

## ANNEX I. SOCIO-ECONOMIC CONTEXT OF THE PROJECT SITE.

### REGIONAL ADMINISTRATION

1. South Sinai Governorate is divided to eight municipalities: Tor Sinai, Sharm El-Sheikh, Dahab, Nuweiba, Ras Sedr, Abo Zeneima, Abo-Reideis and St. Katherine. The St. Katherine municipality is divided to the 12 districts of; El-Matar, Wadi Mandar, Wadi Elagramiah, Wadi Abo Selah, Wadi Asbaeia, Wadi Tarfa, Wadi Sheikh Awwad, Wadi Leboud, Wadi El-Arbaien, Wadi El Marwa, Wadi El-Zeitohah, and Wadi Nabi Saleh.

2. The South Sinai Governorate and St Katherine's City Council administer St. Katherine's municipality. The Governorate is responsible for general planing and development strategies, disbursing funds to the City Council and initiating, co-ordinating and managing large-scale projects such as main roads. St Katherine's City Council is responsible for implementation and management of the projects and services in education, housing, agriculture, drinking water, sewage treatment, and policing.

3. The EEAA agency is responsible for the management of Natural Protectorates in Egypt including St. Katherine's Protectorate. It is responsible for the planning and management of the activities concerned with the conservation of the nature and environment in the Protectorates. St. Katherine Natural Protectorate was established in 1988. In 1993, the Government of Egypt and the commission of the EU (European Communities) agreed on a project of technical co-operation to undertake a combined feasibility study for a management and protection program for the St. Katherine Natural Protectorate. The study proposed that St. Katherine should be reclassified as IUCN category National Park with the following goals<sup>(11)</sup>:

- ❖ To preserve biodiversity.
- ❖ To promote sustainable socio-economic development in the area through a sustainable use of its natural and allied cultural resources.
- ❖ To preserve the mountain ecosystem Southern Sinai and the tradition of knowledge in the use of its natural resources.
- ❖ To integrate the whole St. Katherine area into a single functional management unit.
- ❖ To facilitate the recreational, educational and scientific uses compatible with conservation of the area.

### REGIONAL PLANNING

4. The Shura Council has approved the National Project For The Development of the Sinai, covering the period 1994 to 2017. The total budget for the plan is estimated to be 75 billion LE over the period. The purpose of the plan is to sustainably develop the Sinai peninsula, in keeping with conservation objectives of the region, and draw population pressure away from the Nile valley. Some of the main investments are described below.

**Table 1: Development Plan for Sinai 1994-2017 – Sector Investment (million LE)**

<b>Funding Sector</b>	<b>1994-1997</b>	<b>1997-2002</b>	<b>2002-2017</b>	<b>Total</b>
Agriculture	1431	4422	6410	12263
Tourism	440	2940	4800	8180
Construction & housing	715	4700	15385	20800
Energy& electricity	600	2405	2950	6200
Transport	1000	2250	2950	6200
Potable water & sewage treatment	1600	3150	1850	6600
Health services	10	115	375	500
Police services	2	8	40	50
<b>Total</b>	<b>5798</b>	<b>19990</b>	<b>34760</b>	<b>60793</b>

Source; National Plan for Development of Sinai, 1998.

5. Job creation is the central tenet of the National Plan to develop the Sinai, and will have significant impact on population numbers. The Plan expects population to increase from a 1994 base of 39,992 to 672,583 by 2107. The major of source employment will be through development of the tourist industry in Southern Sinai, which has pristine environmental conditions, spectacular landscape, winter sun, biodiversity, and cultural heritage. Tourism is expected to take advantage of the Protected status of Southern Sinai, allowing development of the industry without destruction of the resource base.

### **Tourism**

6. The Egyptian Tourism Development Agency (TDA), estimates that each new hotel room creates 5 new jobs. In tourism alone then 252,710 new jobs will be created through hotel development. Assuming 40% of an average Egyptian family works tourism is expected to attract a population of over 400,000 people, by 2017, or 60% of planned population increase.

**Table 2: Hotel Capacity in Southern Sinai (number of beds)**

<b>Area</b>	<b>1995*</b>	<b>2017**</b>
St. Katherine's	1,134	2,980
South Sinai	16,798	67,340

\* National Parks Survey, 1995

\*\* Ministry of planning, 1995

### **Agricultural Development**

7. 12.2 billion LE. under the Sinai development plan will be devoted to Agricultural development. Planned activities for agriculture include:

- ❖ reclamation of 250,000 feddans East of Suez canal at a cost of 7.7 billion LE, irrigated from Nile water;
- ❖ reclamation of 6,500 feddans at a cost of 290 million LE, including 8000 feddans in Southern Sinai, for rain fed and well fed agriculture;

- ❖ pasture improvement in 300,000 feddans in Northern Sinai at a cost of 16 million LE;
- ❖ establishment of an institute to promote animal product processing, such as leather, wool and dairy products etc at a cost of 20 million LE;
- ❖ the development of potable water and municipal drainage throughout the Sinai at a cost of 2,800 million LE;
- ❖ 3 billion LE of investment in electricity generation capacity in the Sinai, of which 40% will be targeted in the Southern Sinai Governorate.

### Potable Water and Sewage Treatment

8. Water resources are the main constraint to any form of economic development in the Sinai, and sustainable water resource development is a central bulwark of the National Plan.

**Table 3:** *Planned Expansion of Potable Water and Sewage Treatment Capacity (m<sup>3</sup>/day) in the Sinai*

Investment	1994	1995-1997	1997-2017	Total
Potable water	35,500	4,000	12,000	51,500
Underground	53,000	129,600	310,000	492,600
Nile Desalinisation	4,900	8,500	95,000	108,400
Sewage treatment	121,000	325,000	154,000	600,000
<b>Total</b>	<b>214,400</b>	<b>467,100</b>	<b>571,000</b>	<b>1,252,500</b>

9. 6 billion LE of investment is planned between 1994 and 2017 to meet expected demand for potable water and sewage treatment from population growth in the region. This includes 4.1 billion LE in sewage treatment and water recycling stations and pipelines for water transportation; 1.9 billion LE for desalination plants; 0.2 billion LE for the development of underground water sources; and 0.4 billion LE for sewage treatment.

**Table 4:** Existing and Planned Expansion of Potable Water Sources (m<sup>3</sup>/day) in St Katherine's Protectorate

Well Location	m <sup>3</sup> /day	Quality
<b>Existing Capacity</b>		
Zeituna	60	Contaminated only non-potable use
Souwal	30	Ok
El-Watea	120	Ok
Al-Akhdar	-	Contaminated, no longer used
Haroun (old city well)	120	Contaminated, no longer used
<b>Total potable</b>	<b>150</b>	-
<b>Total non-potable</b>	<b>180</b>	-
<i>Planned expansion</i>		
New Haroun	100	-
Wadi Asbaiya	50	-
-	50	-
<b>Total potable</b>	<b>200</b>	
<b>Gross total potable</b>	<b>350</b>	

10. St Katherine's City currently has access to 150m<sup>3</sup>/day of potable water from 3 government wells. Two others are contaminated and can no longer be used for drinking. Existing demand is 250m<sup>3</sup>/day, thus an additional 100m<sup>3</sup>/day is trucked in from any one of the 125 other wells in the Protectorate to meet this additional demand at a cost of 4-6 LE per m<sup>3</sup>. Demand for potable water is expected to rise to 1200m<sup>3</sup>/day by 2015. In addition to the wells planned in the table above, both a desalination plant at Nuweiba and a pipe from El-tour are being considered to supply water to the Protectorate and meet additional demand without drawing down the water table. Furthermore 27 million LE of investment is planned for sewage treatment where monitoring data has identified ground water contamination.

### Population change

11. Population influx is expected to fundamentally alter the cultural characteristics and urban rural patterns of Southern Sinai.

**Table 5:** Population Increase in Southern Sinai (1982-1994) and Ministry of Planning Year 2017 Target Populations

	1982	1986	1993	1994	2017
St. Katherine	3,269	3,373	4,037	4,603	17,378
South Sinai	20,908	28,988	34,693	39,992	672,583

Source: Arcotech-July, 1994 for 1982-93 figs, and ministry of planning for 1994 and 2017 figs

12. The population of South Sinai accounts for less than 0.1% of Egypt's total population. Between 1982 and 1996 the population increased from 20,908 to 54,495, and

the number of settlements by 60%. In 1996, 46% of the Southern Sinai population lived in urban areas. In St Katherine's Protectorate population increase has been much slower, in part due to the conservation designation placed on St Katherine's, although the percentage of the population living in urban areas is much greater. Over the same period the population of St Katherine's increased by 4%, from 4037 to about 4219, 82% of which live in urban areas <sup>(8)</sup>.

**Table 6: Ethnic Composition of South Sinai in 1993**

<b>Region</b>	<b>Total Population</b>	<b>Bedouin Population</b>	<b>Bedouin as % of Population</b>
El Tor	7,855	1,427	18.2
Abu Zeneima	3,613	2,207	61.1
Abu Rudeis	6,155	2,156	35.0
St. Katherine	4,037	3,031	75.1
Sharm El Sheikh	1,673	330	19.7
Dahab	1,917	915	47.7
Nuweiba	2,975	1,081	34.2
<b>Total</b>	<b>34,693</b>	<b>11,084</b>	<b>39.3</b>

Source: Census 1986 and Arcotech- July'1994

**Table 7: Urban and Rural Populations of St. Katherine and South Sinai, 1996.**

	<b>Male</b>	<b>Female</b>	<b>Total</b>	<b>Number of Families</b>
<b>St. Katherine's Protectorate</b>				
Urban	554	200	754	110
Rural	1812	1652	3464	780
<b>Total</b>	<b>2367</b>	<b>1852</b>	<b>4219</b>	<b>880</b>
<b>South Sinai Governorate</b>				
Urban	19487	9836	9323	5402
Rural	14179	10993	25172	4875
<b>Total</b>	<b>33666</b>	<b>20829</b>	<b>54495</b>	<b>10277</b>

Source: Census 1986 and Arcotech- July'1994

13. The reported average family size in St. Katherine's is about six persons, though this may vary widely based on income and social status<sup>1</sup>. Non-urban Bedouin populations in St. Katherine amounted to 75% of the total population in 1993/94. Assuming a natural growth rate of 3% to the year 2017, this sector of society would become a minority in St Katherine's Protectorate dropping to 36% of the total population of the Protectorate, if MoP targets are achieved. The population influx is expected to stimulate urban growth. The South Sinai Governorate, and St Katherine's City Council have been planning to absorb this expansion with the minimum of environmental impact, and identified the following options to absorb this growth <sup>(9)</sup>:

- ❖ consolidation of St. Katherine town to avoid urban sprawl extending to Wadi Raha;

<sup>1</sup> Population statistics are difficult to measure, in part because of the difficult terrain in Sinai and because many families do not register the birth of girls.

- ❖ A new tourism settlement at Nabi Saleh;
- ❖ The adaptation of the traditional Bedouin settlement as visitor and service centres; and
- ❖ Diversion of sustainable urban growth to Tarfa.

14. A strategic development concept plan for St. Katherine Protectorate was set out in March 1997.

#### THE BEDOUIN OF SOUTHERN SINAI

15. The indigenous people of Sinai are Bedouins, or nomadic people of Arab origin. There are about 6, 500 Bedouins living in the mountains of Southern Sinai or 39.2% of the total population according to Protectorate statistics. Since their arrival in Sinai, Bedouins have settled along caravan trails used by nomadic herdsmen who transport livestock to other parts of the Middle East. The founding of Christian Monasteries in Southern Sinai and the pilgrimage traffic to the Hadj in Mecca has provided tribes with opportunities for trade for hundreds of years.

16. Most Bedouins today are sedentary and live in small urban centres or small settlements of four or five families of a single clan. Such isolated settlements are scattered throughout the mountains of Southern Sinai. St. Katherine Protectorate authorities carried out a preliminary survey for the inhabitants in some settlements.

**Table 8: Population of St. Katherine by settlement:1998**

Settlement	Population*	Settlement	Population*
Abo-Seilah	247	El-Sedoud	12
Esbacia(lower)	165	Sheikh Awwad&Gharba	159
Esbacia(safha)	22	Sebaia(Safha)	78
Esbacia(upper)	71	Sebaia (Soweria)	17
Arbeien	47	Sebaia (Elbasra)	61
El-Oskof El-Hamami	93	Noumana	49
&Mekhlafa	59	Solaf	157
El-Kharrazin	43	Sahab	83
EL-Raha	166	Sheikh Mohsen	22
El-Rahba	47	Beiar (EL-Tor)	178
El Ramthi	25	Nasab (lower)	30
El-Zaytonah	34	Nasab ( upper)	84

Source: Survey carried out by St. Katherine Protectorate

\* Population includes men, women and children

17. Results of the household survey also showed that the north-west area in Tarfa and Solaf has the highest population (38.72%), followed by the central area of Katherine, then the Northern area (15.94%). The least number was found in the Western area (7.74%) (see also map 1).

18. Men have an average of one or two wives, and each woman has on average four or five children. Sedentary populations mainly work as labourers, drivers and provide tourism services. Small minorities continue traditional lifestyles as semi-nomadic herdsmen particularly in areas far from tourist attractions. They migrate during winter grazing seasons and return to permanent dwellings at the end of the season. In the last decade there has been a major influx of immigrants from Cairo and the Nile delta attracted to Southern Sinai by the expanding tourism industry and the oil production industry.

### **Tribes**

19. The 6 main tribe in Southern Sinai are the Gebaleya, Mezina, Sawalha, Alegat, Quararsha, and Awlad Said. The Gebaleya live in the centre and north of the area. The Mezina live in settlements in the South-East of the Protectorate and along the coast. It is usual for members of different tribes to live apart, although The Alegat and Sawalha live together in Wadi Feiran, while the Awlad Said, Mezina and Alegat tribes live in Wadi Isla. The Gebaleya tribe is the largest in the whole area (30.77%), followed by Mezina (28.21%), and Awlad Saeed (23.08%), and Awlad Selim (10.26%).

**Figure 2:** *Bedouin Tribes in St Katherine's Protectorate, Southern Sinai*

#### **Gebaleya**

The Gebaliya tribe is the most prominent in the St. Katherine region with about 2500 people. They are said to be descendants of a group of 200 families brought from Wallachia in Rumania as slaves, later entrusted with guarding the Monastery and providing various services. Though originally Christians, they converted to Islam by the 7th century. The tribe consists of four clans: the Awl Salamah, the Awlad Gindi (Warrior tribesmen), El Hamayda and El Wahabat. The Archbishop of Saint Katherine is considered to be their leader and they monopolize work in the tourist sector, serving as guides, drivers and safari leaders.

#### **Mezina**

The Mezeina tribe lives in the coastal region of Southern Sinai and in the south-eastern part of the mountainous region, and are the second most important tribe in St. Katherine's Protectorate, with about 1100 people. Their main activities are fishing, making charcoal, palm tree cultivation and camel breeding. They originally came from the Arabian Peninsula and still have strong ties with their relatives in Saudi Arabia. Important branches are Al Shazazinah and Al Awaysat.

**Awlad Said**

The Awlad Said are pastoral and live in a vast mountains and remote territory south of Saint Katherine. The tribe is divided into five clans; El Zeherat, El Awarmah, the Awlad Mesallam, the Awlad Said and El Razazna. There are around 1300 people in the tribe.

**Sawalha**

This tribe lives to the West of St Katherine's Protectorate, in Wadi Feiran, Wadi el Sheikh and the mountains of Serbal and Umm Shomar. They are a semi-nomadic tribe of about 1200 people divided among five clans: El Fawansa, El Rudaisat, the Awlad Shahin, El-Nawasra and El Mahasna.

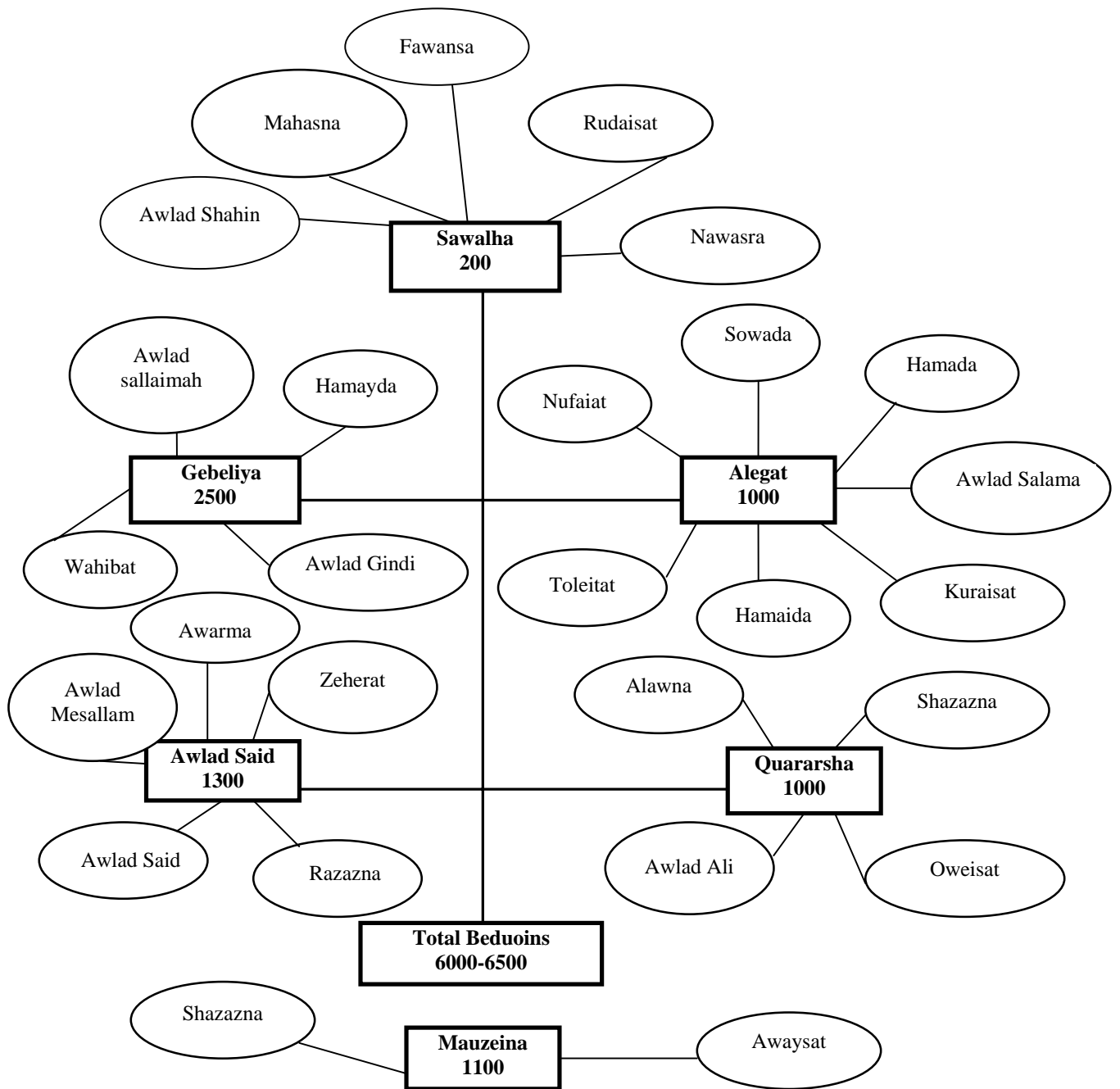
**Alegat**

Their land extended from Ramlah to Gharandel valley, but they are extensively mixed with other tribes. The tribe is divided into seven clans of 1000 people in total: The Awlad Salama, El Toleitat, El Hamaida, El Khuraisat, El Hamaida, El Sowada and El Nufaiat.

**Qararsha**

They are concentrated around Feiran oasis. The tribe is divided into four clans: El Alawna, El Shazazna, El Oweisat and the Awlad Ali. They practice agriculture and have more sedentary way of life. They are about 1000 persons.

**Figure 3: Estimated Number of Bedouins in South Sinai and their Tribal Distribution**



## LOCAL ECONOMY

20. Economic activity in Southern Sinai is dominated by tourist activity in St. Katherine's City, Mount Sinai, Sharm El-Sheikh and Dahab. Tourism has also stimulated growth in construction, particularly hotels and infrastructure, which supports many other families in the region. Oil production is found along the western coast of the peninsula and there are scattered mining activities (especially manganese) in the mountainous regions. Agriculture, when water is available, is concentrated in the sub-desert areas of the El Tih plateau and Qaa plains

21. 53% of families interviewed in St Katherine's Protectorate said tourism was their major source of income. 19% said driving and governmental jobs were the most important source of family income; followed by construction; and finally collection of medicinal plants either for Hakim or other trading activities 10%. Crop cultivation is considered the major source of income for only 5% of families. In almost all cases, the collective family income comes from more than one source. Herding is still practised by the majority of these families, although not for income, but mainly for home consumption, poultry and meat are otherwise not produce in the Southern Sinai Governorate.

### **Tourism**

Number of hotel rooms in St. Katherine's in South Sinai increased from 4563 rooms in 1992 to reach 10436 rooms in 1996.

22. Tourism is, by far, the most important economic activity in the area and it is heavily concentrated around the monastery of St. Katherine and Mount Sinai. Most visitors are international and come in tour groups by bus on their way from Cairo to Israel or visa versa. Others venture independently or in small groups from nearby resort towns of Sharm El-Sheikh and Dahab. Daily visitors to the area range from 370 in May/June to 1442 in September/October. The average daily number of visitors was about 420 in 1996.

23. There are 932 hotel beds and 510 camps in the Protectorate far outstripping exiting demand. Most rooms are of inferior quality and their utilisation rate is poor. In 1996, a total of 69,484 bed-nights were sold giving an occupancy rate of 21.4%. An occupancy rate of 60% is required to cover costs, and ensure adequate customer service. Visitor numbers would need to increase by 175,540 hotel nights, or a 250% increase from 1996 levels to achieve this occupancy level. There is intensive development in the tourism sector; if present trends continue, 3 million people could visit South Sinai annually by 2017, and their effects on the local environment and urban infrastructure are likely to be enormous. In anticipation of this 1,385 new beds are planned.

24. Tourism in St. Katherine could be grouped in three categories;

- ❖ *Religious and Cultural Tourism*: consisting mainly of international visitors travelling by bus under tour-operators. Generally they stop in St. Katherine's Protectorate to visit the Monastery and to climb Gebel Mousa which draws visitors from around the

world. Some stay overnight, to climb the mountain to see the sun rise from the top; others just stay a few hours to visit to the monastery.

- ❖ *Safari tourism:* Desert Safari groups or individuals travelling in 4 wheel-drive cars through the South Sinai for 2-7 day trips. Usually these tourists stay in St. Katherine's Protectorate overnight or in a few cases, two days. Their areas of preference, however, are wadi beds close to the road between Sharm El-Sheikh and Taba;
- ❖ *Trekking:* many tourists come to the area to enjoy camel tracking in the wild and mountainous areas of St. Katherine's Protectorate. They travel on camels through the wadis and mountains, camping out for several days at a time. Their areas of preference are Wadi Gebel and other tracks emanating from St Katherine's city;

25. The Protectorate has visitor management plans to disburse pressure from these activities both geographically and temporally.

**Table 10:** *St. Katherine's Protectorate : Visitor Arrivals in 1996*

<b>Period</b>	<b>Average Number of Visitors Per Day</b>
2 Jan – 6 Feb	553
7 Feb – 30 Apr	N/A
1 May – 31 Jul	370
1 Aug – 10 Sept	536
13 Sept - 8 Oct	1442
9 Oct – 31 Dec	720
<b>Average/ day</b>	<b>420</b>

Source: St. Katherine's Monastery Visitor Records

### **Herding**

26. Most Bedouin families practice herding, though it is the main source of income only in areas, such as Wadi Solaf, far from tourist attractions. Goats and sheep are the most important animals. An average a family in the survey owned between 5 to 10 animals in settlements around St. Katherine City, and 15-20 in the mountainous areas. Bedouin living in St. Katherine's city or near by, have smaller herds as the grazing is scarce, and there are other more lucrative forms of employment.

27. The number of livestock in St. Katherine's has decreased dramatically because of desiccation, the high cost of feed and lucrative alternative sources of employment.

**Table 11:** *Average Livestock Numbers in South Sinai between 1993 and 1998.*

<b>Livestock</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>
Sheep	23093	16337	14071	13467	13467	12157
Goat	40377	27530	25421	23686	23086	20932
Camel	20688	2751	2306	2430	2430	2155
Buffalo	0	16	11	10	13	11
Cows	0	17	10	5	20	11

Source: Statistics of South Sinai Governorate, 1998.

28. On average a herd doubles its size annually; typically half are eaten and half are sold. Goats fetch between 50-150 LE, while sheep fetch 150-250 LE, depending on their health and age. The high price of supplementary feed (50 pilaters/day/animal) often means that livestock husbandry is not profitable for more sedentary families who depend more on supplementary feed.

29. Most families surveyed owned 2 or 3 camels. Female camels are left to graze unattended for months during temperate periods, while male camels are usually kept close by for tourist trekking and transport.

### **Cultivation**

30. The cultivated area in South Sinai decreased from 7,199 feddans in 1992 to 5,439 feddan in 1996. Scattered plots of cultivated land are found along the Wadi beds irrigated by floodwater from the mountains and ground wells. Crops cultivated in the area are mostly subsistence crops of barley and wheat. Fruit, olives and almonds are grown in some flood plains, while palms and tamarind can be found in the oases. Most orchards or fields are owned by landowners and farmed by landless families. The cultivated area in St. Katherine municipality was constant at 214 feddan during the period from 1992 to 1996. However, but increased to 252 feddan in 1999.

31. Orchards occur throughout the Protectorate, although the 27% of families who said they owned orchards were mainly concentrated in the north-west, north, centre, and north-east areas. Of which 125 are recorded in Wadi Feran, the average size ranged from between 1 and 3 feddans. 3 orchards identified were between 20 and 23 feddans, while 175 orchards ranged between 0.25 and 3 feddans in size.

**Table 3. The Status of Gardens in Sample Areas of St Katherine's Protectorate**

Locality	Good		Semi abandoned		Abandoned		Total	
	Number	Area m <sup>2</sup>	Number	Area m <sup>2</sup>	Number	Area m <sup>2</sup>	Number	Area m <sup>2</sup>
Abu Saila	3	3,750	9	11,250	0	0	12	15,000
W. Telah	24	49,090	3	6,800	8	7,175	35	63,065
W. El- Arbae'in	13	115,600	0	0	1	3,000	14	118,600
W. El- Faraa	1	7,500	1	800	1	7,500	3	15,800
Talaat Abu Geifa	8	7,550	0	0	0	0	8	7,550
W. Toboq	7	9,300	1	750	0	0	8	10,050
W. Zawateen	3	3,500	6	7,300	0	0	9	10,800
W. Gebal	4	13,200	10	13,800	6	9,800	20	36,800
W. El-Seig	1	4,500	2	2,400	0	0	3	6,900
W. Me'ir	0	0	0	0	0	0	0	0
<b>Total</b>	<b>64</b>	<b>213,990</b>	<b>32</b>	<b>43,100</b>	<b>16</b>	<b>27,475</b>	<b>112</b>	<b>284,565</b>

32. Water is the limiting factor, as rainfall is low and ground water is scarce. Orchards are always situated near ground water wells in the wadis or close to water springs, and Black plastic (PVC) hoses are increasingly used by Bedouins to transport water from upper springs or wells to their orchards. Wells are manually built using traditional techniques to a depth of between 10 and 30 meters. Some are equipped with water pumps and generators. An alternative means of water harvesting has been through the construction of small dams, which are scattered through out the area to enhance water infiltration.

### Energy

33. Bedouin use fuel for cooking and heating, particularly in winter when temperatures reach as low as 5<sup>C</sup> at night.

34. *Butagaz*: Most people use propane, known locally as *butagaz*, as their primary fuel source. It comes in large metal canisters that cost about 7-10 LE each, which typically serves a family of 10 for about a month. It is preferred because it does not require foraging and does not produce high levels of indoor pollution. Its use has increased and its adoption is hampered only by availability. Since residents must return the old canister before they can get a new one and it is not unusual for them to wait as much as a week to obtain new canisters from distant locations such as the town of El-Tour. About 96% of the interviewed families depend on bottled gas as the major energy source and the remaining 4% depend mainly on fuel wood. However, all these families need to use fuel wood for making bread, and between receiving butane gas recharged canisters.

35. *Hatab*: Dry foliage and small branches, known locally as *hatab*, are used for fuel when propane is not available and for specialised purposes such as baking bread, heating tea, or as a winter heat source. Surveys reveal the consumption of the fuel is about 1 kg/person/day in summer increasing to 2 kg/person/day in winter, and the women and

children generally collect this. The considerable time and effort used to find suitable materials in an ever-widening perimeter makes the use of such fuels inconvenient. Plants mostly commonly used for fuel are *retem*, *ethl*, *remth*, *agram* and *sayal*. The latter two species are more available in the southeast region of the Protectorate. When these favoured species are not available; *baatharan*, *geida*, and *nehieda* may be substituted. Much of this material is collected after they have been uprooted following floods in flood basins of *wadis*.

36. *Electricity*: Electricity is in almost all of the settlements visited (75 of 80 households) and is used primarily for lighting. In St. Katherine municipality, the electricity share per person increased from 12 KWH/year in 1960 to 21 KWH/year in 1996.

37. *Solar energy*: Up to now, solar energy has not been introduced to St. Katherine's Protectorate, however there is potential, both because of the remoteness and the climate. Furthermore Egyptian models exist for both for cooking and heating.

### **Transportation**

38. There is only 1 asphalt road that crosses the mountain region from El-Tour in the West to Dahab on the East Coast, providing access to St. Katherine town in the heart of the peninsula. The rest of the Protectorate is accessible only by four-wheel drive vehicles, camel, donkey or foot.

### **The Role of Women**

39. Unmarried and older women shepherd the family herd of goats and sheep. Women also collect fuel wood and medicinal plants and make cheese and butter "samn" out of milk.

### **Traditions and Customs**

40. *Social organisation*: Throughout all southern Sinai, social organisation is based on tribal affiliation and the extended family system. There are six important tribes living in St Katherine's Protectorate: Sawalha, Alegat, Muzaina, Qararsha, Awlad Said, and Gebaliya, each control certain areas in the region. Some 4 to 5 clans usually constitute one tribe. A tribe is made up of a number of sub-units as follows: *Kabela*, the tribe, *Emara*, *Batn*, *Fakhd*, *Faselah*, and *Eila* the family unit. Traditionally Camels, donkeys, sheep and goats are marked with the tribal identification.

41. Bedouin live in small settlements where 4 or 5 families belonging to the same clan live together. Generally these settlements are located in wadi beds close to the mountains to avoid floods, or in higher places where water is available. Each settlement includes a series of houses, one for each family; a garden or orchard surrounded by a stone wall to prevent goats and sheep from entering, and a water source nearby (spring or well). If the later is relatively permanent, the number of houses increases (more than 10

houses per well). In the mountain region of St. Katherine's there are about 66 settlements; Esbaeya(11), Abo Seilah(10), Nasab (4), Wadi Kied (1), and St. Katherine (40). Most of these settlements are concentrated in St. Katherine due to natural conditions of the area, its accessibility and the attraction of jobs created by tourism. Other Bedouin settlement concentrations are found along Wadi El Seikh and Wadi Feiran (see map 1).

42. *Usufruct*: All the land is a governmental property, however, the traditional usufruct rights the Bedouin are respected by the GoE. "*Orf*" is the unwritten communal law of the Bedouin. Each law was given a specific name like "*Onwa*", "*Doukhl*" and "*Hilf*".

43. One of the most interesting Bedouin communal laws in St. Katherine's Protectorate was the "*Hilf*". Through communal agreement places were set aside from grazing during certain times of the year to allow flora to recover before grazing again. Every year, the Sheikh's agreed which areas were to be set aside and for what period. The period usually started before rain in October, and ran until the following summer. The setting of the apricot fruit was usually the indication that grazing could start again. For the first month camels would be allowed to graze after which sheep and goats would also be allowed to graze in the previously set aside area. Monastery maps identify *Hilf* agreements up until 1973. Beyond this practice appears to have died out.

44. Borders are well known to tribesmen, though they generally do not prevent movement of individuals or groups in the area. Grazing and water resources are available to all tribes through inter-tribal agreement. Under traditional law individual who discover new water sources are able to settle next to it, so long as it is in his tribal area, however he would not be allowed to prohibit use of the water by others. Individuals can however have the rights to exclusive cultivate an area of land, however the viability of this is dependent on the availability of the water.

Between clansmen, verbal tongue-lashing was usually sufficient to ensure compliance, with agreements, but in the event there is conflict over land or usufruct The "Sheikh" or tribal leader resolves disputes both within the tribe and represents the tribe in disputes with other tribes. A "*Haseeb*" is selected to represent each party in the dispute. One interviewee during household surveys in the said Bedouin could be fined 50 LE. for cutting the green parts of a tree. It is interesting to note that Bedouins are relatively powerless to discipline non-Bedouin offenders, and this has important implications on resource use in St Katherine's Protectorate with immigration into the area.

### **Conservation and the Traditional Bedouin Way of Life**

45. Pastoral nomads are widely regarded as being uninterested in protecting their natural resources. While they may inadvertently be in balance with their environment as long as pastures are plentiful, they make no effort to safeguard resources during times of stress, or to ensure that future generation will enjoy what nature provides. However investigation of their life style, culture, customs and traditions especially regarding their use of plants and animals suggest the opposite conclusion; traditionally pastoral nomads

do protective of their environment and work to maintain a balance between themselves, their herds, and the availability of wild resources <sup>(11)</sup>. Attitudes towards resource management do consider future impacts of present actions.

46. The principle resource supporting the nomads' desert livelihood is one that they have no control over, rainfall. Remarkably, their careful use of perennial trees, like acacia and sayal, is one of the nomads' principle means of maintaining their traditional life-style during prolonged drought. These trees produce green leaves that can sustain livestock when no other pasture is available. In times of environmental stress, then, the nomads must achieve a very delicate balance between using and abusing their perennial resources. Their conservation rules are defined clearly. The most important rule is that only dead wood can be cut. Only when no other food is available should a man take acacia or other tree leaves for his herd, and only then by shaking them off. This prohibition, which may be rooted in an understanding of the trees ecological and economic importance, is justified by a religious explanation. God the nomads say, demanded in the *Koran* that man should not cut living trees. As recently as the first century AD, the long-term effects of tree cutting were observed, and proclamations were made to protect trees on a family-by-family and place-by-place basis. Similar guidelines also apply to certain shrubs. Although they fetch high price in Nile markets, plants such as *argel* and *wormwood* must never be uprooted or defoliated completely, in the Bedouin tradition.

47. Bedouin practices come from a detailed knowledge of the desert ecosystem. For example they can offer biologist a nearly complete basic inventory of their regions plants, animals and other resources. They can distinguish between habitats, identify floral ranges, life cycles, and identify species with medicinal uses, those that are palatable for man and animals, and the usefulness of a species as a source of fuel. Bedouin also have a good sense the extent to which an area can exploited without degrading it and diminishing its capacity to recover.

48. The Bedouins' conservation practices preserve not only economic and aesthetic values, but also an entire way of life. Conservation of plants and animals is an expression of the nomads' deep-seated beliefs. Loss of livelihoods, also means loss a desert home and without their cultural and historical ties that go with the place.

### **Extracts and Finding from Household Surveys with Bedouin in St Katherine's Protectorate**

49. During the PDF B some of the interviewees commented as follows;

- ❖ Soliman Saleh; We accept any way to conserve our medicinal plants;
- ❖ Mohamed Hameed Farhan; Regardless of the restrictions made by the Protectorate authorities, the Bedouins themselves do not dig out the herbs because thy are aware about the sustainable growth and use of these plants for their benefit;
- ❖ Husein Mohamed Hussen; Removal of the dried parts from the herbs and trees is beneficial for the renewal and better growth;

- ❖ Hemdan Fargallah; People pay much consideration to the trees, for them it means shade, beauty and wood, but they also know that pruning of dry branches is useful for renewal growth of the trees;
- ❖ Zayed Mohamed Hemeid said “Something like *hif* could be arranged for the conservation of medicinal plants, but it should be out of the settlements in areas rich with flora”.

## ANNEX J – EXISTING NATIONAL TECHNICAL CAPACITY TO EXECUTE PROJECT ACTIVITIES

Necessary Technical Capacity	Institution and capacity
<p><i>In-situ conservation</i> Species identification and GIS; techniques for assisted in-situ regeneration of wild medicinal plants;</p>	<p><i>Suez Canal University:</i> in co-operation with the EEAA, Local Bedouin and the South Sinai Governorate have been monitoring small enclosed areas in St Katherine’s Protectorate for the conservation impact on endangered medicinal plants species. Early results have suggested that enclosure has worked for some species, however management approaches need to be worked out on a species by species basis. Suez Canal has also been conducting collaborative research in the reproductive ecology of a range of medicinal plants in Sinai. In particular they have done a number of studies on the germination propagation requirements of a number of medicinal plant species to understand the conservation management implications.</p>
<p><i>Medicinal plant cultivation:</i> Seed storage, germination, propagation, pollination; cropping systems; and pest management; and collection</p>	<p><i>The National Research Centre (NRC) and the Suez Canal University:</i> are currently expanding their expertise in the cultivation of wild medicinal plants. 19 medicinal plants found wild in the Sinai are now undergoing cultivation tests at an experimental station near Ismailia</p> <p><i>EBDA:</i> has the capacity to provide a full range of extension advice to over 150 farms growing a number of medicinal plants commercially.</p> <p><i>Desert Research Centre:</i> have surveyed and evaluated medicinal plants of Sinai, and have conducted trials in the introduction of the most economically promising in the North-west of the Sinai.</p>
<p><i>Medicinal plant processing and packaging:</i> cleaning; drying; extraction of active ingredients;</p>	<p><i>Medicinal Plant cultivation in Egypt:</i> there is a small but growing USD 50 million medicinal plant in Egypt including companies such as Sekem, Kato Aromatic and El Baquley, who process package a range of medicinal plant products. Sekem has already expressed an interest in implementing the medicinal plant cultivation output.</p> <p><i>Hakim:</i> there are a number of <i>Hakim</i> in St Katherine’s who have indigenous knowledge in processing and preparing medicinal remedies.</p>
<p><i>Medicinal plant marketing:</i></p>	<p><i>Sekem, Kato Aromatic and El Baquley</i> promote their medicinal plant products in domestic and international markets. They regularly attend trade fairs, and actively develop trade links with wholesalers and retailers to sell their products.</p> <p><i>Local Sales:</i> There is already one outlet in St Katherine’s that markets medicinal plants in St Katherine’s own by a local businessman</p> <p><i>National Organisation for Drug Control and Research (NODCAR):</i> Sets standards to control the quality of medicinal products manufactured in Egypt, helping to provide consumer protection.</p>
<p><i>Sustainable collection methods for Wild Medicinal Plants</i></p>	<p><i>NRC:</i> The NRC has been conducting extensive research on the active ingredients of the medicinal plants of Egypt, in which part of the plants they are found, and during which seasons these ingredients are present in greatest quantity. The NRC has the capacity to help define guidelines on when to collect medicinal plants, and which plants to collect</p> <p><i>Suez Canal University:</i> conducted biomass and productivity during the PDF B on a sample of medicinal plants found in St Katherine’s Protectorate. The results in the Report to UNDP clearly indicated that they were able to undertake these types of measurements.</p> <p><i>Suez Canal University:</i> A number of studies conducted by researchers at Suez Canal University have been sited, which indicate that the capacity to study reproductive ecology of medicinal plants exists in Egypt.</p> <p><i>National Research Centre/Desert Research Institute:</i> both organisations screen wild medicinal plants for active pharmaceutical ingredients. Work has</p>

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<p><i>Grazing management:</i> Shepherd training; modern rest and rotation techniques</p>	<p>included testing in which plant parts and in which seasons the greatest concentration of active ingredients are found. While more work needs to be done, the capacity to further develop knowledge of plant ecology, biomass production and active medicinal plant ingredients clearly exists to develop best practice wild medicinal plant collection guidelines.</p> <p>Under the auspices of the <i>Ministry of Agriculture, the Directorate of Agriculture in southern Sinai Governorate</i> provides extension services on rangeland management that encourage rotational grazing in vulnerable desert areas, dryland farming, orchard cultivation and home gardening. The Directorate is located in El -Tour Area with a department in St. Katherine. It is represented on the Governorate and the city Councils.</p>
<p><i>Solar Energy:</i></p>	<p><i>The National Research Centre</i> in Egypt through its <i>Department of Solar Technology</i> has the required capacity to undertake activities related to developing solar energy equipment suited to the environment and people in remote areas in Sinai.</p>
<p><i>Community Intellectual property rights:</i></p>	<p><i>The Patent Office affiliated to the Academy for Scientific Research and Technology</i> administers Egypt's existing intellectual property right laws. Egypt will need international expertise in developing framework legislation and creating the institutional capacity to administer community intellectual property rights law.</p>

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