

**EX-POST EVALUATION REPORT OF  
JAPANESE ODA LOAN PROJECTS 2009  
(SWAZILAND, TUNISIA)**

**NOVEMBER 2010**

**JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)**

**SANSHU ENGINEERING CONSULTANT**

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## Preface

Ex-post evaluation of ODA projects has been in place since 1975 and since then the coverage of evaluation has expanded. Japan's ODA charter revised in 2003 shows Japan's commitment to ODA evaluation, clearly stating under the section "Enhancement of Evaluation" that in order to measure, analyze and objectively evaluate the outcome of ODA, third-party evaluations conducted by experts will be enhanced.

This volume shows the results of the ex-post evaluation of ODA Loan projects that were mainly completed in fiscal year 2007. The ex-post evaluation was entrusted to external evaluators to ensure objective analysis of the projects' effects and to draw lessons and recommendations to be utilized in similar projects.

The lessons and recommendations drawn from these evaluations will be shared with JICA's stakeholders in order to improve the quality of ODA projects.

Lastly, deep appreciation is given to those who have cooperated and supported the creation of this volume of evaluations.

November 2010

Atsuro KURODA

Vice President

Japan International Cooperation Agency (JICA)

## Disclaimer

This volume of evaluations shows the result of objective ex-post evaluations made by external evaluators. The views and recommendations herein do not necessarily reflect the official views and opinions of JICA.

Minor amendments may be made when the volume is posted on JICA's website.

JICA's comments may be added at the end of each report when the views held by the operations departments do not match those of the external evaluator. No part of this report may be copied or reprinted without the consent of JICA.

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Kingdom of Swaziland

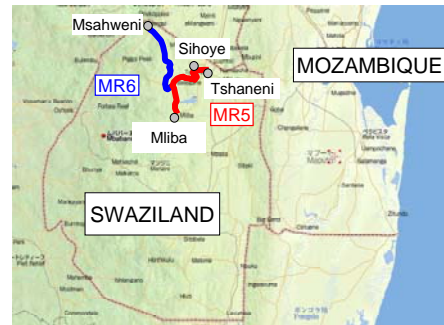
Ex-Post Evaluation of Japanese ODA Loan Project  
“Northern Main Road Construction Project”

Yasuhiro Kawabata, Sanshu Engineering Consultant

**1. Project Description**



Location of Project Site  
(Southern African Region)



Location of Project Site  
(Swaziland)

**1.1 Background**

The total length of Swaziland’s national road at the time of appraisal (2001) was 2,882 km, which consisted of 1,399 km of Main Road (MR) and 1,483km of District Road (DR). Main road’s pavement ratio was 27%, while gravel and earth roads were 59% and 14%, respectively. Although Swaziland’s arterial route, which traverses from the border with South Africa to Mozambique via the capital city (Mbabane), industrial center Manzini, and the central region of the country, had been paved, pavement of roads in the country’s rural area, such as northern and southern parts of the country, was still undergoing. In addition, efficient road network was considered essential from the perspective of collaboration and partnership under the Southern Africa’s regional alliance called Southern African Development Community (SADC), as well as to promote a well-balanced regional development in a medium to long-term basis.

For a small country like Swaziland, the development of its economy, improvement of its domestic employment, and alleviation of poverty were limited through domestic demand expansion. It needs to improve its access with neighboring countries and enhance trade. Improvement of undeveloped arterial roads in the Swaziland’s northern area was particularly needed in order to improve access with the Maputo Corridor (a road connecting Pretoria, the capital of South Africa with Maputo, the capital of Mozambique), which is the most important corridor in the neighboring regions. A high priority was given to the road development, especially with the purpose of transporting sugar and citrus in the northern area and wood pulp

in the southwestern area.

## 1.2 Project Outline

The objective of this project is to promote trade mainly of agricultural products with peripheral countries by paving roads and replacing bridges for MR5 (Mliba – Tshaneni) and MR6 (Madlangampisi – Mshaweni) among arterial roads in the Swaziland’s northern region, thereby contributing to the economic development in Swaziland’s northern districts.

The location of the project site is shown in Figure 1.

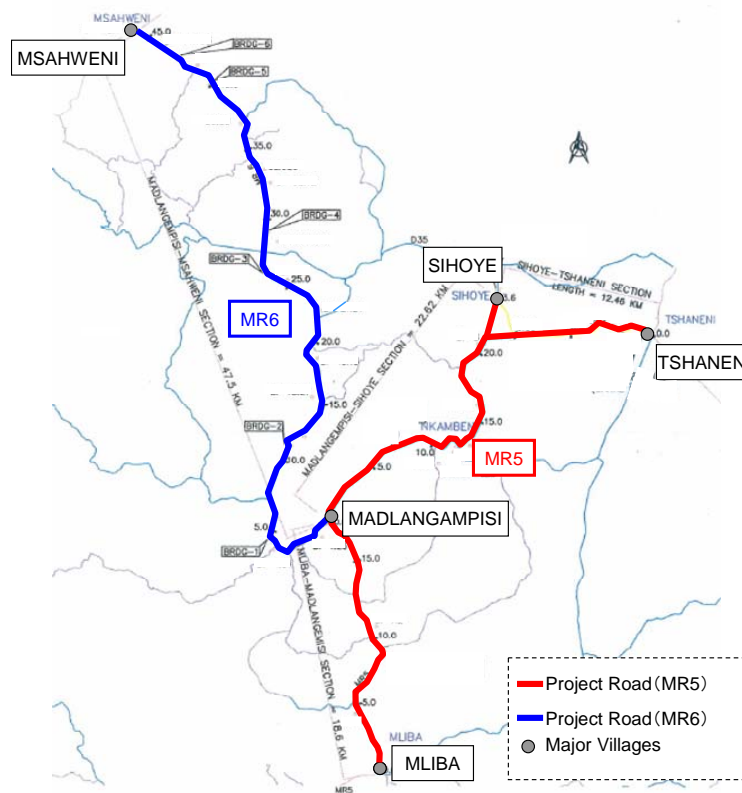


Figure 1 Location of Project Site

Approved Amount / Disbursed Amount	4,412 million yen / 4,412 million yen
Exchange of Notes Date / Loan Agreement Signing Date	January 2001 / January 2001
Terms and Conditions	Interest Rate: 2.2%; Repayment Period: 30 years (Grace Period: 10 years) ; Conditions for Procurement: General Untied Consultant: Interest Rate: 0.75%; Repayment Period: 40 years (Grace Period: 10 years) ; Conditions for Procurement: Bilateral tied
Borrower / Executing Agency	The Government of the Kingdom of Swaziland / Road Department, Ministry of Public Works and Transport
Final Disbursement Date	May, 2007
Main Contractor (Over 1 billion yen)	Grinaker-LTA (South Africa) • CCIC (Lebanon)
Main Consultant (Over 100 million yen)	Nippon Koei (Japan) • ED Simelane & Associate (Swaziland) • STCS (Swaziland)
Feasibility Study, etc.	F/S by Ministry of Public Works and Transport (MOPWT) F/S for MR5 (Mliba - Tshaneni) (55km) was done in April 1996, F/S for MR6 (Madlangampisi - Msahweni) (48km) was done in February 1997

## 2. Outline of the Evaluation Study

### 2.1 External Evaluator

Yasuhiro Kawabata, Sanshu Engineering Consultant

### 2.2 Duration of Evaluation Study

The subject ex-post evaluation assignment was implemented as follows:

Duration of the Study: January 2010 to November 2010

Duration of the Field Study: February 28th to March 8th, 2010 and May 23rd to 29th, 2010

## 3. Results of the Evaluation (Overall Rating: B)

### 3.1 Relevance (Rating: a)

#### 3.1.1 Relevance with the Development Plan

Swaziland's National Development Plan (1999/00-2001/02) emphasizes: 1) improvement of arterial roads, and 2) upgrading of irrigation facilities for agricultural development, with improvement of access with the Maputo Corridor as its urgent and top priority. In addition, the Road Sector Development Program formulated in October 1998 aimed at: 1) paving all roads with traffic volume of more than 200 vehicles per day by 2010, and 2) reducing transport costs

and promoting trade with neighboring countries by constructing an arterial road network with sufficient highway capacity in order to link major cities and towns with high population and core economic activities.

The current Swaziland National Development Plan (1999/00-2001/02) is still valid, and upgrading of arterial roads remains its priority. MOPWT's current basic principle is to provide, maintain, and improve a safe, reliable and environmentally sustainable road network that will stimulate socio-economic development, create jobs, and reduce road user costs.

Development of an arterial road network was/is one of the National Development Plan's top priority both at the time of appraisal and post evaluation, and this project is consistent with MOPWT's development plan for the project area.

### 3.1.2 Relevance with the Development Needs

At the time of appraisal (2001), roads were mostly unpaved in the country's northern districts, where major exporting products (i.e., sugar and citrus) were produced. This created obstacles in trade promotion and economic development. Development/upgrading of arterial roads were also a major issue in enhancing accessibility with the Maputo Corridor. The project contributed in promoting distribution of goods within the country and to neighboring countries and industrial development, as well as in the establishment of efficient transport network in the Southern Africa under the Maputo corridor comprehensive development initiatives. The project provided benefits to neighboring countries as well, hence it was highly needed. The project with the objective to enhance the road network in the northern Swaziland area was in accordance with Swaziland's development needs.

The objective of the project is to enhance the road network and accessibility to the Maputo Corridor by improving arterial roads (MR5 and MR6) in the northern districts. Thus, the project is in accordance with the current development needs at the time of post evaluation.

### 3.1.3 Relevance with Japan's ODA Policy

The Overseas Economic Cooperation Implementation Policy (December, 1999) emphasizes that assistance to development of fundamental infrastructure would contribute to poverty alleviation and adjustment of disparity, as a foundation for attaining stability of Africa. Thus, the project was consistent with the Japan's ODA policies at the appraisal.

This project has been highly relevant with the Swaziland's development plan and needs, as well as Japan's ODA policies, therefore its relevance is high.

### 3.2 Efficiency (Rating: c)

#### 3.2.1 Project Outputs

The project outputs (original and actual) are summarized in Table 1.

Table 1 Comparison of project outputs (original/actual)

Item	Planned	Actual
①MR5: Mliba - Tshaneni	<ul style="list-style-type: none"> <li>• Total length: 55km</li> <li>• Asphalt pavement (thickness 50mm, two-lane highway with a 3.65m carriageway and a shoulder (2m+0.85m)</li> <li>• drainage ditch (excluding rocky areas)</li> </ul>	almost as planned <ul style="list-style-type: none"> <li>• Total length: 54km</li> <li>• Asphalt pavement (thickness 40mm, two-lane highway with a 3.65m carriageway and a shoulder (2m+0.85m)</li> <li>• drainage ditch (excluding rocky areas)</li> </ul>
②MR6: Madlangampisi - Msahweni	<ul style="list-style-type: none"> <li>• Total length: 48km</li> <li>• Asphalt pavement (thickness 50mm, two-lane highway with a 3.65m carriageway and a shoulder (2m+0.85m)</li> <li>• drainage ditch (excluding rocky areas)</li> <li>• 6 bridges (totaling about 250m)</li> </ul>	almost as planned <ul style="list-style-type: none"> <li>• Total length: 48km</li> <li>• Asphalt pavement (thickness 40mm, two-lane highway with a 3.65m carriageway and a shoulder (2m+0.85m)</li> <li>• drainage ditch (excluding rocky areas)</li> <li>• 4 bridges (totaling about 200m) 2 bridges were changed to box culverts (about 50m)</li> </ul>

Source: JICA Appraisal documents and Responses to the questionnaire

The major changes in the project output (construction work) were: 1) at the time of appraisal, the planned thickness of the pavement in the F/S was 50mm (SADC standard), however at the detailed design phase, after the design was re-examined, the thickness was changed to 40mm (standard pavement thickness for Swaziland arterial roads), 2) for MR6, the bridge structure was switched to culverts (2 locations) because the bedrock for bridge support was not found.

Six items were included in the consulting services: 1) to assist in procurement activities (review of detailed designs, preparation for tender documents, and bid evaluation); 2) to assist in project management (construction supervision); 3) to assist in coordination between MOPWT and JICA, and submit reports; 4) to assist the executing agency in capacity building (institutional strengthening); 5) to advise on bidding documents focusing on environmental aspects; and 6) to monitor the environmental impacts and provide advice on countermeasures during construction and installation work. All these items, except for item 4), were implemented almost as planned. The assistance of the executing agency in capacity building comprised: 1) assessment of practices for the Road Department; and 2) provision of recommendations and undertakings of training on six items regarding capacity building. Except for implementation of the training program, the capacity building subcomponent was completed as planned and the achievement made is summarized in a completion report/manual of March 2004. Staff were initially interested in the training programs (six items), but attendance to the training programs gradually decreased due to overloaded routine works, and most of the programs were not completed. Twenty persons were originally enrolled in the spreadsheet preparation course, but

by the second week the attendance became zero. One staff member was enrolled at the start of the road management system course; however the student had to drop out to attend a university. Without any substitute participants, the course had to be terminated.

The original plan for consulting services input were 102M/M by foreign experts and 150M/M by local experts for construction supervision, and 48M/M by foreign experts for other technical assistance. However, the actual input were 114M/M by foreign experts and 180M/M by local experts for construction supervision, and 48M/M by a foreign expert for other technical assistance.



MR5/MR6 branching point (Madlangampisi)  
Before the project



MR5/MR6 branching point (Madlangampisi)  
After the project

### 3.2.2 Project Inputs

#### 3.2.2.1 Project Period

The project period was significantly longer than planned. The planned project period was from January 2001 (Loan Agreement signing) to April 2005 (civil work completion) with a total period of 52 months. The actual project period was from January 2001 (Loan Agreement signing) to October 2007 (civil work completion) with a total period of 82 months, or equivalent to 158% of the planned period.

The main reasons for the delay were: 1) selection of a consultant took longer than expected; 2) preparation of civil works bidding documents (including detailed designs) was delayed by 14 months because the MOPWT staff was unfamiliar with preparation of international competitive bidding documents, 3) selection of contractors was greatly delayed from 12 months to 24 months mainly because the bidding price for construction works substantially exceeded its planned price. As a result, JICA held its concurrence to the bid evaluation results until Swaziland government confirmed that



MR5 Mliba Area  
Starting point of the project



it would locally fund the cost overrun portion. Though the land acquisition (resettlement compensation) in some sections (additional construction work of 3 access roads along MR6) required some time for negotiation, it did not affect the construction work overall schedule.

### 3.2.2.2 Project Cost

The total project cost estimated at appraisal was 5,882 million yen (of which the Japanese ODA loan amount was 4,412 million yen and the rest was to be locally funded). The actual total project cost was 10,660 million yen (of which the Japanese ODA loan amount was 4,412 million yen and the rest was locally funded), which was significantly higher than planned, or equivalent to 181% of the planned project cost. The main reasons for cost increase were:

- 1) exchange rate rose by 9% toward yen appreciation;
- 2) price escalation of material, machine, labor costs, and fuel price. The contract stipulated that contract price would be increased by multiplying the price escalation of commodity to the price as of March 2003 (baseline). The price escalation rate from September 2004 to May 2007 was 6.24% - 22.7% with a high average rate of approximately 20%;
- 3) the project description in the appraisal documents is a simple improvement and pavement work of the existing roads. However, almost new roads (including additional land acquisition) had to be constructed, resulting in substantial increase in construction volume. In addition, the earth volume in the mountainous area had increased due to inaccuracy of the topographic maps used in the Feasibility Study (1997-1998). These maps, with a scale of 1/5,000, were prepared based on aerial photos taken in 1976 and the detailed designs conducted during January - November 2002 were also based on these same topographic maps. The design speed applied for both roads to be improved was 100 km/hour and the planned route was off the existing route, particularly in the mountainous area. The less-accurate topographic maps could be a major factor for changes in construction work volume; and
- 4) as a part of compensation for land acquisition and resettlement, three additional access roads (with a total length of approximately 2km) were constructed along MR6 for local residents and public facilities.



MR6 Access road (additional work)



MR6 Route changed section

Both project period and project cost significantly exceeded the plan, therefore efficiency of the project is low.

### 3.3 Effectiveness (Rating: a)

#### 3.3.1 Quantitative Impacts

##### 3.3.1.1 Results from Operation and Effect Indicators

##### (1) Average Daily Traffic

Table 2 shows the project section's average daily traffic.

Table 2 Average Daily Traffic

(Unit: vehicle/day)

Year Road	2000 Base year	2002	2004	2009 (2 yrs after completion)
MR5	763	888		2,057 (1,300)
MR6	459		582	1,366

Source: Documents provided by Ministry of Public Works and Transport (MOPWT)

Note 1: A counting station for MR5 is near Sihoye, and that for MR6 is almost the halfway point of the subject project road section

Note 2: Traffic counting was not implemented during the construction work period(2004 – 2007)

Note 3: Figures in ( ) are the estimated traffic volumes taken from F/S (August, 1998) Table 3.3.4-2

The subject roads, MR5 and MR6, are both arterial roads located in the north of the country connecting with the Maputo Corridor. Increase of traffic volume on both roads is an indicator to measure status of trade promotion with SADC (Southern African Development Community). Compared to the traffic volume in the base year (2000), the average daily traffic of the MR5 and MR6 after project completion in 2009 has increased by approximately 2.7 and 3 times, respectively. The growth rate of registered vehicle during the same period (2000-2009) was 6 percent per annum and registered vehicles increased by 1.7 times during the same period. The number of registered vehicles as of 2009 was approximately 153,000 (including 4,700 motorcycles). Based on the above figures, the effectiveness is considered high. The main reason for increase of traffic volume could be that the travel time was substantially shortened (approximately by half) since the existing earth road was paved.

##### (2) Travel Time

Table 3 shows the changes in project section's travel time.

Table 3 Travel Time

(Unit: minutes)

	2000 Base year	2009 (2 yrs after completion)
MR5	73	33
MR6	64	29

Note 1: MR5: Average running speed (passenger vehicle) between Mliba and Tshaneni (55km) before the project was assumed at 45 km/hour, while after the project assumed at 100 km/hour.

Note 2: MR6: Same assumption used for MR5 used for the section between Madlangampisi and Msahweni (48km).

Upon completion of the project, the travel time on both roads (traveling the entire stretch) was reduced by about half.

(3) Traffic Accidents (number of cases)

Table 4 shows changes of traffic accidents in the project road sections.

Table 4 Traffic Accidents

(Unit: number of accidents)

Year	Route	Fatal	Serious	Minor	Damage	Total
2001	MR5	5	22	14	31	71
	MR6	1	8	9	19	16
	Total	6	30	23	50	87
2002	MR5	6	14	10	41	71
	MR6	2	12	9	31	54
	Total	8	26	19	72	125
2003	MR5	4	11	13	31	59
	MR6	3	6	5	14	28
	Total	7	17	18	45	87
2004	MR5	1	12	8	34	57
	MR6	2	5	8	11	26
	Total	3	17	16	45	83
2005	MR5	3	24	22	26	75
	MR6	0	8	5	9	22
	Total	3	32	27	35	97
2006	MR5	9	17	19	45	90
	MR6	1	2	11	10	23
	Total	10	19	30	55	113
2007	MR5	6	16	10	46	78
	MR6	5	11	6	23	45
	Total	11	27	16	69	123
2008	MR5	6	16	26	34	82
	MR6	3	8	10	37	58
	Total	9	24	36	71	140
2009	MR5	7	17	31	61	116
	MR6	4	8	14	33	59
	Total	11	25	45	94	175

Source: Commissioner of Police

The number of traffic accidents has almost doubled from before the project (2004) to 2 years after the project completion (2009). However, there is no significant change in traffic accident ratio since the traffic volume (MR6) has also doubled during the same period. The increase in fatal accidents and the total number of accidents are becoming the subject of discussion within the police authority and actions are being taken to tackle these issues. The two major factors in traffic accidents are excessive speed and drunk driving. The police authority and the road department are enhancing its patrol and installing road speed humps near the neighborhoods.

### 3.3.1.2 Results of Calculations of Internal Rates of Return (IRR)

#### Economic Internal Rate of Return (EIRR):

Economic Internal Rate of Return (EIRR) at post evaluation was calculated assuming that construction costs, maintenance costs, and reinvestment capital costs are considered “cost” and savings of vehicle operating costs, travel time savings, and reduction of maintenance costs are considered “benefit”, and that the project life is twenty years. It was estimated at 15.5%, which is slightly lower than the EIRR (16.6%) at appraisal. The traffic volume exceeded the projected estimates (in the case of MR5, the estimate was 1,300 vehicles/day in 2009 and actual was approximately 2,000 vehicles/day), while the project cost had significantly increased (181% of the planned). Thus, EIRR at post evaluation is slightly lower than at appraisal (see Table 5).

Table 5 Economic Internal Rate of Return (EIRR)

	EIRR
At appraisal	16.6%
At post evaluation	15.5%

Source: PCR

### 3.3.2 Qualitative Effects

Beneficiary surveys were conducted, through interviews, in 7 villages (4 along MR5, and 3 along MR6). The number of respondents was 166 persons and the classification of respondents by sex was 36% female and 64% male.

The major results of the beneficiary surveys are described as follows. With regards to promoting the smooth distribution of goods and enhancing transport capacity, 94% perceived that the travel time was shortened. Amongst these, 44% said the reduced travel time was 25 minutes on average, while 32% said 30 minutes or more, and only 15% said 15 minutes. In addition, some respondents appreciated the increased frequency of the mini-bus operation on the project roads because it improved the lives of the local residents upon completion of the project. Moreover, 67% stated that the project (road improvement) contributed to the improvement of accessibility to the major cities (Manzini and Piggs Peak) for marketing agricultural products.

Regarding alleviation of traffic congestion, 86% of respondents identified alleviation of traffic congestion in the market, social services, and hospital at 81%, 80% and 78%, respectively. In addition, 75% stated that the project contributed to reduction of traffic accidents.

Through improvement of the existing road from earth road to paved road, the travel time was significantly shortened. It was also noted that distribution of goods and transport capacity have improved. It was confirmed, through the beneficial survey interviews, that the public transport system along the corridor, as well as the accessibility to public services such as hospitals has improved.

This project has largely achieved its objectives, therefore its effectiveness is high.

### 3.4 Impact

#### 3.4.1 Intended Impacts on Economy

The Swaziland’s population was 1,185,000 as of 2008, while the population along the MR5 and MR6 corridor was approximately 127,000 (as of 2007), which is about 10% of the nation’s population.

In Swaziland, diversification of the manufacturing industry had been promoted since mid 1980s, however at present sugar and citrus are still the major exporting items to acquire foreign currency. The major market for sugar is South Africa. The secular change on sugar export is shown in Table 6.

Table 6 Sugar Export Amount

Year	To Southern African Development Community		All export
	ton	Share (%)	ton
2005/2006	316,455	49.7	636,667
2006/2007	318,202	49.9	638,037
2007/2008	307,232	49.0	626,739
2008/2009	319,716	51.7	618,290
2009/2010	325,000	51.7	628,577

Source: Swaziland Sugar Association Website Documents

Since 2007, the gross product has been slightly decreasing, with less exporting amount to South Africa as well. However, from 2008 and especially in 2009 the exporting amount has been increasing with the share of more than 50% to South Africa. The export amount of citrus is shown in Table 7.

Table 7 Citrus Export Amount

Year	Export Amount (ton)
2005	23,900
2006	21,300
2007	33,700
2008	30,000
2009	39,500

Source: Swaziland Citrus Administrative Board

The export amount is greatly influenced by the market price/socio-economic conditions of importing countries. However, the export amount after the project completion has been increasing. According to the Director of the Administrative Board, before the project, products were transported to both Mozambique's Maputo port and South Africa's Durban port for export. However, after the project completion, products were transported to the northern Maputo port via MR5 because of substantial reduction in travel time. He concluded that the project has positively contributed to the country's economy. Major destinations for export are Europe, Russia, and Middle East countries.

The above results indicate that the improved roads (MR5 and MR6) have contributed to enhancement of goods distribution and transport capacity, as well as to the country's economic development (especially in the northern area). In addition, 55% of the beneficiary survey respondents acknowledged that the project contributed to the stimulation of regional economic activities and 70% reflected that the project contributed to the enhancement of business opportunities. Among the respondents who live along the project's corridor, 54% (89 persons) indicated that upon completion of the project their household income has increased. Among these, 27% (24 persons) and 24% (21 persons) stated that their income increased by 50% and 10%, respectively.

#### 3.4.2 Other Impacts

##### (1) Impacts on the surrounding environment

There are settlements scattered along the MR5 and MR6 corridor caused by the low traffic volume and low traffic noise during day time. However, since the existing houses are simple frame houses, some people expressed that traffic noise during nighttime has been causing problems. The speed humps constructed on roads around schools and settlement zones have forced the driving speed to slow down. Since the shoulder of the road is surfaced, it has been effectively used as a commuting road to school by children.

##### (2) Land acquisition and Resettlement

The number of affected people due to the subject project was 861. Since the land of the project site is basically state-owned, only compensation for resettlement was paid. Nine

households with 30 persons were originally planned to be resettled, however, 25 households with 150 persons were actually resettled. For each resettled resident, alternate land was provided within the same settlement, and enough compensation was paid to build a new house. The total cost for land acquisition and resettlement was 30 million emalangenzi (477 million Japanese yen). In addition, for the regions where access from settlements was deteriorated by construction of the road project, access roads were newly constructed (3 locations along MR6 with a total length of approximately 2km) as a part of the resettlement compensation.

### **3.5 Sustainability (Rating: a)**

#### **3.5.1 Structural Aspects of Operation and Maintenance**

At the time of the ex-post evaluation, the Road Department of the Ministry of Public Works and Transport (MOPWT) was in charge of planning, design, construction, and operation and maintenance of roads as it was at appraisal. The Road Department is staffed with engineers and management staff at its Mbabane Headquarters. It allocated staff to regional offices and road depots to be in charge of maintenance and repair throughout the country. Among the business undertaken by the Road Department is maintenance, which it carried out directly. Routine maintenance of arterial and district roads is conducted by workers under the Road Department, while periodic maintenance is often entrusted to private firms.



MR5 Road Depot near Sihoye



MR6 Settlement near Madlangampisi

The routine maintenance work of project roads (garbage collection, drainage cleanup, patrol, etc.) is implemented by section on a daily basis. The routine maintenance work for MR5 is undertaken by Tshaneni depot of the Maintenance Division under a manager with 1 supervisor, 2 machine operators, and 8 workers. The MR6, Ndzngeni depot of Maintenance Division under a manager, has 1 supervisor, 2 machine operators, and 8 workers. Periodic maintenance (repair of drainage, guardrails, fences, etc.) is entrusted to a private contractor, who is selected through bidding. Taking into account the current traffic volume (about 2,000 and 1,400 vehicles/day on

MR 5 and MR6, respectively), the current organizational setup and staff assignment are considered appropriate.

### 3.5.2 Technical Aspects of Operation and Maintenance

A depot manager must be a vocational school graduate technician; however other staff members and workers are not required to have any qualification. No manuals were prepared for routine maintenance work. In order to enhance the capacity of the staff, training on relevant subject needs to be taken, and manuals on the road maintenance work need to be prepared. Both depots are equipped with 1 grader, 1 bulldozer, and 2-3 trucks, which are considered insufficient in terms of type and number of equipment. Further improvement on maintenance equipment is necessary.

### 3.5.3 Financial Aspects of Operation and Maintenance

The annual budget expenditure of MOPWT and the Road Department for the past 3 years is shown in Table 8.

Table 8 Financial status

(Unit: million emalangeni)

	2007	2008	2009
Ministry of Public Works and Transport (MOPWT)	296	312	348
Road Department (DR)	169	183	215
Share of DR to MOPWT (%)	57	59	62
Road Department's operation and maintenance budget	92	97	118
Share of operation and maintenance within Department (%)	54	53	55

Source: Responses to the questionnaire

Note 1: Fiscal year from April 1 to March 31

Note 2: FY2009 is estimated.

The share of operation and maintenance budget against the total Department budget is more than 50 percent, which is significantly higher compared to that of other countries. The reason is that Swaziland has almost completed its upgrading/improvement work of arterial roads (32 routes with a total length 1,400 km). As a result there is no major new construction/improvement work that has been implemented. Currently, the widening and upgrading of MR1 is planned. Should this work be implemented, a reduction in the budget for operation and maintenance work could be made.

Construction work for MR5 and MR6 was completed in October 2007. There was no operation and maintenance budget allocated in 2008 for both roads. Instead, a budget of 300,000 emalangeni (about 3.5 million Japanese yen) was allocated in 2009 for periodic maintenance, and additional works of culverts and drainage ditches were implemented as an erosion control



work. In 2010, three years after the project completion, a budget of 741,600 emalangeni (about 8.7 million Japanese yen) was allocated for regular operation and maintenance. The budget will be used for weeding on the shoulder, cleanup of drainage, and repair of traffic signs. However, the maintenance budget is considered insufficient, therefore further allocation is required.

#### 3.5.4 Current Status of Operation and Maintenance

Swaziland's total road length as of 2006 is 3,102km, of which 1,141km (36%) has been paved, and the rest is unpaved. As of 2003, surface of paved road sections was maintained to meet national standards. However, the road sections, not complying with the national standards, have been increasing yearly; 80km in 2005, 117km in 2006, and 145km in 2007. At the time of field inspection, it was observed that the subject project roads of 98km (MR5 and MR6) seemed to be well maintained without any cracks or potholes.

Even though it is noted that the budget for maintenance is not necessarily sufficient, the road surface of both roads is well maintained. No major problems have been observed in the operation and maintenance system, therefore sustainability of the project is considered high.

## 4. Conclusion, Lessons Learned and Recommendations

### 4.1 Conclusion

This project has been highly relevant to Swaziland's development plan and needs, as well as Japan's ODA policies, and therefore its relevance is high. Both project period and cost have significantly exceeded the plan, therefore efficiency of the project is low. This project has largely achieved its objectives, therefore its effectiveness is high. In addition, no major problems have been observed in the operation and maintenance system, therefore sustainability of the project is considered high.

In light of the above, this project is evaluated to be satisfactory (B).

### 4.2 Recommendation

#### 4.2.1 Recommendations to the Executing Agency

The rating on project's efficiency is rated "c", since the project cost was 181% and the project period was 158% against the plan, respectively. The substantial increase in the project cost was due to the actual construction volume which was much higher than estimated. It is considered that the inaccuracy of the topographic maps, which were the basis for the detailed designs, was the contributing factor. For future similar projects, before starting the detail designs, the center line of the proposed alignment should have been marked on the ground, and detailed supplemental topographic surveys should have been carried out along the alignment,

particularly in the sections where construction volume would greatly affect the project cost and implementation.

#### 4.2.2 Capacity Building

The capacity building (institutional strengthening) of the executing agency was one of the project components, and the training program by foreign experts was included in the project. However, majority of the programs were not implemented due to the burden on the staff to perform daily work. Proposals for implementing the training program more effectively should be reviewed in detail at the project preparation stage. It is recommended that for future similar projects, staff should undertake short/mid-term training programs being offered in South Africa and the budget for training be included in the project cost.

### Comparison of the Original and Actual Scope of the Project

Item	Original	Actual
1. Project Outputs		
1) MR5: Mliba - Tshaneni	<ul style="list-style-type: none"> <li>• Total length 55km</li> <li>• Asphalt pavement (thickness 50mm, two lanes each way 3.65m, shoulder (2m + 0.85m))</li> <li>• Culvert (exclude rock area)</li> </ul>	<p>Mostly as planned</p> <ul style="list-style-type: none"> <li>• Total length 54km</li> <li>• Asphalt pavement (thickness 40mm, two lanes each way 3.65m, shoulder (2m + 0.85m))</li> <li>• Culvert (exclude rock area)</li> </ul>
2) MR6: Madlangampisi - Msahweni	<ul style="list-style-type: none"> <li>• Total length 48km</li> <li>• Asphalt pavement (thickness 50mm, two lanes each way 3.65m, shoulder (2m + 0.85m))</li> <li>• Culvert (exclude rock area)</li> <li>• Bridge 6 (total approximately 250m)</li> </ul>	<p>Mostly as planned</p> <ul style="list-style-type: none"> <li>• Total length 48km</li> <li>• Asphalt pavement (thickness 40mm, two lanes each way 3.65m, shoulder (2m + 0.85m))</li> <li>• Culvert (exclude rock area)</li> <li>• Bridge 4 (total approximately 200m), 2 were changed to box culvert (approximately 50m)</li> </ul>
2. Project Period	January 2001- April 2005 (52 months)	January 2001– October 2007(82 months)
3. Project Cost		
Amount paid in Foreign currency	3,621 million yen	4,697 million yen
Amount paid in Local currency	2,261 million yen (132 million emalangeni)	5,963 million yen (374 million emalangeni)
Total	5,882 million yen	10,660 million yen
Japanese ODA loan portion	4,412 million yen	4,412 million yen
Exchange rate	1 emalangeni = 17.09 yen (As of January 2000)	1 emalangeni = 15.74 yen (civil work) 1 emalangeni = 19.32 yen (consulting service) 1 emalangeni = 15.99 yen (other) (fixed rate determined in the contract with contractors)

**EX-POST EVALUATION OF JAPANESE ODA LOAN PROJECT: NORTHERN  
MAIN ROAD CONSTRUCTION PROJECT – SECOND OPINION**

**Bruce Roy T. Vilane  
Faculty of Agriculture  
University of Swaziland**

The road construction project's objective embodies Swaziland's National Development Plan (NDP). Its ex-post evaluation by JICA enshrines the project's economic sustainability in line with NDP. The project met its objectives in terms of relevance (in line with NDP) and effectiveness in terms of speed, travel time and traffic volumes. The methodology and data utilised comprised Average Daily Traffic (ADT), Travel Time (TT), and the Internal Rate of Return (IRR) featuring the economic internal rate of return (EIRR). The qualitative procedures used comprised the beneficiary surveys using personal interviews. Though the sampling frames and size were not stated for the beneficiary surveys, the methods used for evaluation are standard and valid for such projects. The conclusion, lessons learned and recommendations made were thus informed and reached using valid methodology.

The project was driven by objectives in line with the NDP. It will contribute significantly to the local economy in terms of travel time and speed which will expedite ease of timeously reaching produce markets and inputs within Swaziland and beyond (through the N4; South Africa and Mozambique).

Republic of Tunisia

Ex-post evaluation of JICA ODA loan project  
“Integrated Reforestation Project”

Akemi Serizawa, Sanshu Engineering Consultant

**1. Project Description**



Project areas



Forests rehabilitated by the Project (Béja)  
(Cork oaks and pinyon pines)

**1.1 Background**

The forests in Tunisia have always been at risk of deforestation due to the dry climate and the pressure from human activities. Increased pressure such as excessive logging during the period of colonization in the 20th century accelerated deforestation: the national forest area decreased from 1.25 million hectares in the beginning of the 20th century to 368,000 hectares in the mid-1950s. While the forest area had recovered to 831,000 hectares by 1995 through reforestation, further efforts have been urged in order to prevent soil erosion and conserve natural environment.

People in the forest zones are authorized to access to the forests and collect resources such as fire woods and plants for self-consumption. Excessive exploitation of forest resources is one of the causes of deforestation. In the 1990s, the forestry sector of the Republic of Tunisia introduced a strategy to promote sustainable forest management through socio-economic development of the forest zones. The strategy aims at diversification of the livelihood of the community in the forest zones and then to reduce the pressure on the natural resources from human activities. The integrated approach, which combines both technical components (such as plantation) and socio-economic development components, has always been employed in the forestry projects in Tunisia since the Forestry Development Project financed by the World Bank

(20 million dollars in 1987 for the first phase and 69 million dollars in 1993 for the second phase). The integrated approach has been continuously improved from the experiences of the similar forestry projects, including the JICA project.

The Directorate General of Forestry (Direction Générale des Forêts: DGF) of the Ministry of Agriculture and Hydraulic Resources and the Forestry Departments (Arrondissement de Forêt) of the Regional Commissaries for Agriculture Development (Commissariat Régional au Développement Agricole: CRDA) are responsible for forest management. Unlike participatory forest management in some other countries, communities of the forest zones do not participate in forest management in Tunisia.

## 1.2 Project Outline

The objective of this project is to prevent soil erosion, increase forest area and improve economic and social living conditions at the target areas by reforestation and socio-economic development activities, thereby contributing to improvement of natural environment. The target areas were Oued Barbara (Governorate of Jendouba), Sidi El Barrak-Nefza, (Governorate of Béja), Oum Jédour (Governorate of Kasserine) and Southern region of Governorate of Le Kef. The target areas are indicated in Figure 1 below.

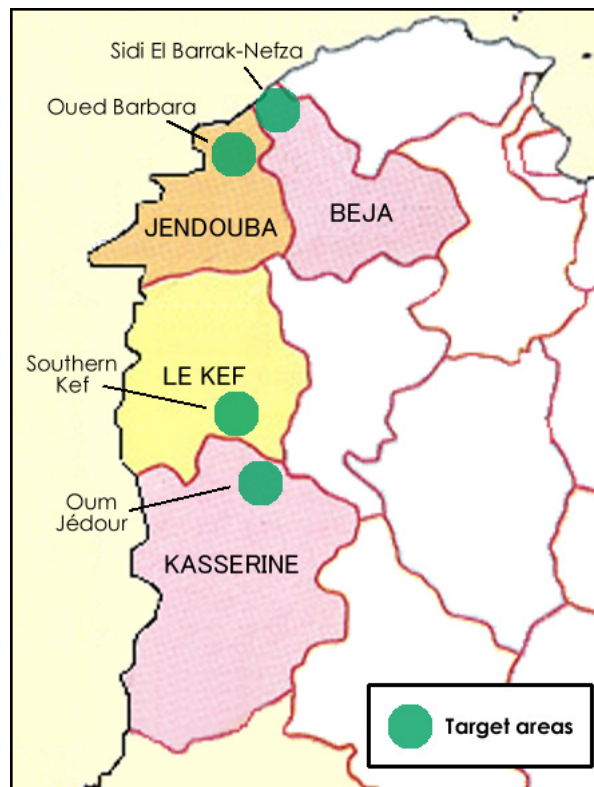


Figure 1 Project target areas

Approved Amount / Disbursed Amount	4,080 million yen / 3,999 million yen
Exchange of Notes Date / Loan Agreement Signing Date	4 February 2000 / 23 March 2000
Terms and Conditions	Interest Rate: 0.75 % p.a. Repayment Period: 40 years (Grace Period 10 years) Conditions for Procurement: Bilateral-tied
Borrower/Executing Agencies	Government of the Republic of Tunisia / Directorate General of Forestry, Ministry of Agriculture and Hydraulic Resources
Final Disbursement Date	13 July 2007
Main Contractor (Over 1 billion yen)	PCI (Japan) / EXA (Tunisia) / JAFTA (Japan)
Main Consultant (Over 100 million yen)	None
Feasibility studies, etc.	F/S by Directorate General of Forestry, Ministry of Agriculture and Hydraulic Resources, 1998
Related projects	JICA Expert (coordination with ODA loan) JICA Integrated Reforestation Project II (TS-P33) World Bank Forestry Development Project (I)(II) World Bank Climate Change Project AFD: Forestry project

## 2. Outline of the Evaluation Study

### 2.1 External Evaluator

Akemi Serizawa, Sanshu Engineering Consultant

### 2.2 Duration of Evaluation Study

Duration of the Study period: January 2010 – November 2010

Duration of the Field study: April 11– April 30, May30 – June 16, 2010

Beneficiary survey (Governorates of Béja and Le Kef): May 2010

### 2.3 Constraints during the Evaluation Study

In consultation with the DGF, the Governorates of Béja and Le Kef were selected for the beneficiary survey and site visits. Among the four target governorates, Béja and Jendouba are Mediterranean climatic regions where cork oaks and pinyon pines are among the typical vegetation. Le Kef and Kasserine are semi-arid climatic regions where Aleppo pines are found. The DGF suggested one from each group to represent different climate and vegetation. Accessibility and time constraints were also taken into account. Therefore, the results of the field study might not represent the situation of all target areas.

### **3. Results of the Evaluation (Overall Rating: A)**

#### **3.1 Relevance (Rating: a)**

##### 3.1.1 Relevance with the Development Plan of Tunisia

The objectives of the First Forestry Strategy of Tunisia (1990-2000) were prevention of deforestation, increase of forest area and socio-economic development of the forest zones. It targeted national forest cover<sup>1</sup> to achieve 15% by 2000 through the National Plan of reforestation, anti-desertification and soil conservation (Plan national de reboisement, de lutte contre la désertification et de protection de sol) (appraisal documents).

The objectives of the Second Forestry Strategy (2001-2011) are increase of forest area, protection of biodiversity and socio-economic development of the forest zones. It aims at increasing national forest cover to 13.5% by 2011 and 16% by 2020 (DGF).

At the times of both appraisal and ex-post evaluation, the objectives of the Project were in line with these national policies of Tunisia that aimed at increase of forest area and socio-economic development of the forest zones.

##### 3.1.2 Relevance with Development Needs of Tunisia

At the time of appraisal of the Project (2000), the forest area of Tunisia was 959,000 hectares and the forest cover was 9.2% (FAO Forest Area Statistics). The forest cover was below the target (15% by 2000) that was set by the National Plan explained above, and therefore further reforestation was required. JICA project responded to these needs, and it also employed the integrated approach that combined the technical and socio-economic development components to improve living conditions in the forest zones in order to decrease the pressure from human activities on the natural resources.

By the time of the ex-post evaluation, the forest cover had increased to 13.04% (2009, DGF) thanks to the contribution of this Project and other programs supported by the World Bank and the French Development Agency (Agence Française de Développement) Yet, continued efforts are required to achieve the target (16% by 2020) set by the Second Forestry Strategy.

At the times of both appraisal and ex-post evaluation, the objectives and approach of the Project were in line with the development needs of the country.

##### 3.1.3 Relevance with Japan's ODA Policy

At the time of appraisal, the Basic Strategy of Japan's ODA Loan (1999-2002) prioritized rural development in its development assistance for Tunisia in order to reduce the regional

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<sup>1</sup> Denominator to calculate forest cover: the DGF seems to use 10,387 thousand hectares (land area excluding desert in the southern Tunisia) as the denominator (appraisal document), while FAO uses 15,536 thousand hectares (total land area excluding inland water).



disparity

The forest zones in the north-western region of Tunisia were selected as the target areas of the Project. Local industries are small and people earn income as small-scale farmers, seasonal workers and migrant workers in large cities. Forest resources are important means of livelihood. This Project aimed at improvement of living conditions through the integrated approach and therefore at reduction of the regional disparity and was in line with the Strategy.

This Project has been highly relevant with the country's development policies, development needs, as well as Japan's ODA policy, therefore its relevance is high.

### **3.2 Efficiency (Rating: b)**

#### **3.2.1 Project Outputs**

The Project Outputs are composed of eight components (A-H) explained below. In view of the project objectives, Component B (forest management), Component C (rehabilitation of ecosystems) and Component D (soil and water conservation) as well as sub-component E2 (creation of Agriculture Development Groups (Groupement de Développement Agricole: GDA)) are the key components. These key components, except for some sub-components of Component B and sub-component D3 (construction of a hill dam), achieved the original targets and also the revised ones agreed in the mid-term evaluation that was conducted in July 2004 by JBIC Paris office as a part of project management. Therefore, the level of the achievement of the Project Outputs is high on the whole.

In the mid-term evaluation, the targets of many project components were revised upward and some activities were newly added, benefitting from the increase of the project budget by 7 million Tunisian dinars due to continuing rise of the value of yen and economization of the project cost by the tender process. The modification was also a response to the needs of the target communities that were identified in the Community Development Plans (Plan de Développement Communautaire: PDC), some of which were added as new sub-components of socio-economic development of the Project.

Some activities were cancelled or did not achieve the target due to the reasons mentioned below.

#### Component A: Infrastructure

All sub-components except for A2 (rehabilitation of forest roads) exceeded or almost achieved (80% or more) the original and/or revised targets. The reason of the underachievement of A2 was that some tenders failed as it was difficult to attract large competent companies to the remote areas and their bids were often beyond the target price. Local companies were not a

choice as their technical competence was not at a sufficient level.

Table 1 Output of Component A: Infrastructure

Sub-components	Target		Achievement (July 2007)	Degree of attainment	
	Original (March 2000)	Revised (July 2004)		compared to the original plan	compared to the revised plan
A1. Construction of forest roads	90km	116km	106km	118%	91%
A2. Rehabilitation of forest roads	200km	225km	155.5km	78%	69%
A3. Construction of firebreaks	140km	110km	91km	65%	83%
A4. Rehabilitation of firebreaks	210km	424km	1,111.5km	520%	262%
A5. Construction of foresters' offices	4	5	6	150%	120%
A6. Rehabilitation of foresters' offices	9	12	15	167%	125%
A7. Construction of observation towers	9	9	8	89%	89%
A8. Rehabilitation of observation towers	3	9	10	333%	111%
A9. Construction of water tanks	27	27	24	89%	89%
A10. Rehabilitation of compartments	51,000ha	51,000ha	51,929ha	102%	102%

Source: Project Completion Report (PCR)

#### Component B: Forest management (thinning)

Sub-components B1 (pine), B3 (acacia), B4 (regeneration of pine forests) and B6 (improvement of forest health) exceeded the original and revised targets. B2 (cork oaks) and B5 (regeneration of cork oak forests) did not reach the target, as the technicians were reluctant to cutting down cork oaks from their growing awareness of environmental conservation. B7 (plantation of eucalyptus) and B8 (study of forest management) were newly added in the mid-term evaluation, but the achievements were far below the target due to failure of some tenders from the same reasons as A2 explained above.

Table 2 Output of Component B: Forest management (thinning)

Sub-components	Target		Achievement (July 2007)	Degree of attainment	
	Original (March 2000)	Revised (July 2004)		compared to the original plan	compared to the revised plan
B1.Pine	6,400ha	6,842ha	9,002.5ha	141%	132%
B2. Cork oak	3,520ha	3,600ha	1,911ha	54%	53%
B3. Acacia	1,650ha	1,650ha	2,031ha	123%	123%
B4.Regeneration of pine forests	3,700ha	4,200ha	6,963ha	188%	166%
B5. Regeneration of cork oak forests					
B5.1 Natural regeneration	450ha	200ha	78.5ha	17%	39%
B5.2 Artificial regeneration	250ha	300ha	241ha	96%	80%
B6. Improvement of forest health	10,250ha	11,500ha	14,209.5ha	139%	124%
7. Eucalyptus	(not included)	200ha	58ha	N/A	29%
B8. Study on forest management	(not included)	35,000ha	8,550ha	N/A	24%

Source: PCR

Component C: Rehabilitation of ecosystems (plantation)

All sub-components achieved the original and revised targets.

Table 3 Output of Component C: Rehabilitation of ecosystems (plantation)

Sub-components	Target		Achievement (July 2007)	Degree of attainment	
	Original (March 2000)	Revised (July 2004)		compared to the original plan	compared to the revised plan
C1. Plantation in the forest	1,300ha	1,800ha	3,359ha	258%	187%
C2. Plantation in riverbank	550ha	700ha	807ha	147%	115%
C3. Plantation around dams	1,450ha	1,450ha	1,749ha	121%	121%
C4. Plantation in pasture	630ha	1,180ha	2,165ha	344%	183%
C5. Seed orchard	5	5	5	100%	100%
C61. Modernization of nursery	1	4	5	500%	125%
C62. Glasshouse	(not included)	2	2	N/A	100%
C7. Natural reserves	2	2	2	100%	100%

Source: PCR

#### Component D: Water and soil conservation

All sub-components except for D3 (construction of a hill dam) exceeded the original targets and also almost achieved the revised ones. The hill dam was to be constructed in Oum Jédour in the Governorate of Kasserine, but the land did not meet the hydro geologic requirements. As no alternative land was identified, sub-component D3 was cancelled in the mid-term evaluation.

Table 4 Output of Component D: Water and soil conservation

Sub-components	Target		Achievement (July 2007)	Degree of attainment	
	Original (March 2000)	Revised (July 2004)		compared to the original plan	compared to the revised plan
D1. Construction of water and soil conservation facilities	5,150ha	5,750ha	5,566ha	108%	97%
D2. Plantation of semi-forests	655ha	895ha	740ha	113%	83%
D3. Construction of a hill dam	1	Cancelled	0	0%	N/A

Source: PCR

#### Component E: Socio-economic development

Sob-component E2 (establishment of GDAs), which is the most important in this category as a basis for all other sub-components, achieved the target. Other sub-components showed the mixed level of attainment as shown in Table 5 below.

Table 5 Output of Component E: Socio-economic development

Sub-components	Target		Achievement (July 2007)	Degree of attainment	
	Original (March 2000)	Revised (July 2004)		compared to the original plan	compared to the revised plan
E1. Organization of community: recruitment of animators	25 animators	25 animators	21 animators	84%	84%
E2. Establishment of Agriculture development groups (GDAs)	13	13	13	100%	100%
E3. Water points	32	40	14	44%	35%
E4. Fence of family gardens	1,240ha	1,740ha	2,965ha	239%	170%
E5. Plantation of fruit trees	1,560ha	1,560ha	1,566ha	100%	100%
E6. Improvement of pasture	1,450ha	1,450ha	1,150ha	79%	79%
E7. Promotion of income generation activities					
E7-1. Construction of training centers	4	13	7	175%	54%
E7-2. Procurement of equipment and materials	4	14	3	75%	21%
E8. Establishment of forest workers units	25	22	7	28%	32%
E9. Construction of nurseries of fruit trees	11	7	2	18%	29%
E10. Saving of energy (improved stoves)	1	4	4	250%	250%
E11. Breeding					
Equipment of beekeeping	(not included)	1,700	3,735	N/A	220%
Equipment of poultry farming	(not included)	1,000	0	N/A	0%
Equipment for rabbit breeding	(not included)	750	0	N/A	0%
E12. Construction and maintenance of forest roads	(not included)	200km	30.2km	N/A	15%
E13. Purchase of fishery equipment	(not included)	60	30	N/A	50%

Source: PCR

The reasons of under-achievement are explained in Table 6.

Table 6 Reasons for under-achievement of some socio-economic components

Sub-components	Reasons for not attaining the target
E3 Construction of water points	Some candidate sites did not meet the technical requirements.
E7-1 Construction of community centers E7-2 Provision of equipment	Some tenders failed. When the construction of the centers was delayed, procurement of equipment was also delayed. Construction of the center in Kasserine was cancelled as there was already one.
E8 Establishment of forest workers groups	The original plan was to contract out some planting and construction work to GDAs for income generation of the community. However, direct contracts with GDAs became virtually impossible after the rule of public tender was revised in 2004.
E9 Creation of nurseries	The community was reluctant as potential market was not clearly identified.
E11 Poultry farming and rabbit breeding	These activities were cancelled due to fear of avian influenza. Beekeeping was taken up instead of these.
E12. Construction and maintenance of forest roads	The activity in the Governorate of Béja was added in the mid-term evaluation, but the tender failed.

Source: PCR

Component F: Promotion of forestry sector (research) and G: Institutional development (procurement of materials)

Component F achieved the target on the whole, while the number of workshops and seminars (F3) was slightly below the target. The themes of the four strategic researches (F1) were “the Study of participative and integrated development of forests in Jendouba” (“Etude d’aménagement intégré et participatif des forêts de Jendouba”), “the reforestation guide in Tunisia” (“Le guide de Reboisement en Tunisie”), “the strategic study for sustainable development of cork oak forests in Tunisia” (“Etude stratégique pour le Développement Durable de la Subéraie tunisienne”), and “the guide of development and implementation of community development plans in the forest zones” (“Un guide d’élaboration et de mise en oeuvre des PDC dans les zones forestières”). The manuals developed through F1 and F2 include “Practical guide of development and implementation of community development plans in the forest zones” (“Guide pratique d’élaboration et de mise en oeuvre des PDC dans les zones forestières”), “Practical guide of forestry work” (“Guide pratique des travaux sylvicoles”) and “the reforestation guide in Tunisia” (“Le guide de Reboisement en Tunisie”).

Component G achieved the target.

Table 7 Output of Components F and G

Sub-components	Target		Achievement (July 2007)	Degree of attainment	
	Original (March 2000)	Revised (July 2004)		compared to the original plan	compared to the revised plan
F. Promotion of forestry sector (research)					
F1. Strategic research (regional and national)	4 studies	4 studies	4 studies	100%	100%
F2. Research	9 studies	9 studies	9 studies	100%	100%
F3. Workshops and seminars	10 (twice a year)	10 (twice a year)	7	70%	70%
G. Institutional development (procurement of materials)					
G1. Materials	1 set	1 set	1 set	100%	100%

Source: PCR

#### Component H: Consulting services

Technical support (H1) was provided to assist project management and development and implementation of forest management plans, and it was conducted almost as the plan.

There was no detailed plan for the training (H2) at the time of appraisal. Ten training sessions were conducted in Tunisia, each of which lasted from two to ten days and had about 30 participants, and ten training sessions were conducted in other countries including France and Canada, each of which had from one to eight participants.

Table 8 Output of Component H: consulting services

Sub-components	Target		Achievement (July 2007)	Degree of attainment	
	Original (March 2000)	Revised (July 2004)		compared to the original plan	compared to the revised plan
H1. Technical support	200HM	200HM	172.6HM	86%	86%
H2. Training	-	-	20 sessions	N/A	N/A

Source: PCR



Forest road constructed by the Project  
(Béja)



Observation tower rehabilitated by the  
Project (Béja)

### 3.2.2 Project Inputs

#### 3.2.2.1 Project Period

The actual project period was slightly longer than planned.

The Memorandum dated 26 October 2001 between JBIC and the DGF defined project completion as follows:

When the afforestation components and the (other<sup>2</sup>) components complete according to the definitions as follows:

(1) Afforestation components: when each subtotal area of afforestation by forest category that has passed the National Standard inspection reaches the respective figures as follows: (they correspond to the original targets of the components C1, C2, C3 and C4)

(i) Planting in Forest = C1	1,300ha
(ii) Planting in Riverbank = C2	550ha
(iii) Planting around the Dam = C3	1,450ha
(iv) Planting in Pasture = C4	630ha
Total	3,930ha

(2) Components other than afforestation: completion of commissioning of all the facilities for the Project.

(Source: Memorandum of the Integrated Reforestation Project)

The original project period was 70 months from March 2000 (L/A signing date) to December 2005 (project completion defined as above). In the mid-term evaluation in July 2004, the Project was extended one year to December 2006 (82 months in total) Most components were continued until March 2007 utilizing the fund disbursed in December 2006, except for the employment of animators (sub-component E1) that was continued until June 2007 just before the final disbursement date (13 July 2007).

Although it is not clear what the above definition of completion of “components other than afforestation” meant, it would be reasonable to interpret that it meant when the hard infrastructure was transferred to the parties responsible for operation and maintenance. According to this interpretation, the project was completed in March 2007 when all components other than E1 (employment of animators) were completed. Therefore, actual project period was from March 2000 to March 2007 (85 months), which was 121% of the original plan and 104% of the revised plan.

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<sup>2</sup> This word “other” is not in the original sentence.



Some activities experienced delay, the reasons for which were as follows:

Preparation period	It took time for the executing agency to establish the project management structure, to familiarize themselves with the JICA loan administrative procedures and to recruit consultants.
Components A-D (technical components)	Some tenders failed and others took time to finalize because it was difficult to attract appropriate contractors to work in the remote areas. The targets of some components were too optimistic compared with the situation on the ground and the capacity of contractors. Some activities were delayed due to problems of financial arrangement and supervision of the contractors.
Component E (socio-economic development components)	Discussions with the target communities took time
Component F (research)	Contracts with the external research institutes were concluded later than planned.

### 3.2.2.2 Project Cost

The actual project cost was lower than planned.

In Japanese yen, the project cost estimate at the appraisal was 5,440 million yen (including 4,080 million yen to be financed by yen-loan). The actual cost was 5,047 million yen (including 3,999 million yen financed by yen-loan), which was 93% the plan. In Tunisian dinars, the project cost estimate at the appraisal was 51,953 thousand dinars (DT1=JPY104.71). The actual cost was 44,969 thousand dinars (DT1=JPY88.6), which was 6,984 thousand dinars less than the plan and its 86%.

In the mid-term evaluation in July 2004, some activities were added and some targets were upwardly revised to spend the increased project budget (seven million dinars) as explained in the section of Output above. Yet, the actual project cost in dinars was smaller than the plan because of the continued increase of value of Japanese yen and because some sub-components did not achieve the target.

Although the project period was slightly longer than planned, the project cost was lower than planned, therefore efficiency of the project is fair.

## 3.3 Effectiveness (Rating: a)

### 3.3.1 Quantitative Effects

#### 3.3.1.1. Results from Operation and Effect Indicators

(1) Contribution to the national plan of reforestation, anti-desertification and soil conservation

The target of the National Plan of reforestation, anti-desertification and soil conservation and the contribution of this Project are shown in Table 9 below. Data to indicate the achievement by the original project completion date (December 2005) was not available. Achievement of the

Project by December 2007 and its contribution to the National Plan exceeded the target. According to the DGF, the contribution of the Project is important considering the fact that the Project was implemented only in the four governorates.

Table 9 Contribution of the Project to the national plan of reforestation, anti-desertification and soil-conservation

	Target of the national plan by 2000	Original target of this Project (by Dec .2005)		Achievement of this Project (July 2007)	
		Quantity	Share	Quantity	Share
1) Soil conservation	3,000,000 ha	5,805 ha	0.19%	6,306 ha	0.21%
D1. Soil conservation work		5,105 ha		5,566 ha	
D2. Plantation of semi-forests (sylvo-pastoral)		655 ha		740 ha	
2) Forest cover (15% by 2000)	Additional 635,000 ha	3,300 ha	0.52%	5,915 ha	0.93%
C1. Plantation		1,300 ha		3,359 ha	
C2. Plantation on Wadi banks		550 ha		807 ha	
C3. Plantation around dams		1,450 ha		1,749 ha	

Source: Appraisal document; PCR

#### (2) Prevention of soil erosion

There was no data available to indicate the direct effect of this Project on prevention of soil erosion. According to the DGF, however, the Directorate General of Planning and Agricultural Land Conservation of the Ministry of Agriculture estimates that one hectare of land loses 10.36 cubicle meters soil per year in Tunisia. As this Project implemented soil conservation work on 5,566 hectares (sub-component D1), it is estimated that the Project would have prevented 57,000 cubicle meters soil erosion per year.

#### (3) Forest area

The national forest area increased from 959,000 hectares in 2000 to 1,200,000 hectares in 2007 as shown in Table 10 below. The contribution of this Project (5,915 ha as in Table 9) is 2.5% of the increase (241,000 ha), which is not small considering the fact that the Project was implemented only in the four governorates.

#### (4) Forest cover

The national forest cover in 2009 was 13.04% (DGF) and it almost achieved the target of the Second Forestry Strategy (13.5% by 2011). The contribution of the Project to the increase of the forest cover is not negligible as explained in the section above.

Table 10 Forest area and forest cover in Tunisia

Year	Forest area	Forest cover	
		Achievement	Target
1900	1,250,000ha (*1)		
1956	368,000ha (*1)	3.5%	
1990	643,000ha (*2)	6.2%	
1995	831,000ha (*1)	8.0%	
2000	959,000ha (*2)	9.2%	15% (*3)
2005	1,056,000ha (*2)	10.1%	
2007	1,200,000ha (*1)	11.6%	
2009	1,304,000ha (*1)	13.04% (*1)	
2011	-	-	13.5% (*4)
2020	-	-	16% (*4)

Source: (\*1) DGF, (\*2) FAO Forest area statistics, (\*3) First forest strategy 1990-2000, (\*4) Second forest strategy 2002-11

### 3.3.1.2 Results of Calculations of Internal Rates of Return (IRR)

To calculate the economic IRR of the Project, the Cost was defined as the project cost and the Benefit was defined as the estimated additional value of the forest products increased by the Project. The project life is 74 years. The re-calculated EIRR is 14.9% and larger than that at the time of appraisal (8.3%). This is because the outputs of 11 out of 14 sub-components used for the EIRR calculation exceeded the original target and the estimated additional value from beekeeping, which was added as a new activity in the mid-term evaluation, was large. Beekeeping was excluded from the project scope at appraisal, but the estimated additional value from it had been calculated.

Due to the nature of the Project, a quantitative analysis of the financial internal rate of return was not possible.

### 3.3.2 Qualitative Effects

#### (1) Improvement of living conditions of the target communities

The Project assisted creation of 13 GDAs and developed PDCs for five-year period in a participatory manner. The PDCs included plans of small projects to respond to the needs identified by the community. Some of them were implemented within the scope of Component E (socio-economic development) of this Project and some of others have been funded by other development partners. The DGF and the forestry departments of the CRDAs needed to collaborate with other departments of their organizations, other governmental and local agencies and development partners because PDCs included activities that are not within their mandates<sup>3</sup>.

In the beneficiary survey of the ex-post evaluation study, 80 community members from seven

<sup>3</sup> For example, if a PDC included construction of a school building or skill training for income generation activities, the DGF and the CRDA have to discuss with relevant organizations to explore possibilities of support.

project sites in two governorates (Béja and Le Kef) and 22 staff of CRDAs from the same areas were interviewed. Among the community members surveyed, 62 were men and 18 were women.

As indicated in Table 11 below, all community members and most CRDA staff confirmed that the living conditions in the community had been improved thanks to the Project.

Table 11 Improvement of living conditions

	Community members		CRDA staff	
	Number	%	Number	%
Living conditions of the community have improved.	80	100.0%	20	91%
<i>Details (multiple answers allowed)</i>				
<i>Increase of income</i>	64	80.0%	17	77.3%
<i>Improvement of access by forest roads</i>	62	77.5%	19	86.4%
<i>Better jobs / diversification of sources of income</i>	29	36.3%	10	45.5%
<i>Increased participation of women in decision-making<sup>4</sup></i>	17	21.3%		
<i>Increase of availability of forest resources</i>	17	21.3%	12	54.5%
<i>Improvement of relationships between community members</i>	11	13.8%	8	36.4%

Source: Beneficiary survey

Seventy-two community members (90% of the surveyed community members) have started and still continue income generation activities. The details of their income generation activities are shown in Table 12. Beekeeping has been popular because it was relatively easy to start and the results can be obtained in the short term. Some people sold woods and other forest products, which are in fact illegal. Average increase of monthly income per person was 106 dinars (monthly income was increased from 216 dinars before the Project to 318 dinars at the time of ex-post evaluation), and average increase of household monthly income was 102 dinars.

Table 12 Income generation activities

	Number	%
Livestock breeding	31	38.8%
Beekeeping	18	22.5%
Vegetable farming	14	17.5%
Fruit growing	9	11.3%
Fishing	3	3.8%
Sales of forest resources (other than woods)	3	3.8%
Sales of woods	2	2.5%

Note. Multiple answers were allowed.

The answers include activities outside of the scope of this Project.

Source: Beneficiary survey

<sup>4</sup> A GDA has around nine board members, about two of which are women (DGF).

From the above, the Project has contributed to the improvement of the living conditions of the target communities.



Grazing (Béja)



Beehive (Le Kef)

This Project has largely achieved its objectives, therefore its effectiveness is high.

### **3.4 Impact**

#### 3.4.1 Intended Impacts

##### (1) Improvement of natural environment

##### 1-1) By the direct intervention of the Project

In addition to the increased forest areas and the estimated decrease of soil erosion described in the section of Effectiveness, 89% of the surveyed community members reported that the environmental condition had been improved. Among those, 76% reported decrease of soil erosion; 50% reported increased availability of river water; 19% reported improved condition of the forests; 11% reported increase of forest resources; and 11% reported return of wild animals, especially deer. The surveyed CRDA staff supported the responses of the community members: 96% reported decrease of soil erosion; 68% reported improved condition of the forests that had been brought about prevention of forest fire, protection from insects, reforestation and rehabilitation of forests; 46% reported return of wild animals; 41% reported increase of forest resources, and 32% reported increase of water in river and/or dams/lakes.

According to the DGF, forest fires in the whole country have decreased from 1,375 cases that damaged 159 hectares in 2000 to 98 cases that damaged 132 hectares in 2009. While there were no data available for the target areas, the DGF has an impression that forest fires in the target areas have also been decreased. Construction and rehabilitation of forest infrastructure such as observation towers and fire breaks (Component A), as well as the increased awareness of the

community on prevention of forest fires through the socio-economic development activities (Component E), might have contributed to the decrease of forest fires.

From the above, the technical components of the Project have contributed to improvement of natural conditions and decrease of forest fire to certain extent.

#### 1-2) By the decreased pressure from human activities on the forests

The Project aimed at decreasing the pressure on the forests by human activities through awareness-raising on environmental conservation as well as diversification of livelihood by the socio-economic development components.

Community members are authorized to enter into the forests and collect forest resources for self consumption. Collection of forest resources for sales purposes is illegal. According to the beneficiary survey, however, 11% of the community members reported that they still collected forest resources such as fire woods, pine cones and herbs for sales purposes and the average monthly income from it was about 58 dinars. Yet, the DGF reported that illegal logging in the target areas had been decreased from 2,298 cases in 2002 to 1,703 cases in 2007. At the same time, 12.5% of the surveyed community members reported that they collected less fire woods and 7.5% reported that they collected less forest resources other than fire woods than before. Introduction of the energy saving cooking stoves (sub-component E10), respect of the regulations and increased awareness on environmental conservation among the community members might have contributed the reduction.

From the above, the socio-economic components of the Project have reduced the pressure from human activities on the forest resources to a certain extent.

### 3.4.2 Other Impacts

#### (1) Impacts on the natural environment

Improvement of the environmental conditions was the purpose of the Project. No negative impact was observed on the natural environment as necessary measures were taken, such as conformity to the technical standards of forest road construction (forest roads should be 2km or less per 100 hectares of forests and the width should be 6m) and construction of banks and drains on road shoulders to prevent soil erosion.

#### (2) Land Acquisition and Resettlement

In the Governorates of Béja and Jendouba, there was land acquisition to plant eucalyptus and acacia around hill dams (sub-component C3). Compensation money and fruit trees were provided to the ex-owners. Construction of a hill dam (sub-component D3) was cancelled and therefore there was no land acquisition. There was no resettlement of the population by the

Project.

### (3) Unintended Positive/Negative Impact

Access to the forests by the community members was reduced to a certain extent for forest rehabilitation and prohibition of taking livestock into the forests. Some community members showed anxiety in the beginning of the Project. Through repeated discussions with the Project, community members consented to the reduced access to the forests.

The Project created public works of 1.5 million days during the project period that amounted to 8,220 thousand dinars in total (PCR). The CRDA of Le Kef created employment for about 4,000 people during the period between 2002 and 2007. To generate employment for the communities, the Project contracted out some planting and construction work to six GDAs (sub-component E8) for 278 thousand dinars. However, it did not continue because single tendering with GDAs became virtually impossible after the revision of the public tender rules in 2004.

From the above, the Project has realized the intended positive impact on natural environment. No negative impacts were observed.

## **3.5 Sustainability (Rating: a)**

### 3.5.1 Structural Aspects of Operation and Maintenance

The DGF and the CRDAs are responsible for operation and maintenance. The DGF has three principal members (head, in charge of technical matters and in charge of socio-economic matters) who have managed forest management projects including JICA's and also its Phase II. Each forestry departments of the four CRDAs is composed of the head, some engineers and some animators. Béja, Jendouba, and Le Kef are also the target governorates of JICA project Phase II and manage it by the same structure.

The forestry departments of the four CRDAs have a plan to recruit 80 forestry technicians and 15 engineers by 2016.

The animators, who were in direct contact with the target communities on the socio-economic development components, were employed on the fixed-term basis by the Project budget. Some of them were recruited again in JICA project Phase II and some were absorbed in the governmental organizations through recruitment competitions.

The GDAs established in the Project are supported by the CRDAs after the Project came to the end. Some of them have been supported by other development partners to conduct small projects included in the PDCs, the coordination of which is in principle is made by the CRDAs. The DGF and the CRDAs have been improving the mechanism of collaboration with other

organizations, taking the lessons from this Project and others.

According to the DGF, most of 13 GDAs continue functioning successfully. Having been assisted by other organizations, their management capacity has been improved through implementation of small projects in the PDCs. Operation and maintenance of community infrastructure are GDAs' responsibility.

### 3.5.2 Technical Aspects of Operation and Maintenance

According to the self-evaluation of the DGF (PCR), the four CRDAs had good technical capacity in terms of number of staff and skill levels. Also at the time of ex-post evaluation, the technical capacity of the DGF and the CRDAs are satisfactory as they continue operation and maintenance of the outcomes of the Project as well as manage similar projects. Lessons from the Project and manuals developed in the Project have been utilized by them and their technical capacity has been improved in many aspects such as how to proceed with discussions with the communities and how to conduct tender process efficiently.

### 3.5.3 Financial Aspects of Operation and Maintenance

#### (1) Budget of the forestry sector

In the national budget of the forestry sector, about 10% is set aside for operation and maintenance.

Table 13 Expenditure of the forestry sector

(thousand DT)

Year	Expenditure of the forestry sector	Expenditure of operation and maintenance
2002	49,178	4,918
2003	52,755	5,276
2004	44,550	4,455
2005	41,380	4,138
2006	43,811	4,388
2007	46,031	4,603
2008	41,110	4,110
2009	57,400	5,740

Source: DGF

Also at the CRDA level, about 10% of the budget is used for operation and maintenance.



Table 14 Expenditure on operation and maintenance of the four CRDAs

(thousand DT)

Year	Béja	Jendouba	Le Kef	Kasserine
2007	220	229	198	309
2008	220	230	195	320
2009	234	293	226	365

Source: DGF

As the DGF and the CRDAs conduct operation and maintenance of the forests and infrastructure rehabilitated or constructed by the Project without problems as discussed in the section below, the amount of the budget for operation and maintenance is appropriate.

The GDAs conduct operation and maintenance of the community infrastructure at their own expenses. Details of GDAs' financial status were not available.

#### 3.5.4 Current Status of Operation and Maintenance

During the site visits in the ex-post evaluation, it was observed that the forests and forest infrastructure (such as forest roads and observation towers) constructed or rehabilitated by the Project were in good condition, regularly maintained by the DGF and the CRDAs. The trees planted by the Project show good survival rate<sup>5</sup>.

Table 15 Survival rate of trees planted by the Project (as of September 2007)

Plantation	Béja: Pinyon pine 60% Le Kef: Aleppo pine 83% Kasserine: Aleppo pine 85%
Pastoral plantation	Béja: Acacia 65% Le Kef: Acacia 80% Kasserine: Acacia 77%
Plantation to fix the dunes	Béja: Acacia 70%
Plantation around the hill lakes	Béja: Eucalyptus and Acacia 70% Jendouba: Eucalyptus and Acacia 70%
Plantation to protect wadi banks	Jendouba: Eucalyptus and Acacia 73% Kasserine: Eucalyptus and Acacia 96%
Plantation for regeneration of forests	Le Kef: Aleppo pine 84% Kasserine: Aleppo pine 84%

Source: DGF

It was also observed during the site visits that GDA infrastructures such as community centers (sub-component E7) were in good condition, maintained by the GDAs. Items provided by the Project to the individuals such as beehives, wire nets and fruit trees were also in good condition.

<sup>5</sup> Survival rate is considered good if it is around 80% or more one year after plantation (DGF).

No major problems have been observed in the operation and maintenance system, therefore sustainability of the Project is high.



Dune stabilization by plantation of trees  
(Béja)



Aleppo pines planted by the Project (Le Kef)

## **4. Conclusion, Lessons Learned and Recommendations**

### **4.1 Conclusion**

In light of the above, this project is evaluated to be highly satisfactory. The relevance is high as they were in line with the development policies and needs of Tunisia as well as Japan's ODA policy. The efficiency is fair because the project period was longer than planned for all projects, while the project cost was lower than planned. The effectiveness is high as the projects produced the planned outcomes and impacts. The sustainability is high because there is no problem in the structural, technical and financial aspects of operation and maintenance.

### **4.2 Recommendations**

#### 4.2.1 Recommendations for the Executing Agencies

The animators were employed by the project budget on the fixed-term basis. Some of them were recruited again as animators for similar projects, and some were absorbed as permanent staff in the governmental organizations through the recruitment competitions. In order to institutionalize the know-how of integrated forestry management projects and maintain the motivation of the animators, it is recommended to regularize the position of animators by the national budget if possible.

#### 4.2.2 Recommendations for JICA

There is no recommendation for JICA.

### **4.3 Lessons learned**

The socio-economic development components included activities that were beyond the mandate of the DGF and the forestry departments of the CRDAs. Therefore, they had to coordinate with other sections of the Ministry of Agriculture and CRDAs, as well as other governmental and local authorities and development partners to seek for their cooperation. In planning and implementation of projects taking integrated approach, it is probable that some activities requested by communities could be beyond the mandate of relevant executing agencies. In such case, the system for coordinating with other organizations needs to be established to attain higher objective.

### Comparison of the original and actual scope of the Project

Items	Original	Actual
1. Outputs (only key components)		
C1. Plantation in the forests	1,300ha	Higher than planed (3,359ha)
C2. Plantation on wadi banks	550ha	Higher than planed (807ha)
C3. Plantation around dams and fixation of dunes	1,450ha	Higher than planned (1,749ha)
C4. Pastoral plantation	630ha	Higher than planned (2,165ha)
D1 Water and soil conservation work	5,150ha	Higher than planned (5,566ha)
D2. Plantation of semi-forests	655ha	Higher than planned (740ha)
E2. Forest user groups	13 groups	As planned (13 groups)
2. Project period	March 2000 – December 2005 (70 months)	March 2000 –March 2007 (85 months)
3. Project cost		
Amount paid in Foreign currency	1,498 million yen	3,999 million yen
Amount paid in Local Currency	3,942 million yen (37,647 thousand DT)	1,048 million yen (12,000 thousand DT)
Total	5,440 million yen	5,047 million yen
Japanese Yen loan portion	4,080 million yen	3,999 million yen
Exchange rate	1DT = 104.71 yen (as of June 1999)	1DT = 88.00 yen (average between 2000 and 2007)

### **Third party opinion**

*Dr Noureddine Mejdoub*

*Ambassador, President of "Tunisia - Japan Friendship Association"*

#### **Relevance**

Arriving in Tunisia, the sixth century Arab horsemen referred to the country as “Green Tunisia”. But climatic conditions, erosion and the human need for fuel and materials have, over the centuries, reduced the areas occupied by forests. By the first half of the 20th century, the damage inflicted was already substantial. The reforestation effort undertaken since independence (1956) had considerably improved the situation. Japanese-Tunisian cooperation in reforestation of the country falls within the country's national, social and environmental priorities.

#### **Impact and Efficiency**

The integrated approach advocated by the initiators of the project enabled the inclusion of aims, both for water and soil conservation, as well as for reforestation and pastoral plantation. In other words, the forestry situation was improved, soil erosion was reduced and more water flowed into rivers and holding dams. Nature and wildlife was revived and a new forestry economy grew in the four governorates. Overall, the outcome of the activities undertaken led to a clear improvement in the population's living conditions. Citizens confirmed that their activities had been diversified and that their incomes have increased.

As a whole, finally, the project costs were reasonably respected and sometimes enabled the planning of new activities, decided during the mid-term evaluation.

#### **Sustainability**

The integrated reforestation project is part of a long term undertaking to restore to Tunisia – despite climate and environmental change – a green vocation in an area designated by geographers as being a semi-arid zone.

We know that we can count for its success on the strong political will that is particularly marked for agricultural and environmental projects. It is based on a pyramidal and regional administrative organization that is able to ensure the sustainability of the project.

Republic of Tunisia

Ex-post evaluation of JICA ODA loan projects

“Inter-city Telecommunications Network Development and Expansion Project (TS-P5)”

“Telecommunications Network Development Project II (TS-P16) and III (TS-P21)”

Akemi Serizawa, Sanshu Engineering Consultant

## 1. Project Description



Project areas  
(all over the country)



Telecommunication tower  
of wireless local loops (WLL)

### 1.1 Background

In 1991, telephone subscribers were 337 thousand and telephone density<sup>1</sup> was 4.02 in Tunisia. The waiting list for main lines<sup>2</sup> was 131 thousand and it was about 40% of the number of subscribers, which indicated that the demand overwhelmed the supply. The telecommunication services were not at a sufficient level despite the fact that the telecommunication sector was regarded crucial for the country’s economic development and that the tourism sector, with which telecommunication is closely related, is one of the key sectors to promote its economy. The 8th National Development Plan (1992-96) aimed to promote the private sector, attract foreign investment and reduce regional disparities, and therefore the telecommunication sector was prioritized as basic infrastructure serving for the above purposes.

By 1996, telecommunication services had been improved (telephone subscribers: 600 thousand; telephone density: 6.59), but the waiting list for main lines was still long at 90 thousand. The 9th National Development Plan (1997-2001) prioritized basic infrastructure including telecommunication networks as an engine for industrial development, promotion of

<sup>1</sup> Telephone density: number of telephones per 100 population

<sup>2</sup> Waiting list for main lines: un-met application for connection

exports, increase of agricultural production as well as promotion of agricultural, industrial and tourism sectors. In the 9th plan, the telecommunication sector aimed to enhance the telecommunication services, improve the reliability of networks and introduce new telecommunication services.

## **1.2 Project Outline**

### Inter-city Telecommunications Network Development and Expansion Project (TS-P5):

The objective of this project is to expand telecommunication networks, improve the reliability and respond to the increasing international traffic by digitalization and double-routing of major inter-city telecommunication networks and digitalization of regional telecommunication networks and existing satellite earth stations, thereby contributing to the enhancement of the efficiency and the activation of the economy of Tunisia.

### Telecommunications Network Development Project II (TS-P16):

The objective of this project is to improve the quality and quantity of the telecommunication services by upgrading the national (6 areas) and regional (17 areas) telecommunication networks, thereby contributing to the enhancement of private investment and to the national economic development.

### Telecommunications Network Development Project III (TS-P21):

The objective of this project is to improve the quality and quantity of the telecommunication services by provision of regional telecommunication networks (21 governorates) and wireless local loops (WLLs)(19 governorates), thereby contributing to the enhancement of private investment and to the national and regional economic development.

Figure 1 below shows the telecommunication networks installed or upgraded by TS-P5, and Figure 2 shows the governorates where wireless local loops (WLL) were installed by TS-P21. The networks installed by TS-P16 and the regional networks installed by the TS-P21 stretch all over the country.



Figure 1 Telecommunication networks installed by the project TS-P5

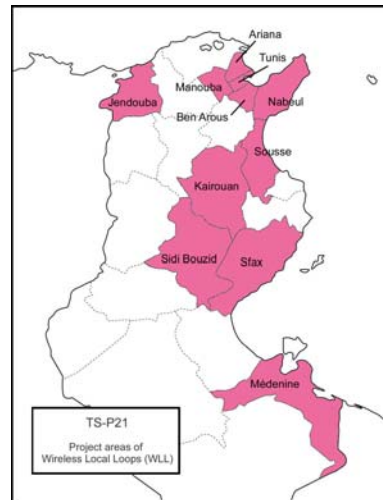


Figure 2 Governorates where WLLs were installed by the project TS-P21

#### TS-P5

Approved Amount / Disbursed Amount	8,718 million Yen / 3,941 million Yen
Exchange of Notes Date / Loan Agreement Signing Date	28 June 1993 / 7 July 1993
Terms and Conditions	Interest Rate: 3% p.a. Repayment Period: 25 years (Grace Period 7 years) Conditions for Procurement: General untied
Borrower/Executing Agencies	Government of the Republic of Tunisia / Directorate General of Telecommunication, Ministry of Communications. The directorate became Tunisia Telecom in January 1996
Final Disbursement Date	6 November 2000
Main Contractor (Over 1 billion yen)	Sotetel (Tunisia) / Mitsubishi Corporation (Japan) / SAT, later absorbed into SAGEM (Tunisia)
Main Consultant (Over 100 million yen)	None
Feasibility Studies, etc.	F/S by Japan Telecommunications Engineering and Consulting Service (JTEC), 1992
Related Projects	JICA TS-P16 and TS-P21



#### TS-P16

Approved Amount / Disbursed Amount	9,139 million yen / 5,309 million yen
Exchange of Notes Date / Loan Agreement Signing Date	6 March 1998 / 30 March 1998
Terms and Conditions	Interest Rate: 2.7% p.a. Repayment Period: 25 years (Grace Period 7 years) Conditions for Procurement: General untied
Borrower/Executing Agencies	Government of the Republic of Tunisia / Tunisia Telecom
Final Disbursement Date	15 October 2004
Main Contractor (Over 1 billion yen)	Sototel (Tunisia) / Lucent Technologies Nederland (Netherland)
Main Consultant (Over 100 million yen)	None
Feasibility Studies, etc.	F/S by Tunisia Telecom, 1997
Related Projects	JICA TS-P5 and TS-P21

#### TS-P21

Approved Amount / Disbursed Amount	8,653 million yen / 4,721 million yen
Exchange of Notes Date / Loan Agreement Signing Date	4 February 2000 / 23 March 2000
Terms and Conditions	Interest Rate: 2.2% p.a. Repayment Period: 25 years (Grace Period 7 years) Conditions for Procurement: General untied
Borrower/Executing Agencies	Government of the Republic of Tunisia / Tunisia Telecom
Final Disbursement Date	13 July 2007
Main Contractor (Over 1 billion yen)	Mitsubishi Corporation (Japan) / Omnicom (Tunisia)
Main Consultant (Over 100 million yen)	None
Feasibility Studies, etc.	F/S by JTEC, 1997
Related Projects	JICA TS-P5 and TS-P16

## 2. Outline of the Evaluation Study

### 2.1 External Evaluator

Akemi Serizawa, Sanshu Engineering Consultant

### 2.2 Duration of Evaluation Study

Duration of the Study period: January 2010 – November 2010

Duration of the Field study: April 11 – April 30, May 30– June 16, 2010

### 2.3 Constraints during the Evaluation Study

The three JICA projects were implemented all over the country and the networks installed or upgraded by them are intertwined each other and also with networks installed by other projects,

some of which were a part of the same national development plans and others belonged to either preceding or succeeding national plans. Therefore, it is difficult to extract the direct outcomes of the three JICA projects from the global outcomes. The improvement of the telecommunication services since the implementation of the JICA projects until present, as shown in Table 6 below, was a result of all telecommunication projects.

No information was available to show the exact contribution of the JICA projects to the relevant national development plans or to the growth of the telecommunication sector on the whole. The estimated project cost of TS-P5 was about 10% of the investment plan of the telecommunication sector of the 8th National Development Plan<sup>3</sup>, and that of TS-P16 and TS-P21 combined together was about 18% of the 9th plan<sup>4</sup>.

No data were available to indicate the actual investment to the telecommunication sector in the 8th and 9th National Development Plans<sup>5</sup>; therefore, it is not possible to calculate the share of the JICA projects on the basis of actual cost. Tunisia Telecom estimated just for a reference that the share of the two JICA Projects (TS-P16 and 21) in the actual investment of the 9th plan was likely to be between 15 and 17 per cent. They were not able to provide similar information on TS-P5 and the 8th plan.

As years have passed since the end of the JICA projects and the persons in charge had already left the position, information requested by the evaluator was not always available from Tunisia Telecom.

### **3. Results of the Evaluation (Overall Rating: A)**

#### **3.1 Relevance (Rating: a)**

##### 3.1.1 Relevance with the Development Plan of Tunisia

The 8th National Development Plan (1992-96) aimed to promote the private sector, attract foreign investment and reduce regional disparities. The telecommunication sector was prioritized as basic infrastructure to serve for the above purposes.

Also, the 9th National Development Plan (1997-2001) prioritized basic infrastructure including telecommunication networks as an engine for industrial development, promotion of exports and increase of agricultural production, as well as development of agriculture, industry and tourism sectors. The objectives of the telecommunication sector were expansion of telecommunication services, improvement of the reliability of networks and introduction of new

<sup>3</sup> [TS-P5] Estimated project cost: JPY11,624 million (=DT85 million @137). Total investment plan in the telecommunication sector in the 8th plan: DT850 million.

<sup>4</sup> [TS-P16] Estimated project cost: JPY12,186 million (=DT111 million @110). [TS-P21] Estimated project cost: JPY12,949 million (=DT124 million @114.71). Total: DT235 million. Total investment plan in the telecommunication sector in the 9th plan: DT1,335 million.

<sup>5</sup> Detailed information was not available about the 8th and 9th plans on the whole or about other telecommunication projects, such as plan and achievement of outputs.

telecommunication services.

The succeeding 10th and 11th National Development Plans (2002-06, 2007-11) have also prioritized the telecommunication sector as an engine for the economic development. The current 11th plan aims to increase the share of the telecommunication sector in GDP from 8% in 2006 to 13.5% in 2011 and to create 50,000 jobs in the sector.

The JICA project TS-P5 was a part of the 8th National Development plan. It installed and upgraded inter-city telecommunication networks throughout the country in order to enhance the capacity of the networks and improve the reliability of the telecommunication services. The succeeding two JICA projects (TS-P16 and TS-P21) were a part of the 9th plan. They installed and upgraded national, regional and branch telecommunication networks all over the country.

At the times of both appraisal and ex-post evaluation, the objectives of the three JICA projects were in line with the national policies of Tunisia.

### 3.1.2 Relevance with Development Needs of Tunisia

By 1991, just before the start of the 8th plan, the telecommunication services in Tunisia had been improved in terms of smoothness and reliability as the telephone had been automated. However, the waiting list for main lines was still long at 130 thousand reflecting the fact that the provision of the telecommunication services was not catching up the increasing demand. Improvement of quality and quantity of the telecommunication services, with an emphasis on the access in rural areas and promotion of new telecommunication services, was prioritized as a basic infrastructure for the economic development.

In 2009, the telephone subscribers were 11,030 thousand (1,280 thousand of fixed and 9,750 thousand of mobile) and the targets of the 11th National Plans (2007-11) (11,600 thousand, consisting of 3,000 thousand of fixed and 8,600 thousand of mobile) had almost been achieved (Tunisia Telecom). The number of subscribers of the mobile phones has already exceeded the target. The increase of mobile and internet subscribers has been rapid in the recent years, and it is expected that the demand for such new telecommunication services will keep increasing.

At the times of both appraisal and ex-post evaluation, the objectives and the approach (including digitalization and installation of WLLs in rural areas) of the JICA projects were consistent with the needs of improvement of telecommunication services in Tunisia.

### 3.1.3 Relevance with Japan's ODA Policy

At the time of appraisal, the previous version of Japan's ODA Charter (1992) prioritized infrastructure development as an engine for economic and social development. Also, Japan's Strategy of ODA Loan (1999-2002) prioritized basic infrastructure to strengthen Tunisia's international competitiveness and promote private investment to the country, during the period

of which TS-P21 was appraised (2000). The JICA projects were consistent with these policies as they aimed to develop telecommunication networks as a basic infrastructure for the economic development.

These projects have been highly relevant with the country's development policies, development needs, as well as Japan's ODA policy, therefore the relevance is high.

### 3.2 Efficiency (Rating: b)

#### 3.2.1 Project Outputs

The actual outputs of the three projects were mostly as planned, although there were some differences between the plan and the achievement as described in Table 1, 2 and 3 below. According to Tunisia Telecom, the differences between the plan and the achievement are not significant because the changes were within the basic scopes of the projects. Taking the delay of the tender process and construction work into account when necessary, they often modified the plan such as selection of routes or sites so that they could respond better to the changing demands, always procuring the latest equipment.

Table 1 Output of TS-P5

	Plan	Achievement
<b>(1) National transmission network</b>		
Digital microwave system	24 hops	18 hops (less than planned)
Optical fiber cable system	17 sections, 972km	17 sections, 972km (as planned)
Centralized monitoring system	7 sites (1 system)	7 sites (1 system) (as planned)
<b>(2) Regional transmission network</b>		
Digital microwave system	47 sections (54 hops)	47 sections (54 hops) (as planned)
Optical fiber cable system	60 sections, 444km	60 sections, 444km (as planned)
(3) Digitalization of satellite earth station	IDR/DCME for INTELSAT standard-A earth station	Same as the plan
(4) Consulting services	Factory inspection 3M/M Acceptance test 3M/M Operation and maintenance 3M/M	(None) These actions were carried out by Tunisia Telecom.

Source: Appraisal documents, Project Completion Report (PCR), questionnaire response

Table 2 Output of TS-P16

	Plan	Achievement
(1) National network		
New stations	23	23 (as planned)
Extension stations	15	15 (as planned)
Optical fiber cable	914km (6 loops, 8 lines)	1,425km (6 loops, 1 line) (higher than planned)
(2) Regional network (17 districts)		
Optical fiber cable	41 links, 491km	42 links, 648km (higher than planned)
Microwave	30 links, 34 sets	38 links. No data for the quantity of "sets" (higher than planned)

Source: Appraisal documents, PCR, questionnaire response

Table 3 Output of TS-P21

	Plan	Achievement
(1) Regional transmission network		
Microwave	21 governorates	21 governorates (as planned)
	51 links including 3 loops (74 hops)	60 links including 1 loop (73 hops) (higher than planned)
	106 terminal stations	106 terminal stations (as planned)
	11 add drop stations	11 add drop stations (as planned)
	11 relay stations	13 relay stations (higher than planned)
Optical fiber	21 governorates	22 governorates (as planned)
	61 links including 4 loops (503km)	54 links including 6 loops (550km) (almost as planned)
	114 terminal stations	114 terminal stations (as planned)
	35 add drop stations	35 add drop stations (as planned)
	15 through stations	(no data available)
Other equipment	7 power generators	(no data available)
	25 towers	28 towers (higher than planned)
(2) Wireless local loop (WLL)		
	19 governorates	11 governorates (less than planned)
	18,000 subscriber units	21,415 subscriber units (higher than planned)
	27 base stations	47 base stations (higher than planned)
	40 repeater stations	144 repeater stations (higher than planned)
	316 cell stations	400 cell stations (higher than planned)

Source: Appraisal documents, PCR, questionnaire response



Transmitter  
(Medjez el Beb station, Béja)



Transmitter  
(Medjez el Beb station, Béja)

### 3.2.2 Project Inputs

#### 3.2.2.1 Project Period

The actual project period was significantly longer than planned for all three projects.

Table 4 Project period

	Plan	Actual	Difference
TS-P5	July 1993 – May 1997 (47 months)	July 1993 – July 2004 (133 months)	86 months longer (283% of the plan)
TS-P16	March 1998- March 2002 (49 months)	March 1998 - December 2006 (106 months)	57 months longer (216% of the plan)
TS-P21	March 2000 - July 2003 (41 months)	March 2000 - March 2007 (85 months)	44 months (207% of the plan)

Source: Appraisal documents, PCR

According to the definition given by Tunisia Telecom (questionnaire response), the commencement of the projects was the signing date of the loan agreement, and the completion of the projects was defined when the systems were installed, operation was started and testing was complete. The reasons for the delay of TS-P5 were that administrative procedures took longer than expected as Tunisia Telecom was not accustomed to the Japanese Yen Loan procedure, that there were some technical problems when equipment was installed and it took time to solve them, and that training sessions were also postponed when the installation of equipment was delayed. The reasons for delay of TS-P16 and 21 were that administrative procedures were still time consuming even though they had been improved compared to the period of TS-P5, that land acquisition and approval of civil engineering works as well as the procurement of equipment and materials took long time.

### 3.2.2.2 Project Cost

The actual project cost was lower than planned for all three projects.

Table 5 Total project cost

	Plan	Actual cost	Difference
TS-P5	11,624 (incl.yen-loan 8,718)	5,892 (incl.yen-loan 3,941)	51% of the plan
TS-P16	12,816 (incl.yen-loan 9,139)	7,552 (incl.yen-loan 5,304)	62% of the plan
TS-P21	12,949 (incl.yen-loan 8,653)	6,017 (incl.yen-loan 4,722)	47% of the plan

Source: Appraisal documents, PCR

The reasons for the difference were that the tender process contributed to the economization of the prices and that the value of Japanese yen had increased vis-à-vis Tunisian dinars.

Although the project period was significantly longer than planned, the project cost was lower than planned, therefore efficiency of the project is fair.

## 3.3 Effectiveness (Rating: a)

### 3.3.1 Quantitative Effects

#### 3.3.1.1. Results from Operation and Effect Indicators

##### (1) Improvement of quality and quantity of the telecommunication services

As indicated in Table 6 below, the quality of the telecommunication services is measured by the “fault ratio” and “faults cleared within certain hours” in this evaluation study. The quantity is measured by the “number of subscribers (fixed and mobile)”, “telephone density” and “traffic”. They are standard indicators to measure the quality or quantity of the telecommunication services, and relevant data are available at Tunisia Telecom. This section compares the targets and achievements of the 8th and 9th national plans, which corresponded to the three JICA projects, and summarizes the changes of each indicator up to present.

TS-P5: This project was a part of the 8th national plan. At the end of the period of the 8th plan, telephone density achieved the target and the number of subscribers and fault ratio were slightly below the target. The international traffic improved from 984 million in 1991 to 4,648 million in 1996, while its target in the 8th plan was not available. TS-P5, whose share in the total investment plan of the 8th plan was about 10%, is likely to have contributed to the improvement to a certain extent while it is not possible to know its exact contribution as explained in the section of “constraints during the evaluation study.”

TS-P16&21: These two projects were a part of the 9th national plan. At the end of the period of the 9th plan, the number of subscribers and telephone density achieved the target. The two JICA projects, whose estimated share in the actual total investment of the 9th plan was 15-17% according to Tunisia Telecom, are also likely to have contributed to the improvement to a certain extent while it is not possible to know their exact contribution.

TS-P21 installed about 20 thousand WLL lines, which was about 3% of the increase of fixed telephone subscribers between 1996 and 2006 (690 thousand lines).

Table 6 Indicators of the Telecommunication services

National plans	7th plan	TS-P5		TS-P16&21		10th plan	
		8th plan	9th plan	Achievement (2001)	Achievement (2006)	Achievement (2009)	
Indicators	Achievement (1991)	Plan	Achievement (1996)	Plan	Achievement (2001)	Achievement (2006)	Achievement (2009)
Subscribers Total (thousand)	340	590	580	1,080	1,430	8,600	11,030
(fixed)	-	-	-	-	1,060	1,270	1,280
(mobile)	-	-	-	-	370	7,330	9,750
Telephone density (%)	4.02	6.50	6.50	14	15	84.5	105.2
Fault ratio (case/year)	1.30	0.5	0.64	Less than 0.2	(No data available)	(No data available)	0.22 (2008)
Faults cleared within certain hours	Within 72hrs: 67%	Within 48hrs: 90%	(No data available)	Within 48hrs: 90% Within 72hrs: 98%	(No data available)	(No data available)	Within 48hrs: 78.2% Within 72hrs: 98%
Traffic (million)	2,272 International 984 Domestic 1,288	(No data available)	International 4,648	(No data available)	(No data available)	(No data available)	International 4,090
Internet subscribers (thousand)	-	-	-	-	60	180	370 (2010)

Source: Appraisal documents; PCR, questionnaire responses

Table 6 shows that the subscribers of mobile phones and internet have increased rapidly this century. The infrastructure installed by the JICA projects have also been utilized for mobile phones and internet, therefore it has contributed to the increase of users of these new telecommunication services<sup>6</sup>. Also, fault ratio decreased and most faults are cleared within 72

<sup>6</sup> Tunisia started mobile phone services in 2002 as the second operator. The share of Tunisia Telecom



hours now.

From the above, the JICA projects have contributed to the improvement of the quantity and quality of the telecommunication services to a certain extent as their share in the actual total investment cost of the respective national plans was estimated between 10 and 17%.

### 3.3.1.2 Results of Calculations of Internal Rates of Return (IRR)

Financial IRRs of the three projects are shown in Table 7. The project life is 20 years for all of them. Both actual Cost and Benefit were smaller than the estimate for the three projects. Regarding TS-P5 and TS-P21, the re-calculated FIRR were slightly higher than the estimate because the decrease of the Cost was smaller than that of the Benefit. The original FIRR of TS-P16 seems to have been miscalculated in the appraisal documents<sup>7</sup>. The re-calculated FIRR of TS-P16 was lower than the correct estimate calculated by the evaluator, because the decrease of the Cost was larger than that of the Benefit.

A quantitative analysis of the economic internal rate of return was not possible because the economic benefit produced by these projects is not grasped in quantitative terms.

Table 7 Financial Internal Rate of Return

	FIRR at appraisal	Re-calculated FIRR	Cost	Benefit
TS-P5	10.1%	10.9%	Cost of construction and operation and maintenance. Working capital.	Service charges. Decrease of connection fees by digitalization of the satellite earth station.
TS-P16	15% (11.1%)	10.1%	Cost of construction and operation and maintenance	Service charges.
TS-P21	8.4%	8.9%	Cost of construction and operation and maintenance	Service charges.

Source: Appraisal documents, PCR, questionnaire responses

### 3.3.2 Qualitative Effects

1) Improvement of telecommunication services

(1) Improvement of reliability and transmission speed

The three JICA projects installed and expanded digital networks, which contributed to the increase of transmission speed. The rapid increase of ISDN lines, which was only 32 in 1997

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and Tunisiana in the mobile phone services was about 50-50 as of the beginning of May 2010. Orange entered into the market as the third operator in May 2010.

<sup>7</sup> It is probably because of clerical errors during development of an Excel file to calculate FIRR. Some formulas missed some cells that should have been included in the calculation.

but was 3,084 in 2009 (questionnaire responses), is a supporting evidence. The double routing of the telecommunication networks has made reverse transmissions possible, which keep transmission going when an error occurs. The double routing has contributed to the improvement of the fault ratio as shown in Table 6.

#### (2) Improved access to telecommunication services and diversification of services

The JICA projects, as a part of the 8th and 9th national plans, have contributed to the improvement of the accessibility to the telecommunication services in the whole country. WLL was a useful technology especially in rural areas where installation of cables was not efficient due to the small population density and the unfavorable topographic conditions. The infrastructure installed by the projects has been utilized not only for fixed telephones but also for mobile phones and internet, the users of which have increased dramatically during the last decade. The JICA projects have also contributed to the diffusion of these new telecommunication services.

From sections (1) and (2) above, the projects contributed to the improvement of telecommunication services in Tunisia to a certain extent, while it is not possible to measure their exact contribution.

These projects have largely achieved its objectives, therefore the effectiveness is high.



Transmission antenna of WLL  
(El Hrairia station, Tunis)



Telecommunication tower of WLL  
(Suburb of Tunis)

### 3.4 Impact

#### 3.4.1 Intended Impacts

- (1) Promotion of private investment, enhancement of efficient and activated economy and economic development in Tunisia

The GDP of Tunisia increased by 32% between 2001 and 2006 as shown in Table 8. The GDP of the telecommunication sector increased by 167% in the same period and its share in GDP increased from 3.9% to 8.0%. Also, according to Tunisia Telecom, the sector created 24,000 jobs in the 9th plan and 30,000 jobs in the 10th plan.

Table 8 Share of the telecommunication sector in GDP

	2001 End of 9th plan	2006 End of 10th plan
GDP (million DT)	18,027.5	23,869.6
GDP of the telecommunication sector (million DT)	711.6	1,899.7
Share of telecommunication sector	3.9%	8.0%

Source: The 10th National Development Plan, Tunisia

Although there are no data available to show directly the relationship between improvement of the telecommunication services and the economic development, it would be reasonable to conclude that the telecommunication services have contributed to the economic development both at the national and regional levels, which is supported by the dramatic increase of users of the telecommunication services including mobile phones and internet and improved access to the services in rural areas.

#### 3.4.2 Other Impacts

- (1) Impacts on the natural environment

No positive or negative impact on the natural environment was observed. The telecommunication stations and towers were constructed in relatively deserted areas near communities.

- (2) Land Acquisition and Resettlement

Some lands were acquired to construct telecommunication stations and towers, although the details were not available from Tunisia Telecom as some years have already passed since the end of the projects. There was no resettlement of the population or forced land acquisition. As explained in the above section, stations and towers are found in relatively deserted areas near communities such as in the edge of a community or in a corner of a park, as observed by the evaluator during the site visits. Therefore, they do not pose any particular negative effect on the

living conditions of the communities.

(3) Unintended Positive/Negative Impact

There was no particular unintended positive or negative impact.

### **3.5 Sustainability (Rating: a)**

#### 3.5.1 Structural Aspects of Operation and Maintenance

Tunisia Telecom has experienced organizational changes several times, which improved efficiency in decision-making and administrative procedures every time. The key events were its establishment in 1996 and the acquisition of 35% of its capital by Tecom-Dubai of the United Arab Emirates in 2006. The sections responsible for operation and maintenance were the network operation department and the operation and maintenance department until 2009 when they were merged into the Direction Central Technique. The regional offices (*Directions Régionales*) are responsible for operation and maintenance of their equipment. There are several staff members per system in charge of operation and maintenance, and technical support are provided by the Direction Central Technique when necessary. Some operation and maintenance work is contracted out and is supervised closely by the regional offices.

When the first JICA project TS-P5 started, Tunisia Telecom was not familiar with the yen-loan administrative procedures. They had become more familiarized with the process through the implementation of the three projects when a person-in-charge of yen-loan was nominated in June 1999 and yen-loan administration was assigned to the department of finance (*Direction Centrale des Finances*) in September 2000, which further improved the yen-loan procedures at the end of Tunisia Telecom.

#### 3.5.2 Technical Aspects of Operation and Maintenance

Tunisia Telecom reported in the respective Project Completion Reports (PCRs) that, when the three projects were completed, there were 636 staff members related to operation and maintenance, which consisted of 141 engineers, 328 technicians and 167 workers. While the current number of those staff members was not available during the ex-post evaluation, the number and technical level of operation and maintenance staff seem to be sufficient as no particular problem was observed in the actual operation and maintenance work during the site visits.

Training is planned and conducted when necessary, such as when new equipment is installed and when the regional offices place requests to catch up new technologies.

### 3.5.3 Financial Aspects of Operation and Maintenance

The expenditure of operation and maintenance has been approximately 2% to 4% of the total expenditure of Tunisia Telecom as shown in Table 9. The budget for operation and maintenance at the regional level is about 1,500 to 2,000 thousand dinars per year, which is distributed to the 24 regional offices. The level of the operation and maintenance budget seems to be sufficient as no problem was observed in the operation and maintenance work.

Table 9 Expenditure of Tunisia Telecom

(thousand DT)

Year	Expenditure of Tunisia Telecom	Expenditure of operation and maintenance
2006	860,440	20,580
2007	864,179	25,014
2008	901,921	33,837
2009	925,255	40,541

Source: Questionnaire responses

### 3.5.4 Current Status of Operation and Maintenance

The equipment provided by these projects is in good condition, while some of them have already been replaced by the latest machines. Tunisia Telecom takes preventive measures such as regular check-ups and also performs troubleshooting. Equipment installed in the smaller stations is monitored real-time from the base stations and errors are taken care of rapidly. There are no constraints in obtaining spare parts.

No major problems have been observed in the operation and maintenance system, therefore sustainability of the projects is high.



Transmitter (Jendouba)



Transmitter (Jendouba)

## **4. Conclusion, Lessons Learned and Recommendations**

### **4.1 Conclusion**

In light of the above, these projects are evaluated to be highly satisfactory. The relevance is high as they were in line with the development policies and needs of Tunisia as well as Japan's ODA policy. The efficiency is fair because the project period was significantly longer than planned for all three projects, while the project cost was lower than planned. The effectiveness is high as the projects produced the planned outcomes and impacts. The sustainability is high because there is no problem in the structural, technical and financial aspects of operation and maintenance.

### **4.2 Recommendations**

None.

### **4.3 Lessons learned**

None.

### Comparison of the original and actual scope of the Projects

(TS-P5)

Items	Original	Actual
1. Outputs		
(1) National transmission network		
Digital microwave system	24 hops	Lower than planed (18 hops)
Optical fiber cable system	17 sections, 972km	As planned (17 sections, 972km )
Centralized monitoring system	7 sites (1 system)	As planned (7 sites (1 system))
(2) Regional transmission network		
Digital microwave system	47 sections (54 hops)	As planned (47 sections (54 hops))
Optical fiber cable system	60 sections, 444km	As planned (60 sections, 444km)
(3) Digitalization of satellite earth station	IDR/DCME for INTELSAT standard-A earth station	As planned
2. Project period	July 1993 – May 1997 (47 months)	July 1993 – July 2004 (133 months)
3. Project cost		
Amount paid in Foreign currency	6,531 million yen	3,023 million yen
Amount paid in Local Currency	5,093 million yen (37,175 thousand DT)	2,869 million yen (33,797 thousand DT)
Total	11,624 million yen	5,892 million yen
Japanese Yen loan portion	6,531 million yen	3,941 million yen
Exchange rate	1DT = 137 yen (as of February 1993)	1DT = 84.89 yen (average between 1996 and 2004)

(TS-P16)

Items	Original	Actual
1. Outputs		
(1) National network		
New stations	23	As planned (23)
Extension stations	15	As planned (15)
Optical fiber cable	914km (6 loops, 8 lines)	Higher than planned (1,425km (6 loops, 1 line))
(2) Regional network (17 districts)		
Optical fiber cable	41 links, 491km	Higher than planned (42 links, 648km)
Microwave	30 links, 34 sets	Higher than planned (38 links)
2. Project period	March 1998 – March 2002 (49 months)	March 1998 – December 2006 (106 months)
3. Project cost		
Amount paid in Foreign currency	9,139 million yen	5,304 million yen
Amount paid in Local Currency	3,047 million yen (27,700 thousand DT)	2,248million yen (26,006 thousand DT)
Total	12,816 million yen	7,552 million yen
Japanese Yen loan portion	9,139 million yen	5,310 million yen
Exchange rate	1DT= 110 yen (as of July 1997)	1DT= 86.44 yen (average between 1998 and 2006)



(TS-P21)

Items	Original	Actual
<p>1. Outputs</p> <p>(1) Regional transmission network</p> <p>Microwave</p> <p>Optical fiber</p> <p>(2) Wireless local loop (WLL)</p>	<p>21 governorates</p> <p>51 links including 3 loops (74 hops)</p> <p>106 terminal stations</p> <p>11 add drop stations</p> <p>11 relay stations</p> <p>21 governorates</p> <p>114 terminal stations</p> <p>19 governorates</p> <p>18,000 subscriber units</p> <p>27 base stations</p>	<p>As planed (21 governorates)</p> <p>Mostly as planned (60 links including)</p> <p>1 loop (73 hops)</p> <p>As planned (106 terminal stations)</p> <p>As planned (11 add drop stations)</p> <p>Mostly as planned (13 relay stations)</p> <p>Higher than planned (22 governorates)</p> <p>As planned (114 terminal stations)</p> <p>Lower than planned (11 governorates)</p> <p>Higher than planned (21,415 subscriber units)</p> <p>Higher than planned (47 base stations)</p>
<p>2. Project period</p>	<p>March 2000 – July 2003 (41 months)</p>	<p>March 2000 – March 2007 (85 months)</p>
<p>3. Project cost</p> <p>Amount paid in Foreign currency</p> <p>Amount paid in Local Currency</p> <p>Total</p> <p>Japanese Yen loan portion</p> <p>Exchange rate</p>	<p>8,653 million yen</p> <p>4,296 million yen (41,028 thousand DT)</p> <p>12,949 million yen</p> <p>8.653 million yen</p> <p>1DT= 104.71 yen (as of June 1999)</p>	<p>4,722 million yen</p> <p>1,295 million yen (14,716 thousand DT)</p> <p>6,017 million yen</p> <p>4,722 million yen</p> <p>1DT= 88.00 yen (average between 2000 and 2007)</p>

### **Third Party Opinion**

Dr Noureddine Mejdoub

Ambassador, President of Tunisia- Japan Friendship Association

#### **Relevance**

The telecommunications sector held special priority under the 8th and 9th National development plans (1992-96, 1997-2001). Tunisia turned to Japan in view of its leading world performance in this area, to strengthen its telecommunications services and respond to national and international needs. According to planners, the quantity and quality of services were vital to encourage private investment and for the development of the national economy. Negotiations between Japan and Tunisia for the three projects set out the priorities and the needs of the country that were totally line with the Japanese development assistance policy.

#### **Impact and Efficiency**

Planning of the three projects unfolded as the work progressed, which in all lasted over a period of fourteen years. Technological progress required some changes to be made during implementation which was an appropriate pragmatic approach to a sector where progress occurs rapidly. The outcome seems positive and significant on new technologies and the increased density and diversity of exchanges. Political leaders, the education system, the speed with which youth have turned towards this sector and the awareness of the Tunisian public of the paramount need for this tool have all contributed over the last twenty years, to placing Tunisia in the leading group of emerging countries.

The result is that the reality and the prospects of the Tunisian virtual economy have led to the creation of several important Technocities, to mention only Ghezala and Borj Cedria. Tunisia is in the process of an increasingly digital development. It now figures amongst the advanced countries in the ICT sector and is the leader amongst African countries.

#### **Sustainability**

Tunisia has so far made giant steps forward on the economic and social levels. Its government has added to this over the last twenty years, the challenge of conquering the virtual world and these three projects are proof of this. It would be highly desirable that Japan, which is amongst the forerunners of the virtual world, maintain and continue this exemplary cooperation with Tunisia.