WATER CONVENTION

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The Use of Wastewater For Irrigation

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INTRODUCTION

1. Jordan is a nation burdened with extreme water scarcity that has always been one of the biggest barriers to our economic growth and development.
2. This crisis situation has been aggravated by **a population increase that has doubled in the last two decades** alone because of refugees fleeing to Jordan from neighboring countries. We must then add to this **the transboundary and climate change issues affecting Jordan's water supplies**.
3. In the face of these challenges, and to achieve our goal of successful integration of Jordan's water resources management, the Ministry of Water and Irrigation has been active in putting forward new policies that set clearly defined rules to manage the scarce water resources efficiently and sustainably. These new policies lay out the measures and actions required to achieve our national goals for long-term water security. These result-oriented policies are built upon and updated from previously adopted strategies, policies, and plans. Together, they are an integral and ongoing part of the overall management efforts that have already been achieved.

Irrigated agricultural has boomed, particularly in the highlands, with steady expansion year on year since the eighties. This growth is not sustainable without significant substitution of reclaimed water for freshwater in irrigation.

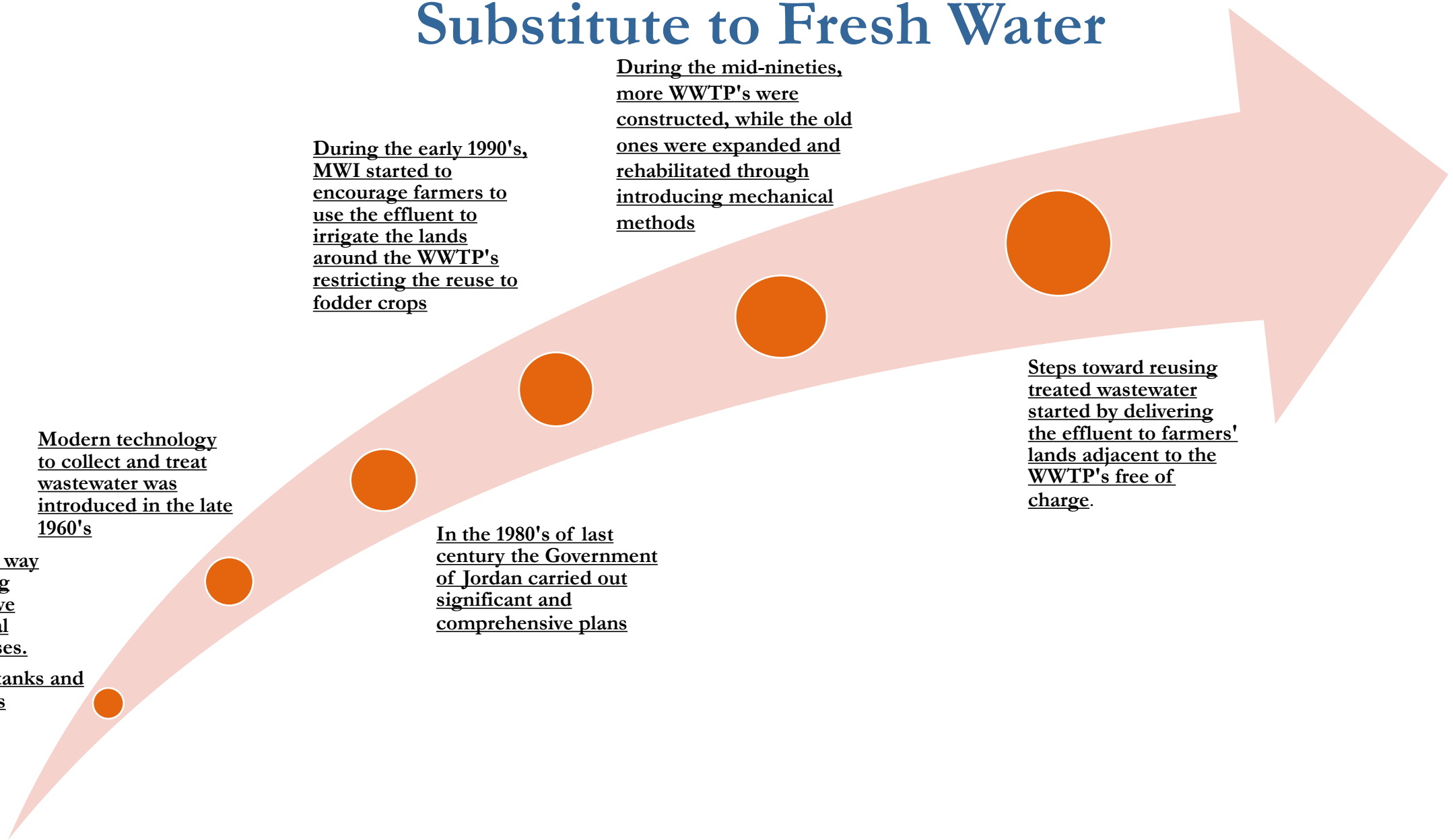
History and Development of Treated Wastewater as Substitute to Fresh Water

1. **Wastewater collection has been practiced in Jordan in a limited way utilizing primitive physical processes. Septic tanks and cesspits** were mostly used with gray water often discharged to gardens. This practice created major environmental hazards, where many groundwater aquifers were polluted.
2. **Modern technology to collect and treat wastewater was introduced in the late 1960's when the first collection system and treatment plant was built at Ain Ghazal** utilizing the conventional activated sludge process. The treated effluent was discharged to Seil Zarqa.
3. **In the 1980's of last century the Government of Jordan carried out significant and comprehensive plans with regard to the different issues of wastewater management primarily related to the improvement of sanitation**. Major cities were served with modern sanitation and treatment services where approximately 68% of the population at the time were connected to sewer networks and gained access to wastewater services.
4. However, due to the strength of the waste because of the small amount of per capita water use and the salinity in the drinking water, said systems failed to produce effluent qualities suitable for irrigation, especially in terms of high salinity where large volumes of water evaporate causing an increase in the effluent's salinity.
5. **During the early 1990's, MWI started to encourage farmers to use the effluent to irrigate the lands around the WWTP's restricting the reuse to fodder crops because the discharged effluent's poor quality**.

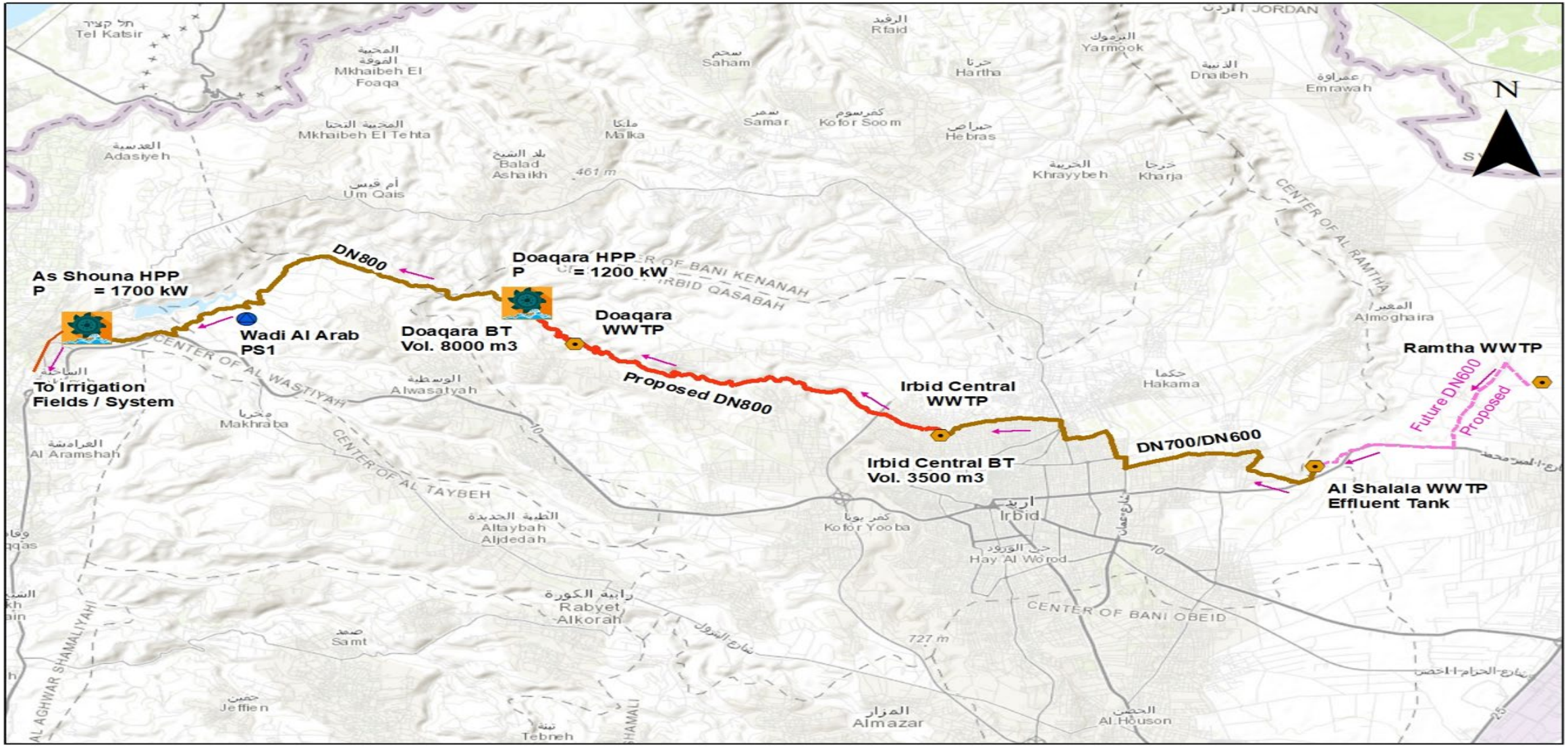
History and Development of Treated Wastewater as Substitute to Fresh Water

6. **Steps toward reusing treated wastewater started by delivering the effluent to farmers' lands adjacent to the WWTP's free of charge**. As public acceptance was achieved, the next step is to recover cost of delivery of the effluent.
7. **During the mid-nineties, more WWTP's were constructed, while the old ones were expanded and rehabilitated through introducing mechanical methods** which rendered the effluent quality in full compliance with local and international standards for reuse without restriction
8. **Currently, there are 33 different WWTP's discharging approximately 177 MCM per year of effluent**. This volume, combined with the decreased volumes of fresh water available for irrigated agriculture, caused MWI to adopt the substitution policy which is the subject of this document.

History and Development of Treated Wastewater as Substitute to Fresh Water



Wastewater Treatment Plants & Northern Reuse Systems



Wastewater Treatment Plants & Reuse Systems

There are five relevant investment projects currently being implemented, or are planned and have a high probability of being implemented

ACTIVITIES	TIMELINE
1. Upgrade of Wadi Al Arab WWTP	2025
2. Upgrade of Central Irbid WWTP	2025
3. Construction of Hydropower Plant at Wadi Al Arab WWTP	2026
4. Replacement of existing DN600 gravity pipeline with new DN800 Steel Pressure Pipe	2026
5. Construction of Hydropower Plant at As Shouna	2026
6. Upgrade of Ramtha WWTP and Wastewater Networks	2026

Wastewater Treatment Plants & Reuse Systems

Location: Irbid

Capacity: 13000 m^3/day

Sludge final location: Al-Ekaider

Status: under upgrade and rehabilitation to include anaerobic digestion and CHP system

Catchment Areas: Irbid

Wastewater Treatment Plants & Reuse Systems

Location: Irbid

Capacity: 27000 m^3/day

Sludge final location: Al-Ekaider

Status: under upgrade and rehabilitation to include anaerobic digestion and CHP system

Catchment Areas: West Irbid

Wastewater Treatment Plants & Reuse Systems

Location: Irbid

Capacity: 13700 m^3/day

Sludge final location: Al-Ekaider

Status: under upgrade and rehabilitation to include anaerobic digestion and CHP system

Catchment Areas: Irbid

Wastewater Treatment Plants & Reuse Systems

Location: Ramatha

Capacity: 5700 m^3/day

Sludge final location: Al-Ekaider

Status: under upgrade and rehabilitation to reach a capacity of 10,000 m3/day and to include anaerobic digestion and CHP system

Catchment Areas: Irbid

Flow Projection

Year		2022	2025	2030	2035	2040	2045
Daily Effluent Volume	m^3	45,800	53,570	61,340	64,110	66,700	69,290
Yearly Discharge	MCM	16.7	19.5	22.4	23.4	24.4	25.3

Thank you

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