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Palestinian landscape and the Israeli–Palestinian conflict

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Palestine, as it stands today, consists of two physically separated land masses, namely the West Bank (including East Jerusalem) and Gaza Strip with a total area of 5661 km² and 362 km², respectively. Although small in size, its unique location at the crossroads of three continents has made Palestine an environmental melting pot for the flora and fauna of Africa, Asia and Europe. This natural diversity has become an innocent bystander to the destructive practices of the Israeli occupation. This paper examines the Israeli practices that violate the environmental rights of the Palestinians. Sustainable peace is only possible through just and equitable resource use between Israelis and Palestinians.

Keywords: Israeli occupation; Environmental degradation; Environmental rights

1. Introduction

World attention has focused on the political conflict between Israelis and Palestinians with less attention to the environment of the area. While environmental problems do not recognise political, racial or religious boundaries, there is an organic relationship between environmental degradation in the Occupied Palestinian Territory (OPT) and the political conflict. The OPT differs from other countries as it is characterised by the presence of two contradictory planning schemes that aim at exploiting its natural resources to serve two peoples: the endogenous Palestinian population and the Israeli settlers and army, which has controlled the area since 1967.

The fragile Palestinian environment has been the first casualty of this reality. It has been exposed to pressures ensuing from the activities of the Palestinian population on the one hand, and from the practices of the Israeli Occupation on the other hand, which have systematically impeded Palestinian economic development and significantly contributed to changing the environmental landscape of the OPT.

Lack of sovereignty over land and natural resources has denied the Palestinian people their rights to regulate land use and to manage their own resources, without exceeding the carrying capacity of the land. Without the ability to regulate land use over a contiguous area, natural ecosystems cannot be maintained, the status of the environment cannot be monitored, and environmental protection cannot be implemented and enforced. On the

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other hand, the plans of the Israeli Occupation in the OPT have been geared by political factors, aiming at grabbing as much as possible of the Palestinian land to implement the Israeli colonising strategy and to change the demographic status.

The Israeli Occupying Authorities have focused on exploiting the Palestinian natural resources to ensure a good standard of living for the Israeli settlers. They have used the Palestinian water resources far and beyond any rational and equitable system of allocation. They have imposed restrictions on the Palestinians’ water use in all sectors of life. In addition, they have hindered the economic development of the Palestinian people and damaged their physical environment. Furthermore, the Israeli Occupying Authorities have badly neglected the management of waste in the OPT. The geographical discontinuity, created in the lands under Palestinian control through the implementation of the Israeli Segregation Plans and the construction of the Segregation Wall, has hindered the implementation of several centralised projects related to waste management. Untreated sewage streams flow unchecked in wadis. Not only is pollution causing health problems; it is also causing visual distortion to the landscape and decreasing the aesthetic value of the living and natural environment. It has also worsened the land deterioration problem. The existence of accessible and inaccessible areas for Palestinians has also made the management and conservation of natural resources a very difficult job. The prolonged years of the Israeli Occupation have converted large areas in the Palestinian Territory to deserts. Indicators of desertification appear clearly in the Eastern Slopes, which are characterised by steep slopes that have limited the agricultural activity in such zones to animal grazing. The closure of 85% of these zones by the Israeli Occupying Authorities for military purposes, has led to severe overgrazing of the remaining area accessible to the Palestinian herders. Overgrazing has resulted in the loss of the vegetation cover, soil erosion problems, and intensive desertification [1].

The practices of the Israeli Occupation and control used by the Israeli Authorities have systematically hindered the development of the Palestinians, helped to increase poverty among them, damaged the environment in the process and resulted in major physical impediments towards accomplishing sustainable development in the OPT. Environmental problems, such as land degradation, deterioration of biodiversity, depletion of water resources, deterioration of water quality, air pollution, etc. have dramatically accelerated during the Israeli Military Occupation since 1967.

2. The status of the environment in the OPT

2.1. Location

The OPT comprises two physically separated land masses which are the Gaza Strip and the West Bank (figure 1). Their total area including the area of the Dead Sea reaches approximately 6221 km² constituting around 23% of the total area of historic Palestine which is estimated at 27,000 km² [1]. The Gaza Strip is a coastal zone located at the eastern extreme of the Mediterranean Sea and on the edge of the Sinai Desert. It covers an area of 362 km² and is surrounded by Israel from the north and east, Egypt from the south and the Mediterranean Sea from the west. The West Bank, which occupies an area of 5856 km² (including the Dead Sea area), is surrounded by Israel from the west, south and north, and the Jordan River from the east.
2.2. Water resources

Water resources in the OPT consist mainly of surface and groundwater resources. The most stable surface water resource is the Jordan River. Nevertheless, since the Israeli occupation
of the Palestinian Territory, groundwater resources have become the major source of fresh water supply in the OPT as the Palestinians were deprived of their rightful share in the Jordan River by the Israelis [2].

Most of the renewable water resources in the East Mediterranean region, particularly in Turkey, Iraq, Syria, Lebanon, Jordan, Palestine and Israel, are transboundary and shared between these countries. These resources mainly consist of surface water resources stemming from the Tigris-Euphrates and the Jordan River systems as well as groundwater resources represented by the West Bank Aquifer on the western side of the Jordan Rift Valley and the Coastal Aquifer on the south-eastern side of the Mediterranean Sea [3].

During the last five decades, several plans were prepared to divide the Jordan River waters among the riparian countries. The main plans are those of Lowdermilk (1944) and Johnston. Lowdermilk proposed to use the Dan, Zarqa, Banias, and Yarmouk Rivers in Jordan and the Hasbani River in Lebanon as contributors to irrigate the Jordan Valley. Furthermore, the Litani should feed an artificial lake in northern Palestine from where water should be pumped to the Negev Desert in southern Palestine. But, the United States under Eisenhower did not agree to Israel’s use of half or more of the flow of the Litani [4].

The Johnston Plan was the most favourable in the view of the technical committees of the riparian countries, as it reflected an equitable allocation of the Jordan River waters among the riparians including the Palestinians. It called for the construction of a West Ghor Canal to provide the Palestinians with their share, estimated to be 250 MCM per year [2]. Table 1 outlines the allocation of the Jordan River waters according to the Johnston Plan. However, the plan was never ratified and the current use of the Jordan River waters does not comply with it as can be noted in table 1 [5,6]. Since the Israeli occupation of the West Bank and Gaza Strip in 1967, Palestinians have been denied access to the Jordan River waters through the Israeli restrictions imposed on water resources and on the use of lands located along the river as they have been declared closed military areas.

In the West Bank, groundwater is in three major drainage basins, viz., the Western Basin, the North-Eastern Basin and the Eastern Basin; whereas, in the Gaza Strip, groundwater is available in the shallow sandstone coastal aquifer. The renewable water quantity in the West Bank aquifer system is estimated at 679 MCM based on the data recognised in Article 40 under the Oslo II Accord [7]. The Western Basin is the largest, with approximately 80% of the recharge area located within the West Bank boundaries, whereas 80% of the storage area is located within the Israeli borders. As such, this basin is considered shared between the OPT and Israel. For the North-Eastern basin the majority of the recharge area is within West Bank boundaries. Unlike the Western and North-Eastern basin, the Eastern Basin lies completely within the West Bank boundaries.

Regardless of this reality Israel exploits the largest portion of water from the West Bank aquifer systems. Figure 2 shows the estimated recharge of the West Bank aquifers and the respective amounts of water used by the Israelis and Palestinians [8].

<table>
<thead>
<tr>
<th>Country</th>
<th>First Johnston Plan</th>
<th>Revised Johnston Plan</th>
<th>Present usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syria</td>
<td>50</td>
<td>132</td>
<td>153</td>
</tr>
<tr>
<td>Lebanon</td>
<td>–</td>
<td>35</td>
<td>5–10</td>
</tr>
<tr>
<td>Jordan</td>
<td>829</td>
<td>720</td>
<td>480</td>
</tr>
<tr>
<td>Israel</td>
<td>426</td>
<td>375–475</td>
<td>647</td>
</tr>
</tbody>
</table>
even worse due to the over-abstraction of the coastal aquifer, which has led to a decline to critical levels in both the water levels and the quality of the water. The natural annual sustainable yield of the coastal aquifer underlying Gaza is estimated at about 55 MCM. This is around 15% of the total yield of the shared aquifer, which is estimated at 360–420 MCM. In recent years the aquifer had been over-pumped at the rate of more than 155 MCM [9] annually resulting in a lowering of the ground water table below sea level and saline water intrusion in many areas. Now 5–10% of the aquifer underlying Gaza is drinkable.

2.3. Biodiversity

The location of the OPT at the crossroads of Africa, Asia and Europe has allowed for a wide range of species to settle and evolve within its borders. Furthermore, the diverse topographical features, climate and soil distribution within such a small geographical area have provided many ecological niches for a rich biodiversity of flora and fauna. The vegetation cover in the OPT consists of a variety of plant formations, ranging from dense forests to thin patches of desert herbs, passing through different forms of woodland, such as maquis, garrigue and batha. The OPT comprises five main agro-ecological zones: the Jordan Valley, the Eastern Slopes, the Central Highlands and the Semi-coastal Plain (West Bank), and the Coastal Plain (Gaza Strip).

There are 93 major forests in the West Bank and 13 in the Gaza Strip, covering about 230 km² and 2 km², respectively. Forests cover approximately 4% of the total area of the West Bank and 0.6% of the Gaza Strip. In addition, the total area of nature reserves in the West Bank and Gaza Strip is about 774 km², forming 12.8% of the total area of the OPT. The OPT contain 2076 species of plants [1]. Some 1959 species (in 115 families) are growing in the West Bank and 1290 species (in 105 families) are growing in the Gaza Strip. There are 102 endemic species (in 28 families), forming 5% of the total species, of which 12% are rare endemic species. As a result of its geographical position, the OPT has a vast variety of wildlife. There are an estimated 30,904 species [1,10], of which 30,000 are invertebrates, 427 birds, 297 fish, 92 mammals, 81 reptiles and seven amphibians [1,10].
2.4. The geopolitical situation

In 1993, the PLO signed the Oslo Accords with the State of Israel, accepting just 22% of historic Palestine as the basis for a Palestinian state. The ‘Oslo II’ Interim agreement, signed in 1995, sets out the interim stage for Palestinian Autonomy in the West Bank and Gaza Strip, pending ‘final status negotiations’ which were scheduled to begin in 1996 and end by 1999. The OPT was divided into Areas ‘A’, ‘B’, and ‘C’, which designate varying levels of control (table 2).

The jagged distribution of areas ‘A’, ‘B’, ‘C’, has scattered the OPT into isolated cantons, separated from one another and from the Gaza Strip. It was agreed that the Strip would have a safe connecting route with the West Bank [7], but the Israelis did not allow it to function as agreed at any time. Moreover, the issue of Israeli settlements existing in violation of international laws and United Nations Security Council resolutions; along with the issues of borders, water, Jerusalem and the refugees’ Right of Return were deferred to final status negotiations. Nevertheless, construction of new Israeli settlements and expansion of existing ones have continued until now, ignoring the Oslo agreement. This violation is in addition to the boundary manipulation by Israel with the continuing construction of the Segregation Wall [11].

The Israeli colonising activities in the OPT have been accompanied by confiscation of thousand of dunums of Palestinian land. After signing the Declaration of Principles in 1993, the Israeli Occupation Forces (IOF) confiscated 642.6 km² of Palestinian land in the West Bank [12]. Today 199 Israeli settlements are built all over the West Bank, all of which have a total area of 189 km² [12]. This figure does not include military complexes, closed military areas, and bypass roads. Master plans for these settlements, however, occupy a much larger area, amounting to 485 km² (8%) of the West Bank. In addition to that, in 1996, the Israeli settlers instigated a new phenomenon which later became known as ‘outposts’. It is simply identified as a group of Israeli settlers taking control of Palestinian hilltops located in close proximity to an existing Israeli settlement [13].

According to the ARIJ database there are 232 locations for outposts in the West Bank. Moreover, the Israelis in their planning schemes focused on creating irreversible foundations and structures to put an end to any prospect of a viable Palestinian State to be established over the entire OPT. Among the irreversible items are the bypass roads, which were constructed to link the Israeli colonies with one another and with Israel, while circumventing Palestinian built-up areas. Table 3 provides a description of the Israeli colonising activities that represent the core of the Israeli planning schemes in the OPT [12].

The continuous construction of Israeli colonies and bypass roads all over the Palestinian land has contributed to the segregation of the West Bank into 64 isolated areas. With slight

<table>
<thead>
<tr>
<th>Definition</th>
<th>%</th>
<th>Area (km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Israeli army has pulled out fully and Palestinians hold all responsibilities for internal security and public order</td>
<td>17.7</td>
<td>1004.8 Area A</td>
</tr>
<tr>
<td>Palestinians have full control over the civil administration and Israel continues to have overriding responsibility for security</td>
<td>18.3</td>
<td>1035.4 Area B</td>
</tr>
<tr>
<td>The Palestinians have responsibility for civil life such as economics, health and education; however, Israel retains full control over security and administration related to territory</td>
<td>61.1</td>
<td>3456.4 Area C</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>164.5 Nature Reserve</td>
</tr>
</tbody>
</table>
adjustments to the Israeli Security Zone Plan, the Israeli Authorities started on June 2002 their policy of unilateral segregation within the OPT by establishing a Segregation Zone along the western terrains of the occupied West Bank (figure 3).

The Israeli Segregation Zone covers sizeable and significant land areas rich with natural resources as it runs along through the western part of the West Bank from north to south; grabbing the most fertile agricultural lands, isolating Palestinian communities in enclaves, undermining the territorial contiguity between the Palestinian villages and cities, controlling the natural resources, and encapsulating most of the Israeli settlements. Table 4 shows classification of isolated Palestinian land within the western segregation zone. The fragmentation and segregation of Palestinian land have increased the problem of geographical discontinuity with the Palestinian Territory and limited the possibility of achieving comprehensive development planning [1].

3. Israeli violations against the Palestinian environment

The OPT represents a striking example for the corresponding relationship that exists between environmental degradation and political conflict (figure 4). The Israeli occupation has contributed to changing the environmental landscape of the OPT during the occupation period through many factors: the strict control over Palestinian land, land confiscation for implementing the Israeli colonisation policy and unilateral segregation plan, control over water resources, and the exploitation of natural resources. All these practices have contributed to the deterioration of the environment. The absence of Palestinian sovereignty over natural resources has prevented the Palestinians from achieving sustainable development and sound environmental management in the OPT. Palestinians lack determination of land use over a continuous geographical area. This has impeded the maintenance of natural ecosystems, monitoring the status of environment and taking the necessary measures for environmental protection. These practices are further intensified by the direct violations of the Israeli colonists living in the OPT against the Palestinian environment.

3.1. Depletion of water resources

In spite of the availability of fresh water resources in the OPT, the Palestinian water rights have been violated by Israel and consequently Palestinians have not had adequate access to potable water or water for agricultural and industrial purposes. Regarding the Palestinian

<table>
<thead>
<tr>
<th>Percentage (of total area of the West Bank of which, 702 km²)</th>
<th>Area (in km²)</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>8%</td>
<td>485</td>
<td>Settlements Master Plan</td>
</tr>
<tr>
<td>1%</td>
<td>49</td>
<td>Israeli Military Base</td>
</tr>
<tr>
<td>18%</td>
<td>999</td>
<td>Closed Military Area including parts declared nature reserve</td>
</tr>
<tr>
<td>2%</td>
<td>112</td>
<td>Bypass roads</td>
</tr>
<tr>
<td>12%</td>
<td>417</td>
<td>Israeli Proclaimed Nature Reserve Areas</td>
</tr>
<tr>
<td>41%</td>
<td>2336</td>
<td>Total of Occupied West Bank Area</td>
</tr>
</tbody>
</table>
water rights in the Jordan River, the riparian Palestinians have been deprived of their right in the Jordan River since 1967 when Israel began its occupation of the West Bank and Gaza Strip. The Jordan River water resources, which are considered to be shared among
Israel, Lebanon, Syria, Jordan and Palestine, have never been distributed based on the accepted legal understanding [14]. The international agreements between co-riparians of the Jordan River basin are curtailed by Israel’s predominant power over the shared water resources in the region, as illustrated in table 5 [15]. These international agreements include: i) three agreements between the British and French governments (1920 to 1926); ii) the Syria and Jordan agreements (1953 and 1987); iii) the Syria and Lebanon agreement (1994); iv) the Peace Treaty between Israel and Jordan (1994); v) the Declaration of Principles from 1993 and the Interim Agreement of 1995 between the Palestine Liberation Organisation and Israel; and vi) the so-called tripartite agreement of 1996 between representatives of Palestine, Israel and Jordan, relating mainly to the development of new water [16].

Until the 1950s, the Jordan River had an annual follow of 1320 MCM discharging into the Dead Sea [2]. Today only 50 MCM of highly saline water of poor quality ends up as surface water run-off into the Dead Sea, due to the Israel’s unilateral diversion of the Jordan River waters to the Negev desert and other diversion projects.

The most significant projects carried out in the Jordan River Basin are the Israeli National Water Carrier through which Israel diverts the water from Lake Tiberias to Negev desert and the Jordanian East Ghor Canal.
There is much concern that the level of the Dead Sea is dropping due to the constant decrease of input from the Jordan River and increased use of other sources such as natural springs that supply water to the Dead Sea. The surface area of the Dead Sea has shrunk by around 30% in the past 20 years [17].

Concerning groundwater, the Israelis are currently using about 82% of the annual safe yield of the groundwater basins to meet 25% of their water needs, whereas the Palestinians in the West Bank consume about 18% of the annual safe yield. This extremely disproportionate use of water resources illustrates Israel’s infringement of the treaties between Palestine and Israel. During the last 10 years Palestinian abstraction from the West bank aquifer systems has declined from 138 MCM in 1999 to 113 MCM in the year 2007 as outlined in figure 5 [8].

As a result of Israeli water policy and practices in the OPT, the total amount of water available for about 2.4 million Palestinian inhabitants in the West Bank is 105.9 MCM for their domestic, industrial and agricultural needs. For comparison, the total amount of water available for about 7.1 million Israelis is 1408.6 MCM, in addition to 727 MCM from other sources (i.e. storm and brackish water) [8]. On a per capita basis, water consumption by Palestinians is approximately 73 litres per capita per day (l/c/d) compared to about 300 l/c/d for Israelis. Therefore, the per capita consumption in Israel is four to five times higher than the Palestinian per capita consumption in the OPT. This per capita figure represents only about a quarter of what is recommended by the World Health Organisation (WHO) (figure 6). Another example that illustrates the depletion of Palestinian water by the Israelis is that the 580,000 colonists residing in the West Bank including East Jerusalem consume

<table>
<thead>
<tr>
<th>Country</th>
<th>Water quantity MCM/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lebanon</td>
<td>5</td>
</tr>
<tr>
<td>Syria</td>
<td>160</td>
</tr>
<tr>
<td>Jordan</td>
<td>235</td>
</tr>
<tr>
<td>Israel</td>
<td>870</td>
</tr>
<tr>
<td>OPT</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 5. Use of Jordan River

![Palestinian withdrawal form the West Bank aquifer systems 1999, 2007](image)

Figure 5. Palestinian withdrawal for the West Bank Aquifer systems 1999 and 2007.
on average 369 L/c/d. Furthermore, the Israeli colonies are regularly provided with water while more than 203 Palestinian localities are not served by the water network. Even those connected to the network suffer from frequent water shortages resulting in worse health conditions [18]. In fact, the Palestinians in the rural communities of the West Bank survive on far less than even the average 70 litres; in some cases the per capita water use may not exceed 20 litres per day [19].

Among the recent Israeli schemes affecting the water resources in the West Bank are the fragmentation of the West Bank into several security zones and the erection of the Segregation Wall, begun in 2002. The construction of the wall has not only confiscated Palestinian lands, but also has isolated several Palestinian groundwater wells and springs used for domestic and agricultural purposes. This will result in cutting off the Palestinians from these water supply sources or at least imposing more restrictions on their use. The construction of the Segregation Wall has isolated 29 wells with an annual discharge of 5.5 MCM. In the Eastern segregation zone, the Palestinians depend upon about 165 artesian wells [12].

3.2. Pressures on biodiversity and desertification

The Israeli occupation authorities have both grabbed the Palestinian lands from their owners, and have also practised several violations in the West Bank and Gaza Strip: razing agricultural lands, uprooting trees, causing great losses to the Palestinian agricultural sector. Figure 7 illustrates the number of trees uprooted by the Israeli Occupation forces [20]. This reduction of woodland areas has adversely affected the number of PGRs growing as part of the forest system in the OPT.

Moreover, the Israeli Occupation contributes greatly to the decrease in the forest area in the OPT, by taking land in the forested area for colonist settlements, military bases and bypass roads. One case in particular illustrates this impact on forests. This is the deforestation of Abu Ghneim Mountain in the Bethlehem governorate to construct Har Homa.
Settlement. Jabal (mountain) Abu Ghneim, which sits opposite the north side of the town of Beit Sahour to the south of Um-Tuba, was classified by the illegal Israeli municipality of Jerusalem as a ‘green area’ in order to preserve its ecological diversity.

This point of illegality needs to be explained. After the Israeli occupation of the West Bank, including East Jerusalem, Israel acted illegally – in violation of international law – to annex the occupied eastern part of Jerusalem, and then redrew its boundary from 6.5 km² (the area of the eastern part of Jerusalem city prior to the 1967 war) to 71 km². This is not a trivial annexation in land area, let alone its cultural and political dimensions! According to UN Resolution 242, East Jerusalem is part of the territories occupied by Israel in the 1967 war and it is illegal for an occupying state to move parts of its population to the occupied territory or take any actions that alter the geographic characteristics of the land unless it is considered absolutely essential for security needs and as long as it is done in a temporary manner. Hence, all the Israeli municipalities that governed the eastern part of the city of Jerusalem and actions and activities carried out since 5 June 1967 are illegal under international law.

That classification as a ‘green area’ only lasted until 1991, when the Israeli Government approved the expropriation of the land and re-zoned it as a building area. At that time, the decision to build Har Homa settlement was sanctioned. The former Prime Minister Shimon Peres gave approval to the building of this settlement during the transition period: 4 November 1995–18 June 1996. This followed the assassination of Yitzak Rabin. Israel then decided to postpone the construction to avoid any anticipated reaction from the Palestinians.

The next Israeli Prime Minister, Binyamin Netanyahu, decided to go through with the construction plans. In March 1997, the Israeli Government announced it would build Har Homa settlement at the location of Jabal Abu Ghneim with 6500 housing units to accommodate 30,000+ Israeli settlers. The first building phase was for 3500 units, 500 of which were financed by the Israeli government; private investors financed the rest. As a result, more than 60,000 pine trees were uprooted and an entire ecosystem was destroyed [21].

At present, Har Homa settlement occupies 2205 dunums. This does not seem to be the intended maximum extent. The Israeli ‘Master Plan Jerusalem 2000’ [22] shows

Figure 7. Number of trees uprooted by the Israeli occupation forces during the period from 1994 to 2010.
concentration in development plans in Israeli dominated areas in East Jerusalem. This includes Har Homa settlements where two neighbourhoods are in prospect. When built, these two additions will mean that Har Homa will occupy 3285 dunums [23].

Figure 8 shows Abu Ghneim Mountain before and after destruction. It is clear that the construction of Har Homa resulted in the complete destruction of Abu Ghneim planted forest and the extinction of many endemic plants and animals.

Palestinian environmentalists also express concerns over the potential impacts of the continuing development of the segregation zone along the western and eastern parts of the West Bank. In view of the size of land confiscated from the West Bank, and thus the far greater development pressures, the segregation zone impedes efforts to conserve representative ecosystems, landscapes and habitat corridors especially between protect areas and forests. The segregation zone threatens the biodiversity in the OPT. It hinders the movement of terrestrial fauna, by fragmentation of ecosystems and habitats in both Israel and the West Bank and by cutting natural ecological corridors.

Furthermore, the segregation zone has fragmented agro-ecosystems and annexed them to Israel including their valuable water, fauna and flora resources and arable lands. Habitat fragmentation as a result of the Segregation Wall may prevent many species of mammals from travelling to their sources of food and mating sites, which may endanger the survival of specific populations or creation of new sub-populations. This will increase the probability of Palestinian natural heritage loss by impacting the existence of a large number of plant and animal species.

Figure 8. The Deforestation of Abu Ghneim Mountain.
The segregation zone also causes strip clearing of land including forest and other vegetation covers. Almost 49 forested areas are included in the segregation zone. Up to 32,916 dunums of forested area are included in the western segregation zone and 1486 dunums in the eastern segregation zone, forming 42.7% of the total forested area of the West Bank [20]. This strengthens the long-term trend of degradation of planted and natural forests in the area. More than 31 protected areas are also included in the Israeli segregation zones, forming 71% of its total area, to which Palestinians cannot have access, not even for management purposes [20].

This threatens the existence of unique vegetation cover through isolating such sites from their surrounding environments and their habitats, in addition to the risk of threatening the plant species that grow naturally in the same area. The vegetation cover in the eastern part of the segregation zone is characterised with a diversity of geographical territories. Furthermore, the eastern segregation zone contains more than 80% of the Palestinian rangelands areas where the herders usually take their sheep and goats to graze. If this grazing area is reduced, the remaining rangeland will be overgrazed. There will be accelerated land degradation. Green cover biomass and grazing capacity will both be reduced. Desertification will follow [24].

3.3. Pollution resulting from the Israeli colonies and industrial zones

Palestinians object to the Israeli settlements and industrial zones in the OPT both because they are illegal and because they threaten the sustainability of Palestinian natural resources and the environment. The domestic wastewater generated annually by the 580,000 Israeli colonists living in the West Bank including East Jerusalem amounts to 51 MCM per year [25]. Thus, the wastewater generated by Israeli colonists – though fewer in number – exceeds that generated by Palestinians in the West Bank – 44.8 MCM per year [26]. This excess is explained by the higher levels of affluence enjoyed by the Israelis: they consume more water for domestic purposes. A rough analogy: the impact of Israel on resources of Palestinians is comparable to the impact of Americans on resources of the planet. Most Israeli colonies are sited on hill tops and they often allow the generated wastewater to run untreated into nearby wadis and Palestinian agricultural lands which results in the pollution of these lands [27]. For example, the wastewater generated in the Ariel settlement, located in the Salfit governorate, is discharged untreated into Palestinian agricultural lands and passes near a domestic artesian well as shown in figure 9 [28]. It is worth mentioning that these practices pose a great threat to the groundwater resources in the area as most of the Israeli settlements overlie the recharge areas of the West Bank Aquifer systems.

In regard to solid waste, the Israeli settlements generate a considerable amount. In the West Bank, around 80% of the solid waste generated by the colonists is dumped at dumping sites located within the West Bank including Abu Dis site in the Jerusalem governorate, Al Bireh site in the Ramallah governorate, Yatta site in the Hebron governorate, and Tovlan site in the Jericho governorate. These dumping sites represent environmental disasters as they are not designed as sanitary landfills and receive large quantities of solid waste from both Israeli colonists and Palestinians.

Israel has constructed industrial zones within the West Bank and relocated several polluting industries from its areas into Palestinian areas close to the Israeli–Palestinian borders [27,29]. In most cases the reason behind the relocation of such industries is the complaints of the Israeli residents about the impacts of the industries on their lives. It is worth mentioning that the Israeli industrial plants located in the OPT have never applied or enforced
any of the Israeli environmental laws but have added more pressure on the Palestinian environment due to the discharge of untreated industrial waste (which includes hazardous waste) into the environment. According to Israeli law (Ministry of Environmental Protection, Model Local Authorities by-law), no industrial plant can be approved until it ensures adequate treatment of its industrial wastewater prior to discharge into the municipal system [30]. But, by extraordinary self-contradiction, this law is not strictly applied in the Israeli Industrial Parks located in the West Bank [27]. The evidence for this is the generated industrial wastewater from Barqan Park which is discharged untreated into the Palestinian land. This wastewater goes into the nearby Wadi, in spite of the risks’ including those to public health and groundwater [31]. The effluent poses a great threat to the health of Palestinians living in nearby villages’ as well as to the groundwater, since the industrial zone overlies the highly permeable recharge areas of the Western basin of the West Bank Aquifer.

Israel’s transgressions against legally binding environmental responsibilities can also be found in its burial of hazardous solid waste on Palestinian lands. According to the Palestinian Quality Environment Authority (PQEA) report in March 2006 [32], Israeli authorities are still smuggling solid waste and poisonous substances from industry inside Israel into the OPT, particularly into the southern part of the West Bank. The Israelis are also designating special waste disposal locations on Palestinian land. In 2005 there was an attempt to designate the Abu Shusha brick-breaker factory (near the Deir Sharaf village, northwest of the West Bank city of Nablus), as a waste disposal site. Furthermore, Israeli Occupation Forces (IOF) have used Palestinian lands for the burial of zinc, nickel, radioactive substances and industrial wastes for many years. There are also fears that Israel buried nuclear materials to the east of Yatta village.
4. Conclusions and recommendations

The Israeli–Palestinian conflict has negatively affected all elements of the natural environment including the quality of human life. The status of the environment has a fundamental role in determining the viability of a Palestinian state, since it provides the physical context in which society exists and it determines the extent to which society can be sustainable. Restrictions on the available resources, poor management and unsustainable practices have resulted in the radical transformation of the Palestinian environment, degradation of its ecosystems, and depletion of its natural resources. While most Palestinians struggle for survival and therefore rarely consider environmental protection as a personal priority, the environmental damages caused by the conflict will affect them in their lifetime by requiring much effort, time and money to reverse or mitigate the negative effects of a deteriorated environment. Moreover, since the future of the OPT is uncertain, it is clear that the environment will continue to deteriorate. This is because the Occupation places massive restrictions on the capacity for sustainable development. Environmental problems do not recognise political borders or geopolitical boundaries and many of the ones faced by Israel and the OPT are transboundary. There must also be transboundary solutions.

References


