



Title: Reality and Challenges of Water Quality in Palestine: Focus on Regulations and Monitoring of Wastewater Treatment and Reclaimed Water

**التركيز: في فلسطين واقع وتحديات جودة المياه
المياه العادمة معالجة انظمة ورقابة على
المياه المستصلحة واستخدام**

Prepared by: Dalia Jaradat

Supervised by: Dr. Rashed Al-Sa`ed

University: Birzeit University

Funded by: German Ministry of Science
and Education (BMBF)

Email: dalia_jar@outlook.com

Introduction

Palestine suffers not only from the shortage of water but also from the poor quality of available resources. More than 95% of groundwater wells, main potable source in Gaza Strip, are reported unfit neither for human consumption nor for agricultural irrigation. Lack of financial resources and the prevailing political environment are among the main reasons behind poor water quality management in Palestine. The institutional building and good governance are crucial for the development and sustainable management of wastewater infrastructures, supported by governmental reform program for the water and sanitation sectors. The reform program in 2014, resulted in a new Water Law (WL), aimed at ensuring good governance within the water and sanitation sectors. The new WL divided the historical functions of the Palestinian Water Authority (PWA) into ministerial and regulatory functions. The PWA functions as a regulatory body for protection and monitoring of water resources, while monitoring of water and sanitation services is the mandate of the Water Sector Regulatory Council, a newly established governmental institution.

The goal of this study focuses on challenges and perspective of water quality management with special emphasis on water law and regulations pertinent to wastewater treatment facilities and reclaimed water use in agriculture. Specific objectives are two folds; first to critically review and analyze the current valid water legislation and quality standards required; second

to examine the current practices on water quality monitoring of reclaimed water use in agricultural purposes. For this purpose, Nablus West wastewater treatment plant (Nablus West WWTP) was taken as a case study, where monthly self-monitoring reports were collected and analyzed.

One major finding of this study is the lack of by-laws regarding monitoring and enforcement mechanisms to ensure sustainable water and wastewater treatment facilities. The by-law on household connection to public sewers is the only endorsed instrument currently valid. The current water and wastewater treatment facilities are barely monitored or controlled, where monitoring mechanism and use of polluter pay principles are non-existing. Local rules and regulations set for monitoring of raw sewage characteristics into sewerage networks and standards on quality of treated water for diverse beneficial uses are not forced or applied.

The study underlines the fact of considering wastewater as an integral part of water resources management, where the construction or rehabilitation of urban sewage works are of high priority. This is reflected by the increased amount of wastewater generated reaching about 180 million cubic meters [MCM] of treated water by 2025. The study shows that the current regulations and standards applied in Palestine are in line with regional and WHO standards and regulations. To elevate the pressure on fresh water, priority of reuse of treated effluents should be directed as a source for irrigation. Treatment of wastewaters shall be targeted towards producing an effluent complying with local effluent rules and regulations. The quality of reclaimed water for agricultural purposes shall consider soil characteristics, type of crops, irrigation methods, and quality of other waters if mixed with treated wastewater.

Results analysis of monthly self-monitoring reports on process performance and effluent quality of Nablus West WWTP revealed a reliable treatment system complying with set local effluent limits for agricultural irrigation, except for microbiological limits. Since no chlorination system installed at Nablus West WWTP, the microbiological quality of the effluent exceeded by far the limits for the lowest quality standard (Class D) set by Palestinian obligatory Technical Rule (TR 34-2012). For farmer's safety, soil and produce irrigated with reclaimed water, disinfection unit must be installed as an integral unit operation of any given wastewater

reuse scheme.

Current liquid discharges from industrial enterprises within Nablus area shall be monitored by enforcing the municipal by-law governing limits discharge criteria and the polluter pays principle. This study underlines the importance of intra-collaborative efforts between the PWA and the WSRC to prepare relevant by-laws endorsed within the diverse water law articles. Of priority are by-laws pertaining to water service providers, monitoring of and sanitation facilities including effluent discharges. All this, shall promote sustainable water and sanitation facilities and enhance the economic development of Palestinian communities.