



JICA's Cooperation



for Water Sector in Jordan

30 years history of remarkable achievements



Message from Chief Representative of JICA Jordan Mr. TANAKA Toshiaki



Japanese ODA to Jordan started much earlier than the establishment of JICA office. The first ODA loan to Jordan was provided in 1974, the same year when Embassy of Japan in Jordan was established. The first technical cooperation project started in 1977, though technical cooperation to Jordan may have started earlier, and the first grant aid to Jordan was provided in 1979.

Since then, the Government of Japan has provided Jordan with total amount of more than 200 billion Japanese yen as ODA loan, more than 60 billion yen as Grant aid and nearly 30 billion yen as technical cooperation.

In 1985, two agreements between the two countries on JICA activities were concluded. One is the technical cooperation agreement and the other is the agreement on Japan Overseas Cooperation Volunteers. On the basis of the agreement, JICA started JOCV program in Jordan and established JOCV coordination office which was followed by the establishment of JICA Jordan office. For the promotion of South-South Cooperation in the region, Japan-Jordan Partnership Program was agreed in 2004, furthering Jordan's position as a donor country and entering a new stage of relationship between the two countries.

In 2006, Japan Bank for International Cooperation (JBIC) inaugurated Amman office, which was integrated with JICA Jordan office in 2008 when new JICA was established as a result of a merger of JICA with ODA loan operation of JBIC. The new JICA integrated three major types of Japanese ODA: ODA loans, grant aid and technical cooperation.

Looking back to the long history of Japanese ODA to Jordan, Water sector is one of the most important fields of JICA's cooperation activities in Jordan to enhance their capacity of water sector people of Jordan through extraordinary effort of Jordanian Counterparts, JICA Experts, Embassy of Japan in Jordan and JICA Jordan office staffs. I am appreciate for their great contribution for this field so I want introduce some of our achievements of Japanese ODA project through 30 years history of cooperation in Jordan by this brochure.

Even Jordan water situation is very critical condition, I believe that Jordanian people can overcome by their own effort. JICA want to support and work together with the people of the Hashemite kingdom of Jordan.

Message from Minister of Water and Irrigation H.E. Mousa Jama'ani



Jordan's water resources are limited and have imposed constrains on economic and social development for several years, The yearly increasing deficit will impact all sectors, therefore collective efforts must be made by all stockholders to cope with this matter.

Our vision for the water sector is to provide adequate and safe water supply for all uses, accordingly our water resources should be managed effectively and efficiently, within this context, the Japan International cooperation Agency (JICA) have been contributing significantly in improving the Jordan's water resources management. JICA provided expertise, technical cooperation and grants in critical issues needed by this sector. The ***Project for Improvement the Water Supply to Greater Amman*** to cope with the additional water resources after the peace treaty is considered the backbone of supplying more than 2.5 million inhabitants in Amman and surrounding governorates, The ***Capacity Development Project for NRW Reduction*** has remarkable results, NRW reduced from 60% to less than 40%, the rehabilitation of water networks, reservoirs and pumping station at the Zarqa, Tafileh and Jordan Valley improves the reliability and availability of water supply as well as energy consumption, by changing from direct pumping in the networks to gravity supply.

The long lasting cooperation of JICA with the Ministry of Water and Irrigation is highly appreciated by the people of Jordan, particular appreciations and thanks for JICA Jordan Office staff for their tireless efforts in improving the water sector in Jordan.

Technical cooperation project

Title:

Capacity Development Project for Non-Revenue Water Reduction in Jordan (2005 - 2008)
Capacity Development Project for Non-Revenue Water Reduction in Jordan Phase 2 (2009-2011)



Outline of Project

Jordan has serious water shortage, and the rationing of water supply is practiced throughout the country. Water is supplied only a few days a week in Amman, 24 to 30 hours a week in Jordan Valley, and sometimes less than 10 hours a week in small villages in the countryside. The increase in water demand from the rapidly increasing population is putting heavy pressure on the limited water resources. In addition, NRW reaching more than 50% of water produced as of 2002, is becoming an urgent issue as population continues to grow. The accumulated deficit of the Water Authority of Jordan (WAJ) is 723.98 million JD as of 2003, accounting for 10% of GDP.

The Project aims at developing the capacity of the WAJ staff in terms of designing and implementing NRW countermeasures in ten (10) Governorates to enhance the effective use of water resources in Jordan.

The first phase of the project was completed in 2008. Key elements of the Action Plan for the 1st Phase included:

- Leakage survey (pipe line sounding) ■ Leak repair ■ Leakage and illegal use survey (individual household sounding)
- Water meter replacement ■ Service pipe replacement ■ Rectification of illegal connection
- NRW level reassessment (flow balance survey) ■ Minimum Night Flow measurement ■ Public awareness campaign
- GIS network drawing preparation ■ Subscriber database preparation

The second phase of the project started in 2009. The Project Design Matrix, which was prepared and agreed by WAJ and JICA, calls for reducing NRW percentage by half in at least six (6) pilot areas.



Project Impact

The Governorate Water Administrations (GWAs) have achieved this target as shown in Table below.

Table NRW Level Achieved against the Set Target

GWA	Pilot Area	Subs. (No.)	NRW Baseline (%)	NRW Target (%)	NRW Level Achieved (%)
Balqa	Al-Salalim	2,060	45	23	20
Zarqa	Hashimiah	1,030	58	29	25
	Wadi Al-Hajar	241	47	23	25
Madaba	Faisalea	695	57	28	28
Karak	Smakeheh & Hmoud	384	44	22	23
	Muhay & Hamdieh	220	63	31	-
Tafilah	Mansurah	566	28	14	18
Ma'an	Odruh 1	218	55	27	17
Simple Arithmetic Average			49	25	22

The majority of NRW countermeasures adopted in the pilot areas are underground leakage detection and repair, water meter replacement and illegal connection rectification. Pipe replacement was not carried out to any significant extent except for Balqa Governorate.

This experience indicates that substantial decrease of NRW (around 40% - 60%) is achievable if countermeasures are intensively applied. The GWAs are encouraged to continue to implement similar activities in other areas.

Grant Aid project

Title:

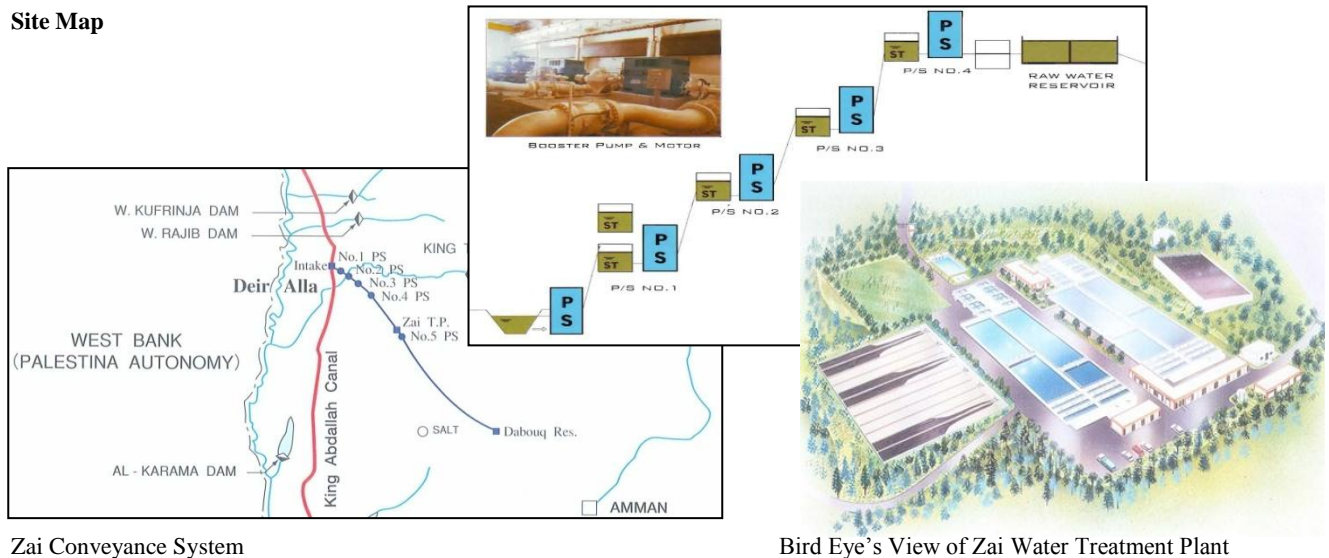
The Project for Improvement of Water Supply System to Greater Amman Phase I, 1997-1998, JPY12,750,000,000

The Project for Improvement of Water Supply System to Greater Amman Phase II, 1998-2002, JPY74,220,000,000

Outline of Project

In 1994 the Peace Treaty was signed between Jordan and Israel, which brought additional water resource to Jordan from Yarmok river and Lake Tiberius in Israel as peace dividend. By taking advantage of this resource, the Government of Japan assisted to implement two water supply projects to mitigate the severe water supply condition in Amman. The phase I project renewed the deteriorated 4 pumping stations in the Zai conveyance system between Deir Ala and Amman, which convey raw water between about 1,100 m difference of elevation. The phase II project expanded the 4 pumping stations in the Zai conveyance system and the existing Zai water treatment plant from 45 million m³/year to 90 million m³/year, which increased water supply amount to 250,000 m³/day in total covering a design population of 1,970,000.

Site Map



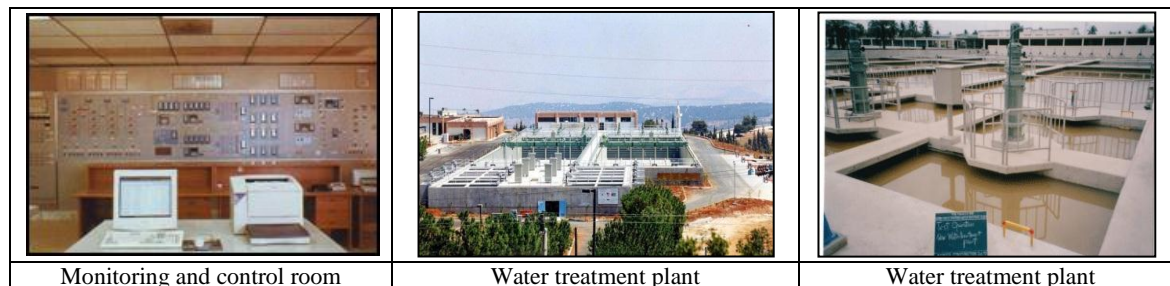
Zai Conveyance System

Bird Eye's View of Zai Water Treatment Plant

Project Impact

1. The capacity of the existing Zai system including conveyance pumping stations and water treatment plant was expanded from 45 million m³/year to 90 million m³/year. The Zai system is the most importance sources for Amman, which accounts for about 40 % of the Amman's water supply sources including Zara-Maen, Qastal wells, Qatraneh, and Swaqa
2. In the summer of 1998 before the project, the Zai water treatment plant malfunctioned and water without treatment was supplied to Amman, which caused panic in the citizen. After the project, the water quality of supplied water is stable and ensured and the Water Authority of Jordan re-established confidence in the citizen.

Pictures



Grant Aid Project

Title

- (i) The Project for Improvement of the Water Supply for the Zarqa District (JPY 1,721,000,000 2002-2005)
- (ii) The Project for Improvement of the Water Supply for the Zarqa District (Phase II) (JPY 2,371,000,000; 2007-2010)

Outline of Project

JICA conducted a Study covering areas of Zarqa District during 1994-96 to formulate a long-term water supply improvement plan. The Study identified major issues and proposed a plan of action for improvement of water supply of Zarqa District. Based on this Plan, JICA provided assistance to Water Authority of Jordan to improve water supply in Zarqa District through a project in two phases as listed above. The first phase of the project covered Ruseifa and Awajan areas while the second phase covered Zarqa city, Hashemeyeh, and Sukhna areas

The physical facilities were constructed and trainings were provided to WAJ staff. The main area of Zarqa District was divided into eight distribution zones. Eight number of service reservoirs (one in each distribution zone) with total storage capacity of 35,200 cubic meter, 23.2 km of transmission main with diameter ranging from 200 to 500 mm, and 15.3 km of distribution main with diameter ranging from 200 to 600 mm were constructed. In addition, a chlorination facility, a pumping station, and about a dozen isolation valves were installed.

Site Map

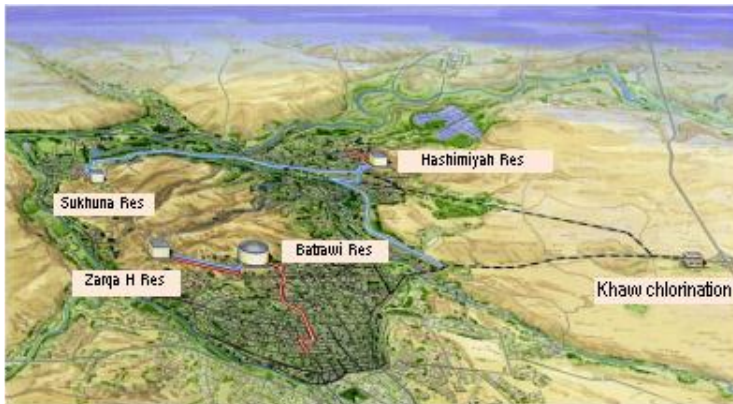


Figure: Bird's Eye-view of Facilities Constructed in Project Phase II

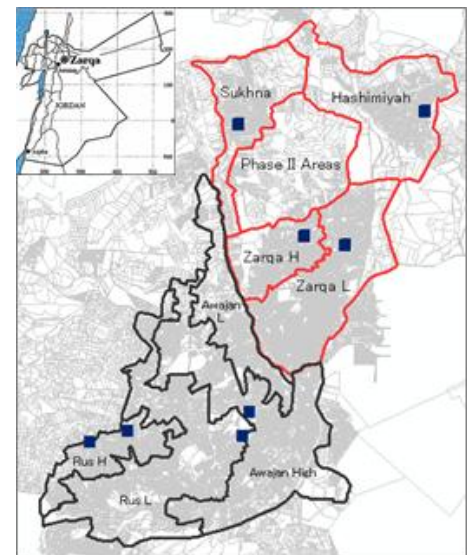






Figure: Zoning and newly constructed reservoirs in Zarqa

Project Impact

The Zarqa Project has been an exemplary project in many respects. Through the zoning and gravity supply distribution operation has been greatly simplified. Stability has come to the supply pressure and customer complaints of unstable supply have been reduced. Cost of electricity and operation and maintenance have been also reduced. Water availability is expected to increase by the amount saved from leakage reduction. Result of leakage reduction will take some time to realize as it is still less than a year since completion of the major part of the project in March 2011. The frame work established by the project and the facilities constructed are being used by other donors such as GIZ, USAID, Chinese Government etc. to further improve the system and rehabilitate smaller pipe network. Without the frame work, these improvement works are not effective. The reservoirs are serving not only as facilities to store water but also as symbols of quality work and displayer of water messages daily to innumerable people who pass-by them.

Pictures

			
14,000 m ³ PSC Reservoir at Batrawi	1,800 m ³ RCC Reservoir at Ruseifa	Pumps at Batrawi P. S.	Pipe laying work in Ruseifa

Third Country Training Project

Title

Capacity Building in Water Management for Palestinians (2006-2011)

Training Purpose

To enhance capacity in operation and maintenance of water supply and sewage network as well as waste water treatment in Palestine. (260 participants)



Background:

Water is a scarce resource in Palestine. The existing water & sanitation infrastructure in Palestine suffers from a lack of investment, coupled with inadequate level of skills in planning, designing, managing, operating and maintaining of the infrastructure to ensure its sustainability. Since the beginning of the Israeli occupation in 1967, little investment has taken place in water sector infrastructure.

Besides, the water sector faces a lack of training opportunities for employees within the different levels of the water service providers (WSP) and within certain staff categories. Such status, if remained, will contribute to the degradation of services and the inability to provide adequate water and waste water services to the population. Responding to such a situation, TCTP was formulated and conducted to improve Palestinians' staff skills.

Training Fields:

- (1) Operation and Maintenance of Water Supply System
- (2) Operation and Maintenance of Sewer System and Wastewater Treatment Facilities
- (3) Sampling and Testing Water/Wastewater

Message from Deputy Chief Program Officer of JICA Jordan Eng. Hani Kurdi

The water sector is of the highest priority and receives special attention from the Government of Jordan and the Donors as it represents the backbone for integrated social and economic development of the nation. In Jordan, the demand is far exceeds the water supply, and the challenge is to match the foreseen demands with the available conventional and non-conventional water resources.

JICA's approach is curbing demands and seeking more efficient management and effective use of water resources, therefore, it is of fundamental importance to help Jordan reduce its water consumption and improve waterworks management, to achieve these objectives, JICA have been implementing various rehabilitation, improvement and expansion waterworks studies and projects overall Jordan, aiming at improving water supply availability and reliability as well as reducing energy consumption.

Reducing the high ratio of Non-Revenue Water (NRW) in the networks is one of JICA technical assistance project which include on-job-training, provision of equipment and dispatch of Japanese experts, the results were remarkable and enable trained Jordanian counterparts to disseminate the gained technology to the countries in the region namely, Iraq, Palestine and Yemen within JICA's third country training program scheme.

As a Jordanian working with JICA, I am very much confident that we are helping the water sector in the areas where it is extremely needed, not forgetting the excellent Jordanian counterparts to who thanks and appreciation is extended.



JICA Cooperation History (Water Sector)

Water works	Non Revenue water	Water Resource	Irrigation
			<p>Study for Wadi Arab irrigation Dam FY1975-1976 F/S for to improve water use for Wadi Arab Dam for irrigation and water supply</p>
			<p>The project for Wad Arab irrigation Dam Yen Loan FY1977 7,500Million JPY Construction for to improve water use for Wadi Arab Dam for irrigation and water supply</p>
		<p>Mujib water use Development Planning study FY1985-1987 F/S for to improve water use for Mujib Dam for irrigation and water supply</p>	<p>Mujib South Ghor irrigation Dam Yen Loan FY1984 13,900Million JPY Construction for to improve water use for Mujib Dam for irrigation and water supply Dam</p>
		<p>Water resources study of Jafr Basin FY1987-1989 F/S for to improve water resources use for Jafr Basin</p>	<p>North Ghor conversion Project Yen Loan FY1989 4,080Million JPY The project covered the conversion of open canals to pipelines for an existing irrigation area of 7,200 hectares, and the development of a pipeline distribution system</p>
<p>Dispatch of Project Formulation Advisor for Water sector FY1993 To formulate several projects to support Jordan Water sector</p>		<p>Study on brackish groundwater desalination FY1993-1995 Study for to improve water desalination of brackish groundwater in Jordan</p>	
<p>The Project for Improvement of Maintenance Equipment for Water Supply Facilities Grant Aid, FY1994 660million JPY Up grading the workshop equipment for water facilities and equipment repair</p>			
<p>The Study for Improvement of the Water Supply System for the Zarqa District Study, FY1994-1996 F/S for to improve water supply conditions in Zarqa area by rehabilitating and upgrading the water supply facility</p>			
<p>The Project for Improvement of Water Supply System to Greater Amman Grant Aid, FY1997, 1,275 million JPY Renewal of equipment of 4 pumping stations (pump, generator, Transformer)</p>			
<p>The Project for Improvement of Water Supply System to Greater Amman (Phase 2) Grant Aid, FY1998-2001, 7,422 million JPY Expansion of water intake facility Expansion and upgrading treatment plant capacity from 125,000m³/day to 250,000m³/day</p>	<p>NRW and GIS/Distribution system mangement Individual Expert FY1999-2002 To investigate the water loss problems To take necessary measures to reduce the NRW</p>	<p>The study on water resources management FY2000-2001 Formulating a Master Plan integrating all water resources in Jordan, and conducting pre-feasibility study for priority projects based on the finding and results of the Master Plan</p>	
<p>The Project for Improvement of the Water Supply System for the Zarqa District Grant Aid, FY2003-2005, 1,721 million JPY Rehabilitation of main distribution pipe Construction of reservoir and transmission line</p>	<p>NRW and Water distribution management Individual Expert FY2002-2005 Technical transfer on NRW through the on-job-training</p>	<p>The project for water pollution monitoring system Grant aid FY2000-2004 868million JPY Procurement and installation of 13 monitoring stations, telemetry system and analysis equipment</p>	
<p>Improvement and Expansion of the Water Supply Networks in North/Middle Jordan Valley Grant Aid, FY2003-2005, 2,011 million JPY Rehabilitation of main distribution pipe, reservoir and booster pump</p>	<p>Policy advisor and Project formulation Individual Expert FY2005-2007 To formulate several projects and review of the master plan to tackle the water issues</p>		
<p>Project for Energy Conservation through Upgrading Water Supply Network Grant Aid, FY2010-2012, 1,132 million JPY Hamonization for water and energy through rehabilitation of main distribution pipe</p>	<p>Capacity Development Project for Non-Revenue Water Reduction in Jordan Technical Cooperation Project FY2005-2008 Capacity of WAJ staff to design and implement NRW countermeasures in ten (10) Governorates is enhanced</p>		
<p>Rehabilitation and Improvement of Water Facilities in Tafieleh Grant Aid, FY2011-2012, 1,911 million JPY Rehabilitation of main distribution pipe Construction of reservoir and transmission line</p>	<p>Capacity Development Project for Non-Revenue Water Reduction in Jordan Phase 2 Technical Cooperation Project FY2009-2011 Advance Capacity of WAJ staff to design and implement NRW countermeasures in ten (10) Governorates is enhanced</p>		



JICA Project Map (Water Sector)

Technical Cooperation

- (1) JICA Expert
Amman
- (2) Capacity Development Project for Non-Revenue Water Reduction
Irbid, Ajloun, Jerash, Mafraq, Balqa, Zarqa, Madaba, Karak, Tafileh, Ma'an
- (3) Third Country Training Program (for Palestine, Iraq, Yemen)
Amman

Grant Aid

- (4) Zay water treatment plant (Balqa governorate)
- (5) Zarqa water facility (Zarqa governorate)
- (6) North and Middle Jordan Valley water facility (Irbid governorate)
- (7) Tafileh water facility (Tafileh governorate)

Yen Loan

- (8) Wadi Arab Dam (Irbid governorate)
- (9) Mujib Dam (Madaba governorate)
- (10) North Ghor Irrigation conversion (Irbid and Balqa governorate)

