



# *On the Brink of Disaster*

## *The Beit Lahia Treatment Plant and Human Rights*



*Al Mezan Center for Human Rights - June 2003 - by Julia Kendallbacher*



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Dr. Nabil El-Sharif, Director of the Palestinian Water Authority

Dr. Abd Eljabbar Y. El-Tibi, Director General Primary Health Care in the Ministry of Health

Atyeh Al-Ijlleh, Director of the Environmental Health Department in the Ministry of Health

Mohammed Adil Al-Massry, Mayor of the Beit Lahia Municipality

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Dr. Samir Afifi, Professor at the Environmental and Earth Science Department, Islamic University Gaza

Younis Ghalea, Director of Environmental Health in the Municipality of Beit Lahia

Ibrahim Abu Ghasala, Head of the Um-An Nasir Village Council

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### Introduction

Within the last years, the open pools of the Beit Lahia sewage treatment plant have become the main environmental problem facing the Northern Area of Gaza. The plant's limited capacity, its close vicinity to highly populated areas, and the steady increase of sewage have created a huge environmental and health problem for the surrounding communities. The Al Mezan Center for Human Rights has organized several "Face-the-Public" – meetings with the responsible Palestinian Authorities. As a result, there has been a stronger focus on the issue and more cooperation among different governmental departments to develop comprehensive and sustainable solutions to the problem. Unfortunately, to this day all their efforts have been frustrated by continuous Israeli interference. As a consequence, the communities of Um-An Nasir and Beit Lahia live on the verge of an environmental and humanitarian disaster. This report intends to highlight the human rights implications of the problem and the threat to the entire North Area of Gaza. It will introduce the problem of freshwater sources in the Gaza Strip and give an overview of existing wastewater treatment facilities and the related problems. It will outline the history of the Beit Lahia treatment plant in North Gaza and the situation for the surrounding areas, specifically the Bedouin village of Um-An Nasir. This section is followed by a description of the solutions developed by the Palestinian Authority (PA) and the obstacles the PA has faced in the implementation. The second part of the report will go into the details of the various human rights implications including health problems, economic difficulties and threats to personal security. It will then provide the legal background relevant to this case and conclude with recommendations for the international community and the Palestinian Authority.

### Background

#### *Water in the Gaza Strip*

Water is a scarce natural resource in the Gaza Strip, with most of the water coming from the aquifer in the Northern Area. The extraction of groundwater currently exceeds the aquifer recharge rate. As a consequence, overpumping has led to reduced groundwater levels and intrusion of seawater, contaminating the aquifer and increasing groundwater salinity. Moreover, the Gaza Strip aquifer is very close to the surface – between 10 and 120 meters – making the aquifer vulnerable to contamination from the uncontrolled discharge of sewage, agricultural and industrial activities.<sup>1</sup> The excessive use of pesticides and fertilizers – more than 160 types of herbicides, fungicides and insecticides are used in the Palestinian Territories<sup>2</sup> – and the inadequate solid waste management are other sources of water pollution. Considering the high population growth rate in the Palestinian Territories, the situation is expected to become even worse in the future.

The problem of water scarcity is exacerbated by the Israeli water policy. The Palestinian Law Society calls the water situation in Palestine "dramatic, as water is used by Israel as a prime political tool."<sup>3</sup> After the full occupation of the Palestinian Territories in 1967, Israel granted full control over all water resources to its military

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<sup>1</sup> Sharif, Fadel A. "Impact of a Wastewater Treatment Facility on Wells Waters in Beit Lahia, Gaza Strip." in The Islamic University Journal. Vol. 11, No. 1, January 2003, p99.

<sup>2</sup> Affi, Samir and Ashraf Abu-Swareh. "Adsorption Behavior of 2, 4-Diclorophenol and 2, 4, 5-Trichlorophenol on Soil of Gaza Strip." Bethlehem University Journal. Vol. 18, 1999, p37.

<sup>3</sup> LAW – The Palestinian Society for the Protection of Human Rights and the Environment (LAW). An Overview of the Consequences of Israeli Occupation on the Environment in the West Bank and Gaza. Jerusalem, 2000, p43.



forces. As a consequence, Palestinians have since suffered from arbitrary interference with their water supply and a notorious shortage of this basic resource. Not until the signing of the Oslo II accords in 1995 did the Palestinian Authority gain control over its own resources in the Gaza Strip.<sup>4</sup> The same year the Authority established the Palestinian Water Authority (PWA), which has since worked hard on developing a reliable water infrastructure. In practice, however, the Israeli Occupation Forces (IOF) have continued to interfere with Palestinian water policy in the Gaza Strip and exploit the resources. According to a report on Palestinian Health and Human Rights, “the best drinking water is pumped up from boreholes just outside Gaza in Israel for use within Israel and within the settlements, leaving Gazans with limited access to their own water. Surface water is prevented from its natural flow into Gaza by dams within Israel.”<sup>5</sup> In Beit Lahia alone, three wells pump water directly to Israeli settlements. Moreover, the Jewish settlers' per capita irrigated areas are seven times larger than the areas accorded to Palestinians for irrigation in the Gaza Strip.<sup>6</sup> As a result, Palestinian water consumption has decreased to an average of 25-30m<sup>3</sup> per capita per year, while the average Israeli water consumption is 90-100m<sup>3</sup> per year.<sup>7</sup> Palestinians in the Khan Younis Governorate in the south of Gaza are even forced to purchase water from the Israeli water company Mekorot.<sup>8</sup>

In addition to water theft, the Israelis contribute to the deterioration of Gaza's freshwater sources in various other ways. Israeli settlements in Gaza dump manure, untreated sewage and wastewater into the valleys – polluting Palestinian water sources and agricultural land. According to the Center for Economic and Social Rights, Israel discharged 3.5 million cubic meters of untreated wastewater mixed with rainwater into northern Gaza strip towns in February 2001.<sup>9</sup>

The supply situation has become even worse because of the continued demolition of homes and agricultural land by the Israeli forces. Despite an agreement of the Joint Water Committee in 2001, pledging to keep water out of the cycle of violence, the IOF have deliberately targeted water and wastewater facilities throughout the Gaza Strip. The wastewater treatment plant in Gaza City – with a capacity of 42,000 m<sup>3</sup> per day the biggest in Gaza – has been damaged by Israeli shelling in early 2002; the Rafah facility also sustained severe damages from Israeli attacks. Municipality technicians and other workers are not allowed to reach the areas to fix the damages. In the Northern Area the destruction of landfills has further exacerbated the problem. The IOF have destroyed the dumpsite in Beit Hanoun, so the Municipality is forced to transport the garbage to the Gaza landfill, which is at a distance of 36 km.<sup>10</sup> When the IOF close even this route, the garbage remains in the city for the duration of the closure, usually between three and eight days. Leachate from the untreated waste further contaminates the groundwater.

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<sup>4</sup> In the West Bank all water-related issues are controlled by a Joint Committee, chaired by both the Israelis and Palestinians since the Oslo II accords.

<sup>5</sup> Johannes Wier Foundation. A False Dawn: Palestinian Health and Human Rights Under Siege in the Peace Process. Netherlands, 1998, p51.

<sup>6</sup> “Special Report: The Socio-economic Impact of Settlements on Land, Water, and the Palestinian Economy.” Report on the Israeli Settlement in the Occupied Territories. Vol. 8, No. 4, July 1998.

<sup>7</sup> EQA, Palestinian National Report on Sustainable Development. Summary Report. Jerusalem 2002, p4.

<sup>8</sup> United Nations Environment Programme. Desk Study on the Environment in the Occupied Palestinian Territories. Geneva, 2003, p29.

<sup>9</sup> Center for Economic and Social Rights. The Right to Water in Palestine. Brooklyn, 2002.

<sup>10</sup> The direct way to the landfill is only 4km from Beit Lahia. The IOF, however, has closed this road for Palestinians, so the garbage has to be transported via an alternative route, which is 36km of mostly unpaved road.





### ***Wastewater Treatment in the Gaza Strip***

The depletion of water resources and the deterioration of water quality have become major environmental threats in Palestine. The wastewater system in the Gaza Strip is inadequate and has been subject to repeated attacks by the IOF. According to a study of the Environmental Research Unit of the Islamic University Gaza, only one third of the population was connected to a sewage system as of 1997.<sup>11</sup> The rest has to rely on latrines connected to unsealed vaults and groundfills. A recent UN study estimates that 70 to 80% of the domestic wastewater in Gaza is discharged into the environment – into the Mediterranean as well as into open land – without treatment.<sup>12</sup> The Palestinian Ministry of Planning expects the current annual wastewater production of 30 million m<sup>3</sup> to increase four fold until 2025, mostly due to population growth. There are three wastewater treatment facilities in the Gaza Strip: in Beit Lahia, Gaza City, and Rafah. None of them has the appropriate capacity and efficiency to handle the daily amount of sewage and treat it according to environmental standards. According to the UN study, the situation is worsened by the discharge of untreated wastewater from the illegal Israeli settlements.<sup>13</sup>

Frequent attacks on treatment facilities and workers have aggravated the problem. As mentioned above, the treatment plants in both Gaza City and Rafah have been attacked and partially destroyed. Moreover, partial or full closures of the checkpoints as well as repeated attacks by the Israeli Occupation Forces on municipal maintenance staff to treatment plants have impeded Palestinian efforts to improve the sewage system. Security concerns have prevented workers and researchers from completing their tasks, and international donors have been reluctant to fund projects because of the political situation.

### ***The Beit Lahia Treatment Plant***

The Beit Lahia wastewater treatment plant is located some 1.5 km east of the town center of Beit Lahia in the northern part of Gaza. The outskirts of Beit Lahia, however, reach as close as 50 meters to the effluent lake, and the Um-An Nasir village in the East is separated only by a narrow sand fence of around five meters. Its construction started in 1979 by military order during the Israeli occupation, and it was ordered to be located over the best aquifer in the area, the main source of underground water for human consumption.

The treatment plant had been designed a certain capacity to serve up to 50,000 inhabitants. It was not taken into account that this treatment plant will serve the Jabalia refugee camp in the North Governorate, the most dense refugee camp in the area. Therefore, the plant was expanded in 1991 with the help of UNDP funding to increase its capacity to 5,000 m<sup>3</sup> per day. Today the plant receives a daily average of 10,000 m<sup>3</sup> (or 3.6 million m<sup>3</sup> per year), even though there are still areas in the Northern Area that are not connected to the sewage system. Younis Ghalea, Director of Environmental Health at the Beit Lahia Municipality, reports that while 90 percent of Jabalia is connected to the system, only 60 percent of Beit Hanoun and 40 percent of the Beit Lahia population has sewers.<sup>14</sup> The daily amount of sewage exceeds the plant's capacity by far; for many years the plant has been overloaded. Even more problematic is the fact, that this treatment plant has no outlet for the effluent, even though the sea is only 4.5 km away. Therefore, the effluent is spilling over the basin and into the

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<sup>11</sup> Afifi, Dr. Samir A. "Microbiological Assessment of Beach Quality in Gaza Strip." in Egyptian Journal of Medical Laboratory Sciences. Vol. 9, No. 1. March 2000. 51.

<sup>12</sup> UN Desk Study on the Environment in the Occupied Palestinian Territories. January 2003. 47.

<sup>13</sup> 44.

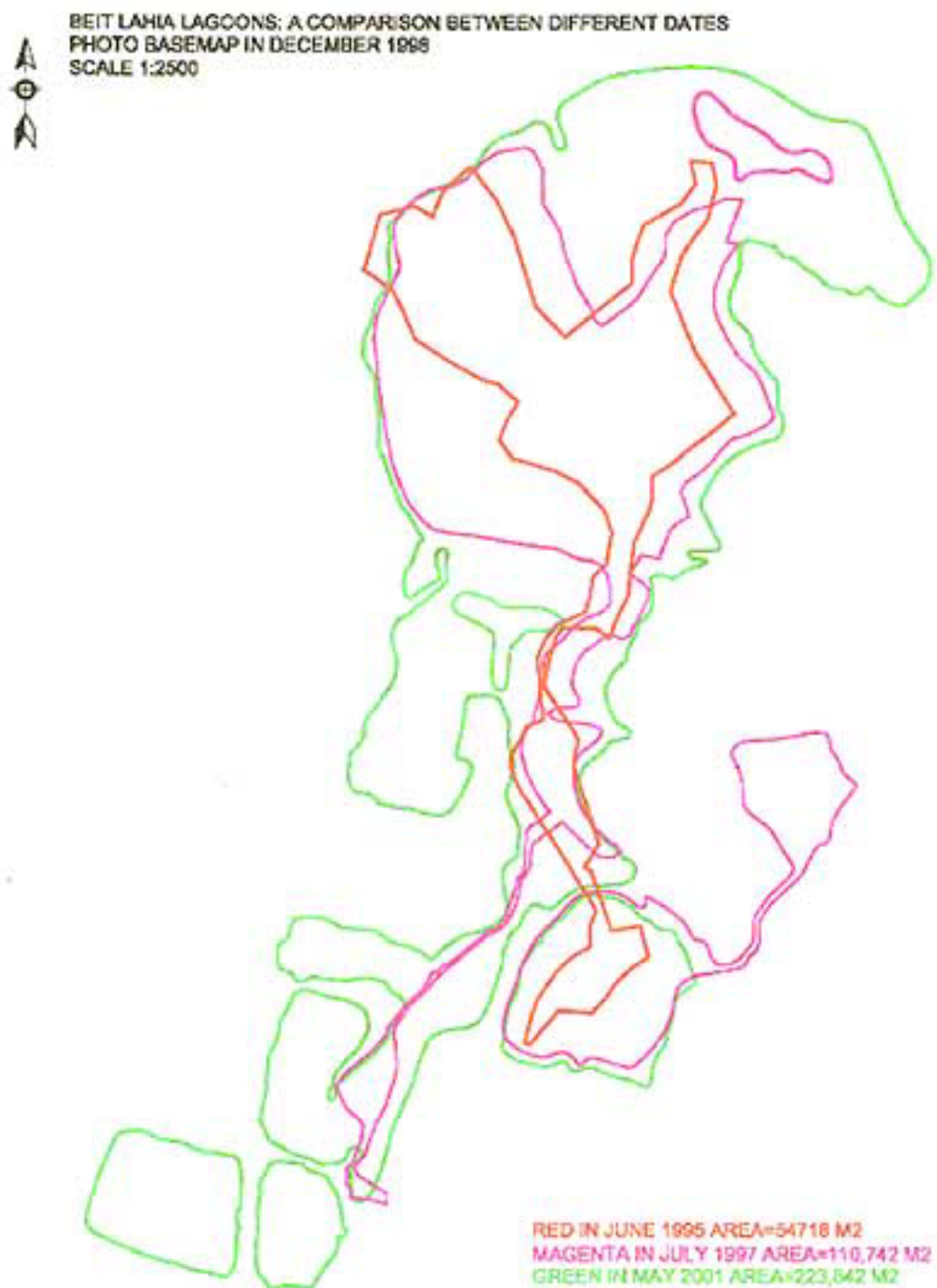
<sup>14</sup> Interview, 7 June 2003.



surrounding sand dunes. The created effluent lake covered more than 450 dunams<sup>15</sup> today and has become a significant source of pollution to the aquifer. Moreover, since the water is stagnant and the soil is oversaturated, it has created a layer at the bottom, which minimizes the infiltration rate day by day. As a consequence, the overflow area has been enlarged tremendously over the part two and a half years alone (see map).

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<sup>15</sup> 1 dunam = 1,000 m<sup>2</sup>



The green line indicates the covered area in 2001, more than 300 dunams. Meanwhile, the area has further increased.

The continuous rise of the effluent level poses a severe threat to the surrounding areas. The surrounding communities have already been flooded twice by the sewage, causing severe economic and environmental problems. The last flooding was in 1992, when the water level was still low and the lake very small. Still the impact of the flooding was tremendous. Today, the water level has reached twelve meters over the land of Beit





Lahia. The area covered by the effluent lake has increased from 50 dunams in 1995 to over 450 dunams today. Another flooding would now lead to an environmental and humanitarian catastrophe.<sup>16</sup>

### ***The Um-An Nasir Village – Living on the Brink of Disaster***

The Um-An Nasir village was established by the Palestinian Ministry of Housing. Its community members, mostly Bedouins, used to live in different areas within the North District. In 1995, Sheikh Zayed donated US\$15 million to build a new town in that area – the Sheikh Zayed Town. Thus, the Bedouins were forcefully removed from the land and relocated close to the treatment plant. The authorities claimed several reasons for the displacement to that area: They wanted to stop the encroachment of the Israeli settlements into the Palestinian areas. Unless they developed the ground, the expansion of these settlements could not be halted. Moreover, there was not much governmental land available for the village to be established.<sup>17</sup> Whatever the Authority's reasons were, the Bedouins resisted their forceful displacement, but were – after some violent clashes between villagers and Palestinian security forces – finally relocated. Their compensation consisted of a piece of land in the vicinity of the sewage pools and US\$2,000. The money is not sufficient to enable the villagers to build homes on the land. In addition, due to the permanent enlargement of the pools and the contamination of the soil and groundwater, the land is largely unsuitable for agriculture. Negotiations on an additional compensation have not been completed yet.

The main problem for Um-An Nasir, however, is its close vicinity to what Mohamed Eila, Director of Projects at the Environmental Quality Authority, calls “a real disaster area.”<sup>18</sup> Beit Lahia's mayor, Mohammed Adil Al-Massry, admits that the Palestinian Authority failed to resolve the problem between 1995 and 1998, when the political climate was suitable. When it finally raised the funds and started to work more effectively, the political atmosphere changed and prevented any progress. Thus, since the beginning of the Al-Aqsa Intifada, the villagers have faced permanent Israeli aggression from the North and a growing environmental threat from the treatment plant in the South. Every day, Israelis fire from the watchtowers near the village; five people have been killed and dozens wounded.<sup>19</sup>

### ***Palestinian Solutions and Israeli Obstacles***

The Municipality of Beit Lahia and the Palestinian Water Authority (PWA) together with the Um-An Nasir Village Council have been working on the problem for a long time. In the long run, the only solution that will prevent further environmental damage and reduce the threat to people's health is the construction of a new sewage treatment plant. The PWA and the Environmental Quality Authority have completed an environmental impact assessment and a feasibility study for this new plant; the first phase of construction is to be completed by 2012. Transfer of the sewage from the old plant could start as early as 2005, if construction could be started now.

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<sup>16</sup> Most of this information is taken from interviews with the Beit Lahia Municipality and the Palestinian Water Authority.

<sup>17</sup> Interview with Mohamed Eila, Director of Projects at the Environmental Quality Authority. 5 June 2003.

<sup>18</sup> *ibid.*

<sup>19</sup> Information in this section is derived from interviews with the Village Council, the Beit Lahia Municipality and the Environmental Quality Authority. The killings were documented by Al Mezan.



The new sewage collection system will be located in the South-Eastern part of the Gaza North Governorate far from populated areas.<sup>20</sup> It is designed to provide a capacity of 36,000 m<sup>3</sup> per day by the completion of phase 1 in 2012 and 62,000 by 2025. Equipped with the most advanced technology the plant will be able to reduce the amount of nitrogen to 10 to 15mg/l, producing water of higher quality than the groundwater in the area. The system will finally recharge the treated water back to the aquifer, thereby both increasing the quantity of potable water and improving its quality. After completion of the new facility, the pools at Beit Lahia will be used for rainwater collection.<sup>21</sup> At this point, the reports, the studies, and the design are ready; the Swedish government has agreed to fund the construction of the plant with US\$21 million, and the Palestinian Authority is ready to start construction.

The project, however, is currently on hold, since the Israeli Occupation Forces block any activities in the proposed area. The area has been declared a security zone, and the IOF refuse to give a security clearance to start the construction. More than once employees investigating the site to conduct their report have been shot at. Sadi Ali, Project Manager at the PWA, describes the difficulties his team encountered when it worked on the geotechnical investigation:

“We managed to contact the Israelis through the Palestinian Civil Affairs. It took a long time to get a permission to take people to go out or to book the equipment. It is quite a long and complicated procedure to apply for permission. We submit all the means, all the equipment numbers, the chassis numbers, colors, etc. to the Palestinian Civil Affairs, and they ask us to dress a certain color, all the people on the site. Under normal conditions, this could be finished in four months. It has been finished in almost one and a half years. It took one and a half years due to the current situation.”

Mohamed Eila, Director of Projects of the Environmental Quality Authority, confirms that the Israeli military is hampering the Palestinian’s efforts to solve the problem:

“We have sat with the Israelis a hundred times to solve this problem; their environmental experts say they don’t have any problem. There is no legal problem, no environmental problem, no problem with land acquisition, there is no problem at all, except you have to get a clearance from the military authority. And the military commander will not give you this clearance.”

In fact, the correspondence between Dr. Abu-Safieh, Director of the Environmental Quality Authority, and Tzachi Hanegbi, Israeli Minister of the Environment at that time, proves the dilemma. In a letter dated from 1 May 2002, Hanegbi states “it is important that the permanent treatment plant for Beit Lahia’s wastewater be established as soon as possible.” However, when Dr. Abu-Safieh then asked to ensure the IOF would retreat their tanks from the new site and allow construction, Hanegbi replied briskly that “because of the way you chose to address us, it is beyond my authority to comment.”<sup>22</sup> Since then there has been no further communication between the two agencies; still no one is allowed to enter the site of the proposed new plant.

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<sup>20</sup> See Appendix II for a map with the locations of both the existing and the proposed plant.

<sup>21</sup> Ministry Communication

<sup>22</sup> Letter from 4 February 2003. The correspondence has been made available to Al Mezan.



The site for the new proposed treatment plant in the Eastern part of North Gaza is controlled by heavy Israeli tanks. Technicians and other civil employees, who attempted to inspect the area, have repeatedly been shot at by Israeli forces.

Even without IOF sabotaging the construction of the new site, the situation in Um-An Nasir and Beit Lahia has reached a stage that requires immediate short-term solutions. The water level in the lagoon is now almost equal to the water level in the plant. Once both water bodies reach a balance, the sewage will not be able to flow into the effluent lake, but spill into the lower regions of Beit Lahia and back into people's homes through the pipelines. The threat has become so immanent that short-term measures have to be taken this year. After studying all possible options, the Palestinian authorities concluded that the fastest solution would be to take the treated water from a far edge of the effluent to the sea shore. They proposed to establish a pumping station and a pipeline that would transfer up to 6,000 m<sup>3</sup> per day to the sea shore in order to keep the level of the water under control and reduce the threat to the surrounding areas. This project complied with international environmental standards and was going to be financed by the French Government. Again, the design was finished, the funds secured, and the Authority was going to award the lowest bidder for the construction, when the Israelis blocked the project and occupied the entire area where the pipeline was planned to be built. Sadi Ali recalls: "We have tried to convince them that this is a temporary measure and that we will pump very acceptable water from an environmental point of view. We have decided to consider the environmental issues, because this project was financed by SEDA, the Swedish International Cooperation Agency. If it is not environmentally acceptable according to international standards it would not be financed. Unfortunately, we could not manage to convince the Israelis. Dr. Yousef Abu-Safieh and I even met with the Israeli Minister for the Environment at that time, Dalia Itzik<sup>23</sup>, who promised to assist and talk to the Israeli military. But she could not manage to do

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<sup>23</sup> Dalia Itzik was succeeded by Tzachi Hanegbi as the Israeli Minister of the Environment in 2001. In 2003, Hanegbi was again replaced by Yehudit Naot.



anything in this respect.” Dr. Abu-Safieh confirms that Itzik confessed this issue was beyond her authority, but depended on the Ministry of Defense.

The only available option for the Palestinian Authorities at the moment is the construction of another infiltration basin and the recharge of the effluent to the aquifer. This, however, can only be an emergency solution, and it adds to the existent environment.<sup>24</sup>

At this point, the Beit Lahia treatment plant is the main environmental problem in the North of Gaza. The high probability of a sewage spill threatens the entire North Area with a population of 210,000 people. It is the cause for severe health problems, economic losses and other human rights violations, which will be described in the following sections.

### Human Rights

The problem of the Beit Lahia treatment plant involves a variety of aspects. It has become a political tool for the Israelis to humiliate and pressure the Palestinian Authority. It constitutes an enormous environmental threat not only to the Um-An Nasir village, but to the entire Northern Area of Gaza. Most of all, however, the existence of the sewage pools severely derogate the people's enjoyment of basic human rights. The following sections analyze the various human rights implications for people's health, their economic situation, their safety, and their right to life. It should be noted that while this report does not include specific research on the psychological effects of all these infringements, it is obvious that the prevailing conditions have a dramatic impact on people's mental and psychological health as well.

### Health

The most immediate threat to human rights that derives from the treatment plant and its overflow is the violation of the right “to the enjoyment of the highest attainable standard of physical and mental health”.<sup>25</sup> Due to the contamination of underground water, the entire North Area of Gaza experiences an unusual high number of water-borne diseases. In the month January 2003 alone, the Palestinian Ministry of Health recorded the following diseases in North Gaza:

Disease	New Cases in January 2003
Meningococcal Meningitis <sup>26</sup>	3
Hepatitis A	7
Typhus	2

<sup>24</sup> Information in this section has been taken mostly from interviews with the Palestinian Water Authority, the Beit Lahia Municipality and the Environmental Quality Authority.

<sup>25</sup> International Covenant on Economic, Social and Cultural Rights (ICESCR), Article 11.

<sup>26</sup> Meningococcal Meningitis: Inflammation in response to infection with neisseria meningitidis of the pia-arachnoid and the fluid residing in the space which it encloses as well as the fluid in the ventricles of the brain. This condition occurs most often in children and adolescents.



Aerial Diseases <sup>27</sup>	182
Pneumonia	16
Ascariasis <sup>28</sup>	47
Enuresis <sup>29</sup>	75
Giardiasis <sup>30</sup>	83
Diarrhea (children under 3 yrs)	231

## Nitrogen and Water Contamination

The major pollutant of Gaza's groundwater is nitrate-nitrogen, a chemical contaminant that causes serious health problems especially in children. At the same time, removal of nitrate-nitrogen requires highly sophisticated technology. In an interview with Al Mezan, Dr. Abd Eljabbar Y. El-Tibi, Director of Primary Health Care at the Palestinian Ministry of Health, confirmed that "the chemical contamination is over our ability to interfere. The microbiological contamination could be minimized by adding chloride, or some other decontaminant to the water. But the levels of nitrate, nitrite, and fluoride are higher than the accepted levels for drinking water, and we cannot do anything about it."

The most vulnerable group to this contaminant are infants under the age of six months. According to a study by the U.S. Center for Environmental Quality, the primary health hazard from drinking water with nitrate-nitrogen occurs when nitrate is transformed to nitrite in the digestive system. The nitrite oxidizes iron in the hemoglobin of the red blood cells to form methemoglobin, which lacks the oxygen-carrying ability of hemoglobin. This creates methemoglobinemia, where the children's hemoglobin is less than normal, which has serious effects on their development. This condition is also known as the "blue baby syndrome", because of the bluish appearance of babies' veins and skins due to a lack of oxygen. The study also reports potential birth defects associated with pregnant women drinking water high nitrogen as well as a potential cancer risk. A major problem in this respect is that little is known about the long-term effects of chronic exposure of high-level nitrate water.

The World Health Organization set the acceptable limit for nitrate at 50 mg/l<sup>31</sup>, a number that is frequently exceeded in wells throughout the Gaza Strip, where levels are as high as 272 mg/l. Wells around the Beit Lahia

<sup>27</sup> Aerial diseases include all kinds of diseases transmitted through the air, including influenza, pneumonia, TB, diphtheria, measles, whooping cough, and scarlet fever and other streptococcal diseases (Ausubel, Jesse et al. "Death and the Human Environment: The United States in the Twentieth Century." *Technology in Society*. Vol. 23, No. 2, 2001, p139.

<sup>28</sup> Ascariasis: A parasitic infection, mostly in children under 10 caused by *Ascaris lumbricoides*. Symptoms include colics, appendicitis, haematemesis, pneumonitis.

<sup>29</sup> Involuntary discharge of urine after the age at which urinary control should have been achieved; bed wetting.

<sup>30</sup> Giardiasis: An infection of the small intestine caused by the flagellated protozoan *giardia lamblia*. It is spread via contaminated food and water and by direct person-to-person contact.

<sup>31</sup> WHO Guidelines for Drinking-Water Quality 3, Chapter 8, March 2003, p293.



plant show levels up to 66.2 mg/l.<sup>32</sup> For comparison: the United States Environmental Protection Agency (EPA) adopted a 10 mg/l standard as the maximum contaminant level (MCL) for nitrate-nitrogen.

### Mosquitoes and Gases

Living at the very edges of the treatment plant and its overflow, the Um-An Nasir population is the most affected group in the North Area. They suffer from the contamination of their groundwater sources, from the foul gases produced by the effluent lake and the sewage pools, and from millions of mosquitoes that find an ideal breeding environment in and around the lake. Dr. Mohamed Yaghi, doctor at the UPMRC clinic in Um-An Nasir, describes the health situation in the village as “very bad.” He divides the main health problems for the community members into three areas.

The most common and problematic health hazard in the village are parasites and helminths, transmitted by the mosquitoes. Dr. Yaghi estimates that more than 50% of the community’s children have problems with their digestive system. He explains: “The symptoms include bloody diarrhea, abdominal pain, sometimes severe abdominal pain, constipation, appetite reduction. Sometimes vomiting, sometimes high fever. There are also indicators of malnutrition among children. We have cases of anemia, which can be caused by parasites or helminths.”<sup>33</sup>

With 62.2%, the majority of parasitic infections in the Gaza Strip is caused by *Giardia lamblia* and is most prevalent in younger children, age 6 to 11. Children exposed to these infections are likely to suffer from long-term effects such as anemia, retarded growth, and mental disorders.<sup>34</sup>

The second kind of health problems prevalent in this area are skin infections and allergies. Villagers suffer from ulcers, itching, and rashes. With thousands of mosquitoes swamping the area, especially at the beginning of summer, many people have developed allergies. In an interview community member Ibrahim Abu Ghazall reported that between May and August, he cannot wear any shirts, as the mosquitoes would fill the whole of his clothes.

Finally, the gases produced by the sewage pools – combined with an extremely high level of humidity – create severe hazards to the people’s respiratory system. Many villagers have developed asthma; other symptoms include fever, cough, and severe wheezy chests<sup>35</sup>. Dr. Yaghi reports that some of his patients arrive at the clinic with symptoms of status asthmaticus, their conditions sometimes “life threatening.”

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<sup>32</sup> Ministry of Health data from 22 April 2002 and 4 May 2002.

<sup>33</sup> Interview, 7 June 2003.

<sup>34</sup> Yassin M. Maged et al. “Prevalence of Intestinal Parasites among School Children in Gaza City, Gaza Strip.” in *Journal of the Egyptian Society of Parasitology*. Vol. 29, No. 2, August 1999, p368.

<sup>35</sup> Wheezy Chest: describes symptoms of noisy breathing and redness of the chest indicating infections of the lungs and chest area.





The foul smelling gases produced by the sewage pools are not only a permanent nuisance for the people, but also the cause for various respiratory diseases.

For the community, these health problems constitute grave impairment of their living conditions. Even though there are no comprehensive studies on the health effects of the pools on the villagers, it is clear that the majority of the population is heavily affected, directly or indirectly. In addition, no one knows what diseases and allergies people will develop in the long run. Dr. Yaghi admits that it is impossible to predict future health effects at this point, but he is convinced that the chronic diseases and the parasites that many girls suffer from will have an effect on their reproductive health.

### ***Economic Situation***

The major economic problem of Um-An Nasir is not directly related to the sewage pools. 80% of the villagers used to be employed as workers and farmers in Israel. Due to the closure, they are now unemployed. Moreover, the Israeli Occupation Forces have continuously seized land – up to 500 dunams – that could have been used for agriculture by the community.

Regarding the treatment plant, the head of the Village Council, Ibrahim Abu Ghasala, says he cannot talk so much of direct impacts, but more of “lost opportunities.” Theoretically, the aquifer in this area makes this land suitable for agriculture. In reality, the contamination of groundwater and soil by the sewage water has made it very difficult to use the land for agricultural purposes. Twice, the village’s harvest had to be destroyed by the Palestinian Ministry of Agriculture, because sewage spills had wasted the crop.

The pools direct economic impact on the village’s economy is connected with the notorious health problems of many community members. Respiratory and digestive diseases impair people’s physical abilities to work, in some cases they force workers to give up their jobs completely. Following is the affidavit of Ibrahim Salem Abu Ghazall, 41 years old and suffering from severe asthma:



We are eight in my family: me, my wife and my six children. The problem started when we were first moved to the village in 1998. The first night here, I experienced sneezing and coughing, and there were small bleedings with the cough. Since then I have had a lung infection, which is sometimes severe. I have tried to find the right medicines for it, I went to many doctors, but there was no solution. I used to work inside Israel in the past. Every day I went to Israel, worked, went back home, slept for a while, and then I woke up and felt very sick. Once, I went to Egypt, stayed there for 20 days and there finally my health started to improve a lot. The first night I came back from Egypt, I started to suffer from the same symptoms and troubles.

I used to work as a hired farmer in Israel and the Gaza Strip. Because of my physical condition I am unemployed and my health does not allow me to work anymore. I have to take three doses of asthma spray every day; otherwise I suffer pains and many other problems with breathing. I used to make good money, now I depend on the help of other people and rations from UNRWA and other NGOs. And I am not the only one. Many people have health problems and cannot work anymore. My 12-year-old son has problems breathing, another community member has just been taken to hospital because his condition has deteriorated.

The people in the community of Um-An Nasir belong to the poorest of the poor. Forced to live in an environmentally hazardous area and under the constant threat of a biological disaster on one side and violent Israeli attacks on the other side, their living conditions are far below any acceptable standard. In addition to their health problems, the contamination of groundwater by the sewage plant deprives the villagers of the basis of their existence.



Dwellings in the Um-An Nasir village. The living conditions of the Bedouin people are extremely poor.



## **Safety**

### **Floods**

Beside the permanent hazards to the environment and to people's health, the treatment pools also present a significant security threat to the surrounding areas. The consequences of spills and floodings affect not only the Um-An Nasir village, but the entire area, including Beit Lahia's population of around 55,000. On two occasions, in 1989 and 1992, the sand barriers already collapsed under the pressure of the overflow. As a result, the sewage flooded houses and land in Beit Lahia, causing severe environmental, economic and health problems. Samia Al-Kaseeh is one of the victims of the 1989 flooding. Following is her affidavit given to Al Mezan:

We are a family of nine people. The incident happened in October 1989 at 11 at night, when we were all sleeping. We had only the ground floor then and the whole family lived there. Suddenly, we had the sewage entering from two directions, from the South and from the North. The water flooded the house in a two to three meter wave; it happened so fast! We to run away with some of our furniture. We took it to the on the roof. It was in October 1989, and my kids were all just little children then. It was difficult to take them all upstairs. After we took what we could carry of our furniture and saved the kids, we secured them on the roof. I went downstairs and saw that the floor had collapsed and the tiles were completely broken. The sewage had caught the sand from underground and the floor broke down. My mother-in-law's room, which is outside, was completely destroyed.

We also used to have cages with chickens, pigeons, a donkey and other animals, which were all lost in the flood. They all drowned. The fruit and pine trees and our garden were also destroyed. Many people lost their gardens and their crop that night. What was not destroyed by the flood was destroyed by the Ministry of Agriculture, because the vegetables and fruits were not safe to be sold.



After the flood we kept our furniture on the roof for twenty days. We had to make a new floor, but first we did not have the money – it cost over \$1,000. The authorities did not give us a single shekel, so we had to borrow money from friends and relatives. We finally managed to buy some sand to cover the sewage in front and inside the house. Then we fixed one room and slept in it, while we were working on the next room. The damage outside the house was even more devastating, because the sewage stayed for months. It smelled so bad, so we suffered a lot during that time. It was not until last year that we could recover the vineyard, and we are still suffering from the economic damage. And what is worse, the fear remains. We know it can happen again any time. Three months ago, for example, there were rumors that another flood would come. So, I took my children to relatives further away for two months every night, because I was scared. We also built a wall around the house, which cost us \$1,000. We hope it will save us.

As the water level of the affluent lake is rising, the threat of another flood is increasing constantly. Moreover, as Sadi Ali explains, the lagoons are close to the point where the pools' level and the water level in the effluent lake balance. As a consequence, water would not be able to spill into the overflow area anymore and would have to find its way into lower regions. These regions happen to be the Beit Lahia lands and housings. Thus, in addition to their daily burden of health problems and economic difficulty, the people live in constant fear of being flooded by raw sewage.



Constantly threatened by the pools: today the Um-An Nasir community is separated from the effluent water only by narrow sand fences. There is no more room for enlargement.

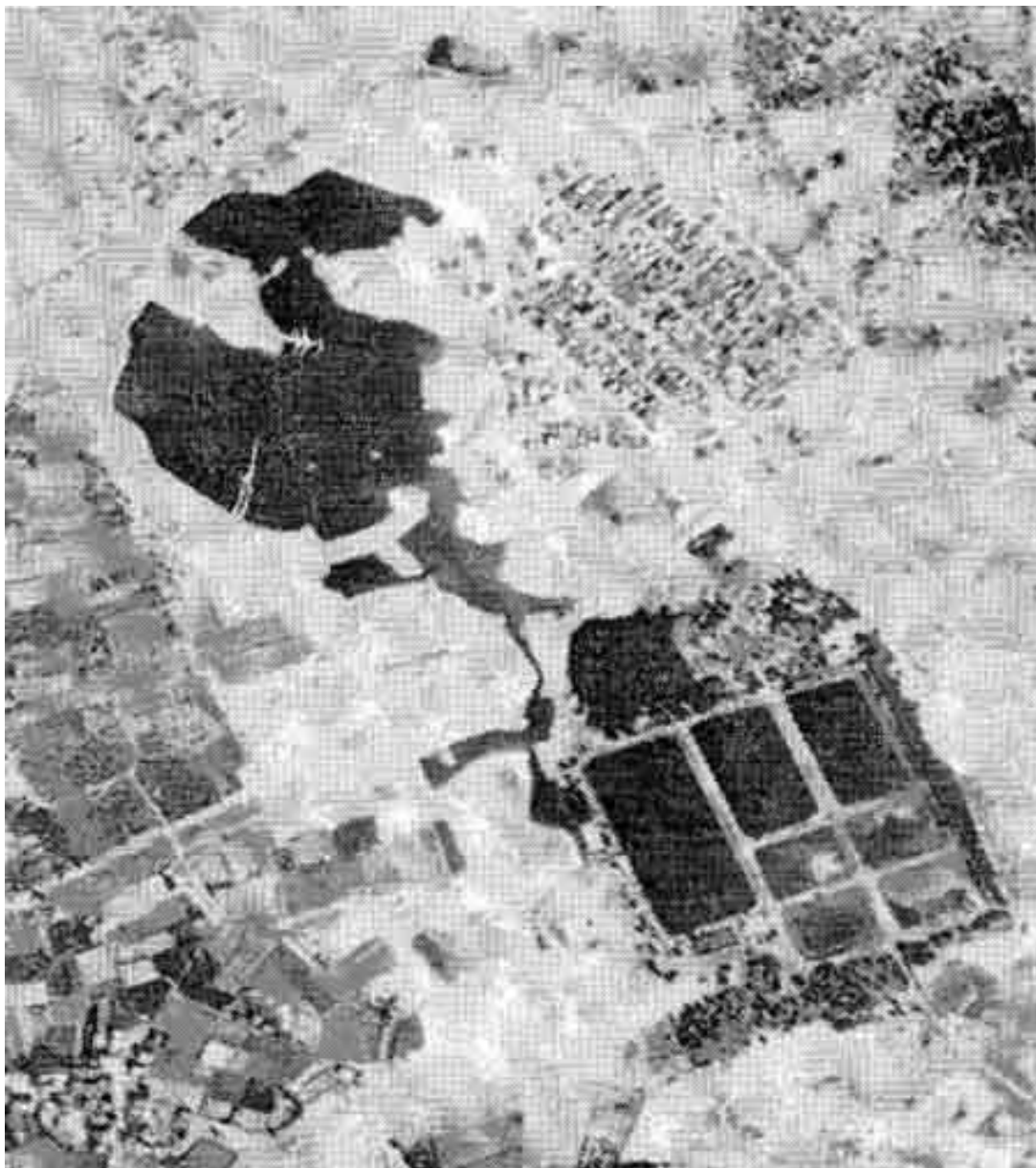
### Accidents

The continual enlargement of the effluent lake does not provide any opportunity to secure the areas surrounding the plant and its overflow. Sadi Ali, Project Manager at the Palestinian Water Authority, explains: "It used to be every two months – and now it's every few weeks – that we need to raise the sand in order to prevent the flooding of the surrounding area." A fence in 30 meters distance around the pools, established by the Palestinian Authority a few years ago, has drowned long ago. Now the pools extend to an area 50 meters





beyond the fence. All the Municipality and the Ministry of Public Health can do now is building up the sand fences.



The lake in 2001. Since then it has increased by more than 150 dunams.

The lack of security has already resulted in two dreadful accidents. Since 1992, two children have died a terrible death in the sewage pools. The following affidavits are given by their fathers, Jaber Salama Saleh Abu Ayeshe and Sabri Yusif Al-Masri.

Nida was eight and a half years old, when she drowned in the pools in August 1992. We noticed that she was missing, and started to look for her around this area. The next day we searched the entire village again. Then on the third day we organized a campaign where around 1,200 men from the Northern Area started a search. There was one person every three meters and then we found her in the sewage pools. It was really painful and I thank God that one of these trees caught her dress so she was not lost forever and I thank God that the dogs did not eat her.



Nida

Two years later, Jaber Abu Ayesh lost his son in the same effluent lake:

My son's name is Salama. He was eight years old when he drowned in 1994, four months before the Israeli Occupation of Gaza ended. He was on the way back from school. It was three o'clock in the afternoon. Salama saw some of his fellows and friends playing near the pools, so he went there. When they stood at the edge of the pool, Salama suddenly fell in the pool. I was not there to help nor was anyone else of our family. People tried to help, one person, called Jaman, brought a rope and tied it to himself. Somebody took the other edge, and he swam in the pool to look for Salama. He found him, but he was dead.

At the time of the last incident, the pools were six meters high, and there were no fences or any other safety measures. The Palestinian Authority has tried to set up fences, but they have been washed over by the rising water level. Until the Israelis allow any activities to solve the problem, all the Municipality and the Ministry of Public Health can do now is increase the sand fences. And hope that no more children die in the sewage pools, which are always getting higher and higher.

### Israeli Attacks

As mentioned before, the Bedouins of Um-An Nasir face threats from all side. Since the beginning of the Al-Aqsa Intifada five people have been killed in the village and many more have been wounded. Every day the village is subject to firings from the Israeli watchtowers guarding the illegal settlements in the North of Gaza. The following affidavit was provided to Al Mezan by Fayza Muhammad Fatuh, who lives in the Al-Nada Towers opposite to the Bedouin village. She watched the murder of 9-year-old Mahmud al-Talaqa by an Israeli soldier:

"About 12:05, Friday 1 March 2002, I was sitting in my flat when I heard the sound of a tank. I looked out of the window and saw the tank going up a small hill opposite to the building. A group of children gathered and stood looking at the tank and at a soldier who looked out of a hole. Many times the soldier waved to the children in a friendly way. Three children walked up the hill near the tank, which moved back. One of the





children followed the tank and when he was about 15 meters from it, the same soldier opened fire directly. I later knew the boy was Mahmud al-Talaqa, who died from wounds.”

As mentioned before, the IOF have also repeatedly attacked municipal workers, who visited the site of the proposed new treatment plant. Asked for an explanation their attacks on civilians at the site, the IOF refused to give any details and explained that “being the executive our job is to ensure the safety of Israeli citizens and IDF soldiers by any legal means necessary. Whether or not construction is allowed at the so-called border, is a political decision and we have nothing to do with it.”<sup>36</sup>

### Legal Background

It has become clear that the people of Um-An Nasir have been deprived of their human rights on various levels. Both the Palestinian Authority and Israel as an occupying power have legal obligations to ensure the physical well-being and safety of the people in the OPT. The following pages describe the various international laws and conventions to the four main clusters of legal issues:

- the forced displacement of the Bedouin village by the Palestinian Ministry of Housing;
- the authority's obligation to provide Palestinians with safe drinking water and protect their natural resources;
- the violent attacks on construction workers by the Israeli military;
- the Israelis' refusal to cooperate with the Palestinian Authority on the issue and their continuous interference and sabotage of the PA's efforts to solve the problem.

Firstly, however, it is most important to define the status of Palestine as regards its international standing and applicable humanitarian laws. In the aftermath of the June 1967 war, Israeli military forces occupied the West Bank, the Gaza Strip, and Jerusalem and imposed military law throughout the occupied territories. The international community has thus determined the Israeli forces to be a Belligerent Occupying Power and the Palestinian territories to be Occupied Territories. Therefore, the articles of the Fourth Geneva Convention of 1949 relative to the protection of civilians during times of war are de jure applicable to the Palestinian Occupied Territories. For the international community this means that according to Article 1 of the Fourth Geneva Convention (“The High Contracting Parties undertake to respect and to ensure respect for the present Convention in all circumstances.”), the states are obliged to pressure Israel as the Occupying Power to comply with Humanitarian Law.

Concerning the Um-An Nasir case the following articles are relevant:

#### ***I Concerning the Palestinian Ministry of Housing's Forced Displacement of the Bedouin Village People***

The forced displacement of the Bedouin people to make room for the new town constitutes a violation of Art. 12 of the ICCPR, which grants everyone the “right to freedom to choose his residence.” International further requires that in case of forced eviction or displacements, “prompt, adequate and effective” compensation be paid. In a 1994 resolution, the Sub-Commission on Prevention of Discrimination and Protection of Minorities emphasized the importance of “immediate restitution, compensation and/or appropriate and sufficient

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<sup>36</sup> Telephone interview with the IOF, 23 June 2003. The name of the interviewee is known to Al Mezan.



alternative accommodation or land, consistent with their wishes or needs, to persons and communities that have been forcibly evicted, following mutually satisfactory negotiations with the affected persons or groups.”<sup>37</sup> The US\$2,000 and the land given to the Bedouin people are neither adequate nor effective, since they do not enable the villagers to build new and adequate homes.

Moreover, the particular site chosen by the Palestinian Ministry of Housing for the relocation proves to be unsuitable for human settlement. The Ministry was well aware of the existence of a treatment plant that was – already at this point – overloaded and environmentally dangerous. There had already been two major sewage spills onto the surrounding areas. Although the Guidelines on Development-Based Displacement were adopted by UN Habitat and the UN Human Rights Commissioner after the relocation of the Bedouin village, it is worth mentioning here to highlight the human rights implications of this displacement. Article 13 in Section 3 of the Guidelines insists that “States should ensure that no persons, groups or communities are rendered homeless or are exposed to the violation of any other human rights as a consequence of a forced eviction.”<sup>38</sup>

Clearly, the severe health problems, the closeness to the Israeli settlement and therefore the constant threat of assault, and the economic losses due to contaminated soil and water constitute human rights violations resulting from the displacement to the close vicinity of the sewage pools.

### ***II Concerning the Obligation to Provide Safe Drinking Water***

The people’s right to fresh and healthy water is one of the most important and basic of human rights. It is implied in Art. 3 of the Universal Declaration of Human Rights, which guarantees everyone’s right to life. More specifically, Art. 25(1) states “[e]veryone has the right to a standard of living adequate for the health and well-being of himself and of his family.” The International Covenant on Economic, Social and Cultural Rights confirms this right in article 11 and adds the right of “everyone to the enjoyment of the highest attainable standard of physical and mental health<sup>39</sup>,” and obliges State Parties to ensure the enjoyment of this right by taking steps for “the improvement of all aspects of environmental and industrial hygiene” (Art. 12(2)(b)). In its general comment on the rights to water, the UN Committee on Economic, Social and Cultural Rights specifies the right to water as “clearly fall[ing] within the category of guarantees essential for securing an adequate standard of living, particularly since it is one of the most fundamental conditions for survival” (I(3)). It goes on to say that “[e]nvironmental hygiene, as an aspect of the right to health under article 12, paragraph 2 (b), of the Covenant, encompasses taking steps on a non-discriminatory basis to prevent threats to health from unsafe and toxic water conditions” (I(8)). In fact, Art. 24(2) of the Convention on the Rights of the Child states explicitly the State Parties’ obligation to provide children with “adequate nutritious foods and clean drinking-water, taking into consideration the dangers and risks of environmental pollution.”

### **Palestinian Environmental Law**

The Palestinian Environmental Law was passed by the Legislative Council on 6 July, 1999. It guarantees “the right to every individual to live in a sound and clean environment” and the “[p]rotection of the country’s natural

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<sup>37</sup> Resolution 1994/39 regarding forced evictions, Par. 4

<sup>38</sup> The Practice of Forced Evictions: Comprehensive Human Rights Guidelines On Development-Based Displacement, adopted by the Expert Seminar on the Practice of Forced Evictions Geneva, 11-13 June 1997.

<sup>39</sup> See also Art. 10(d) of the Declaration on Social Progress and Development, Art. 24(1) of the Convention on the Rights of the Child and Art. 14(2)(h) of the Convention on the Elimination of Discrimination Against Women.



fortunes and economic resources [...] without any harms or side effects that are likely to occur sooner or later as a result of the variant industrial, agricultural or constructional activities, with an impact on the quality of life and basic ecosystems such as air, water, soil; marine resources, animals and plants.”<sup>40</sup> More specifically, the article 25 of the law requires the Ministry of the Environment to establish standards and conditions to “reduce environmental nuisance generated by different activities.” The law’s definition of environmental nuisance includes “the release of smells which result from any activity of humans, facilities, transportation facilities or any other agent in a manner that affects properties or the human (exercise of natural) life.” This provision unmistakably obliges the Ministry to resolve the problem of the treatment plant and create a safe and healthy environment for the Um-An Nasir community.

It should be noted again that the Palestinian authorities are well aware of their obligations and responsibilities. They have conducted the necessary environmental impact assessments and developed feasible solutions. Their efforts to implement the policies, however, have been continuously frustrated by Israeli resistance and interference.

### ***III Concerning Israel’s Attacks against Municipal Employees***

The Universal Declaration of Human Rights and the International Covenant on Civil and Political Rights (ICCPR) state clearly: “Everyone has the right to life, liberty and security of person (Art. 3; Art. 9(1) ICCPR). As mentioned above, Israel, as the Belligerent Occupying Force, has a special obligation to comply with the provisions of the Fourth Geneva Convention of 1949. The Protocol I relating to the Protection of Victims of International Armed Conflicts prohibits “indiscriminate attacks” (Art. 51(4)). More specifically, Art. 52(1) and Art. 54(2) state that “[c]ivilian objects shall not be the object of attack or of reprisals” and respectively that

It is prohibited to attack, destroy, remove or render useless objects indispensable to the survival of the civilian population, such as foodstuffs, agricultural areas for the production of foodstuffs, crop, livestock, drinking water installations and supplies and irrigation works, for the specific purpose of denying them for their sustenance value to the civilian population or to the adverse Party, whatever the motive, whether in order to starve out civilians, to cause them to move away, or for any other motive.

Furthermore, the UN has issued several comments and resolutions that address a State’s obligation to respect and protect people’s right to water. As recently as 2002, the UN Committee on Economic, Social and Cultural Rights issued a general comment regarding the Right to Water. It states that “[t]he obligation to respect [the right to water] requires that States parties refrain from interfering directly or indirectly with the enjoyment of the right to water. The obligation includes, inter alia, refraining from engaging in any practice or activity that denies or limits equal access to adequate water; ...; and limiting access to, or destroying, water services and infrastructure as a punitive measure, for example, during armed conflicts in violation of international humanitarian law” (III(21)). Moreover, “[w]ater should never be used as an instrument of political and economic pressure” (III(17)). The attacks against construction workers building the new treatment facility clearly violate Israel’s obligation to respect the Palestinian’s right to water.

The UN Resolution 52/207 of 1997 specifically calls upon Israel as the occupying power, “not to exploit, to cause loss or depletion of or to endanger the natural resources in the occupied Palestinian territory, including Jerusalem, and the occupied Syrian Golan.” Again, the Israeli attacks on the construction workers constitute a

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<sup>40</sup> Article 5 (A)(B).



severe interference with the Palestinian's efforts to protect their freshwater resources. Israel is therefore responsible for possible damage to the aquifers as a result of the Palestinian authorities being forced to refrain from appropriate action. In this regard, the PA can also refer to Article 26 of the Declaration on Social Progress and Development, which grants "compensation for damages, be they social or economic in nature – including restitution and reparations – caused as a result of aggression and of illegal occupation of territory by the aggressor."

It is worth mentioning that in 2001, the Israeli-Palestinian Joint Water Committee passed a Joint Declaration for Keeping the Water Infrastructure out of the Cycle of Violence, where it calls "on those involved in the current crisis not to harm in any way the professional teams that conduct regular maintenance or repair damage and malfunctions to the water and wastewater infrastructure." It is reasonable to assume that the construction of an alternative wastewater treatment plant in order to protect the aquifers in Beit Lahia falls under the scope of this statement.

#### ***IV Concerning Israel's Refusal to Cooperate with the Palestinian Authority and its Continuous Interference and Sabotage of Palestinians' Efforts to Solve the Problem***

1. There are no international laws specifically requiring Israel to support the Palestinian Authority in its effort to alleviate the problem in Beit Lahia. And the Palestinian Authority does neither expect nor require any Israeli assistance. All they ask for is, as Younis Ghalea said, "that they just let us implement the solutions we developed ourselves." Moreover, besides humanitarian law prohibiting Israel to attack civilians, there are a number of provisions in international conventions that are applicable to the case. For example, the UN Committee on Economic, Social and Cultural Rights in its comment on the Right to Water emphasizes the State Parties' obligation "to facilitate realization of the right to water in other countries, for example through provision of water resources, financial and technical assistance, and provide the necessary aid when required. In disaster relief and emergency assistance, including assistance to refugees and displaced persons, priority should be given to Covenant rights, including the provision of adequate water" (III(34)).

#### **Conclusion and Recommendations**

Living conditions in the communities surrounding the Beit Lahia treatment plant have been deteriorating for years on several levels. At this point the situation has become unbearable especially for the Um-An Nasir villagers. The plant affects their health, their economy, their safety – every aspect of their lives. The urgency and importance to implement immediate solutions cannot be overemphasized. If no action is taken instantly, the entire North Area faces a humanitarian disaster. Israel's refusal to allow the Palestinian Authority to alleviate the problems constitutes a grave breach of many international conventions and a severe violation of human rights. It has created a ridiculous situation, in which solutions to the problem have been developed, the authorities are willing and capable to act, and funds are secured. Israel's determination to use the basis of human existence as a political tool against Palestinians is the main – if not the sole – reason for people's continued suffering.

The case of the Beit Lahia treatment plant provides an excellent opportunity for the international community to prove their commitment to their own conventions. The Committee on Economic, Social and Cultural Rights



stated in its General Comment No. 15 regarding the right to water, that “State parties have a special obligation to provide those who do not have sufficient means with the necessary water and water facilities and to prevent any discrimination on internationally prohibited grounds in the provision of water and water services.” The Palestinian Authority needs the international community’s support to resolve this problem. We therefore call upon the international community to

- exert significant political pressure on Israel to stop interference with the Palestinian Authority’s wastewater project in Eastern Gaza.
- exert political pressure on Israel to stop any attacks on water treatment facilities and water infrastructure in the Occupied Territories.
- demand Israel to fully respect Palestinians’ sovereignty over their resources and monitor their compliance with respective agreements.
- support the Palestinian Authority financially to ensure the implementation of effective and sustainable solutions to the problem.
- support the Palestinian Authority in developing and building an environmentally sustainable water infrastructure in Gaza.
- cooperate among donor countries to guarantee maximum support for the Palestinian Authority. The current practice of funding projects on the premise of exclusiveness (i.e. one project is funded by only one country that claims full credit) hinders effective and comprehensive assistance to Palestine.

Recalling the Palestinian Authority’s legal obligation to ensure the safety and well-being of its people, we further call upon the PA

**regarding future projects to:**

- make Environmental Impact Assessments mandatory for all infrastructure and housing projects.
- in particular, ensure that any treatment facilities or any entities that could present possible harm or nuisance to communities are located far away from populated areas.

**regarding alleviation of the current situation to:**

- improve and increase environmental and health education in schools and community centers to create a better awareness among the population.
- increase compensation for the Um-An Nasir village for their forced displacement to enable the people to construct safe and adequate housing.
- provide compensation to the victims of the floodings of 1989 and 1992 that helps them recover from their economic losses.



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Appendix 1: Results of Water Analysis at the Beit Lahia Treatment Plant - June 2003



18/6/2003

الجامعة الإسلامية - غزة  
THE ISLAMIC UNIVERSITY OF GAZA

Ref: \_\_\_\_\_  
Date: 18/6/2003

مركز الدراسات البيئية والريفية  
Environmental & Rural Research Center

Al mezan Center for Human rights      المصمومون الميزان لحقوق الإنسان  
السيد: محمد يونس مدير مركز الميزان لحقوق الإنسان  
المنطقة: أحواس وبيت لاهيا

Please find attached the cost analysis of your samples sent to us at  
11/6/2003 and the analysis results.

Parameters	in			out		
	1	2	3	1	2	3
PH	7.4	7.8	7.9			
BOD mg/l	700	180	120			
COD mg/l	1564	410	257			
Pt mg/l	0.16	-	-			
Hg mg/l	0.8	-	-			
F.C/10	Full	$3 \times 10^4$	$6 \times 10^3$			

Dr. Zeyad Abu Heen

Director of ERRC

18-6-2003

