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Abu Ghnaim Environmental Impacts Assessment

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Abu Ghnaim Mountain

Introduction

Abu Ghnaim area is located at the northern borders of the town of Beit Sahour in the Bethlehem district of the West Bank. It consists of Abu Ghnaim mountain (a man made forest); Abu Alsokhour mountain (a small hill to the east of Abu Ghnaim); and Khirbit Mazmoriah (a plane area lies between Beit Sahour and Umm Tuba). As being the only forested area, it is considered the oasis of the biological diversity in its region. Various types of flora and fauna depends on the Abu Ghnaim ecosystem where a unique microclimate is available. Abu Ghnaim area was particularly attractive to Israeli government, therefore, the area was included inside the borders of illegally expanded Jerusalem municipal boundaries in 1967. Today, the Israeli government is planning to build a huge Jewish settlement in the area of Abu Ghnaim. And so, we, the Palestinians living in the areas surrounding the mountain, demand to stop the development of this settlement on the land that is for us an important environmental, cultural, and historical site, as well as a heritage.



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Background

The slopes of Abu Ghnaim were planted with approximately 72,000 pine trees by the Jordanian and Israeli government between 1967 and 1972, as an application to the Jordanian Law of Plantation. Today, approximately 60,000 pine trees remain, as some trees were lost to cutting, burning, and pruning (Records of the Department of Agriculture).

Area

The threatened Abu Ghnaim area is approximately 2126.75 dunams; and is located at an elevation ranging between 600-775 (ARIJ GIS Unit, 1996).

Soil Structure

The area is dominated by Brown Rendzinas and Pal Rendzinas soil association. Soil structure is crumbly with a reddish to dark reddish brown color. The texture is loamy or clay, and about 30% is rocky (ARIJ fieldwork, 1996).

Climate

Rainfall: The mean annual rainfall ranges between 600 and 700 mm.

Temperature: The annual average temperature ranges between 15 and 19 Oc.

Humidity: Relative humidity is about 60% (ARIJ GIS Unit, 1996)

Vegetation

The major vegetation includes *Pinus halepensis*, *Pistacia lentiscus*, *Pistacia palaestina*, *Quercus ithaburensis*, *Ceratonia siliqua*, and *Ballotetalia undulatae* (ARIJ Fieldwork, 1996).

Historical And Archeological Significance

The land in Abu Ghnaim mountain and the surrounding areas are historically owned by Palestinians from Beit Sahour and the village of Umm Tuba. After the 1967 war, in which Israel occupied the West Bank -- including east Jerusalem, and Gaza Strip. Abu Ghnaim mountain and the surrounding areas were cut out from the Bethlehem District and illegally annexed to the Jerusalem municipal borders in 1967.



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Since the early centuries, various inhabitation existed in the pastoral area between Jerusalem and Bethlehem, known as the area of Abu Ghnaim. This area was itself the site of Byzantine Christian monastic activity. Abu Ghnaim is in the midst of an area intensively identified with the early Christians whose archeological remains have been under the Custodianship of the Franciscan Brothers since the middle ages.

Following is a brief list of the main historical sites identified in the Abu Ghnaim area ([Green, 1995](#)):

1. Cathisma (Bir Qadismu): Means "the place of sitting", located on the third milestone from Jerusalem to Bethlehem. The name refers to the belief that Mary dismounted precisely here before giving birth to Jesus. It was the site of an octagonal church and monastery said to have been built in the fifth century by a wealthy woman, who dedicated it to Saint Mary.
2. Khirbet Abu Ghnaim (St.Paul's Hill): Property of the Franciscans, who excavated it under V. Cordo in 1952. Near the village of Umm Tuba which in the Byzantine time was called Metopa. The site is also identified with the Monastery of Marinus named after Photinus in the fifth century.
3. Khirbet Luqa (Biyar Luqa; Umm Tuba): Excavated by V. Corbo for the Franciscans in 1954. Build by Marinus in Metopa, Byzantine Umm Tuba.
4. Bir El Qutt: A Georgian monastery of the sixth century dedicated to St. Theodore the Martyr. The Georgians had a long history in Palestine, though their churches eventually came under the Greek Orthodox Patriarch. Excavated by Corbo for the Franciscans in 1952-3.
5. Siyar El-Ghunam (Beit Sahour): Traditional site of the Shepherd's Field, east of Bethlehem. Excavated by C. Guarmani 1934. In 1951-2, V. Corbo cleared the entire complex on behalf of the Franciscans.

It is clear that this area, so suggestive of spiritual experimentation and so crucial to the history of early Christianity and the Byzantine church, must be preserved as a national park and a center of tourism and peace between Jerusalem and Bethlehem, the cities of holiness for Christians, Muslims, and Jews.

Land Ownership

Historically, all tracts of land in the Abu Ghnaim area were inherited through local Palestinian families from Bethlehem, Beit Sahour, and Umm Tuba. During the 1930's, Jewish companies and Banks attempted to purchase land tracts in the area. Today, several Israeli Banks, companies, and individuals claim to hold documented tracts of land at the summit of both Abu Ghnaim and Abu Alsokhour mountains (Jerusalem Municipality, 1995).



Chronology Of Events

1. After the 1967 war, the Israeli government formed a committee responsible for expanding the borders of Greater Jerusalem. As it was uninhabited and close to Jerusalem, Abu Ghnaim area was particularly attractive to the work of this committee. Therefore, the border drawn by the committee included all of the Abu Ghnaim area inside the borders of annexed 'United Jerusalem'.
2. For twenty years, alleged Jewish landowners, led by Mikor and Himnota companies, were planning to privately build a huge Jewish settlement in the area. They officially appealed to the government of Israel to expropriate all tracts of land at Abu Ghnaim area and asked the government to grant them the right to develop a settlement.
3. On June 6, 1991, the Israel Minister of Finance (Mr. Isaac Moda'ee) ordered the expropriation of the land tracts of Abu Ghnaim mountain. The expropriation order was based on the Lands Law of 1943 which authorizes the Minister to expropriate lands for Public use.
4. Landowners, Palestinian and Israeli, appealed to a special committee against the expropriation of their lands. While landowners were awaiting the decision of that committee, the expropriation procedure was finalized.
5. The Israeli government retreated from its previous agreement with Micor and Himnota companies to build a Jewish settlement on Abu Ghnaim, and initiated its own plans to develop the area and to build the planned Jewish settlement.
6. The new government attitudes pushed it into a legal conflict with Israeli landowners. The same company (Micor) who initiated the expropriation procedure, prepared counter plans to privately develop the same area and satisfy the needs of the Jewish public.
7. Based on the acts of the Minister of Finance and the counter plan, the Israeli Supreme Court of Justice issued a conditional verdict freezing the expropriation of the area, and ordered negotiations to start between Micor and the Israeli government.
8. By initiating direct negotiations and through offering large compensations, the Israeli government is trying to cancel the mentioned Supreme Court verdict. Both parties, the Israeli government and Micor company, are still engaged in a legal conflict in the Supreme court (Jerusalem Municipality, 1995).
9. After previously announcing the indefinite freezing of the Israeli settlement project on Abu Ghnaim in February 1996, the Israeli government currently decided to resume building the settlements.



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Conditions Surrounding Abu Ghnaim Area

Urbanization

Abu Ghnaim area is surrounded by Palestinian towns and villages which are highly overcrowded. These surrounding conditions makes the existence of Abu Ghnaim green area very crucial, as it forms a micro-climate filter for the whole area that is suffering from a high rate of deforestation.

Deforestation

Deforestation is a serious phenomena in the district of Bethlehem (including Beit Sahour and Umm Tuba). The lack of trees and the necessity of having green areas as that of Abu Ghnaim, pushed the Jordanian Government, who rarely got involved in such projects in the West Bank compared to the massive work they did in the East Bank, to plant this mountains (Cohen, 1995). Historically, most of the trees in the West Bank were uprooted by the Ottomans for the building of railways, and later by Israel for the building of settlements and settler roads. So, Abu Ghnaim area represents a forested area and an ecological reserve in an area characterized by a deteriorating environment and increasing desertification.

Most the developments that destroyed forests in and around Bethlehem District are the Israeli building of settlements in areas close to Abu Ghnaim, mainly Gilo, Har Gilo, and East Talpiyot. The Israeli developers are not concerned with replanting new trees near the destroyed ones nor do they have to protect the environment.

Landuse

Studying Table (1), one can recognize the great importance of Abu Ghnaim area in relation to the classification of landuse in the surrounding areas.

Landuse	Area (Dunams)	Percentage of land (%)
Palestinian Built-up Areas	20,000	3.5
Israeli Settlements	7,900	1.5
Closed Military Areas	310,000	54
Military Bases	4,00	<1



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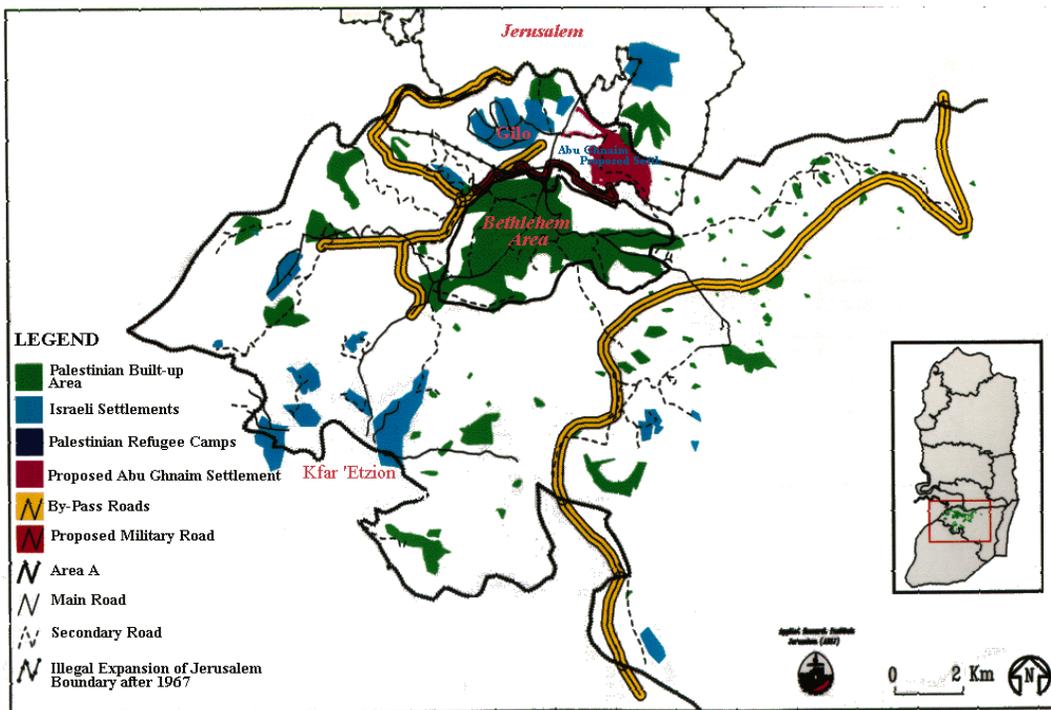
Nature Reserves	48,000	8.5
Forests	<3,800	<1
Cultivated Areas	43,000	7.5
Other	141,900	25
Total	575,000	100

Table Notes: "other" represent either unused land or land used for grazing, unofficial waste dumping and quarrying.

Source: ARIJ , 1995

The percentage of the green land is very small in comparison to other land uses. For example, the nature reserves, cultivated areas and forests are about 17%, whereas the closed military areas alone form are 54% of the total land. The lack of forests in the area makes the presence of green land very important. Abu Ghnaim area is one of these important areas that must be protected.

See also the Bethlehem district map which shows the new Israeli by-pass roads and Abu-Ghnaim site location.





The Consequences Of Deforestation Of Abu Ghnaim Mountain

Like all biodiversity 'hotspot areas', the degradation of Abu Ghnaim area will reach the point where it threatens the extinction of many organisms and, in the long-term, will deprive humankind of unique genetic resources. When forest degradation becomes serious, there may be little time to act to aid recovery as desertification happens quickly. If preventive action is not taken, the loss could well be total and permanent. Great caution is thus needed when mapping and assessing the degradation of forests. One must not lose sight of the fact that forests are dynamic systems, subject to a complex range of influences.

The major consequences of Abu Ghnaim settlement project are:

Species loss

The rapid loss of the Abu Ghnaim forest will directly and indirectly endanger the survival of a large proportion of the area's wildlife. The unique presence of Abu Ghnaim forest area makes the uprooting of its trees a disaster to the biological diversity of fauna and flora. This area is considered the only refuge to the wild types of certain birds, mammals, and reptiles, listed in Tables (2; 3; 4; and 5).

Table 2: Some of the Major Birds Inhabiting or Passing Through the Area

English Name	Scientific Name	Type	Habitat
Chukar Partridge	<i>Alectoris chukar</i>	Resident	Rocky, forested land
Common Bulbul	<i>Pycnonotus xanthopygos</i>	Resident	Gardens
Common Swallow	<i>Hirundo rustica</i>	Resident	Cultivated area
Black Bird	<i>Turdus merula</i>	Resident	Forested land
Golden Oriole	<i>Oriolus oriolus</i>	Vagrant	Common in parks
Golden Eagle	<i>Aquila chrysaetos</i>	Resident	Mountainous areas
Gos Hawk	<i>Accipiter gentilis</i>	Passage Visitor	Coniferous forests
Lesser Throat	<i>Sylvia curruca</i>	Winter Migrant	Nature reserves



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Little Owl	<i>Athene noctua</i>	Resident	Forested land
Mistle Thrush	<i>Trudus viscivorus</i>	Vagrant	Nature wood
Palm Dove	<i>Streptepelia senegalensis</i>	Resident	Pine trees
Raven	<i>Corax subcorax</i>	Resident	Common Mountains
Swift	<i>Apus apus</i>	Summer Visitor	Forested land
Syrian Wood Pecker	<i>Dendrocopos syriacus</i>	Resident	Forested land
Tawny Owl	<i>Strix aluco</i>	Resident	Forested land
Eagle Owl	<i>Bubo ascalaphus</i>	Resident	Coniferous forests
Robin Redbreast	<i>Erithacus rubecula</i>	Resident & Visitor	Coniferous forests
Source: ARIJ Fauna Database, and Field work, 1996			

Table 3: Some of the Major Mammals in the Area

English Name	Scientific Name	Type	Habitat
Bonden heimer's Pipistrelle	<i>Pipistrellus bodenheimeri</i>	Bats	Dense forests
Indian Crested Porcupine	<i>Hystrix indica indica</i>	Rodents	Forests, Rocky areas
Hare	<i>Lepus capensis syriaca</i>	Lagomorphs	Rocky mountains
Long-eared Bat	<i>Plecotus auritus</i>	Bats	Forests, Gardens
Common Noctule	<i>Nyctalus noctula</i>	Bats	Woodlands, Forests
Common Dormouse	<i>Eliamys quercines</i>	Rodents	Mountain forests
Forest Dormouse	<i>Drymysnitedela phrygies</i>	Rodents	Woodlands, Forests
Wild Cat	<i>Felis sylvestris</i>	Carnivores	Extensive forests



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Wolf	Canis lupus	Carnivores	Mountains
European Hedghog	Erinaccus europaeus concolor	Hedghog	Rural forests
Wagner's Gerbil	Gerbillus dasyurus	Rodents	Extensive forests
Source: ARIJ Fauna Database, and Field work, 1996			

Table 4: Some of the Major Reptiles in the Area

English Name	Scientific Name	Type	Habitat
Common Chameleon	Chamaeleo chamaeleon	Chamaeleo Forests	
Sheltopusik	Ophisaurus apodus	lizard	Grassy, forests
Source: ARIJ Fauna Database, and Field work, 1996			

Table 5: Some of the Major Flora in this Area

English Name	Scientific Name	Value	Habitat
Anatolian Orchis	Orchis anatolica	Herbicious	Jerusalem Mountains
Cyclamen	Cyclamen persicaum	Nutritionalvalue	Palestinain Mountains (Protected species)
Salvia	Salvia fruticosa	Medical value	All over Palestine
Jerusalem Spurge	Euphorbia hierosolymitana	Scenic View	Jerusalem Mountains
Oleander	Nerium oleander	Economical value	Palestine
Red poppy	Papaver rhalas	Scenic view	Southern parts
Paronychia	Paronychia palestina	Medical value	Palestinain Mountains
Hyoscymus	Hyoscyamus aureus	Medical value	Mountainous areas
Thymus	Marjorana syriaca	Medical value	Mountainous



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			areas
Chamomile Anthemis	Anthemis pseudocotula	Scenic view	Mountainous areas
Gundelia	Gundelia tournefortii	Nutritional value	Mountainous areas
* Add to these the vegetation mentioned on page(1).			
Source: ARIJ Flora Database, and Field work, 1996			

It is obvious from these tables that Abu Ghnaim area is a habitat for many important species and a source of food chains and genetic diversity. Not only it is a habitat of beneficial plants and animals, but it is also an important station to migrating birds and animals passing through. Abu Ghnaim area is considered a scenic view consisting of unique natural attractions which is visible from most Bethlehem areas and the neighboring communities. The consequences of uprooting or disturbing such an important ecosystem of Abu Ghnaim will be disastrous on the many different species depending completely on this land.

Ironically, Israel's Environmental Laws are very much concerned with protecting forested areas similar to that of Abu Ghnaim. The 1962 Forest Ordinance states that (Warchaiger, 1993):

The following activities are forbidden in a forest-reserve without a permit:

- To remove forest products (logs, charcoal, sap, or resin, gutta percha, tree oils, weeds, vines, thatch, leaves, fruit, seeds, roots, bark, fibers, nests or any other material or parts of trees and plants; truf, soil, or minerals);
- To uproot or burn a tree; to remove its bark or damage it in any other way;
- To burn grass or to start any fire without taking adequate measures to ensure that it will not spread; the Minister of Agriculture may forbid the lighting of any fires in certain areas or during certain seasons. In addition, smoking is forbidden in a forest-reserve from the fifteenth of March until the sixteenth of November each year;
- To graze livestock or to allow them to enter a forest area;
- To dig up the earth;
- To build a dam or otherwise stop the flow of any river or stream; and
- To live in, or to build any building in a forest reserve.



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Protected Trees

The following are declared protected trees from 1976 until 1996 In the whole country:

Quercus	Cistus	Salix	Laurus nobilis	Arbutus
Pistacia	Cercis siliguastrum	Acacia	Ficus carica	Zizphus
Pinus	Styrax officinalis	Eucalyptus	Phoenix dactylifera	Grevillea robusta
Tamarix	Phillyrea media	Casuarina	Ficus sycomorus	Schinus molle
Salvia	Populus	Cupressus	Cadrus	

This law is very clear and should be applied to Abu Ghniam, especially the item concerning the protected trees, where Pinus trees is the main green cover for Abu Ghnaim. In this consideration, the Israeli Jerusalem Municipality in its Town Planning Schemes for East Jerusalem, designated Abu Ghnaim and its vicinity as "Green Area". Green Areas are areas left for parks and protection of nature.

Climatic Change

Abu Ghnaim area with its planted Pinus trees is moderating the surrounding climate, reducing temperature fluctuation between day and night, maintaining humidity, reducing windspeed, and balancing atmospheric oxygen. The removal of such an extensive area of forest will reduce downwind rainfall by as much as 20% in a place which needs every single drop of water for survival. Also, forests generally reduce heat from the warming of the sun through evapotranspiration than do bare soil or grassland, so the destruction of this forest could alter the heat flux in the area (for example, the change in the surface temperature will be between 0.5 0C and 5.5 0C) (Barrow, 1991).

There is a clear relationship between rising global CO₂ levels and deforestation, particularly in the case of Abu Ghnaim area and its relation to its surrounding. Mature forests act as a sink for excess CO₂, converting CO₂ to oxygen. The destruction of this forest would cause a reduction in the CO₂ fixation that is done by its vegetation. The



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increase of the CO₂ level would have an impact on the local and global environment and its terrestrial biota.

Trees in general are the best tool for purifying and cleaning the atmosphere. Pinus trees filters dust and pollutants from the air. Studies done in California show that Pinus trees fix relatively high amount of CO₂ gas. One thousand Pinus trees can remove 800 Kg of CO₂ gas/year (Surkel et al., 1990). The 60,000 Pinus trees in Abu Ghnaim area fix 48,000 Kg of CO₂/year, removing a significant amount of pollutants generating from the social, physical, and chemical actions in the cities surrounding the mountain. Therefore, the presence of Pinus tree is very important to sustaining human survival in this area.

Impacts on soil erosion and hydrology

Root systems play an important role in protecting and enhancing both the physical and chemical properties of soil. **Root systems provide beneficial soil properties such as:**

- Soil aeration.
- Soil particles porosity.
- Enriching the organic matters.
- Soil improvement through breaking down soil parent materials to fertile soil.
- Preventing soil erosion.
- Nitrogen fixation.
- Increasing water holding capacity or increase soil water availability.

Serious deforestation can lead to increased erosion and downslope flooding, an environmental loss to healthy land.

Health impacts

A number of diseases can afflict humans or livestock in the neighboring areas where vegetation cover is altered. For example, altering vegetation may favor trypanosomiosis transmission through flies. Also, human breathing may be impacted by greater levels of dust pollution and CO₂, higher heat, less rain and increased wind. This, in turn, form a growing public health due to resulted complex environmental reasons.

Economic impacts

The loss of forests or woodlands brings great economic loss. Species may become extinct without their potential value being appraised; genetic resources are lost; loss of grass species and native herbs; and timber may be wasted. The value of forests is difficult to assess economically, and its economic costs could far exceeds any gain from cleared agricultural land, sales of timber, etc. In this specific case, it is clear that the loss of habitat would far exceed the economic benefits of building the Israeli settlements.



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Tourism impact

By degrading this forest, the scenic value of the region will decline, this negligence leads to a decrease in the rate of tourism activity, and so to the decrease in country incomes. In a country such as Palestine, tourism provides support in different fields such as: hotel management, wood carving, recreation resort, etc. Tourism funds can be used for environmental management and to bolster marginal land agriculture.

Also, the closeness of Abu Ghnaim to the Christian traditional sites especially the site of Shepherd's fields adds to the holiness of the wilderness setting. The removal of the trees and replacing them with modern houses and industrial parks will definitely destroy this holy image and greatly damage the holiness of the site. Moreover, Abu Ghnaim itself is considered the Shepherds' fields for some denominations, including the Mormon's. Such action will also create an undesired environmental impact and destroy a panorama which all people living in the area surrounding to the mountain (Bethlehem, Beit Sahour, and Umm Tuba) are very proud of.

The Governmental Plan

The government is planning to build a settlement on Abu Ghnaim mountain. **The development will be on two stages:**

- **Stage 1:** To build 4,500 housing units in high-rise structure, with all the required infrastructure (such as: roads, hotels, schools, market-places), on the 1851 Dunams expropriated (the land includes all the high lands and slopes of Abu Ghnaim and Abu-Alsokhour mountains).
- **Stage 2:** To build a similar number of housing units on Khirbit Mazmouriah, a plane land to the east of Abu Ghnaim and Abu Alsokhour mountains. Khirbit Mazmouriah is totally owned by Palestinians from Beit Sahour and is not yet expropriated. The plans might also include the construction of a huge central prison. Overall, the new settlement is expected to be able to accommodate thirty to forty thousands Jewish settlers.



This plan appears clear in the Map of Abu Ghnaim area (Municipality of Jerusalem , 1995) .

Landuse	Area in percentage (%)	Area in Duram
Industrial zone	3.44%	71.6
Forest area	16.75%	356.4
Roads	13.12%	277.6
Side road trees(Panorama)	4.84%	103.4
Public institutions	3.31%	70.6
Built-up area	37.50%	797.6
Gardens	4.95%	106
Public buildings	11.01%	234.2
Hotels and tourist village	1.35%	29
Private commercial zone	2.63%	56.2
Monuments	0.63%	13.65
Christian religious site	0.47%	10.5
Total	100%	2,126.75

The Consequences Of The Settlement Building

In addition to the previously mentioned important consequences, other issues of concern should be stated here. Conclusions can easily be drawn by comparing the building of settlement to the green land of Abu Ghnaim area. It is obvious that the forested area will not exceed 16.75% of the total, the rest of the land will be used for housing, commercial, and industrial activity. All these activities will increase the environmental degradation in an area that used to have clean microclimatic condition. The establishment of a new settlement will be a source of pollution such as noise, radiation, gases, dust, garbage, wastewater, air pollution, ... etc. These impacts can not be ignored and should be taken into consideration by the Israeli planners and environmentalists.



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Industrial wastes

Industry produces particularly toxic airborne pollutants such as copper, mercury or nickel. Consequently, extensive areas may suffer vegetation and soil damage. Also, a number of mineral processing and industrial activities cause sufficient pollution to drive down the value of nearby land, for example: heavy metals, toxic compounds, radioactivity pollution (Barrow, 1991).

Domestic wastes

It is planned that 37% of the proposed settlement land will be built-up, including approximately 9,000 housing units, in which over 30,000 Israeli settlers will live. The collection and disposal of domestic waste and sewage can cause many environmental problems, especially high levels of heavy metals contamination to the air and groundwater. This problem can expand, if the industrial impurities are mixed with domestic sewage residues (Barrow, 1991). It is expected, similar to most established Israeli settlements in the West Bank and Gaza Strip, that the generated sewage from this proposed settlements will be left to run in the open fields and valleys, thus creating great damage to the agriculture in the area and becoming a source of diseases.

Acid deposition

Acidification will increase especially when commercial, public institutions, industrial zones, and monuments will be replacing the forested area of Abu Ghnaim. The increase of acidity can lead to the damage of all types of sensitive living organisms including plants and animals; and will alter the soil characteristics. The CO₂ concentration will increase as the forested area will not exceed 16%. CO₂ reacts with rain in the atmosphere to form weak carbonic acids that contaminate the rain and makes it slightly acidic (Barrow, 1991).

It is obvious now that pollutants can be deposited much more once the settlement is established, particularly in comparison with the forestry lands existing now. If action is not taken, the loss will be total and permanent. So great caution is needed in mapping and assessing the degradation of this crucial area.

Conclusion

It is to our surprise that such a large project as Abu Ghnaim settlement, which will clearly bring devastating effect on the area and its vicinity, was approved by the Israeli Government without requesting or considering environmental impacts assessment. In fact, the protection and conservation of the environment were core items in the latest Oslo B agreement between the Israelis and the Palestinians, in which both parties are obliged to abide with.



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This new settlement will severely alter the environment of the area by removing the benefits the forest now provides and bringing domestic and industrial pollution. The loss of genetic diversity and the rare habitat that the Abu Ghniyam area provides is a serious degradation and loss for plants, animals, and human life. This forest area must not be disturbed in order to protect the tentative balance of nature and society.



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