Supplementary Material

Table S1. Survey with Farmers

1- Form n° : …… 2-Date : ……
3- Location : …….

A. SOCIO-DEMOGRAPHIC DATA:

- Main activity :

1- Farmer Fellah 2 Other

- Age :
- Marital status:

1- Married 2- Single 3- Divorced 4- Widowed

- Number of children:
- Married and living with you:
- Number of family members:

B. EDUCATION :

- Level of education:

1- None 2- Mosque (Masjid) 3- Primary 4- Secondary 5- Other :

Number of children enrolled in school:

1- Boys : 2- Girls :

- If not, what work do they do?

1- Family farming 2- Employee : 3- Other :

C. LAND TENURE

Total area:

Number of plots? :

Area per plot:

Type of ownership: Melk or other? :

D. AGRICULTURAL EQUIPMENT

Transport : -Animal : - Plow : - Tractor : - Seeder : - Truck :

Plowing and seeding: - Traditional : - Mechanical:
Harvesting and threshing: - Traditional : - Mechanical:

Irrigation : - Traditional (Séguia) : -Other :

Other equipment:

- ✓ Cereal Crops

Species& Varieties	Origin	Area	Yield (Q)	Trend	Price (Dh/k)		Storage Type/Method	Use (Puchase/Sale)
					Achat	Vente		

- ✓ Legume Crops

Species & Varieties	Origin	Area	Yield (Q)	Trend	Price (Dh/k)		Storage Type/Method	Use (Puchase/Sale)
					Achat	Vente		

- ✓ Fruit Trees

Species	Varieties	Origin	Number of Trees	Use		Propagation Method	Processing
				Al	others		

- ✓ Date Palm

Variety	Color	Texture	Shape	Susceptibility to Bayoud	Sale Price	Use	Variety

- ✓ Vegetable Crops

Species	Varieties	Seed Origin	Area	Production	Yield	Use

✓ Forage Crops:

Species	Varieties	Seed Origin	Area	Production	Yield	Use

✓ Livestock

Species	Breed	Herd Size	Feeding	Products	Destination
Cattle					
Sheep					
Goats					
Others					

Table S2. Producer survey (Amaghousse)

1- Form n° : …… 2-Date : ……

3- Location

Producer:

- Gender : -Age : - Educational Level:

- Marital Status

Name :

-others :

Raw Material:

- Type (Pomegranate): Melk Or others - Number of Pomegranate Trees:

-type of pomgranate :

- Ripening Stage (Pomegranate) color : -Mature : -Medium : -Not mature :

- Harvest Period (Fruit): - Amaghousse Production Period

- Storage Method (Pomegranate):

- Ratio (Pomegranate (Kg) / Amaghousse (L)) – how many Kg of pomegranate per liter of Amaghousse:

Production Location: - Home : - Cooperative (Group): other :

Production Method

- Pomegranate Processing:

- Cooking ? if Yes - Modern: - Traditional : - Cooking Time:

- After Cooking: - Infiltration Yes/No?

Product Description (Amaghousse) - State - Color - Taste - Preservation Method:: -other :

Acheteur : **-**si ou**i** **-**Consommateur -Commerçant -Autres

- Demand (High / Medium / Low / Declining) : - Sale Price per Liter: - Yield (Total Seasonal Production):

Uses	**Mode of Use**	**Production Constraints**
Other Observations		
-		

Table S3. Trader survey (Amaghousse)

1- Form n° : …… 2-Date : ……
3- Location

Type of Business:

-Shop : -Stall :

-Market : -Weekly Souk: -Other :……..

-Herbalist only : -Grocery : -Mixed : -

other :…….

Trader Information :

-Gender : -Age : -Education Level:

Place of Origin:

-Product origin:

Product Procurement:

-Directly from the producer: Yes / No: -Through an

intermediary :……

Pricing :

-Purchase price: -Selling price:

Buyers :

Buyer profile

-Gender : -Age : - Origin (local, tourist, etc.):

-Demande :

Product Description:

-Condition : -Color : Packaging :

-Taste:

-Quantity sold:

-Do you know how the product is made? Yes / No

-Shelf life of the product:

-Known Uses and Methods of Use:

Table S4. Summary of species and varietal richness of fruit trees present in the studied oasis agroecosystems.

Crops / Scientific Name	Vernacular Name (Arabic / Amazigh)	Cultivars	Citation Percentage (%)	Guelmim					Tata					
				Tighmerte	Ifrane	Fask	Tagante	Taghjijte	Tissinte	Akka	Ait Ouabelli	Foum Zguid	Foum Lahcen	Tagmoute
Fig *Ficus carica sp.*	Kermouss / Tazart	*Byed*	100	+	+	+	+	+	+	+	+	+	+	+
		Kahla	100	+	+	+	+	+	+	+	+	+	+	+
		Lghdania	45	+	-	-	+	-	-	+	+	-	-	+
		Bakour	36	+	-	-	+	-	-	-	-	+	-	+
		BzoulteLâ-awda	36	+	+	-	+	-	-	-	-	+	-	-
		Abachil	18	+	-	-	+	-	-	-	-	-	-	-
		Tamalka	18	+	-	-	+	-	-	-	-	-	-	-
		Tagordante	9	-	+	-	-	-	-	-	-	-	-	-
		Tafounaste	9	-	-	-	-	-	-	+	-	-	-	-
		Iâisa	9	-	+	-	-	-	-	-	-	-	-	-
		Espagnole	9	-	-	-	+	-	-	-	-	-	-	-
Pomegranate *Punica granatum sp.*	Rommman/ Taremmant	*Beldi*	100	+	+	+	+	+	+	+	+	+	+	+
		Al-Hamed/ Guersmo-um	90	+	+	-	+	+	+	+	+	+	+	+
		Sefri	45	+	+	-	+	-	-	-	-	-	+	+
		Roudani	27	+	+	-	+	-	-	-	-	-	-	-
		Elâadmi	9	+	-	-	-	-	-	-	-	-	-	-
Olive *Olea europaea sp*	*Zitoune/ Azmmur*	*Beldi*	100	+	+	+	+	+	+	+	+	+	+	+
		Dahbia	18	-	-	+	+	-	-	-	-	-	-	-
		Meknasia	18	-	-	+	+	-	-	-	-	-	-	-
		Haouzia	9	-	-	+	-	-	-	-	-	-	-	-
Grape *Vitis vinifera sp*	*Laaneb / Adil*	*Kehla*	90	+	+	-	+	+	+	+	+	+	+	+
		Bida	73	+	+	-	+	+	-	+	+	+	+	+
		Bzollaawd	9	-	-	-	-	-	-	-	-	+	-	-
		Moska	9	-	-	-	-	-	-	-	-	+	-	-
Apricot	Mechmach/ Tamazgunt	*Beldi*	100	+	+	+	+	+	+	+	+	+	+	+
		Romi	36	+	-	-	-	-	-	-	-	+	+	+

Prunus armeniaca sp.		*Lozmech-mach*	18	+	-	-	-	-	-	-	-	-	-	+
Almond *Prunus amygdalus sp*	*Louz/ Tamellalt*	*Lhlo*	90	+	+	-	+	+	+	+	+	+	+	+
		Elhare	55	-	+	-	+	-	-	+	-	+	+	+
Orange *Citrus sinensis sp.*	Limon / Litchin	*Nafile*	100	+	+	+	+	+	+	+	+	+	+	+
		Zenboh	64	-	-	-	-	+	+	+	+	+	+	+
Lemon *Citrus limon sp.*	Lhamed/ Tasemmamt	*Beldi*	73	+	-	-	+	-	+	+	+	+	+	+
		Roumi	45	-	-	-	-	-	-	+	+	+	+	+
Mandarin *Citrus reticulata sp.*	Mandarine / Tamenzart	*Beldi*	64	+	+	+	-	-	+	+	+	-	+	-
Apple *Malus domestica sp.*	Touffah/ Tamcnt	*Beldi*	55	-	-	-	+	+	-	+	+	+	-	+
Quince *Cydonia oblonga sp.*	Sferjel /Tighrdant	*Beldi*	73	+	+	-	+	+	-	+	+	-	+	+
Peach *Prunus persica sp.*	Khokh/ Tazawt	*Beldi*	27	+	+	-	-	+	-	-	-	-	-	-
Pear *Pyrus communis sp.*	Bouaawed / Tafiraste	*Beldi*	82	-	+	+	+	-	+	+	+	+	+	+
Carob *Ceratonia siliqua sp.*	Kharoub /Taslight	*Beldi*	36	+	-	-	-	+	-	-	-	+	-	+

Table S5. Crops and Varieties Identified in the Studied Oases

Crops	Varieties	Alnif	Zagora	Aoufouss	Rich	Guel-mim	Tata
Soft wheat *Triticum aestivum*	*Unknown*	+	+	-	-	-	+
	Achtar	+	+	-	-	-	+
	Nesma	+	+	-	-	-	-
	Azouga	-	-	-	-	+	-
	Tagoraret	-	-	-	-	-	+
Durum wheat *Triticum turgidum subsp. durum*	*Aghzzaf*	-	-	-	+	-	-
	Aberyoun	+	-	-	-	-	-
	Aksad	+	-	-	-	-	-
	Karim	+	-	-	-	-	+
	Korite	+	-	+	-	-	-
	Merzouka	+	-	-	-	-	-
	Zarban	+	-	-	+	-	-
	Tafilalet	-	-	-	-	-	+
	Tizekerte	-	-	-	-	-	+
	Ouchen	-	-	-	-	+	+
Barley *Hordeum vulgare*	*Beldi*	+	+	+	+	+	+
	Algouz	-	-	-	-	+	+
	Azermz	-	-	-	-	-	+
	Bour	-	-	-	-	-	+
	Amazigh	-	-	-	-	-	+
	Lalten	-	-	-	-	-	+
	Mderma	-	-	-	-	+	-
	Non précis	-	-	-	-	+	-
Maize *Zea mays*	*Byed*	+	+	+	+	+	+
	Hmar	+	-	+	+	+	+
	Araïchi	+	-	-	-	-	-
	Rich	+	-	-	-	-	-
Sorghum *Sorghum bicolor*	*Beldi*	-	-	-	-	+	+
Millet *Pennisetum glaucum*	*Beldi*	-	-	-	-	-	+
Fava bean *Vicia faba*	*Beyda*	+	+	+	+	+	+
	Ouarzazate	-	-	-	-	-	+
	Kehla	+	-	+	-	+	+
Lentil *Lens culinaris*	*Beldi*	+	+	-	-	-	+
Green pea *Pisum sativum*	*Beldia*	+	+	+	-	+	+
	Romia	+	-	-	-	-	-
Chickpea *Cicer arietinum*	*Beldi*	+	-	-	-	-	+

Bean *Phaseolus vulgaris*	*Beldi*	-	-	-	+	+	+
Potato *Solanum tuberosum*	*Beyda*	+	+	-	+	-	-
	Hamra	+	-	-	+	+	+
Onion *Allium cepa*	*Roumi*	-	-	-	-	-	+
	Beldi	+	+	+	+	+	+
Carrot *Daucus carota subsp. sativus*	*Sfar*	-	-	-	-	+	+
	Hmar	+	+	+	+	+	+
Tomato *Solanum lycopersicum*	*Beldi*	+	+	+	+	+	+
Okra *Abelmoschus esculentus*	*Hamra*	-	+	+	-	-	-
	Mchawka	-	+	-	-	-	-
	Ratba	+	+	+	-	-	-
Turnip *Brassica rapa subsp. rapa*	*Elfajli*	-	-	-	-	+	+
	Tagherdayte	-	-	-	-	+	+
	Mahfour	-	-	-	-	-	+
	Romi	+	+	+	+	+	+
Bell pepper *Capsicum annuum*	*Beldi*	+	+	-	+	-	-
Zucchini *Cucurbita pepo*	*Beldi*	+	+	+	+	+	+
Pumpkin *Cucurbita maxima*	*Mkerkba*	+	+	+	+	+	+
	Slaoui	+	+	+	-	-	-
Beetroot *Beta vulgaris subsp. vulgaris*	*Beldi*	+	+	-	-	+	+
Eggplant *Solanum melongena*	*Beldi*	+	+	+	+	+	+
Lettuce *Lactuca sativa*	*Beldi*	+	-	+	-	-	-
Cucumber *Cucumis sativus*	*Beldi*	+	-	+	-	-	-
Garlic	*Beldi*	+	+	-	-	-	-

Allium sativum							
Cabbage *Brassica oleracea var. capitata*	*Beldi*	+	+	+	+	+	+
Watermelon *Citrullus lanatus*	*Beldi*	+	-	-	-	-	-
Melon *Cucumis melo*	*Beldi*	+	-	-	-	-	-
Parsley *Petroselinum crispum*	*Beldi*	-	+	+	+	+	+
Coriander *Coriandrum sativum*	*Beldi*	-	-	-	-	+	+
Mint *Mentha spicata*	*Beldi*	-	-	+	+	+	+
Chili *Capsicum annuum*	*Beldi*	+	-	+	+	+	+
Cumin *Cuminum cyminum*	*Beldi*	+	-	-	-	-	-
Peanut *Arachis hypogaea*	*Beldi*	+	-	-	-	-	-
Fenugreek *Trigonella foenum-graecum*	*Beldi*	-	-	-	-	-	+
Sesame *Sesamum indicum*	*Beldi*	+	-	-	-	-	-
Alfalfa *Medicago sativa*	*Beldia*	+	+	+	+	+	+
	Australia	+	+	+	+	+	+
	Saoudia	+	-	-	-	-	-
	Canada	-	-	-	-	+	+
	Demnate	-	-	-	-	+	-
	Moapa	-	-	-	-	-	+
	Américaine	+	-	-	-	+	+
Forage Sorghum *Sorghum bicolor*	*Beldi*	+	-	+	-	+	+
Fig *Ficus carica sp.*	*Byed*	+	+	+	+	+	+
	Abachil	-	-	-	-	+	-
	Tamalka	-	-	-	-	+	-
	Bakour	-	-	-	-	+	+

	Lghdania	-	-	-	-	+	+
	Tagordante	-	-	-	-	+	-
	Tafounaste	-	-	-	-	-	+
	Iâisa	-	-	-	-	+	-
	Espagnole	-	-	-	-	+	-
	Bzoulte Lâawda	-	-	-	-	+	+
	Kahla	-	-	-	-	+	+
	Hmar	+	+	+	+	-	-
	Khder	+	+	+	-	-	-
	Ain lhejla	+	-	+	+	-	-
	Lfokaâ	+	-	-	-	-	-
	Targuiyte	+	-	-	-	-	-
Pomgranate *Punica granatum sp.*	*Beldi*	+	+	-	+	+	+
	Al âansri	-	-	+	-	-	-
	Khrifi	-	-	+	-	-	-
	Al-Hamed	-	-	+	-	+	+
	Roudani	-	-	-	-	+	-
	Elâadmi	-	-	-	-	+	-
	Sefri	-	-	-	-	+	+
Apricot *Prunus armeniaca sp.*	*Lozmechmach*	-	-	-	-	+	-
	Romi	-	-	-	-	+	+
	Beldi	+	+	+	+	+	+
Grape *Vitis vinifera sp*	*Bida*	-	-	-	-	+	+
	Kehla	-	-	-	-	+	+
	Bzollâawd	-	-	-	-	-	+
	Moska	-	-	-	-	-	+
	Non précis	+	+	+	-	-	-
Orange *Citrus sinensis sp.*	*Zenboh*	-	-	-	-	+	+
	Nafile	+	+	+	-	+	+
Mandarin *Citrus reticulata sp.*	Beldi	-	-	-	-	+	+
Almond *Prunus amygdalus sp*	*Elhare*	-	-	-	-	+	+
	Lhlo	+	+	+	+	+	+
Apple *Malus domestica sp.*	*Beldi*	+	-	+	+	+	+
	Romi	-	-	-	+	-	-
	Stark	-	-	-	+	-	-
	Golden	-	-	-	+	-	-
	Mchrat	-	-	-	+	-	-
	Lgala	-	-	-	+	-	-

Olive Olea europaea sp	*Beldi*	+	-	+	+	+	+
	Dahbia	-	-	-	-	+	-
	Meknasia	-	-	-	-	+	-
	Haouzia	-	-	-	-	+	-
Quince Tree *Cydonia oblonga sp.*	*Beldi*	+	-	+	+	+	+
Peach Tree *Prunus persica sp.*	*Beldi*	-	-	+	+	+	-
Walnut Tree *Juglans regia L.*	*Beldi*	-	-	-	+	-	-
Prickly Pear *Opuntia ficus-indica*	*Beldi*	-	-	-	+	-	-
Carob Tree *Ceratonia siliqua sp.*	*Beldi*	-	-	-	-	+	+
Pear Tree *Pyrus communis sp.*	*Beldi*	-	-	-	-	+	+
Limon *Citrus limon sp.*	*Beldi*	-	-	-	-	+	+
	Roumi	-	-	-	-	-	+
Date Palm *Phoenix dactylifera L.*	*Mejhoul*	+	+	+	-	-	+
	Boufaggouss	+	+	+	-	+	+
	Tahmoute	+	+	+	-	-	+
	Saïr(Khelt)	+	+	+	-	+	+
	Azizaw	+	-	-	-	-	-
	Toungalte	+	-	-	-	-	-
	Bouslikhene	+	-	+	-	-	-
	Tazggaghte	+	+	-	-	-	-
	Lferch	+	-	-	-	+	-
	Jihl	-	+	-	-	+	+
	Klane	-	+	-	-	-	+
	Aglide	-	+	-	-	-	-
	Bourar	-	+	-	-	-	+
	Ahardane	-	+	-	-	-	-
	Bousakri	-	+	-	-	+	+
	Chatoui	-	+	-	-	-	-
	Jaâferi	-	+	-	-	-	-
	M'ket	-	+	-	-	-	+
	Mallal	-	+	-	-	-	-
	Akadousse	-	-	+	-	-	-
	Bid Djaje	-	-	+	-	-	-

	Rass Latmer (Rass la7mar)	-	-	+	-	-	-
	Initfite	-	-	+	-	-	-
	Bousserdoune(Tarzawa)	-	-	+	-	-	-
	Maäjoune	-	-	+	-	-	-
	Kerna	-	-	+	-	-	-
	Kerchaou	-	-	+	-	-	-
	Admou	-	-	+	-	-	-
	Bellahzid	-	-	+	-	-	-
	Ouhefssa	-	-	+	-	-	-
	Ouâamrane	-	-	+	-	-	-
	Bouwtoube	-	-	-	-	+	+
	Ist-Taghjijte	-	-	-	-	+	-
	Tamoucha	-	-	-	-	+	+
	Admam	-	-	-	-	+	+
	Bouteffah	-	-	-	-	+	+
	Taghanimte	-	-	-	-	+	+
	Tahddadte	-	-	-	-	+	+
	Bousouayer	-	-	-	-	-	+
	Najda	-	-	-	-	-	+
	Tabouâtirte	-	-	-	-	-	+
	Amennan	-	-	-	-	-	+