghf, Whole Ourika, Aghbalou)
Sampling number of questionnaire	Ourika	Setti Fadma	100 tourists
		Iraghf (Oulmes)	76 tourists
	Rheraya	Imlil (Oulmes)	N/A (very few people in the river)
		R'ha Moulay Brahim	140 tourists
Counting survey	Tourist counting	Setti Fadma	
		Iraghf (Oulmes)	
		R'ha Moulay Brahim	
		Asni market (only every Saturday open)	
		Whole Ourika (from Aghbalou to Setti Fadma)	
	Traffic counting	Setti Fadma	
		Iraghf (Oulmes)	
		R'ha Moulay Brahim	
		Asni market (only every Saturday open)	
		Whole Ourika (from Aghbalou to Setti Fadma)	
		Aghbalou (fixed point traffic going in and out of Ourika)	

Table F.2.2 SUMMARY RESULTS OF QUESTIONNAIRE TO TOURISTS

		Total	Setti Fadma	Iraghf	R'ha
Sampling number		316 tourists	100 tourists	76 tourists	140 tourists
Sex	1. Male	76 %	89 %	62 %	74 %
	2. Female	22 %	11 %	36 %	24 %
Nationality	1. Moroccan	90 %	88 %	96 %	89 %
	2. Foreigner	6 %	10 %	1 %	6 %
Trip style	1. One day trip	50 %	53 %	68 %	28 %
	2. Stay	50 %	47 %	32 %	72 %
	(days)	8.3days	7.3days	14.8days	6.0days
Composition of member	1. Adults only	41 %	62 %	29 %	33 %
	2. With children	51 %	38 %	59 %	55 %
Group style	1. Family	61 %	45 %	76 %	65 %
	2. With friends	29 %	49 %	12 %	24 %
Did you join package tour?	1. Yes	9 %	14 %	0 %	11 %
	2. No	86 %	82 %	96 %	84 %
How did you come here?	1. Own car	39 %	36 %	41 %	40 %
	2. Taxi	44 %	49 %	49 %	37 %
	3. Rental car	1 %	1 %	1 %	0 %
	4. Coach	16 %	12 %	4 %	26 %
	5. Mini bus	1 %	0 %	1 %	1 %
	6. Motorbike	1 %	1 %	0 %	1 %
	7. bicycle	1 %	0 %	1 %	1 %
For what did you come here?	1. Climbing the mountain	38 %	61 %	25 %	28 %
	2. Playing in and around the river	94 %	88 %	97 %	96 %
	3. Others	3 %	1 %	7 %	3 %
What attracts you?	1. Weather	77 %	65 %	92 %	78 %
	2. Mountain	83 %	80 %	89 %	81 %
	3. Nature	95 %	98 %	97 %	91 %
	4. River & water	86 %	79 %	97 %	86 %
	5. Others	7 %	1 %	18 %	5 %
How many times do you	(times / year)	2.3times / year	2.7times / year	3.2times / year	1.6times / year
How many days do you	(days / year)	7.9days / year	6.1days / year	12.4days / year	6.8days / year
What language can you read and write?	1. French	68 %	73 %	76 %	60 %
	2. Arabic	88 %	85 %	92 %	89 %
	3. Berber	11 %	0 %	13 %	19 %
	4. English	27 %	26 %	32 %	25 %
What language can you speak and hear?	1. French	71 %	73 %	79 %	66 %
	2. Arabic	94 %	89 %	95 %	97 %
	3. Berber	30 %	36 %	25 %	29 %
	4. English	24 %	22 %	28 %	24 %
How much do you	(Dh./ day/ person)	106.4	120.0	90.5	105.4
Do you know previous disasters?	1. Yes	92 %	92 %	97 %	89 %
	2. No	6 %	3 %	1 %	11 %
Do you fear a flood?	1. Yes	61 %	64 %	74 %	52 %
	2. No	17 %	33 %	0 %	15 %
Where do you evacuate if flood comes?	1. Car	12 %	9 %	13 %	14 %
	2. Restaurant or cafe	0 %	0 %	0 %	1 %
	3. Climb the highest place	81 %	82 %	83 %	79 %
	4. No idea	8 %	13 %	4 %	6 %
	5. Others	4 %	0 %	5 %	6 %
Do you want alarm?	1. Yes	99 %	99 %	99 %	99 %
	2. No	0 %	1 %	0 %	0 %
Do you want guides?	1. Yes	97 %	93 %	97 %	99 %
	2. No	3 %	6 %	1 %	1 %
Do you go to Moulay Brahim also?	1. Yes				91 %
	2. No				4 %
Which is main destination R'ha Moulay Brahim or Moulay Brahim?	1. Moulay Brahim				6 %
	2. R'ha Moulay Brahim				4 %
	3. Both				68 %

Table F.2.3 QUESTIONNAIRE FORM OF TOURISM SURVEY (1/2)

No.

Date	
Name of Surveyor	
Name of Place	
Time	

Questionnaire to tourists

No.		
1	Sex	1. Male 2. Female
2	Nationality	1. Moroccan 2. Foreigner
3	Where did you come from?	()
4	Trip style	1. One day trip 2. Stay (days)
5	A member of group	1. Adults only 2. With children (Less than 15 years old)
6	Group style	1. Family 2. With friends
7	Do you come here by package tour?	1. Yes 2. No
8	How did you come here?	1. Own car 2. Taxi 3. Rental car 4. Coach 5. Mini bus 6. Motorbike or bicycle
9	Purpose	1. Climbing the mountain 2. Playing in and around the river 3. Others ()
10	Attraction	1. Weather 2. Mountain 3. Nature 4. River & water 5. Others ()
11	How many times do you visit a year?	(times / year)
12	How many days do you visit a year?	(days / year)
13	Which languages can you read?	1. French 2. Arabic 3. Berber 4. English
14	Which languages can you speak and hear?	1. French 2. Arabic 3. Berber 4. English

Table F.2.3 QUESTIONNAIRE FORM OF TOURISM SURVEY (2/2)

15	How much do you spend per day?	(Dh./ day/ person)
16	Do you know that the disaster (flood and debris flow) has happened here before?	1.Yes (skip to No.17) 2.No (skip to No.18)
17	If yes in no 16, do you fear a flood?	1. Yes 2. No
18	Where do you evacuate if a flood happens?	1. Car 2. Restaurant or café 3. Clime the higher place 4. No idea 5. Others()
19	Do you want an alarm of flood?	1. Yes 2. No
20	Do you want any guides to evacuate?	1. Yes 2. No