

**Friends of Environment and Water (FEW)**

in cooperation with

**House of Water and Environment (HWE)**



# **Experiences with Use of Treated Wastewater for Irrigation in Palestine**

**Paper submitted to House of Water and Environment**

**for the**

**German-Israeli-Palestinian research project:**

**“FROM CONFLICT TO COLLECTIVE ACTION:**

**INSTITUTIONAL CHANGE AND MANAGEMENT OPTIONS TO**

**GOVERN TRANSBOUNDARY WATERCOURSES”**

**Friends of Environment and Water and House of  
Water and Environment**

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## List of abbreviations

EMWater	Efficient Management of Wastewater; its treatment and reuse project
EQA	Environmental Quality Authority
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
KfW	Kreditanstalt für Wiederaufbau
Mcm	Million cubic meter
MoA	Ministry of Agriculture
MoH	Ministry of Health
PARC	Palestinian Agricultural Relief Committees
PCBS	Palestinian Central Bureau of Statistics
PE	Population Equivalent
PHG	Palestinian Hydrology Group
PSI	Palestinian Standard Institute
PWA	Palestinian Water Authority
UNDP	United Nations Development Programme
UNRWA	United Nations Relief and Works Agency
USAID	United States Agency for International Development
WHO	World Health Organization
WWTP	Wastewater Treatment Plant

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## Executive Summary

The poorest region of the world in terms of water resources, both globally and per inhabitant is the Mediterranean and Middle East. Therefore, water is a particular concern of life in this area of the world. Indeed, water scarcity in the West Bank and Gaza Strip results mainly from the Israeli control over the vast majority of the Palestinian water resources. Another cause is the arid and semi-arid climate conditions prevailing in the region. Considering these causes, water scarcity in the West Bank and Gaza Strip becomes a critical constraint to further expanding or maintaining existing irrigated areas and to supply the ever increasing population with water. The agricultural sector is the major consumer of water in Palestine, utilizing more than half the amount of the available water and the irrigated area constitutes a small percentage of the total Palestinian cultivated areas. Thus the expansion of the water sector is necessary to cope with the expansion of the population as well as the irrigation water requirements.

So, the gap between water demand and supply is widening while the demand for domestic and irrigation water is continually increasing. As a result, using local reclaimed sewage water in Palestine becomes one of the most cost effective alternatives for improving the efficiency of water use in agriculture. However, Palestinian communities seriously lack sewage collection systems and proper treatment facilities and they can't afford the capital investment for constructing such infrastructure.

The existing urban sewage collection and treatment facilities are mainly constrained by limited capacity, poor maintenance, process malfunction, and lack of experienced or properly trained staff. Very little progress in the construction of wastewater treatment plants has taken place on the ground. Thus far, only one project was implemented in Al-Bireh city, while the others remain on hold and the other existing plants are overloaded. The poor design and improper operation and maintenance of the treatment plants are the causes of the low purification efficiency that could be achieved by these plants. Considering this, raw or partially treated wastewater is discharged into the wadis where it is used for irrigation purposes. Yet there have been some small scale reuse projects taking place recently, such as the Al-Bireh greenhouse project.

Generally, wastewater treatment and reuse projects are associated with many obstacles, which are mainly political, financial, social, institutional and technical. Also, the Palestinians have not developed an integrated vision for the reuse issues. These include the political side, institutional, potential and locations of wastewater reuse, awareness, marketing and tariff setting. Political reasons and public acceptance could be considered the main factors affecting the wastewater reuse in agriculture. The unstable political situation, along with the lack of communication with the Israeli side, has made it very difficult in moving forward with proposed reuse projects. Also, Palestinian local society is still having concerns on using the treated wastewater in agriculture. To ease social constraints, efforts have been increased toward the development of integrated public awareness programs, which highly assist towards establishing a new perception of wastewater.

Despite the fact that the legal and institutional frameworks for the sustainable management of treated wastewater have been expressed in the Palestinian development plans and have been under focus in the policies and strategies of the Ministry of Agriculture (MOA) and the Palestinian Water Authority (PWA), the enforcement of such issues are still lacking. The re-use of treated wastewater in agricultural production in Palestine is still on the pilot scale and the Palestinians lack the proper experience

in using this resource in a safe and sound way.

Nevertheless, wastewater in Palestine has a high reuse potential. New recycling techniques should be employed to make use of the wastewater discharged. It is important to emphasize the vitality of water reuse to the Palestinian water sector since recycling the wastewater will lower the burden and pressure on the water resources.

## **Introduction**

Water is a major concern in the Middle East since this is the poorest region of the world in terms of water resources. Water scarcity in the West Bank is mainly attributed to the Israeli control over the majority of the Palestinian water resources, as well as the arid and semi-arid climate conditions of the region. Therefore water shortages in the West Bank represent a critical limitation to further expanding or even maintaining existing irrigated areas. Historically, agriculture plays an important role in the Palestinian economy and life. Therefore, the availability of water is the most important factor controlling this sector. The Agricultural sector is the greatest consumer of water in Palestine, utilizing up to 65% of the available water and the irrigated area constitutes less than 11% of the total Palestinian cultivated areas.

Compared to other countries in the Middle East, Palestine has a serious position regarding rainfall and water resources and it is forecasted that Palestine will have to face a water deficit within the next 10-15 years due to several reasons. As the country is still suffering from the Israeli occupation, the Palestinian territories face deficiencies in the water supply and wastewater sector. Sanitation and environmental problems are caused as a result of the lack of funds in order to install the appropriate infrastructures related to wastewater treatment and integrated management. Almost half of all water produced is unaccounted for because of losses and billing deficiencies, while leaking or overflowing wastewater collection systems are affecting the environmental conditions and contaminating groundwater resources.



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