Integrated Water Resources Management in the Lower Jordan Rift Valley

Sustainable Management of Available Water Resources with Innovative Technologies

Work package 5, Deliverable D 505

Report

On the Documentation on Workshop with decision makers to discuss implementation barriers

Subhi Samhan [(1)]
Abdelrahman Tamimi [(2)]

[(1)] Palestinian Water Authority
[(2)] Palestinian Hydrology Group

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Corresponding author:

Author name Dr Abdelrahman Tamimi
Institution Palestinian Hydrology Group
Adress Ramallah.PB.OBX 565
Email a.tamimi@phg.org
Phone0097222966315

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Project Coordination:

Main Coordinator:
Prof. Dr. Nico Goldscheider

Karlsruhe Institute of Technology

Adenauerring 20b

76131 Karlsruhe

Germany
Phone: +49 (0) 721 6084546
+49 (0)721 608 - 47610
+49 (0)721 606 279

Web: www.agw.kit.edu

Assistant Coordinator
Dr. Jochen Klinger

Karlsruhe Institute of Technology

Adenauerring 20b

76131 Karlsruhe

Germany
+49 (0)721 608 - 47610

E-Mail: jochen.klinger@kit.edu

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1. Introduction

The urban sector is the fastest growing land use class in the Jordan Valley and surround-ings, e.g. Amman, Ramallah and Jericho are growing fast. The water demand of the ur-ban sector is gaining more and more weight compared to the agricultural sector. Never-theless, urban water systems, both in terms of sanitation systems as well as from indus-trial and point source pollution are not sufficiently managed and provide ample potential for improvements towards sustainability.

Within the study area, there are substantial amounts of raw sewage that are discharged into the Wadis. This sewage often pollutes the groundwater resources (rise in nitrate, organic matter and bacteria concentrations in the water produced from wells and in the springs). New analytical parameters will be evaluated for their suitability as anthropogen-ic tracers for catchment characterization. The risk assessment platform to be developed in the WP05 will be applied to the water production facilities (wells, springs) in order to determine the incurred risks, resulting from the proximity of pollution sources. These studies will form the backbone for the definition of protection zones to the water sources

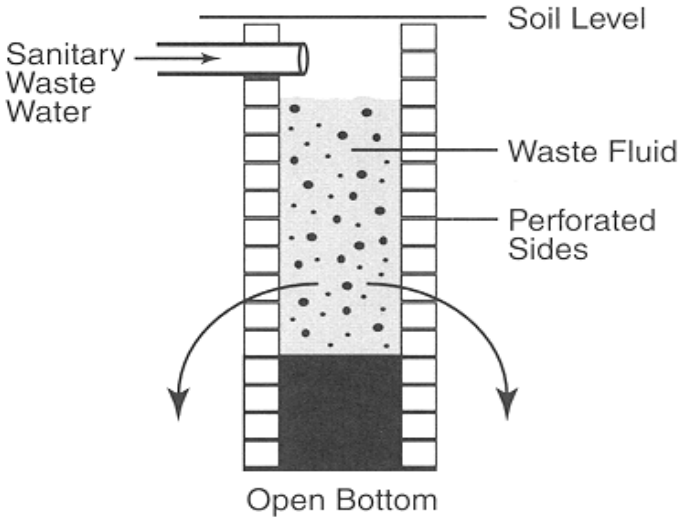
2. Objectives of the work packages

- Adapt the concepts and methodologies for the definition of protections zones (well head, springs and other water sources) to the conditions and specificities of the re-gion.
- Estimate the pollution risks resulting from the release of raw sewage and or treated effluent (coliforms, nitrates, Xenobiotics, chloride, emerging pollutants);
- Investigate the possible impacts resulting from the use of treated effluent and or brackish water in agriculture (human health, soil integrity and longevity, pollution of freshwater bodies etc.)
- Estimate the applicability of instruments of biological water quality assessment (bio-film monitoring and macro invertebrate survey)
- Provide quantitative microbiological risk assessment in karstic / fractures aquifers
- Investigate economical aspects of water resources protection measures

3. **Workshop** : in order to create an participatory based water protection zones the Palestinian Hydrology Group and Palestinian Water Authority have organized two days workshop between February 13-14 ,2013 , the workshop participant were from different institutions and different educational background) water, legal and land use). The workshop focused on ground water and wells protection ,Since Groundwater is considered the main fresh water resource in the West Bank and definitely the only reliable source for water supply for Palestinians. Protecting groundwater from pollution is a priority and a major concern as well. Wellhead Protection zones is an effective

management plan to minimize the risk of groundwater contamination that involves integrated water resource planning and preventative actions intended to solve an on-going problem or to avoid the occurrence of a potential problem from contaminants. The groundwater wells are highly vulnerable to pollution from cesspits, dumping sites, wastewater discharged without any type of treatment, industrial and agricultural activities. Cesspits are considered as concentrated point sources of pollution yet widespread.

The majority of cesspits that are in use in the West Bank are not coated or lined and thus wastewater will leach down and percolate and may negatively affect the quality of groundwater



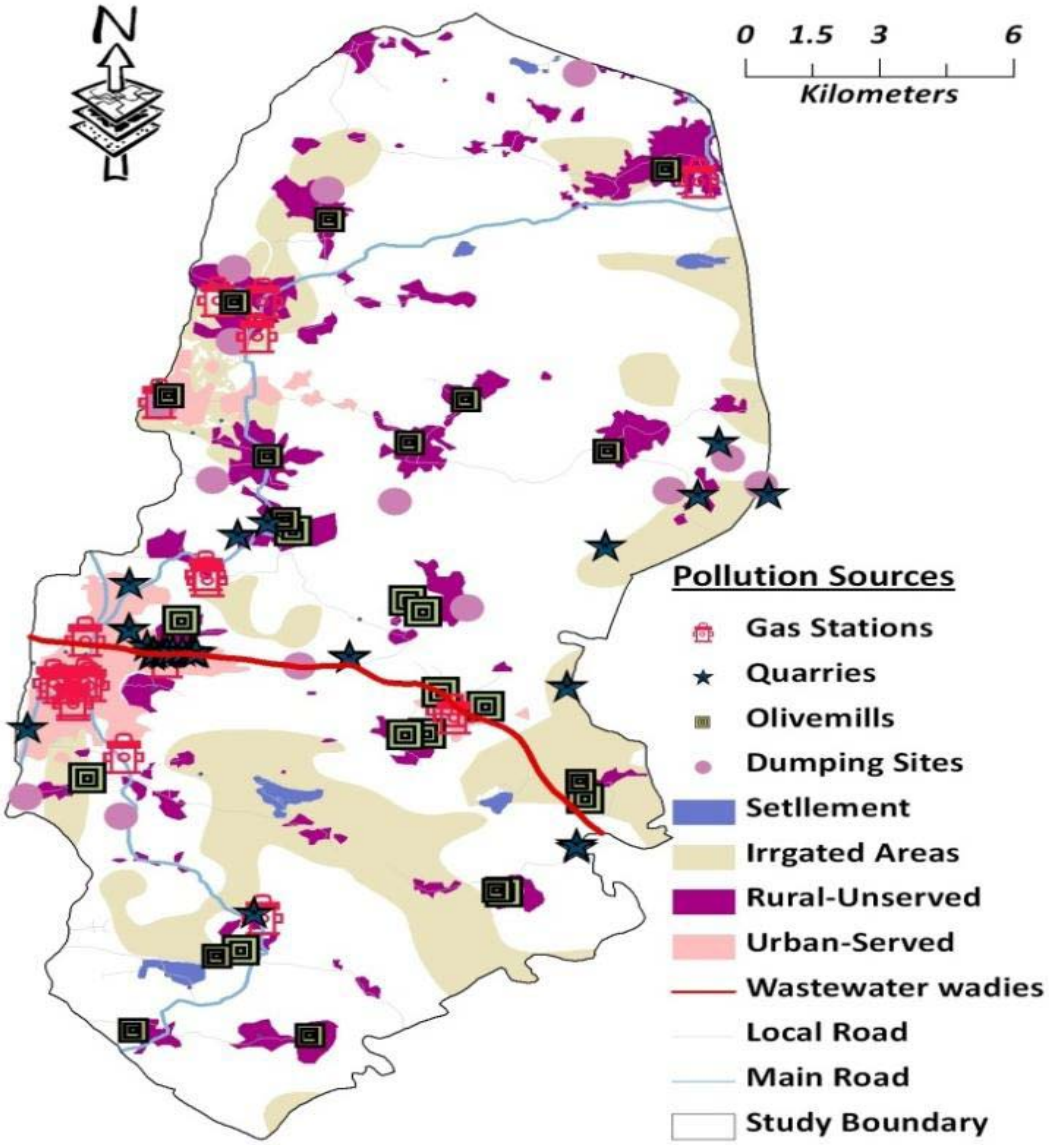
Wellhead protection zone is the area surrounding the groundwater well, through which contaminants are reasonably likely to move toward and reach groundwater well. It is good way to protect groundwater from pollution and improve its quality.
Three zones were delineated that make up a wellhead protection area are based on how long it would take a contaminant to travel through the aquifer and reach the well.

3.1. Objectives of The Workshop :The main objectives of the workshop were :

- To delineate the wellhead protection zone for groundwater wells in Tulkarem district.
- Identify the potential sources of contamination within each zone.
- To develop strategies and preventive guidelines necessary to ensure better management of groundwater wells

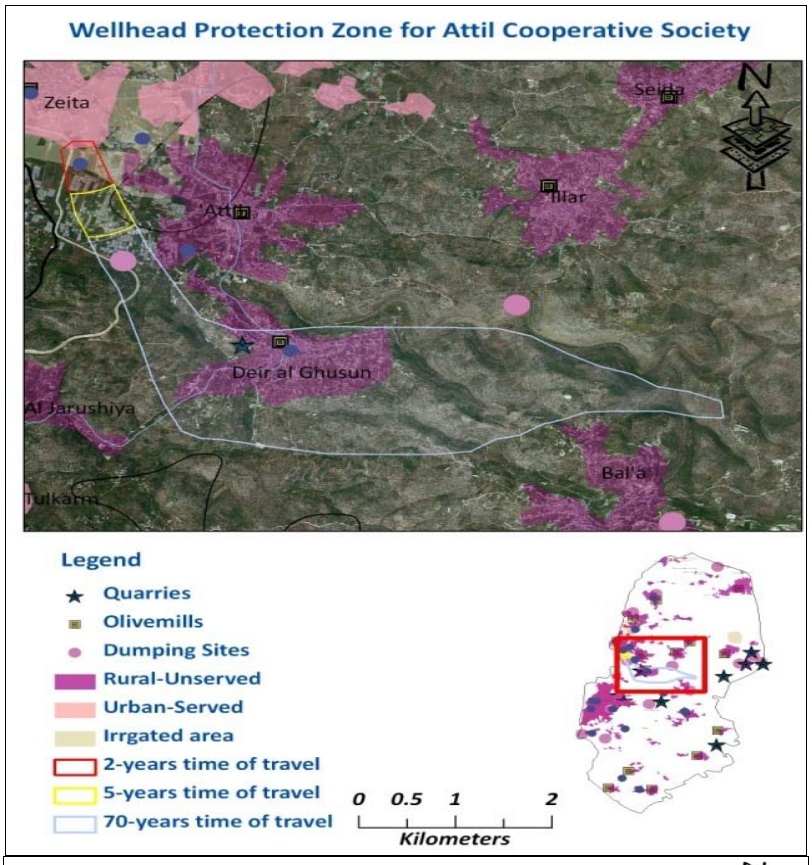
3.2. Content of the Wokshop presentation

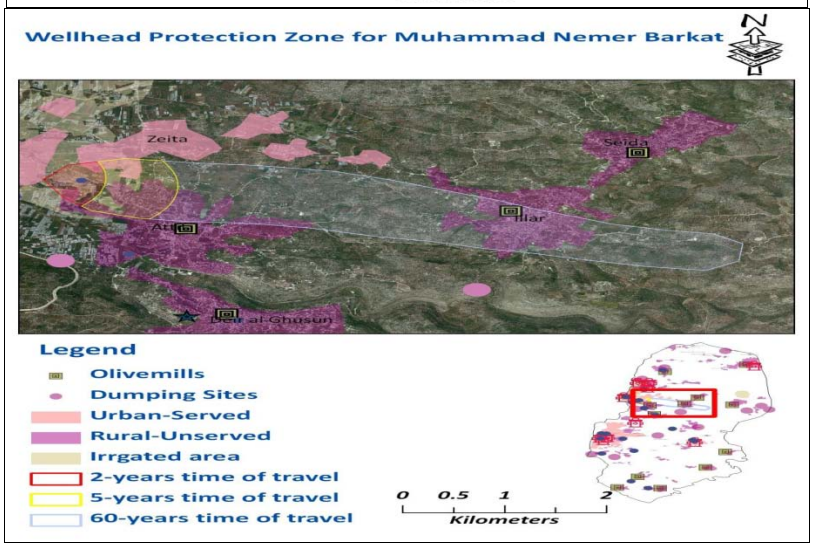
The distribution of pollution sources in the study area (Tulkarm district and part of Jenin District).



Delineation of Protection Zones for Groundwater Wells in Tulkarm District

The wellhead protection zone was delineated for groundwater wells in the study area using MODPATH backward tracking model. The data was processed and analyzed by GIS tools for better visualization.



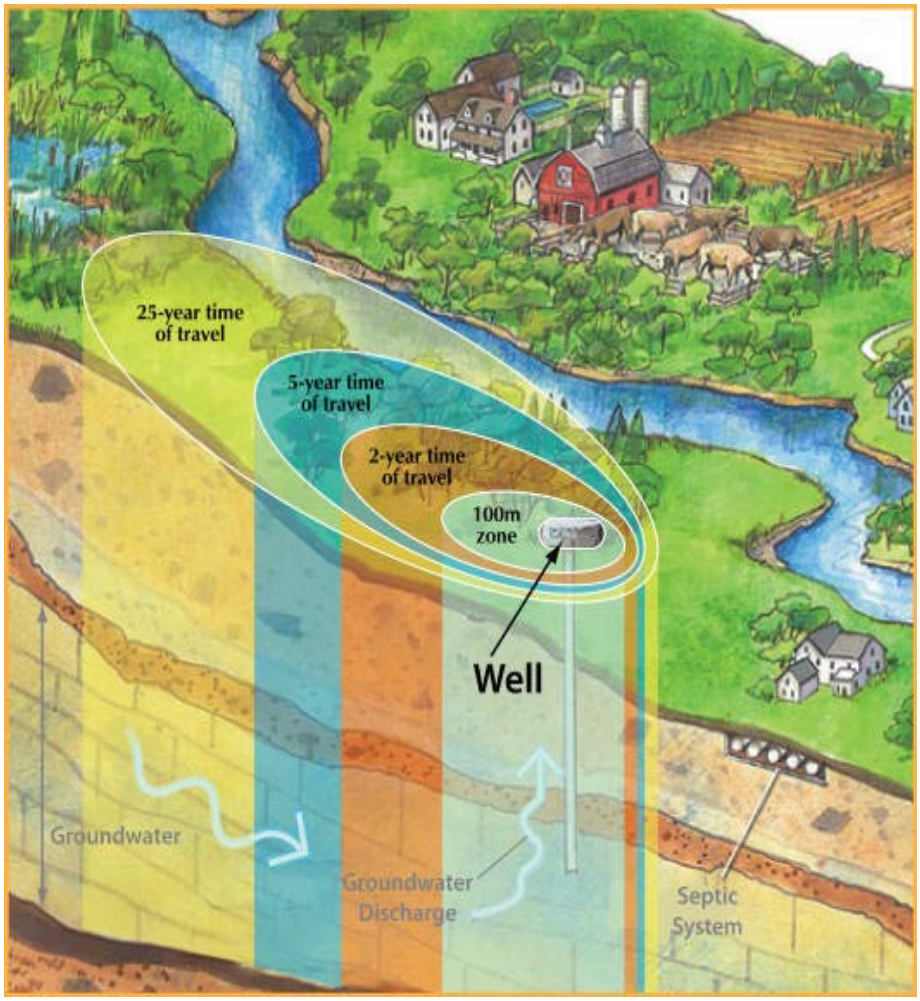


The Zoning System:

ZONE 1 Groundwater Protection

The area where the highest risk to the groundwater well and the greatest care should be taken in handling any potential contaminant.

- ✓ The first protection zone must be totally a fence and the land use activities should be prevented.



There are many actions within each zone that should be considered to protect groundwater wells as follows:

1. The majority of groundwater wells are located in or near un-served communities, so the construction of a wastewater sewage network and treatment plant is imperative.

2. Public education and workshops in coordination with all stakeholders

3. Minimizing the random solid waste disposal and establishing main isolated dumping site and outside the wellhead protection area.

4. Fertilizer and pesticide applications must be controlled in irrigated areas and restricted or limited in the critical zones around wells. In addition, public education and workshops on safe pesticide and fertilizer use must be implemented by the Ministry of Agriculture.

5. Forcing the industrial sector such as quarries and olive mills to treat their wastewater before disposing it.

6. All public authorities such as Palestinian Water Authority, Ministry of Health, Ministry of Agriculture, Ministry of industry, Ministry of environmental and Municipalities to

meet their responsibility and take immediate actions to prevent and control groundwater contamination.

7. The public participation is extremely an important part in developing management plans of wellhead protection. This is achieved through public information via advertisements and brochures.

8. The selection of new location for domestic wells should be preceded by delineation of well head protection zone, identification and consultation of development plans to identify the impact of future land use and any need for land use controls within zones to protect well from contamination.

Set up management policies and preventive guidelines which can be part of the Palestinian Water Authorities regulations of land use activities for wellhead protection zones especially the critical zones around the groundwater sources

4. **Legal constrains ;**

- Some ground water resources are located in areas out of Palestinian control “(c area)
- lack of law or legal arrangement
- overlap of institutional mandates (ministry of agriculture, PWA, ministry of environment , local municipalities

5. **social constrains**

- Land owners around one wells are not the wells owners
- Lack of awareness
- Different pollution source

6. **Economic Constrains**

- Expensive land around water resources
- Lack of policy for compensation
- Lack of cost-benefit analysis to compare Square meter value with lost water cubic meter value