

## World Heritage Scanned Nomination

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UNESCO Region: ARAB STATES

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**SITE NAME:** Saint Catherine Area

**DATE OF INSCRIPTION:** 29<sup>th</sup> June 2002

**STATE PARTY:** EGYPT

**CRITERIA:** C (i)(iii)(iv)(vi)

**DECISION OF THE WORLD HERITAGE COMMITTEE:**

*Excerpt from the Report of the 26<sup>th</sup> Session of the World Heritage Committee*

**Criterion (i):** The architecture of St Catherine's Monastery, the artistic treasures that it houses, and its domestic integration into a rugged landscape combine to make it an outstanding example of human creative genius.

**Criterion (iii):** St Catherine's Monastery is one of the very early outstanding examples in Eastern tradition of a Christian monastic settlement located in a remote area. It demonstrates an intimate relationship between natural grandeur and spiritual commitment.

**Criterion (iv):** Ascetic monasticism in remote areas prevailed in the early Christian church and resulted in the establishment of monastic communities in remote places. St Catherine's Monastery is one of the earliest of these and the oldest to have survived intact, being used for its initial function without interruption since the 6<sup>th</sup> century.

**Criterion (vi):** The St Catherine's area, centred on the holy mountain of Mount Sinai (Jebel Musa, Mount Horeb), like the Old City of Jerusalem, is sacred to three world religions: Christianity, Islam, and Judaism

### BRIEF DESCRIPTIONS

The Orthodox Monastery of St Catherine stands at the foot of Mount Horeb where, the Old Testament records, Moses received the Tablets of the Law. The mountain is known and revered by Muslims as Jebel Musa. The entire area is sacred to three world religions: Christianity, Islam, and Judaism. The Monastery, founded in the 6<sup>th</sup> century, is the oldest Christian monastery still in use for its initial function. Its walls and buildings of great significance to studies of Byzantine architecture and the Monastery houses outstanding collections of early Christian manuscripts and icons. The rugged mountainous landscape, containing numerous archaeological and religious sites and monuments, forms a perfect backdrop to the Monastery.

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**1.b State, Province or Region:** Governorship of South Sinai

**1.d Exact location:** N28 33 53.4 E34 00 22.9

A “Consolidated Replacement Text” for the Nomination of

**THE ST. CATHERINE AREA, SOUTH SINAI, EGYPT,  
AS A MIXED WORLD  
CULTURAL AND NATURAL HERITAGE SITE**

**1. IDENTIFICATION OF THE PROPERTY**

**One. Country: The Arab Republic of Egypt**

**b. . Region: Governorate of South Sinai, Sinai Peninsula**

**Three. Name of Property: Saint Catherine Area**

**Four. Exact location on map and indication of geographical co-ordinates to the nearest second:**

The naturally delineated geological area includes two categories, the “core” area for which the present request is submitted, and “a cluster of satellites”, *indicated here but left to be requested at a later stage. They are referred to only as a reminder for possible future consideration.*

(One) The “core” area of the St. Catherine Protectorate is a natural geological feature within the boundaries of the igneous crystalline Pre-Cambrian circular dyke (or ring complex) formation, more than 600 million years old, and all of the numerous cultural and natural heritage sites within it, e.g., Mount Sinai and the Monastery of St. Catherine, as well as the head of Wadi Feiran watershed, harbouring a large number of endemic species. This area is entirely within the boundaries of the larger area of the St. Catherine Nature Protectorate, under the management of the Nature Protection Sector of the Egyptian Environmental Affairs Agency (EEAA), of the State Ministry for Environmental Affairs. The Protectorate is responsible for preserving and managing the natural landscape and its biotic components, as well as for some socio-economic activities related to sustainable development of the Bedouin community.

**(Two) These are the coordinates of the presently requested area (in decimal degrees):**

	<b>X - Eastings</b>	<b>Y - Northings</b>
<b>1</b>	<b>34.01665948</b>	<b>28.73331906</b>
<b>2</b>	<b>34.02690981</b>	<b>28.72064700</b>
<b>3</b>	<b>33.99636123</b>	<b>28.68512030</b>
<b>4</b>	<b>34.06282639</b>	<b>28.62735333</b>
<b>5</b>	<b>34.01567107</b>	<b>28.59019007</b>
<b>6</b>	<b>34.11499044</b>	<b>28.50405603</b>
<b>7</b>	<b>34.00709725</b>	<b>28.44322512</b>
<b>8</b>	<b>33.91780123</b>	<b>28.44146043</b>
<b>9</b>	<b>33.80056800</b>	<b>28.48651660</b>
<b>10</b>	<b>33.82085860</b>	<b>28.60395275</b>
<b>11</b>	<b>33.89484871</b>	<b>28.63053304</b>
<b>12</b>	<b>33.96339410</b>	<b>28.69338151</b>

The surface area is about 595.87 sq. km, and the perimeter 112,713.2 m. The buffer zone is the area bounded from the inside by these coordinates, and the

boundaries of the St. Catherine Nature Protectorate. Within the whole area of the Protectorate, Law 102/1983 on Nature Protectorates (Nature Reserves), is the law that applies (see below).

(Three) The “cluster of satellites” with a number of other obviously outstanding natural and cultural heritage monuments outside the “core” area, in a “cluster”, within or without the boundaries of the St. Catherine Protectorate. These are (1) Gabal Serbal, and (2) Gabal Umm Shomer, which are of the same lithological nature as the rocks of the ring complex, of similar history, and of similar elevation, harbouring some more endemic species. Gabal Serbal in particular has a number of Alpine mosses and endemic higher plants, wild *Pistachia* groves, scenic views, is a refuge for the ibex, could be the last haunt of the Sinai leopard, and has as well a Nabataean temple and graffiti. Other satellites are referred to and are equally noteworthy for important archaeological sites of world fame. These are: (1) Serabit Al-Khadem with the oldest known alphabet in history, (2) the Nuns’ Convent and its archaeological perimeter in the bed of Wadi Feiran and at the foot of Gabal Serbal with Gabal El-Tahuna (the mill mountain) and Gabal El-Banat (the girls’ mountain) on the other side of the Wadi, (3) the properties of the Monastery at the city of El-Tor, on the Gulf of Suez coast, (4) as well as the Monastery’s Headquarter in Cairo. Cultural components within the St. Catherine Protectorate or outside it are under the responsibility of the General Organization for Antiquities, of the Ministry of Culture. The accompanying Documents, Maps, and Appendices show these properties and give details about them (except the Cairo HQ).

*A word about transliteration:* St. Catherine may be written as St. Katherine, or Sta. Katarina. Gabal (=mountain) may be written as Jabal or Jebel. Gabal is the the Cairene dialect, while Jabal is in the Bedouin dialect, and it is how Europeans are used to write it. The same applies to the name of the Bedouin tribe at the St. Catherine area: Gebaliya or Jebaliya (people of the mountain).

**e. Map and/or plans showing boundary of area proposed for inscription and buffer zone:** (see Attachments of 2 maps, no buffer zone required, since the property lies within the boundaries of the St. Catherine Nature Protectorate).

**Six.** Area of “Core” Property: About 601 km<sup>2</sup> for the present request, plus smaller areas of “satellites”, not to be considered, for the time being. The area of the St. Catherine Protectorate (Nature Reserve) is 4300 km<sup>2</sup>. The proposed area is the naturally protected ring complex (Eyal and Hezkiyahou 1980). Because of its unusual rugosity, and its evident inaccessibility, it is unlikely to suffer from “savage” development. The other sites are of special natural and cultural interest, but are of a second priority, at least for the time being.

## **2. JUSTIFICATION FOR INSCRIPTION**

### **a. Statement of Significance**

The Sinai Peninsula, joining the Continents of Asia and Africa, has had an unsurpassed role to play in human history. It may be common knowledge that so

many peoples and armies have passed across it from both sides, bringing with them different cultures and different ways of viewing life. Moses and Christ have humbly travelled through it, radically changing these views after them, so that monasteries and churches were built at certain isolated spots. The Arab leader Amr Ibn Al-Ass led the Muslim army to Egypt and from there Islam spread into the rest of Africa. But what may be less known is that most plants and animals that had been domesticated by man in the Middle East region continued to be exchanged between the two Continents across the Sinai Peninsula, and locally adapted in various countries, from time immemorial, and from there spread all over the world, thereby leading to equally radical transformations in man's use of environmental resources.

Southern Sinai is thus particularly rich in many religious monuments of interest and highly venerated by followers of the three monotheistic religions. Most prominent of these monuments is of course the St. Catherine monastery (sometimes spelt St. Katherine) and its smaller satellite monuments. All this richness gives the region a particular importance as a cultural heritage site of international value. Moreover, the geographical position of S. Sinai, its rugged landscape, and its high altitudes, allowed it to become a relict site of rare, endemic (i.e., not found elsewhere), and threatened plant and animal species and hence are of great international value, especially now within the context of the Biodiversity Convention of 1992. A high percentage of these plants is locally used, and profitably, as medicinal plants. Together with the monuments and the grandiose scenery, great tourist attractions, which have been the basis of a flourishing tourist industry in the past 20 years, the rare and endemic species are valuable biodiversity resources.

#### **Accordance with WHC criteria**

More specifically, and according to the WHC criteria, with the same notation as in the paragraphs 24 and 44 of the Operational Guidelines, the following is presented:

#### **As a Cultural World Heritage Property (para 24 of the Operational Guidelines):**

(a) (i) The historical buildings within the site are of outstanding universal value from the point of view the three great monotheistic religions of the world history (oldest remaining Byzantine 4<sup>th</sup> century architecture), and art (numerous icons that escaped the iconoclastic destruction).

(ii) They exhibit a remarkable and unique interchange of human values (respected and revered by followers of Judaism, Christianity, and Islam, more than one third of humanity).

(iii) They are obviously a unique cultural testimony of the peaceful co-existence and mutual respect of the three great monotheistic religions of the world that sprang up in the Middle East, an aspect much in demand nowadays. This is why H.H. Pope John Paul II, Head of the Universal Catholic Church, chose to visit the site and hold prayers there.

(iv) They are an outstanding example of Byzantine buildings found very rarely elsewhere on Earth.

And

(b) (i) They meet the test of authenticity in design (churches with a mosque within its walls, a living testimony of much needed religious tolerance in this world).

(ii) They have adequate legal protection and enjoy the favourite attention of several ministries in the Egyptian Government (Environment, Culture, Tourism, etc.), as well as many international organizations.

**As a Cultural Landscape (para 36 et seq. of the Operational Guidelines):**

(ii) The site is an organically evolved landscape with a continuing landscape history retaining an active social role in contemporary society closely associated with a traditional way of life (that of monks on one hand, since the 4<sup>th</sup> century, and Gebaliya Bedouin Tribe on the other hand, from the same period). The Gebaliya Tribe has by tradition right of use (territory) of the Ring Complex, or Pluton area (see para (a) (i) below).

(iii) The site has a powerful associative character with strong religious and cultural associations of the natural elements (Mount Moses, the Burning Bush, the Plain of Raha (Resting Plain)).

**As a Natural World Heritage Property:**

(a) (i) The area with its granite high mountain peaks (the Ring Complex, or Pluton), represents a formation of Precambrian landscapes more than 600 million years ago, with the splitting of the Arabo-Nubian massif and the birth of the Red Sea as the greater and wider extension part of the Great Rift Valley.

(iii) It contains areas of exceptional awe-inspiring natural beauty, so much so that hundreds of thousands of tourists come annually just to contemplate its rugged terrain at sun rise from the top of one of its peaks, Gabal Musa (Mount Moses or Mount Sinai of the Revelation).

(iv) It possesses a high rate of endemism and juxtaposition of four important phytogeographical realms: the Palaeartic, the Saharan, the Afro-Tropical, and the Irano-Turanian, and contains the most important and significant natural habitats for *in situ* conservation, as well as significant fauna and flora representing the biogeographical hinge between those of Asia and of Africa.

And

(b) It also fulfils the following conditions of integrity:

(ii) The site is of sufficient size and contains the necessary elements to demonstrate the key aspects of processes essential for long-term conservation, as provided by legal declarations, the St. Catherine Nature Protectorate for natural heritage, and the Department of Antiquities, for cultural heritage.

(iii) It is a rugged landscape of outstanding aesthetic value, as attested by the numerous paintings and poems provided by poets and painters over the ages.

(iv) It contains habitats for maintaining a highly diverse fauna and flora characteristic of four contiguous biogeographical provinces and their related montane ecosystems: The Palaearctic, the Saharan, the Afro-Tropical, and the Irano-Turanian.

(v) The area has a solid and officially approved management plan.

(vi) It has adequate long term legislative, regulatory, and institutional protection.

(vii) The site has an unquestionably high biodiversity and a large assemblage of endemic species, in spite of being a desert area, because of its unique central geographic position, its rugosity, and its long history of isolation.

#### **b. Possible Comparative Analysis**

This prominent cultural heritage site is combined with a history that goes back to several millennia in the history of mankind and the origin of today's three great monotheistic religions of the world. According to well established tradition, God chose this spot out of all places to reveal Himself and deliver the Ten Commandments to Moses. Throughout the world, there does not exist a comparable Christian Byzantine monument that traces a continuous occupation and history from the 4th century to the present.

It is said that the Monastery is the only well-kept and intact Byzantine building from that period, in the world. The buildings, the sacred works of art that they harbour that escaped the iconoclastic movement, and the precious library (volumes in 48 languages), are in a remarkable state of preservation, despite the inherent difficulties of the desert environment and the imposed isolation, with the limitations on conservation and restoration attempts that they impose. These attributes compare most favourably with those of any related monastery anywhere, and more generally with those of any religious monument in the broader Middle East, the Eastern Mediterranean, as well as in the world at large. The recent visit of the Roman Catholic Church of Rome, Pope John Paul II, to the Monastery in February 2000 and his holding of holy mass there, together with the warm welcome he received from Egyptian authorities, and the presence of a mosque from the Fatimid period within its walls, are all an eloquent testimony as good as any of its religious unequalled importance to people of all three monotheistic faiths, and a much needed symbol of co-existence amongst their followers.

This is not the whole story, since the area holds a number of endemic species that were developed there thanks to the contiguity of various biogeographical regions, and were saved in place till the present time thanks to their isolation. For this high rate of endemism, the St. Catherine area is considered one of the most significant biodiversity hot spots in the Middle East.

#### **c. Authenticity/Integrity**

The buildings of the St. Catherine Monastery maintain the authenticity of their initial construction to a remarkable degree, with few departures from archaeological

standards as known today. These are repairs that date back to the Middle Ages, made by both the monks and the Bedouins. In meeting practical needs, within its protecting walls, it was natural that later constructions should present deviations from the initial architectural designs of the edifices of Justinian. Yet, among these are architectonic forms that may be classed as notable works of art in their own right, unique in the world. These building efforts, intermittent, some small and simple, some more elaborate, have all left their imprint, and all continue to be noteworthy. This is due, above all, to the continued reliance upon the local materials that are available for construction, with only minor exceptions. The careful maintenance of these buildings, with their monastic and desert character, allows them to convey a sense of respect and piety. They present a harmonious whole that brings inspiration and serenity of heart to pilgrims and visitors alike. Any intervention for the maintenance of the buildings in their original authenticity is very carefully evaluated by both the Monastery authorities and the Egyptian Supreme Council of Antiquities. Nothing is permitted that may risk the slightest obliteration of the original character of the buildings. Moreover, not only are the buildings protected as such, but more importantly, the monastic life within the walls of the Monastery is under close control, while life in the whole area is also as far as possible developed through a rigorous management plan.

As for the elements of natural heritage, the proposed area allows for the free movement of animals and includes a large number of habitats, such as waterfalls and small lagoons, high mountain tops, and deep wadis, where the endemic plant species grow. Both the watersheds and the downstream areas of these wadis are included within the boundaries of the proposed site (the ring complex). It should be noted that the boundaries of the ring complex coincide with the territory of the Gebaliya Tribe, who are historically intimately related in their lifestyle with the monastic life within the Monastery. This again is another crucial cultural uniqueness, which characterizes the St. Catherine area, as compared with areas around other monasteries elsewhere.

**d. Criteria Under Which Inscription is Proposed (and Justification for Inscription under These Criteria)**

- (1) The international religious history and the significance of the monument and its surroundings to perhaps more than the third of humanity (more than 1 billion Christians, more than 1 billion Muslims, and millions of Jews).
- (2) The unique collection of manuscripts dating back to the fourth century and icons dating back to the sixth, which escaped the iconoclastic destruction of the eighth century, are of great historical and artistic importance.
- (3) The international interest in these monuments gives it more than reasonable concern to be protected under the WHC, vehicle of international protection of such a notable historical monument.
- (4) The gardens that Bedouins have cultivated for generations contain special fruit tree varieties adapted to the climatic conditions of the area, and also need to be preserved.
- (5) As for the natural elements, it is normal that intrusions from exotic species may occur, as a result of building hotels in St. Catherine City and the need to embellish their gardens. The Monastery has also introduced foreign trees such as eucalypts, as well as some fruit trees in its gardens, outside its walls. These plants remain, however, within the walls of the buildings and do not show any sign of spreading beyond, perhaps due to the drought. No exotic animals are observed that should cause a serious ecological imbalance.

### 3. Description

#### a. Description of Property

##### THE PHYSICAL SETTING

###### Climate

St. Catherine area has an arid climate with a mean annual rainfall of about 60 mm, though the high peaks receive orographic precipitation, some in the form of snow, which may reach up to 300 mm annually. At El-Tor, on the Gulf of Suez, precipitation is about 13 mm/year. Rainfall is sporadic but usually falls between October and May. The area lies within the Saharan-Mediterranean climate type. The high elevation attracts moisture (mist) and improves the temperature conditions to that of a cool desert winters and hot dry summers. It is the coolest area in Egypt. Mean maximum temperature in August is 36° while winters are relatively cool with mean minimum temperatures of -7.8° in February. During winter, temperatures near the Red Sea coast vary from 13° to 23° C. The range for spring, is 20°-30° (40° C in the *Khamasin*, the hot dry winds of spring, blowing for about 50 days, hence the name), for summer 25°-35° C, and for autumn 20°-30° C. Rainfall does not exceed 20 mm/yr on the Red Sea coast, and 50-70 mm in the highlands. The maximum is usually in spring rather than in winter. Relative humidity is 60% on average in the southern tip between the two Gulfs, and rarely exceeds 50% in the highlands. The diurnal and the annual ranges of variation do not exceed 10%, except again during spring, season of the hot and dry *Khamasin* winds, when it drops markedly. Potential evaporation rates are very high, in excess of 20 mm/day during August. Water supply is consequently very limited for both wildlife and people. In the crystalline mass small amounts of ground water are available only in shallow aquifers of wadi alluvium or in shattered dyke structures. These supplies were traditionally exploited by Bedouins, digging wells and requiring local precipitation for replenishment. Recent tourism development has resulted in a serious depletion of this meager resource.

###### Geomorphology

The Sinai Peninsula has an intricate basement complex core near its southern end, composed of high, very rugged igneous and metamorphic mountains, with a high escarpment overlooking the northern plains. The mountains have the highest peaks in Egypt: Gebel Katherina (2641 m), G. Umm Shomar (2586 m), G. Musa or Mount Sinai (2300 m), and G. Serbal (2070 m). These mountains and their deep rocky gorges, in spite of their relatively small surface area, form one of the most rugged tracts of the country. The higher part of the limestone plateau at the flanks of the igneous core to the north forms G. El-Tih (= maze). The eastern and western edges are dissected by numerous narrow wadis draining into the Gulfs of Suez and Aqaba, with somewhat wide fans (mini-deltas) near the shores. Relatively dense *Acacia* forests used to exist in such favoured but limited habitats, now obliterated by the scores of extensive buildings exploiting the flat land provided by the wadi deltas.



## THE BIOLOGICAL SETTING

### Vegetation

Besides the 27 ultra-rare moss species occurring at the mountain tops, it is estimated that almost 1285 species of higher plants exist in Sinai, more than half of the Egyptian flora. Species endemic to Sinai alone are about 33, while 4 species are endemic to Sinai and other regions in mainland Egypt. The total number of endemic plant species for Egypt is 61, so that Sinai again harbours more than half of the Egyptian endemic species, mostly concentrated in the southern highlands. The unique geographical position of Sinai, linking Asia and Africa, and not very far from Europe, is reflected in this unique flora. Some of the southern highland plant species are found along the mountain chains extending to Iran in the east, and some others along the mountain chains extending to the African subtropics in the south. The vegetation of the southern highlands can be distinguished into the following groupings:

- 1) Dwarf montane vegetation including about 30 endemic species and characterized by *Hypericum sinaicum*, *Phlomis aurea*, *Primula boveana*, *Veronica musa*, etc., occupying the high mountains of southern Sinai.
- 2) Hot deserts near the southern coast, characterized by *Acacia tortilis* (specially common in the southern wadis), mixed with *A. raddiana*, *Aerva javanica*, *Calotropis procera*, *Capparis decidua*, *Cassia italica*, *Ochradenus baccatus* and *Ziziphus spinachristi*, as the common prominent species.
- 3) Mangrove vegetation at Ras Mohammad in the southern tip of the Peninsula, with *Avicennia marina*.

Some researchers consider the high mountain region of Sinai a well-defined biogeographical "island" of Central Asian steppe vegetation, as a relict of the Irano-Turanian Zone that covered most parts of the Middle East during colder and wetter periods in the past, leaving behind entities which later became endemic. Trees originating from the mountain steppe-forest belt are found living with plants typical of the Alpino-Tragantic belt in Central Asia. Among the trees, *Crataegus sinaica* and *Pistacia khinjuk* are typical. They are members of the low, open steppe-forest formations in the mountains of Iran and Afghanistan. These two species occupy different habitats in the Sinai mountains: *Pistacia* in cracks and cliffs, and *Crataegus* in the flat wadi beds with deep soils. The Alpino-Tragantic vegetation is represented by short bushes of the cushion type, like *Astragalus echinus* and *Bupleurum falcatum*. Endemics within this group include *Atraphaxis spinos*, *Phlomis aurea* and *Pyrethrum santolinoides*. Endemics of the more remote central mountains include *Hypericum sinaicum*, *Primula boveana*, *Pteroccephalus sanctus* and *Thymus decussatus*. An even more curious fact is that some annual plants show a similar pattern of distribution, occurring in Sinai and Iran, without a connection inbetween. Two such examples are *Lappula sinaica* and *Paracaryum intermedium*. Only two Mediterranean species occur in this high mountain region: *Ballota undulata* and *Majorana syriaca*. In the lower altitudes with warmer habitats, endemics from the surrounding Sudanic and Saharo-Arabian vegetation elements are found, such as *Linaria sinaicum*, *Phagnalon sinaicum*, and *Varthemia montana*.

In the alluvial fans, with *Acacia raddiana*, *A. tortilis*, *Hammada salicornia* (= *H. elegans*), *Hyoscyamus boveanus*, and *H. muticus*, where new human settlements are established, new plants occur from five different sources: (a) desert ruderals, (b)

desert springs, (c) other desert habitats, (d) common weeds derived from nurseries, and (e) newly arrived "xenophytes". More than 25 such alien species, of which at least 14 are new to Sinai, could be recorded. Such alien species have the ability to replace the original ones, and are therefore to be monitored carefully. The similarity of this coastal flora with that of the gardens of the St. Catherine Monastery is rather low (21%, before 1981), but perhaps more of this unwanted uniformization of the natural vegetation, and eventually its precarity, is to be expected with increasing ease of communication between the coast and the highlands.

### **Flora**

The mountains of the South Sinai have been recognized as one of the important centers of endemism of plant diversity for the Saharo-Sindian (Irano-Turanian) region of the Middle East (McNeely *et al.* 1994). Approximately 316 higher plants have been recorded within the Protectorate. Of these, 19 species are endemic. Local Bedouins use more than 170 species (see Appendices) of plants for the treatment of various medical disorders, ranging from colds, digestive troubles, skin symptoms, to bites and stings, and even diabetes. Several species have properties that attracted international pharmaceutical interest, e.g., *Cleome droserifolia*, which is being investigated for the treatment of none other than diabetes. The value of the medicinal plants and associated indigenous knowledge is well embodied in the local medicine man, Mr. Ahmad Mansour. In 1999, the UNDP presented a proposal to the Global Environmental Facility (GEF) for the conservation and sustainable use of the remarkable wide diversity of medicinal plants of the St. Catherine area. This proposal is still being under study.

### **ALFRED KAISER'S SINAI HERBARIUM**

Alfred Kaiser (1862-1930) was a Swiss who became interested in natural sciences and geography in his school days. At the age of 18 he decided to come to Egypt and travelled in the desert selling household goods to the Bedouins, from whom he picked up the Arabic language. He went back home in 1882 but soon returned to become Curator of the Khedive's natural science collections. He went to Sinai in June 1886 and stayed for 7 months at El-Kurum, a few kms south of El-Tor, from where he travelled in all directions, all the time collecting plants. He made a second trip to Sinai on 15 March 1887 and penetrated the mountain region of Sinai, then returned to Switzerland in 1888. His third voyage to Sinai was in 1890. He erected a small research station with money out of his own pocket at El-Kurum, even with a branch in Wadi Bedr, inside the mountain region. Kaiser lived there all the time, collecting specimens of plants and animals, which he sold, to European museums. The station existed till 1899, when he returned to Switzerland. In 1907, he was appointed by the Swiss Government as Commercial Attaché in Alexandria, till 1914. In April 1926 he went to Sinai again, at El-Tor. He lived a long time in the beautiful Monastery of Deir El-Arba'in, on the way to Gabal Katherina. He left in October 1927 to Switzerland and died there in 1930. The great work on Sinai he dreamt of was never completed. What we have is preliminary work entitled "*Die Sinaiwüste*" (1922).

For Kaiser, Sinai was the chosen country. He loved its nature and its people, he mastered its language, and he gave his heart and life to its scientific exploration.

Although his book is “*Die Sinaiwüste*” is only a short preliminary summary of the great publication he was working on, it is the finest work, which has ever been written on the natural history of Sinai. It shows fabulous knowledge, not only about plants, but also about mammals, birds, reptiles, mollusks, fossils, rocks, as well. All based upon his own observations. Kaiser’s find of an orchid in this region is a great sensation. It is the only time a wild orchid has been found in Egypt. It was never found again. His specimens were sent to the Herbarium Delessert in Geneva, but there might be some more sent to Zurich.

Vivi Täckholm, the Swedish botanist who lived in Egypt from 1926 to 1978, wrote in her introduction to Alfred Kaiser’s Sinai Herbarium, that future Sinai explorers will always remember Alfred Kaiser’s name with deepest respect and gratitude. He laid the foundation.

Vivi went to Herbarium Boissier in Geneva and saw only a few of the specimens kept there. Determinations of the 1895 collections were apparently made by the great Schweinfurth, judging by his characteristic handwriting on the list she had seen. However, she did not see the specimens themselves. She examined the specimens of the 1926-1928 collections and published about them in *Publ. Cairo Univ. Herb.* (now *Taekholmia*) vol. 2 (1969). It contains an enumeration of 450 species.

The interesting aspect of this publication is that it indicates two important types of information:

- 1 - the geographic distribution of these plants within 12 sectors in South Sinai arbitrarily designated by Kaiser, and
- 2 -. the uses of each plant species.

### **Geographic Distribution of Plants (see “Kaiser” map)**

No plants are recorded from sector no. 1. This may be because Kaiser did not collect from there in the period 1926-1928, or that the specimens are lost or could not be found in Herbarium Boissier in Geneva, or they are kept in the Zurich Herbarium (which Vivi Täckholm didn’t see). From the enumeration of species in each sector from 2 to 12 (done by Miss Samiha Ghabbour) it appears that the species richness of each sector is as such:

Sector	No. of Plant Species
2.	44
3.	5
4.	33
5.	60
6.	87
7.	24
8.	211
9.	301
10.	186
11.	242
12.	64

It is clear that the highest species richness is in sectors 8-11, which are the sectors of the “ring complex”, requested as a “core” area, of first priority, in this Nomination

File. The total number of these species exceeds of course 450, because many species are distributed in more than one sector.

### **The Local Uses of Plants**

The types of uses mentioned by Kaiser were categorized into 7 types: timber, grazing, medicinal, human food, fuelwood, charcoal, and “other uses”. Guidance for this enumeration was from a similar field investigation in the Wadi Allaqi Biosphere Reserve (Belal and Springuel 1996). The enumeration of the uses for each plant (made by Miss Samiha Ghabbour). It gave the following results:

Timber, 2 species  
 Grazing, 171 species  
 Medicinal, 58 species  
 Human food, 77 species  
 Fuelwood, 0  
 Charcoal, 0  
 “Other uses”, 31 species

It is quite strange that Kaiser did not record any of the 450 species in the list (which is not exhaustive anyway) used as timber (only 2), fuelwood (none), or charcoal (none). He probably was not very much interested in these uses as he was in medicinal uses. Undoubtedly, innumerable species can potentially be used for fuel and charcoal production, or as timber, and so he probably thought that it would be superfluous to mention these particular uses. At any rate, the percentage of useful plants is highest for grazing, followed by human food, and medicinal. The total uses are 339, for a flora of 450 species (88%). There are 165 plants with only one use, 63 with 2 uses, and 16 with three types of uses.

### **PLANTS FOUND IN SOUTH SINAI BUT NOWHERE ELSE IN EGYPT**

Prof. M N. El-Hadidi and Prof. A.-A. Fayed published in 1995 an Excursion Flora of Egypt in which they showed South Sinai as a separate phytogeographic entity. This was not the practice of other Egyptian works on the flora and phytogeography of the country. This publication is therefore much valuable for the reconnaissance of the uniqueness of the mountainous area of South Sinai, in separating the plant species of this area from those of the coastal strips on the Gulfs of Suez and of Aqaba. In other works either the whole of Sinai is regarded as one single phytogeographic entity, including its Mediterranean coast, or as three entities: the Mediterranean coast, the northern part of Sinai (the Isthmic Desert), and South Sinai.

Miss Amira Shawky and Miss Samiha Ghabbour made a listing of the plant species of this mountainous area given in the Excursion Flora of Egypt, especially for the present Files. They found that according to El-Hadidi and Fayed, there are 710 plant species in the mountainous area of South Sinai. This is 260 species more than those recorded by A. Kaiser for the whole of South Sinai. Naturally, this is due to at least two reasons: (1) there has been more thorough exploration of the flora of Sinai in recent years, especially in South Sinai, and (2) there has been more thorough taxonomic work on the relations and affinities of species, leading to the “splitting” of some taxa. Of these 710 species recorded by El-Hadidi and Fayed, 136 species occur in this area and do not occur elsewhere in Egypt.

**Plants of St. Catherine Area and South Sinai, (Excluding the Coastal Zones)  
Found Nowhere Else in Egypt**

<b>No.</b>	<b>Family &amp; Species</b>	<b>Habitat</b>
<b>Aspleniaceae</b>		
1	- <i>Asplenium adiantum-nigrum</i>	shady rocky slopes
<b>Moraceae</b>		
2	- <i>Ficus carica</i> ssp. <i>rupestris</i>	in the mountains
<b>Nyctaginaceae</b>		
3	- <i>Commicarpus sinuatus</i>	rocky ground
4	- <i>C. grandiflorus</i>	rocky ground
<b>Caryophyllaceae</b>		
5	- <i>Bolanthus hirsutus</i>	in the mountains
6	- <i>Gypsophila viscosa</i>	sandy soils and rocky slopes
7	- <i>Ankyropetalum gypsophiloides</i>	rocky ridges
8	- <i>Silene aegyptiaca</i>	moist places and cultivations
9	- <i>S. affinis</i>	desert plains and wadi beds
10	- <i>S. leucophylla</i>	rocky habitats ( <u>endemic</u> )
11	- <i>S. odontopetala</i>	rocky ground
12	- <i>S. oreosinaica</i>	rock crevices and slopes ( <u>endemic</u> )
13	- <i>S. schimperiana</i>	rocky slopes and crevices
14	- <i>Bufonia multiceps</i>	rocky slopes ( <u>endemic</u> )
15	- <i>Arenaria deflexa</i>	rocky places
16	- <i>Minaurtia meyeri</i>	rocky slopes and wadi beds
17	- <i>Cerastium inflatum</i>	rock crevices
18	- <i>Holosteum umbellatum</i> ssp. <i>glutinatum</i>	rocky slopes and ridges
19	- <i>Herniaria glabra</i>	rocky places
20	- <i>Cometes surattensis</i>	rocky ridges
<b>Chenopodiaceae</b>		
21	- <i>Chenopodium vulvaria</i>	weed
22	- <i>Atriplex glauca</i>	chalky hills
23	- <i>Bassia eriophora</i>	dry mountain habitats
24	- <i>Salsola orientalis</i>	rocky habitats
25	- <i>Anabasis syriaca</i>	rocky ground
<b>Guttiferae</b>		
26	- <i>Hypericum sinaicum</i>	rocky ground ( <u>endemic</u> )
27	- <i>H. lanuginosum</i>	rocky slopes
<b>Papaveraceae</b>		
28	- <i>Glaucium flavum</i>	moist rocky habitats
<b>Cruciferae</b>		
29	- <i>Sisymbrium septulatum</i>	moist places
30	- <i>S. orientale</i>	weed
31	- <i>Robeschia schimperii</i>	rocky habitats
32	- <i>Malcolmia africana</i>	moist places
33	- <i>Arabidopsis pumila</i>	rocky ground
34	- <i>A. kneuckeri</i>	rocky ground
35	- <i>Arabis auriculata</i>	in the mountains

36 - <i>A. verna</i>	desert plains
37 - <i>Matthiola arabica</i>	rocky slopes
38 - <i>Ricotia lunaria</i>	rocky ground
39 - <i>Alyssum marginatum</i>	rock crevices
40 - <i>Clypeola jonthlaspi</i>	rocky ground
41 - <i>Moricandia sinaica</i>	rocky slopes
<b>Crassulaceae</b>	
42 - <i>Umbilicus rupestris</i>	rocky habitats
<b>Rosaceae</b>	
43 - <i>Rosa arabica</i>	rocky slopes of higher altitudes ( <u>endemic</u> )
44 - <i>Crataegus x sinaica</i>	mountain sides
45 - <i>C. azarolus</i>	rocky habitats
46 - <i>Cotoneaster orbicularis</i>	rocky mountain sides
<b>Leguminosae</b>	
47 - <i>Trigonella schlumbergeri</i>	sandy soils
48 - <i>Lotus lalambensis</i>	rocky slopes
49 - <i>Bituminaria flaccida</i>	desert wadis
50 - <i>B. bituminosa</i>	rocky ground
51 - <i>Indigofera arabica</i>	desert plains
52 - <i>Astragalus fresenii</i>	rocky habitats ( <u>endemic</u> )
53 - <i>Astracantha echinus</i>	desert plains
54 - <i>Pisum flavum</i>	moist places
<b>Geraniaceae</b>	
55 - <i>Geranium rotundifolium</i>	desert plains
<b>Zygophyllaceae</b>	
56 - <i>Fagonia olivieri</i>	rocky habitats
<b>Tribulaceae</b>	
57 - <i>Tribulus kaiseri</i>	sandy wadi beds and stony highlands
<b>Euphorbiaceae</b>	
58 - <i>Euphorbia maculata</i>	irrigated gardens
59 - <i>E. nutans</i>	irrigated gardens
60 - <i>E. obovata</i>	rocky habitats
61 - <i>E. sanctae-catherinae</i>	wadi beds at high altitudes ( <u>endemic</u> )
<b>Anacardiaceae</b>	
62 - <i>Rhus coriaria</i>	rocky slopes
63 - <i>Pistacia atlantica</i>	rocky habitats
<b>Rhamnaceae</b>	
64 - <i>Sageretia thea</i>	rocky cliffs
<b>Malvaceae</b>	
65 - <i>Malva neglecta</i>	cultivated ground
66 - <i>Alcea apterocarpa</i>	wadis
67 - <i>A. rosea</i>	moist places
68 - <i>Sida rhombifolia</i>	sandy soils
<b>Violaceae</b>	
69 - <i>Viola tricolor</i>	occasional weed
<b>Cistaceae</b>	
70 - <i>Helianthemum sessiliflorum</i>	rocky slopes
<b>Umbelliferae</b>	
71 - <i>Pycnocycla tomentosa</i>	rocky slopes

- 72 - *Bupleurum falcatum* rocky slopes  
 73 - *Pimpinella cretica* stony slopes  
 74 - *Scandix stellata* stony slopes
- Primulaceae**  
 75 - *Primula boveana* rock crevices
- Gentianaceae**  
 76 - *Centaureum malzacianum* freshwater springs (endemic)
- Rubiaceae**  
 77 - *Callipeltis cucullaris* stony slopes  
 78 - *Galium ceratopodium* weed
- Convolvulaceae**  
 79 - *Convolvulus spicatus* sandy wadi beds  
 80 - *C. scammonia* wadis
- Boraginaceae**  
 81 - *Heliotropium makallense* rocky habitats  
 82 - *Paracaryum calathicarpum* rocky ground  
 83 - *Ogastemma pusillum* moist places  
 84 - *Asperugo procumbens* weed in gardens  
 85 - *Alkanna orientalis* rocky slopes and crevices  
 86 - *Nonea ventricosa* wadi beds
- Labiatae**  
 87 - *Thymus decussatus* gravelly wadi beds  
 88 - *Satureja myrtifolia* rocky ground  
 89 - *Ziziphora teuior* steppes at high altitudes  
 90 - *Salvia multicaulis* rocky habitats  
 91 - *Nepeta septemcrenata* rocky habitats (endemic)  
 92 - *Leucas inflata* rocky habitats  
 93 - *Phlomis aurea* wadi beds  
 94 - *Otostegia fruticosa* rocky ground
- Solanaceae**  
 95 - *Solanum sinaicum* rocky slopes
- Scrophulariaceae**  
 96 - *Verbascum decaisneanum* rock crevices  
 97 - *Anarrhinum pubescens* among rocks  
 98 - *Kickxia macilenta* rock crevices  
 99 - *K. scariosepala* rocky habitats  
 100- *Scrophularia libanotica* rock crevices  
 101- *Veronica macropoda* wadis  
 102- *V. biloba* wadis  
 103- *V. campylopoda* stony slopes and gardens  
 104- *V. rubrifolia* ssp. *respectatissima* stony slopes  
 105- *V. islensis* wadis
- Plantaginaceae**  
 106- *Plantago sinaica* rock crevices
- Dipsacaceae**  
 107- *Pterocephalus sanctus* rocky habitats  
 108- *P. arabicus* rocky slopes
- Campanulaceae**  
 109- *Campanula dulcis* rock crevices

- 110- *Asyneuma rigidum* rocky habitats
- Compositae**
- 111- *Echinops macrochaetus* sandy and rocky slopes
- 112- *Phagnalon sinaicum* rock crevices
- 113- *P. nitidum* rock crevices
- 114- *Anthemis scrobicularis* sandy soils
- 115- *Tanacetum santolinoides* rocky habitats
- 116- *Tragopogon collinus* rocky habitats
- 117- *T. coelisyriacus* stony habitats
- 118- *Scorzonera syriaca* rocky habitats
- 119- *S. drarii* desert plains (endemic)
- 120- *Lactuca undulata* cultivated areas
- Alliaceae**
- 121- *Allium stamineum* rocky slopes and ridges
- Juncaceae**
- 122- *Juncus effusus* moist places near wells (Wadi Feiran)
- 123- *J. punctorius* moist places near wells
- Gramineae**
- 124- *Bromus pectinatus* moist places and around wells and springs
- 125- *Vulpia myuros* rocky slopes
- 126- *Melica persica* rocky ground and slopes
- 127- *Eremopyrum bonaepartis* moist sandy places
- 128- *Taeniatherum caput-medusae* weed in gardens and moist places
- 129- *Agrostis stolonifera* moist places around springs and wells
- 130- *Oryzopsis holciformis* rocky ridges and slopes
- 131- *Stipa arabica* rocky ridges and slopes
- 132- *Stipagrostis drarii* rocky ridges and slopes
- 133- *S. multinerva* rocky slopes
- 134- *Andropogon distachyos* rocky ridges
- Orchidaceae**
- 135- *Epipactis veratrifolia* slopes of high mountains
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### Threatened Trees and Shrubs of St. Catherine Area

El-Hadidi and Fayed (1994/95) recognize the area of St. Catherine and the core area of South Sinai as a separate phyto-geographical region of Egypt. They designate it as: "Sinai mountainous block between the Suez and Aqaba Gulfs". This is an innovation not adopted either by earlier botanists (Täckholm 1974), or by later ones (Boulos 1995). The characterization of this area as a separate phyto-geographic region in the Egyptian flora allows us to identify the flora of the St. Catherine area and the core area of S. Sinai in a more clear and precise manner.

This area contains, according to El-Hadidi and Fayed (1994/95), about 710 plant species. Of these, 575 are common with other parts of Egypt, while 135 species (out of 2076 species in the Egyptian flora, according to the same reference, viz. 6.5%), are found in this area alone and not in other parts of Egypt (above list). These 135 species include the single orchid that is part of the Egyptian flora. If it is not endemic, it is certainly a unique bio-geographic phenomenon. The 70 years between Alfred



Kaiser's collection of 1923 and the mid-1990's witnessed an intensive collection by scores of botanists from Egypt and from other countries. This explains why Kaiser's collection of the whole of S. Sinai (including the coastal zones) amounts to only 450 species, while we can now enumerate 710 species in the same area (excluding the coastal zones), using the above reference (El-Hadidi and Fayed 1994/95), published almost 70 years later.

The habitats of the 135 species that are found in the area studied are predominantly rocky habitats. This has three implications:

- first, it explains why their discovery took some time;
- second, they show, and also explain, the uniqueness of the S. Sinai flora and its distinction, as a phyto-geographic region (and as a biodiversity hot spot), from other phyto-geographic regions of Egypt (Le Houérou 1995, Ghabbour 1997, 1998 and 1999);
- third, they demonstrate the precariousness of their situation and the dire need for their conservation as witnesses of past palaeo-climatic conditions. Most of these species represent the southernmost limit of their extension from cooler regions in the north.

The high rate of endemism in the above list (6 species) also shows the unique character of this region, of rugged mountains and isolated wadis. However, the consideration of these 6 species as endemic, may be short-lived. They are considered endemic because they were found where they are only a few times (or perhaps only once) in the recent past. They are in fact both endemic and extremely rare, and hence also endangered.

No matter how rare or endangered they may be, once another rare specimen of the same, supposedly endemic species is found in a neighbouring country, its designation as "endemic" is immediately removed. This is the misgiving of the definition of the term endemic. It does not reflect the rare and endangered status of a species, if it has a distribution that is discovered outside the country in which it was first found.

Intensive search for new species is now on-going in many countries of the world as a result of the new interest in inventorying biodiversity at the national level in many countries, where no such intensive search was common before. Many species considered endemic in a country are now losing this status if discovered in a second country. Political boundaries thus have a profound effect now on the totality of endemic species globally known, leading to the inevitable reduction of their numbers.

Therefore, evaluation of biodiversity hot spots simply in terms of number of endemic species (whose status is becoming more or less doubtful), is not enough. It should rather be assessed in terms of rarity and of threats to which the totality of biodiversity is exposed.

A flora made up of species that constitute a linking bridge between the two largest Old World continents, and most of whose elements managed to hang on cliffs for millennia, exposed now to ultimate disappearance, is certainly worth of being considered as an integral part of humanity's world heritage.

**Wild Medicinal Plants in South Sināi**

Batanouny in a paper about medicinal plants in the St. Catherine area, prepared especially for the present Nomination File, enumerates 39 species as examples. He states that allover the Sināi Peninsula Bedouins have common knowledge of using plants for medicinal purposes. However, traditional healers have more knowledge and can concoct compound medicines formed of more than one plant. In recent years, knowledge of this traditional medicine has become well known in cities, so that there is over-collection of medicinal plants from their native habitats. Overexploitation of many species eventually leads to their disappearance, resulting in threatening their existence. It is to be noted that some of these species are in official pharmacopoeia, e.g., *Hyoscyamus muticus*, *Plantago ovata*, and *Senna italica*.

**Endemic Plant Species in the St. Catherine Area**

Boulos, in another paper also especially prepared for this Nomination File, enumerates an unusually large number of endemic plants (18), for a desert area. The obvious reason is that isolation due to the rugged territory allowed over millions of years the development of variations and subsequent speciation. The 18 endemic plants of the area, as can be seen from the following table, belong to 10 Families, at the rate of almost 2 species per Family. The highest number is found in Caryophyllaceae, Labiatae, and Scrophulariaceae.

## Mosses of St. Catherine Area

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No.	Family & Species	Habitat
<b>Pottiaceae</b>		
1 -	<i>Gyroweisia mosis</i>	Jebel Serbal, 1500-1600 m
2 -	<i>G. aaronis</i>	
3 -	<i>Didymodon topheceus</i>	Jebel Katherina, 1900-2100 m J. Serbal, 1800 m
4 -	<i>D. ehrenbergii</i>	in brook, Wadi Tarfa (St. Catherine area)
5 -	<i>Barbula gracilis</i> var. <i>viridis</i>	J. Serbal, 1500-1950 m
6 -	<i>B. vinealis</i>	on granite, J. Serbal, 1950 m
7 -	<i>Aloina aloides</i>	
8 -	<i>Crossidium geheebii</i>	on coarse granite, J. Serbal, 1800-1900 m
9 -	<i>C. squamigerum</i>	
10 -	<i>Tortula atrovirens</i>	J. Serbal, 1500-1900 m
11 -	<i>T. kneuckeri</i>	Lower part of J. Katharina, 1900-2100 m
12 -	<i>T. rigescens</i>	J. Katharina, 1900 m J. Serbal, 1800-1900 m
13 -	<i>Eucladium verticillatum</i>	
14 -	<i>Encalypta intermedia</i>	J. Serbal, 1950 m
<b>Grimmiaceae</b>		
15 -	<i>Grimmia alpicola</i>	J. Serbal, 1950 m
16 -	<i>G. anodon</i>	J. Arriba, 1700-1800 m J. Katharina, 2450 m J. Serbal, 1800-1900 m
17 -	<i>G. sinaica</i>	J. Arriba, 1700-1800 m J. Serbal, 1800-1900 m J. Katharina
<b>Bryaceae</b>		
18 -	<i>Bryum capillare</i>	J. Serbal, 1950 m
19 -	<i>B. caespiticeum</i>	J. Katharina, 1600-2100 m
20 -	<i>B. gemmiporum</i>	J. Katharina, 1900-2100 m
21 -	<i>B. atropurpureum</i> (syn. <i>B. bicolor</i> )	J. Katharina, 1900- 2100 m J. Moussa, 1500-1700 m
22 -	<i>B. syriacum</i>	small brook in Wadi Tarfa, 600-1050 m
23 -	<i>B. schleicheri</i>	small brook in Wadi Tarfa, 600-1050 m
<b>Hypnaceae</b>		
24 -	<i>Brachythecium umbilicatum</i>	J. Serbal, 1950 m
25 -	<i>Rhynchostegiella tenella</i>	J. Serbal, 1950 m
26 -	<i>Rynchostegium rusciforme</i>	J. Serbal, 1950 m
<b>Funariaceae</b>		
27 -	<i>Entosthodon templetoni</i>	J. Serbal, 1950 m

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## Lichens

*Gasparinia elegans* near summit of J. Serbal, 1950 m

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## Algae

*Chara gymnophylla* f. *subinermis tenuifolia* brook in Wadi Isla

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## Comments

According to Täckholm (1932), the Sinai mosses are enumerated in Hume's book of 1906, where 27 species are mentioned, collected by Schimper, Ehrenberg, and Kneucker. They are still found there thanks to water from springs and the cool temperatures of the high altitudes. They represent relics of an alpine extension from the Pluvial/Glacial periods of the Pleistocene, into the western-most part of Asia. Only very few of them have a distribution in Egypt outside the Peninsula. The one lichen species recorded is certainly not the only species of the group present in the area. Limited knowledge about lichen taxonomy is the reason for the apparent paucity of lichen species there. The same is also true for algae, as no serious attempt has been made so far to study the algae of spring waters in the Peninsula. *Chara* could be easily detected due to its large size.

A group led by Prof. S. I. Ghabbour made an excursion to Wadi Tal'a near Raha Plain in the St. Catherine area in June 1996, in connection with IUCN study project of biodiversity hot spots in Egypt. They collected some mosses that were kindly identified by Dr. U. Y. Abou Salama (Bot. Dept., Fac. of Sci., University of Ain Shams, Cairo) as:

- 1 - *Bryum bicolor*, of temperate regions
- 2 - *B. pseudotriquetrum*, of boreal regions, and
- 3 - *B.* sp.

The finding of the second species, viz., *B. pseudotriquetrum*, of boreal regions, is a characteristic of the mosses of the mountains of the St. Catherine area. They are perhaps the southernmost extension of boreal mosses into the hot arid zone, since the mosses of the mountain massif of Gebel Elba in the southeastern corner of Egypt, on the borders with the Sudan, are all of Mediterranean origin.

**Fauna****Mammals**

Southern Sinai mammalian fauna, is characterized by the hyrax (*Procavia*), the ibex, the Sinai leopard (*Panthera pardus*, formerly named *Leopardus jarvisi*, could now be

locally extinct), the caracal (*Felis (Caracal) caracal*) thought to be almost extinct, the larger hedgehog (*Hemiechinus dorsalis*), the rodents *Sekeetamys calurus*, *Acomys russatus*, the jerboa *Jaculus jaculus*, and the gerbil *Gerbillus gerbillus*, the hare *Lepus capensis*, Rüppel's fox *Vulpes rueppelli*, and the hyaena *Hyaena hyaena*. The high diversity of the vegetation is reflected in a high diversity of the fauna. All in all, about 25 mammalian species have been counted, 7 of them bats. The hyena is not common, but widespread. The wolf has penetrated from neighbouring Palestine into a very small area, but is considered now resident. There is still some shooting but not as before, thanks to the efforts of the vigilant wardens. The fox is the common predator. As to the Sinai leopard, it might reappear if the increase in the ibex population observed in the 1970's is to be maintained.

### Birds

The following 45 bird species (10 % of the bird fauna of Egypt), have been recorded in southern Sinai:

*Ciconia ciconia*, *C. nigra*, *Gypaetus barbatus*, *Neophron percnopterus*, *Torgos tracheliotus*, *Accipiter nisus*, *Buteo buteo*, *B. rufinus*, *Aquila chryseotis*, *A. verreauxii*, *Falco tinnunculus*, *Alectoris chukar*, *Pluvialis apricaria*, *Pterocles coronatus*, *Columba livia*, *Streptopelia turtur*, *S. senegalensis*, *Strix butleri*, *Apus pallidus*, *Ammomanes deserti*, *Galerida cristata*, *Ptyonoprogne obsoleta*, *Pycnonotus xanthopygos*, *Erithaceus rubecola*, *Cercomela malanura*, *Oenanthe monacha*, *O. leucopygea*, *Turdus torquatus*, *T. pilaris*, *Sylvia nana*, *S. leucomelaena*, *S. hortensis*, *S. curruca*, *Nectarinia osea*, *Corvus rhipidurus*, *Onychognathus tristrami*, *Fringilla montifringilla*, *Serinus serinus*, *S. syriacus*, *Carduelis spinus*, *Caprodaicus sinaicus*, *Emberiza striolata*, *E. tahapisi*, *E. cineracea*, and *E. melanocephala*. The rose finch *Caprodaicus sinaicus* is interesting in that it dwells in high valleys and mountain tops in summer and descends to lower areas during the severe winter. It breeds at 2000 m altitude. A recent catalogue of important bird sites in Egypt has included the St. Catherine area because its resident bird community includes 76% of Egypt's Saharo-Sindian biome-restricted species. Many of these species are not well represented or are not at all represented elsewhere in Egypt. The site is also an outpost for several species that have larger ranges elsewhere. A number of rare large and small birds (eagles and finches) may still breed there (Bahaeddin 1999). Due to habitat diversity, a unique assemblage of birds, characteristic for each stage of altitude, is found in the Protectorate. Besides the Sinai rosefinch, Tristram's grackle is characteristic of the area, which is their only home in Egypt. The mountains are the only breeding site in the Western Palaearctic for Verreaux's eagle and also host a significant population of Hume's tawny owl, one of the world's least known owls.

### Reptiles

Reptiles recorded in southern Sinai include: *Ptyodactylis h. hasselquisti*, *Agama sinaica*, *A. stellio*, *Uromastix ornatus*, *U. aegyptius*, *Varanus g. griseus*, *Acanthodactylis boskianus*, *A. s. scutellatus*, *A. p. pardalis*, *Eremias g. guttulata*, *Chalcides o. ocellatus*, *Eumeces schneideri*, *Leotophlops macrorhynchus*, *Coluber rh. rhodorhachis*, *C. rogersi*, *C. sinaica*, *Eirenis coronelloides*, *Lytorhynchus diadema*, *Psammophis sh. shokari*, *Teleoscopus hoogstraali*, *Echis coloratus*, *Atractaspis engaddensis*, and *Cerastes vipera*. The reptilian fauna is relatively rich (natural for hot arid zones). One endemic and one near endemic reptiles are known to occur (see next Table).

## Reptiles of St. Catherine Area

No.	Family & Species	Status and Threats
<b>LIZARDS</b>		
<b>Agamidae</b>		
1 -	<i>Laudatia stellio brachydactyla</i>	Vulnerable, commercial overexploitation
2 -	<i>Pseudotrapelus siniatus</i>	Insufficient data
3 -	<i>Trapelus pallida pallida</i>	Low risk
4 -	<i>Uromastyx acanthinurus</i>	Insufficient data
5 -	<i>U. aegyptius</i>	Vulnerable, commercial overexploitation
6 -	<i>U. ocellatus ornatus</i>	Endangered, comm. overexploitation
<b>Gekkonidae</b>		
7 -	<i>Bunopus tuberculatus</i>	Of doubtful occurrence #
8 -	<i>Cyrtopodion (Cyrtopodion) scaber</i>	Not evaluated
9 -	<i>Ptyodactylus hasselquisti hasselquisti</i>	Low risk
10 -	<i>Ptyodactylus guttatus</i>	Low risk
11 -	<i>Stenodactylus doriae</i>	Not evaluated
12 -	<i>S. sthenodactylus sthenodactylus</i>	Low risk
13 -	<i>Tropicolotes nattereri</i>	Insufficient data
<b>Lacertidae</b>		
14 -	<i>Acanthodactylus boskianus asper</i>	Low risk
15 -	<i>A. pardalis pardalis</i>	Vulnerable
16 -	<i>A. scutellatus scutellatus</i>	Low risk
17 -	<i>Messalina brevirostris</i>	Not evaluated *
18 -	<i>M. guttulata guttulata</i>	Low risk
19 -	<i>M. olivieri</i>	Low risk
20 -	<i>Latastia longicaudata longicaudata</i>	Insufficient data
<b>Scincidae</b>		
21 -	<i>Chalcides ocellatus ocellatus</i>	Low risk
22 -	<i>Sphenops sepsoides</i>	Low risk
23 -	<i>Eumeces schneideri</i>	Vulnerable
<b>SNAKES</b>		
<b>Typhlopidae</b>		
24 -	<i>Typhlops vermicularis</i>	Insufficient data
<b>Leptotyphlopidae</b>		
25 -	<i>Leptotyphlops macrorhynchus</i>	Insufficient data
<b>Colubridae</b>		
26 -	<i>Coluber elegantissima</i>	Of doubtful occurrence #
27 -	<i>C. nummifer</i>	Rare and vulnerable

28 - <i>C. rhodorachis</i>	Low risk
29 - <i>C. rogersi</i>	Low risk
30 - <i>C. sinai</i>	Rare and data insufficient *
31 - <i>Eirenis coronella</i>	Insufficient data
32 - <i>Lythrorhynchus diadema</i>	Low risk
33 - <i>Psammophis shokari shokari</i>	Low risk
34 - <i>Rhynchocalamus melanocephalus</i>	Insufficient data *
35 - <i>Sphalerosophis diadema cliffordii</i>	Low risk
36 - <i>Telescopus dhara obtusus</i>	Low risk
37 - <i>T. fallax hoogstraali</i>	Insufficient data *

#### **Atractaspididae**

38 - <i>Atractaspis engaddensis</i>	Insufficient data *
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#### **Elapidae**

39 - <i>Walterinnesia aegyptia</i>	Low risk
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#### **Viperidae**

40 - <i>Cerastes vipera</i>	Low risk
41 - <i>C. cerastes</i>	Low risk
42 - <i>E. coloratus</i>	Low risk
43 - <i>Pseudocerastes persicus</i>	Vulnerable

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### Comments

Apparently no Amphibian occur in South Sinai, and of course any crocodiles. The number of reptile species of certain occurrence is 46, plus 2 of uncertain occurrence (marked with #), out of Egypt's 98 species. Thus almost half of Egypt's reptilian fauna exists and is concentrated in the very small area of S. Sinai. Moreover, there are 6 species (marked with \*) that occur only in S. Sinai and not elsewhere in Egypt. The 2 uncertain species are also unknown from the rest of Egypt. All eight are from Asiatic origin and occur in the Negev Desert and/or the Arabian Peninsula. If the occurrence of the two additional species is confirmed, this means that about 16% of the reptilian fauna of S. Sināi is unique as far as Egypt's reptilian fauna is concerned, due to this area's unique position between the two continents.

As is the case of the flora, S. Sināi is both an enclave and a bridge between Asia and Africa. It is a unique bio-geographic hot spot in that it is harbouring relicts of past Pleistocene southward and westward advances of Asian biota into northeast Africa. These elements had to use this narrow passage between the two continents, and could be kept in place within the several wadis that protected them for millennia.

Most of this reptilian fauna is species that are either endangered or vulnerable. Many of them are of unknown conservation status because of insufficient information. It is well known that it is much easier to assess the vulnerability status of plants than of animals, since the latter can hide underground and are mostly active only by night.

There is no doubt that the expanding urbanization will threaten them with disappearance.

### **Invertebrates**

Usually it is the mammals and birds which attract the attention of visitors to a nature reserve, and perhaps the reptiles too to a certain extent. Almost no attention is given to invertebrates, which are nevertheless much more numerous and abundant. This is why not only in Sinai alone, but also elsewhere in Europe, Africa, or the Americas, it is much easier to give lists of mammals, birds, and reptiles, than to give lists of invertebrates. And yet, visitors, as well managers and wardens (or rangers), need to know about the useful and harmful vertebrate species (such as the viper), as well as useful and harmful invertebrate species just the same (e.g., the scorpions). Very little is known about the invertebrates of the St. Catherine area. Some studies (unpublished) were recently carried out about the flying insects, so that they are fairly well known, although a comprehensive list of them and their significance would be beyond the scope of this proposal. One such study showed a remarkable relationship between a certain endemic plant and its endemic wasp pollinator, one we can consider an “endemic relationship”. St. Catherine can boast of the smallest butterfly in the world, an endemic (*Pseudophilotes sinaica*), as might be expected (Larsen . Suffice to say that the ground level insects and other invertebrates and the species living within the soil need thorough investigation. The local inhabitants complain of insect pests, which destroy many of their fruit production. These pests need also a thorough study to see how serious it is and solve the problem. But solving such a problem must be done using only integrated pest management techniques, and not conventional pest control methods relying on pesticides application.

### **Soil Invertebrates**

Soil Invertebrates were investigated even less extensively than above ground ones. An investigation carried out under the auspices of an IUCN-Egyptian project in 1996 revealed the relative paucity of this soil fauna, presumably due not only to the drought, but also to the thin soil cover. Some of the species found include two species of carabid beetles (natural enemies of pests), one dermapteran, and three acridids. It also included a notable number of other potential plant pests that need to be more deeply investigated (Table below). Again, the use of pesticides for their control, should they gain economic importance, must be kept to a minimum and integrated pest management techniques are to be applied. The survival of the locally adapted biological control agents must be ensured through appropriate conservation practices. The five sites which were selected in southern Sinai during the excursion from 24 to 28 March 1997 were: Gebel Musa, Wadi El-Arba'in, Hammamat Pharaon, Ras Mohammad, and Khalig Neama (Naama Bay). These five sites represent a wide range of different ecological situations, montane and coastal, which allows a comparison of their soil faunas.

### **Earthworms**

Most of the species constituting the earthworm fauna of Egypt are from African origin. The few species that are of European origin came from either the northwestern Mediterranean coast, or across the Sinai Peninsula (Ghabbour 1998). Earthworm species from both western and eastern directions could not come unless there was enough soil moisture to help them travel along several hundred kilometers of dryland



### Soil Fauna species Collected from Sites of Southern Sinai

A, Hammamat Pharaon;

B, Gebel Mousa;

C, Wadi Arbaein;

D, Ras Mohammed;

E, Khalig Neama (Bay).

	A	B	C	D	E
Araneidae	2	4	1		
Coleoptera					
Carabidae					
<i>Lebia arcuata</i>		1			
<i>Scarites sinatiicus</i>	1				
<i>Pterostichus</i> spp.		1			
Coccinellidae					
<i>Coccinella undecimpunctata</i>				1	
Dermestidae					
<i>Dermestes</i> spp.				2	
Elateridae					
<i>Drasterius bimaculatus</i>			1		
Scarabaeidae					
<i>Tropinota squalida</i>		1			
Tenebrionidae					
<i>Scelosodis castaneus</i>	1				
Dermaptera					
Labiduridae					
<i>Labidura confusa</i>	5				
Hemiptera				3	
Lygaeidae					
<i>Aellopus syriacus</i>		2	4		
Pentatomidae					
<i>Trigonosoma</i> spp.			2		
Hymenoptera					
Apidae					
<i>Anthophora</i> spp.		1			
Braconidae				4	
Formicidae					
<i>Monomorium</i> spp.	500+	3			
Sphecidae					
<i>Larra anathema</i>	1				

Continued Soil Fauna Table

Taxa	A	B	C	D	E
Lepidoptera		5	1	1	
Noctuidae					1
Nymphalidae					
<i>Vanessa cardui</i>					3+
micro-Lepidoptera		1			
Neuroptera					
Chrysopidae					
<i>Chrysopa vulgaris</i>				4	
Odonata					
Libellulidae					
<i>Sympetrum fonscolombei</i>					1
Orthoptera					
Acrididae					
<i>Aiolopus</i> spp.		1			
<i>Pyrgomorpha</i> spp.		1			
Gryllidae					
<i>Gryllus domesticus</i>		2			

Present day rainfall in the Mediterranean coast of Egypt (90-200 mm/year) is too little to allow such migration at present. All earthworms of European origin in Egypt are confined to the Delta. What concerns us here is the species that came from the northeast, from Palestine. The most important of which is *Allolobophora jassyensis* var. *orientalis*, which exists in Roumania, Palestine, and the Egyptian Nile Delta, as well as a certain subspecies of *Eisenia rosea*, which exists in Palestine and the Delta. These species must have crossed the Sinai Peninsula during some pluvial periods (Khalaf El-Duweini and Ghabbour 1968). As a matter of fact, three species were recently discovered for the first time in the area of the St. Catherine Monastery at altitudes varying from 1670 to 2470 m.a.s.l. (Pavliček *et al.* 1997). These authors discovered *Eisenia rosea* only, of the two above mentioned species, but whose subspecies name was unfortunately not given. They also discovered a semi-aquatic species, *Eiseniella tetraedra*. This finding shows, however, that the wadis of South Sinai may actually have been the route by which earthworm species migrated from Palestine to the Delta. If the southern Sinai mountains and their sinuous wadis were well watered at a certain Pluvial Period, so as to allow migration of earthworms, they must have also helped as well many other animal groups to travel between Asia and Africa, and *vice versa*, especially from among invertebrates that have to be searched after.

### **Butterflies**

Sinai as a whole has 44 species of butterflies. Among them, 34 are resident breeding species, 9 occur as migrants only, while 1 is of uncertain breeding status. The level of specific or subspecific endemism in Egypt is very low. Yet there are two endemic species and one slightly differentiated species in Sinai. The 2 endemic species are *Satyrium jebeliya* and *Pseudophilotes sinaicus*, and the differentiated species is *pseudotergumia pisidice*. All three are in the St. Catherine area. *P. sinaicus* is tiny; its small specimens can compete for the title of the smallest butterfly in the world (Larsen 1990).

### **The Fascinating Pollinator**

A unique example of a plant-pollinator relationship in an arid region is exhibited by two rare commensal species in the area. In the Wadi Al-Araba'in in the St. Catherine area, *Anthophora pauperata* Walker (Anthophoridae) is an important insect in the ecosystem. In addition to its valuable role as the main pollinator of *Alkanna orientalis* L. (Boiss.) (Boraginaceae), it has a co-evolutionary importance with the plant (Gilbert *et al.* 1999). Phenologically, the foraging activity periods of *A. pauperata* is synchronized with the blooming time of *A. orientalis* (Semida 1994). On the spatial scale, there may be a correlation between the morphology of *A. pauperata* and the floral architecture of *A. orientalis* (Gilbert *et al.* 1996). The plant floral resources constitute the main source of food for *Anthophora* bees and their offspring. The bees make their nests in the Wadi sides at varying depths where the females provision the cells with floral nectar and pollen, mainly from *Alkanna* (Semida 2000).

### **General Comments**

The indigenous fauna in the St. Catherine area is relatively poor in species, curiously not consistent with the high species density of the flora. This may be due to less intensive zoological investigations. Animals are elusive while plants are fixed. With

the exception of the red fox, which is fairly common, as it thrives near human settlements, the conservation status of the other mammals is uncertain. The Nubian ibex exists throughout the Protectorate in low numbers. They are strictly protected and no hunting is allowed. It is noteworthy that men shoot it on sight, but when girls tend their flocks and spot it, they let go and do not report about its presence, except later in the day. Small relict populations of the dorcas gazelle remain in isolated wadis, particularly in the very south, where they are threatened by a project for a new paved road.

### **Biogeography**

Until the opening of the Suez Canal in the 19<sup>th</sup> century, the Sinai Peninsula was the only land bridge between Asia and Africa. Its biogeography reflects the intercalation of these two greatest landmasses of the globe. The coasts of the two Gulfs of Aqaba and Suez provide important corridors to and from. Four phyto-geographic regions meet and overlap in Sinai. Of these, two largely characterize the central mountain block of South Sinai, which covers most of the area south of parallel 29° N, where the St. Catherine area is located. This rugged landscape of the South Sinai massif is an isolated mountainous block of igneous crystalline rocks. It is of Pre-Cambrian origin and is geologically related to the African Plate and the Arabian Shield. The high mountains that starkly stand in the middle of the area constitute the core of the St. Catherine Nature Protectorate and form an island of Central Asian steppe vegetation with their Irano-Turanian biota. Sinai's endemic species are largely restricted to this mountainous island, along with relict populations of Palaeartic and Oriental species. It is the only place in Egypt where there is almost regular snowfall in winter. In February 2000 snow was about 20 cm thick; it remained on the ground for a whole month.

### **b. History and Development**

#### **God's Preferred Summit**

The St. Catherine area represents a unique phenomenon of continuous human settlement and how humans and their cultures adapted by different means to harsh and changing conditions over the ages, within an extreme environment. True, such situations are common to many mountain regions all over the world, but the uniqueness of the St. Catherine area is that this settlement is strongly attached to a major religious symbolism of great universal significance for more than one third of humanity, spread in the four corners of the earth, wherever live followers of the three Great Monotheistic Religions, Islam, Christianity, and Judaism. A similar situation may be found in only one other place on earth, and that is in the case of Lhasa in Tibet, the top of the World. However, St. Catherine, which may be smaller in size, has a much wider global significance; it may not be the top of the World, as Tibet is usually called, but it can confidently be claimed to be the top of the Middle East at least, where the World's three Monotheistic Religions were born. No wonder that God has chosen it as the favourite summit from where to reveal Himself to Moses and hand him the Commandments. This, perhaps the most glorious event in human history, has naturally marked the history of St. Catherine forever. No other spot on Earth can boast such a privilege.

The area proposed for inclusion within the World Heritage Property is of outstanding universal value in that it represents a unique combination of cultural and religious features and values, within a landscape of exceptional natural beauty. **Mount Sinai** (Gabal Musa), of 2300 m altitude, is said to be the place where Moses received the Tablets of the Law after an absence of 40 days in the presence of his Creator. According to the Old Testament, they were inscribed by the hand of Almighty God Himself. It is the spot selected by God, out of all other places on earth, for His meeting with a mortal. It is the spot where God trod, where He revealed Himself through the Burning Bush to make humans a more civilized species. This is the spot where according to tradition the people of Moses settled for a long time (Exodus 19:1-2), where Moses met the Lord (Exodus 19:3-25), where the Lord made the Covenant (Exodus 20: 1-26), and where the Golden Calf was manufactured (Exodus 32: 1-35).

### **The Monastery of St. Catherine**

This is the oldest Christian monastery in continuous existence, is the other world famous site, besides the Mountain of Moses, within the proposed area. It is also the only existing example of Byzantine 4<sup>th</sup>-5<sup>th</sup> century architecture. They both were suggested for inscription on the World Heritage List by the Egyptian Ministry of Culture in 1998. However, when WHC experts came and visited the area in early June 1999, they were so overwhelmed by the whole landscape and its biodiversity that they found it would be a great pity not to include a much wider area as a World Heritage Property. This suggestion was taken into serious consideration by the Egyptian authorities, and the present proposal therefore supplants the earlier one of 1998, in order to enlarge the proposed area and to include other equally important sites a little further outside the “core” area.

To explain the above, the proposed World Heritage area includes the highest mountain peaks in Egypt, with their unique high montane desert ecosystems, which include several endemic species, and others that are globally threatened. Several Bedouin clans of the Gebaliya tribe, with a variety of unique types of cultural and traditional heritage, populate the area, and have their own histories and their own traditions, still functional, for nature conservation. As an example of their conservation of precious water, what is found is sometimes stored in a “thamila”, a rocky hole dug in the dry season to receive rainwater in winter. They are envied by their neighbours for having access to water throughout the year, from mountain springs. This water enables them to exercise one of their important traditional activities, horticulture. Today, the Bedouins of St. Catherine area face a very serious problem, shortage of water. Many of the old mountain orchards, mainly in Wadi Gebal, in what they call “ard el-gudud” (land of the forefathers), are at present dry. They also complain about the drying off and disappearance of certain plants and animals.

The spot of the Monastery of St. Catherine was chosen from early Christianity as a place of isolation and worship by hermits of Sinai, especially those of Wadi Feiran and Raytu, the ancient El-Tor. It has attracted pilgrims and visitors since as far back as 337 AD, when the Empress Helena, mother of Emperor Constantine, visited the place and ordered the building of a sanctuary around the site of the Biblical **Burning Bush** at the base of Mount Sinai. The Emperor Justinian ordered the building of a castle on top of the Mountain, but his chief architect found the task impossible, and

instead, preferred a lower spot in the Valley, around the Monastery. The Emperor was furious upon hearing this, and this decision cost the poor man his life, as the story goes. But this latter rational (?) preference gives us a spectacular setting of the Monastery at the foot of Mount Sinai, looking over the Plain of El-Raha (= rest) where the Israelites are supposed to have waited for Moses while he was conversing with God. One of the most precious objects kept at the Monastery, which was accepted by Moslem rulers, is a document signed by the hand of Prophet Mohammad (sallallahu alaihi wa sallam) conferring protection upon the Monastery and its monks, years before the Moslem Arabs moved into Egypt. If the document is authentic, as purported, it clearly shows that the special character of the Monastery was well known, even outside the sphere of the Byzantine Empire, in the 5<sup>th</sup> and 6<sup>th</sup> centuries A.D. It is highly probable that it was visited by Amr Ibn El-Aas, the Commander of the Moslem Arab army which entered Egypt in 640-641 A.D., when he used to come to Egypt for trade before Islam. Even if the exact identification of the Biblical locations mentioned in Genesis does not exactly coincide with tradition, as some researchers would imply, the landscape configuration of Mount Sinai gives every support to suppose that it must be here where the action took place. By the tradition of sanctity of pilgrimage, the site has become imbued with sanctity, and is the right site, in the eyes of millions upon millions for more than 50 generations of believers.

### **The well of Moses**

Within the Monastery is the “Well of Moses”, from where Israelites could drink while in their bewilderment. It is also said to be the well of Jethro where Moses met his wife. Just outside the Monastery, on the right hand side on your way up, is a haut-relief on the mountain cliff, which strongly resembles a calf. Bedouins allege that it is the Golden Calf which stuck to the side of the cliff when it was violently thrown away by Moses, upon discovering this ignoble offense against his Host. To ecologists, what matters is how much firewood must have been used for melting all that gold, how much environmental degradation must have occurred in that desert, but this will always remain a mystery.

### **The Burning Bush**

The Burning Bush still stands within the walls of the St. Catherine Monastery, witness to where and how God revealed Himself to a mortal. It is where God ordered Moses to remove his slippers and took him upwards, and kept him on top of the Mountain for 40 days, after which period He gave Moses the Tablets with the Ten Commandments inscribed by God’s own fingers. This is a phase in human history that constitutes the first step in the establishment of monotheism.

### **The *Codex sinaiticus***

It is to be recalled that because of the secluded position of the St. Catherine Monastery that the famous 4<sup>th</sup> century *Codex sinaiticus* could be found there in the mid-19<sup>th</sup> century by a Russian traveller who took it to St. Petresbourg, the then capital of Russia. It was the earliest Bible known at the time. As is well known, its discovery revolutionized our understanding of early Bible manuscripts.

## **An Account on How the Property Has Reached Its Present Form**

### **Archaeological Sites in the St. Catherine Area Proposed for Inscription on the World Heritage List**

In this account, it will be necessary to tell the story not only of the proposed area of 601 sq. km representing the ring complex, but also the areas surrounding it, as they are inevitably closely interlinked. This information was kindly provided by Mr. Mohammad Said Al-Sawy, Supreme Council of Antiquities.

The ancient inhabitants of South Sinai are known as the Amalekites. They lived in houses of unworked stones and of mud. From the time of the Ist Dynasty up till the XXth, Ancient Egyptians mined turquoise, copper, and manganese from South Sinai. The Nabataeans dominated the area for a long time, and were followed by the Greeks, the Romans, the Byzantines, and then the Arabs. The antiquities of South Sinai comprise the following:

#### **Prehistory**

1 - The Nawawis (singular *nawoos*, in Arabic = *naos* in archaeology): These are stone huts made of unworked stones and of mud, circular in shape, found in Wadi Islaf, Wadi Hibran, and the Sawawin area at the entrance of Wadi Hibran. They go back to the Early Bronze Age (appx. 3000-2800 B.C.), and are probably the oldest roofed stone buildings in the world. They were later reused for burials. The French expedition found this year (2000) human bones and skulls, pottery sherds, beads, and some precious stones. The *nawoos* is 2-3 m in diameter and of the same height. The entrance may be facing either north or west. The expedition has studied 77 of them.

2 - Al-Qasr: These are also circular structures of the same material, but smaller in size, found in Wadi Al-Mallaha, a tributary to Nabq Hibran.

3 - The Dawrat: These are also circular structures made of unworked stones or zaribas (circular sheds) of tree branches, apparently earlier than the Nawawis.

4 - The caves: These are caves in mountains, either natural or man-made, used as shelters from rain and flash floods, and as store houses.

Another type of Prehistoric structures is found in the Qa' Plain near the city of El-Tor. The Washington University Expedition worked at the Abu Gedar site near Me'ar village, and also at the A'waj Plain and found remains of Prehistoric settlements, probably of Late Mesolithic or Early Neolithic age. Human bones, tools, and arrowheads were found. Their age was estimated as 12,000 B.C.

At the Wadi Nisreen archaeological site (in the precincts of Wadi Feiran), Prehistoric wall tombs were found. Primitive settlements are also widespread in many places of South Sinai, including workers' settlements in Gabal Maghara (for turquoise mining), and at Sarabit Al-Khadem. Other Prehistoric settlements exist at Wadi Garafi and Wadi Shaira, near Nuweiba. Another site near the Ras Al-Naqab (near Taba), was excavated by an American expedition (Prof. F. Wendorf) and several wall tombs and

totems were found. At any rate, there are many other sites, some known, and others still unknown.

### **Ancient Egyptian Antiquities**

Some of the most important historical and archaeological sites that must eventually be inscribed on the World Heritage List for what they represent of outstanding human cultural value, are Sarabit Al-Khadem and Wadi Maghara.

**1 - Sarabit Al-Khadem:** This is a flat-topped oblong mountain about 80 km southeast of Abu Zeneima, and of an elevation of 945 m. From the north, it overlooks the Ramlah Plain and the Great Raknah scarp. From this mountain Ancient Egyptians mined turquoise, from the 1st to the XXth Dynasties. The ancients dug caves into the mountain from its upper levels. One of the most important buildings they erected is the temple of the goddess of turquoise, Hathor. The site is important because it was Semitic workers who helped the Egyptians acquire their own alphabet, known as the Proto-Sinaitic, and that Ancient Egyptians shared with these workers the worship of their own local gods. This temple is the oldest where this sharing was practiced. Peaceful co-existence and mutual respect of different religions started here. It was far from a relationship of masters and slaves.

**The Temple of Hathor, the Holy of Holies:** This was a small cave carved on top of a plateau on the mountain surface. It had a western gate, for the worship of the Goddess Hathor, goddess of the sun, or light, and of turquoise, probably also the goddess of the indigenous tribes, and probably identified with the goddess Ashtar of the Phoenicians. When the Egyptians came for mining the valuable stone, they worshipped the local gods, with the same rites as the indigenous people used. This cave goes back to the time of King Senefru (4750 B.C.), whose emblem was found, a statue of the Hawk King.

**The Cave of the God Sobet:** After a long period of worshipping Hathor, the God Sobet of the east was also worshipped, using again Semitic rites. This cave goes back probably to the time of Queen Hatchepsut (1503-1481 B.C.), of the XVIIIth Dynasty. The French University of Lille Expedition, however, believes the god worshipped here was the Egyptian God Ptah. The rooms (halls) of these two caves extend westwards in one line so that the temple is 80 m long and 35 m wide. The thickness of the walls is 26 cm. The oldest room goes back to the XIIIth Dynasty (3439-3295 B.C.). Kings of the XVIIIth to the XXth Dynasties extended the temple.

### **2. The Stelae**

The stelae. Each time a king completed a hall, he erected two stelae at the entrance. On one or on both sides were inscribed a chronicle of the expedition, the king's name, the captain's names, the foremen, the size of the expedition, and the quantity of turquoise extracted. The names of Senepfru, Thotmoses III, Ramses II, and Ramses VI, are inscribed. The mountain is named Sarabit Al-Khadem because a *sarbout* in Sinaitic language is the big stone, and *khadem* is the black slave girl. The name may refer to the black stelae stones, resembling rows of standing black slave girls. The Temple of the kings stands to the north of the temple, inside the wall. It is a relict of Queen Hatshepsut dedicated to Hathor and reminiscent of Senefru. Tallet Al-Ramad (ash hillock) is situated south of the temple, outside the wall, covered by heaps of ash leftover from the offerings.



### 3. Pharaonic Antiquities in Wadi Maghara

This Wadi is considered one of the most important sites from where Ancient Egyptians extracted turquoise. They inscribed here chronicles of their expeditions, how they dominated the area and subdued the tribes. One of the most important inscriptions is on the stone of Semerkhet, a king of the I<sup>st</sup> dynasty, which is oldest vestige of Pharaonic Sinai. It is situated at an elevation of 1260 m, on top of Gabal Maghara. The king is represented in three forms:

- King of Upper Egypt
- King of Lower Egypt
- King of Upper Egypt smiting a local.

The two stones of Sankhet, founder of the III<sup>rd</sup> dynasty (4945-4917 BC) were on top of one of the turquoise mines and represent the king with Ethiopian features (transferred to the Cairo Egyptian museum). The other is too deformed (transferred to the British museum). Zoser's stone (4917-4888 BC) shows him smiting a local. The two Senephru stones (4787-4757 BC) of the VI<sup>th</sup> dynasty show him on one stone smiting a local with the inscription "The Great God Senephru Conqueror of countries, Giver of power, holdfast, health, life and peace of mind forever". On the back is the king in three forms like the Semerkhet stone. Both are now in the Egyptian museum, n<sup>os</sup> 111 and 112). The Sahn-Re (4426-4413 BC) of the V<sup>th</sup> dynasty has lost much of its material and is in Cairo (n<sup>o</sup> 113). The Zoser stone of the VI<sup>th</sup> dynasty shows him victorious over the locals (Egyptian Museum n<sup>o</sup> 87). The Amenemhat III stone, XII<sup>th</sup> dynasty. Petrie also found many stones with the names of Cheops and Pepi I.

Turquoise caves and workers' settlements. These are situated in the upper strata of the mountain at an elevation of 369 m. Workers lived in huts, near the caves on a nearby plateau. Their remnants show a work force of 200, all built of unworked stones and mud, circular, square, or oblong, with very narrow doors.

### The Nabataeans

The power of the Nabataeans began to be felt starting from the 4<sup>th</sup> century BC. King Antigones of Asia Minor intended to invade Sinai and the Nabataean kingdom in Petra, but failed. This allowed Nabataean kings to gain more powers in the 3<sup>rd</sup> and 2<sup>nd</sup> centuries BC, to the extent of minting coins with their names, the effigy of the king on one side and the queen's on the other. The first of these kings was Al-Haris I (169 BC). Their merchants acted as middlemen between Yemen, the Levant, and Egypt, carrying to the latter tar (used for mummification) and aromatic plants. [They also extracted copper from South Sinai, on the model of the Pharaohs SIG]. Their caravans carried timber from Africa, spices, cotton, and jewels from India and Ceylon, and silk from China. No trade between East and West could pass out of their hands. Their wealth aroused the envy of Romans and Trajan finally destroyed their capital Petra (106 AD), after which they almost disappeared from history. They continued, however, to trade in Sinai but as nomads.

Nabataean inscriptions are widespread by the thousands in Sinai, in caravan paths, mountainsides, and mining sites. They also left primitive houses called also *nawawis*. Early inhabitants of Sinai used to build circular stone towers on mountain tops and wadi bends that also resemble *nawawis*. These are some of the sites where *nawawis* are found in plenty: Wadi Feiran, Wadi Al-Shallal, Wadi Tamara, Wadi Nisreen,

Naqb Hibran, Wadi Aglah, Gabal Al-Tahuna (Wadi Feiran), Wadi Al-Mukattab (the wadi of written inscriptions, in Arabic), Wadi Al-Hamrayat, Wadi Maghara, Sarabit Al-Khadim, and Wadi Jubeil.

### **The Monastery of St. Catherine**

When the Romans destroyed Petra and the Nabataeans almost disappeared, all locals from the Jordan River to the Red Sea lost all control and reverted to larceny. The Romans left the area in the second half of the 4<sup>th</sup> century and much confusion ensued, so the hermits wanted a sanctuary to protect them. Justinian (527-566 AD) fulfilled their wish and sent them teams of masons build a two-purpose fort, to protect the monks, and to secure the road from Aqaba to Suez. He ordered rations of grain for them and for the garrison he sent with their families. The wall is Justinian's but the inner buildings are of various ages. The wall is 85 m long and 75 m wide, 12-15 m high, with a thickness of 2.25 m. Granite was used at the base. The Monastery has a western gate but the monks had to close it and replaced it by another narrow one leading to a vestibule 2 m long, and then to a door, which opens on the court.

1. The main, or major church, the Transfiguration, is in the northeast corner of the surrounding wall. It is 38 m long and 19 m wide. It was built in the period 561-565 AD, date of Justinian's death. It is built on the Roman basilican style and has a large collection of icons and valuable hanging lamps. However, the most beautiful part is the semi-circular altar with paintings of Christ, the Prophets, the Apostles and the Fathers of the church. There is a painting of Moses receiving the Ten Commandments from a heavenly hand, one of an angel pointing upwards, and of Justinian. The main church was first named after the Virgin Mary but later after St. Catherine. At the southern entrance, at the right of the altar is a beautiful marble case in which are preserved the head of St. Catherine and her hand, decorated with valuable rings. This Monastery is the heart of the St. Catherine Protectorate, which comprises a large number of historical and cultural monuments.

### **Wadi Feiran**

Wadi Feiran is also within the boundaries of the Protectorate and comprises Gabal Al-Tahuna (mountain of the mill, in Arabic). Upon this mountain is a number of small churches, cells, and tombs of hermits and monks, under the protection of the Supreme Council of Antiquities, which gives this site the full right to be inscribed on the World Heritage List.

## **THE HUMAN SETTING**

### **The People and Their Culture**

There is evidence of human occupation in Sinai from the Lower Palaeolithic Period. Agriculture appears to have been developed in the region between the 5<sup>th</sup> and the 4<sup>th</sup> millennium B.C. Increased domestication of plant crops and livestock is evident in the Chalcolithic Period (4000 - 3100 B.C.). This is the period of the "Nawawis" (plural of "naos"), widespread in the eastern part of south Sinai. They are the oldest known roofed stone buildings in human history. They were either graves or ceremonial

structures, or both. Substantial human activity seems to have ceased in the region from that time until the Iron Age (1200 B.C.). The area was intensively used, however, for transiting Nabataean caravans. In the early Byzantine Period, human occupation became again extensive, as church records and recent excavations by Prof. P. Grossman at Wadi Feiran and those at El-Tor by a Japanese team tell us. It is at this time that a number of ascetes preferred to go further up to Gabal Musa and later asked the Byzantine Emperor to build the Monastery for them. A garrison of Balkan soldiers were brought to protect the Monastery. They became Moslems and they are now the Gebaliya Tribe of today and they are in close relationship with the monks of the Monastery. A steep decline in the population occurred after the 7<sup>th</sup> century. Till the beginning of the 19<sup>th</sup> century the area was dominated by nomadic populations of mixed descents, many migrating from the Arabian Peninsula. During the Islamic Period, Sinaï was a standard route for pilgrimage caravans from North Africa to Mecca. Many forts and garrisons were erected to protect this route which was either across the northern part, or along the southern coasts. The ancient Byzantine City of Raitu became El-Tor in the Islamic period. During the period of the Crusades, and the Ottoman Period, however, there was a more particularly stronger military presence in South Sinaï too. In World War I the Turks attempted to cross the Suez Canal but failed. The events of the second half of the 20<sup>th</sup> century are still in everyone's memory.

### **The local inhabitants**

The first ever inhabitants of the St. Catherine area still settled, and users of its environment, were of course the monks of the Monastery. They were immediately followed by the present day Gebaliya Tribe (people of the mountain) members. The Tribe is divided into 4 subtribes, 14 clans and 12 families. These 4 subtribes are: Wilad Salim, Wahibat, Hamdiya, and Wilad Jindi. Their clans and families are:

# Wilad Salim: clans -Abu El-Haim, Abu Madroush, Abu El-Rafii, and Abu Meghanam; families -Abu Megabel, El Aruz, Abu Mesed, and El Akra.

# Wahibat: clans -Abu Heib, Abu Ghannam, Abu Matar, and Abu Quersh; families: - El Wahibi, Wilad Mehayed and El Junini.

# Hamidiya: clans -Abu Mesaed, Abu Hejazy; families: -El Hashash, El Sane, and El Degoni.

# Wilad Jindi: clans: -Abu Masoud, Abu Gais, Abu Afayla, and Abu Wardi; families: -Abu Qorayshem and Abu Elwan.

It is known that the Gebaliya people suffer from low quality housing and from poor health conditions, especially from chest and skin diseases. Health services are now provided by the Protectorate. A modern hospital has been built in St. Catherine City and now partially operative.

### **Traditional Land Use**

The fruit gardens (with trees belonging to about 15 species) of the Gebaliya Tribe associated with the St. Catherine Monastery, in the upper valleys of their area, is certainly an outstanding feature of traditional land use. The rugged red granite rocks enable some soil to accumulate in the depressions. This used to be the basis of their agriculture, when the soil is wetted by the rains. Close to 400 micro-gardens, each just a tiny spot surrounded by rocks, were known a few decades ago. The fruit trees are mainly deciduous and cold-adapted varieties, some of them endemic. The gardens are inhabited during the summer as part of a transhumance cycle, but many of them

have been forsaken in the last few years as Bedouins became more and more engaged in tourist activities and services. These fruit varieties, like other wildlife biodiversity resources in the region, are threatened with extinction, and any management plan seeking to realize a sustainable development of the region's natural heritage, must consider conservation measures for the protection and rational utilization of such rare and unique biodiversity resources.

### **The newcomers**

With the modern orientation towards developing desert regions of Egypt, including Sinai as a special high priority area, much investments and infrastructural inputs have poured into Sinai in recent years. St. Catherine, as an area of important natural as well as cultural heritage, was no exception. It has been declared a township, and has grown steadily into a relatively densely populated area, with fluxes of permanent (government employees) and temporary residents (workers, tourists). About 1000 newcomers, mainly government employees and workers, with their families, come from the Nile Valley. They live in the urban area of the town that has a population of about 2500 people. Significant urban planning problems exist and are compounded by inadequate support services for drinking water supplies, sewage, and solid waste disposal. The Protectorate administration has organized landfill sites for solid waste disposal.

As a measure to prevent the development of unplanned squatters, the Governor of South Sinai decreed a moratorium on building within the precincts of the City itself. New buildings have to be more than 3 kms away. A comprehensive land use plan for the entire area of the St. Catherine Protectorate has been approved at the highest official levels and is to be respected in any further development.

There has been some strengthening of infrastructure (schools, government offices, clinics, etc.). Tourism is doing well, but hotel owners wish to raise their categories from 3 and 4 star levels to 5 star levels. This is possible - according to Ministry of Tourism regulations - only if they have swimming pools. Some of them already started to dig the ground of their courts for swimming pools, but the Protectorate administration - knowing that this trend would be disastrous to the City - succeeded in convincing them for having mini-pools instead. Ground water pumping to supply tourist hotels and sanitary drainage went on in an uncontrolled manner so that there are now water shortages and serious risk of ground water contamination. The Environment Center of Suez Canal University is precisely suffering at present from water shortage. This situation is threatening the further development of tourism, and will probably end up by impeding it altogether. This is surely a flagrating example of the harmful consequences of uncontrolled and unrestrained tourism activities.

### **Human Settlements**

Fairly recent information (1992) indicates that St. Catherine Township covers an area of approximately 819 km<sup>2</sup>, with a population of about 4126 . Farms of local Bedouins cover about 74 acres in wadi beds and 234 acres as gardens (or orchards). Other elements of the local infrastructure are:

- # 6 government wells and 125 native ones.
- # 4 electrical generators with a capacity of 1.3 megawatts, whereas the total energy used is .7 megawatt.
- # 9 primary schools and 2 preparatory ones.
- # One hospital, one health unit, and 2 ambulance cars.

- # 7 tourist compounds with a capacity of 879 beds.
- # Sewage disposal is by 2 trucks (where? is not known!).
- # One police station and one fire brigade with 2 cars.
- # One gasoline station.
- # More than 50 shops of all sorts.

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### **The St. Catherine Monastery According to Al-Maqrizi (an Arab geographer who visited the area a thousand years ago)**

#### **Quote**

#### **[[The Monastery of El-Tor**

“El-Tor in Arabic means the mountain. There is no doubt among Christian historians that the Mountain of El-Tor is the one at which God the Almighty spake to his Prophet Moses. It now has a Monastery in the belonging to the Melkites. It is inhabited and has a large orchard with palms, vineyards and other fruit trees. Al-Shabishti alleged that the Tor of Sinaï is the one at which Light was revealed to Moses, and at which he was struck by lightning. The Monastery is at the top of the Mountain, built in black stones. Its fort is seven cubits wide and it has three iron gates. On its western side is a hidden gate with a stone in front. If they wish to remove it, they do. If someone wants to get inside they remove it, and then they put it back in place, so that no one can know where the door is. Within the Monastery is a spring, and there is another outside. Christians allege that the Monastery has a fire of the same type that was in Jerusalem. They light from it every evening. It is white, light, lukewarm, and does not burn, and then it becomes stronger when lamps are lighted from it! Monks inhabit the Monastery and people visit it. It is one of those Monasteries prescribed for pilgrimage. Christian historians mention that the building of this Monastery was ordered by “Yostianos”, King of the “Roum” in Constantinopolis. A dungeon was built with cells on its top. Guards from a people called “Banu Saleh of the Arabs” were assigned to the Monastery to protect its monks. It is in the days of that King, that the Fifth of Christian Councils was held. Between that Monastery and Qalzam (Suez) - which was a city - are two roads: one overland, and the other by sea. They both lead to the city of Faran, which is one of the cities of the Amalekites. From it to El-Tor is a walk of two days, and from the city of Egypt (Cairo) to Suez is three days. The Mount of El-Tor is ascended by 6666 steps. Midway to the top is a church for Iliyya the Prophet, and on its top another one dedicated to Moses the Prophet, with columns of marble and doors of brass. It is the spot where God spake to Moses. It has only one monk for its service. They say that no one can sleep inside, but a place is arranged for the visitors outside for sleeping. These two churches no longer exist.]]

#### **End of quotation**

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### **The St. Catherine Monastery in Modern Times**

St. Catherine lies 150 km south-east of Abu Rudeis. It stands on a high plateau, nearly 2000 m. above sea level. It is rich in natural water springs and fruit orchards. It has an airport for small and medium-sized aircraft. The Monastery's construction dates back to the 6th century. It was dedicated to the daughter of one of Alexandria's rulers who had been converted to Christianity and was severely tortured to death for the sake of her new faith. When her body was miraculously found in the vicinity of

the Mountain of Moses, somewhere on The Gabal Katharina, the highest peak in Egypt, the place was chosen to build a Monastery dedicated to her name, and the body is kept within the Monastery to this day. The Monastery is surrounded by a huge 85 m wall, whose breadth is 25 m and average height 11 m. Inside the wall a number of churches have been built, and the eastern wall is characterized by primitive lifts which the monks had been using in the past to avoid opening the gate.

**The main features of the Monastery are:**

a - First of all, is the Burning Bush where God revealed Himself to Moses and handed him the Tablets with the Ten Commandments inscribed by His own finger.

b - The Small Church, built next to the sacred Burning Bush of Moses, by Emperor Constantine in the 4th century A.D. to commemorate the time when God spoke to Moses at this spot.

c - The Basilica Church built by Emperor Justinian in 542 A. D., consisting of three halls divided by granite columns. The ceiling has two apertures to let in sunlight at carefully regulated times during the year. The Church contains statues of its founder and his wife, Empress Theodora, as well as a beautiful icon of St. Catherine herself. There is also the breathtaking famous mosaic design, similar to its contemporaries in Ravenna, representing in the upper half of the dome, the Transfiguration of Jesus Christ.

d - The Crusaders Church, being a large chamber, rectangular in shape, with a long oak table. Paintings of Crusaders can be seen on the walls.

e - The Mosque, adjacent to the Monastery, west of the main Church. It was built during the reign of Al-Hakim Bi-Amrillah, in the Fatimid period (1101-1120 A.D.). The building of this Mosque testifies to the long-lived tolerance of the Egyptian culture and its acceptance of all creeds together.

Some of the other important cultural heritage sites in the St. Catherine area include:

a- The Shrine of Prophet Haroun (Aaron): In the Raha Plain in Wadi Feiran near the Safsafa Mountain.

b- The Mountains of Moses and Safsafa, a mountainous range 2 km long. The highest peak is that of Mount Moses. There is a large assemblage of monuments which date back to the 3rd century A.D. There is also an ancient monastery there. Climbing this Mountain is a must for all tourists who can get to the top on foot. The trek usually starts at 2 or 3 a.m., so that when one reaches the top at 5 or 6 a.m., one is rewarded by seeing an unsurpassed colourful and magnificent sunshine over the mountainous landscape.

c- Shrine of Prophet Saleh: This is situated at the point where Wadi Nourrah meets Wadi El-Sheikh. Two km away is the tomb of the Prophet.

d- The newly discovered Neolithic artifacts in Wadi Raha, just at the entrance to the Monastery. These are imminently threatened by urban development.

e- A wealth of Nabataean rock graffiti, especially in Wadi El-Arba'in and Wadi Al-Mukattab, adopted by Nabataean caravans to reach Petra in Jordan.

**Three. Form and a Date of Most Recent Records of Property**

According to Egyptian law, all desert lands belong *de juri* to the Egyptian State. The Monastery registered its properties within all the Sinai Peninsula in 1981, at the office of the Governor of South Sinai, located at El-Tor City, capital of South Sinai.

#### **Four. Present State of Conservation**

For hundreds of years the Monastery has survived in comparative isolation from the world. It was in real danger several times in history, when invaders, looters, or fanatics wanted to attack it, but so far it has emerged almost unscathed. However, the greatest danger it is facing now, is the hordes of well-intentioned tourists who not only threaten its peace, but, it is feared, its identity and its integrity.

Two rehabilitation projects for the Monastery are already underway, one is to prevent sliding rocks from slipping on the sides of the surrounding mountains on to the Monastery's buildings, the other is to repair the fragile protecting walls. Rocks constitute a risk because of people's incessant treading, rainfall, and the melting of snow in winter, as well as slight earthquakes from time to time, not exceeding 2 or 3 on the Richter scale. There were two of these in the last decade. Flash floods, of a one per century occurrence, are also probable risks.

Moreover, a new circuit for the entry of visitors into the Monastery has been put in place, from within a new entrance in a side wall. The objective is to limit visitors' circulation away from the fragile structures and guiding them rationally without causing probable damage, especially to the main church and its precious icons, due to overcrowding.

An inner museum is also under construction, with air conditioning, in the place within the Monastery, which was its sacristy, where the precious items were kept. The museum occupies 250 sq. meters and should allow a better preservation of these items, while at the same time permitting the public to enjoy and appreciate them.

The Burning Bush was about to die away because of continuous picking of its leaves and branches by visitors wishing to acquire its blessing. About 20 years ago, it was surrounded by a protective wall higher than a man's height. It is thus now in very good condition, healthy and flourishing.

#### **Five. Policies and Programmes Related to the Presentation and Promotion of the Property**

A Master Plan for the City of St. Catherine in order to protect its special character has been drafted and many of its components are already implemented. (See Attachments).

### **4. MANAGEMENT**

#### **One. Ownership**

The Greek Orthodox Archbishop of Sinai, in the St. Catherine Monastery, endorsed the application by personally supervising and preparing the documents concerning the Monastery at earlier occasions. The Monastery and its outlying chapels, gardens, paths, and all other structures, including the Cairo offices located at 18 Midan Al-Zaher (or Al-Daher) Square in Cairo belonging to the Greek Orthodox Monastery of Saint Catherine and the Archdiocese of Sinai. Obviously, they all form together a cluster of one integrated network that is preferable to be inscribed on the World Heritage List, since they are unseparable.

### **b. Legal Status**

Egyptian Legal Autonomous Religious Institution of the Greek Orthodox Church (Greek Orthodox is said in Arabic: Roum Ortodox), that has been recognized by a specific Egyptian Presidential Decree. In 1988 the St. Catherine area was declared as a Nature Protectorate (Reserve), under Law 102/1983, by Prime Minister's Decree no. 613. The total area of the site is approximately a 50 km radius from the town of St. Catherine, lying just below the Monastery of the same name in Wadi Raha. As a matter of fact, the town was practically non-existent before 1960. In 1994 another Decree extended the area to become about 4300 sq. km. The Protectorate is a complex system of mountains and valleys at the meeting of Wadi Asbaaiya with Wadi El-Arbain. The reason for the declaration was due to: (1) a rich endemic flora and substantial wildlife, (2) it is a fertile and productive agricultural area with a large Bedouin population, and (3) it is important for the three major religions. The objectives were: (1) to protect critical high altitude desert ecosystems, (2) to maintain biological diversity, (3) to ensure the survival of endemic species, (4) to develop a protected and multi-use management area, (5) to prepare a land use plan and a master plan for the development of the St. Catherine area, (6) to protect the cultural heritage of Bedouin populations and to integrate these into the proposed management plan, (7) to establish a genetic seed bank, and finally, (8) to regulate tourism access to the area while increasing the number of visitors.

### **c. Protective Measures and Means of Implementing Them**

The rules and regulations of Law 102/1983 on Nature Protectorates (Nature Reserves) are applied to the entire area of the St. Catherine Nature Protectorate. According to Article 2 of this Law,

“It is prohibited to carry on actions or take measures that would result in destruction or deterioration of the natural environment, or harm to terrestrial or marine life, or to the area’s natural beauty. It is also prohibited to raise buildings, build roads, move vehicles, or carry on any agricultural, industrial, or commercial activities within the area of the Protectorate, except by license from the competent administrative authority, according to conditions, rules, and measures that are to be issued by Decree from the Prime Minister”.

Article 3 of the same Law stipulates, for the buffer zone,

“It is not allowed to practice any activities or business in the areas surrounding the Protectorate, that are to be delineated by the competent Minister, at the proposal of the Environmental Affairs Agency, if these activities are to affect the environment of the Protectorate, or its natural phenomena, except by license from the competent administrative authority”.

These rules and regulations are realized through the vigilant care of the Egyptian Government (the Ministry of Culture for Antiquities, and the State Ministry of the Environment for the Nature Protectorate), and its various policing bodies, principally the Security Corps and the Tourist Police. Secondly, the high protective walls of Justinian provide adequate shelter. Thirdly, there are various security systems, as well as the ever attentive care and interest of the monks and of the Bedouin community, besides the remoteness from large urban centers. Lastly, the relatively great distances of the region and the consequent difficulty in access have contributed to a large extent in this sense, at least up to now. If tourism is to increase to higher volumes, this



luckily more than compensated for by a correspondingly increased care and vigilance on the part of the Egyptian Government.

The St. Catherine Protectorate appoints “Community Guards” from among the Gebaliya tribe members. They are so named because they are elected by their own tribal communities, divided into 4 sub-tribes. The Protectorate’s Administration was recently in need of 5 guards, and asked each sub-tribe to elect one of its able-bodied young members. Four were thus elected and appointed. As for the fifth, the Protectorate Administration, in agreement with the 4 sub-tribes, asked the Archbishop of the Monastery to elect him. And chose he did, not as representing any sub-tribe, but as a super-numerary, on personal merits, irrespective of his tribal affiliation. The choice was accepted by the whole tribe. Such is the respect of the tribe for the Archbishop’s wisdom and how the Protectorate’s Administration acts within the framework of the local community’s customs and value system. Asking the Archbishop to intervene in solving such issues is the normal procedure among the Gebaliya tribesmen, whose territory boundaries are the same as those of the Ring Complex (the Pluton). This is a remarkable example, if any, of environmental perception and the stages of cultural development on one hand, and physical/geological features on the other hand, eventually overlapping.

A new source of underground water was sought to solve, at least partially, the water resources problem of the St. Catherine area, was tapped in the year 2001, from an underground water reservoir in Wadi Feiran, between the towns of Tarfa and Zeitun. Four pumping stations successively help to lift the water to St. Catherine. A new sewerage facility has also been installed concomitantly, based on sound environmental principles. With these new projects, water is also being rationed in spite of its better availability, in order to render its consumption sustainable. By orders of the Governor, water is piped into homes for a limited and previously announced periods every day. The local inhabitants have, on their own, installed tanks on roof tops in order to save some water when it is not flowing. This obliges them to know that water is a valuable resource not to be squandered. As for hotels, each is allocated a fixed amount in relation to its needs. It cannot be increased, so that the hotel is obliged to use this amount as efficiently as possible. The tourists will be alerted not to overuse water in their hotel bathrooms by appropriate notices.

Some suggestions by the St. Catherine Protectorate staff have been proffered to improve management arrangements. They are under study by the Protectorate Administration and by the EEAA. These include:

- 1) Finding a way for the financial independence of income earning nature reserves. For example, The number of foreign visitors to St. Catherine in 1999 reached 300,000. If they should pay an entrance fee the same as for Ras Mohammad Marine Park, viz., 5 US\$, this would generate an income of 1½ million US\$ (more than 5 million L.E.). If the St. Catherine Protectorate is to be made a “Unit of Special Character”, as is the designation in Egyptian legislation, it can obtain all of its annual needs from this income, according to its preset plan, and the rest can be transferred to the Environment Protection Fund. The Protectorate should be accountable for the handling of its own funds.
- 2) Building up a strong administrative system in nature reserves. South Sinaï may be taken as an example, whereby a number of specialized departments affiliated to the

Under-Secretary of State are to be established. Their Directors are to be of the same grade as the directors of nature reserves. These central suggested departments are to be for:

A - Environmental monitoring and conservation research, working on studies necessary for conservation and monitoring systems in terrestrial and marine reserves.

B - Training, for planning training programmes for all workers in the EEAA, on the basis of their needs.

C - Environmental awareness and mass communication, for specifying target groups and planning adequate awareness programmes.

D - GIS and databases, for storing, retrieval, and organizing the use of information about nature reserves.

E - Finance and administration.

These departments will have to work hand in hand with nature reserve directors and their personnel.

There is already a recommendation to declare St. Catherine an autonomous unit. Because it is already a city of a special character, for what it has of natural resources and the rich cultural and spiritual heritage of its own, it can be declared an autonomous city run by a Supreme Council, in which are represented all administrations and stakeholders. The Council should be able to coordinate more easily the combined action in the area, without having to go back to the Governorate of South Sinaï for every decision or action. Its precedent is the city of Luxor, which has been declared an autonomous city a few years ago, when it was part of the Qena Governorate before. This experiment can be studied and lessons from it learned, for application to the case of St. Catherine.

#### **d. Agency/Agencies With Management Authority**

These comprise the St. Catherine Monastery (the Archbishop and the Monks), along with its lay personnel of every grade and specialization. The existing harmonious collaboration with the Egyptian Supreme Council of Antiquities, the Governorate of South Sinaï, the St. Catherine City Council, and last but not least, the Egyptian Environmental Affairs Agency (EEAA) and its affiliated Administration of the St. Catherine Protectorate, is a fine example to be copied by other agencies.

#### **e. Level at Which Management is Exercised and Name of Responsible Persons for Contact Purposes**

(1) Egyptian Supreme Council of Antiquities (SCA), South Sinaï, Mr. Abdel-Hafeez Diab, El-Tor. The Secretary-General of SCU is Dr. Gaballah Ali Gaballah, in Cairo, tel. 00-2012-327-6070, for the St. Catherine area, the Superintendent Mr. Khaled, tel. 2012-258-1369.

(2) Saint Catherine Protectorate, Area Manager Eng. Mohammad Shakir, St. Catherine tel. 2069-470-032, fax 2069-470-033, portable 012-242-5330.

(3) Monastery of Saint Catherine, H.E. Archbishop Damianos, St. Catherine, tel. 2069-470-349, fax 2069-470-349, and 18 Midan Al-Zaher, Cairo, tel. 202-482-8513.

#### **f. Agreed Plans Related to Property**

The St. Catherine and the Protectorate. When it was first thought of declaring the St. Catherine area as a Protectorate, the city was the greatest worry to planners. With its extremely wanting infrastructure it constituted a pressure on the rest of the

Protectorate. Planners therefore decided that in order to alleviate this pressure, the city's infrastructure had to be improved, through sound environmental planning.

Such master landscape plans have been lately prepared by the St. Catherine Protectorate Development Project and the Monastery. Their implementation has already started by imposing a moratorium on building within the premises of the City of St. Catherine and allocating other areas separated from the City by at least 5-10 km. This new landscape plan is provided in the accompanying Attachments. The implementation is supervised by the Protectorate Administration and the EEAA, in cooperation with the Governorate of South Sinai.

#### **g. Sources and Levels of Finance**

Some of these are provided by the Monastery for conservation of its own property, after obtaining permission from the EAO. The other part is provided by the Government of Egypt for environmental issues, through the EEAA and the Protectorate administration. Presently, the European Union (EU) provides funds for the temporary project of upgrading the Protectorate. The Monastery is also supported by foundations abroad. Among them are the Mount Sinai Foundation in Athens, Greece, under the Presidency and the High Patronage of H.E. Archbishop Damianos (Archbishop of Sinai), the St. Catherine Foundation in London, under the Royal Patronage of HRH Prince Charles, Prince of Wales, and the American Association of the St. Catherine Foundation in New York, under the Patronage of H.E. former President of the United States Mr. George Bush.

It is not a secret that the Egyptian Government's contribution to the EEAA budget is quite insufficient, since they do not generate enough self-supporting income. Those reserves that do have plans and programmes are the usually the ones whose development projects are financed by international donors. One of them is the group of South Sinai reserves funded by the EU. The St. Catherine Project started in 1996 with 30 million Euros that helped to accomplish its strategic plan and to start thematic programmes comprised in that plan. Reserves obtain their needs annually either from the EEAA budget, or from foreign aid.

#### **h. Sources of Expertise and Training in Conservation and Management Techniques**

At present, some specialists and expertise from collaborators based in the EU and especially for work in the Library of the Monastery, from the Greek National Library, and the Camberwell College of Art Conservation Center. Excavations are carried out by the University of Athens. Building conservation is organized by the Monastery's Technical Office, under the supervision of the Egyptian Supreme Council of Antiquities, which has jurisdiction in an area bounded by the distance of one and half kilometer from the walls of any archaeological structure, by Decree from the Minister of Culture. The local labour is trained by specialized technicians.

Egyptian nature reserves are not lacking in personnel who can take up these responsibilities if aided by some more training and habilitation, with support from Egyptian and/or foreign expertise, so as to help them carry on the work alone at a later time. It is they who do the environmental monitoring in South Sinai, and who are responsible for environmental awareness and mass communication. Questions of

training have found specific answers by now, because the bases for a solid administrative structure have been laid down. It would secure conserving and managing Sinai's terrestrial and marine reserves, and may also help in the work carried out in several other Egyptian reserves, as well as in Arab countries.

#### **i. Visitor Facilities and Statistics**

According to a plan set by the Governorate and the City Council a visitor center and some shops and a cafeteria are organized and maintained at the foot of the Monastery. It is estimated that in normal years 100,000 to 150,00 visitors come to see the Monastery and many (presumably several score) climb Mount Moses each day before sunrise to watch it from mountain tops, a truly thrilling experience. They descend, take breakfast, visit the Monastery, and leave to the more attractive beaches of Sharm El-Sheikh. However, the number in 1999 was 300,000 visitors.

As part of the operational management plan, tourist buses will be stationed at about 5 kms from the Monastery in order to make a sufficient distance between them and the buildings, so that the icons are not damaged by the exhausts.

#### **j. Property management plan and statement of objectives**

(copy of full legal text enclose)

#### **k. Staffing levels (professional, technical, maintenance)**

The Protectorate has a Director, about 12 Rangers, 25 Community Guards from among the Bedouin Gebaliya Tribe, and about 2 secretaries, 5 drivers, and 5 assistants (including a tablet maker, guides, etc.).

### **5. Factors Affecting the Property**

#### **a. Development Pressures (e.g., encroachment, adaptation, agriculture, mining)**

When the St. Catherine Protectorate was first declared by Prime Minister's Decree no. 613/1988, it did not comprise more than the Monastery and the mountainous area around it; an area small in size but important both culturally and naturally. It was quickly found, however, that this small area did not allow full freedom for the administrators to properly perform their duties in conserving such an incomplete ecosystem, nor protect the wild animals, which roam freely to and from the area. This situation made difficult the monitoring and study of their movements. Moreover, a large part of that area was the built up area of the town, which in turn exerts pressure on the free area, with its garbage and the considerable size of unmanaged tourism, moving around without any environmental controls.

When the boundaries of the Protectorate were expanded by Decree no. 940/1996 to their present state, the shape of the protected ecosystem became much more natural. Consideration was taken of the proximity of Nabq and Abu Galum Reserves on the Gulf of Aqaba. But the protection of this larger area of ca. 4350 km<sup>2</sup> is again not an easy matter, for the following reasons:

- 1 - The larger area and the much rugged terrain make its regular surveying a difficult matter.
- 2 - The number of Bedouin settlements within the new area reaches 52 settlements.

3 - The urban area of St. Catherine town is still within the Protectorate, and other settlements are added.

4 - There are developmental requirements and a host of economic activities within the new area that need to be reckoned with.

### **Demographic Structure**

The larger area of the St. Catherine Protectorate is inhabited by more than 10,000 people, including resident Bedouins as well as newcomers from the Delta and Nile Valley for work as Government employees, in services, or in tourism. These live in the urban area within St. Catherine city limits and also in Tarfa and in Feiran. Most live in buildings built by the Township, while some rent their homes from the Bedouins. Rarely does any one buy a piece of land and build one's home on it.

Immigrants from the Nile lands do not represent yet a stable society that can settle down. Any newcomer can be transferred to any other place in Sinai or elsewhere in Egypt at any time. Those amongst them who aspire to a higher socio-economic status wish to leave when their children reach secondary school or university age. The number of these immigrants is about 600 people.

Bedouins living within the Protectorate are still the majority. They are divided into seven tribes and each has its own territory and its own frontiers. They have in their possession written documents that determine the rights of each tribe in the resources of the lands divided amongst them. These documents were written more than a century ago under the auspices of the Egyptian Government.

Movements of Bedouins vary according to tribes and to family groups within tribes. The Jebaliya, for example, do not move much since their water supplies are almost secure in their wells, while their income is mainly from tourism. Other tribes move in spring to find good pasture, towards the coast in summer and to the highlands in winter.

As in any tribal society, only the élite has the chance to establish official contacts with the governmental administration. Therefore members of this élite were the ones to benefit most from development projects implemented in the area, and aiming at Bedouin welfare. This is the case even with food aid, because it is to the chiefs that this primarily delivered, and they are given the responsibility of distributing it. Officials of the Protectorate have therefore to take this into consideration when offering services to Bedouin communities, in order to avoid creating a gap between the élites and the rest of the community.

Tourism has become the most important economic activity for the Bedouins, followed by herding, horticulture, and then fishing (in coastal areas). The élite reaps alone all contracting and entrepreneurial activities, due to what these activities require of considerable capital. Some persons work in construction and masonry, or as mechanics, or electricians.

### **The tourist industry**

One objective given in Decree 613/1988 as justification for establishing the St. Catherine protected Area, is: to regulate tourism access to the area while increasing

the number of visitors. This could be one objective, but its consequences for the fragile area's resources have to be carefully assessed. Another alternative objective could be: increasing income from tourism while keeping visitor's numbers at a minimum. From an environmental and a resources point of view, the second alternative should be considered a more rational one in the long term. Striking a proper balance between the need for income generation (which is really the objective behind encouraging tourism), and the conservation and maintenance of resources, is, or should be, the worthwhile long term objective of the management plan. It is not believed that an objective is income generation in the shortest possible time, else the Project would not have been given 5 years for its completion. This 5-year period is a strong indication that the authorities are willing to wait and are not anxious to obtain quick gains during this given 5-year period. It is here that modelling and gaming technologies have their place and can come to help. What is needed is not merely to regulate access to the area, but rather to rationalize it. In other words, the ultimate objective is to safeguard the resource base of the tourist industry, which, in the case of the St. Catherine area, is both of natural as well as cultural value, exactly as mentioned in the tender, so as this industry becomes sustainable. In order to clarify this concept, we can say that contrary to conventional economic thinking, which attempts to maximize profit and minimize time (by shortening investment cycles), ecologically sustainable development attempts to maximize time of use of resources, even if some profit is sacrificed in the short term. We believe, from what seems to us, from both the spirit and the wording of the tender, that this is what the management plan is expected to achieve at the end of the day. Furthermore, it is observed that tour operators are the ones who make decisions about the nights tourists spend in each one of the Southern Sinai resorts, as well as the routes they take, and the hours they stay at each monument. The management plan should be finally able to provide the elements for making such seemingly small but really very effective decisions, more profitable and at, the same time, less environmentally harmful.

### **Uncontrolled Tourism**

Thus, uncontrolled tourism poses a risk to the very basis of its existence. Not only Egyptian and foreign environmentalists, but also the Egyptian government authorities, are concerned about the future prospects of this industry and its impacts on its supportive resources, if what happened in other fragile ecosystems (e.g., at Hurghada, on the Red Sea coast) is anything to go by. The Egyptian Environmental Affairs Authority (EEAA) has been alert to this problem and was first instrumental in issuing a Prime Ministerial Decree to declare the area protected under Law 102/1983, as a National Nature Reserve. The EEAA has prepared a management plan, in collaboration with European Union, for the St. Catherine Area Protectorate, after a similar action has proved successful in the adjacent coastal/marine area of the Ras Mohammad Nature Reserve. Although the proposed St. Catherine management plan hasn't yet been officially approved, it is nevertheless being implemented (Mr. Mohammad Shakir, Director of the St. Catherine Protectorate, pers. comm., Sep. 2001). Since the year 1999, a special Nature Protection Sector has been created within the EEAA, under the leadership of Dr. Mostafa Fouda. The European Union has offered 1.2 million Euros over a period of 5 years started in 1996, that has been extended to 2002 at the same budget, with some reallocations, to help in the implementation of the proposed management plan, set according to EEAA requirements. This management plan consists of a number of elements, including: (a)

Participatory planning, (b) the Bedouin Support Programme, (c) Community Guards, and (d) Bedouin managed ecotourism (Grainger 2000). In the next phase it is designed that the EU may offer 6 million Euros and the Government of Egypt the equivalent of 1.75 Euros (J. Grainger, pers. comm., Sep. 2000). It may be decided at this stage to link the two Nature Reserves in one comprehensive management plan at a later date.

### **Tourism and Its Threats**

The St. Catherine Nature Protectorate (whose logo is SK, for St. Katherine, similar to the Monastery logo), in spite of efforts deployed for its rational management, has enormous national and international significance, but its natural and cultural heritage is at risk of long term irreparable damage from unsustainable development pressures. The Protectorate's boundaries abut the coastal/marine reserves of Ras Mohammad National Park at the southern tip of the Peninsula, and the Nabq and Abu Galum Managed Resource Areas lying along the Gulf of Aqaba. The terrestrial Taba Protectorate lies to the northeast, at the dead end of the Gulf of Aqaba. Sinai's coastal areas on the Gulf of Aqaba, from Ras Mohammad in the south to Taba in the north, are the main attraction for the mass tourist industry that has become the mainstay of Egypt's economy in recent years, and is likely to remain so for many decades to come. Coastal resorts are growing like mushrooms. Their relative proximity to St. Catherine and Mount Sinai has resulted in growing numbers of visitors desiring to add them to their plans. There is a daily average of 700 to 1000 visitors to the Monastery and its immediate surroundings. On frequent occasions, however, this can rise to near 3000 visitors a day. Every day several hundred people attempt the ascent of Mount Sinai, mainly to view the sun rising over a breathtaking series of mountain tops. The impact of this sensitive site is considerable.

Unplanned development in the area, coupled with this rapid expansion of tourism, threatens to undermine the Protectorate's intrinsic values. The major threats arise from a combination of inappropriate urban development, an expanding resident and migrating population, changes in life-style, and deficiencies in institutional planning. A land use plan has been approved, with the participation of a number of experienced landscape planners having a respect for the environment. Nevertheless, evident symptoms of degradation are a deformed landscape, localized overgrazing, disappearance of shrubby plants (for clearing the land, for fuel, or for sale if of medicinal value), damage by safari vehicles (the golden Monastery icons have signs of fading out), the depletion and contamination of the meager ground water resources (swimming pools have been stopped), unsanitary waste disposal (except where the Protectorate administration has intervened), and last but not least, the socio-economic marginalization and the distorted enculturation of local Bedouin communities. The Protectorate administration is doing its best to prevent this last phenomenon by offering sincere and effective programmes for grass root community services.

It is hoped that the inscription of the St. Catherine area on the World Heritage List will give the appropriate answers to the issues raised, so that the plan being now prepared by the EEAA can be elaborated taking account of WHC precepts. It will be observed that while keeping within the limitations of the EEAA plan, the WHC study is focussing on the combination of cultural heritage conservation, as well as on natural heritage and biodiversity conservation, and is giving suggestions of its own. These

are based on the experience of the Egyptian MAB Committee experts on conservation problems in Egypt, as well as on the excursions carried out there in May-June 1996, in August 1999, March 2000, and again in May 2000, led by Prof. Samir I. Ghabbour, Rapporteur of the Egyptian MAB Committee. It is also dependent on several discussions with the Nature Reserve staff during and after those excursions, and on discussions with the Archbishop of the Monastery, besides the more recent research lately published on the St. Catherine area, and, above all, the Workshop of Stakeholders held on 8 June 2000, and the following Sub-Committee meeting on 25 June 2000.

## **b. Environmental Pressures (e.g., pollution, climate change)**

### **Topography**

No need to elaborate here on the natural resources of the Protectorate's area, but a brief description of its topography will promptly explain the distribution pattern of these resources. The area resembles a 3-sided pyramid high in the center and sloping towards the outside, reaching the Qaa' Plain in the west, sharply declining in the north to reach Wadi Feiran and Wadi Zaghra, and eastwards touching the Nabq and Abu Galum Reserves on the Gulf of Aqaba. The western and eastern sides of the pyramid meet in the south at the borders of the Ras Mohammad Marine Reserve. Wadis drain from the center either to the west or to the east and end up in alluvial fans on the coasts of the two Gulfs. The Qaa' Plain absorbs much of the water brought by the western wadis.

### **The Effect of climate**

Temperatures and humidity increase from top to bottom and from mountains to the wadis. Plant life therefore is in the form of succeeding rings as we go from lower to higher altitudes.

## **c. Natural disasters and preparedness (earthquakes, floods, fires, etc.)**

The area has seen about 2 mild earthquakes in the last decade. Flash floods are very rare but several ones have lately occurred in wadis outside the area (particularly Wadi Watir on the eastern coast, on the Gulf of Aqaba).

## **d. Visitor/tourism pressures**

There are enormous threats which face both the Monastery (and its smaller dispersed dependencies) and the unique natural awesome beauty of landscapes within the Reserve. These can be summarized as:

- (1) Water scarcity, small underground water reservoirs, so that drinking water is contaminated by sewage, and drought.
- (2) An uncontrolled flow of tourism (50,000 in 1997, 100,000 in 1999, and 300,000 were expected in the Jubilee year 2000, on the occasion of the Millennium). Furthermore, a highly placed official in the Egyptian Ministry of Tourism declared in a BBC Arabic Service interview (24 Jan. 2000), that 420,000 Israeli tourists come to South Sinai every year through the Taba gate.
- (3) Five 4-star hotels requiring swimming pools for their guests in order to keep them for a longer time, and to be upgraded to 5-star status, so as to be allowed to raise their rents.
- (4) Lack of a rigorous and respected land use plan.



- (5) Uncertainty of the fate of on-going conservation efforts after the EU withdraws its financial grant.

**e. Number of inhabitants within property, buffer zone**

Probably about 7000-8000 in the designated area, of whom about 5000-6000 in the City of St. Catherine itself.

**f. Other**

**The Bedouin Support Programme.** This is one of the especially interesting programmes in the Protectorate. It has a number of sub-programmes having the objective of inducing the Bedouin community to accept the idea of protection and conservation, participate in it, and raising their living standards, without destroying their cultural heritage. In order to reach a formula of mutual understanding with this culturally different society, several meetings were held in their own campsites, out of which resulted the various Bedouin Support Sub-programmes.

Although this Programme is undoubtedly totally consistent with the objectives of the Protectorate, its too many service programmes, such as the health and the veterinarian programmes, make it wrongly look in the eyes of some as inconsistent with the principles of conservation. Offering such services is usually the competence of other departments and not the Protectorate staff. But St. Catherine is certainly a special case by its large area, the dispersed settlements, and the dire need for such services. Conservation should be dependent on people, where people should participate in management, and feel that they are having benefits from it. At any rate, some limits may later be set with other Government departments that are there specifically to offer these same services. We should not pull the carpet from under their feet, or from other programmes more directly related to conservation, such as environmental monitoring.

**The Institutional Setup**

St. Catherine City has much less inhabitants than just one street in Cairo or Alexandria, yet it has representatives of all government departments as anywhere in Egypt. This is an overload that the small city's stomach cannot accommodate. Each one of these institutions has its own regulations which it has to follow, but which may contradict those of its sister institutions. This situation inevitably leads to some sort of institutional competition amongst them, which may at times reach a point of mutual antagonism and to a halt of useful work.

In order to answer these two questions, it is important to have a look upon the intensive rate of work in implementing the programmes of the Protectorate, what goes on at the rate that is planned, what is lagging. We shall find that the programmes that are slowest in implementation are those related to the infrastructure of the Protectorate itself. This needs buying of land and procurement of documents and permits from the Governorate. Furthermore, landscape planning of such a one-street sized city has taken three years to be rejected, modified, and then waiting for approved. The programme of solid waste management has not yet been achieved, also since three years. This can be taken a proof as good as any of the lack of integration between the Protectorate and other Government administrations. If, on the other hand, we compare the weak potential of these administrations with those available at the

Protectorate, thanks to aid from the EU, we find that an additional burden is shouldered by the Protectorate in trying to cooperate with its sister administrations, by trying to help them realize their objectives with whatever potential it has. This means new burdens and new programmes not accounted for in the original work plan. The best examples are the two solid waste disposal dumps in the cities of Dahab and Sharm El-Sheikh, that were provided by the Protectorate.

It appears from this that, in the absence of integrated planning, personal relations among small-scale decision-makers become the ruling element in the level of cooperation and achievements of these institutions, in their daily work. This of course has a negative effect on institutional performance, and especially that of the Protectorate, which has to control the large land territory within its boundaries. Egyptian Law 102/1983 on nature reserves does not give propriety rights of the territory of nature reserves to the Environmental Affairs Agency (EEAA). The Agency is given responsibility only for the administration of nature reserves. Legally, such lands belong to the Governorates. The Agency has only the legal control of activities carried out within the boundaries of the nature reserve. It can prevent activities harmful to the flora and fauna, but its own activities and buildings need permission from the Governorate. If we consider the logical political order of priorities of the St. Catherine Protectorate territory, the first and foremost is the encouragement of development and investment. The place of environmental protection in this order still has to be sought.

### **Environment and Development.**

Development has been the preoccupying driving force of Government action for the past several decades, whether under socialist or open door orientations. It has also been, and still is, the main incentive for the people to exert an extra effort for producing export goods.

As we all know, well-ordered development starts by surveying the available resources and then laying down land use plans, and provision of capital and cadres necessary for project implementation. What happens in St. Catherine, however, is that development has been equated with building cement structures. Buildings are erected first, and then people start to think about how to use them. Therefore, it is quite difficult for decision-makers to accept the idea of environmental management. This usually comes at a later stage, when it should have come in the beginning, before planning, when maps are still drawn in pencil, especially when recommendations on environmental management will contradict the developer's own personal glory of erecting huge edifices while he is in power.

The particularly large area of the St. Catherine Nature Protectorate increases the front of frictions and institutional confusion. As an example, the Decree for the expansion of the area of the Protectorate, was issued by the Prime Minister in 1994. The same person, a few months later, issued another Decree specifying the location of sites for three heavy and polluting industries in South Sinai. One of these is in the southern part of the Protectorate. Decisions like this open the door for institutional conflicts between the EEAA, the Ministry of Industry, and the Governorate.

### **Goals and Programmes of the Protectorate**

Work on the Development Project of St. Catherine started in 1996. It was based on a predefined strategic plan. The general main objectives to be achieved were:

- 1 - Protection of the resource base (natural and cultural) in St. Catherine, for a sustainable touristic activity in the area.
- 2 - Support of the national network of nature reserves in Egypt.
- 3 - Demonstration of economic importance of nature reserves as part of the land use map of Egypt.

These objectives were set on the assumption that the Egyptian Government's support of the philosophy of participation in conservation efforts in South Sinai, as well as legal support for imposing entrance fees to the Protectorate.

There was also a set of specific objectives as such:

- 1 - To develop and to apply an integrated management plan for the St. Catherine area.
- 2 - To emphasize the importance of conservation and sustainable utilization of natural, cultural, and spiritual resources.

These objectives also included cooperation with the organizations and municipalities present in the sector, increasing income by imposing entrance fees, in order to guarantee the continued implementation of programmes, and the realization of legal deterrence measures by the application of Law 102/1983 on nature reserves.

From these objectives and assumptions, eight application objectives emanated:

- 1 - Establishing an administrative unit for the St. Catherine Protectorate and delineation of its boundaries.
- 2 - Completion of its infrastructure.
- 3 - Setting up a support programme for local inhabitants (the Bedouins).
- 4 - Setting up a landscape plan and a system for dealing with solid waste.
- 5 - Definition of needs for the protection of the area's monuments
- 6 - Setting up programmes for environmental monitoring and for protection works.
- 7 - Setting up programmes for environmental awareness and visitor management.
- 8 - Setting up programmes for training and capacity building of personnel.

### **The Consistency of Objectives and Programmes, and Performance Rates.**

As a whole, programmes are consistent with the set objectives, except in certain points that should be taken into consideration in the future. But what is needed is a structure that is solid enough to endure after the departure of the donor agency and the complete transfer of management into the hands of the Egyptian Government.

The most important of these points is to furnish the administrative unit of the Protectorate with its needs and to fix its personnel in their posts, whether as ecosystem monitors or as environmental researchers. Till now, only 7.5% of personnel are fixed; the rest being either under contract with the EEAA, or with the EU Project, because the EEAA has no funds yet for their salaries. Yet, their dedication to the cause is truly exemplary.

The training they get is highly beneficial, but is run randomly - and not to a predefined plan. Whenever there is a scholarship, they take the chance and apply for it. In most

cases training is offered as an incentive to those who do a good job. There is yet little orientation training for new recruits, so they lack some skills that they should have from the first day of taking up field responsibilities. There is little training too for those who will acquire middle level administrative responsibilities, such as management of a nature reserve or a specialized environmental monitoring programme, which inevitably leads to undesirable management attitudes or necessitates reliance on centrally made decisions.

### **The Impact of Institutional Problems on the Performance of the Protectorate.**

From the preceding review of institutional problems faced by the Protectorate, we find that it is quite natural that certain programmes were delayed, as a result. The most important of these is the one for establishing the infrastructure (the administrative building, workers' housing, and the visitor center), all being dependent on the allocation of land by the Governorate, for building, issuing of permits, etc. Although this programme has an advanced priority, little has yet been done about it, because these measures have to be taken at the Governorate level. Land use and landscape plans took a long time to be approved. The solid waste management system is not yet completed and is dependent upon other partners from other institutions.

## **6. Monitoring**

This activity needs more attention, in the form of increased budget, more training, especially for monitoring wild animal life. Very few people are trained in Egypt for this kind of monitoring.

### **a. Key indicators for measuring state of conservation**

- (i) The number of species, their distribution, and their status,
- (ii) The major conservation programmes are likely to be completed in a period of 5-7 years, and
- (iii) The rate of encroachment on marked buildings and wadis where the wild plants and animals are living is diminishing, among other things.

### **b. Administrative arrangements for monitoring property**

A strong monitoring programme has been in place for the last 2 years, depending on the Bedouin "Community Guards" who are equipped with mobile phones and report any change they observe (they already have a sharp eye for that), as well as by the highly trained Rangers (Masters' Degrees in Environmental Management from the UK), who roam the property daily, flash cameras that take pictures at the movement of any object in front of them (they have authenticated the presence of a hyena's den and many other animals in remote places), and monthly reports of such changes.

### **c. Results of previous reporting exercises**

A full yearly report on monitoring is presented to the managing authorities and steps are taken whenever the change is deemed harmful. The Administration of the Nature Protectorate, and the EEAA behind it, have a veto on any change that is judged harmful.

## **7. Documentation**

These have been already provided in August 2000.

- 1 - Location map of Proposed World Heritage Site in Saint Catherine Protectorate, Sinai, Egypt.
- 2 - Map with coordinates of above.
- 3 - St. Catherine Maps, Coordinates, and Surface Area (3.5" diskette).
- 4 - CD St. Katherine Protectorate World Heritage Nomination, prepared by St. Katherine Protectorate Staff.
- 5 - Saint Katherine Protectorate Management Objectives, Plans, Interventions, and Monitoring Activities.

**a. Photographs, slides and, where available, film/video**

These have been already provided in August 2000.

**b. Copies of property management plans and extracts of other plans relevant to the property**

These have been already provided in August 2000. More are attached herewith.

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**Zalat, S. M. and Gilbert, F. S. (1998)** *A Walk in Sinai. St Katherine to Al Galt Al Azraq.* El Haremeen Press, Cairo: 66 pp.

**d. Address where inventory, records and archives are held**

- (i) The St. Catherine Monastery, St. Catherine Town, South Sinai
- (ii) The Administration of the St. Catherine Nature Protectorate, St. Catherine Town, South Sinai,
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**8. Signature on behalf of the State Party**

NOMINATION OF ST. CATHERINE AREA AS A PROPERTY FOR INCLUSION ON THE WORLD HERITAGE LIST (MIXED NATURAL AND CULTURAL)

**Signature .....**

**Name of Authority:** Mrs. Mervat Omar

**Position:** Secretary-General,  
National Egyptian UNESCO Commission

**Date .....**

## ATTACHMENTS

### **The following documents are attached:**

(Other documents were delivered in August 2000, while some more were also sent in September 2000.)

1 - Diskette of the "Consolidated Replacement Text" (one copy)

#### Three copies of:

2 - Topographic map with proposed site boundaries (plus one copy of diskette). The fourth copy was sent to ICOMOS in late October 2001.)

#### Four copies of each of:

3 - Legal documents

4 - St. Catherine Town Landscape Development Programme

5 - Slides and photos

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- The Environmental Guards of the Gebaliya Tribe

### **The Monastery of St. Catherine**

- Archbishop Damianos
- Father Yoannes

### **The People of St. Catherine**

- Mr. (Sheikh) Ahmad Mansour, Jebaliya medicine man
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Scenario and montage of a special collective video tape about St. Catherine

**STAKEHOLDERS' WORKSHOP  
FOR PLACING THE ST. CATHERINE AND SOUTH SINAI AREA  
ON THE WORLD HERITAGE LIST  
CAIRO, 8 JUNE 2000**

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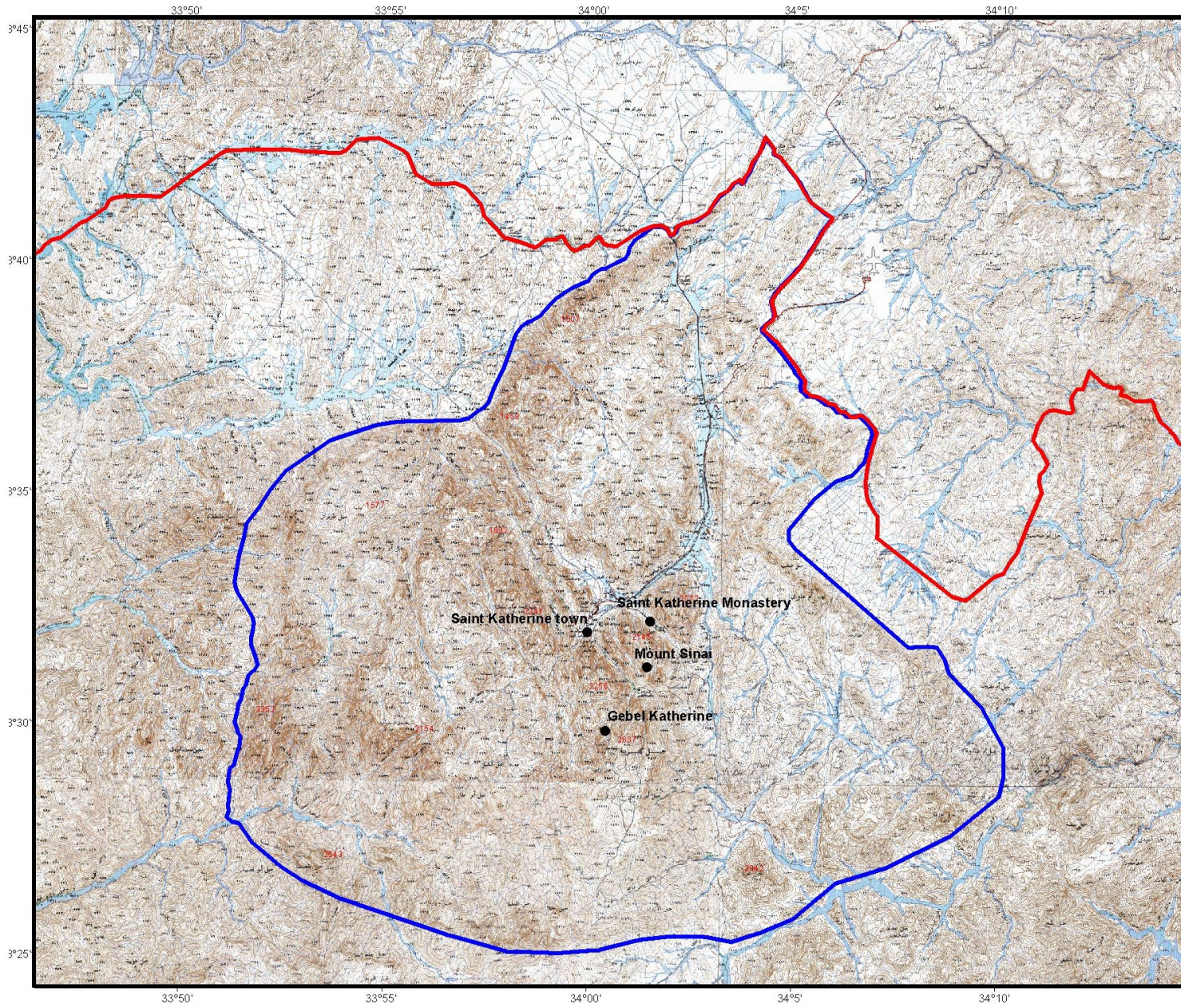
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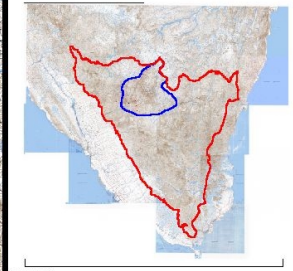
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**Proposed World Heritage Site**

— Saint Katherine Protectorate boundary  
 — Proposed World Heritage Site boundary



Scale 1:100000  
 0 5 Kilometers



**Plate 1 - H.E. Damianos Archbishop of Sinai  
Receiving Some Members of the Expert Team.**



**Plate 2 - Wadi Al-Arbain with Natural Vegetation.**



**Plate 3 - Nabataean Inscriptions in Wadi Al-Arbain.**



**Plate 4 - Nabi Haroun (Aron, Brother of Moses) Mausoleum on the Road  
to the St. Catherine Monastery**



**Plate 5 - Cypress Trees in Wadi Al-Arbain.**



**Plate 6 - Troglodyte House in the St. Catherine Area.**



**Plate 7 - Visitor Center Near the Entrance to the St. Catherine Monastery.**



**Plate 8 - Domesticated Cony (*Hyrax*) at the house of Mr. Ramadan,  
on Top of Safsafa Mountain**



**Plate 9 - Skull of *Hyaena* Shot in St. Catherine Area.**





**Plate 10 - Meeting of St. Catherine Area Stakeholders  
at the National Egyptian UNESCO Commission, 8 June 2000.**

**(All Plates photo by S. Ghabbour).**