Wastewater Status In Palestine

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Water Resources

Total annual water use to meet users requirement in WBG

Use Category	Use Quantity (MCM/Yr)		Supply	Quantity (MCM/Yr)	
	GS	WB		GS	WB
Municipal and Industrial	50.1	68.7	Surface Water (Jordan River. Wadis and Cisterns)	0	4.9 6.6
Agricultural	83	89.7	Groundwater	48.1	131
			Desalination	1.1	0
			Mekorot (Israeli Water Co.)	4.9	21.6
			Brackish	43	0
			Wastewater reuse	0	0
Total	**133.1**	**158**		**133.1**	**159.0**

Source Figures are taken from the WSSPS, 2000 PWA and CH2MHILL Final Integrated Water Resource management plan, 2002.

Water Quality

In general, drinking water in the WB is good, Cl, NO3 increase in Jordan valley and northern areas. In the agricultural wells Cl might reach 1500mg/l while NO3 might reach 400.

In Gaza its worse both for drinking and irrigation, CL reached 1580mg/l and NO3 200mg/l in some municipal wells and CL reached 2709mg/l and NO3 885 in some irrigation wells

Demand GAP (20 years Plan)

- Overall demand more than double 369-812 MCM/y.
- Municipal and industrial demand 4- fold 141-422 MCM/y.
- Agriculture would grow a little bit 228-340 MCM/y.
- Gab is expected to grow 60-550 MCM/y.

Potential Resources

- Groundwater development 510 MCM/y
- Surface water (Jordan river, dams, cisterns) 133MCM/y
- Demand Management (losses, efficient agriculture,..) 40MCM/y
- Desalination 105(55GZ, 50WB) MCM/Y.
- Conservation/groundwater protection 28MCM/y
- Change in cropping pattern 80MCM/y
- Reuse of treated effluents 100MCM/y

Wastewater Status

Existing and Planned collection systems

- Collection is limited to urban centers about 35% in WB and 65% in Gaza are connected.
- Wastewater generated is 50 MCM/y(29 in WB and 21 in G).
- In the WB 10.2 MCM/y collected through networks (7% is treated) while 18.6 MCM/y is collected through cesspits.
- In Gaza 15 MCM/y is collected through networks (84% partially treated, nothing fully treated) while 6.4 collected in cesspits.

Existing and Planned WWTP

- WB, Al-Bireh is the only functioning WWTP the others are either not functioning or overloaded
- In GZ, some of the effluent is directed to the sea thru wadi GS untreated, there is no full treated in Gaza but 84% of the effluent is being partially treated.
- PWA is planning to construct about 25 WWTP in both WB and GZ in the coming 20 years.

Reuse projects

- Reuse of treated effluent is not currently practiced, at Al-Bireh WWTP in WB the effluent is being thrown in the wadi, but there is a plan for recharging it to the ground water..
- According to PWA Plan (WSSPS 2000) the estimated quantities of treated effluent and proposed for use in the coming 20 years is in the range of 100MCM/y

WWTPs built during occupation

Tulkarem

Ramallah

Key issues and hot spots

- Wastewater in wadis: Raw wastewater discharged in wadis infiltrates into groundwater since most of the wadis are located on sensitive areas.
- Cesspits: Wastewater infiltrates into groundwater from unsealed cesspits. This phenomenon is wide spread all over the area.
- Networks: Wastewater discharges from sewer networks
- Agricultural activities: Infiltration of irrigation water into the groundwater containing fertilizers and pesticides
- Dumping sites: Seepage from the uncontrolled solid waste dumping sites contains high contents of COD, Cl, hydrocarbons, and micro pollutants

Institutional Framework

The Institutional Framework in the Water Sector

- **The Policy Making Level-**
  National Water Council(NWC)

- **The Palestinian Water Authority "PWA"**
  (Regulatory Level)

- **Service Delivery level**

  Bulk Water Supply Utility:

  Regional Utilities

Supporting and Advisory Level

- Universities: provide support to the water sector research activities and training and experience to the Palestinians working in the water sector.
- NGO's: provide financial and technical support to the water sector projects.
- Water User's Associations: provide direct feedback to the regulator regarding their requirements and concerns.

Strategic Stakeholders

- Palestinian Water Authority (PWA)
- Ministry of Agriculture (MoA):
- Ministry of Planning (MoP):
- Ministry of Local Government (MoLG):
- Ministry of National Economy (MoNE)
- Environment Quality Authority (EQA):
- West Bank Water Department (WBWD):
- Regional Water Utilities (RWUs):

Constituent Stakeholders:

- The constituent stakeholder institutions include:

Ministry of Justice, which impacts final approval of water regulations.

Ministry of Finance, which will provide final approval of water tariff schemes and will aid in identifying financing sources and methods of cost recovery.

Municipalities and Village Councils, which provide support and guidance to the design and implementation of water-related activities.

Water Users Associations, which provide direct feedback to decision makers regarding water-users requirements and concerns.

Universities, which supports water sector research activities and develop training and experience of Palestinians working in the water sector.

Non-Governmental Organizations (NGOs), which provide financial and technological support to water sector projects.

Government Actions

Water Law No.3,2002

To secure sustainable development of water resources based on environmentally sound and enabling bases.

To provide and satisfy social and individual needs of water in an optimal and equitable way.

To protect all water resources from pollution and secure water quality.

To secure a safe environment to human health and well being

To secure sufficient water for production and self-renewal

Effluent Quality Standards for Wastewater Reuse

This had been prepared by the Palestinian Standard Institute in cooperation with all concerned Ministries including the Palestinian Water Authority. It covers a set of criteria and standards for treated effluent to be reused and disposed

Related Agreements

The Palestinian-Israeli Agreement, Article 40 1995 on Water and Sewage

Palestinian-Israeli Joint Water Committee Memorandum of Understanding on guidelines and technical criteria for sewerage projects, 2003

This MOU sets out guidelines for collection systems, WW treatment, sludge treatment and reuse or disposal, effluent reuse and disposal and cooperation between the two sides.

Wastewater drafted Policies

Wastewater Collection including Storm Water Handling

Legal and Administration

Wastewater Collection including Storm Water Handling

Tariff

Awareness and Stakeholders participation

Wastewater Treatment

Reuse of treated wastewater

- Reuse of wastewater must be considered in all treatment schemes.
- Co-operation must be established with different relevant bodies (Ministries, authorities and NGO's which must be identified and contacted).
- For every reuse project - beneficiaries (farmers, etc) must be involved in all project phases.
- Flexible reuse plans should be developed to be able to utilise treated wastewater in winter seasons and when the effluent quality drops below the demands.
- Establish planning tools (regulations, standards, guidelines, etc) for reuse and recharge.
- Discharge to surface water may be considered as an interim action, or if reuse are not feasible.

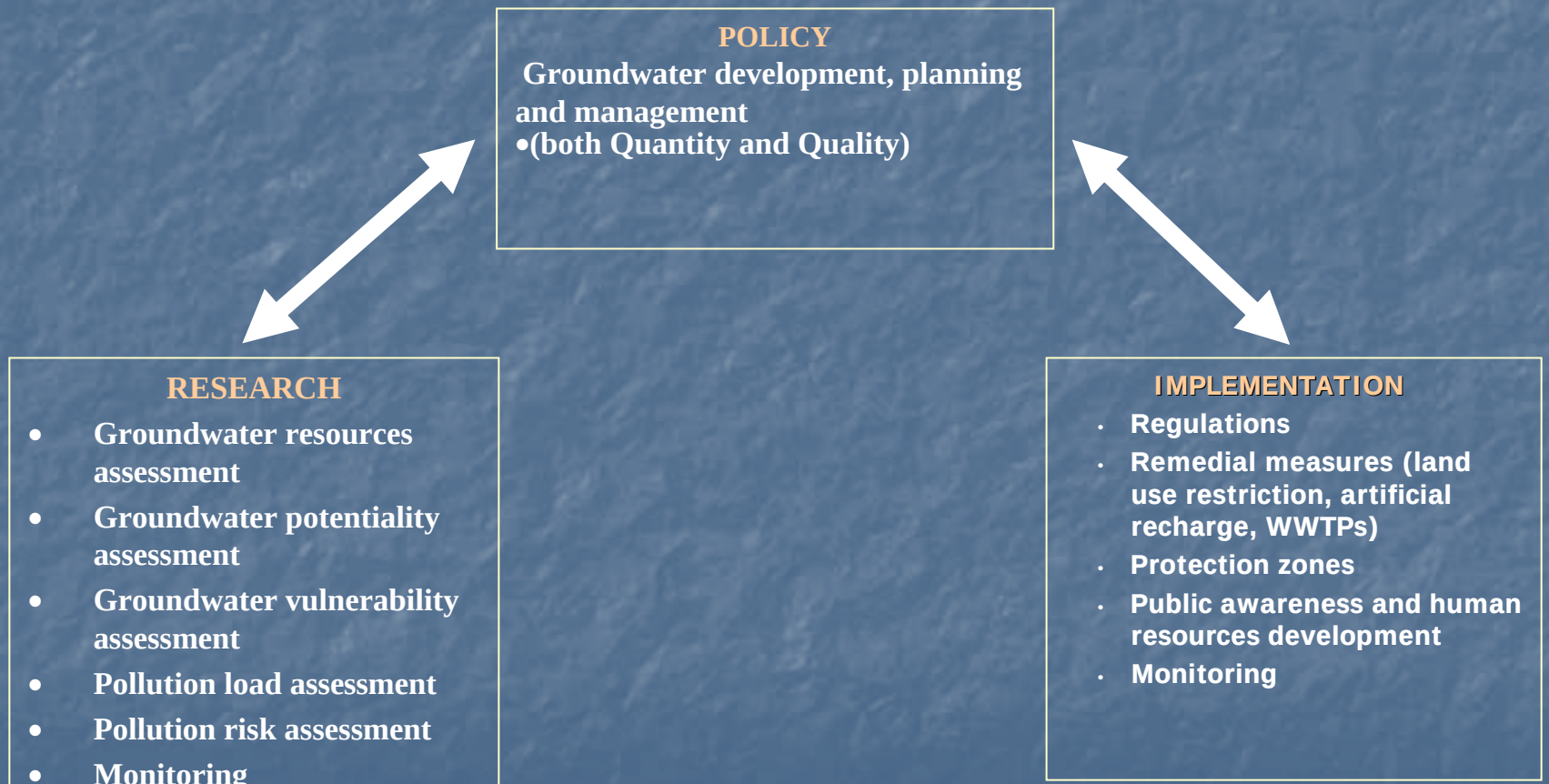
Reuse of treated wastewater

- Do not allow irrigation of crops eaten raw by treated effluent and adopt appropriate enforcement means.
- For better water quality and reuse efficiency, consider (1) mixing of treated effluent with urban and surface runoff, (2) artificial recharge of groundwater with treated effluent wherever possible and (3) establish surface storage for treated effluent with or without harvested runoff.
- Allow private sector and/ or public to manage or share the management of wastewater reuse projects (contract private companies or public associations and co-operative to mange wastewater reuse.
- Develop a program for modifying water use habits to include reuse of treated effluent in urban centres (greening, fountains, urban parks and landscape irrigation forestation, and other areas).

Integration

- In the pre feasibility phase, PWA, consultants, manufacturers and universities must be involved in all development projects. This to ensure that the Palestinian policies are being implemented and the national industries developed along with the infrastructural development of the country.
- Co-ordinate of staff at all levels in Palestine, and give inputs for needed education in the sector (teachers, researchers, managers, advisors, operators and industrial people). Make sure that Palestine educate and train the people necessary to maintain in an effective way the investments in the wastewater sector.
- Make sure the wastewater administration sectors are being integrated at regional and national levels.
- Develop investment plans co-ordinated with plans for collection systems, reuse, storm water and water supply.
- All major technical plans and developments should be integrated.

GROUNDWATER PROTECTION FRAMEWORK



Major Achievements

- Prepared Ground Water Protection Policy.
- Pollution Control Regulations.
- Wastewater Management Plan .
- Prepared the National Policy and strategy for Wastewater.
- Allocated about 250 MUSD from Donor to Wastewater infrastructure.
- Prepared effluent standards.
- Technical assistance programs to municipalities.
- Facilitated the implementation of many projects through NGO’s.

Obstacles

- No work permits form the Israelis.
- Checkpoints.
- Lack of funds for collection systems, Treatment Plants and small scale Plants.
- Lack of expertise in the technical and O&M for Wastewater systems.
- Lack of public awareness programs specially for reuse of treated effluent.

Thank You