

## Simplified Ex-Post Evaluation for Grant Aid Project

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Project Name	The Project for the Improvement of Solid Waste Management in the Greater Amman (Phase II)	February 2010 – December 2010

### I Project Outline

Country Name	Hashemite Kingdom of Jordan	
Project Period	December 2004-November 2005	
Executing Agency	Municipality of Greater Amman	
Project Cost	Grant Limit: 743 million yen	Actual Grant Amount: 627 million yen
Main Contractors	(Procurement) Marubeni Corporation	
Main Consultants	Yachiyo Engineering Co., Ltd.	
Basic Design	“The Project of Supplying Equipment for New Landfill Site of Madona-Ghabawi in the Hashemite Kingdom of Jordan”, Yachiyo Engineering Co., Ltd., October 2004	
Related Projects (if any)	JICA, “The Project for the Improvement of Solid Waste Management in the Greater Amman” (1993-1995) JICA, “Project for Improvement of Solid Waste Management in Major Local Areas” (1995-1997)	
Project Background	<p>It was forecast that in the Municipality of Greater Amman (MOGA), the capital of Jordan, and Zarqa, adjacent to the city, as well as other municipalities around them, the growing population would emit a greater amount of solid waste. To deal with the increase in the amount of garbage, MOGA built a new final landfill site with a capacity to accommodate solid waste from the city until 2025 in Madona - Ghabawi, a region 30 kilometers east of the capital. But MOGA had problems with a series of solid waste management operations – collection in the city, transfer, and final disposal;; it was feared that the decrepit equipment would cause a sharp decline of collection capacity and work efficiency; in the low income areas, where roads were narrow, a lack of suitable equipment kept the collection rates low; and insufficient equipment at the landfill site had hampered the use of appropriate landfill methods. In order to solve such problems, the Implementation of a Global Solid Waste Management Scheme (Master Plan) was drawn up in 2002 with the aim of constructing and operating a final disposal (landfill) site and transfer stations to improve solid waste collection in the city. With a backdrop described above, for the purpose of achieving efficient implementation of solid waste management, Japan was requested to provide assistance for 1) procurement of waste collection vehicles, 2) procurement of equipment for final landfill site, 3) procurement of transfer station vehicles, and 4) procurement of vehicles for operation and maintenance.</p>	
Project Objective	The objective of the project is to enhance the skills in appropriate solid waste management (collection, transportation, and disposal) by providing the solid waste management equipment for the target area (MOGA).	
Output[s] (Japanese Side)	<p>Equipment Procurement</p> <p>Waste collection vehicles (29 units); transfer station vehicles (14 units); equipment for final landfill site (14 units, such as bulldozers); and vehicles for operation and maintenance (12 units, such as dumper trucks).</p>	<p>Technical Assistance Component</p> <p>Technical guidance on the landfill method, and technical guidance on operation of collection/transportation vehicles</p>

### II Result of the Evaluation

Summary of the evaluation
<p>In this project, MOGA has been supplied with waste collection and transfer vehicles, equipment for the final landfill site, and vehicles for operation and maintenance. In terms of technical assistance components, technical guidance on the landfill method and technical guidance on operation of collection/ transportation vehicles have been provided. As a result, the amounts of solid waste collected, transported and disposed have all increased. The waste collection rate in MOGA, including the low income areas, has improved. In addition, a better landfill method has been introduced to the final disposal site; work safety at the site has been enhanced; and the measures have been taken to extend its lifetime.</p> <p>Better landfill methods and more efficient collection and transportation work have resulted in the improvements in hygiene conditions at the final disposal site, and now there are fewer heaps of garbage found in the city, which has removed the anxiety of public hygiene problems.</p> <p>In terms of operation and maintenance of the site, needed manpower has been secured and regular inspections are conducted without any specific problems.</p> <p>In light of the above, this project is evaluated to be highly satisfactory.</p>

1 Relevance
<p>(1) Relevance with the Development Policy of Jordan After attending the Earth Summit in 1992, the country set out “Jordan Agenda 21,” offering several suggestions about general waste. Among them, the promotion of environmentally sound solid waste disposal and improvements in the waste collection rate were declared. In addition, the National Agenda (2006-2015) includes, as one of the development challenges, “improvement of infrastructure equipment,” and solid waste disposal is mentioned there as a topics for efforts in the environment sector.</p> <p>(2) Relevance with the Development Needs of Jordan The Implementation of a Global Solid Waste Management Scheme, formulated by MOGA in 2002, is regarded as a master plan for this project. To deal with the increasing amount of solid waste generated by its growing population, MOGA has been working to raise its waste collection rate, including the Palestinian refugee camps.</p> <p>(3) Relevance with Japan’s ODA Policy In Japan’s basic policy on ODA for Jordan, “improvement of basic life,” “industrial promotion” and “environment protection” were regarded as the priority areas for assistance. Aid provided in this project for solid waste management was closely related to the improvements in living conditions and environment protection; thus was consistent with the priority areas of improvement of basic life and environment protection.</p> <p>This project has been highly relevant with the country’s development plan, development needs, as well as Japan’s ODA policy; therefore its relevance is high.</p>
2 Efficiency
<p>(1) Project Outputs Outputs on the side of Japan were generally as planned, with some minor alternations.</p> <p>(2) Project Period The project was completed in 12 months and was shorter than the planned period of 12.5 months. (96% of the planned period)</p> <p>(3) Project Cost The project cost was 627 million yen and was lower than the planned cost of 743 million yen (84% of the planned cost).</p> <p>Both project period and project cost were within the plan; therefore efficiency of the project is high.</p>
3 Effectiveness / Impact
<p>(1) Quantitative Effects The annual amount of solid waste collected and transported increased from 447,000 tons to 728,000 tons (approx. 162% increase) from 2003 to 2009, and so did the amount of solid waste disposed of from 548,000 tons to 880,000 tons (approx. 160% increase) during the same period. Between these six years, the waste collection rate rose from 92% to 95% in the entire area of MOGA, and from 60% to 90% in its low income areas. The capacity of transfer stations increased from 900 tons per day to 1,800 tons per day (annual capacity of 658,000 tons in 2009 translated into daily capacity). With the provision of technical assistance components (technical guidance on the landfill method, and technical guidance on equipment operation), the pushing-up cell type landfill method and ways to design collection, transportation and transfer routes were learnt and a manual for the pushing-up cell type landfill method and collection transportation plans were produced. As a result of the improvement of the pushing-up cell type landfill method, the capacity of the No.1 Cell increased from 2 million tons to 4.5 million tons, which has led to the longer life of the final disposal site.</p> <p>(2) Impacts This project has introduced a better landfill method to the final disposal site, in which work safety has been enhanced. MOGA says the project was also effective in improving hygiene conditions of the final disposal site, upgrading the soil-covering and transportation work at the site, enhancing waste collection patrolling, securing a means of commuting transportation for its staff, and delivering a quicker response to vehicle or heavy machine troubles.</p> <p>An introduction of a more efficient landfill method has reduced the wasted time, allowing more time to be spent on essential work. Improved waste collection work in the city has succeeded in reducing the number of garbage heaps which were the sources of pests and bad smells, and has removed the anxiety of public hygiene problems.</p> <p>The environment monitoring commissioned by MOGA and conducted by a private-sector institution has concluded that this project has brought no specific negative impacts on the environment. In order to build new transfer stations, land acquisition was conducted. But in the areas where the residents objected to the construction, the government had consultations with them, and cancelled the construction. For the stations constructed, no resettlement was observed.</p> <p>This project has largely achieved its objectives; therefore its effectiveness is high.</p>
4 Sustainability
<p>(1) Structural Aspects of Operation Maintenance MOGA’s Waste Disposal Division and Transfer Station Division have been staffed in response to an increased number of vehicles and machines after their procurement. In order to deal with the added equipment, some staff were trained and relocated as needed. No specific problems have been observed in the staff allocation. In the Waste Disposal Division, the Maintenance Unit has been set up.</p> <p>(2) Technical Aspects of Operation Maintenance Vehicles and heavy machines undergo regular inspections of every two weeks and oil exchanges every three weeks, and the inspection records are retained. The records are used by the employees to improve their work, which is a fact demonstrating that they are highly motivated to acquire better skills.</p> <p>(3) Financial Aspects of Operation Maintenance Incomes from the solid waste disposal services increased from 6.3 million Jordan dinars (JD) in 2003 to 16.1 million JD in 2009. Some subsidies come from the municipal budget: 7.8 million JD in 2003 and 9.3 million JD in 2009. The ratio of subsidies coming from the municipal budget to income from solid waste disposal services has been falling since 2003; therefore it can be said that there are no specific concerns.</p> <p>(4) Current Status of Operation Maintenance</p>

Operation and maintenance of the equipment including the existing ones is appropriately carried out. As the equipment procured in this project is used in an effective manner, there are no specific problems.

No major problems have been observed in the operation and maintenance system; therefore sustainability of the project effects is high.