

**Water Resources Management**  
**In The**  
**Occupied Palestinian Territories**

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## Chapter I: Introduction

Water in the Middle East is a compelling issue. It is critical for the future because without it human activity comes to a stop. As a result, the policies that deal with water resources management have a significant impact on other factors of production – namely, the economic, social, and political status of the land. Furthermore, the main importance of water for human survival and economic growth, along with the fact of its rapid depletion in the region, makes it an issue of great political and economic significance. Thus, when one considers that there is the demand for water has outstripped supply for both Palestinians and Israelis in the area, all the policies and regulations formulated for water resources management assume a level of sensitivity that cannot be ignored. The deficit is sure to grow as populations increase and economies grow. One study regarding the availability of water resources in that particular region is noteworthy. M. Ionides, a British employee of the Trans-Jordanian government, conducted it in 1937. The survey focussed specifically on the Jordan Valley and proposed a diversion scheme for the Yarmouk River, which was later adopted in part by the Jordanian government. The main finding of the survey was that there were insufficient water resources in the river to sustain a Jewish state.<sup>1</sup>

The main aim of this paper is to show that past and existing Israeli policies on water resources management in the Occupied Territories (OT) will block any opportunity for

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<sup>1</sup> Brooks and Lonergan (1994), p. 122.

sustainable development in Palestine. Whatever the scope of the Arab Israeli conflict, yesterday or today – immigration, refugees, settlements, Jerusalem, history – control over the land and its resources has always been central (table A). A point that is seldom recognised is that water plays a major role in Israel's territorial claims and thus will affect Palestinian access to water.<sup>2</sup>

This study is divided into five chapters. Chapter II will discuss how the problems of water supply in the area did not begin under Israeli rule but before it, when the unregulated use of water produced chronic over-pumping and depletion of local supplies. Starting with the Egyptians who considered water to be a private resource of which individuals could claim ownership, a system based on customary law ensured that everyone had the right to use water for any purpose. However, after the 1967 war, when Israel occupied the Gaza Strip and the West Bank, Israel's national water carrier Mekorot took control over all surface and underground water in the OT.<sup>3</sup> Since then, the problem of water supply has been exacerbated by Israel's own, often urgent requirement to supplement its own water resources.

The early Zionist immigrants in the 1900's perceived water as an integral economic resource that needed to be brought under their control in order to maintain large-scale irrigation, which was a prerequisite for the absorption of a large number of immigrants and the establishment of an economically viable Jewish entity. As a result, the determination to gain absolute control over water resources at the expense of the indigenous populations of the OT was a policy formulated in the name of national

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<sup>2</sup> El-Musa (1996), p. 70.

<sup>3</sup> Roy (1995), p. 162.

survival. Furthermore, one important factor to keep in mind is that Palestine lacked coal or other fossil fuels, so water was seen as very integral to generating electricity for powering industry.

Chapter III of this study will deal with the facts surrounding Israel's policy toward water resources management and their effects on Palestinian economy, especially in the agricultural sector. It will show how Israel's exploitive and restrictive policies towards water allocation, among other policies, have hampered the agricultural development in the OT. The Israeli authorities are considered to be the main factor responsible for this situation. Their aim is to deter economic growth and to discourage investment. This could be seen in the distortion of the role and the role of the production sectors in amassing of the Gross Domestic Product. In the case of the agricultural sector, table 1 shows this trend. In agriculture, there is an annual surplus of some kinds of vegetables as opposed to an acute shortage of other vegetables and crops. This is because Palestinians are prevented from engaging in any general planning and supervision of agricultural production whereas the Israeli agricultural crops are dumped on the Palestinian market.

Also, the difference between the Arab majority and the Jewish settler community will be examined when analysing the unfair policies taken by Israel in pursuit of its own interests. For example, the percentage contribution of the agricultural sector to GDP in 1990-91 was 2.3% and 20.6% for the Israelis and Palestinians respectively.<sup>4</sup> Despite this fact, Jewish settlers are highly subsidised by the Israeli government and receive water development assistance that helps them better manage their available water resources.

Since Israel's occupation, the insufficiency and the decreased quality of the water in

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<sup>4</sup> Brooks and Lonergan (1994), p. 75.

the OT has been exacerbated by Israel's own, often urgent, need to supplement its own water resources. For example, Military Order 158 prohibits only the local Arab population from developing new water sources.<sup>5</sup> This order does not apply to the Jewish settlers in the Gaza Strip. In addition, government measures regarding water use have assumed several forms, but all fall within the single objective of controlling water resources in the area, whatever the human or the economic cost.

Chapter VI will deal with the current negotiations between Palestinians and Israelis regarding water use and allocation under the Declaration of Principles on Interim self-government Arrangements, signed on the 15<sup>th</sup> of September 1993. Among other issues, this bilateral agreement called for the creation of a Palestinian Water Administration authority. This section of the paper will trace and note the policies and decisions regarding water resources management, if any, under the so-called peace treaties between Israel and the Palestinian Authority.

Chapter V will provide the concluding remarks on the issue of water rights and its implications for the future. Certainly, the notion of "water wars," which afflict not only Arabs and Israelis, but also Middle Easterners as a whole, has led to polarisation views expressed through the media. It is known that in the 1950s and in 1964, in particular, Israel and Syria were engaged in armed confrontations over water and that Israel's diversion of the Jordan River resulted in a special Arab summit in 1964. Whether any armed confrontation over water will occur on a larger scale in the region is still to be seen. But as long as Israel exploits the water resources and distributes them unevenly, economic production and agriculture in the OT will be negatively affected.

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<sup>5</sup>Roy (1995), p. 165.

## **Chapter II: Water Politics Before and After 1967**

This chapter gives a historic overview of the role of water in the Israeli-Palestinian conflict. The issue of water in the Middle East is very compelling. As a result, the policies that affect water and water resources management have a defining impact on other factors of production, specifically on the economic, social, and political value of the land. When one considers the fact that there is not enough water to meet the demands of the Israeli and Palestinian populations, the policies determining water use and allocation assume a level of importance that is difficult to ignore.

### **2.1: Water Politics Before 1967**

Water was declared by the early immigrant Zionists to be of great significance to the success of their dreams. It was perceived as an indispensable economic resource that had to be brought under their immediate control in order to make possible large-scale irrigation. This was essential to absorbing a large number of immigrants and for building the foundations of an economically viable Jewish entity in Palestine. Hence, the territorial and water claims made by the Zionists early in the 1920's were recognised on the basis of the "requirements of modern economic life."<sup>1</sup> Furthermore, because Palestine lacked coal and other fossil fuels, water was seen as essential to the generation

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<sup>1</sup> Brooks and Lonergan (1994), p. 121.

of hydroelectricity to power industry.<sup>2</sup> The World Zionist Organisation's participation in the Paris Peace Conference in February 1919 clearly showed that the proposed boundaries of Palestine include the headwaters of the Jordan River, the lower Litani River in Lebanon, and the lower reaches of the Yarmouk River (see Figure 1)<sup>3</sup>. The borders were justified with respect to several criteria: economic (i.e. water, agricultural land in the Jordan Valley), strategic (i.e. Port of Aqaba on the Red Sea as an open route between Asia and Africa), and historical (from Dan to Beersheba).<sup>4</sup> At the conference, Chaim Weizmann, who later became the first president of Israel, declared that it is of "vital importance not only to secure all water resources already feeding the country, but also to be able to conserve and control them at their sources."<sup>5</sup> Later on, Weizmann clarified this declaration by arguing that the main consideration was economic, namely, the water supply. Water was seen as an essential element for the livelihood and viability of the Jewish State.

Until the 1930s, the economic development in Palestine was easily facilitated by the existing water supplies. Since then, however, increasing settlement necessitated the development of new sources. The most controversial issue at that time was Jewish immigration and, hence, the carrying capacity of land. However, as mentioned above, one survey of water resources carried out in 1937 is noteworthy. It was administered by M. Ionides, a British employee of the Trans-Jordanian government. The survey focused specifically on the Jordan Valley and proposed a diversion scheme for the Yarmouk

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<sup>2</sup> El-Musa (1996), p. 70.

<sup>3</sup> Ibid.

<sup>4</sup> Ibid.

<sup>5</sup> Ibid.

River, which was later adopted in part by the Jordanian government. The main conclusion of the survey was that there were insufficient water resources in the river to sustain a Jewish state.<sup>6</sup>

Prior to the 1967 war, Israel and the neighbouring Arab states had occasionally fought over access to Jordan River waters. Numerous water-related cease-fire violations in the Jordan River basin have been documented between 1951 and 1967.<sup>7</sup> Each state, however, more or less accepted its share of water dictated by the Johnston Plan in 1955. Hence despite increasing demands for water for agricultural, domestic, and industrial consumption during the decade before 1967, the *status quo* seemed acceptable.<sup>8</sup>

## 2.2: Water Politics After 1967

After the 1967 war, Israel was tapping all of its available freshwater supplies and started to consume more than its share of Jordan River water.<sup>9</sup> During the war, Israeli planes managed to destroy a half-completed dam on the Yarmouk River between Jordan and Syria, along with the intake facilities of the King Abdullah Canal (previously known as the East Ghor Canal) on the Jordanian side of the Jordan River Valley. Whether these attacks were intentional or targets of opportunity chosen in time of war is unclear. However, the successful construction of these structures were to reduce the flow to either the Upper or the Lower Jordan Rivers and, hence, the water available for consumption in

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<sup>6</sup> Brooks and Lonregan (1994), p. 122.

<sup>7</sup> Brooks and Lonergan (1993), p. 70.

<sup>8</sup> Ibid.

<sup>9</sup> Brooks and Lonergan (1994), p. 125.

Israel.<sup>10</sup>

Israel's occupation of the West Bank and the Golan Heights significantly altered the scope of water demand and supply in Israel. The Gaza Strip, which was a water deficit region, was less important in this respect. Israel took control of the headwaters of the Jordan River and its tributaries, except for the Yarmouk River and the recharge areas for aquifers that flow north-west and west into Israel (at approximately 140 Mm<sup>3</sup>/year and 320 Mm<sup>3</sup>/year, respectively).<sup>11</sup> The entire renewable recharge of these aquifers has been exploited. Moreover, as a result of the occupation of Palestinian lands, Israeli fresh water supplies increased by almost 50 percent.<sup>12</sup> Israel was always a downstream riparian on the Yarmouk River (which establishes the boundaries between Jordan and Syria); but, as a result of the war, it took control of half the river as opposed to its former 10 percent. As a result, Israel increased its using capacity of the Yarmouk River and appears to be consuming approximately 100Mm<sup>3</sup>, most of which Jordan would like to regain to meet its own very limited sources.<sup>13</sup> This also made any upstream development of the Yarmouk dependent on Israel on agreement with Israel.

Thus, as mentioned above, control of the West Bank gave Israel access to additional water supplies and better control over existing supplies. Since the 1967 war, Israel had grown more independent of the aquifers in this region, especially for drinking water. Because any over-pumping would result in salt-water intrusion into Israeli wells, Palestinian water usage has been significantly restricted by the Israeli authorities.

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<sup>10</sup> Ibid.

<sup>11</sup> Wolf (1995), p.160.

<sup>12</sup> Brooks and Lonergan (1994), p. 125.

<sup>13</sup> Ibid.

Almost immediately after the 1967 war, Israel's water policies and institutions were extended to include the OT. Also, whenever existing water laws did not permit enough control, military rules were formulated to ensure total Israeli control over the water resources of the West Bank. Responsibility for water resources and water management was taken over by the Israeli military. Initially, the civil administration provided its powers to a "water officer," who was to answer to the Water Commissioner.<sup>14</sup> However, in 1982 responsibility was delegated to Mekorot, the national water authority. Mekorot is a public corporation owned by the government, the Jewish Agency, and the National Federation of Labour. It is responsible for the water supply infrastructure, including wells, pumping stations, irrigation processes, and the National Water Carrier; it also supervises overall water quality and quantity management, distribution of water to users, conservation and efficiency of water use and allocation, and water supply generation.<sup>15</sup> The other main operational arm of the Water Commission is Tahal, the water planning company, which along with Mekorot also operated in the OT – although they collaborate only minimally with local Palestinian authorities. Tahal is a government corporation whose main responsibility is to overlook overall water planning, research, and design.<sup>16</sup> Both Mekorot and Tahal must extend permission before any new wells are drilled in either Israel or the OT. So both these agencies operate in the OT, though mostly in cooperation with the military authorities and, to a lesser extent, with local Palestinian authorities.

Hence, the Arab municipalities and district councils which were administering the

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<sup>14</sup> Ibid., p. 62.

<sup>15</sup> Brooks and Lonergan (1993), p. 37.

water supply and sewage management – including planning – before the 1967 war, saw their responsibilities restricted to the operation and the maintenance of existing systems after the war. These Arab agencies were left with providing menial operations like reading metres and collecting water fees; they exhibit no abilities whatsoever to raise the funds needed to restructure existing systems.<sup>17</sup>

To allow for the development, formulation, and implementation of technical solutions to existing water problems in the OT, a significant financial investment is required and for the most part, Israel has avoided such a commitment. Only three to six percent of Israel's expenditure in the West Bank goes towards water projects, this share being issued mainly to maintain existing systems.<sup>18</sup>

Hence, as early as August 1967, all activities came under the administration of military orders, which particularly in the case of water have been extensive. Absolute control over water resources in the West Bank was extended to the military commander (Military Order No. 92), and any publication of information on water was prohibited (Military Order No. 158).<sup>19</sup> Nevertheless, the civil administration continued to administer a water department to supervise water quantity and quality. The information is then sent to the Israeli Hydrological Service, which monitors the wells used by settlers and Palestinians.

Therefore, in Israel the water supply and demand that underlies water management and the geopolitics of water are interrelated. It is evident that the boundaries of surface

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<sup>16</sup> Ibid.

<sup>17</sup> Brooks and Lonergan (1994), p.62.

<sup>18</sup> Ibid.

<sup>19</sup> Roy (1995), p.165.

water supply do not correspond to political boundaries. As a result, the control of rivers is very much in dispute. This is especially true of groundwater, a problem exacerbated by the absence of any agreed body of international law. Ironically, in the case of Israelis and Palestinians, the obstacles are increased by the remarkable overlap between the geological location of the Mountain Aquifer and the political boundaries of the West Bank. All told, about 70 percent of the groundwater on which Israel is dependent, and more than 33 percent of its sustainable annual water supply, originate in the Occupied Palestinian Territories, mainly in its aquifers.<sup>20</sup> Thus, as the next sections will show, the Israeli policies toward water resources management in the OT have and still do hamper economic development on the Palestinian side. It will be shown that unfair Israeli water policies have retarded the development of Palestinian agriculture and hence economy.

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<sup>20</sup> Brooks and Lonergan (1993), p. 72

### **Chapter III: Water in the West Bank, Gaza Strip and Israel: Main**

#### **Facts**

This chapter focuses on Israel's policies towards water resources management in the OT and their adverse effect on Palestinian agriculture and hence economic development.

The problems of economic development in any Third World country are significant under normal circumstances. Under occupation or military aggression, economic development faces an even greater challenge. With respect to the latter situation, the analysis of economic development should not be limited to studying and measuring conventional determinants, such as long run increases in per capita income. Sustainable economic development requires innovation to build and to maintain an institutional infrastructure on a national scale and the essential national resources as the struggle against occupation continues.

Israel has used its occupation of the Palestinian lands as a means of control so as to achieve its own strategic aims: to achieve maximum profit from occupation through the exploitation of the material and human resources and through the use of the territories as a free market for its own benefit. The transformation of the occupation into a profitable commercial enterprise generated hundreds of millions of dollars annually into the Israeli budget. For example, one third (120,000) of the Palestinian labour force was employed in Israel in 1993. Most of these workers (58.4%) work in construction, which shows the

largely unskilled structure of this labour migration.<sup>1</sup> Employment in other sectors of the Palestinian economy was affected. For example, employment in the Palestinian agriculture decreased from 42% in 1970 to 15% in 1993.<sup>2</sup> Also, Palestinian labour in Israel is commuter labour, implying that Israel reaps the benefits of employing cheap foreign labour without undergoing the full social burden of integrating them residentially and institutionally into the Israeli society.

During the years of occupation, systematic patterns of land confiscation and economical hardships have resulted in displacing thousands of Palestinians within the OT, and from their to neighbouring countries. Also, a series of laws were adopted by Israel (i.e. the Law on Absentee Property and Return, gives preferential and privileged treatment to Jewish immigrants over those enjoyed by Arab citizens of Israel and Arab refugees from Israel) to ensure that land and property were not accessible to Palestinians. In addition, Israel has established and maintained more than 250 settlements on confiscated Palestinian land. These settlements are inhabited by an imported civilian population that is protected by a separate legal, economic, and judicial system by which Israel also seeks to control and to exploit the human and the natural resources of the OT. Given the structural weaknesses of the Israeli economy, the resources offered by the OT play a significant role in helping Israel deal with its economic vulnerability. The OT is a supplementary market for Israeli goods and services, on the one hand, and a source of factors of production, especially unskilled labour, for the Israeli economy, on the other.

This chapter will, therefore, show how Israel exploited the water resources of the

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<sup>1</sup> Shatayyeh, (1995), p. 128.

<sup>2</sup> Ibid.

OT, controlling all policies that bore any relation whatsoever to water resources. Doing so, it served its own interests at the expense of the sustainable development of a Palestinian agriculture. Israeli policies, however, did not affect only agriculture, but also the total supply and quality of water available for Palestinian consumption.

### **3.1: Palestinian Agriculture**

The role of agriculture in the OT has witnessed a significant transformation since 1948. Despite profound growth in the absolute value of farm output before 1967, agricultural contribution to GDP declined significantly, plummeting in 1966 to 18% in the West Bank and 34% in the Gaza Strip.<sup>3</sup> Despite the relatively low share in GDP, farming offered substantial income to more than 50% of Palestinians. Clearly, the role of Israeli water resources management in Palestinian agriculture is a topic that requires serious study.

Since the 1950s, the West Bank has become a significant exporter of farm produce to neighbouring countries, especially the East Bank of Jordan and, to a lesser extent, the Gulf States and Iraq. A phase of rapid growth in the agricultural sector has been fuelled by such factors as relatively abundant water supplies, easy access to capital resources, and the provision of needed supportive services (table 1). Growth was especially rapid in market-oriented sectors such as citrus, vegetables, poultry and melons.<sup>4</sup>

In the Gaza strip, the pace of growth took a different turn. Relatively scarce water

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<sup>3</sup> Awartani (1995), p. 174.

<sup>4</sup> Ibid.

and capital resources combined to create an unfavourable climate. However, it was possible to expand citrus farming so quickly that this branch became a main economic sector by the mid-1960s. Citrus farming does not require extensive land areas but is also unavoidably linked to the rapidly deteriorating water balance in the region. As a result, Gaza's citrus sector has been undergoing significant decline during the past decade.

The development structure of Palestinian agriculture has witnessed significant transformations under the Israeli occupation for a number of reasons. The most obvious consequence the occupation since 1967 was the immediate severance of relations with Jordan. This meant that a support system and free access to a large market was lost. However, one advantage was in the area of technology transfer, especially irrigation techniques, which gained momentum because of the proximity to a much more advanced Israeli agriculture. This resulted in higher productivity levels in Palestinian production for the export market. As a result, growth was accelerated, especially for irrigated farming.

On the other hand, the West Bank and the Gaza Strip came under an exploitive and expansionist power that imposed constraints and impediments, most importantly directed at restricting access to land and water resources. For example, the total area of land under cultivation in the West Bank decreased on average by 20 percent, compared to its pre-occupation average (1963-1966).<sup>5</sup> Table 2 depicts this trend.

The closure of wide areas by the Israeli government was justified on the basis of being declared government property. Israel controls more than 52% of the land in the

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<sup>5</sup> Ibid., p. 176.

West Bank and 33% in the Gaza Strip.<sup>6</sup> Moreover, the Palestinian agricultural sector has been significantly restricted by unequal competition from Israeli farm produce, even in the domestic market. All these developments have had negative and far-reaching consequences on the economics of Palestinian agriculture, the main consumer of water and the traditional focus of economic activity.

Most countries of the Middle East allocate more than 80% of their water supplies for irrigation and in Israel's case, roughly two thirds of all water currently consumed in Israel is used for agricultural purposes. For example, in 1985, *agriculture consumed 74 percent* of the total water available.<sup>7</sup> In 1985, agriculture accounted for at least 80% of Gaza's total water consumption; this percentage has easily risen due to an increase in population and in the demand for expanded agricultural output. The water used in agricultural purposes comes from two main sources: pumped well water and purified sewage water. The pump well water provided around 70,000 dunums of citrus groves, the main livelihood for 10,000 of Gaza's farmers.<sup>8</sup>

The high cost of agricultural inputs is causing serious problems for the Palestinian irrigated agriculture. The total area of land under irrigation has witnessed considerable change during the occupation years. As table 2 indicates, the area under irrigation decreased significantly in the West Bank during the 1985-1990. The main reason behind this decline is the scarcity of water in certain regions and the rigid restrictions on the quantity of water available to Palestinian farmers (i.e. restrictions imposed on the drilling

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<sup>6</sup> Isaac (1990), p.17.

<sup>7</sup> Brooks and Lonergan (1994), p. 74.

<sup>8</sup> Roy (1995), p. 166.

of new wells). Also, the deteriorating profitability situation of several farming patterns and the high cost of agricultural inputs is causing serious problems for farmers. There exists a lack of central planning that usually results in surplus production because there is no sophisticated and well-developed marketing outlets. The unfair trade barriers( i.e. only Palestinian produce that cannot compete with Israeli produce is allowed in...etc.)that exist between Israel and the OT in the form of Israeli produce flooding the Palestinian markets while Palestinian produce is not allowed into the Israeli market, also has significant impacts. This certainly destabilises the already fragile Palestinian market and results in severe fluctuations in prices for local producers who cannot compete under these conditions.

As a result, Israeli measures towards water use have acted against the expansion of Palestinian agriculture. According to Itzhak Galnoor who made water planning in Israel an object of academic interest: "If not for the extension of the water supply to agriculture, it would have been impossible to create a modern farming economy with an export market or to consolidate new settlements based largely on agriculture."<sup>9</sup> However, the reverse has actually been true, especially in the Gaza strip. By the mid-1970s, the Israeli authorities had imposed water quotas on Arab farmers, restricting them to 800 cubic metres per year for hard soil and 1,000 cubic metres per year for sand soil.<sup>10</sup>

Furthermore, the government placed metres on all wells, including those wells dug before 1967, and refused Arab permits to dig new agricultural wells. The Israeli authorities wanted to control access to water resources and, hence, to discourage the

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<sup>9</sup> Ibid.

<sup>10</sup> Ibid.

healthy development of Palestinian agriculture. It even admitted having a policy against granting permits to Palestinians. It justified these policies by arguing that greater productivity can be achieved through improved irrigation methods, as opposed to expanding the amount of land under irrigation.

Yet, these policies did not apply to Jewish settlements in the OT. Settler consumption per person is significantly higher than that of Arabs for agricultural use. This is not surprising, given the smaller population of the settler community and, most importantly, their ethnic status. Also, one need not forget that most settlements in the OT are based on irrigated farming. Although Israeli policies restrict the digging of wells by Arabs, the Israeli settlements have dug 35 to 40 new wells since their establishment over a decade ago. Furthermore, these wells were dug on average 300 to 500 metres deep against the average Palestinian well, which is not deeper than 100 metres.<sup>11</sup> Obviously, this has implications regarding the availability of water to the Palestinians. By using more powerful pumps, the deeper Jewish wells adversely affect existing Palestinian wells by diverting water away from them. Furthermore, Jewish farmers do not suffer from imposed water quotas and their wells are not metered. This is not the case for the majority of Arab population.

Palestinian agriculture exhibits attributes associated with the local resource base, especially land and water. However, the problems faced by most Palestinian farmers in the OT involve three factors: total supply, water quality, and the price of irrigation water.<sup>12</sup> The problems compromise the roots of the Israeli policies regarding each of

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<sup>11</sup> Ibid., p. 167.

<sup>12</sup> Brooks, (1993), p. 35.

these factors (table B).

### 3.1.1: Total water supply

The difference in total water consumption between Arabs and Jews shows further the inherent injustice of Israeli policies. For example, the *annual per capita water consumption* among the Arab population in 1986 averaged around 142 m<sup>3</sup> against the 2,240 m<sup>3</sup> among Jews.<sup>13</sup> Also, most of the Israeli settlements in the Gaza Strip withdrew 2.2 Mm<sup>3</sup> of water from the Strip's own reserves.<sup>14</sup> This amount would otherwise have been available for Arab consumption if no settlers were there. The distribution of population is indicated in table 3.

The difference in agricultural consumption rates between the Arab and the Jewish populations is also striking. As table 4 indicates, in 1989, the Arab agricultural consumption rate stood at 154Mm<sup>3</sup> against 1238Mm<sup>3</sup> for the Jewish population. This, despite the fact that the agricultural sector contributed more to the Palestinian GDP than to the Israeli GDP. As Table 5 shows, the percentage contribution of the agricultural sector to GDP in 1990-91 was 2.3 and 20.6 for the Israelis and Palestinians, respectively. Also, the percentage of employment in the Israeli and the Palestinian agricultural sector amounted for 3.5 and 14.5, respectively.<sup>15</sup>

As section 3.1.3 will show, one obvious reason for the higher consumption rate

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<sup>13</sup> Roy, (1995), p. 167.

<sup>14</sup> Ibid.

<sup>15</sup> Brooks and Lonergan (1994), p. 75.

among the Jewish settlers is that agriculture is highly subsidised by the Israeli government. Settlers receive water development assistance that helps them better manage their available water resources. This assistance is mainly supplied by the various Jewish agencies and organisations that help the farmers. Predictably, the Palestinians receive no such assistance whatsoever, thanks to government restrictions on water development and external assistance.

As Table 1 shows, the relative share of agriculture in the OT's GDP increased in the mid-sixties to the early seventies, but then took a downturn in the 1970s, 1980s, and 1990s. The drop in the relative importance of agriculture in the last decade is due mainly to the increasing significance of the service sector, especially trading activities. Moreover, agriculture has been adversely affected by increasing marketing problems, lower profitability margins, and Israel's unfair and restrictive policies.<sup>16</sup>

### **3.1.2: Water quality**

The harsh regulations aimed at keeping minimum water use, the most important input for capitalisation, have hobbled modernisation in every sector of the economy. But water quality, too, has deteriorated with over-pumping through the deep wells operated mainly by neighbouring Israelis. It is an especially acute problem for the Gaza strip in the Jordan Valley.

Water quality problems are a combination of various factors, namely, over-pumping of aquifers, pollution of watercourses, and the limited size and the protection of

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<sup>16</sup> Awartani, (1995), p. 195.

ecological preserves.<sup>17</sup> A summary of the following is shown in table B.

The over-pumping of wells has resulted in a significant decline in the water table. This adds to pumping costs and increases energy consumption for pumping. A lower water table lowers the level of fresh water below sea level, reduces the pressure in the aquifer and thus permits lower quality water (mostly sea water from the Mediterranean) to flow inward, contaminating the mostly fresh water of the aquifer. This inflow exacerbates the effects of using and re-using water for irrigation, creating a situation where 10% of the wells tapping the Coastal Aquifer now produce water that is too salty for either domestic or agricultural use.<sup>18</sup> Israel's Hydrological Service estimates that one fifth of the wells will eventually be too salty even for irrigation.<sup>19</sup>

The over-pumping of the Mountain Aquifer, the main source of drinking water in Israel, also causes the nearby saline aquifers to seep into the over-pumped zones. Every zone of the Mountain Aquifer contains brackish water and since it is composed of channels in limestone, water and pollutants flow more quickly through the mountain aquifer than through sandstone aquifers with smaller pores.<sup>20</sup>

Water pollution also poses great difficulties to Palestinian farmers. Dumping into water streams and valleys is a common practice, especially in the case of valleys, which at every rainfall give way to contaminants that seep into the aquifers. One has also to consider that cleaning a polluted river is difficult, but cleaning an aquifer is downright impossible. Only in 1991 were jurisdictional issues over water resolved. Toxic and

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<sup>17</sup> Brooks and Lonergan (1994), p. 61.

<sup>18</sup> Ibid.

<sup>19</sup> Ibid., p. 62.

<sup>20</sup> Ibid.

hazardous substances, pest control, and the prevention of nuisances all came under the responsibility and control of the Ministry of Environment.<sup>21</sup>

The main sources of pollutants – including sediments, nitrogen, phosphorous, and pesticides – involve agricultural run-offs. Run-off is significantly high since Israel's per hectare use of fertiliser and pesticides is also very high.<sup>22</sup> Regulations relating to pesticide use are very flexible and almost non-existent in the case of agricultural run-off. In the past two decades, the level of nitrate concentrations present in the Coastal Aquifer has almost doubled. According to the World Resources Institute Report of 1992, such practices as contour planting and filter systems can control the level of soil erosion and, hence, reduce phosphorous and nitrogen run-off up to 60 percent. If left untreated, on the other hand, the Coastal Aquifer with its high level of nitrate concentrations will severely affect irrigation water quality and thus overall agricultural production.<sup>23</sup>

Pesticide residues are a serious problem. There is a lack of strict standards for permissible levels of pesticides in drinking water and only lightly enforced ones for domestically consumed food. Moreover, the growing use of brackish water can increase soil salinity, which is already evident in some parts of the country.<sup>24</sup> Measures to deal with this problem have yet to be formulated. Washing out the salts using fresh water could initially be used. The trouble is that this method would allow the salts to drain into watercourses or even aquifers. A polluted aquifer poses more serious problems than a polluted river because treating it is impossible.

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<sup>21</sup> Ibid., p. 63.

<sup>22</sup> Brooks, (1993), p. 38.

<sup>23</sup> Brooks and Lonergan (1993), p. 63.

<sup>24</sup> Ibid.

Water quality is also undermined by the entry of sewage into underground water supplies, especially through Gaza's poor sewage system. The sewage infrastructure in the Gaza strip continues to be largely inadequate and insufficient. It is estimated that around 10 percent of the population is not served by any system and simply dumps raw sewage.<sup>25</sup> Around 80 percent of the villages and towns maintain a poorly structured and inadequate sewage system and depend entirely on the use of septic tanks and soaking pits for sewage disposal (figure 2).<sup>26</sup>

The Gaza City System, for example, was planned in early 1973 in order to provide a population of 189,000 basic sewage facilities. By 1986, however, the facilities that were constructed provided services for only 50,000 people, although Gaza City's population was around 200,000.<sup>27</sup> An even worse situation persists in the refugee camps where living standards are much lower. By 1989, only two camps, Jabalya and Beach, had partial systems. This is partly due to the levels of population density: most of the camps have close to 50,000 people per square kilometre.<sup>28</sup> Most of the water and the sewage systems in the refugee camps were financed by UN agencies; they deliver an average of less than 100L/person-day.

The main consequence of an inappropriate sewage system has to do with the concentration of nitrates in the groundwater supplies. The growing salinity of local water resources has reduced the amount of water drawn for agricultural purposes, which in turn has lowered the area under cultivation. The problem is significant for local agriculture,

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<sup>25</sup> Roy (1995), p. 167.

<sup>26</sup> Ibid.

<sup>27</sup> Ibid.

<sup>28</sup> Brooks and Lonergan (1994), p. 113.

which can tolerate the 11.5% of nitrate found in certain regions.<sup>29</sup>

A primary consumer of water, for example is Gaza's citrus crop, which has suffered from this continuous increase in the level of nitrate contamination and, as a result, citrus output and quality have fallen dramatically. Thus, the growing salinity of local water resources has reduced the amount of water drawn for agricultural purposes, lowering the area under cultivation. This had a direct and adverse effect on Palestinian farmers and their produce. The total land area of the West Bank is around 5,800 square kilometres with only 10 percent of this area classified as fit for irrigation farming and 27 percent fit for rain-fed agriculture.<sup>30</sup> Therefore, any contamination of groundwater affects the quality of water drawn for both agricultural and domestic use. As a consequence, human health and agricultural production will suffer significantly.

The quality of land intended for farming is much better in the Gaza strip, although the total area is very small, only 363 square kilometres.<sup>31</sup> Any agricultural expansion in the Gaza strip would be severely constrained by the high population density as well as the severe shortage of water resources. Another constraint on agricultural expansion revolves around Israel's policy towards the expansion of Jewish settlements. This obviously decreases the land under cultivation available to Palestinian farmers (table 2).

The third concern regarding water quality revolves around the nature preserves. While 18 percent of Israeli land consists of national parks and nature reserves, the protected areas are still quite small. Most fresh water areas come under terrible pressure,

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<sup>29</sup> Roy (1995), p. 165.

<sup>30</sup> Awartani (1995), p. 175.

<sup>31</sup> Ibid.

especially during summer, from domestic recreational use and tourism. What exacerbates the situation is that Israel has regularly set aside its concern for nature and the Biblical landscape. It has justified its actions by citing the need to ensure water supplies. Waste contaminates many beaches and the flow in the Jordan River has been reduced to a fraction of its former volume.<sup>32</sup>

Despite these problems, nature preserves are still highly regarded in Israeli politics, because of the growing recognition of the economic potential of tourism. However, the ecological servicing of natural areas aimed at protecting the quantity and the quality of water outside these preserves has not yet been widely accepted or even regulated. This clearly affects the amount of water available to Palestinians, since Israel first seeks to ensure its own adequate, though growing, supplies of water, at the expense of both the nature preserves and the Palestinian's needs and requirements.

### **3.1.3: Price of irrigation water**

The price of irrigation water charged also poses obstacles to Palestinians farmers. The high cost raises overall production costs, thereby contributing to the decision of certain farmers in the Gaza Strip to lower consumption, but at the expense of both productivity and quality. Production for competitive export markets has been adversely affected. The cost of irrigation water has risen significantly due to the appalling conditions of artesian wells, a consequence of poor maintenance and a lack of technical expertise and financial resources.

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<sup>32</sup> Brooks and Lonergan (1994), p. 116.

Furthermore, the problem in Israel, as in other countries, is that farmers pay far less than the full delivery cost of irrigation water.<sup>33</sup> This obviously applies to Jewish farmers (table 6). This is because most of the farmers cannot afford to pay a steep price for water if the crop is to be sold profitably. Water is expensive because conventional water supply systems are capital intensive, especially per dollar of revenue. According to a World Bank Report, the Middle East-North Africa region has the highest capital costs of water supply in the world. Also, operating costs are high, with Israel and Jordan using 12 percent and 20 percent, respectively, of their electricity to pump water.<sup>34</sup> Other non-conventional supply alternatives are also very expensive, especially in the case of desalination. Few countries can afford these techniques, which are mainly used in the rich Gulf countries.

As mentioned before, farmers cannot afford to pay a high price for water if the crop is to be sold at a profit. What has to be taken into consideration is that about 80 percent of the water used for irrigation costs \$0.125/m<sup>3</sup> and the remaining 20 percent costs \$0.20/m<sup>3</sup> and within the Green Line, farmers purchase water for agricultural purposes at \$0.16/m<sup>3</sup> as opposed to \$0.70/m<sup>3</sup> and \$1.65/m<sup>3</sup> for household consumption.<sup>35</sup> The prices paid by households depend on the amount of water consumed: the more water consumed, the higher the price. For households, the first 18m<sup>3</sup> in a two-month period – which certainly meets the basic needs of a family – are priced at the lowest end of the scale so as to maintain both equity and efficiency. Prices then go on increasing according to a

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<sup>33</sup> Brooks and Lonergan (1994), p. 77.

<sup>34</sup> Brooks and Lonergan (1993), p. 43.

<sup>35</sup> Brooks and Lonergan (1994), p. 77.

block rate structure. Around one third of Israeli households pay the top price of \$1.65/m<sup>3</sup> with industrial users paying around \$0.15/m<sup>3</sup>.<sup>36</sup> When these costs are compared to the actual cost of supplying water to Israel, we notice the discrepancies. Some analysts estimate that the actual cost to supply water in Israel is \$0.36/m<sup>3</sup> a year: whereas others estimate a slightly lower figure. However, all agree that the cost is not less than \$0.30/m<sup>3</sup> a year. Hence, the cost is significantly higher than the actual price.

As a result, households are paying in excess of the full average costs, which range from about \$0.40/m<sup>3</sup> to \$1.00/m<sup>3</sup> year for more sophisticated technologies. On the other hand, farmers and industrial users are highly subsidised. This, of course, applies to Jewish farmers and industrial users. Palestinian farmers receive no such assistance and the Israeli government imposes restrictions on water development projects and external assistance (table 6). It is clear that Jewish farmers have higher consumption rates than their Arab counterparts in the territories because the Jewish community is highly subsidised by the Israeli government. Settlers also receive water development assistance from various Jewish organisations. Thus the Israeli water policy is characterised by discriminatory pricing and unequal distribution.

A researcher at Tel Aviv University, Gideon Fishelson, estimates that about half the water devoted to agriculture in Israel has a marginal value that exceeds its cost. He also indicates that with an appropriate and more efficient pricing scheme for water, 300 Mm<sup>3</sup> per year of water could be transferred from inefficient agricultural to non-agricultural uses. This would be enough to eliminate the pressure on Israel's water system and to supply a further 2 million people with 100L/day.

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<sup>36</sup> Ibid.

One may conclude that the concentration and the subsidies that the agriculture sector receives are well out of proportion with the sector's total economic significance to the country's GDP (table 5). The main reason is the low marginal economic productivity of the water used in agriculture. Hence, water should be reallocated away from irrigating crops towards industrial and household uses. For example, growing flowers and some fruits and vegetables exported fresh to Europe or to any other region – as opposed to grains and most field crops – could cover the full cost of water. Furthermore, a partial restructuring of the Israeli economy towards light industry, services, and information technology would save a lot of water and energy. As mentioned earlier, Israel and Jordan use 12 percent and 20 percent, respectively, of their electricity to pump water.

Therefore, any option for improvements in efficiency has to be based on the reallocation of water among the users, rather than on improvements in use by any specific group. What has worsened the situation is the close connection between the Water Commissioner and the Minister of Agriculture. All water resources belong to the state. Management decisions on water quantities, production and supply system fall under the jurisdiction of the Water Commissioner, who reports to the Minister of agriculture. This arrangement ensures the centralisation of decision-making relating to water supply and, in many sectors, to water consumption. Moreover, it reinforces the subordination of water policy to agricultural policy, reflecting the strong linkage between agriculture and water. This adversely affects Palestinian farmers, since the Ministry of Agriculture is predisposed towards the interests of Israeli farmers by providing them with material and technological assistance.

Therefore, the water crisis essentially revolves around low prices and poor

management, which in turn stimulate the demand for water and reduce the incentive to conserve. The main benefit of subsidised water is passed onto the foreign consumers who buy the export crops. So, one may conclude that any reduction in water use by the agricultural sector could mitigate Israel's water problems, at no or only small economic cost. Given the strength of the farm lobby, however, any plan to divert water from agriculture could never be easily implemented.

Unfortunately, non-economic interests have dominated every proposal for a more efficient use of the country's water resources. However, successive studies have shown that water – in economic terms – was the most essential input factor in Israel's production process. One such study was conducted using inter-industry flow data for 1976 and 1983. In dollar terms, the study concluded that for those two years water was the most critical input in the economy necessary for the success of the production process. The same study ranked economic sectors according to the degree to which constraints on the availability of resources would have the greatest potential of reducing aggregate economic output. For the two years studied, water was ranked number one by a wide margin.

Furthermore, the misallocation of water is at the expense of Palestinian farmers, who are not receiving any assistance whatsoever, thanks to government restrictions on water development and external aid. Hence, subsidies are going mainly to Jewish farmers, who also receive preferential treatment from the Israeli government, mainly the Ministry of Agriculture. The government restricts the amount of water Palestinians can consume and the area of land they can cultivate. A 20 percent drop in the total area under cultivation in the West Bank occurred in comparison with its pre-occupation level (average for 1963-

1966) because of Israel's closing of extensive areas of land, supposedly for security reasons (table 2). The drop in the total area under cultivation was also exacerbated by significant and adverse changes in the economics of agriculture in rain-fed areas, which make up 95 percent of the total land cultivated.

The situation in the Gaza Strip is even more dramatic. The apparent freeze on Gaza's cultivated area during the occupation was the outcome of a growing shortage in water resources and of Israel's unfair allocation policies such as restricting the drilling of new wells. Israel's closure of wide areas in the Gaza Strip was based on it being declared government property. Also, the continuous and persistent encroachment on agricultural areas for construction purposes provides an obstacle to the growth of cultivated land.

As a result, one may safely conclude that the land issue is closely linked and correlated with the water issue. Palestinian farmers suffered under both Israel's unfair policies on water resources management and on land allocation. The economic development of the OT, as a result, has become distorted as seen in the declining contribution of agriculture to the Gross Domestic Product (table 1).

## **Chapter IV: Position of the Declaration of Principles on Water Disputes**

On September 15, 1993, the Declaration of Principles on Interim self-government Arrangements was signed between Palestinians and Israelis. It defined Palestinian autonomy and the redeployment of Israeli forces out of Gaza and Jericho (both occupied in the 1967 war). After signing the peace treaty between the Palestine Liberation Organisation and the State of Israel, the international community rushed to prepare reports about how to bring about improvements in the daily lives of the Palestinian people and how to build the concrete foundations of long-term economic growth in the West Bank and the Gaza Strip. In particular, the World Bank prepared a series of studies on the OT based on its work since 1992 concerned with the economic prerequisites of the peace process, which has intensified after the Declarations of Principles was signed.

This chapter will focus on the first and the second of the World Bank studies: *Developing the Occupied Territories: an Investment in Peace* (presented in 1993) and *Emergency Assistance to the Occupied Territories* (presented in 1994). The second report deals more with the building process of the domestic Palestinian economic infrastructure and will be the main focus of this chapter. Both reports were prepared in response to the priorities of the Palestinian leadership. They aim to specify the intimate and crucial connection between peace and economic development. They also provide the analytical framework and technical foundations required to analyse the financial assistance promised by the participants of the Donors Conference held in Washington,

DC on October 1, 1993. The participants promised an aid package of US\$2 billion.<sup>1</sup> Among the participants were representatives from Denmark, the European Union, the European Investment Bank, Japan, Norway, Switzerland, and the various UN agencies. Extensive contacts were maintained with international and non-governmental organisations (NGOs) working in the OT.<sup>2</sup>

This chapter contains four sections. The first gives a basic summary of the World Bank Report with respect to the various sectors of the Palestinian economy. This will provide the groundwork for analysing the main policies adopted in the area of water resources management. The second section will deal with the World Bank's main recommendations for the water management, showing the points of emphasis on policies aimed at dealing with the problem of water quality and misuse. The main recommendations and the policy formulations of the World Bank will be closely examined. The third section will highlight the main problem with this international package. It will also argue that any economic policy or plan for water resources management that does not deal with demand management, concentrating only on supply augmentation, already contains the seeds of failure. It will also argue that no international economic package can succeed in a hostile environment like the one under study. How can economic policy be successfully adopted when political stability does not exist and the right to self-determination of a people is denied? The fourth section will discuss the alternatives available for a Palestinian water policy.

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<sup>1</sup> World Bank, *Emergency Assistance Program for the Occupied Territories* (1994), p. vii.

<sup>2</sup> Ibid.

#### **4.1: The World Bank Package**

The main objective of the Emergency Assistance Program for the OT is to provide tangible benefits for the Palestinian population quickly, equitably, and efficiently, while laying the foundation for sustainable development. The main reason behind that goal is the belief that once the population starts reaping the benefits of restructuring and rebuilding of the Palestinian economy, the faith in the peace process would never fade away. And hence the commitment to that process would be respected by all.

The report offers a set of expenditure for the next three years. The primary goal is to remove rapidly the most critical infrastructure bottlenecks by rehabilitating and upgrading the public facilities and services in vital sectors of the OT – particularly in transportation, water supply, and wastewater; solid waste management; power; housing; and agriculture. The Program is mainly designed to concentrate on short-term gestation while focusing on the rehabilitation and the maintenance of activities that make for better use of the existing infrastructure. The Program's focus on maintenance and repair reflects the broad impact of such investments on both service availability and the prospects for employment growth. The Program proposes a works program that could help alleviate immediate poverty and unemployment. The main targets would be the areas where living standards are exceptionally low, as in Gaza City and the refugee camps.

The main point to be considered here is that the success of any development project in generating economic growth and well being in the OT to a large extent depends on the

development of its human resources. As a starting point, ameliorating and enhancing the living standards of the Palestinian people should be a priority, since it forms the basis of any further development in human resources.

In addition, investments in housing projects would provide improved shelter for some 20,000 low and middle income families, including some 6,000 of the most needy families in the refugee camps, which have crowded conditions.<sup>3</sup> It is widely known that especially in the refugee camps, more than two generations of the same family lives in the same household. However, housing projects are quite controversial for the Israeli Authorities because they deal with land use. Any housing issue shows a virtual absence of credit for financial real estate and , most importantly, leaves the future of living in the refugee camps in doubt. Hence, the Program encourages the creation of an institutional, regulatory, and policy framework that can support private development in the housing sector. A starting point would be to assist UNRWA's program for improving housing in the camps and for facilitating the channelling of credit to finance private home construction. Technical assistance in this sector encompasses large and controversial issues regarding land use; the success of housing developments and projects depends largely on the continuation of bilateral talks between Palestinians and Israelis.

Another area of concern is the enhancing of the present educational system. Investing in education would significantly improve the competitiveness of the Palestinian workforce, increase their economic security and raise household incomes. Under the occupation, the level of education has deteriorated, especially during the Intifada, the Palestinian uprising. The Program calls for investments in education in order to increase

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<sup>3</sup> Ibid., p. 10.

student access to modern laboratories, computer labs, and library facilities. The Program would also enhance the vocational and the university systems. All this investment would have effects on the student population in the OT. The total cost of improvements would be US\$80 million.<sup>4</sup>

In addition, investments in the health services are much needed. Health care in the Gaza Strip and the West Bank is provided by the Civil Administration (the main governing body in the OT still in Israeli hands), UNRWA, NGOs, and private clinics. Each has a different approach, with UNRWA focussing on primary care and the Civil Administration on more sophisticated procedure at a much higher cost than the Palestinians cannot really afford. The Palestinian authorities face great challenges in this sector. They will need to create an effective and affordable health care system out of the current fragmented and fragile one. The short-term proposals include limiting the expansion of the existing system while maintaining essential services, supporting emergency repairs and assessing the feasibility of health care. Future policies would control health care costs and improve the internal efficiency, particularly at the hospital level.

Primary health care in rural areas is seriously in need of funds and upgrading. Support is also needed to buy new and more sophisticated equipment and to maintain existing facilities. The total cost of the Program is estimated at around US\$18 million.<sup>5</sup> The Program would also provide emergency financial assistance to efficient private, voluntary hospitals and clinics. Technical assistance would help the incoming Palestinian

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<sup>4</sup> Ibid., p. 11.

<sup>5</sup> Ibid., p. 12.

authority design policies that focus on enhancing the internal efficiency of the health sector and controlling the overall costs of implementing an efficient health care system.

In addition, the current combination of expanding agricultural production with the existence of declining external markets within a highly constrained regulatory and natural resource framework is obviously unsustainable. Many of the challenges facing the agricultural sector are reflected in Israel's policies towards the development of that sector. The issues include restrictions on internal transport, the modest pace of technological improvements, and the need to find efficient policies for natural resource management. Therefore, proposals are for adjusting production patterns in the future and improving existing infrastructure. Program financing includes US\$26.5 million to support public infrastructure rehabilitation and institutional development and US\$25 million will be distributed to various NGOs and the private sector in order to maintain the existing support services and to promote needed farm investments.<sup>6</sup> Technical assistance is estimated to cost around US\$1.3 million over the three-year program period, and is directed towards enhancing the trading in agricultural products and the expanding of the production of olives and fish protein.<sup>7</sup> Several activities of interest to agriculture would be encouraged in other sectors. Examples include building a fishing port in Gaza that could also be used as a transport mechanism.

Maximising and investing in the use of local inputs, particularly skilled labour, constitutes a major priority. In reference to the implementation of the program, all locally available capacity should be used, including the UN agencies, NGOs, universities,

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<sup>6</sup> Ibid.

<sup>7</sup> Ibid.

and research institutions. Training and institution building also have to be emphasised, especially in the management process of the development programs. To ensure the effective use of funds, the reports stress the vital need for efficient and transparent procurement, accounting, reporting, and monitoring.

Technical assistance forms an integral part of the Emergency Assistance Program. It includes training and institutional development to enhance the Palestinians' capacity for self-government and for planning and implementing development programs. However, because of the limited administrative and financial resources available, the initial priority is to devise the activities needed to ease the transition to self-government and, hence, to launch the Emergency Assistance Program.

Furthermore, the start-up expenditure component of the Emergency Assistance Program would supply temporary assistance for creating the Palestinian Central Administration. Temporary assistance would provide the funds for a publicly provided social safety net and for the maintenance of vital services previously performed by the NGOs in the OT. In recent years, many of these NGOs have lost their traditional sources of support due to the capricious nature of the international community's support and, so, renewed funding of their services would focus on women and children, education and health care.

The cost of the proposed Emergency assistance Program is estimated at \$US1,200 million, of which 41% would be spent in Gaza. Public investment support would make up 50% of total costs; support to the private sector, 25%; incremental and start-up expenditure support, 19%; and support for technical assistance, 6%.<sup>8</sup>

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<sup>8</sup> Ibid., p. 4.

On the benefit side, the Program is expected to create employment opportunities will be increased significantly through program supported private investment in different sectors like agriculture, industry, and tourism. According to the Program, the benefits would mostly help the poor, low-income families in the urban areas, camps, and villages. Women and young people would benefit from the Human Resource component of the program which mainly aims at providing the necessary standards in education and other essential services.

Because of the vulnerability and fragility of the public finances of the new Palestinian administration during the transition period, the donor community will need to finance the suggested Emergency Program entirely with external sources. The OT's debt service capacity will remain limited for some time to come; therefore, external financing of public sector expenditures will require highly concessional terms. Finally, the Report indicates that because of the unique circumstances of the OT and the inexperience and lack of credibility of the newly created Palestinian institutions, donors will need to keep their procedural requirements straightforward and simple and to manage their aid programs with more than usual flexibility.

#### **4.2: World Bank Recommendations for Water Resources Management**

The Report puts forth several recommendations regarding the public and private investments necessary for a sustainable economy. The investment programs are directed towards correcting the imbalances in access to services, especially in rural areas; these programs are to be determined by feasibility studies and technical analyses. In addition,

the promotion of private sector investment is specified. This requires a legal and regulatory environment supportive of private initiative. Stimulating private investment and growth in the productive sectors and services is essential for sustainable development in the OT and for generating employment opportunities.

The main sectors of the economy for which the Program aims at generating private investment is in industry, tourism, telecommunications, and agriculture. This is to be done by providing long-term financing to local Palestinian entrepreneurs who are more aware of the domestic situation and its requirements.

Public investments are also given importance since the efficient supply of public funds and projects will reflect upon the public body supporting and governing it. This in return could enhance the credibility of the governing entity in the eyes of the Palestinians. The main benefit of the public investment component of the program would be the improvement of the delivery system of essential and vital public services like water, sewage, solid waste, power, and telecommunications. Almost all the residents of Gaza and half the population of the West Bank would benefit from improved facilities that deliver water. Few West Bank municipalities have suitable access to water supplies with an average per capita consumption around 50 litres per day; therefore, there is a significant, unmet demand.<sup>9</sup> Meanwhile, as mentioned in Chapter III, the overdraw of the Gaza aquifer threatens the ground water and has caused severe water quality problems. In response, the Program provides objectives for this sector. The most important of these relate to the initiation of institutional reform and the development of coherent water conservation policies and practices. This includes developing a unified water and sewage

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<sup>9</sup> Ibid., p. 8.

utility in Gaza and regions of the West Bank, and designing and implementing a ground water monitoring system for Gaza.<sup>10</sup>

The World Bank Program presents the specific water issues involved and presents the strategy for completing the implementation process. Poor water resources management is identified in the OT, especially in Gaza, as a major and acute problem. It includes ineffective conservation policies to reduce losses and to manage demands. Furthermore, the Program identifies the dangers of permanently damaging the Gaza Aquifer due to over-pumping by Israeli authorities, which would obviously lead to the deterioration of water quality. Water quality problems have many causes, two of which deserve to be mentioned: over-pumping of aquifers and the pollution of watercourses.

As mentioned in Chapter III, the over-pumping of the aquifers will cause a decline in the water table, with adverse effects. It increases the cost of pumping and, therefore, increases the amount of energy needed for pumping. The main adverse effect, however, is that a lower water table will decrease pressure in the aquifer and, hence, allow lower quality water to flow inward, contaminating the fresh water of the aquifer.<sup>11</sup>

The Israeli occupation of the West Bank and the Golan Heights after the 1967 war dramatically altered the dimensions of water demand and supply in Israel. The occupation gave Israel access to additional water supplies and better control over existing supplies. The country has become highly dependent on the aquifers that rise in this region, especially for its drinking water. The over-pumping of these aquifers to meet Israel's deficit of fresh water has created a situation, which everyone recognises as

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<sup>10</sup> Ibid., p. 4.

<sup>11</sup> Brooks and Lonergan (1994), p. 106.

unsustainable. During the drought of 1993, water levels in aquifers in Israel and the occupied Territories fell by 10 to 40 centimetres per year.<sup>12</sup> The fall was most evident in Gaza's aquifers (where underground water slopes towards the sea); in 1987, over-pumping resulted in a drop of the water table by 7 to 20 cubic metres for the whole of Gaza, thus increasing salinity levels.<sup>13</sup> As mentioned in Chapter III, this lower quality of water significantly affected agriculture. The growing salinity of local water resources has reduced the amount of water drawn for agricultural purposes, which in turn has decreased the area under cultivation (table 2). Given that farming remains a major source of income for more than 50% of Palestinian households, maintaining a sustainable water quality would reflect positively on the economy as a whole.<sup>14</sup>

The pollution of watercourses involves damage to water quality due to the entry of sewage into underground water supplies, thanks to the territories' and especially Gaza's overall poor sewage system. The Program recognises the weak wastewater management and the poor sewage collection, treatment, and disposal. It suggests implementing a program of priority network and treatment plant rehabilitation. It also recommends a wastewater reuse strategy to be formulated on the basis of a review of the technical and financial reasons for the poor operation of the existing water treatment plants. As a matter of fact, out of the 527 rural communities on the West Bank, only 10 had access to a piped network for sewage disposal.<sup>15</sup>

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<sup>12</sup> Brooks and Lonergan (1994), p. 61.

<sup>13</sup> Ibid.

<sup>14</sup> Awartani (1995), p. 173.

<sup>15</sup> Barghouti and Daibes (1993), p.36.

As expected, the inefficiency in the disposal of solid wastes led to an increase in the level of nitrates in ground water. In 1993, UNRWA reported that the nitrate concentration had increased from approximately twice the international standards in the 1980s to more than six times in the 1990s.<sup>16</sup> This hardly came as news to the Israeli government. In 1987, Tahal, one of the main operational arms of the Water Commission, filed a confidential report to the government urging it to act no later than the beginning of the 1990s to combat the rising levels of nitrates. Since UNRWA's report was formulated later than Tahal's but contained the same conclusion regarding the rising level of nitrates, presumably Tahal's recommendations were not implemented by the government.<sup>17</sup>

Improving solid waste management projects, drains, and sewage would ameliorate the environment that Palestinians have to live in. Better collection and disposal of solid wastes is vital for improving the public health and living conditions. For the short term, the Program proposes to improve the coverage of existing collection services; increase the amount of collection vehicles; develop various cost effective collection, transfer, and disposal sites; and most importantly, develop and adopt protective design standards. These activities are to constitute the starting point for the development of sanitary landfills for use by municipalities and villages.<sup>18</sup>

The Report also concentrates on the dangerous effects of the poor water supply delivery system. It recommends the extension of piped water coverage to all villages and the development of new wells as part of an overall water management strategy wherever

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<sup>16</sup> Roy (1995), p. 165.

<sup>17</sup> Ibid.

<sup>18</sup> Ibid., p. 9.

resource, institutional and political conditions permit. Existing supply networks are generally old; unaccounted-for water regularly exceeds 50 percent; metres are frequently inaccurate, by-passed, or broken; supplies are chlorinated; old pipes allow low pipe pressure, which causes reverse flow into the network and contamination; and finally, water departments are very weak and inefficient.

According to the World Bank Report, few West Bank municipalities or villages have suitable access to water supplies: average per capita consumption is around 50 litres a day. This is in comparison to the 100 L/person-day (36.5m<sup>3</sup>/year) generally regarded as the minimum for an adequate quality of life.

The World Bank Report suggests that the implementation of its recommendations be the responsibility of local municipalities and two existing utilities in the West Bank since they would be more familiar with domestic requirements. Technical assistance would be provided for local municipalities through individual, locally contracted consultants to meet institutional reform and to create a coherent water conservation policies and practices. Technical assistance entails reviewing of wastewater treatment, reusing technologies and developing investment proposals that take into consideration local constraints and conditions. The implementation of these investment recommendations is to be aided by advisory services, training and project preparation facilities. The total investment in the domestic water supply and wastewater sector is estimated at around US\$111 million.

Unfortunately, the Program does not take into account the restructuring of local municipalities, which are infested with corruption and fraud. Furthermore, a separate body must be responsible for the distribution of the technical assistance to minimise any

misuse of funds.

Village works would be performed by PECDAR, the Palestinian Economic Council for Development and Reconstruction, in alliance with NGOs or UN agencies. PECDAR was created by the decree of the Palestine National Assembly on October 31, 1993 as the main institution for managing reconstruction and development in the OT during the transition period. Its governing body consists of a 14-member board of governors. The Board is responsible for appointing the Managing and the Office Directors, formulating overall policy guidelines for PECDAR activities, approving of PECDAR's budget and individual project, and administering policy regarding the procedures for procurement, accounting, and auditing. The main functions of PECDAR involve economic policy formulation and project review, technical assistance and training, investment program management and monitoring, and aid co-ordination and facilitation. The focal point for relations with donors with respect to the monitoring of official aid is one of the most important functions of PECDAR. However, most Palestinian analysts fear that donor aid and investment will never be efficiently distributed, especially that corruption among Palestinian political ranks is a well-known fact. Other analysts are sceptical about Israel's declaration that it would facilitate donor investments and aid flows into the OT by granting visas, immunities, and tax exemptions according to international practice. Moreover, pessimism surrounds the international community's pledges to supply the Palestinian Authority with the needed cash flows. Also, some analysts fear that any external funds will put the Palestinian Authority under the mercy of the donors. The consequences of the IMF sponsored structural adjustment programmes on many Third World countries are an example of what may happen. Therefore, the Report stresses the

role, which ought to be played by the donor community and the need to work closely with PECDAR to transform the pledges into firm commitments to specific projects and activities. This would strengthen donor co-ordination and discipline to match the pledges, with agreed sectoral investment priorities. In addition it would create an atmosphere of efficiency, accountability, and transparency in the use of aid money.

The World Bank report noticeably addresses itself to the main concerns regarding the management of water resources in the OT. The Declaration of Principles on Interim self-government Arrangements also called for the creation of a Palestinian Water Administration Authority. The first item in annex III that deals with co-operation in economic and development programs as mentioned in David Brooks and Stephen Loneragan' *The Economic, Ecological, Geopolitical Dimensions of Water in Israel(1993)*, included a focus on:

“Co-operation in the field of water, including Water Development Program prepared by experts from both sides, which will also specify the mode of Co-operation in the management of water resources in the West Bank and Gaza Strip, and will include proposals for studies and plans on water rights of each party, as well as on the equitable utilisation of joint water resources for implementation in and beyond the interim period.”

Eventually, the final political and hydrological situation of the region will have to be determined, but we do not think that the World Bank Report could be adopted and successfully implemented while the Declaration of Principles on Interim self-government Arrangements is still in the making and on the negotiation table. Furthermore, since the

implementation of the Program will take place under unusual circumstances, various risks are present.

First, the success of the Program will need political stability in the OT, the continuation of bilateral and multilateral negotiations and a degree of maturation and equity in the internal political process. The Program strongly emphasises the relation between the rapid delivery of tangible benefits to the Palestinian population and the continuation of the peace process. Any instability in the territories will hinder the implementation of development projects and raise tensions in the population.

The implementation process will require a well-functioning public administration able to direct, monitor and manage a rapidly expanding program. The main body that would be responsible at that stage is PECDAR. There is a risk of over-centralisation of the Program's management, if PECDAR was not to distribute suitable decision-making authority to its field managers. Insufficient flexibility on the part of donors or uncoordinated aid programs could further delay the implementation of the process. The World Bank report suggests that regular examination by the Ad Hoc Liaison Committee, the body set up by the donors to monitor and to co-ordinate their assistance, would be extremely helpful in this regard.

Another inherent risk in the implementation process is the deviation from the proposed program. Implementing development projects of questionable technical or financial feasibility, or involving unusual budgetary constraints, may reflect political objectives that do not correspond to the availability of internal and external funds. The likelihood of political projects to take priority over other development activities appears considerable. Therefore, the Program suggests that PECDAR play its planned role in a

professional, transparent and efficient manner.

#### **4.3: Reality Check**

In August 1993, the Israeli Government and the Palestine Liberation Organisation (PLO) announced a resolution to their conflict. An agreement, known as Gaza-Jericho was reached to implement partial autonomy in the Gaza Strip and the West Bank town of Jericho as a possible first step on the road to peace. This agreement addressed more the issue of how Palestinians and Israelis should live together. Unlike Israel's peace agreement with Egypt where land was divided and returned, Israel's agreement with the Palestinians calls for the continued sharing of the land while Israel maintains ultimate control over it. Under the agreement and its Declaration of Principles, the Israeli government transferred limited political and municipal control over Gaza to the PLO. Economic control, however, was not as easily transferred. The Declaration calls for joint arrangements between Israel and the Palestinians in almost every economic domain: water, electricity, finance, energy, transport, and communications, trade, industry, business development, social rehabilitation, infrastructure, agriculture and tourism.

Nevertheless, the important question is whether it is possible to have meaningful co-operation between very unequal actors in a context where power is very much asymmetrical. In fact, Israel's conception of self-rule in Gaza includes special economic procedures and arrangements that exclude any radical alteration of the economy, the establishment of an independent Palestinian economy, and by extension an independent Palestinian state. In this case, Israel's economic policy for the territories is clearly based

on a specific political arrangement: self-rule or autonomy and on a specific economic arrangement, namely unity. Therefore, the Gaza-Jericho Agreement and its promise of autonomy will not eliminate underdevelopment in the territories because politically and economically, autonomy remains within Israel's ideological mandate. For example, under the plan's terms, the main symbols of territorial jurisdiction – land, water, and zoning – remain under complete Israeli control. Water issues are also subject to an Israeli veto.

The agreement is vague when it comes to the establishment of direct bilateral arrangements between the Palestinian economy and other potential trading partners. Therefore, Palestinian access to external markets has to be negotiated with Israel. Furthermore, Israel has the right to decision-making in sectors crucial to Palestinian economic development, such as finance. The initially slow pace of Israeli tax clearances to the Palestinian Authority under the Gaza-Jericho Agreement also underestimated the international assistance effort. The Palestinian Authority also complained about the rate at which Israel transferred tax records and other economic data.

Thus the end to underdevelopment in the OT is directly tied to the degree to which expropriation, integration, and de-institutionalisation are reversed and Palestinian independence is achieved. Economic development projects and packages could not proceed and specifically in the context of the Palestinian-Israeli conflict, could not succeed because the appropriate political conditions had not been established. Even such international organisations as the World Bank and the IMF are constrained by their members to mirror and not to supersede the resolutions to existing conflicts.

Furthermore, we feel sceptical towards the major objectives behind the World Bank

efforts and that of UN agencies, since the UN itself is most of the time influenced by the word of the United States, which generally vetoes any resolution against the State of Israel. The UN resolutions concerning the withdrawal of Israel from the OT have never been respected. No pressure is placed on Israel to comply with these international demands, since the United States considers it its right arm in the Middle East and protects it.

Contrary to the view that economic reform must be implemented before peace can take its course, we think that peace will be secured only when it takes root in the everyday lives of people. Appropriate political arrangements have to be formulated to ensure that the Palestinians have control over their basic resources of land, water, and labour; and that they determine economic policy with respect to trade, industry, business development, and the mobility of human and capital resources across borders. Therefore, the self-governing authority should be accorded effective legislative power regarding domestic economic matters. This will occur after the Palestinian Authority can negotiate for a just and equitable political settlement, which should allow the OT to have an independent existence.

Increasing economic autonomy and self-sustaining development in the OT implies diversifying trading patterns and relations, shifting from dependence on a few external sources of growth (which are now in decline), towards a broader interdependence with other regions or other parts of the world. The West Bank and the Gaza strip have some advantages. For instance, the Palestinian Authority has no large debt payments. However, as mentioned above, the Palestinian Authority must make sure that donors' funds will not be accompanied with unjust and insufficient conditions that would harm

Palestinian industry rather than help it.

It has to use PEC DAR effectively to implement economic projects and to manage the aid received from different donors; it needs to initiate institution building in order to handle critical administrative and development functions. However, this all requires that Israel ensures the speedy approval of permits, clearances, and approvals to ease the work of newly created Palestinian institutions like PEC DAR. The Israelis should also facilitate the flow of donor investments and aid into the OT.

Sustainable economic development can be achieved when the control of the State of Israel over resources – natural, human, capital – is limited and its responsibilities towards indigenous populations whom it sought so long to impoverish are set within a context of a peace agreement.

The World Bank Report does not seriously examine the main obstacle to the economic development of the OT – namely, Israeli policies, lack of funds or the weakness of the Palestinian Authority. The report goes on about the amount of investments and the degree of structural adjustment required, but it does not draw attention to the need to find solutions to the central problem facing economic development: Israel's imperial economy and its exploitive measures.

The report equally fails to address the core issue of misallocation of water. From a supply point of view, there is plenty of water available if consumers are willing to pay for it. From a demand point of view, the cheaper the water is, the more carelessly and abundantly it will be used. What exacerbates the problem is the possibility that less water may be available in the future because of past and current exploitation of the natural resources due to increased variability of precipitation in the region, higher rates of

evaporation, high rates of natural population growth, and significant immigration to the cities and other urban centres. All this increases the pressure on the water supply systems. In short, the report ignores the real problem of water, one that afflicts not only this specific region but also the Middle East as a whole.

What the report needs to recognise is that a policy of demand management rather than supply augmentation should be the first issue discussed when formulating water plans and strategies. Almost all Middle-Eastern countries are careless about their water use. With technologically advanced systems of irrigation accessible to most countries, water is being used more than is needed. However, there is the potential of increasing efficiency in water use and stimulating greater conservation mechanisms. This includes measures that aim to reduce water use, such as altering habits and patterns of use and switching to other crops requiring less water.

When discussing demand management, therefore, we refer to the ways in which end-users can limit the amount of water they consume to specific requirements. These requirements will be determined by the minimum amounts needed for human survival, the technical options available for extraction and the availability of water along with other inputs (capital, labour). Water quality and existing water policies determine water price.<sup>19</sup> Depending on these inputs, end-users will shift inputs to increase or to decrease the efficiency of water use and may even eventually give up water intensive activities altogether.

Therefore, there exists a strong need to shift from supply-side to demand-side approaches when dealing with water resources management in order to deal efficiently

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<sup>19</sup> Brooks and Lonergan (1994) p. 88.

with the current problem. Even the World Bank has indicated that the cost per cubic metre of water for tomorrow's supply projects will definitely be two to three times today's cost. We may conclude this section with a quotation from Mohammed El-Ashry, the head of the World Bank's Environment Department:

The traditional strategy of responding to water shortages by increasing water supplies through capital intensive water transfer or diversion projections has clearly reached its financial, legal and environmental limits. Attention must now shift from development to management.<sup>20</sup>

#### **4.4: Towards a Palestinian Water Policy**

The past fifty years have had a devastating impact on the economic well being of the Palestinian people. Therefore, focussing on economic and infrastructure development to advance the current transformation is necessary. Achieving sustainable development involves a whole process of reworking priorities. Development projects should be modest, favouring small-scale and often homegrown options rather than expensive and possibly inappropriate showpieces. Before looking at mega-projects such as the one described above, we should make every effort to ameliorate the water crisis in the OT through improving conservation and reducing demand.

The severity of the water shortages led most people to conclude that massive desalination and water importation are the only options. This does not have to be true. If efficient internal supply enhancement projects, in combination with improvements in

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<sup>20</sup> Brooks and Lonergan (1994), p. 103.

conservation and changing patterns in demand were to be carried out, the water crisis could be ameliorated. Such a water program would aim to optimise both the supply and demand of water, by developing a number of techniques and processes.

The most important technique that could be used initially to optimise both supply and demand of water involves improving the supply networks. Water is often supplied to irrigated land through open earth channels. In addition, old pipes and lack of maintenance exacerbate the problem of domestic water supply. Estimates of water loss reach 40 percent in the West Bank and Gaza Strip. Furthermore, ways of lowering demand should be considered. There is no positive correlation between the reduction of water consumption and economic growth rates. A priority must be accorded to internal measures to attain greater efficiency in the use of water, including micro-options aimed at the point of use and macro-options in selecting among methods of uses. Hence, water must be priced according to its value. Those who use water should pay the full cost of extracting and delivering the water – both in capital and operation cost. Price structures should reflect marginal costs, which is the cost of supplying the last unit of water demanded. The objective is to ensure that users are forced to recognise the cost that their demand imposes on the water delivery system.

Cloud seeding – the process by which a safe chemical is introduced into a cloud system – has already proven efficient and is in operation in areas of northern Israel and northern Jordan.<sup>21</sup> Rooftop harvesting is another efficient means to collect rainwater that would otherwise be lost as surface run-off and evaporation. Although rooftop harvesting is negligible in Israel since most Israeli houses have sloping roofs, this technique is used

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<sup>21</sup> Isaac (1994) p. 2.

by more than 50,000 households in the West Bank, with a yield of five Mm<sup>3</sup> per year. Other harvesting methods include the collection of water from greenhouses and valleys. For example, a great amount of water is lost as run-off into the Dead Sea.<sup>22</sup>

A more useful technique is wastewater treatment. Not only will this cut public health and environmental risks, it will be used as a substitute for well water, up to 40 Mm<sup>3</sup> per year.<sup>23</sup>

Therefore, more water would become available for irrigation. Irrigation techniques vary significantly in the efficiency of their water use. Traditional surface methods are only around 45 percent efficient, while drip systems reach efficiency levels of 80 percent.<sup>24</sup> Since agriculture is the region's biggest water consumer and most land is cultivated using surface systems, irrigation is definitely an area with plenty of room for improvements. Many farmers have increased the amount of their produce without any significant increase in water use. In addition to being water efficient, drip irrigation would also be economically efficient.

The process of crop selection also plays a vital role in determining the amount of water used for agricultural purposes. Efforts to enhance and to develop salt-resistant crop varieties should be encouraged and adequately financed; the cultivation of crops with high water requirements, such as cotton and strawberries, should be reduced. Furthermore, cash crops must be developed according to market studies, quality control measures, and product specification to ensure that they are able to compete at the international market. Agro-industry must be developed on the basis of economies of scale

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<sup>22</sup> Ibid.

<sup>23</sup> Roy (1995), p. 166.

<sup>24</sup> Isaac (1994), p. 2.

and must be provided with the necessary technical and economic evaluation.

Some analysts argue that various techniques that aim at optimising both water supply and demand are relevant to economies that have control over their natural resources and capital. This would not be true of the Palestinians. Palestinians continue to face political and legal complications in the formulation of water policies, because the Palestinian Authority does not yet have control over all the areas of the West Bank (including East Jerusalem) and the Gaza Strip. In the absence of control over the land, water resources on that land are also out of reach. Furthermore, important data regarding water resources is lacking, making it more difficult to incorporate households, industry, and agricultural sectors. Therefore, any Palestinian water policy should primarily establish the basis for Palestinian control and equitable distribution of their natural resources. Any other arrangement would accomplish little.

The second priority would be to develop sustainable management, use and protection of water resources, especially from exploitive use and pollutants. This entails the creation of a Palestinian Central Authority once riparian rights and access are established. This will be further explained in Chapter V. This body would be responsible for the sustainable management of water use and for the co-ordination of policies and activities, including all district water authorities. In addition, the Palestinian Water Authority must appropriate more tough regulations in regard for hygienic and health standards so as to ensure the entry into export markets, especially in Israel and western Europe.

Moreover, what should be kept in mind is that the development of the agricultural sector is important for several reasons: it requires low capital investments, the technology is easy to use, and rural populations rely heavily on agriculture. This sector will also act

as an important area in which Palestinian returnees will work. Such an important component of the Palestinian economic base should require much attention to improving its efficiency for maximum benefit and for sustainable development.

## Chapter V: Water Rights and Concluding Remarks

Economics has two different means of understanding environmental and natural resource economics. First, *positive economics* is useful in analysing the actions of people and the impact of those actions on the environmental asset. Second, *normative economics* can provide a steady framework on how optimal service flows can be defined and achieved. Thus it suggests two very important criteria used to judge the optimal level and structure of services: efficiency and sustainability. Efficiency entails maximising the present value of net benefits to society whereas sustainability suggests the fairness of any intertemporal allocations. When using a natural resource in one period will introduce scarcity or increase the degree of scarcity of that resource in consecutive periods, an efficient allocation must take into consideration the marginal user cost. Otherwise, smaller than efficient amounts of the resource will be conserved. This discussion is important to our study since it forms the basis of the relationship between economics and the environment. Any future policies must yield allocations that conform to these criteria.

Economic analysis directs the way to possible means of remedying the current water situation. For example, economic reform policies could be used to reduce the number of restrictions on water transfers. However, as evident from the above discussion, the Palestinians and Israelis begin the final status talks on water with Israel firmly in control of the disputed water resources and with a huge gap between the two sides in access to these resources. The problem of water is compounded by the fact that the chief

Palestinian and Israeli water resources are aquifers. The main obstacle is that the political boundaries do not meet the boundaries of surface water and there exists a remarkable overlap of the geological position of the Mountain aquifer and the political boundary of the West Bank. Also, there exists an absence of any agreed upon body of international law, especially regarding groundwater. Thus it is of extreme importance to discuss the issue of water rights in the Palestinian-Israeli context so as to understand how any resolution can actually work in the region.

There are two types of water rights and both are relevant to the Palestinian-Israeli context. The prioritised rights, or appropriative doctrine of water rights applies to groundwater resources whereas the equal sharing or riparian doctrine applies to surface water resources such as the Jordan river.<sup>1</sup>

For water transfers to be successful and efficient, initial water rights must be specified. Water rights must meet certain criteria so as to ensure that the framework realised in water transfers is well established. First, the water rights must be completely defined and enforceable by treaty so that all parties involved in the exchange of water know exactly the benefits and costs of that arrangement.<sup>2</sup> In our context, the omnipresent geopolitical situation which is filled with distrust and animosity does not help our analysis. To completely define water rights in a region where the issue of land ownership is still under dispute and the water resources do not meet current political boundaries, is a cumbersome task. However, defining water rights must also be enforceable by an external third party so as to ensure that the involved parties are respecting the rules and

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<sup>1</sup> Petterson (1997), p.4.

<sup>2</sup> Ibid., p. 5.

regulations. This may prove to be difficult in our case since past UN resolutions have not been respected by Israel with regards to withdrawal from the Occupied Palestinian Lands of the 1967 war. And thus international organisations do not fare well in the eyes of the Palestinian populations.

Second, water rights must be exclusive in the sense that the benefits and costs related to the consumption and transfer of water accrue to the parties involved in the agreement and not to an external third party. For example, Israel cannot sell water from the Jordan River if that transfer will adversely affect the water rights of other riparian countries such as Jordan and Syria. Thirdly, water rights must represent all the different uses and attributes of water that generate value, including water quality, in stream flows and so on. In the Palestinian-Israeli context, however, this is very difficult when considering the shared groundwater aquifers where no agreed upon international agreement exists. Finally, water rights must be transferable so that their holders can transfer rights in the case of an attractive offer by an external agent.<sup>3</sup>

As mentioned above, the Declaration of Principles on Interim self-government Arrangements also called for the creation of a Palestinian Water Administration Authority. Furthermore, in the treaties signed to date, the two parties have agreed that that the resolution over water conflict would be based on the foundations of equitable utilisation of water rights in the common resources and the joint management of these resources. Here equitable utilisation roughly means a mutually recognised access by both sides to water resources (fixed and /or percentages) under strict conditions relating to

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<sup>3</sup> Ibid.

such factors as points of extraction, seasons and priorities.<sup>4</sup> One thing to take into consideration is that Israel's acceptance in the Declarations of Principles that such rights would be allocated towards equitable use implies that it recognises that the existing allocations are unequal. However, neither the Declaration of Principles nor any subsequent accords specify exactly the way equitable utilisation is to take place.

To discuss the issue of water rights in the Palestinian-Israeli context involves a complicated debate about what belongs to whom. What further complicates the situation is that the land issue is not resolved yet, so all the natural resources residing on that land are still under dispute. Thus to compare the water rights of Palestinians and Jewish settlers in the OT or even within Israel is a very complicated task.

The equitable allocation of water rights has been a core Palestinian demand from the beginning of the peace talks. With its capture of the West Bank and Gaza Strip, Israel managed to take over the Palestinian water sector, changed the pre existing laws so as to serve its own interests and, as mentioned above, imposed restrictions on the drilling and pumping of new wells. As a result of the Israeli control, the present allocations of water resources are highly unequal in Israel's favour. One consequence has been that the Palestinian water supply has remained substandard.

But one can envision a system based on equitable allocation of water rights by incorporating factors that take into consideration the long term social and economic needs of both sides as well as their relative abilities to develop alternative resources. In Israel's case, it is possible to harness alternative capabilities since it does possess not only the technological means but also the financial requirements. However, the Palestinians lack

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<sup>4</sup> El-Musa (1996), p. 25.

any substantive economic or even technical capabilities needed to develop the necessary framework for any alternative resources.

Also, one can take into consideration the minimum requirements of water needed for human survival and efficient agricultural production as a starting point to any analysis of water rights for both parties. Population rates and agricultural technologies available must be taken into consideration so as to determine the needs and requirements of both sides. The UN has declared that the minimum water needed for human survival is 100L/day. In most parts of the OT, this minimum requirement is not met. Also, the amount of water a person requires annually for food production in a semi-arid environment is approximately around 1,000 cubic metres, with slight variations according to land productivity.<sup>5</sup> As table 6 shows, however, the level of irrigation water supply of both sides falls significantly short of the food self sufficiency requirement. Nonetheless, the Palestinian supply is only one third of Israel's. Also shown in table 6, the difference in the irrigation water supply is mirrored in the area of land irrigated. The Palestinian irrigated area per person is about one fourth that of Israel. Furthermore, Israel has allowed the Jewish settlements in the West Bank and Gaza to irrigate tens of thousands of dunums of confiscated Palestinian land.

The important point to be kept in mind here is that the inability of Palestinians to expand their irrigation water supply adversely affected the expansion of the Palestinian agriculture: the area of irrigated land had not significantly changed since 1960 (table 1). Also, the gap in the irrigation of water supply is evident in the types of crops grown by both sides. Palestinians rely heavily on vegetables and fruits, whereas the Israelis can

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<sup>5</sup> Ibid., p. 26.

afford to grow other crops such as cotton and wheat, in addition to horticultural crops. Israel's field crops are basically the result of the generous subsidies that Jewish farmers receive from the government as water development assistance, which is not available for Palestinian farmers. This is despite the fact the Israel's field crops are economically inferior (for example, cotton that is mainly planted in the hot Negev desert requires huge amounts of water) as opposed to the Palestinian crops whose marginal value product of water used exceeds the marginal cost of water (except for certain Gaza's citrus production).<sup>6</sup>

Also, as table 7 shows, the gap in water supply is reflected in the significant Palestinian agricultural trade deficit with Israel. Israeli consumers are obviously benefiting from the fact that Palestinians use water to grow produce and sell it to Israel since in that case they will be paying less as opposed to purchasing the produce from another agent. In addition, Palestinians' wages are much lower than their Israeli counterparts and so Israeli consumers do not have to pay higher prices or even pay for agricultural subsidies.

Furthermore, as mentioned above, the Israeli produce is allowed to flow into the Palestinian markets whereas Palestinian produce faces entry restrictions into the Israeli market. Basically, only the produce that would not compete with the Israeli produce is allowed in the Israeli market. Hence Palestinian agriculture suffered from various factors related to the amount of water supply available. Thus to attempt to pinpoint a single factor that affected the use of water resources for Palestinians would underestimate the problem. The main issues to be considered for analysing the problem of water use

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<sup>6</sup> Ibid.

includes; the subsidies for Jewish farmers and hence the pricing scheme of irrigation water, the restrictive Israeli policies towards Palestinian use of water resources (i.e. water supply, drilling of new wells...etc.) and the fragile Palestinian Authority that does not have the power nor the credibility to manage or even negotiate properly the issue of water rights since land is still under Israeli rule. Israel is considered one of the leading nations in the world with regards to irrigation technologies. But as expected, not all this technology is transferred to the Palestinian production process. However, the proximity of Palestinian agriculture to the Israeli irrigation technology could be classified as the only advantage that Palestinians have gained from the occupation.

In the case of the price structure, both the level of prices and the rate structure are at fault. As mentioned in the previous chapters, the price level is too low and the rate structure does not properly reflect the costs of providing service to different types of customers. Efficient pricing requires the use of marginal rather than average cost. This means that the consumer must strike a balance between conservation of the resource and the marginal cost of supplying the last unit of water. Furthermore, ignoring marginal user cost can also encourage excessive demand, especially in the case of groundwater. In addition, the issue of groundwater is compounded by the fact that it is considered a common property resource.<sup>6</sup> In our case, when many users tap the same aquifer, that specific aquifer becomes a common resource property. In our context, sharing such a resource between the Palestinians and Israelis cannot be established unless proper water rights are formulated. What also has to be taken into consideration is that tapping a common property resource will tend to deplete it too rapidly since users will lose the

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<sup>6</sup> Tietenberg (1996), p. 234.

incentive to conserve and hence the marginal scarcity rent will be ignored.<sup>7</sup> Thus assigning water rights must first determine who has a right to which amount of natural resources and then an incentive structure must be created so as to conserve such a common property resources so as to ensure the existence of proper levels for future consumption.

In terms of joint management of water resources, international law declares that the basis for any kind of joint management should be built on mutuality, equality, and respect for sovereignty.<sup>8</sup> However, in the Palestinian-Israeli context, achieving joint management would require determining the basis of such a management and whether it is to be done between equal partners ( which could be the case after reaching a resolution regarding Palestinian sovereignty) or between unequal partners (in the case that no resolution is reached) in which case joint management could not be fully realised. An example would be the present management in the West Bank , which is essentially a unilateral Israeli enterprise. Furthermore, other issues must be incorporated into the joint management framework such as cost sharing and sovereignty. In the Palestinian-Israeli context, however, this is still to be resolved.

As a result, formulating any resolutions regarding the allocation of water rights and joint management of water resources would require first and foremost the need to settle the land issue. An agreement must be reached about land ownership so as to define properly the ownership of the natural resources on that land.

Second, the determination of the minimum requirements of water use for human

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<sup>7</sup> Ibid.

<sup>8</sup> El-Musa (1996), p. 25

survival and food production is needed so as to form the basis of any water rights allocation scheme. There would be no point of formulating agreements that would not meet the economic and social needs of the average person. Thus any resolution regarding water resources must take into account the different needs (economically, socially...etc.) of both sides and also the present population figures and technological expertise. It is evident that both sides have different requirements. The Jewish farmers in the OT use more sophisticated technology and own more land than the Palestinians. On the other hand, Palestinians number more in the OT and thus require more water resources. Also, in terms of land ownership, the Palestinians are always threatened by the confiscation practices of the Israeli government and hence do not enjoy the same security as their Jewish counterparts.

Third, an enforceable international treaty that also includes the other riparians to the Jordan River, namely Jordan and Syria, must come into place so as to properly define water rights, regulations, responsibilities and costs associated with any allocation scheme. Such a treaty must be based on mutual respect for sovereignty, cost sharing, equitable utilisation and cost sharing between the various countries.

We think that such an agreement can be borne only after the above mentioned conditions are first satisfied since they form the basis for an environment of trust and stability in the region. As a result, an atmosphere of trust and co-operation must be achieved in order to achieve a political and economical stability that would harness the foundations for an economically viable Palestinian and Israeli states.

As a result, we strongly believe that the future of the region is significantly correlated with the formulation of fair and equitable policies regarding not only natural

resources (be it land and water resources) but also regarding the freedom and self determination of the Palestinian people. And here the strong linkage between economic development and politically stable environments comes into place. Once it is realised that achieving the necessary conditions for a just peace is the most integral requirement for the economic development of a Palestinian economy, a more reassuring image of the future of the region could be sought.

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36. Zureik, Elia; Hallaj, Muhammad; Abu-Lughod, Janet; Abu-Lughod, Ibrahim; Said, Edward (1990) *A Profile of the Palestinian People*. Chicago: Palestine Human Rights Campaign.

## Table A

### Stages of 20th Century Palestinian History

<u>Stages</u>	<u>Salient Features</u>
1. Dual Society (Pre-1948)	Asymmetrical power relationships mediated by the British Presence; exclusivist Zionist institutions; stunting of Arab economic development; Zionist hegemony and eventual Palestinian dispersion.
2. Internal Colonialism (Pre-1967)	The marginalization of Palestinian peasants; land confiscation; political manipulation; economic stagnation; residential and occupational segregation; duality of economic and social relations.
3. Dependency of West Bank and Gaza on Jordan and Egypt (1948-1967)	Political and economic dependency on Jordan and Egypt.
4. Internal colonialism in Israel; colonial dependency of West Bank and Gaza on Israel (1967-present)	Further proletarianization of Palestinians in Israel; economic penetration of West Bank and Gaza accompanied by land confiscation and encouragement of Palestinian emigration; political suppression and denial of Palestinian rights.

Source: Zureik, Elia; Hallaj, Muhammad; Abu-Lughod, Janet; Abu-Lughod, Ibrahim; Said, Edward (1990), p. 26.

## Table B

### Palestinian Agriculture

#### Palestinian Agriculture affected by:

1. Total Water Supply
  
2. Water Quality:
  - Over-pumping of aquifers
  - Pollution of water courses
  - Limited size and protection measures of ecological preserves
  
3. Price of irrigation water

# Table 1

## Relative Share of Agriculture in GDP (based on 2 years average)

<u>Interval:</u>	<u>West Bank:</u>	<u>Gaza Strip:</u>
1966	17.9	34
1968-69	38.2	27
1974-75	37.4	26.5
1979-80	34.2	21
1984-85	20.2	16.6
1988-89	24.5	19
1991-92	18	17.8

Source: Awartani (1995), p. 195.

**Table 2****Trends in cultivated area (1000 dunums)**

<b>West Bank</b>	<b><u>1963-66</u></b>	<b><u>1968-70</u></b>	<b><u>1978-80</u></b>	<b><u>1984-86</u></b>	<b><u>1990</u></b>
Total	2015	1732	1614	1643	1793
Field Crops	954	955	530	439	588
Vegetables	253	107	101	170	150
Fruit Trees	808	670	983	1034	1055
<b>Gaza Strip</b>	<b><u>1963</u></b>	<b><u>1966</u></b>	<b><u>1986</u></b>	<b><u>1989</u></b>	<b><u>1990</u></b>
Total	126	166	175	183	188
Field Crops	46	53	23	35	37
Vegetables	11	20	39	40	48
Fruit Trees	69	93	113	108	103

**Area under Irrigation**

<b><u>Year</u></b>	<b><u>West Bank</u></b>	<b><u>Gaza Strip</u></b>	<b><u>Total</u></b>
1966	100	75	175
1968	57	90	147
1975	83	95	178
1980	92	95	187
1985	104	103	207
1989	98	102	199
1990	95	110	205

Source: Awartani (1995), P. 196.

### Table 3

## Distribution of the Palestinian Population and Jewish Settlers in the West Bank and Gaza since 1967

<u>Year</u>	<u>Arabs</u>		<u>Jews</u>
	<u>West Bank</u>	<u>Gaza</u>	<u>West Bank and Gaza</u>
Dec 1 1967 *	604,494	380,800	
1979	791,000	447,700	3,176(1976)
1984	896,000	509,900	16,119(1981)
1988	977,000	588,500	60,500(1986)
1990	1,075,531	622,016	98,750(1991)**

- Israel Census: Dec1, 1967
- This figure does not include the 120,000 Israelis living in Occupied East Jerusalem

Source: The Center for Policy Analysis on Palestine (1992), P. 19.

## Table 4

### Water Consumption- 1989 (Million Cubic Meters)

<u>Area:</u>	<u>Total:</u>	<u>Agriculture:</u>
Occupied Palestinian Territories	216	154
West Bank	117	84
Gaza Strip	99	70
Israel	1840	1238
Jordan	733	535

Source: Awartani (1995), p. 197.

# Table 5

## Economic Characteristics of Israel and the OT, 1990-91

	<b>Israel</b>	<i>OT</i>		
		<b>West Bank</b>	<b>Gaza Strip</b>	<b>Total</b>
Population (millions)	5.059	1.005	0.676	1.681
GDP (millions)	59,127	1,643	536	2,179
GNP (millions)	58,112	2,138	839	2,977
GDP per capita	11,687	1,634	792.9	1,296
GNP per capita	11,487	2,127	1,241	1,771
Sector Contribution (%)				
Agriculture	2.3	22.2	16.7	20.6
Industry	21.8	5.7	11.8	7.2
Employment	3.5	12.2	18.5	14.5
Exports (millions)	18,024	175*	63	
Imports (millions)	27,287	700*	423	

\* Estimated from 1987 data

Source: Brooks and Lonergan (1994), p.75.

**Table 6**

**The Israeli-Palestinian Water Use Gap, 1993**

<u>Item</u>	<u>Palestinian</u>	<u>Israeli</u>	<u>P/I %</u>
Aggregate use (Mcm/y)	210	1,754	12
Irrigation	130	1,112*	12
Household	70	536	13
Industry	10	106	9
Per-capita use (cm/y)**			
Aggregate	105	330	32
Irrigation	65	210	31
Household	35	100	35
Use growth (Mcm)***	25	345	7
Price per cubic meter (U.S.\$)			
Household	1	1	100
Agriculture	17	13	
Household relative to GNP per capita			700****
Irrigated agriculture	200	1,864	11
Total area (1,000 dunums)	0.1	0.35	29
Area/Capita (dunums)	5	50	10
Irrigated/Cultivated (%)	33	90	36
Irrigated/Irrigable (%)	0	340	0
Growth (1,000 dunums)*****			

\* Includes 200 Mcm/y of treated wastewater.

\*\* The 1992 Palestinian Population is 2 million .

\*\*\* 1967-73.

\*\*\*\* 1992 GNP per capita .

\*\*\*\*\* 1970-90.

Source: El-Musa, S. (1996), p. 24.

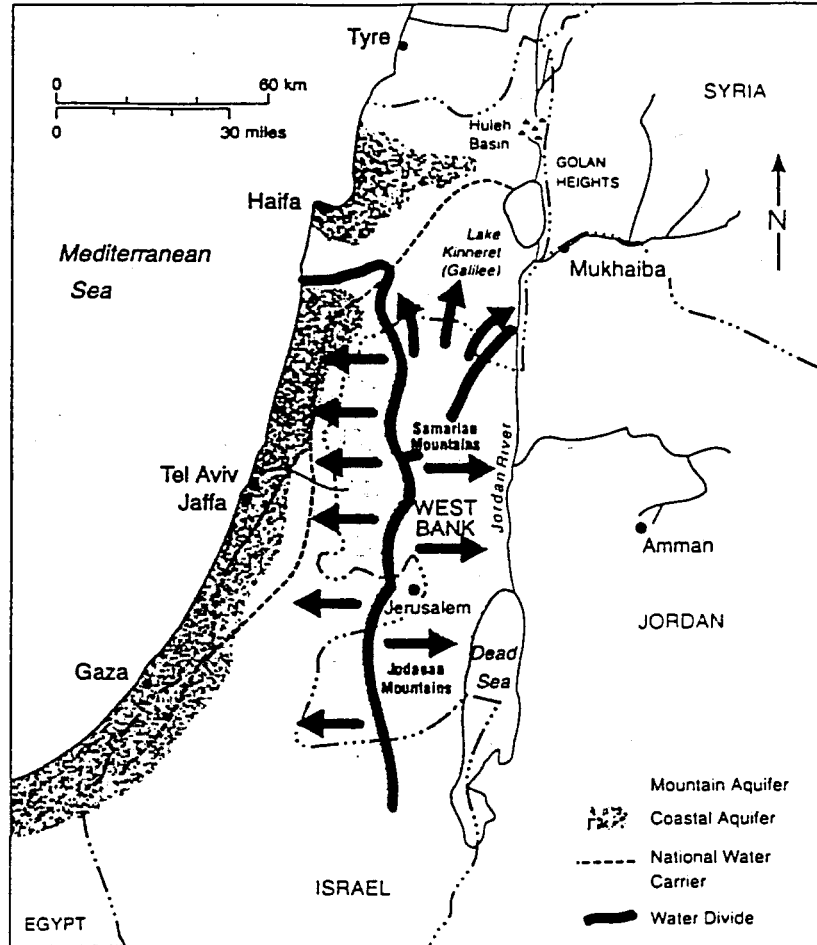
## Table 7

### Palestinian Trade with Israel, 1992 (in million of U.S. dollars)

<u>Trade Category</u>	<u>Amount</u>
Total Exports	290
% to Israel	42
Total Imports	1,037
%from Israel	91
Food exports(non-processed)	67
% to Israel	55
Food imports (non-processed)	197
%from Israel	80
Food Trade deficit with Israel	-119
Total trade deficit with Israel	-995

Source:El-Musa, S. (1996), p. 28.

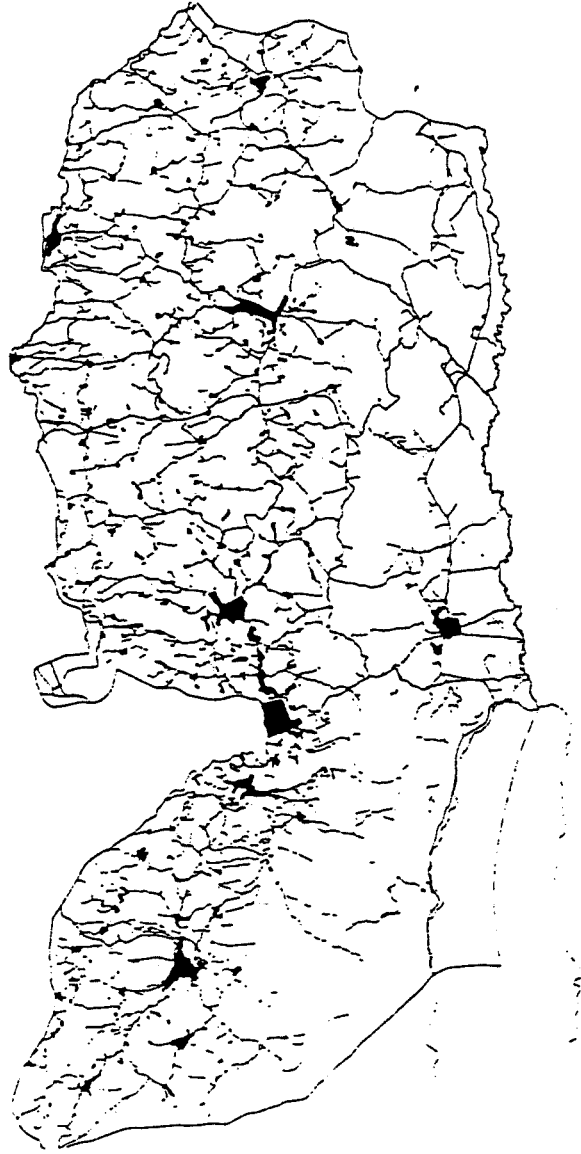
Figure 1



Source: Brooks, D. and Stephen Lonergan. *Watershed: The Role of Fresh Water In the Israeli-Palestinian Conflict*, p32








## Figure 2

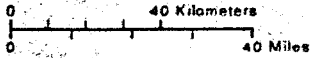
Communities With  
Access to Sewage  
Disposal Networks



Source: M. Barghouti and I. Daibes. *Infrastructure and Health Services in the West Bank: Guidelines for Health Care Planning*, p. 35

# Israel

-  International boundary
-  District (meboz) boundary
-  National capital
-  District (meboz) center
-  Railroad
-  Divided highway
-  Other road



The 1950 Israeli proclamation that Jerusalem be the national capital is not recognized by the United States Government.

