Impacts of Climate Change on Water Resources in Palestinian Territories

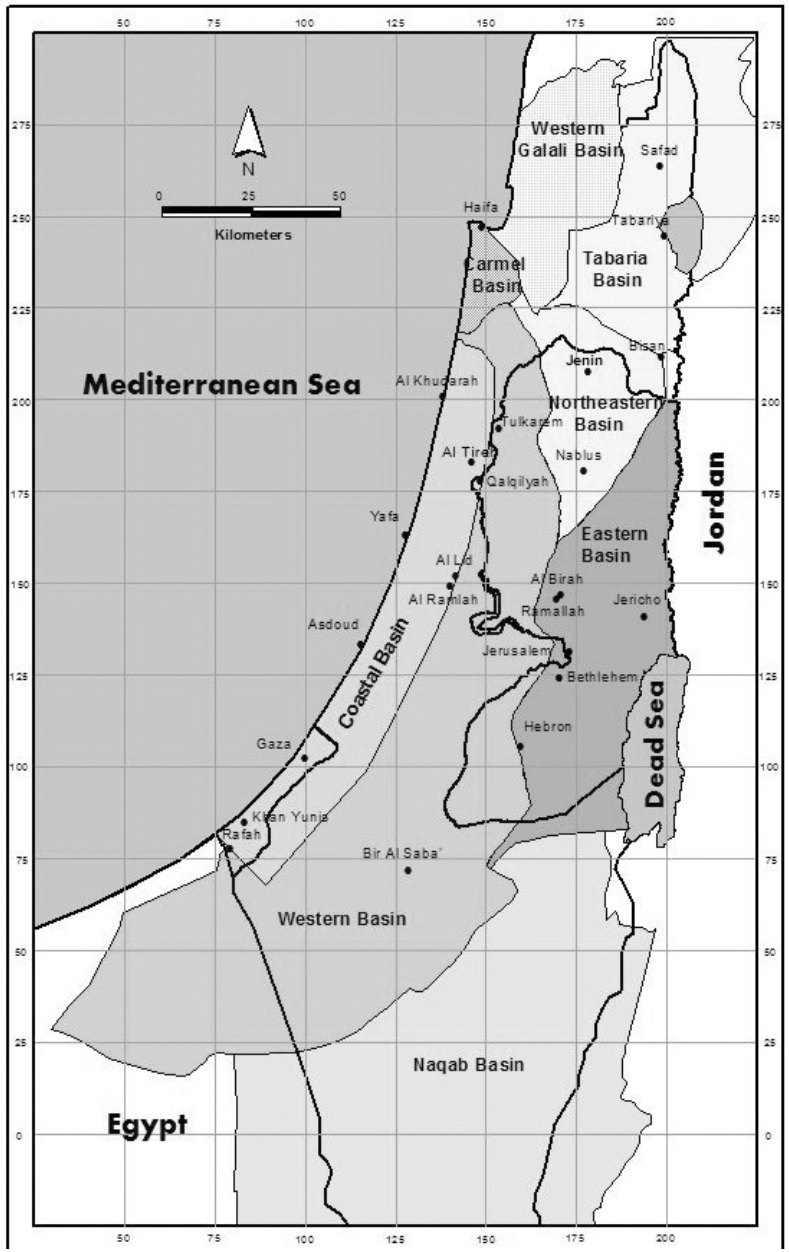
Palestinian TEAM

SPAIN- May, 2014

Transboundary Groundwater Basins

Hydrogeological Boundaries versus Political Boundaries:

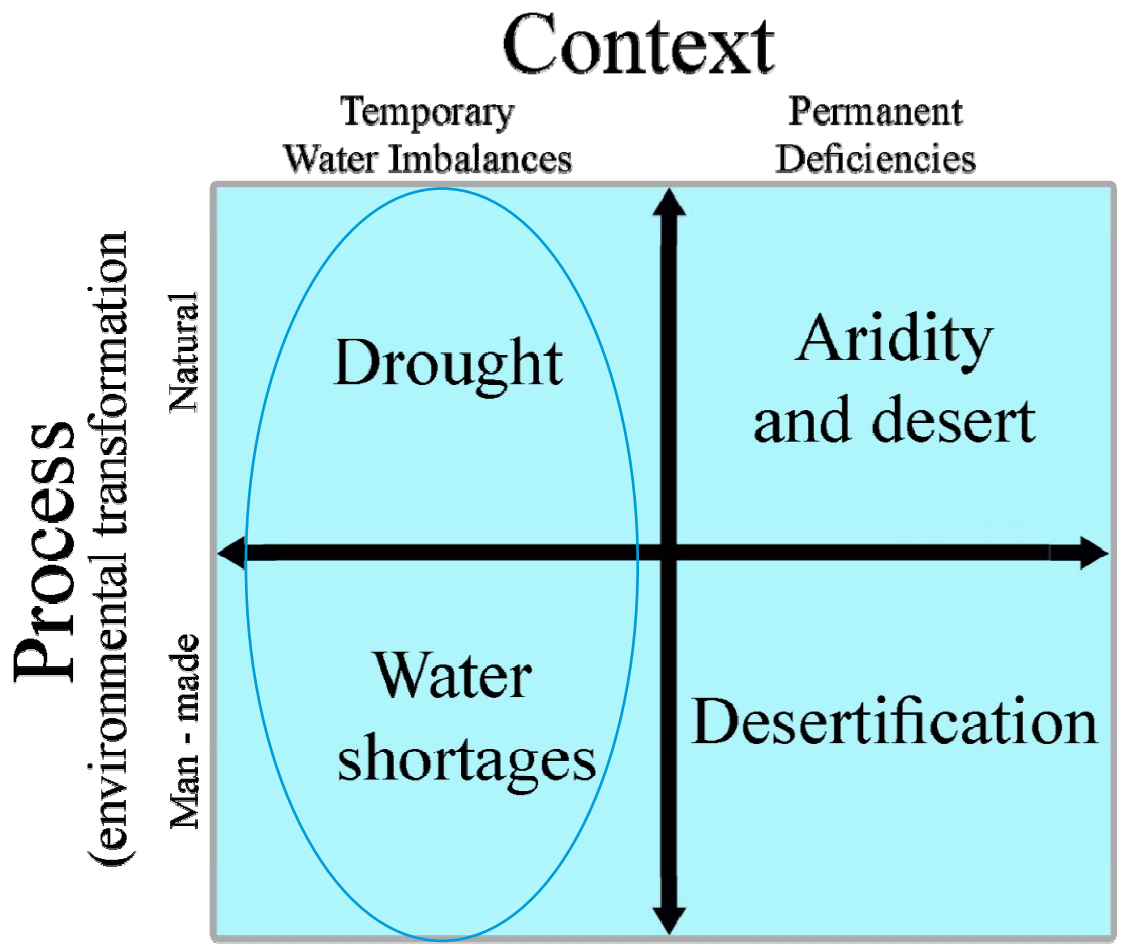
- Eastern Basin
- Northeastern Basin
- Western Basin
- Gaza Aquifer



MAIN CHALLENGE FACING THE WATER RESOURCES IN PALESTINE

- Israeli Occupation (Control 100% of Water resources).
- Drought (Climate Change).
- exploitation.
- Pollution
- Population

TYPES OF WATER SCARCITY



PALESTINIAN WATER SCARCITY

Water Shortage

Israeli Control of Water Resources

Drought

Low Rainfall
Low Recharge Rates

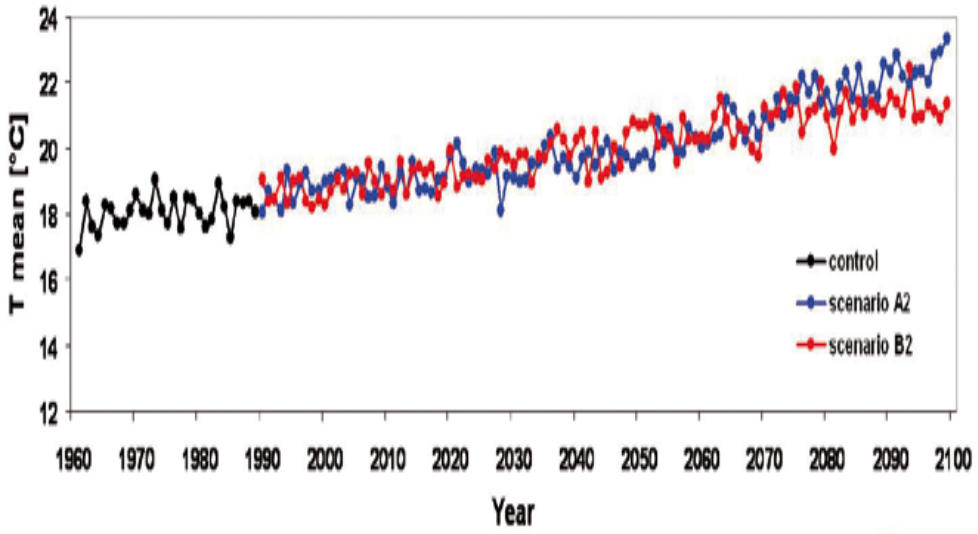
Water Level Decline
Reduce in Springs flow
Low yield

CLIMATE CHANGE/ FACTS FROM PALESTINE

- Increase in the number of droughts
- Rainfall during 2003-2010 were less than the historical average
- Frequency of extreme events has increased.
- Min. and max. summer temperatures have increased, while winter temperatures have declined.
- Probability of very hot summer days has increased.

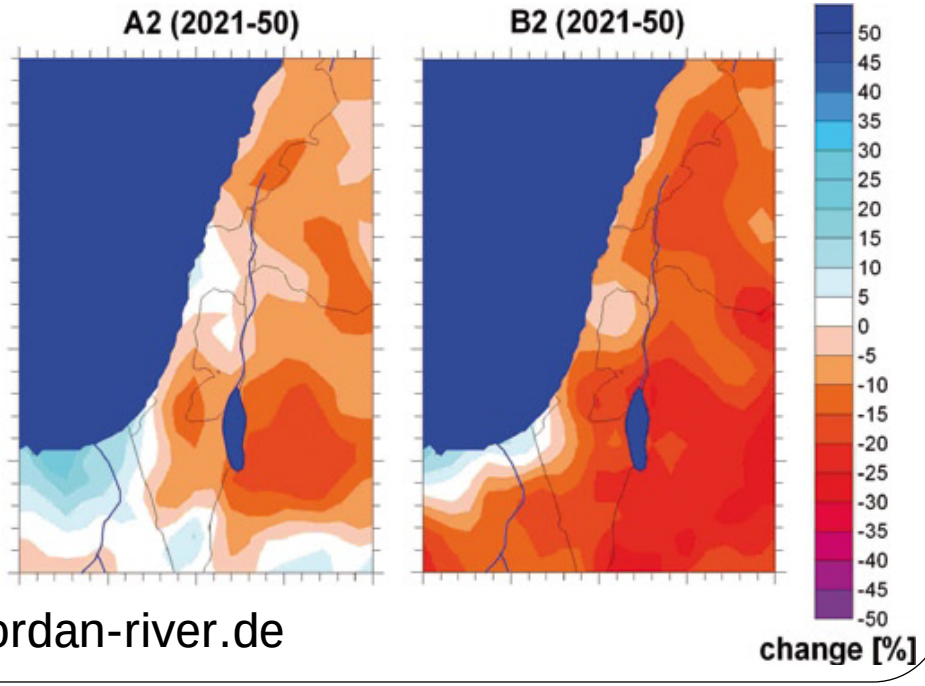
Figure 4.4: The disruptive and destructive impacts of a flash flood in the Gaza Strip, following 36-hours of heavy precipitation on 27-29 October 2008 (Source: UNDP/PAPP).

PROJECTED CLIMATE CHANGE SCENARIOS (GLOWA)



Changes of annual mean temperatures: Significant increase of temperatures in the order of 1°C in the last 50 years. Until 2050, a further increase in mean annual temperature of around 1 - 2 °C is expected

Relative changes in yearly precipitation: A decrease of mean annual precipitation is expected for larger parts of the region (up to 30%) until 2050, continuing with higher levels of significance till 2100.



http://www.glowa-jordan-river.de

Drought Frequency (GLOWA)

Key messages

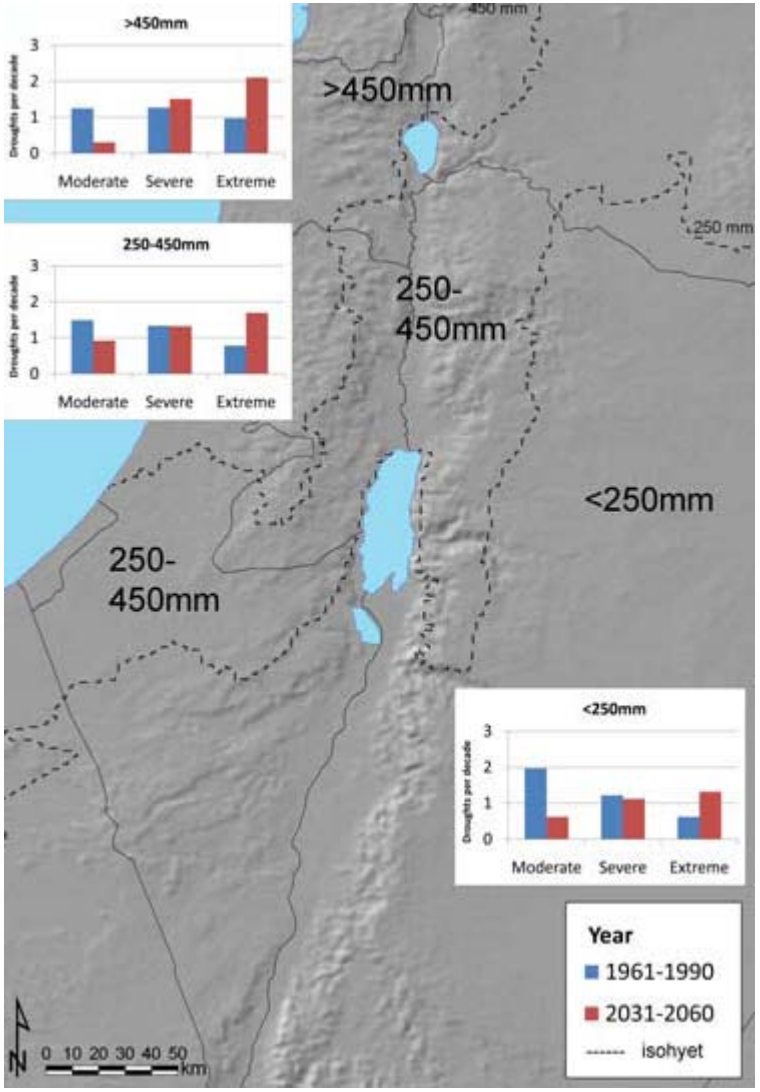
• The drought length in the northern (sub-humid) and middle (semi-arid) zones is expected to slightly increase. The increase is stronger in the southern (arid) precipitation zone.

• The frequency of moderate droughts is expected to decrease and the number of extreme droughts to increase.

• Between the years 1961-1990 most of the droughts are classified as moderate drought.

• Between the years 2031-2060 most of the droughts will be classified as extreme drought.

http://www.glowa-jordan-river.de



HYDROLOGICAL DROUGHT

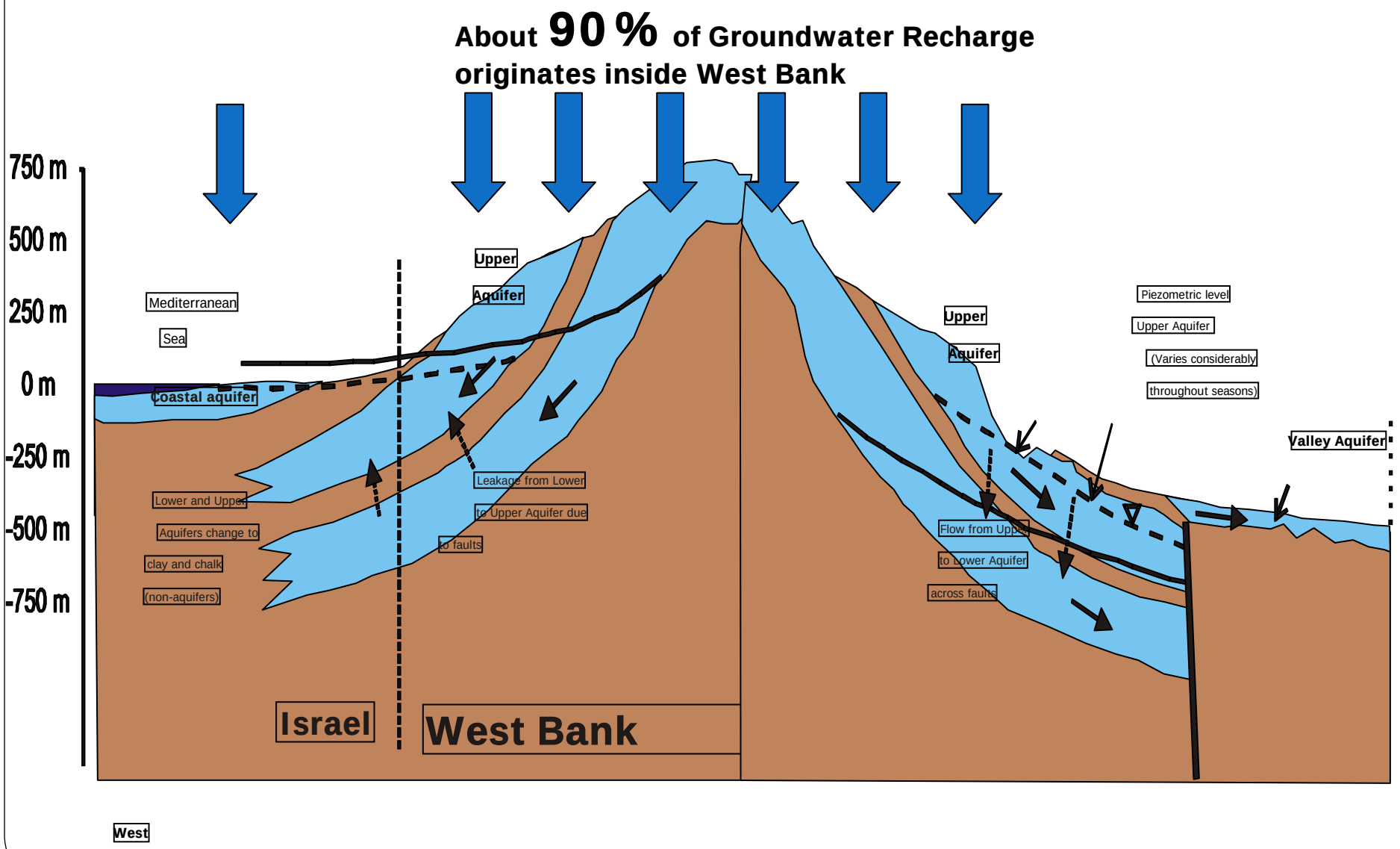
Rainfall deficiency (amount, intensity, duration)

Reduced infiltration and groundwater Recharge

Water Level Decline and reduce in Springs flow

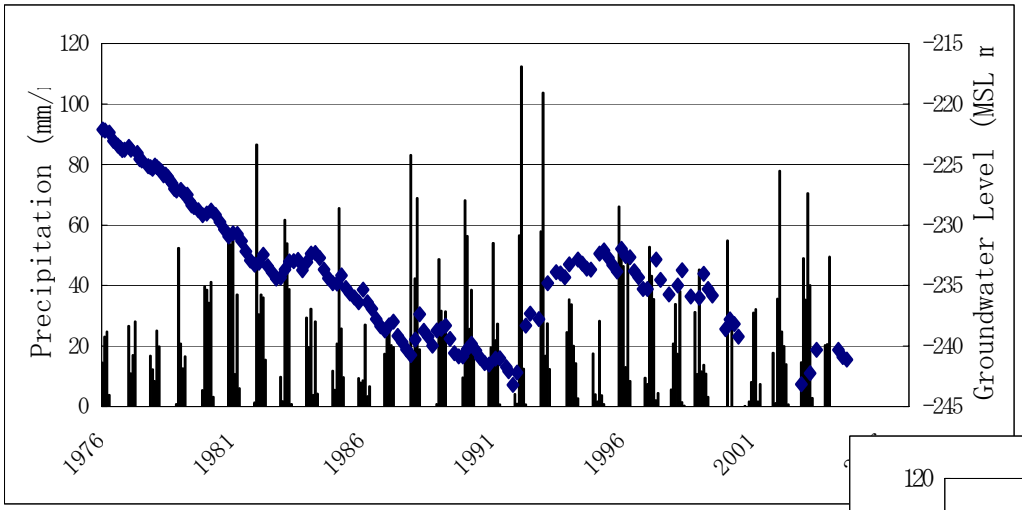
Increase Salinity and pumping cost, water deficit

RAINFALL is the main source of water for our RENEWABLE Aquifers



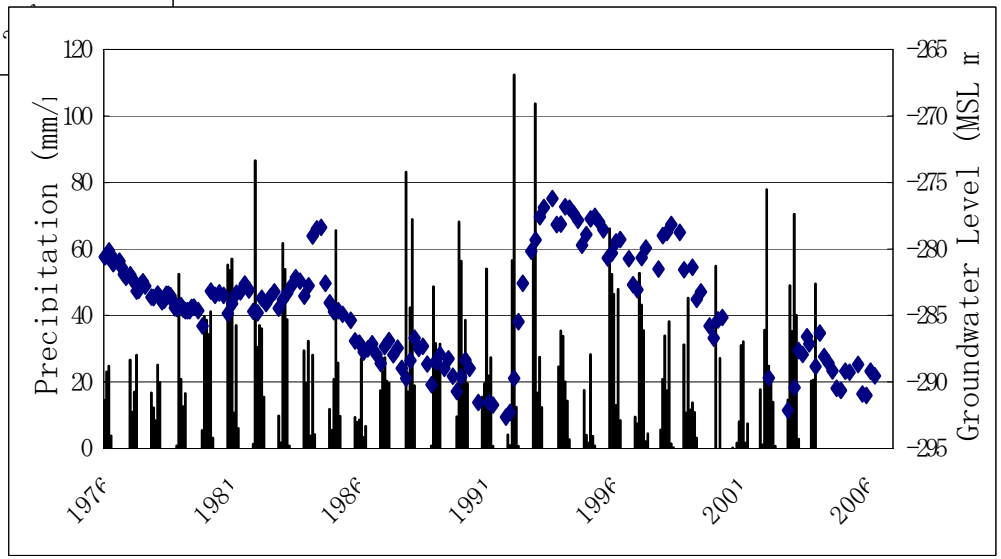
IMPACTS ON GROUNDWATER

Noticeable Decline in Water Level of Groundwater Aquifers



Upper Cretaceous (19-17/047)

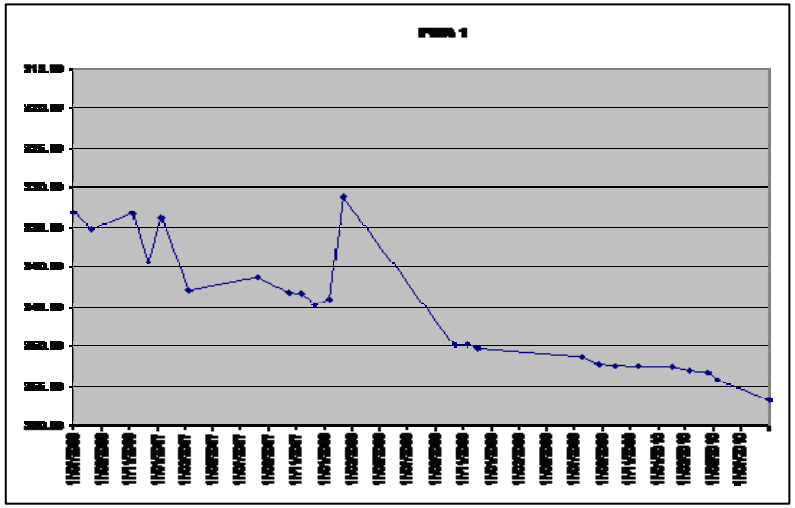
Froush Beit Dajan



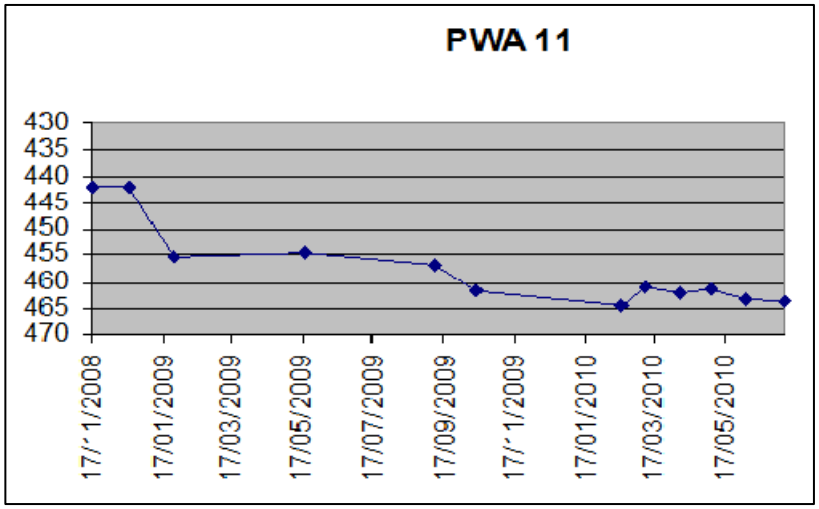
Eocene (19-17/007)

El Jeftlik

THE SOUTH AREA/ PWA WELLS

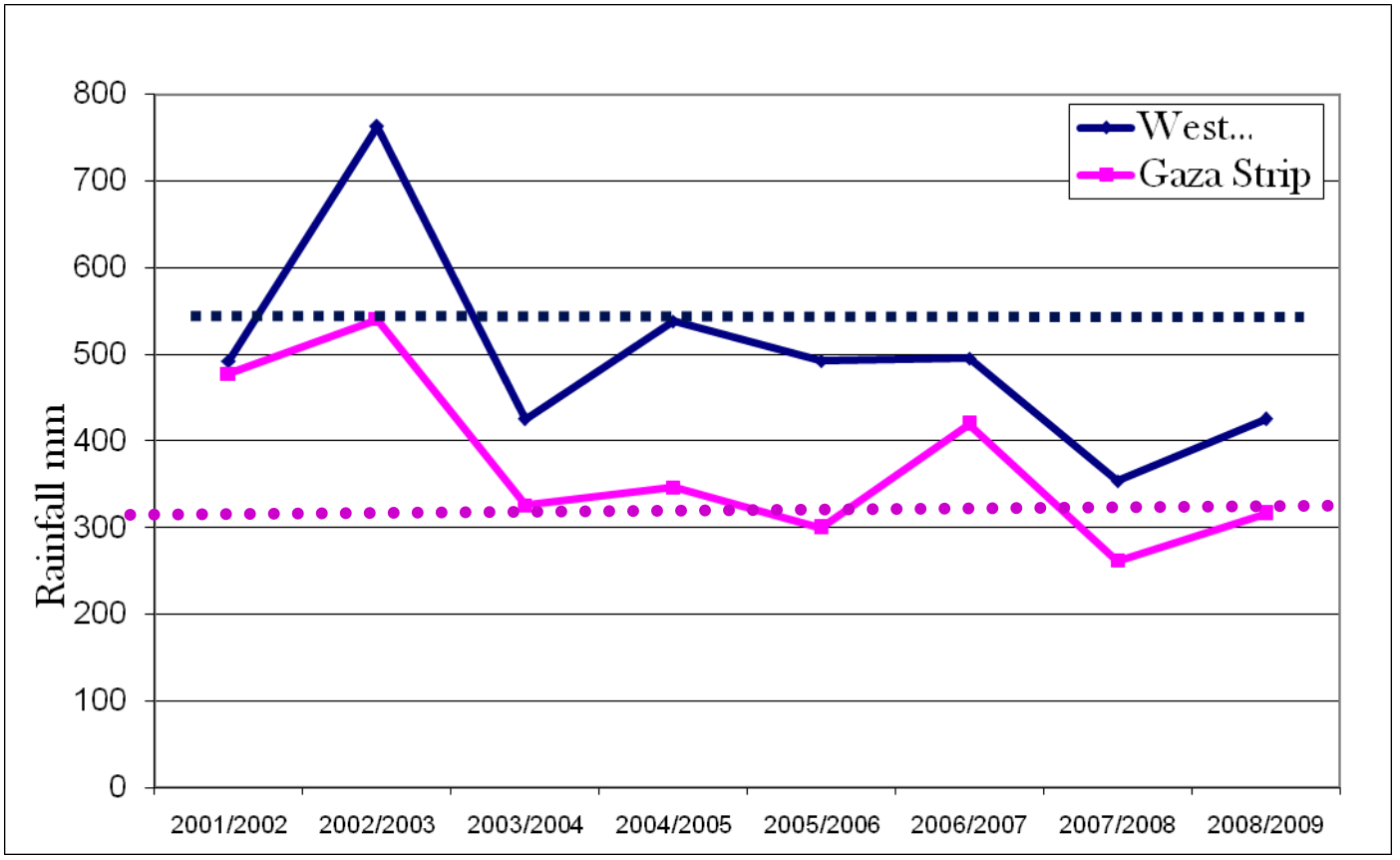


(PWA1)- Between 8/2009 to 9/2010
there is a decline in water level reach to 0.4 m/month



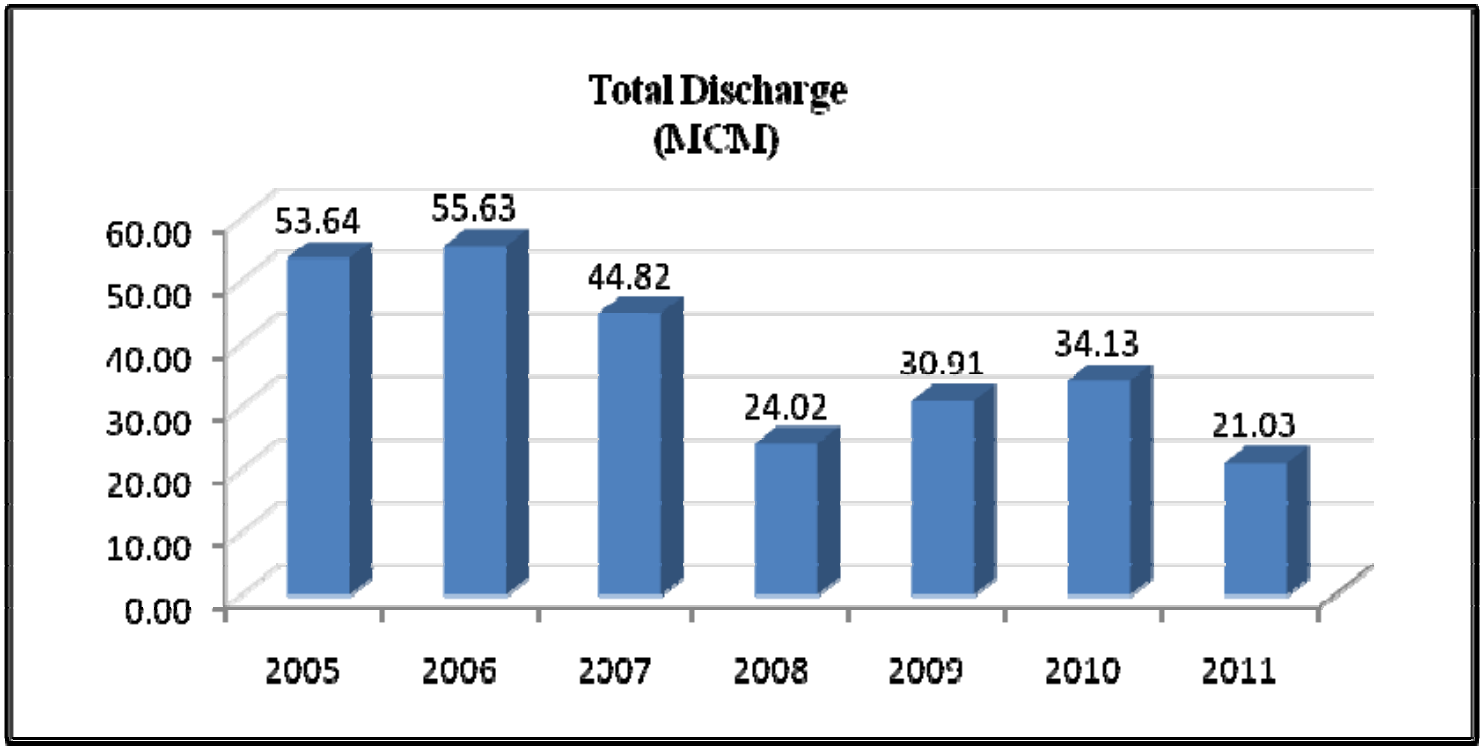
(PWA11)- Between 1/2009 to 7/2010
there is decline in water level reach to 0.5 m/month

ANNUAL AVERAGE RAINFALL IN WB & GS (2001-2009)

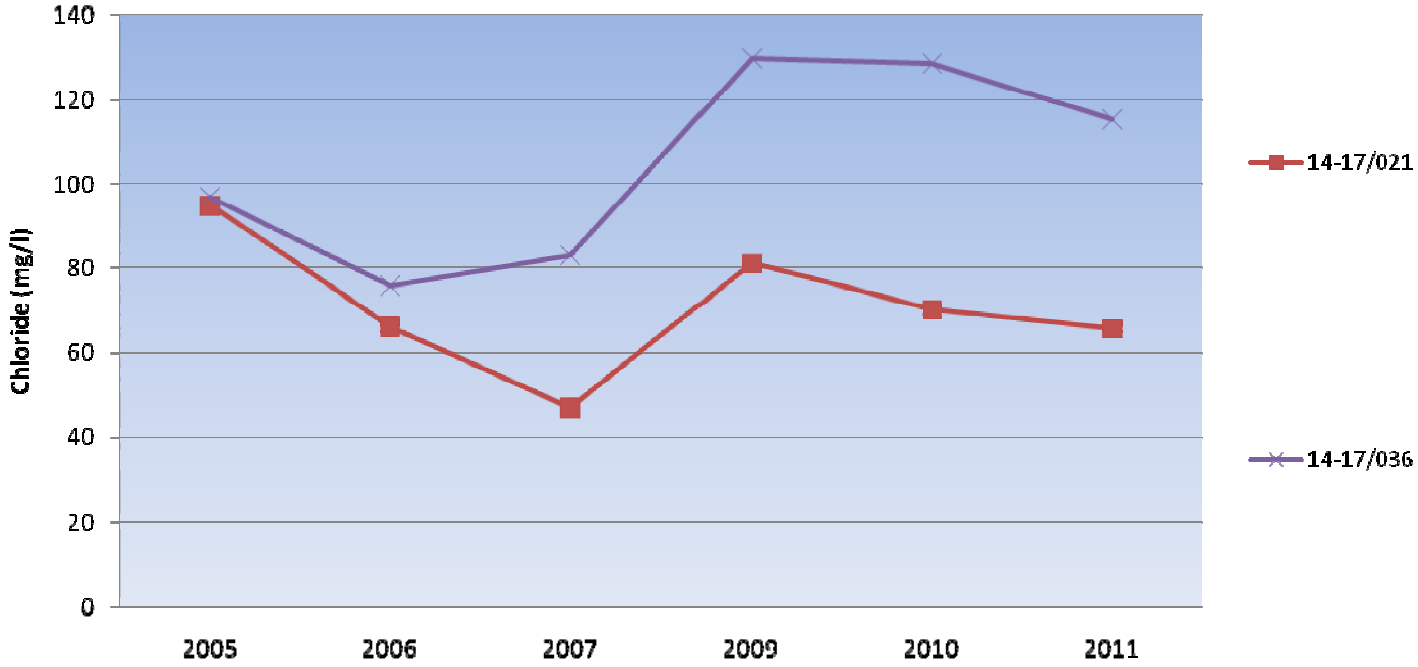


MoA

Springs Discharge



Increasing of Chloride Concentration Rates



Surface Water Resources

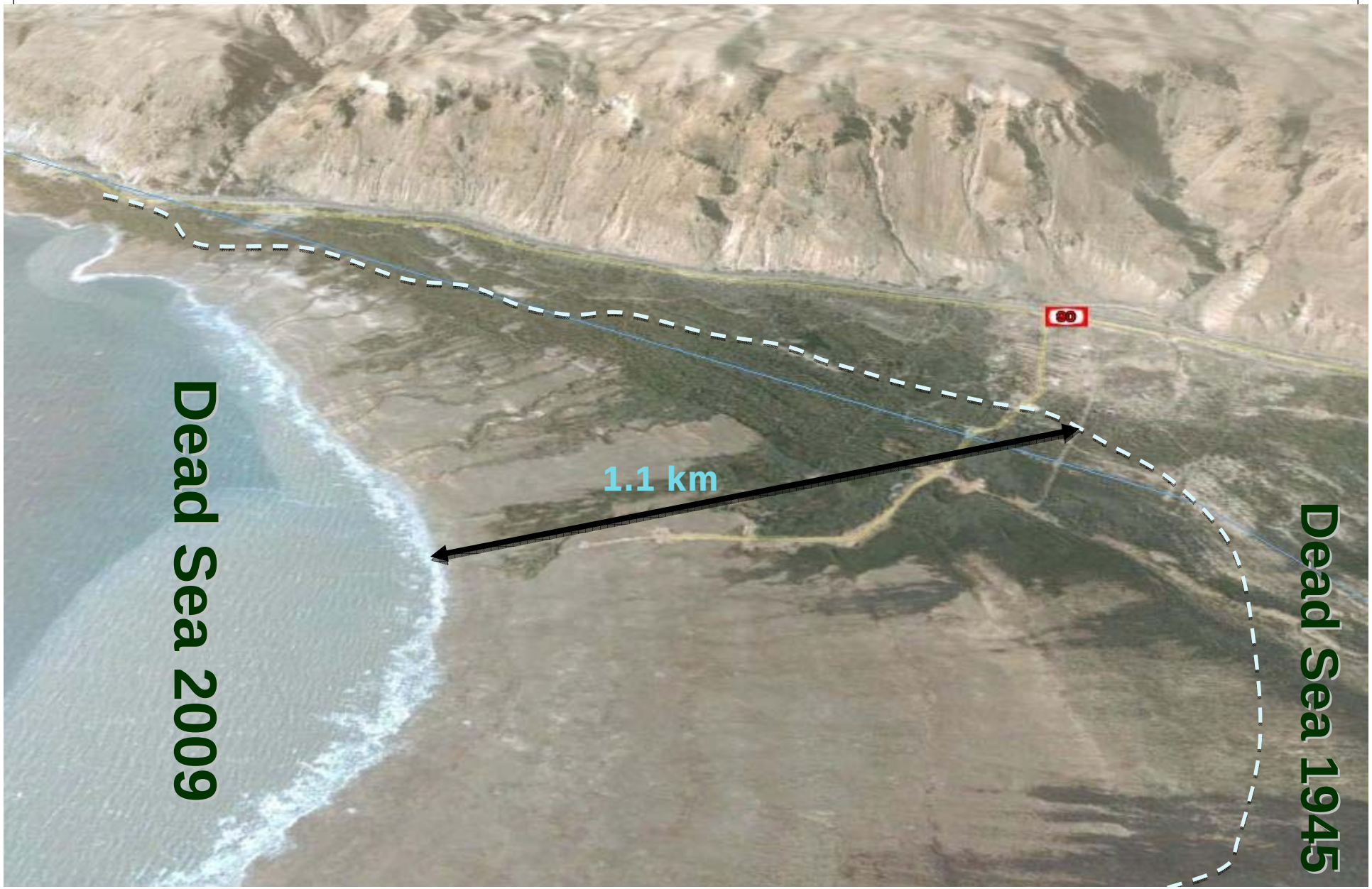
Jordan River

The historical Palestinian water rights in JR is around 241 MCM/Y

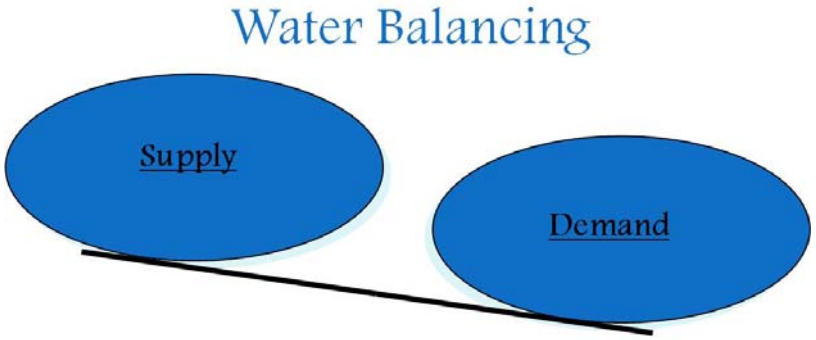
Historical Flow of JR into Dead Sea

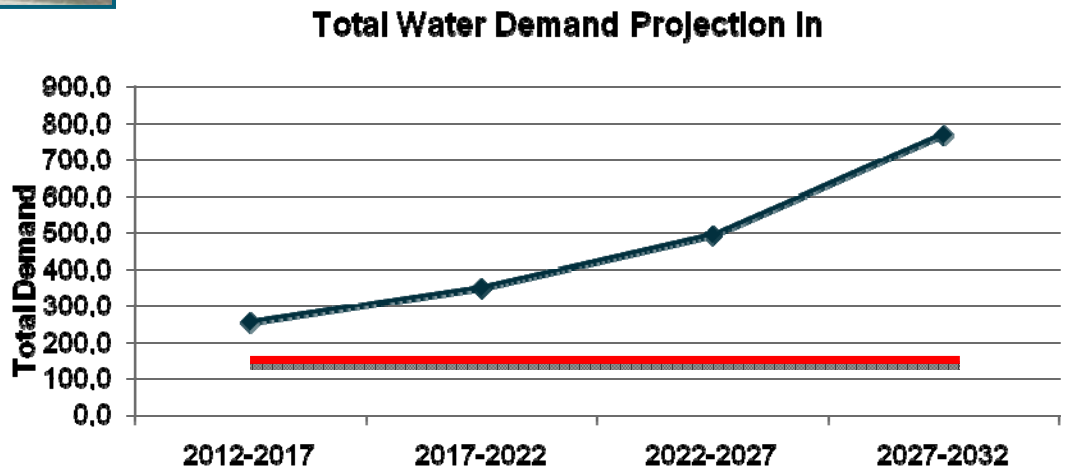
Year	FLOW (Mcm/year)
1948	1400
1967	700
1982	500
1990	150
2003	75
2006	50

Receding of Dead Sea



WATER DEMAND VS SUPPLY





MEASURES CONSIDERED IN THE NEW WATER SECTOR STRATEGY

(1) Groundwater Supply Development:
Drilling of new wells
Rehabilitation of springs and wells

(2) Assess Impact of CC on WR :
Vulnerability Assessment, for the affected sectors Drought Management Plan

(3) Demand Management:
Strategic planning: Physical water losses Reduction, Changing crop patterns, and water use restrictions, Balancing demand centers with water supply sources.

(4) Water Harvesting:
Storm Water Harvesting : Constructing small scale dams in Fara'a and Auja wadis.

(5) Alternative Resources: Purchased water, Desalination, Reuse of TWW and Reallocation management

What's NEXT?

National Drought Management Plan for:

Measures to alleviate water scarcity

- Reallocation Management of Water Resources
- Actions to increase water availability
- Water demand management

Climate Change Adaptation Strateg and Programme of Action for the Palestinian Authority

THANK
YOU