

Cost/Tariff Model and
Efficiency Scenarios
Meeting for the Water
Authority of Jordan

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FORWARD

Collaborative Approaches for Resolving Water Issues



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Introduction

On 26 April 1998, the Secretaries-General of the Jordan Valley Authority (JVA), H.E. Dr. Dureid Mahasneh, of the Ministry of Water and Irrigation (MWI), and H.E. Koussai Quteishat, and representatives of the JVA gathered in Aqaba for the interim presentation of the cost/tariff model prepared by FORWARD.

The purpose of the meeting was to:

- review prior agreements that determined the model structure;
- recognize the model's capabilities and uses;
- examine the model structure for financing, planning, and costing;
- review operation and maintenance (O&M) costs and revenues;
- reach an agreement on the methodology of calculating costs at Deir Alla;
- reach an agreement on data and assumptions included in the model;
- consider performance measures; and
- discuss the status of other FORWARD activities and the proposal for the design and implementation of the Financial Accounting System (FAS).

In his opening statements, H.E. Dr. Dureid Mahasneh, reiterated the importance of the model as a tool for better financial planning of JVA activities. He urged JVA staff to participate actively and seriously in this meeting for the general benefit of the authority.

The Secretary General highlighted the need for JVA to incorporate best business practices into its operation, including improving system efficiency, reducing subsidies, attracting capital, and reallocating the resources cost-effectively. FORWARD provided a forum to engage in a brainstorming session to generate ideas that would maximize the use of the model. The Secretary General emphasized that the model can assist and inform policy development, act as a reference when considering future commercialization, and support deliberations with donors. He said some of his staff might need to change their way of thinking to benefit from the program. While acknowledging reasonable concerns about data gaps and data quality, he asked JVA staff to keep in mind that the model was built with data that the authority had itself provided. The Secretary General noted that this meeting in Aqaba, away from other work commitments, was an excellent opportunity to concentrate on the issues at hand.

Review of Previous Agreements

Following the Secretary General's comments, FORWARD thanked him for his remarks and acknowledged the unprecedented cooperation from JVA Technical Working Group (JVA TWG) and staff in the valley. A presentation on the previous meetings and agreements with the JVA Technical Working Group followed.

JVA TWG and FORWARD had already reached agreements on many issues related to:

- segregation of costs and revenues;
- forecast timeframe;
- methods of calculating capital costs.;
- future incorporation of different water tariffs for different water qualities while including geographic-specific or system-level (primary, secondary, tertiary) data; and
- using JVA data where available and to work with JVA staff to reach rational assumptions where data is missing.

The primary purpose of the model is financial planning and tariff setting. It combines data from various sources into new levels useful for financial planning, and primarily yields information on an annual basis appropriate for budget planning and tariff-setting purposes. The model is not a substitute for a detailed accounting system, a specialized engineering study for a project, a model that calculates reservoir yields, or a daily or monthly system operations simulation.

The JVA Technical Working Group facilitates coordination of the project and assists FORWARD in its work. While there have been slight delays, as a result of the unavailability of some data and the complexity of other data incorporated into the model, the JVA group has been very cooperative with the FORWARD team and was recognized for its hard work and commitment.

The presentation also summarized the work accomplished to date on: model design, water balance, and costs and revenues at different centers.

Purpose, Uses, and Structure of the Model

The JVA cost/tariff model permits an assessment of a wide range of utility planning and management scenarios. It integrates many complex issues into a straightforward analysis that focuses both on the near and longer-term future. The model also allows

utility managers to address budgeting and financing issues more systematically, and it facilitates improved coordination within the government and with donors.

The model will assist the JVA in examining what-if scenarios for their financial planning systems. The scenarios include:

- demand growth rates;
- examining needs for new supplies;
- improving the system's efficiency;
- improving on-farm management;
- different prices for water qualities; and
- requirements for tariff changes to achieve certain recovery rates on operation and maintenance costs.

It would be very difficult for utility planners to examine these scenarios collectively or partially without having such a model. The Integrated Planning and Financial Model (IPFM) is an effective means of putting it all together.

FORWARD presented a "Simplified JVA Model Structure" flow chart and elaborated on the concepts behind the model structure. FORWARD noted that this meeting is the right time to raise questions and suggest changes, prior to finalizing the model.

Cropping Patterns

In the model, cropping patterns were grouped into cropping families with the JVA's consent, and were used to calculate the theoretical demands based on cropping water requirements. The cropping patterns included in the model are citrus, vegetables, fodder, banana, and other trees. Water application rates vary from the north to the south, as well as by crop. The percentage of demand met is obtained from the water supplied (billed) and the theoretical water demands. Some JVA staff raised questions about the percent demand met. They were concerned that percentages are very low in the north and believed that water shortages are not as severe as shown in the model. FORWARD explained that data errors might be behind those percentages. The errors could be the result of estimates on cropping pattern areas, higher crop water requirements, or both. The issue was referred to the Technical Working Group for further discussion and agreement on the figures.

Water Demands and Supplies (Water Balance)

FORWARD presented the water balance for the JVA system. The water balance was based on stage office level, rather than on JVA records, which were project-based. The balance was prepared for the King Abdullah Canal (KAC), that is, for water flows into and out of KAC at different locations. Based on water availability, allocation decisions are made and water use of each water quality per each stage office is determined.

The system efficiency or unaccounted for water (UFW) is obtained per each project. UFW is the difference between the water supplied and the water billed. UFW includes both physical and administrative losses. The water supply for each stage office was calculated in the summer and winter. Summer flows are from April to September; winter flows are from October to March.

One concern of the JVA was the inclusion of water rights in the side wadis, which is not billed. Wadi Shueib water and other water supplies are managed by the JVA, and although it bears some O&M costs for the supplies, it cannot be charged for them. Some JVA staff argued that these resources should be considered as billed water and become part of the accounted for water (AFW). FORWARD explained that they had been excluded because there are no revenues from Shueib and other wadis' water rights in the valley. In financial terms, AFW implies that the water is billed, generating some revenues. This is not true for JVA. H.E. Dr. Mahasneh mentioned that AFW is accounted for and not wasted. H.E. Mr. Quteishat added that the relevant issue at hand is how to include this quantity in the model.

Another issue related to the UFW that emerged recently is how to deal with the water stored in Karameh Dam that is not supplied to farmers. The water is not wasted, but no revenues are generated from sales.

The issue of unaccounted for water was discussed at length. UFW affects the O&M unit cost per cubic meter of water. JVA staff pointed out that the water stored in the dams and along side wadis could be counted as water produced in the system. According to the JVA, the figures FORWARD presented for produced water presented were low. FORWARD explained that the figures do not include water in Shueib, the side wadis, and Karameh. FORWARD suggested working with JVA to reach agreement on estimated quantities of water.

The sum of the total billed water and wadis' water rights will be considered as the amount of billable water. Yet, the issue remains who will pay for this water. H.E. Mr. Quteishat, suggested differentiating between supplied, but not billed, and unaccounted, which includes spills and physical and administrative losses. He added that the issue concerning water from the wadis' water rights requires a policy decision about whether farmers or the nation should pay.

FORWARD asked the JVA to provide quantities of the water in different wadis and systems, including Wadi Arab, Taybeh, Abu Ziad, Ziglab, Jurum, Kufrenjeh, Yabes, and Rajeb. It was agreed that this should be done where water is controlled and measured by the JVA system and not charged to farmers.

Cost and Revenue Centers

FORWARD has developed cost and revenue centers within the JVA system. The cost centers are broken down into:

- primary system
- King Abdullah Canal
- secondary system
- pumping stations

This breakdown will enable JVA to identify costs at discrete levels and to distinguish between bulk water and retail water costs. Also, it will allow costs to be aggregated at the directorate level and for JVA overall.

The revenue centers of water sales are designed at the stage office level. Revenues are based on tariffs for six usage blocks and two seasonal variations. Different water qualities in the valley could eventually be assigned different tariffs. Four water quality zones were designed in the model:

- Quality 1 - fresh water in KAC and other sources;
- Quality 2 - mixed water of KAC and King Talal Reservoir (KTR);
- Quality 3 - KTR water supplied to some stage offices; and
- Quality 4 - mixed KAC and Karamah water

Cost Allocation Procedure

The costs incorporated in the model were those for the Operation and Maintenance, Southern Ghor, and Dams Directorates. The percentages of water/irrigation-related activities were estimated for those directorates and included in the model. The model did not include costs for non-water activities, general and administrative costs of JVA headquarters in Amman, research and planning, the Drainage Directorate, and the Laboratory Directorate. Assumptions, carefully agreed to with JVA, were used to allocate the costs at the four centers.

A key issue in using the model effectively is a clear understanding of the assumptions, which form much of its basis. However, once real costs are identified at the discrete cost centers, JVA can use the figures. Assumptions were employed in the interim to make good use of the model as a tool for financial planning of the utility activities.

Current Operation and Maintenance Costs and Revenues

In the discussion of O&M costs, concerns were raised about the total water billed to the farmers (discussed in the water balance section) and the percent allocation of O&M costs. FORWARD explained how the model calculates the costs based on JVA data and agreed assumptions. JVA questioned some of their own figures. For example, the quantities of water billed provided by the Southern Ghor Directorate are less than some historic records. The JVA also requested that water from the side wadis' water rights be added to the AFW quantities, thus reducing the costs. With respect to the cost items, JVA thought that supplies and spare parts costs should also be looked at.

H.E. Dr. Mahasneh, suggested that these figures should be jointly checked, agreed upon, and verified by the JVA TWG and FORWARD in order to proceed with the model. He added that the study is based on JVA records and that the main purpose of the meeting was to reach agreement on the framework and approach. The JVA TWG and FORWARD agreed to look into the O&M figures after cost allocation. In the meeting they will also check the water quantities billed and the addition of the side wadi water rights.

Cost to Deir Alla

Discussions centered on the cost and pricing of water delivered to the Amman diversion at Deir Alla. There are a number of ways to examine this issue, including cost allocation and policy decisions. FORWARD suggested a methodology that combined the cost of supplying certain water sources to Deir Alla with some adjustments for additional operational costs and some foregone revenue opportunity costs to the JVA. Even with these upward adjustments, some JVA staff thought the price should be higher, and they offered alternative approaches, which were not accepted since they were seen to be double counting and did not reflect a wholesale tariff. JVA also mentioned other opportunity costs that should be considered such as their not being able to use the north canal to its full extent. FORWARD stated that in consultation with JVA TWG and the Minister, water supply allocations to WAJ are from the North Conveyor and Wadi Arab. WAJ is allocated 15 MCM per year from Wadi Arab Dam and the rest of its supply comes from the North Conveyor.

A lengthy debate ensued about the figures, and it was decided that this topic required further discussion outside the meeting in Aqaba. Participants agreed that the model's bottom line figure of .035 JD (35 fils) per cubic meter should be reviewed after the complete submission of expenses and payments by JVA.

Planning Scenarios and Possible Performance Measures

A discussion centered on desirable performance measures, including the operation and financial efficiencies. The main issues of concern were the number of staff per 1000 subscribers and personnel costs to operating cost ratio. Other issues were related to unaccounted for water and system efficiency. Discussions also focused on revenue collection efficiency (collection of bills) and the need for JVA to improve it. Dr. Mahasneh stated that some performance measures are imposed on JVA as a governmental institution under the Civil Service Law and by other laws and that improving performance related to staffing requires changes in the law.

Remaining Modeling Activities, Capital Costs, and Status of Other Efforts

FORWARD listed all the remaining tasks for the completion of JVA cost/tariff model, including:

- incorporating capital costs at different levels of the system;
- completing the forecast of water supplies and demands;
- forecasting expenses and revenues;
- preparing the training manual; and
- conducting JVA staff training.

Also, there was a brief presentation about the other JVA activities within the FORWARD program including:

- Assessment of the Impact of Water Quality Variations in the Jordan Valley
- The Direct and Indirect Benefits of Irrigated Agriculture in the Jordan Rift Valley.

Financial Accounting System

FORWARD presented the proposal for the Financial Accounting System (FAS) for the Jordan Valley Authority. The presentation highlighted the three phases of the system's design: data development; transition; and implementation. Also, the presentation depicted the benefits of FAS and how it could help in improving financial management at cost centers level.

H.E., Dr. Mahasneh, stated that the present JVA information system could not produce the required information and that the FAS was needed. He said FORWARD should proceed promptly with the development of a new financial accounting system.

Closing Remarks

H.E. Dr. Dureid Mahasneh thanked FORWARD for their efforts and stressed reaching more agreements on figures, expanding the model design to include capital costs, and brainstorming to see the best approach to maintain the model in JVA in the future. He added that through dialogue and discussion, we could move into a new era of efficient and cost effective planning. FORWARD expressed appreciation for the active participation of the JVA in the meeting and pledged to work with them on remaining data and policy issues and to conduct the final planning/policy scenarios workshop once the model development and testing is completed in the coming months.

ANNEXES

Annex A
List of Participants

H.E Dr. Dureid Mahasneh	Secretary General JVA
H.E Koussai Quteishat	Secretary General MWI
Dia Al Madani	FORWARD Coordinator of JVA
Mohammed Habashneh	Assistant Secretary General for Operations and Maintenance
Bilal Bashir	Assistant Secretary General for Environment & Technology Transfer
Avedis Serpekian	Assistant Secretary General for Rift Valley Development
Tayseer Massalha	Director of Central Operations & Maintenance
Mohanad Qudah	Assistant Secretary General for Irrigation Projects
Mohammed Maher Iskandar	Secretary General Advisor
Suhail Wahsheh	Advisor to the Secretary General
Shaker Bakheet	Financial Director
Mohammed Saymeh	Director of Information Department
Bill Hoadly	USAID
Raed Daoud	FORWARD
Tony Bagwell	FORWARD
Ahmed Azzam	FORWARD
Samir Dweiri	FORWARD
Narmine Muna	FORWARD
Runa Sindaha	FORWARD

Annex B
Overhead Presentation

Annex C

Scope of Work for Financial Accounting System