

**Ex-Post Project Evaluation 2012: Package II-5
(Pakistan, Algeria)**

September 2013

JAPAN INTERNATIONAL COOPERATION AGENCY

WASEDA UNIVERSITY

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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 2010, and Technical Cooperation projects and Grant Aid projects, most of which project cost exceeds 1 billion JPY, that were mainly completed in fiscal year 2009. 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.

September 2013

Masato Watanabe

Vice President

Japan International Cooperation Agency (JICA)

Disclaimer

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Islamic Republic of Pakistan

Ex-Post Evaluation of Japanese ODA Loan
“National Drainage Program Project”

Evaluator: Juichi INADA, Waseda University/Senshu University

0. Summary

The projects’ objectives are to reduce waterlogging and salinity in the Indus Basin and to restore the sustainability of environmentally-sound irrigated agriculture by improving drainage and irrigation facilities and reforming the Operations And Maintenance (hereinafter referred to as “O&M”) system, there by contributing to the reduction of poverty in targeted areas of Pakistan.

Drainage and irrigation facilities are basic infrastructure required for agriculture in Pakistan. The improvement of those facilities is relevant to development policy and development needs in Pakistan, as well as to Japan’s ODA policy. Thus, its relevance is high.

After 2004, the rehabilitation and remodeling of drainage and irrigation facilities have been progressing steadily. Cultivated areas and the production of major crops, such as wheat, rice, and sugarcane, have increased in target areas. Participatory Irrigation Management (hereinafter referred to as “PIM”) also began to progress after 2005. Farmers’ satisfaction rates are relatively high with respect to dispute resolutions, responses to water thefts, O&M of channels, and abiana (water charges) collection, although performance of those functions varies among Farmers’ Organizations (hereinafter referred to as “FOs”), particularly with respect to abiana collection rates. Thus, the project has largely achieved its objectives. Therefore, the project’s effectiveness and impacts are considered to be high.

Project implementation was delayed and not completed until 2002, the original completion period. However, implementation increased rapidly after 2004. The project costs were much lower than planned, but the project period was extended to more than twice the length of the original period. Therefore, the efficiency of the project is fair.

The O&M of water channels rehabilitated and constructed by this project was transferred from the Punjab Irrigation Department (PID)/Punjab Irrigation and Drainage Authority (PIDA) to the Area Water Board (AWB)/FOs based on the concept of PIM. However, reforms must continue. Some challenges continue to affect the technical and financial aspects of O&M, although some positive factors have developed, such as JICA’s technical cooperation project’s efforts to enhance capacity of FOs. Thus, sustainability of the project is fair.

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

1. Project Description



Project Map (Punjab Water Channels)



Lining of distributary

1.1 Background

Waterlogging and salinity have been significant threats to agriculture and the sustainable irrigation system used in the Indus Basin in Pakistan. To restore the affected land and prevent further waterlogging and salinity, the construction of an effective drainage system was essential. However, under the previous management system, abiana collection rates were low, O&M was ineffective, and some water channels were abandoned. Deterioration of the canal system led to increased waterlogging and salinity, and decreases in agricultural production and cultivable land. Therefore, drastic reforms aimed at the achievement of effective management of the drainage and irrigation system were urgently required.

The Pakistani government designed the National Drainage Program (hereinafter referred to as “NDP”) in 1993. NDP aimed to improve drainage and irrigation facilities and construct an effective drainage management system in the Indus Basin.

In addition, the Pakistani government formulated the “Pakistan Irrigation and Drainage: Issues and Options” report, which emphasized the decentralization of the management system and the establishment of an independent institution in 1994, with the assistance of the World Bank (WB). The report was based on their recognition that institutional reform of the drainage and irrigation sector was essential for the realization of the NDP.

1.2 Project Outline

The project’s objectives are to reduce waterlogging and salinity in the Indus Basin and restore the sustainability of environmentally sound irrigated agriculture by improving drainage and irrigation facilities and reforming the Operations and Management system, thereby contributing to the reduction of poverty in targeted areas in Pakistan.

Approved Amount/ Disbursed Amount	10,832 million yen/ 6,238 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	March 1997/ March 1997
Terms and Conditions	Interest Rate 2.3%, Repayment Period 30 years, (Grace Period 10 years), General Untied
Borrower/ Execution Agency	The president of Islamic Republic of Pakistan / Water and Power Development Authority (WAPDA)
Final Disbursement Date	December 2006
Main Contractor (Over 1 billion yen)	NA
Main Consultant (Over 100 million yen)	UNDP/UNOPS (training component), National Engineering Services (NESPAK)
Feasibility Study, etc.	The World Bank performed the first survey in 1993, and three additional surveys in 1994. F/S was completed in May 1995.
Related Projects	“Special Assistance for Project Implementation of NDP” (2003) Japanese ODA Loan projects: “Lower Chenab Canal System Rehabilitation Project” (L/A in 2005), “Punjab Irrigation System Improvement Project” (L/A in 2008) Technical Cooperation Projects: “Water Management Advisor for Punjab Province” (2006-2008), “Strengthening Irrigation Management System Including Agriculture Extension Through Farmers’ Participation in the Punjab Province” (2009-2013)

2. Outline of the Evaluation Study

2.1 External Evaluator

Juichi INADA, Senshu University/Waseda University

2.2 Duration of Evaluation Study

This evaluation study was performed according to the following schedule.

Duration of the Study: October 2012 – August 2013

Duration of the Field Study: January 9 – January 22, 2013; June 13 – June 22, 2013

2.3 Constraints during the Evaluation Study

Quantitative indicators and baseline data were not described in detail at the time of the appraisal. Therefore, appropriate indicators and relevant data were collected at the time of the ex-post evaluation.

3. Results of the Evaluation (Overall Rating: B¹)

3.1 Relevance (Rating: ③²)

3.1.1 Relevance to the Development Plan of Pakistan

Based on the NDP (1993-2018), the Pakistani government formulated “the 8th 5-Year National Development Plan (1994-1998),” which designated the agricultural sector as a main pillar of Pakistan’s economic development. It prioritized (1) the comprehensive management of drainage and irrigation, and (2) effective land and water management. The NDP pursued economic development and poverty reduction by attempting to increase agricultural production, increase the surface water supply and decrease waterlogging and salinity by introducing new management methods, organizing FOs to increase effective water use.

The project’s priority was changed from drainage to irrigation because a persistent drought occurred between 2000 and 2004. The Pakistani government prioritized the security of water resources and irrigation by improving its canal system and introducing effective water resource management.³

This governmental change in priorities explains the shifts in priorities of JICA’s provision of assistance to NDP from drainage to irrigation. This shift occurred in response to changes made to the above-mentioned policy environment. The JICA project’s objective at the time of the appraisal was to decrease waterlogging and salinity. However, JICA also shifted its priorities, in response to water shortages and a drought that occurred after 2000. JICA changed its assistance scope in early 2003.

At the provincial level, the Provincial Government of Punjab formulated an “Irrigation Sector Reform Program” in 2005. The government announced its involvement with critical irrigation issues such as (1) improved irrigation management, (2) increased transparency in water distribution, (3) the achievement of improved water supply service by transferring irrigation management authority to FOs, and (4) improved on-farm irrigation efficiency and

¹ A: highly satisfactory; B: satisfactory; C: moderate; D: unsatisfactory.

² ③: high; ②: fair; ①: low.

³ The Pakistani government did not change’ NDP’s original objectives. No new water sector strategies have been formulated since 1994. Based on an interview conducted with the Department of Water Resources in January 2013, the central government has considered the formulation of a comprehensive strategy for water resource management. However, the draft has not yet authorized a new official strategy.

agricultural productivity.

Therefore, the project was relevant to Pakistan’s development policy, including the shift in priorities from drainage to irrigation in response to changes in the policy environment.

3.1.2 Relevance to the Development Needs of Pakistan

At the time of the appraisal, the following development needs in the drainage and irrigation sector in Pakistan were mentioned: (1) reduction of water shortages by increasing and preserving water resources, (2) recovery of agricultural production by introducing countermeasures to waterlogging and salinity, (3) introduction of environmentally friendly drainage management, (4) strengthening of sewage management, (5) introduction of integrated flood control programs, (6) increased participation by beneficiaries, (7) development of effective O&M by the capacity enhancement of water management institutions and institutional reforms. These reforms were affected by many challenges, such as further improvements made to governmental policies and strategies, implementations of strategies, and the enhancement of technical and administrative capacity, as well as by financial shortages. The project appropriately reflected Pakistan’s development needs.

The drought became one of the major issues that occurred between 2000 and 2004. Because of decreased rain fall, priorities shifted away from measures to prevent waterlogging and shifted towards measures aimed at the resolution of water shortages. (See Figure 1.)

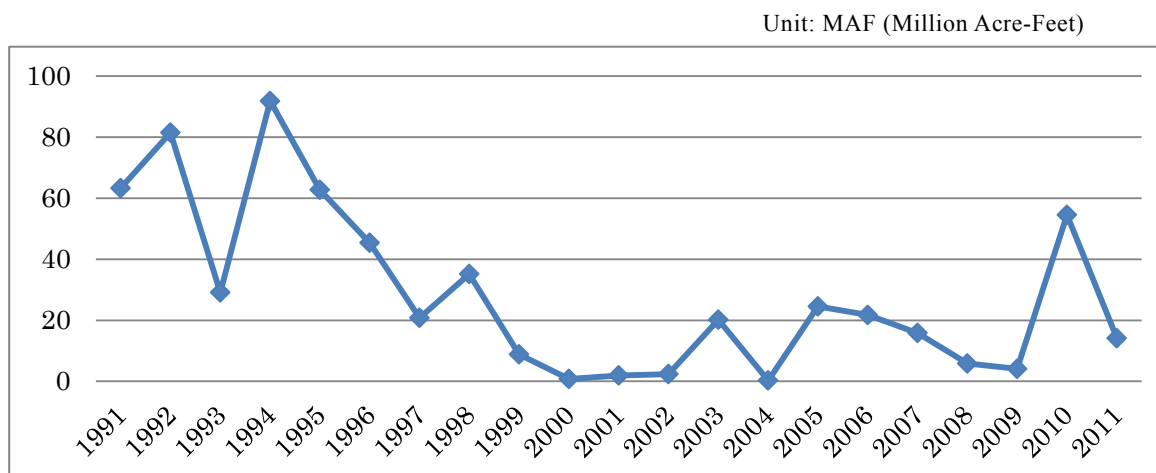


Figure 1. Annual Drainage Discharge in Punjab Province (1991-2011)

Note: Based on data provided by WAPDA.

Figures for fiscal year: From April to March of the following year.

JICA has responded flexibly to changes in Pakistan’s development needs. It has shifted its assistance priority from drainage to irrigation and changed its assistance scope by focusing on areas that exhibit higher irrigation needs. These shifts in JICA’s project priority and scope are appropriate because JICA has been responding to shifting development needs during the

project period.

3.1.3 Relevance to Japan's ODA Policy

In the Medium-Term Strategy for Overseas Economic Cooperation Operations (2002-2005), JICA stated, "Access to social service delivery in Pakistan is still low in comparison with other developing countries. Therefore, improvement of access to socio-economic services in poorer rural areas should be prioritized and significant consideration should be given to the effectiveness of institutions and the participation of local people."

Therefore, the project is consistent with Japan's ODA policy.

The project was highly relevant to Pakistan's development plan and needs, as well as to Japan's ODA policy. Therefore, the project is considered to be highly relevant.

3.2 Effectiveness⁴ (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

Because no concrete quantitative effect indicators were determined at the time of the appraisal, the following quantitative indicators were examined at the time of the post-evaluation.

i. The width of the benefited areas, the number of beneficiaries, and FOs

JICA changed its project scope in January 2003 in response to changes in development needs. It refocused its targets for Components 1 and 2 (rehabilitation of canal system) for sub-projects in area Part A that could be completed by the end of 2006. In Part A, watercourses and minors were included in the list of target sub-projects, in addition to canals and branches. Parts B and C were originally included in the target areas. However, they were excluded when the scope changed in 2003. They became the target areas of later Japanese ODA loan projects.⁵

⁴ Sub-rating for Effectiveness is to be put with consideration of Impact.

⁵ Those areas were included as parts of the following Japanese ODA projects: The "Lower Chenab Canal System Rehabilitation Project" (L/A in 2005), and the "Punjab Irrigation System Improvement Project" (L/A in 2008).

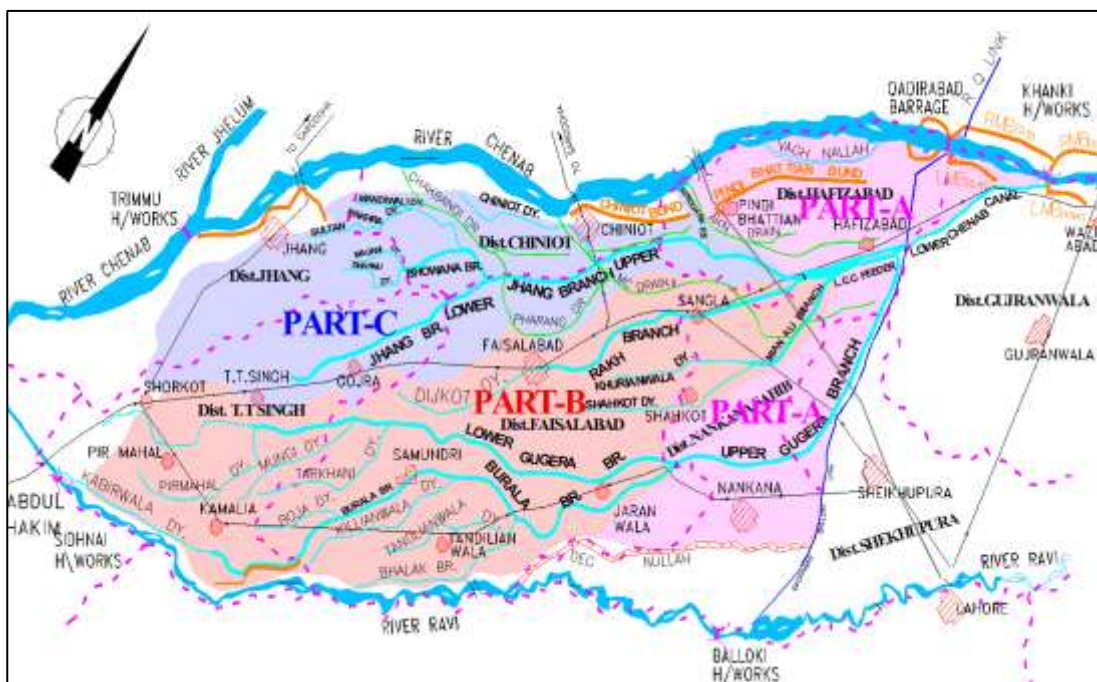


Figure 2. Map of JICA project target areas

Source: PIDA.

Table 1 shows the acres in the benefited areas, the number of beneficiaries, and the FOs. After 2005, 34 FOs were established in area Part A.⁶

Table 1. Estimates of benefited areas and beneficiaries (Part A)

Division	No. of outlets	Gross Canal Area (Acres)	Cultivable Canal Area (Acres)	No. of Beneficiaries	No. of FOs
Khanki	619	272,159	213,737	26,416	12
Upper Gugera	1,166	681,357	550,350	85,312	22
Total	1,785	953,516	764,087	111,728	34

Note: Based on data provided by AWB (LCC-East). The benefited areas described in this table amount to 953,000 acres. However, the figures in this table include all benefited areas in the canal system. They are not limited to areas that directly benefit from JICA's assistance.

ii. Abiana collection rates

Prior to 2005, when FOs had not yet been established, abiana was collected by PID and used for O&M of the canal system. After 2005, PIM was newly introduced and FOs were established. Irrigation Management Transfer (IMT) continues to progress: FOs are responsible for the collection of abiana and for the O&M of distributaries and minors. The abiana collection rates by FOs in targeted areas are shown in Table 2.

⁶ The total number of FOs in Parts A, B, and C is 85. However, one FO has not yet been officially established in law, because some farmers who are members of those FOs have not provided consents (as of the end of 2012). Regardless of whether the target areas are parts of Components 1 and 2, all 85 FOs in Parts A, B, and C are targets of the JICA project as components of its provision of assistance for institutional reforms and capacity building.

Table 2. Abiana collection rates after FOs were established (84 FOs)

Period	Cultivable Canal Area (Acres)	Abiana Assessed (Million Rs.)	Total Collection of Abiana (Million Rs.)	Recovery of Abiana (%)
Rabi 2004-05	1,173,336	48.41	42.38	87.55
Kharif 2005	1,709,482	118.94	93.14	78.31
Rabi 2005-06	1,582,537	64.57	48.65	75.35
Kharif 2006	1,709,482	117.90	80.10	67.93
Rabi 2006-07	1,581,787	65.22	51.77	79.37
Kharif 2007	1,704,522	114.64	73.17	63.83
Rabi 2007-08	1,573,359	61.71	37.21	60.30
Kharif 2008	1,699,204	114.16	68.85	60.31
Rabi 2008-09	1,572,498	59.33	36.72	61.88
Kharif 2009	1,699,204	108.08	55.01	50.90
Rabi 2009-10	1,572,498	58.90	31.05	52.72
Kharif 2010	1,699,228	107.58	78.00	72.51
Rabi 2010-11	1,645,212	63.05	49.39	78.34
Kharif 2011	1,771,918	117.25	86.27	73.57
Rabi 2011-12	1,645,212	73.76	46.50	64.04
Kharif 2012 年	1,771,918	132.76	61.54	46.38

Note: Based on AWB documents. Kharif: May-September; Rabi: October-April of the following year.

The periods after 2005 were divided into the following three stages:⁷

(a) 2005–2007 (Pilot stage): FOs were established and began to engage in PIM under PIDA’s supervision .

(b) 2008 – 2010 (transitional stage): PIDA encouraged FOs that performed well to increase their independent management. It also intervened with FOs that performed poorly to assist with their O&M.

(c) After 2010 (full-scale stage): PIM by FOs was officially introduced by transferring O&M to FOs. Some support was provided by PIDA to strengthen their capacities.

It was reported that abiana collection rates ranged between 35% and 45% prior to 2004 when PID collected abiana. Table 2 shows that abiana collection rates have increased to approximately 70% since 2005 after the new PIM system was introduced, in comparison with low abiana collection rates achieved under the old system. Abiana collection rates were very high (around 80%) during the initial stage that occurred between 2005 and 2007, but the rates decreased to around 50% in 2009. After 2010, when full-scale introduction of PIM was completed, abiana collection rates increased to nearly 80%, but the rates decreased again between 2011 and 2012.

Abiana collection rates improved after 2010 for the following reasons: (1) FOs were very active during the initial stage when PIM was introduced to FOs. (2) Distributaries were improved by JICA’s “Lower Chenab Canal System Rehabilitation Project.” Increases in the number of benefited areas affected farmers’ willingness to pay abiana. In contrast, in recent years, decreases in abiana collection rates reportedly occurred because FOs do not possess the

⁷ Based on interviews conducted with staff members of AWB and PIDA.

compulsory power to prevent farmers' failure to pay abiana. Therefore, the number of farmers who fail to pay abiana has increased.

However, based on the "Performance Monitoring & Evaluation of 84FOs (out of 85, see Footnote 6)" report conducted by PIDA, many FOs in Part A area were rated "poor." Most FOs in Part B/C areas were rated "good" or "satisfactory" with respect to the performance of abiana collection rates.⁸ It has been reported that these ratings may have occurred because many large landowners who participate in the upper stream of the canal system have easy access to water, and they may be reluctant to pay abiana.

In summary, institutional reforms of the O&M system were conducted as part of the JICA project. A new system based on PIM was established in Punjab province, Irrigation Management Transfer (IMT) was performed with Farmers Organizations (FOs), and PIDA was established. As a result, abiana collection rates improved in the targeted areas of Part A/B/C in general.

3.2.2 Qualitative Effects

At the time of the appraisal, it was expected that environmental improvement by decreasing waterlogging and salinity, increased participation by farmers, and poverty reduction would occur if drainage and irrigation facilities and institutional reforms improved, although concrete figures were not proposed as targets. An examination of the project's qualitative effects is outlined below:

i. Improvement of FOs' performance

Although FOs were established, their performance varied (with respect to abiana collection rates, dispute resolutions, provision of water supplies to the tail, responses to water thefts, and so on). Performance evaluations were conducted in 2008 by JICA and PIDA, respectively.

Table 3 shows performance evaluation summaries for 84 FOs. Each FO was rated on four categories (i.e., "good," "satisfactory," "adequate," and "poor"). The majority of FOs was rated "satisfactory." Most FOs were rated more than "adequate." However, some FOs rated "poor," continue to operate. This means that FOs' performance varied. The performance rates of large land owners (who tend to avoid obeying FO rules), the educational levels of FO committee members (members' higher education levels resulted in more effective FO management), and the characteristics of each FO's location (e.g., crime rates) were suggested as reasons for differences in each FO's performance.

⁸ PIDA, *Performance Monitoring & Evaluation of Farmers Organizations*, October 2008. The number of FOs included in each performance category for abiana collection rates (three-year totals) were: more than 90% (good): 29; 80-90% (satisfactory): 11; 60-80% (adequate): 25; less than 60% (poor): 19.

Table 3. Performance evaluations of FOs

Unit: Number of FOs (%: Share of the total)

Performance rating	Internal M&E: (PIDA Evaluation)			External M&E (JICA & Third Party Evaluation)	
	PIDA M&E (2006) 84 FOs	PIDA M&E (2007) 84 FOs	PIDA M&E 3Years (2005-08) 84 FOs	JICA Survey (March 2007) 84 FOs	Third-Party Case Studies (May 2008) 10 FOs
Good	13 (16%)	25 (30%)	19 (23%)	19 (23%)	2 (20%)
Satisfactory	34 (40%)	19 (22%)	28 (33%)	47 (56%)	2 (20%)
Adequate	26 (31%)	25 (30%)	23 (27%)	13 (15%)	4 (40%)
Poor	11 (13%)	15 (18%)	14 (17%)	5 (6%)	2 (20%)

Source: PIDA, *Performance Monitoring & Evaluation of Farmers Organizations*, October 2008.

Note: Performance Standards for the JICA survey: Good: More than 86; Satisfactory: 65-85; Adequate: 50-65; Poor: less than 50. Performance Standards for the PIDA Evaluation (2007, 2005-2008): Good: More than 86; Satisfactory: 70-85; Adequate: 55-70; Poor: Less than 55.

Table 4 shows farmers' satisfaction rates with the performance of FOs, based on the location of farmers' land.

- (a) Farmers' satisfaction rates were relatively high with respect to dispute resolutions, responses to water thefts, O&M of channels, and abiana collection.
- (b) The farmers located at the head of the channel were more satisfied; the farmers located at the tail of the channel were less satisfied. This discrepancy appears to have been caused by differences in accessibility to the water supply between farmers located at the head or tail of the channel.

Based on interviews conducted with FOs, water thefts increased after 2008 because FOs do not possess effective legal authority to prevent water thefts. FOs' legal authority must be strengthened so they can provide effective management.

Table 4. Farmers' satisfaction with FOs' performance based on farmers' locations

FOs' Functioning	Satisfied				Unsatisfied			
	Head	Middle	Tail	Total	Head	Middle	Tail	Total
Dispute Resolutions	494 (87%)	507 (89%)	580 (83%)	1,581 (86%)	75 (13%)	61 (11%)	118 (17%)	254 (14%)
Irrigation Service Delivery	476 (84%)	468 (82%)	473 (68%)	1,417 (77%)	93 (16%)	100 (18%)	225 (32%)	418 (23%)
Feeding Tails	436 (77%)	434 (76%)	462 (66%)	1,332 (73%)	133 (23%)	134 (24%)	236 (34%)	503 (27%)
Control over Water Thefts	459 (81%)	458 (81%)	533 (76%)	1,450 (79%)	110 (19%)	110 (19%)	165 (24%)	385 (21%)
Maintenance of Channels	498 (88%)	500 (88%)	587 (84%)	1,585 (87%)	71 (12%)	68 (12%)	111 (16%)	250 (13%)
Assessment & Billing of Water Charges	499 (88%)	498 (88%)	592 (85%)	1,589 (87%)	70 (12%)	70 (12%)	106 (15%)	246 (13%)

Source: PIDA, *Performance Monitoring & Evaluation of Farmers Organizations*, October 2008.

After 2009, through JICA’s technical cooperation project, “Strengthening Irrigation Management System including Agriculture Extension through Farmers’ Participation in Punjab Province,” JICA offered training materials to FOs. These materials were used by PIDA at seminars provided for FO members (committee members, accounting and technical staff members). FOs were also offered manuals and casebooks focused on dispute resolution to increase FOs’ capacity. It was believed that these efforts contributed to FOs’ performance.

Thus, more than 80% of FOs began functioning after the introduction of PIM, although some variations occurred among FOs. The majority of farmers appeared to be satisfied with the FOs’ functions. However, some challenges remain (e.g., strengthening FOs’ legal authority).

BOX – The Results of a Beneficiary Survey Conducted in Two FOs in the Target Area.

For the project’s beneficiary survey, two FOs were selected from Part A area and interviews and questionnaire surveys were conducted with 100 farmers in each FO between February and March 2013. The first FO interviewed was Qabarwala (“Q” FO, below); the second FO interviewed was Nahra (“N” FO, below). The two FOs are located close to one another. However, “Q” was rated “satisfactory” and “N” was rated “poor” in the PIDA’s “Performance Monitoring & Evaluation of FOs” report. As shown in Table 5, the differences in abiana collection rates between the two FOs are notable.

Table 5. Shifts in two FOs’ abiana collection rates

Period	Qabarwala			Nahra		
	Abiana Assessment	Abiana Collection	Collection Rate (%)	Abiana Assessment	Abiana Collection	Collection Rate (%)
Kharif 2010	494	384	78	1,887	603	32
Rabi 2010-11	293	293	100	1,114	474	43
Kharif 2011	498	498	100	1,908	1,145	60
Rabi 2011-12	321	321	100	1,888	455	24
Kharif 2012	538	538	100	3,189	777	24
Total	2,143	2,033	95	9,985	3,448	39

Source: Data provided by AWB.

Note: Abiana Unit: One thousand rupees

Kharif: May-September; Rabi: October-April of the following year.

Table 6 shows the differences that occurred in basic attribute data and provides answers to key questions that highlight the differences in both FOs.

Table 6. Comparisons of basic data and farmers' responses to questionnaires conducted with two FOs

		Qabarwala	Nahra
Basic data	Cultivable Areas (Acres)	8,072	42,480
	Number of Farmers	about 2,000	about 5,500
	Lengths of Distributaries (miles)	4.02	36.86
	Number of Outlets	14	87
Farmers' responses to questions	Cultivable Area per Household (Acres)	6.69	10.29
	Main Water Source	Canal: 57.3%/ Tubewell: 42.8%	Canal: 18.7%/ Tubewell: 81.3%
	Have you been paying abiana on a regular basis since FO began collecting abianas?	Yes: 98.5%/ No: 1.5%	Yes: 76.4%/ No: 20.8%
	Do you attend FO meetings?	Yes: 45.9%/ No: 54.1%	Yes: 35.3%/ No: 64.7%
	Do you believe the FO's abiana collection has been transparent and fair?	Yes: 89.9%/ No: 7.3%	Yes: 77.5%/ No: 21.1%
	Do you think the FO's dispute resolution is more effective than before?	Better: 58.8%/ Worse: 13.2%	Better: 35.3%/ Worse: 16.2%
	Do you think the FO takes proper actions against water thefts?	Yes: 80.9%/ No: 14.7%	Yes: 64.3%/ No: 22.9%
	Does FO/PIDA use funds for O&M properly?	Yes: 58.2%/ No: 40.3%	Yes: 45.8%/ No: 51.4%
	Do you think FO elections are transparent and fair?	Yes: 87.3%/ No: 7.0%	Yes: 77.5%/ No: 21.1%

Based on comparisons between the two FOs, the following conclusions and presumptions were reached.

- A) In "Q" FO, farmers participated more frequently in FO meetings, abiana collection rates were higher, and FO elections were considered more transparent. Farmers believed "Q" FO was more effective in taking actions against water thefts and dispute resolutions than "N" FO was.
- B) "Q" FO was smaller than "N" FO. "Q" FO had a smaller number of farmers and the area of land per farmer was smaller. Its compact size and smaller number of small land owners might have made management of "Q" FO more effective.
- C) Based on on-site interviews conducted with FOs, "N" FO displayed sectionalism among some factions. Its FO committee was politicized and some farmers were uncooperative with FO committee members. Those factors may have contributed to "N" FO's poor performance.
- D) Many farmers who belonged to "N" FO stated that PIDA was unhelpful. They believed the former PID management system was better than the PIM management system. In contrast, many farmers who belonged to "Q" FO stated that they have been cooperative with PIDA and that PIDA's assistance with "Q" FO's capacity enhancement was important. Those farmers were confident in the new system

ii. Decreases in salinity

To reduce salinity, rehabilitation and/or new construction of drainage and irrigation

facilities or the reclamation of soil in saline ground water areas are required. At the time of the appraisal, the project included investment components of the rehabilitation of saline ground water tubewells and watercourse linings in saline ground water areas. However, in reality, the rehabilitation of tubewells was cancelled and the lengths of watercourse linings in the saline ground water areas were decreased.

In addition, the project's targeted area (Part A) is a less saline area. A more saline area (Part B/C, located in the western part of LCC) was targeted in the next Japanese ODA Loan projects. However, salinity situations differ based on weather conditions (e.g., rainfall volume, and so on), as well as on the exact locations of land areas (e.g., heads or tails of watercourses, and so on). Hence, it is difficult to assess the project's exact impact on decreasing salinity in the targeted area.

Therefore, it is difficult to grasp the project's direct effects (Components 1 and 2) on the reduction of saline ground water areas. However, it can be assumed that the rehabilitation and remodeling of drainage and irrigation facilities have led to an indirect increase in cultivable areas in Part A in Punjab province because the deterioration of facilities has caused increases in the number of saline ground water areas and decreases in cultivable areas.

3.3 Impact

3.3.1 Increases in cultivable areas, agricultural production and changes in crops

At the time of the appraisal, it was assumed that the project had contributed to farmers' increased agricultural production and poverty reduction. However, no quantitative baseline data was proposed. Increases in the water supply by the improvement of water courses might have been a major factor that contributed to increased agricultural production. However, other factors also contributed to these increases. Therefore, increased agricultural production was analyzed as an "impact," rather than a "quantitative indicator" for the project.

The major agricultural products in the target area include wheat, rice, sugarcane, maize, cotton, and so on. The cultivation of double crops or the cultivation of two crops in one year are popular in the area (e.g., rice is cultivated in Kharif and wheat is cultivated in Rabi). Punjab province is a major producer of wheat and rice.

Based on a survey conducted by the International Water Management Institute (IWMI) in Punjab in 2007, agricultural productivity in the target area increased around 10% beginning in 2004-2005. In addition, based on agricultural production statistics provided by the Pakistani Statistical Bureau, the number of cultivated areas of wheat, rice, and maize increased about 20% over the last ten years. In contrast, the number of cultivated areas of sugarcane decreased about 10% over the last ten years.

Table 7 shows shifts in the number of cultivated areas and shifts in wheat, rice, and sugarcane production in the target area between 2000 and 2011.

Table 7. Shifts in the number of cultivated areas and major crop production by district

Unit: One thousand hectares (Cultivated Area); One thousand tons (Production)

	Hafizabad (Part A)		Nankana Sahib (Part A · B)		Faisalabad (Part B · C)		Toba Tek Singh (Part B · C)		
	Cultivated Area	Production	Cultivated Area	Production	Cultivated Area	Production	Cultivated Area	Production	
Wheat	2000	129.9	345.8	0.0	0.0	262.2	766.9	144.9	412.9
	2001	132.7	340.8	0.0	0.0	250.1	651.8	142.1	401.7
	2002	133.5	367.1	0.0	0.0	254.1	716.3	146.5	423.2
	2003	138.0	357.9	0.0	0.0	265.1	789.2	151.3	428.8
	2004	134.4	373.2	0.0	0.0	276.8	901.7	154.6	463.5
	2005	139.2	386.9	142.0	414.2	273.6	793.5	158.6	460.7
	2006	140.4	392.3	138.0	411.1	263.5	817.1	157.8	464.2
	2007	148.1	425.2	159.0	451.2	265.9	697.4	157.0	456.0
	2008	161.5	464.8	166.3	493.7	289.3	846.0	163.1	490.4
	2009	161.1	412.3	141.2	373.7	303.1	861.3	164.3	460.2
	2010	153.0	486.8	113.7	340.9	283.7	897.4	156.6	538.8
Rice	2000	110.9	187.2	0.0	0.0	28.7	41.1	25.1	34.2
	2001	108.1	168.8	0.0	0.0	23.9	29.6	19.8	27.7
	2002	112.5	203.0	0.0	0.0	21.4	32.7	22.3	43.4
	2003	113.7	196.0	0.0	0.0	25.1	32.6	16.7	39.0
	2004	119.4	217.4	0.0	0.0	28.3	38.3	29.1	45.6
	2005	121.8	226.8	100.0	172.5	27.1	41.0	29.1	50.1
	2006	120.2	204.1	96.8	164.1	25.9	37.2	28.7	45.7
	2007	123.4	223.3	101.2	179.6	26.7	42.8	23.9	45.8
	2008	130.3	245.9	114.5	210.6	38.9	61.8	35.2	59.5
	2009	133.1	276.9	102.0	184.2	32.8	53.9	36.0	64.4
	2010	127.1	262.7	96.3	172.7	25.9	46.9	33.2	62.2
Sugarcane	2000	6.5	264.4	0.0	0.0	102.9	4,831.2	37.7	1,803.9
	2001	6.9	288.7	0.0	0.0	108.1	5,481.1	41.2	2,112.9
	2002	7.7	428.3	0.0	0.0	117.4	5,412.1	45.7	2,146.8
	2003	7.3	322.5	0.0	0.0	116.1	5,752.4	43.7	2,192.9
	2004	6.5	281.9	0.0	0.0	106.0	6,023.9	35.6	1,983.9
	2005	6.1	286.1	18.2	666.8	108.5	5,451.6	36.0	1,970.9
	2006	6.1	280.5	19.8	850.4	115.3	6,403.8	38.8	2,182.1
	2007	7.3	282.2	21.0	941.3	125.1	5,999.3	46.6	2,292.1
	2008	6.1	230.7	19.0	863.1	104.8	5,123.5	37.6	1,881.4
	2009	5.7	214.2	16.6	762.1	96.3	4,690.4	35.6	1,826.2
	2010	5.3	206.2	19.4	913.7	104.8	5,471.6	41.7	2,422.0

Source: Statistical Bureau of Pakistan.

Table 7 can be summarized as follows:

- (1) Hafizabad (Part A): After 2005, cultivated areas/ production of wheat and rice increased.
Cultivated areas/ production of sugarcane decreased.
- (2) Nankana Sahib (Part A/B): After 2005, cultivated areas/ production of wheat, rice, and

sugarcane increased significantly.

- (3) Faisalabad & Toba Tek Singh (Part B/C): After 2008, cultivated areas/ production of wheat and rice increased significantly.

In short, cultivated areas/ production of major crop increased in target areas after 2005.⁹ The increase of cultivated areas/production of major crop was considered to be caused by stable water supplies, improvement of agricultural technology,¹⁰ weather changes, and so on. Some FO members stated that improvements to water channels contributed to increased agricultural production and the improvement of soil quality. These responses imply that the project's attempts to improve water channels exerted positive impacts on increased crop production, although they might not have been the sole cause of this increase.

On the other hand, because the project rehabilitated only a portion of the whole canal system (i.e., some core parts of the canal system and the linings of some watercourses), it is difficult to determine exact figures that reveal the Japanese ODA Loan's exact contributions to stable water supplies in the canal system.

3.3.2 Other Positive or Negative Impacts

i. Impacts on the natural environment

The design of the JICA project was based on "The Drainage Sector Environmental Assessment (DSEA)" completed in 1993 by WAPDA. Any construction works that would have exerted negative impacts on the environment were forbidden. In addition, based on a "Performance Review" conducted by PIDA and JICA, farmers responded that two major negative factors that affected the environment were the fact that cattle entered the watercourses and the fact that they excreted feces into the watercourses. No reports were made that stated that rehabilitation and construction of the water channels led to plague outbreaks or soil deterioration in the target area.

ii. Land acquisition or resettlement

Because the project primarily focuses on the rehabilitation of existing facilities, no specific problems related to land acquisition or resettlement have developed. In some portions, pooling areas were expanded at branches. However, this occurred on farmland. Compensation for the land was properly provided in accordance with the "Framework for Land Acquisition and Resettlement." Four off-farm construction works were created on government-owned land area.

⁹ Table 7 also shows that cultivated areas/production of rice and sugarcane increased after 2008 in Parts B and C, which is the target area for the next Japanese ODA Loan projects.

¹⁰ In Part B, JICA conducted the "Strengthening Irrigation Management System Including Agriculture Extension Through Farmers' Participation in Punjab Province" between 2009 and 2013. It attempted to expand agricultural productivity by improving agricultural techniques. It has been reported that productivity increased between 10% and 30% in the pilot area.

However, no resettlement of residents was required.

In light of the above, the project has largely achieved its objectives, therefore its effectiveness and impacts are considered high.

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

Four output components were available at the time of the appraisal. Major deviations in actual output from planned output are summarized in Table 8.

Table 8. Major changes in output (Planned and Actual)

	Planned	Actual
Component 1: Off-farm drainage & irrigation facilities in Punjab	<ul style="list-style-type: none"> – Off-farm surface drains: 4,139km (Rehabilitation/ remodeling: 3,550 km; New construction: 589 km) – Rehabilitation/replacement of tubewells: 530 units; Construction of major cross drainage – Rehabilitation, remodeling and lining of canals (Distributaries and Minors) 	<ul style="list-style-type: none"> – Off-farm surface drains: Rehabilitation/ remodeling: 2,929 km; New construction: 77 km – Rehabilitation/replacement of tubewells, Construction of major cross drainage: Cancelled – Rehabilitation, remodeling, and lining of canals: Lining of Distributaries/Minors: 411 km; Rehabilitation and remodeling: Distributaries/Minors: 343 km; Main/Branch Canal: 113 km; 108 new structures constructed on canal system
Component 2: On-farm drainage & irrigation facilities in Punjab	<ul style="list-style-type: none"> – On-farm drains: 30,000acres – Tile drains: 3,000 acres – Watercourse linings in saline ground water areas: 750 	<ul style="list-style-type: none"> – Surface drains: 1 – Tile drains: Cancelled – Linings: 499 watercourses
Component 3: RBOD priority works	<ul style="list-style-type: none"> – Remodeling of necessary structures: 110 km 	<ul style="list-style-type: none"> – Cancelled
Component 4: Training Services	<ul style="list-style-type: none"> – Training, seminars, study tours for WAPDA, Provincial Irrigation & Drainage Authority, Area Water Board, FOs, PAD 	<ul style="list-style-type: none"> – UNOPS awarded training contract. However, it was not fully implemented and was ultimately cancelled. Later, WAPDA implemented the training services.

The causes of major deviations in actual output from the planned output noted above are listed below:

- (1) Since the project began, time was required to specify sub-projects and coordinate project formation among the many stakeholders. In addition, delays caused bid prices to exceed the original estimates. Contracts were either never awarded or further delayed. Ultimately, the procurement process began after 2004. (In particular, this delay affected Components 1 and 2.
- (2) Delays in the identification and construction of sub-projects led to delays in the initiation of institutional reforms of the PIM of channels. FOs were established after 2005. (This

delay affected Component 4.)

- (3) Sindh Province did not agree with NDP's "Right Bank Outfall Drainage" (RBOD) plan. This component was conclusively cancelled, including the World Bank Project component.¹¹

Those initial delays were highlighted as serious problems during the Joint Mid-Term Review by the WB, Asian Development Bank (ADB), and JICA which was conducted in 2001. These delays were also highlighted in the Joint Donor Review which was conducted in 2002. Ultimately, the scope of Japanese ODA Loan was modified in January 2003. Both JICA and ADB decided to extend their assistance periods until the end of 2006. JICA refocused its assistance components in the following ways:

- (1) Project Components 1 and 2 focused on the support, replacement, and/or rehabilitation of canals located in Lower Chenab Canal.
- (2) Finances for Project Components 1 and 2 only apply to Part A, which covers LCC (East).
- (3) Rather than including sub-projects in Parts B and C, the project included the improvement of distributaries and minors in Punjab Province, regardless of whether they were financed by NDP.
- (4) The requirements for and impacts of tubewells in saline ground water areas should be verified, because they might lead to the development of saline water tubewells.
- (5) Timely progress in the institutional reform of irrigation management is the project's touchstone. Therefore, clear visions and strategies for the improved division of roles among PID, PIDA, and FOs should be proposed. JICA supports its survey on institutional reform.

The United Nations Office for Project Services (UNOPS) was selected as a consultant to provide training services (Component 4) in January 2001. UNOPS implemented 1,204 Person/Days of training (43 million Rs.). However, the contract was terminated because of disagreements that developed on the Pakistani side in September 2003.¹²

In April 2004, the Federal Programme Steering Committee (FPSC) decided to restart new training activities based on the Consolidated Training Plan (CTP) under the direct

¹¹ The World Bank's NDP has located its investment component in Sindh Province. The World Bank Inspection Panel received a Request for Inspection from local residents and NGOs in September 2004 because "the extension of Left Bank Outfall Drainage (LBOD) to the upper stream of the Indus Basin would risk an increase in LBOD water levels and badly affect the already degraded environment of the Indus Basin." In addition, they claimed that the WB Environmental Assessment underestimated the NDP project's negative impacts on marine resources. The Inspection Panel began its work in November 2004. It presented its report to the World Bank's Executive Board in October 2006. Ultimately, the project component was cancelled.

¹² The contract was terminated because WAPDA complained that UNOPS' performance and delays in institutional reforms caused poor project performance. Termination of the contract led to another issue: Returns of advance payments to UNOPS were also delayed.

supervision of WAPDA.¹³

The contents of training services conducted at the provincial level are shown in Table 9. Most seminars and trainings were conducted in Punjab Province. The largest number of trainings was provided to FOs.

Table 9. Contents of seminars/trainings implemented in provinces

Activities	Unit: Person/Days		
	Punjab	Sindh	NWFP
National Seminars/Workshops	678	-	924
Off-the-Shelf Courses, and so on	540	709	
FO Trainings	17,389	-	
Short Courses ¹⁴	800	-	
Learning Tours	227	-	
Subtotal	19,634	709	924
Total	21,267		

Source: WAPDA.

3.4.2 Project Inputs

3.4.2.1 Project Costs

The project was co-financed by the WB, ADB, and JICA and supported by the Government of Pakistan. The actual project costs as of December 2006 are shown in Table 10 (the right column of the table shows completion rates). Initially, the project was supposed to cost 85 million US dollar (foreign currency: 531 million US dollar, local currency: 254 million US dollar). However, the actual project costs amounted to 310 million US dollar (foreign currency: 203 million US dollar, local currency: 107 million US dollar), which amounted to 39.6% of the planned costs.¹⁵

Table 10. Project costs covered by the WB, ADB, JICA, & GoP (Planned/Actual)

	Unit: million US dollar		
	Planned	Actual	Implementation Rate (%)
JICA	106.5	51.3	48.2
WB	284.9	126.6	44.4
ADB	140.0	25.3	18.1
Government of Pakistan	253.6	107.4	42.4
Total	785.0	310.6	39.6

Note: Exchange Rates:

Planned: US\$ 1= Rs.33.69= 101.73 yen (Rs.1= 3.02 yen). Base year: December 1995

Actual: US\$ 1= Rs.60.49= 121.59 yen (Rs.1= 2.01 yen). Base Year: December 2007.

¹³ The following is an outline of the contents of training services: Central government level: 818 person/days (foreign seminars: 35 person or 322 person/days; domestic seminars: 62 persons or 496 person/days). Provincial level: 21,267 person/days. Training targets were primarily staff members of PIDA, AWB, and FOs. Seminar equipment: 6.3 million Rs. (A Vehicle, Computers, and so on).

¹⁴ One-to three-week trainings on drainage and irrigation and environmental issues were provided to staff members.

¹⁵ With respect to project costs, the evaluation team solely evaluated Japanese ODA Loan portion, taking into account the progress, implementation situations, and challenges faced by the entire NDP project.

The project was co-financed by the WB, ADB, and JICA. They coordinated policy direction and institutional reforms. However, they divided their geographical targets for the channels in the following ways:

WB: Drainage and irrigation facilities (Sindh Province, Punjab Province)

ADB: Drainage and irrigation facilities (NWFP, Balochistan Province)

Construction of drainage system (RBOD, LBOD)

JICA: Drainage and irrigation facilities (Punjab Province)

Construction of drainage system (RBOD)

With respect to the Japanese ODA Loan portion, Component 3 was cancelled and the costs for Components 1 and 2 were reduced from the costs included in the original plan. Actual costs were 57.6% (6,238 million yen/10,832 million yen) in comparison with planned costs.

Considering the scope changes made in January 2003, actual costs were 64.2% (6,238 million yen/9,720 million yen), based on calculations that excluded Component 3. (Table 11 also shows the extent of project completion as of December 2002, just prior to the scope changes made in January 2003.)

Table11. Comparisons of Planned and Actual Costs

	Planned	Unit: One million yen	
		(Dec. 2002)	Actual (Dec. 2006)
Component 1	5,541	900	5,540
Component 2	1,469	5	248
Component 3	1,112	0	0
Component 4	1,341	246	341
Contingencies	710	0	0
Interest accrued during construction (IDC)	659	13	109
Total	10,832	1,165	6,238

Note: Exchange rates used in this table are the same as the exchange rates used in Table 10 for Planned/Actual costs.

Exchange rate in December 2002: US\$ 1 = 120 yen.

3.4.2.2 Project Period

At the time of the appraisal, the project was planned to run from March 1997 to August 2001 (54 months). However, the project actually ran from April 1997 to December 2006 (117 months). This represented a delay of 5 years and 4 months (217% delay).¹⁶ Therefore, the project period exceeded more than twice the length of the project period included in the original plan. Comparisons of original and actual project periods by component are shown in Table 12.

¹⁶ The World Bank's NDP project was terminated in December 2004 as planned, regardless of delays in project progress. Both the ADB and JICA extended the NDP Project completion period until the end of 2006.

Table12. Comparisons of project schedules (Planned and Actual)

Items	Planned	Actual
L/A	March 1997	April 1997
Component 1	April 1997-August 2001	March 2003-November 2006
Component 2	April 1997-August 2001	July 2002-December 2006
Component 3	April 1997-December 2000	Cancelled
Component 4	July 1996-August 2001	UNOPS: January 2001-September 2003 WAPDA: April 2004-December 2006
Project completion	August 2001	December 2006

As shown in Table 12, project progress stagnated from its initiation in 1997 until mid-2002. During the initial stage, irrigation management system reform continued to progress. Substantial executing agencies, such as PID, were not fully involved in the planning process. PIDA had not become effective so soon after the establishment of the organization. Reportedly, those factors hindered effective project implementation.

JICA's responses to the above-mentioned delay factors are summarized in Table 13.

Table 13. Major causes for delays and responses to delays

Major Causes for Delays	Responses to Delay Factors
It took one year for L/A effectuation because of delayed enactment of the PIDA Act, one of the prerequisites for effectuation. Time was required to specify sub-projects and to coordinate plans among many stakeholders in the government of Pakistan.	All sub-projects were contracted by the end of 2004 by refocusing target sub-projects. Rehabilitation and construction works were completed by the end of 2006.
The project includes the structural reform of irrigation management transfer and related organizations. This requires many discussions and the time to coordinate decisions for project direction.	The president initiated the establishment of a special committee in 2002 that promoted institutional reform and reconstitution of the project. A committee that functioned at the federal government and provincial levels periodically monitored the project's progress.
Participatory Irrigation Management was pursued and FOs were newly established. However, time was required to decide methods to be used to transfer management to the FOs and to mobilize, organize, and train the FOs.	JICA conducted its survey on the progress achieved in FO formation and promoted institutional reform in Punjab Province. Later, the establishment of FOs accelerated. It was completed in the pilot area by December 2004.

3.4.3 Financial Internal Rate of Return (FIRR) (for reference)

At the time of the appraisal, the Financial Internal Rate of Return (FIRR) had not been calculated. The Economic Internal Rate of Return (EIRR) of Components 1-3 was estimated as 38.0% based on the following assumptions. Component 4 (training) was excluded from the calculation because its benefits were difficult to estimate.

Cost: construction costs, operation and management (O&M) costs

Benefit: increased agricultural production

Project life period: 20 years after completion

In a Project Completion Report (PCR) produced by the Pakistan government, the EIRR for the drainage component in Punjab Province as a whole was estimated as 14.5%, based on figures provided for each NDP sub-project. The WB Implementation Completion Report (ICR) for its NDP project estimated that the EIRR of the WB assisted investment component was 15.0%.

To calculate EIRRs, both completion reports used the estimations of increased agricultural production as project benefits. However, crop production can be affected by many factors other than actual project effects. In addition, exact impact areas can be difficult to identify. Although it can be difficult to make accurate calculations of project benefits, the EIRR for the JICA portion in Punjab Province amounted to 14.5%, based on the same estimations of increased agricultural production used in the PCR produced by the Pakistani government.¹⁷

Project costs were much lower than planned and the project period was extended more than twice. Therefore, the efficiency of the project is fair.

3.5 Sustainability (Rating: ②)

3.5.1 Structural Aspects of Operations and Maintenance

The project's official execution agency was WAPDA. It functioned as the coordination body responsible for inter-provincial issues including NDP. Irrigation policies and projects for each province remain under the jurisdiction of each provincial government. O&M of channels located in Punjab Province are jointly managed by PID, PIDA, AWB, and FOs. The substantial execution agencies for Components 1 and 2 are PID/PIDA. They are responsible for implementation, monitoring and evaluation, and O&M in Punjab Province.

WAPDA is a large agency that employs around 10,000 staff members. Its main pillar is a power wing, and its water wing is relatively small.

PIDA was established in 1997, as part of an irrigation management reform conducted by the Punjab Irrigation Department (PID). After PIDA was established, its recurrent costs were covered by the Punjab Provincial Government's project budget. Most staff members were hired on contracts. However, a decision was made that PIDA would become a permanent body supported by the Punjab Government budget since the fiscal year 2013/14.

After 2005, the Area Water Board (AWB) was established to perform O&M of branch canals. Two AWBs were established in the target areas of the JICA project. Farmers' Organizations (FOs) performed O&M of distributaries. Water user associations (Khal Panchayats) performed O&M of minors. Canal systems were managed by a participatory

¹⁷ This calculation of the IRR was based on data that appeared in the Pakistani government's report. The data was based on rough estimations of future agricultural production. However, our team relied on this data because no other credible data could be found at the time the evaluation was conducted.

framework composed of those organizations. Water User Associations (Khal Panchayats) were introduced by the Punjab Agricultural Department (PAD) as models of participatory management. Their membership overlapped with FOs. As mentioned above, the Punjab government intends to establish PIM based on the FOs. However, PIDA continues to play a significant role, especially with respect to the technical aspects of O&M. Divisions of roles between FOs and PIDA are described below.

Abiana collection and O&M of channels were conducted by PID/PIDA prior to 2004. However, Irrigation Management Transfer (IMT) progressed after 2005. Three stages are included in the process: (1) 2005–2007: Pilot phase in which O&M was transferred to newly established FOs under PIDA's supervision. (2) 2007–2010: Transitional period during which FOs that performed well were encouraged to increase their independent management. PIDA intervened strongly in FOs that performed poorly. (3) After 2010: PIM was officially introduced by FOs by transferring O&M to FOs. PIDA continued to offer support to FOs to strengthen their capacities.

AWB was established to support FOs' PIM in 2005. AWB has functioned since 2007. The chairman of AWB is the representative for FOs. The co-chairs consist of FOs and PIDA. However, AWB has not yet become fully effective because many staff members their expected transfer from PIDA has not yet occurred.

After 2009, JICA provided capacity building seminars to PID/PIDA staff members and assisted in the development of training materials employed by PIDA for FOs, as part of its technical cooperation project, "Strengthening Irrigation Management System Including Agriculture Extension Through Farmers' Participation in Punjab Province."

3.5.2 Technical Aspects of Operation and Maintenance

PID has been engaged in the O&M of water channels for many years. It employs technical staff members that possess sufficient experience. PIDA was established in 1997. Plans were made for O&M staff members to be transferred from PID, and staff transfers have been conducted since 2002. PIDA then began its management of water channels. Technical aspects of the O&M of channels continue to be managed by PIDA's technical staff, and their expertise remains as strong as it was prior to the transfer.

PID/PIDA continues to manage main and branch canals. The new PIM system, which is jointly managed by FOs and AWB, was introduced to address the O&M of distributaries and minors.

However, some challenges developed in relation to those institutional reforms.

One major challenge is the shortage of technical capacity that FOs are required to perform O&M of water channels. FOs have very limited capacity and human resources to perform technical O&M. Ultimately, they continue to depend on PIDA and AWB technical staff

members.

PIDA plans to place four or five civil engineering engineers/ technicians in the area covered by AWB. FOs are performing O&M using workers provided in cooperation with PIDA. However, the transfer of staff members from PIDA to AWB has stagnated. Yet, FOs and AWB depend on PIDA technical staff members to perform O&M.¹⁸ PIDA provides seminars for FOs that primarily focus on daily maintenance work (cutting/trimming berms, desilting channels, and so on).

Remaining challenges include ways to utilize PIDA and AWB's technical staff in the FOs' PIM and ways to divide O&M costs among PIDA, AWBs and FOs.

3.5.3 Financial Aspects of Operation and Maintenance

Prior to 2005, PID collected abiana and conducted the O&M of channels. The FOs began collecting abiana after 2005. (Abiana rates are assessed based on the number of acres and the types of crops cultivated regardless of water supply volume used.) In cases of abiana collection shortages, the Punjab provincial government supplements those deficits. However, actual spending for O&M has been significantly lower than spending for required O&M costs (e.g., around 15% in 1992).¹⁹ The following factors are suggested as possible causes of O&M budget shortages: (1) Very low abiana rates were set for political reasons. (2) A significant part of the O&M budget was used to cover PID personnel costs. (3) Abiana collected by PID was sent to the provincial treasury by revenue offices. They were not used directly for O&M.

As mentioned above, FOs' establishment of PIM can be divided into three stages: (1) the "pilot stage" (2005–2007), (2) the "transitional stage" (2008–2010), and (3) the "full-scale stage" (after 2010). After 2005, collected abiana was apportioned. A 40% share was given to FOs and a 60% share was given to PIDA. PIM was promoted in a collaborative manner among the FOs and PIDA. After 2008, FOs that performed well were given 50% shares of collected abianas.

As shown in Table 2, abiana collection rates have hovered around 70% since 2005. This is an improvement from 35%-45% levels achieved prior to 2004 when PID collected abiana. After 2010, during the full-scale stage that included the introduction of PIM, abiana collection rates increased. However, these rates have decreased again in recent years. This fact demonstrates that PIM continues to face some challenges.

During interviews conducted with a number of FOs, some FOs stated that the abiana collected was sufficient to cover the required costs of O&M for watercourses. However, other FOs stated that collected abianas were too low to cover the costs of O&M. Most FOs noted that the problem resides in the low abiana rates because O&M costs must be covered by

¹⁸ As of June 2013, only 34 staff members have come from PIDA. This number differed from the official number of 137 staff members employed by AWB (LCC-East).

¹⁹ Based on an interview conducted with PID (June 2013).

collected abiana. Abiana rates are purposely kept at very low levels by the Punjab provincial government because of political considerations. PID has requested that the Punjab government raise abiana rates. In May 2013, PID proposed a plan that would raise abiana rates from 135 Rs. per acre to 245 Rs. per acre. However, these rates would only cover 15%-20% of required O&M costs. Additional increases in rates will be required to ensure future financial sustainability.

Based on a “Performance Monitoring & Evaluation of FOs” survey conducted in 2008: (1) the number of FOs that increased their incomes from abiana, rather than their expenditures, decreased from 68 to 45. The number of FOs that showed deficits increased from 16 to 39. (2) In general, personnel costs were higher than O&M costs. According to the detailed questionnaire used in the survey, budget surpluses were realized by controlling expenditures. Deficits were caused by FOs’ high personnel costs.

Table 14. O&M expenses and works performed by FOs

Major O&M Works performed by FOs	Expenses (Rs. in millions)				Number of FOs
	2005-06	2006-07	2007-08	3-Year Total	
Desilting Channels	3.46	3.57	3.95	10.98	56
Strengthening Banks	1.25	2.17	1.30	4.73	57
Cutting/Trimming Berms	4.58	6.97	3.02	14.57	47
Repairing Outlets	0.78	1.61	1.49	3.88	61
Road/Path Inspections	0.23	0.10	0.37	0.70	13
Repairing Breaches/Cuts	2.41	3.20	2.32	7.94	60
Bush Removal	0.25	0.27	0.72	1.25	23
Other O&M Works	0.63	0.92	0.33	1.97	n/a
Total O&M Expenses for Works Performed	13.60	18.90	13.51	46.01	84 in Total

Source: PIDA, *Performance Monitoring & Evaluation of Farmers Organizations*, October 2008.

Note: “Number of FOs” means the number of FOs that conducted major O&M Works listed in the left column within three years (the total number of active FOs is 84).

Table 14 shows O&M expenses for FOs and for O&M works implemented by FOs. Major O&M works conducted by FOs are daily tasks, such as “desilting channels” and “cutting/trimming berms.” Expenses for repair work, such as “strengthening banks,” “repairing outlets,” and “repairing breaches/cuts” were not very high. The right column lists the number of FOs that conducted O&M works listed in the left column. The table demonstrates that some FOs did not implement any daily maintenance and repair efforts.

In conclusion, many FOs were able to maintain a financial balance among income provided by collected abiana, expenditures for O&M, and personnel costs. However, in general, the FOs’ financial status must improve. One major challenge is the fact that the number of FOs that enjoyed budgetary surpluses decreased and the number of FOs that suffered deficits increased. This might lead to the deterioration of drainage and irrigation facilities because required repair works might not be performed in the mid-term future. Most AWB staff

members and FO committee members proposed that one improvement measure would be to raise abiana rates to sustainable levels.

3.5.4 Current Status of Operation and Maintenance

PID and PIDA continue to manage main and branch canals. Many facilities are more than 100 years old; they were constructed during the colonial era. Yet, those facilities are maintained in proper condition because O&M work is being performed

On the other hand, FOs began to manage distributaries and minors based on the PIM system. Irrigation Management Transfer (IMT) also continues to progress. However, it has been reported that many FOs continue to depend on O&M works conducted by PID/PIDA. Even FOs that perform well are unable to conduct required water channel repairs. In fact, some distributaries and minors were not improved in the Part A area. Those channels must be rehabilitated in the future by the use of governmental investments. In addition, some channels have deteriorated during the 7-8 years that passed after rehabilitation was performed between 2004 and 2006. Some breaches and cuts were caused by insufficient repair work. Some challenges continue to affect the PIM system's technical and financial sustainability, as mentioned above. In addition, it is expected that required costs for repairs and maintenance of water channels will increase over the long term.



Chart 3. Branch rehabilitation



Chart 4. New construction of cross drainage



Chart 5. Lining of distributary



Chart 6. Lining of minor



Chart 7. Channel tail



Chart 8. Unrepaired distributary



Chart 9. An example of a leaking minor

In light of the above, some problems have been observed in terms of technical and financial aspects of operation and maintenance. Therefore, sustainability of the project is fair.

4. Conclusions, Lessons Learned, and Recommendations

4.1 Conclusions

Drainage and irrigation facilities are basic infrastructure required for agriculture in Pakistan. The improvement of those facilities is relevant to development policy and development needs in Pakistan, as well as to Japan's ODA policy. Thus, its relevance is high.

After 2004, the rehabilitation and remodeling of drainage and irrigation facilities has progressed steadily. The number of cultivated areas and the production of major crops, such as wheat, rice, and sugarcane, have increased in target areas. Participatory Irrigation Management (PIM) also began to progress after 2005. Farmers' satisfaction rates are relatively high with respect to dispute resolutions, responses to water thefts, O&M of channels, and abiana collection, although the performance of these functions varies among FOs, particularly with respect to abiana collection rates. Thus, this project has largely achieved its objectives. Therefore, the project's effectiveness and impacts are considered to be high.

Project implementation was delayed. It was not completed until 2002, the original completion period. However, implementation increased rapidly after 2004. The project costs were much lower than planned. However, the project period was extended more than twice. Therefore, the efficiency of the project is fair.

On the other hand, the O&M of water channels rehabilitated and constructed by this project was transferred from PID/PIDA to AWB/FOs based on the concept of PIM. However, reforms must continue. Some challenges continue to affect the technical and financial aspects of O&M, although some positive factors have developed, such as JICA's technical cooperation project's efforts to enhance capacity of FOs. Thus, sustainability of the project is fair.

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

4.2 Recommendations

4.2.1. Recommendations to the Executing Agencies (PID/PIDA)²⁰

- i. The O&M mechanism for drainage and irrigation facilities is the key to the project's sustainability. The establishment of FOs and the introduction of Participatory Irrigation Management (PIM) are extremely important. However, the transfer of authority and personnel from PIDA to AWB has not progressed as planned. PIDA and PID with higher authority should take concrete actions to fill AWB's staff vacancies as planned.

- ii. Many stakeholders noted that the abiana rates per acre are too low to maintain financial sustainability of O&M of channels. Abiana rates should be raised to realistic levels to support sustainable irrigation management. In addition, the provision of additional legal support to strengthen FOs' authority is required to ensure abiana collection from defaulters and to provide effective control of water thefts. The Punjab provincial government is responsible for legislation. It should take action to revise relevant laws and regulations.

4.2.2 Recommendations to JICA

Although institutional reforms for PIM began moving in the right direction, the reforms continue to face a number of challenges, such as low abiana collection rates, FOs' limited capacity, the influence of large land owners and political factions on FOs, and so on. JICA should continue to provide assistance with institutional reforms and FOs' capacity enhancement. For example, JICA could offer examples of good practices performed in other countries, suggest ways to address those challenges, and develop methods other than abiana collection that might be used by FOs to obtain additional income.

4.3 Lessons Learned

One prerequisite for a project based on the "program approach," such as NDP, is that the counterpart agency must have sufficient capacity to perform planning, implementation, and monitoring. Use of the program approach concept for the NDP project was unsuccessful because organizations in the drainage and irrigation sector operated under a drastic reform process during the project's initial stage. Substantial executing agencies, such as PID/PIDA, were not involved in the planning process. In addition, many political factors constrained institutional reforms. Therefore, when the program approach is adopted, the voices of relevant

²⁰ Because PID/PIDA are substantial counterparts of the project, rather than directing recommendations to WAPDA, recommendations to the executing agencies are directed to PID/PIDA, after consultations with them.

stakeholders (including beneficiaries in target areas) should be included in the program formation process. Clear strategies and sub-components' priorities, as well as concrete implementation schedules, should be formulated to ensure the effective implementation of the program

Comparisons of the Project's Original and Actual Scope

Items	Planned	Actual
1. Project Outputs Component 1: Off-farm drainage & irrigation facilities in Punjab Component 2: On-farm drainage & irrigation facilities in Punjab Component 3: Right Bank Outfall Drain (RBOD) priority works Component 4: Training services	– Off-farm surface drains: 4,139 km (remodeling: 3,550 km; new construction: 589 km) – Rehabilitation/replacement of tubewells: 530 units – Construction of major cross drainage – Surface drains: 30,000 acres – Tile drains: 3,000 acres – Watercourse lining in saline ground water areas: 750 Remodeling of necessary structures: 110 km – Training, seminars, study tours for WAPDA, Provincial Irrigation & Drainage Authority, Area Water Boards, FOs, PAD.	– Off-farm surface drains: Rehabilitation/remodeling: 2,929 km; New construction: 77 km – Rehabilitation/replacement of tubewells, construction of major cross drainage: cancelled – Lining of Distributaries/Minors: 411 km; rehabilitation and remodeling: 343 km; (Distributaries/Minors): 113 km; (Main/Branch Canal): 108 new structures constructed as part of canal system – Surface drains: 1 – Tile drains: cancelled – Watercourse lining: 499 Cancelled – UNOPS received the training contract but training was not implemented. Ultimately, it was cancelled. Later, WAPDA implemented training services.
2. Project Period	March 1997 – August 2001 (54 months)	April 1997 – December 2006 (117 months)
3. Project Costs WB/ADB/JICA Pakistan Gov. * Total JICA loan portion Exchange Rate	582 million dollar 209 million dollar 791 million dollar 10,832 million yen (106.5 million dollar) US\$ 1 = Rs. 33.69 = 101.73 yen (Rs. 1 = 3.02 yen) (as of December 1995)	203 million dollar 107 million dollar 310 million dollar 6,238 million yen (51.3 million dollar) US\$ 1 = Rs. 60.49 = 121.59 yen (Rs. 1 = 2.01 yen) (as of December 2007)

* Note: The project was co-financed by the WB, ADB, JICA, in assisting the Government of Pakistan. The GoP project cost constituted one part of the total project costs.

People's Democratic Republic of Algeria

Ex-Post Evaluation of Japanese ODA Loan
“Earthquake-Affected Education Sector Reconstruction Project”

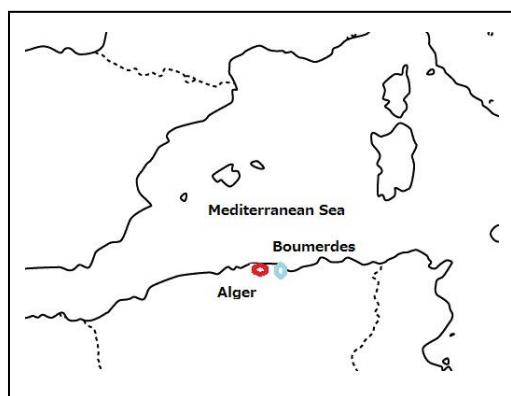
External Evaluator: Takeshi Daimon, Waseda University

0. Summary

This project was intended to rebuild primary, middle and high schools in Algeria—a country hit and severely damaged by an earthquake in May 2003 in order to attain the pre-quake level of education services as well as to realize highly earthquake-resistant school facilities using Japanese earthquake experience. The relevance of this project is considered to be high, because it reflects the reconstruction policy and needs of the education sector, as well as the core human infrastructure of the country, and is also consistent with Japanese assistance policy. The effectiveness as well as impact of the project is considered to be high, because the project was effectively realized nearly as planned, and the physical structure of the affected primary, middle, and high schools became more earthquake-resistant, allowing children to go back to school, and the quality of the educational services such as the class size was raised to the pre-quake level. However, the efficiency is considered to be low, because the project took much longer period and higher cost than originally planned. On the other hand, the sustainability is considered to be high, because there was no major institutional, technological and financial issue raised for the operations and maintenance.

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

1. Project Description



Project Map



Rebuilt School (Boumerdes)

1.1 Background

On May 21, 2003, Algeria was hit by an earthquake that measured 6.7 on the Richter scale and whose epicenter was off the coast of Zemmouri in Boumerdes Province, 70 kilometers east of the capital city of Algiers, leaving a total of 2,274 dead, 11,452 injured (of whom 1,378 dead and 6,789 injured in Boumerdes, and 883 dead and 3,444 injured in Alger), about 1.8 million houses damaged, and many facilities providing public services either collapsed or rendered inoperative.

After the quake, Algerian Government gave top priority to assist the survivors by securing their immediate needs in terms of food and shelters, while at the same time launched a post-earthquake reconstruction plan (July 2003) requiring financial needs of 820 million US dollar for needy sectors (water management, health, education, port, road, airport, railway, and house, of which house is the largest size needing 490 million US dollar), asking assistance for donors including Japan.

The field survey¹ showed that victimized students of primary, middle, and high schools had to 1) use nearby classrooms and dormitories (for school masters, teachers, and students), 2) move to pre-fabricated temporary schools, or 3) quick-fix the existing schools. As a consequence, some schools had to have two-shift system, the average class size was higher than the national average, and the education materials (math, science, and arts) are not arranged, so overall educational environment worsened significantly since the earthquake. Also, those quick-fix or pre-fabricated temporary schools are less likely to resist the earthquakes of similar magnitude that may hit the nation again in future, which proved the necessity of rebuilding quake-resistant schools and this project was launched.

1.2 Outline of the Project

The objective of this project is to rebuild primary, middle and high schools, in Boumerdes and Alger Provinces, especially damaged areas from the earthquake that hit Algeria in May 2003, by raising the quality of the education services in the assisted schools, thereby contributing to help recover the socio-economic situation of those areas.

¹ This survey was conducted by the local consultant.

Loan Approved Amount/ Disbursed Amount	1,943 million yen / 1,486 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	September 2004 / June 2005
Terms and Conditions	Interest Rate: 1.5% Repayment Period: 25 years (Grace Period 7 years) Conditions for Procurement: General Untied
Borrower / Executing Agency(ies)	People's Democratic Republic of Algeria / Ministry of National Education
Final Disbursement Date	November 2010
Related Projects	European Investment Bank (December 2003) Loan for Road and Transport Infrastructure, Water Resource Management, Schools and Houses (230.0 million euros), France (June 2004), Loan for Housing Related Infrastructure (50 million euros) JICA Technical Assistance "Algerian Earthquake Micro-Zoning Survey" (February 2005 to September 2006), etc.

2. Outline of the Evaluation Survey

2.1 External Evaluator

Takeshi Daimon, Waseda University

2.2 Study Period

This ex-post evaluation was conducted as follows:

Study Period: From October 2012 to August 2013

Field Survey: Cancelled

2.3 Limitations of the Evaluation

The field survey was cancelled due to a worsened security situation. Hence, this ex-post evaluation was conducted based upon a review of various reports and replies to a questionnaire

collected from the executing agency. Additional information was obtained from the executing agency through a local consultant.

3. Results of the Evaluation (Overall Rating: B²)

3.1 Relevance (Rating : ③³)

3.1.1 Relevance to the Development Plan of Algeria

In July 2003, two months after the great earthquake, the Government of Algeria drafted a “Post-Earthquake Reconstruction Plan” (820million US dollar), covering water resource management, health, education, public works, public transportation, and housing. The reconstruction and rebuilding of the education sector, including this project, represented 16% of the whole plan, reflecting the country’s priority given to this sector.

The Algerian economy largely depending on the petroleum and natural gas sector, representing about 30% of GDP and more than 95% of its export, has pursued a policy by which to diversify the economic structure by, for example, developing a tourism sector, and to this end, human development has been pursued as a top priority policy, in order to realize high value added economy. This position has not been altered since the earthquake, and the high priority is given to the education sector; according to the latest “Five-Year Plan 2010–14,” 1,300 primary schools, 500 middle schools, and 500 high schools are under rehabilitation and 400 school dining halls are under construction.

3.1.2 Relevance to the Development Needs of Algeria

Boumerdes and Alger Provinces were the most severely damaged, and nearly 1/3 of school in Boumerdes and more than 1/10 schools in Alger were completely or near completely destroyed, and about 340 thousands students were affected. At that time, there were 331 primary schools, 64 middle schools, and 26 high schools in Boumerdes, and 820 primary schools, 257 middle schools, and 110 high schools in Alger; of these, this project assisted 36 of the most severely damaged schools.

² A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory.

³ ③: High, ②: Fair, ①: Low.

Table 1 Number of Damaged Schools in Boumerdes and Alger Provinces

	Province	Primary Schools	Middle Schools	High Schools
Total Schools	Boumerdes	331	64	26
	Alger	820	257	110
Damaged Schools	Boumerdes	238	45	25
	Alger	230	128	66
Severely Damaged Schools	Boumerdes	100	10	7
	Alger	64	37	18

Source: Algerian Ministry of National Education

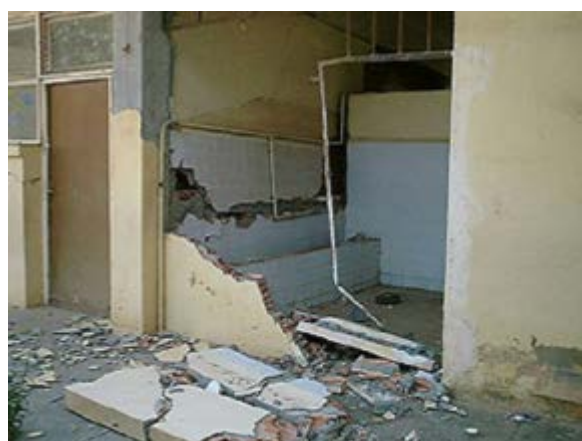


Figure 1 School Building Damaged by the Earthquake (Boumerdes)

Source: Ministry of Foreign Affairs Web Page

This project selectively targeted the locations most urgently needing assistance for the reconstruction. Hence, this project was consistent with reconstruction and emergency needs.

3.1.3 Relevance to Japan's ODA Policy

Algeria is a resource rich economy, largely depending on the export of petroleum and natural gas, and, according to its per capita income measure, it is a middle income country; which usually means that the country becomes a recipient of market-based OOF (other official flows) rather than concessional ODA (official development assistance), the latter not extended since 1982, because its per-capita income became too high. In 1991, the country became ODA eligible again, but no ODA was extended, due to the worsened security situation. However,

from its humanitarian stance to help rebuild the nation affected by an earthquake disaster, JICA's Country Assistance Strategy for Algeria (2004) stressed the necessity to assist the reconstruction of the quake-inflicted country.

In February 2004, a JICA Technical Appraisal was conducted by an expert sent from the City Planning General Office of Kobe City who was well versed in the reconstruction of the city since the Hanshin–Awaji Great Earthquake (1995). As part of that appraisal, proposals for quake-resistant structure design, reflecting the Kobe experience, were made and some were adopted. Also, in relation to the project, activities took place, including seminars and model classes for natural disaster prevention which were realized in Alger with the help of Kobe City, participated by invited stakeholders (i.e., teachers and middle-school pupils)—many of whom took lessons from the Japanese experience vis-à-vis post-quake reconstruction.

This project, intended to help rebuild schools affected by the Algeria Earthquake, was therefore consistent with the reconstruction policy and needs of the time; it was also highly relevant to and consistent with Japan's ODA policy, in taking lessons from its own experience with post-earthquake reconstruction. From development perspectives as well, the necessity of developing human resources and national education remains to be high priority within the national development plan. Therefore, the project is considered to be highly relevant.

3.2 Effectiveness⁴ (Rating : ③)

3.2.1 Quantitative Effects (Operations and Effectiveness Indicators)

By the target year (2008–09), all effectiveness indicators have achieved their objectives, including school capacity (except for that of middle schools), a two-shift primary school system, class size at high schools (less than 36) and other indicators of quality of education. By 2011–12, class size at middle schools had also achieved their target of less than 37). By 2009–11, the number of students decreased by about 3,000, because in 2011, there were new schools constructed (19 primary schools [of which 11 in Alger and 8 in Boumerdes], middle schools [of which 3 in Alger and 5 in Boumerdes], high schools [of which 2 in Alger and 5 in Boumerdes]), resulting in changes to school districts and transfer of students. It is considered to be an improvement in quality of education, in the sense that they can go to school located closer to their residence.

⁴ Sub-rating for Effectiveness is to be put with consideration of Impact

Table 2 Quality of Education Indicators

	Before Earthquake (2002–03)	Target (2008–09)	Realized (2009–10)	Realized (2011–12)
Student Capacity in Assisted Schools (Number of Assisted Schools)	19,960	19,960 (36)	19,960 (35)	19,960 (36)
Enrolled Students in Assisted Schools (Number of Assisted Schools)	22,070	19,190 (36)	19,433 (35)	16,050 (36)
Improvement in Quality of Education				
Primary: Two-Shift (*)	1.23	1.00	1.00	1.00
Middle: Class Size	38	36 <	38	33
High: Class Size	35	37 < (**)	32	33

Source: Algerian Ministry of National Education

Note:

* Number of classes / Number of classrooms; 1.00 indicates an end to the two-shift system.

** Expected temporary expansion due to increased enrollment in high schools.

3.2.2 Qualitative Effects

Qualitative effects are part of the above mentioned “quality of education” indicators, all of which achieved their targets. Also, all newly constructed or rehabilitated schools under this project meet Algerian standards of building, which became more quake-resistant after the earthquake.

In summary, that this project overall has achieved the effect of “raising the quality of education of beneficiary schools to the pre-quake level” by “rebuilding primary, middle and high school facilities in Boumerdes and Alger Provinces.”

3.3 Impact

3.3.1 Intended Impacts

At the time of appraisal, the implementation of this project was expected to raise the quality of education services in the assisted schools in Boumerdes and Alger Provinces, thereby “contributing to help recover the socio-economic situation of those areas” . In fact, Algerians recognize the effects of rebuilding schools, in terms of: 1) expanded schooling opportunities, 2) saved schooling expenses, and 3) in rural areas, in particular) narrowed the educational gap between rural and urban schools.⁵

⁵ This information comes from replies to a questionnaire disseminated by the evaluator.

At the time of the ex-post evaluation, the socioeconomic situation in both provinces has overall recovered and there was no evidence of a worsening in poverty or inequality situation, suggesting a high likelihood that this project and the post-earthquake reconstruction projects have had positive impacts, as expected.

3.3.2 Other Impacts

At the time of the appraisal, this project was not subject to the Environment Impact Assessment (EIA), because the project was intended to rebuild schools affected by the earthquake, therefore involving no resettlement or relocation of residents, having minimal natural or social environmental impact. According to information obtained locally at the time of the ex-post evaluation,⁶ of the 36 assisted schools, all have been equipped with manuals for natural disaster, and 26 have ever conducted drills for earthquake disasters. The manual was drafted in cooperation with the Kobe City Education Board and translated into French and Arabic by JICA, for when the anti-disaster seminars and model classes were held in Alger in April 2008. These measures have contributed to raise awareness of natural disaster as well as to prevent panic when disaster actually takes place.

There were 7 schools for which new land properties had to be acquired, because of mobility of local residents, and change in enrolled students due to the construction of new apartments in those locations. Some of these properties were privately owned, and the landlords were properly compensated in terms of substitute properties or financial compensation) without any major dispute for relocation, according to the Ministry.

In conclusion, this project has largely achieved its objectives, therefore its effectiveness and impacts are high.

⁶ Hearing from the target schools was conducted in June 2013 by the local consultant, because the field survey by the evaluator was cancelled.

3.4 Efficiency (Rating : ①)

3.4.1 Project Output

The original plan was to rebuild 36 primary, middle, and high schools, of which 26 primary (6 in Alger, 20 in Boumerdes), 4 secondary (4 in Alger), 6 high (4 in Alger, 2 in Boumerdes) schools; all of which was completed as planned. However, there was one primary school in Alger that was absorbed into another school that had been rebuilt. Also, 6 primary schools in Boumerdes City were merged into three schools as an organization, but since each school has two school complexes, there were effectively six school buildings rehabilitated as planned (see Table 3). Also, 3 secondary and 4 high schools were rebuilt in substitute land properties, because there were not suitable for the construction of buildings due to improper geological base. The school rehabilitation had to go through the Organisme de Contrôle Technique de la Construction (CTC) for technical inspection, approval of construction, and inspection of completion.

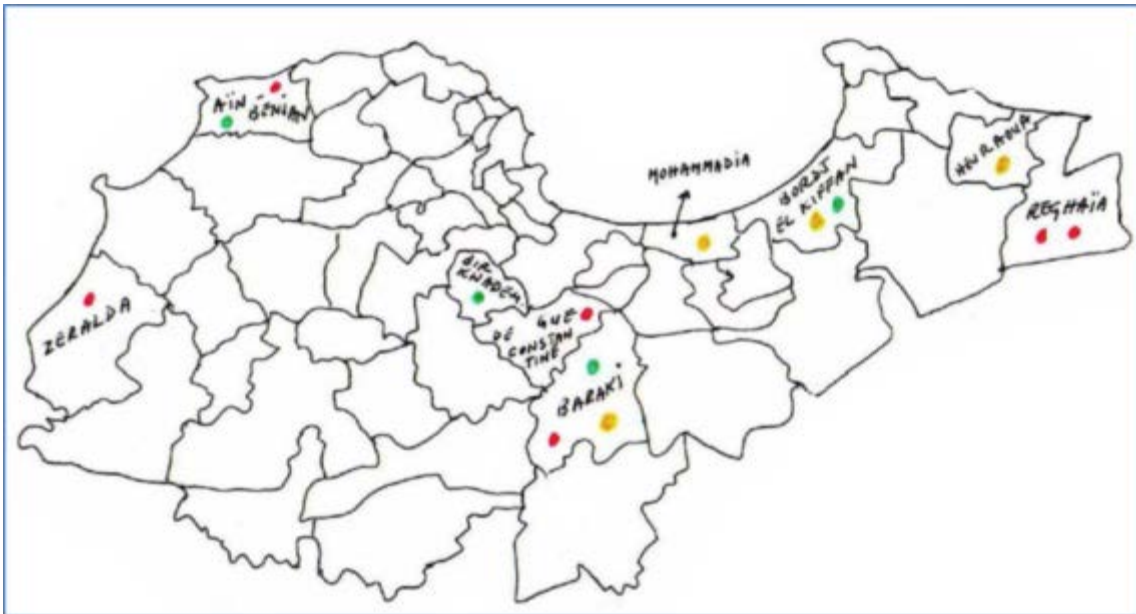


Figure 2 Assisted Schools in Alger

Note: Locations of primary schools are colored in red, middle in yellow, and high in green.

Table 3 List of Rebuilt Schools

Province/Commune		Name of School		Completion: Original Actual			
Primary	Alger	Zeralda	Quartier 1000 logements		2007	2009	
		Reghaïa	Abdehamid Ben Badis		2007	2009	
		Reghaïa	Frères Messaoudi		2007	2009	
		Ain Bénian	Cité Belle Vue 1		2007	2010	
		Gué de Constantine	Moufdi Zakaira		2007	2010	
		Baraki	Mohamed Laïd Khalifa (absorbed by Essalam)		2007	2010	
	Boumerdes	Ouled Moussa	Koudiate Ahcène		2006	2007	
		Ouled Moussa	1 ^{er} Novembre		2006	2006	
		Boumerdès	Les Sablières 1	Integrated as Figurer FAD 450 logements	2006	2011	
		Boumerdès	Les Sablières 2				
		Boumerdès	Boumerdès centre 1	Integrated as Ecole Ali Hamdane	2006	2006	
		Boumerdès	Boumerdès centre 2				
		Boumerdès	Boumerdès centre 3	Integrated as Bourmerdassi Ibrahim	2006	2006	
		Boumerdès	Boumerdès centre 4				
		Corso	Guedouari		2006	2006	
		Corso	Corso 232 chalet		2006	2009	
		Isser	Ounouagha		2006	2008	
		Si Mustapha	V.A. Si Mustapha Djadida		2006	2007	
		Bordj Menaïel	Ecole Site 1 (renamed École Site Jolie Vue)		2006	2008	
		Hamadi	Ben Hamza Djadida		2006	2007	
		Zemmouri	Douar Boussarah		2006	2008	
		Zemmouri	Douar Bendou, renamed as Ryal Ali		2006	2007	
		Cap Djinet	Haouch Ben Ouali		2006	2008	
		Benchoud	Benchoud		2006	2007	
		Nacira	Nacira (renamed Thala Koufi)		2006	2007	
		Baghila	Colonel Amirouche - Baghila		2006	2007	
	Middle	Alger	Bordj-El-Kiffan	Dergana Janoubia		2008	2009
			Baraki	Djemaa Bachir - Bentalha		2008	2009
			Mohammadia	Dr. Abdelmajid Meziane - Les Bananiers		2008	2009
			Herraoua	Malika Gaïd - Heuraoua centre		2008	2009
	High	Alger	Bordj-El Kiffan	Bordj El Kiffane - Cité Faizi		2007	2009
			Baraki	Ahmed Hamani - Bentalha		2007	2008
			Birkhadem	Birkhadem (renamed Mustapha Ourari)		2007	2011
Ain Bénian			Ain Bénian 1600 logements		2007	2010	
B		Béni Amrane	Béni Amrane Djadida		2007	2011	
		Baghlia	Baghlia		2007	2010	

Source: Ministry of National Education

3.4.2 Project Inputs

3.4.2.1 Project Cost

The project cost turned out to be 3,180 million yen (or 2,255 million DA), which is 149% of original estimated cost of 2,128 million yen (or 1,438 million DA). Therefore, the project cost was significantly higher than planned.

Table 4 Comparison of Project Cost

	Original	Actual
Primary School Boumerdes	361	274
Alger	132	181
Secondary School Alger	265	493
High School Boumerdes	243	410
Alger	437	897
Total	1,438	2,255
Yen Equivalent	2,128 million yen	3,180 million yen
Exchange Rate (1DA=)	1.48 yen (February 2004)	1.41 yen (June 2006~August 2011 average)

Source: Ministry of National Education

Note: The original project cost was reconfigured according to the breakdown categories reported as the time of post-evaluation.

According to the Algerian authorities, reasons for the increase in cost: 1) inflation, especially with respect to materials and labor cost, 2) fluctuation of the exchange rate (i.e., devaluation of DA), 3) change in project location, and resulting additional geological surveys, 4) re-appraisal of approval of school construction, and 5) additional expenses due to land quality – land base problems.

3.4.2.2 Project Period

From the signing of Loan Agreement (June 2005) to the handover of the last school (August 2011), it took 75 months long. This represents 182% of the original period of 41 months (December 2004 to April 2008). Therefore, the project period was significantly longer than planned.

Reasons for the delay included the following: 1) nearly half schools that needed to secure new land properties because of relocation of local residents and change in enrolled students due to construction of apartments, 2) for some schools, originally planned to be rebuilt in the same location, land quality-land base was not appropriate and they needed to look for new properties,

3) some bidding process was cancelled and they had to announce a new bid, and 4) a new law on public property management was drafted which delayed the business and administrative procedures.

In summary, both project cost and project period were significantly exceeded the plan, therefore efficiency of the project is low.

3.5 Sustainability (Rating : ③)

3.5.1 Structural Aspects of Operation and Maintenance

Since the time of appraisal, there has been no organizational change in operation and maintenance of the project. Namely, the executing agency remains the Ministry of National Education, while the operation and maintenance of each school are taken care of by the local provinces (i.e., Boumerdes and Alger). Teachers (at primary, middle, and high schools) as well as provincial directors of education are all considered staff members of the Ministry.

According to Algerian law, the maintenance and repair of school buildings are taken care of by the Ministry only after 5 years have passed since the construction. Until then, communes take care of basic maintenance (such as painting, and window repairs, etc.). Daily maintenance (cleaning and security) is taken care of by the communes in primary schools, and by staff sent from respective province at secondary; in middle and high schools (in both cases maintenance staff is technically Ministry officials. No major issue has been raised for the operation and maintenance.

3.5.2 Technical Aspects of Operation and Maintenance

In all 36 assisted schools, regular maintenance is conducted on a daily basis. Depending upon the school size, there are 2 to 7 maintenance staff members in primary schools, 3 to 7 in middle schools, and 7 to 12 in high schools. In primary and middle schools, they are in charge of cleaning and security as well as basic repair (for example, change of broken light bulb, repair of window glass), but major repair needing specialized skills including (e.g., rain leakage or electricity repair) is taken care of by external contractors out of the provincial or commune budget. The daily operation and maintenance (cleaning and security in particular) require no special training, and no major issue has been raised so far.

3.5.3 Financial Aspects of Operation and Maintenance

Out of “facilities and equipment budget” of the Ministry of National Education, 50 billion DA (or some 60 billion yen) is budgeted for the five years of 2010–14, of which 3 billion DA (or about 3.6 billion yen) for Alger and 2 billion DA (or about 2.4 billion yen) for Boumerdes are assigned. This implies that on an annual basis, Alger schools will receive 720 million yen (or 0.61 million yen per school) and Boumerdes schools will receive 400 million yen (or 0.95 million yen per school), which is sufficient to cover daily operation and maintenance. In case of need, more budgets will be allocated for specific operation and maintenance costs through provinces or the communes on the basis of report from the local council in charge of technical services.

However, these budgets are not “pre-assigned” annually or explicitly for respective schools, and all expenses are covered by the national budget in case of need through the provinces and communes, which makes it very difficult for each school to keep records of financial expenses for operations and maintenance, and also because the cost of repairs etc. depends on uncertain factors (such a frequency and level of mal-function) and therefore, schools are usually not aware of the actual cost spent on these items. On the other hand, in the middle and high schools, daily maintenance (change of light bulbs, purchase of sweeping materials, painting, etc.) is allocated budgeted at their disposal (Table 5).

Table 5 Routine Maintenance Costs at Middle and High Schools

Unit: DA		School Name	Annual Maintenance Cost	
Middle	Alger	Bordj-El-Kiffane	Dergana Janoubia	100,000
		Baraki	Djemaa Bachir-Bentalha	200,000
		Mohammadia	Dr. Abdelmajid Meziane-Les Bananiers	140,000
		Herraoua	Malika Gaïd - Heuraoua centre	417,000
High	Alger	Bordj-El Kiffan	Bordj El Kiffane-Cité Faizi	650,000
		Baraki	Ahmed Hamani - Bentalha	734,000
		Birkhadem	Mustapaha Ourari	632,203
		Ain Bénian	Ain Bénian 1600 logements	575,000
	B	Béni Amrane	Béni Amrane Djadida	800,000
		Baghlia	Baghlia	939,000

Source: Hearing from schools.

3.5.4 Current Status of Operation and Maintenance

All 36 schools have been inspected as part of the ex post evaluation, which confirms that all building and facilities have been maintained appropriately on a daily basis, and no major issue has been raised. After the project, 2 primary schools (both in Boumerdes) and one high school dormitory (in Alger) have repaired for rain leak and one high school (in Boumerdes) rehabilitated teachers' lounge. These examples show that, when a necessity arises, a sufficient budget is allocated to cover repairs, even beyond the daily maintenance level.



(a)



(b)



(c)



(d)

Figure 4 Some of the Assisted Schools

- (a) Brahim Boumerdassi Primary School (Boumerdes)
- (b) Heuraoua Centre (Malika Gaïd) Middle School (Alger)
- (c) Mustapha Ourari High School (Alger)
- (d) Abdelhamid Ben Badis Primary School (Alger)

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

4. Conclusion, Lessons Learned and Recommendation

4.1 Conclusion

This project was intended to rebuild primary, middle, and high schools in Algeria, a country hit and severely damaged by an earthquake in May 2003, in order to attain the pre-quake level of education services as well as to realize highly earthquake-resistant school facilities using Japanese earthquake experience. The relevance of this project is considered to be high, because it reflects reconstruction policy and the needs of the education sector, the core human infrastructure of the country, and is also consistent with Japanese assistance policy. The effectiveness as well as impact of the project is considered to be high, because the project was effectively realized nearly as planned, and the physical structure of the affected primary, middle, and high schools became more earthquake-resistant—thus allowing children to go back to school, and the quality of educational services such as the class size was raised to the pre-quake level. However, the efficiency is considered to be low, because the project took much longer period and higher cost than originally planned. On the other hand, the sustainability is considered to be high, because there was no major institutional, technological and financial issue raised for the operations and maintenance.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

None

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

It is highly relevant for Japan to assist earthquake-affected countries, given its own experience as a quake-driven country. Needless to say, for aid to be effective, it is imperative to have a good coordination between financial and technical assistance, and in this sense, a good lesson drawn from this project is the case of anti-disaster seminars and model classes realized in this project, in cooperation with Kobe City Education Board.

Comparison of the Original and Actual Scope of the Project

Item	Original	Actual
1. Project Outputs	Rebuilding of 36 primary, middle, and high schools, of which there were 26 primary (6 in Alger, 20 in Boumerdes), 4 middle (4 in Alger), and 6 high (4 in Alger, 2 in Boumerdes)	As planned
2. Project Period	December 2004–April 2008 (41 months)	June 2005–August 2011 (75 months)
3. Project Cost Amount paid in Foreign currency Amount paid in Local currency Total Japanese ODA land portion Exchange Rate	2,128 million yen 0 million yen 2,128 million yen 1,943 million yen DA = 1.48 yen (As of February 2004)	3,180 million yen 0 million yen 3,180 million yen 1.943 million yen 1 DA = 1.41 yen (June 2005–August 2011 average)

EVALUATION EX-POST DES PRETS APD JAPONAIS

Projet de reconstruction du secteur de l'éducation touché par le séisme

Evaluateur externe du projet : Takeshi Daimon, Université Waseda

0. Résumé

L'objectif de ce projet consistait à reconstruire les écoles primaires, collèges et lycées en Algérie, pays gravement endommagé par un séisme en mai 2003, dans le but de restaurer les niveaux des services d'éducation existant avant le séisme tout en assurant un environnement des établissements scolaires hautement résistant aux séismes, en prenant comme référence l'expérience acquise sur les tremblements de terre japonais. La pertinence de ce projet est considérée comme élevée, car il répond à la politique de reconstruction et aux besoins du secteur de l'éducation ainsi qu'au développement humain de base du pays, et il est également compatible avec la politique de l'aide japonaise. L'efficacité ainsi que l'impact du projet sont considérés comme élevés, car le projet a été effectivement réalisé quasiment comme prévu ; les structures physiques des écoles primaires, collèges et lycées touchés par le tremblement de terre sont devenues plus résistantes aux séismes permettant ainsi aux enfants de rejoindre leurs écoles, la qualité des services éducatifs tels que la taille des classes a été ramenée à son niveau d'avant le tremblement de terre. Cependant, l'efficacité du projet est jugée faible, car la durée de réalisation du projet a pris beaucoup plus de temps que prévu et que son coût a été plus élevé que prévu initialement. D'autre part, la durabilité du projet est considérée comme élevée, vu qu'il n'y avait aucun problème institutionnel, technologique ou financier majeur soulevé par les opérations et la maintenance.

Considérant ce qui précède, la réalisation de ce projet est considérée comme satisfaisante.

1. DESCRIPTION DU PROJET



Carte du projet



Etablissement scolaire reconstruit à Boumerdès

1.1 Contexte

Le 21 mai 2003, l'Algérie a été frappée par un tremblement de terre dont l'intensité a atteint 6,7 sur l'échelle de Richter et dont l'épicentre se trouvait au large des côtes de Zemmouri dans la wilaya (département) de Boumerdès, se situant à 70 kilomètres à l'est de la capitale Alger, faisant un total de 2.274 morts, 11.452 blessés (dont 1.378 morts et 6.789 blessés dans la wilaya de Boumerdès, et 883 morts et 3.444 blessés dans la wilaya d'Alger). De plus environ 1,8 million de maisons ont été endommagées et de nombreuses installations fournissant des services publics se sont effondrées ou rendues inopérantes.

Après le séisme, le gouvernement algérien a donné la priorité pour le secours des survivants en subvenant à leurs besoins immédiats en nourriture et en abris, tandis que dans le même temps il lançait un plan de reconstruction post-séisme (Juillet 2003) qui nécessitait des besoins financiers estimé à 820 millions de dollars US pour les secteurs affaiblis (la gestion de l'eau, la santé, l'éducation, le port, route, aéroport, chemin de fer, et de logements, lesquels ont nécessité un besoin financier s'élevant à 490 millions de dollars US), en sollicitant l'aide de donateurs, dont le Japon.

Les résultats d'une enquête de terrain¹ a montré que les élèves des écoles primaires, collèges et lycées victimes du tremblement de terre avaient à 1) utiliser les salles de classe et les dortoirs proches (pour y abriter les directeurs d'écoles, les enseignants et les élèves), 2) se déplacer dans les écoles provisoires de proximité en préfabriqué, ou 3) emménager dans des écoles précaires temporaires. En conséquence, certaines écoles ont dû fonctionner selon un système à double vacation, la taille moyenne des classes était plus élevé que la moyenne nationale, et les matériels didactiques d'enseignement (mathématiques, les sciences et les arts) n'étaient pas disponibles, l'environnement éducatif, de manière globale, s'était considérablement détérioré depuis le tremblement de terre. En outre, il faut garder à l'esprit que ces écoles précaires temporaires n'étaient pas susceptibles de résister aux tremblements de terre de magnitude similaire qui pourrait frapper le pays à nouveau dans l'avenir, d'où la nécessité de reconstruire des écoles antisismiques et de mettre en œuvre ce projet de reconstruction.

1.2 Aperçu du projet

L'objectif de ce projet visait à reconstruire les écoles primaires, collèges et lycées, dans les wilayas de Boumerdès et d'Alger, en particulier dans les zones où le tremblement de terre, qui a frappé l'Algérie en mai 2003, a fait le plus de dégâts, dans le but d'améliorer la qualité des services éducatifs dans les écoles réhabilitées, contribuant ainsi à aider au rétablissement de la situation socio-économique de ces régions.

¹ Cette enquête a été réalisée par le consultant local.

Montant du prêt approuvé / Montant décaissé	1.943 millions de yens japonais 1.486 millions de yens japonais
Date de l'échange de Notes Accord / Date de signature du prêt	Septembre 2004 Juin 2005
Conditions	Taux d'intérêt: 1,5% Période de remboursement: 25 ans (période de grâce de 7 ans) Conditions d'achats : General non liée
Agence (s) emprunteur / Exécuteur	République Algérienne Démocratique et Populaire d'Algérie/ Ministère de l'Education Nationale
Date finale de décaissement date	Novembre 2010
Les projets connexes	<ul style="list-style-type: none"> - Banque européenne d'investissement (Décembre 2003) prêt pour des infrastructures routières et de transport, la gestion des ressources en eau, les écoles et les maisons (230 millions d'euros) - France (Juin 2004), prêt pour les infrastructures liées au logement (50 million d'euros) - JICA assistance technique (Février 2005 à Septembre 2006), "Tremblement de terre Enquête sur les micro-zonages algérienne» etc.

2. Grande ligne de l'enquête d'évaluation

2.1 Évaluateur externe

Takeshi Daimon, Université Waseda

2.2 Période d'études

Le déroulement de cette ex-post évaluation a été réalisé comme suit :

Période d'étude : d'Octobre 2012 à Août 2013

Enquête sur le terrain : Annulée

2.3 Limites de l'évaluation

L'enquête de terrain a été annulée en raison de la situation sécuritaire qui s'était dégradée. Par conséquent, cette évaluation ex-post a été réalisée sur la base d'un examen de divers rapports et des

réponses aux questionnaires recueillies auprès de l'agence d'exécution. Des Informations supplémentaires ont été obtenues par l'agence d'exécution grâce à un consultant local.

3. Résultats de l'évaluation (Evaluation globale : B²)

3.1 Pertinence (Note: ③³)

3.1.1 Pertinence par rapport au Plan de développement de l'Algérie

En Juillet 2003, deux mois après le tremblement de terre, le gouvernement algérien a élaboré un «Plan de reconstruction post-séisme » (répondant à un besoin de financement de 820 millions de dollar US), il concerne la gestion des ressources en eau, la santé, l'éducation, les travaux publics, les transports publics et le logement. La reconstruction des divers secteurs et la reconstruction du secteur de l'éducation, y compris celui effectué par le biais de ce projet, représentaient 16% de l'ensemble du plan élaboré, ce qui reflète bien la priorité du pays donnée à ce secteur.

L'économie algérienne, dépend en grande partie des ressources du secteur pétrolier et gazier représentant environ 30% du PIB et plus de 95% de ses exportations. Le gouvernement a poursuivi sa politique de diversification de la structure économique du pays, tel que le développement du secteur du tourisme. A cette fin, le développement humain a été poursuivi en tant que priorité de la politique afin de réaliser une économie à forte valeur ajoutée. Cette position n'a pas été modifiée depuis le tremblement de terre, et la première priorité a été donnée au secteur de l'éducation, selon le dernier «plan quinquennal 2010-14 », 1.300 écoles primaires, 500 collèges et 500 lycées sont en cours de réhabilitation et de restauration et 400 cantines scolaires sont en construction.

3.1.2 Pertinence par rapport aux besoins de développement de l'Algérie

Les provinces (wilayas) de Boumerdès et Alger ont été les plus durement endommagés, et près d'un tiers des établissements scolaires et plus d'un dixième de ceux d'Alger ont été respectivement quasiment sinon totalement détruits, et environ 340.000 élèves en ont subi les conséquences. A cette époque, il avait été dénombré la destruction de 331 écoles primaires, 64 collèges et 26 lycées dans la wilaya de Boumerdes, et 820 écoles primaires, 257 collèges et 110 lycées dans la wilaya d'Alger, ce projet a pris en charge la reconstruction de 36 établissements scolaires les plus gravement endommagés.

Ce projet a ciblé principalement les endroits nécessitant une aide d'urgence pour la reconstruction. Par conséquent, ce projet était compatible avec les besoins de reconstruction d'urgence.

² A: Très satisfaisant, B: Satisfaisant, C: Partiellement satisfaisant, D: Insatisfaisant

³ ③: Elevé, ②: moyen, ①: Faible

Tableau 1 Nombre d'établissements endommagés dans les wilayas de Boumerdes et d'Alger

	wilayas	Ecoles primaires.	collèges.	lycées.
Total des établissements	Boumerdès	331	64	26
	Alger	820	257	110
Etablissements endommagés	Boumerdès	238	45	25
	Alger	230	128	66
Etablissements sévèrement endommagés	Boumerdès	100	10	7
	Alger	64	37	18

Source : Ministère Algérien de l'Education Nationale



Figure 1 : à Boumerdès - Construction scolaire endommagée par le tremblement de terre (Boumerdes)

Source : page Web du Ministère des Affaires Etrangères

Ce projet a ciblé de manière précise les endroits nécessitant de toute urgence une aide à la reconstruction. Par conséquent, les objectifs de ce projet étaient conformes à la reconstruction de l'Algérie et des besoins d'urgence

3.1.3 Pertinence avec la politique d'APD du Japon

L'Algérie possède une économie riche en ressources, en grande partie due à l'exportation de pétrole et de gaz naturel ; selon la valeur du revenu par habitant, il est un pays à revenu intermédiaire, ce qui

signifie généralement que le pays devient bénéficiaire de OOF fondé sur le marché (autres flux officiels) plutôt que concessionnel d'APD (aide publique au développement), ce dernier n'a pas été reconduit depuis 1982, parce que le revenu par habitant était devenu trop élevé. En 1991, le pays est devenu éligible à l'APD à nouveau, mais l'APD n'a pas été prolongée, en raison de la situation sécuritaire qui s'était dégradée. Cependant, compte tenu de sa situation humanitaire et pour aider à reconstruire la nation affectée par un tremblement de terre, la politique d'aide aux pays de la JICA pour l'Algérie (2004) a souligné la nécessité d'aider à la reconstruction du pays que le tremblement de terre avait occasionné.

En Février 2004, la JICA a effectué une évaluation technique par l'intermédiaire d'un expert envoyé par le Bureau de la planification générale de la ville de Kobe bien au fait de la reconstruction de la ville depuis le grand tremblement de terre de Hanshin-Awaji (1995). Dans le cadre de cette évaluation, des propositions pour la conception de structures antisismiques, reflétant l'expérience de Kobe, ont été faites et certaines d'entre elles ont été adoptées. En outre, dans le cadre du projet, des activités relatives à un séminaire, à des classes modèle pour la prévention des catastrophes naturelles ont été réalisées à Alger avec l'aide de la ville de Kobe, à ces activités ont participé des intervenants qui y ont été invités (enseignants et élèves de collège), nombre d'entre eux ont acquis des enseignements de l'expérience japonaise pour la reconstruction post-séisme.

Ce projet, destiné à aider à la reconstruction des écoles touchées par le tremblement de terre en Algérie, était donc approprié à la politique et aux besoins de reconstruction de l'époque, il était également très pertinent et en conformité avec la politique d'APD du Japon, qui offrait des enseignements de sa propre expérience de reconstruction post-séisme. Du point de vue du développement, la nécessité de développer les ressources humaines et l'éducation nationale était et reste hautement prioritaire dans le plan de développement national. Par conséquent, le projet est considéré comme très pertinent.

3.2 Efficacité⁴ (Note: ③)

3.2.1 Effets quantitatifs (opérations et indicateurs d'efficacité)

En ce qui concerne l'année cible (2008-09), tous les indicateurs d'efficacité ont atteint leurs objectifs, y compris celle de la capacité des établissements scolaires (sauf pour les collèges), un système de double vacation de l'école primaire, le taux d'occupation des salles de classes dans les établissements secondaires (moins de 36) ainsi que d'autres indicateurs de la qualité de l'éducation. En 2011-12, la taille des classes dans les collèges a également atteint l'objectif visé (moins de 37). Entre 2009-11, le nombre d'élèves a diminué d'environ 3.000 élèves, car en 2011, il y a eu de nouvelles constructions de 19 écoles primaires (dont 11 à Alger et 8 à Boumerdès), 8 collèges (dont 3 à Alger et 5 à Boumerdes), 7 lycées (dont 2 à Alger et 5 à Boumerdes), ce qui a entraîné des modifications des limites de districts

⁴ La sous-estimation de l'efficacité est à mettre au compte de l'impact

et des transferts d'élèves. Cet aspect est considéré comme une amélioration de la qualité de l'éducation, dans le sens où les élèves concernés peuvent poursuivre leur scolarité dans établissements scolaires situés près de leur résidence.

Tableau 2 Indicateurs de qualité de l'Education

	Avant le tremblement de terre (2002-2003)	objectif (2008 -2009)	Réalisation (2009-2010)	Réalisation (2011 -2012)
Capacité d'élèves inscrits dans les écoles assistées (Nombre d'établissements)	19,960	19,960 (36)	19,960 (35)	19,960 (36)
Les élèves inscrits dans les établissements assistés (Nombre d'écoles subventionnées)	22,070	19,190 (36)	19,433 (35)	16,050 (36)
Amélioration de la qualité de l'éducation				
Primaire: double vacation (*)	1.23	1.00	1.00	1.00
collèges: Taille des classes	38	≥36	38	33
lycées : Taille des classes	35	≥37 (**)	32	33

Source : Ministère de l'éducation nationale

Note :

* Nombre de classes / nombre de salles de classe, 1.00 signifie la fin du système à double vacation

** extension temporaire prévue en raison de l'augmentation des inscriptions dans les écoles secondaires.

3.2.2 Les effets qualitatifs

Les effets qualitatifs font partie de la «qualité de l'éducation» susvisée, ils sont exprimés par les indicateurs ci-dessus qui ont atteint leurs objectifs. En outre, tous les établissements scolaires nouvellement construits ou réhabilités dans le cadre de ce projet répondent aux normes algériennes de construction qui nécessitent une plus grande résistance des constructions aux tremblements de terre.

En résumé, ce projet global a eu pour effet de rétablir la qualité de l'enseignement, dans les établissements bénéficiaires, à son niveau d'avant le séisme en reconstruisant des infrastructures d'écoles primaires, de collèges et de lycées dans les wilayas de Boumerdès et d'Alger.

3 Impact

3.3.1 Effets prévus

Au moment de l'évaluation, la mise en œuvre de ce projet prévoyait d'augmenter la qualité des services éducatifs dans les écoles reconstruites dans les wilayas de Boumerdes et d'Alger, aidant ainsi

à «contribuer à rétablir la situation socio-économique de ces régions ». Dans les faits, la partie algérienne reconnaît les apports de la reconstruction des écoles en termes de (1) élargissement des possibilités de scolarisation, (2) frais de scolarité enregistrés, et (3) (dans les zones rurales, en particulier) réduction de l'écart en termes d'éducation entre les écoles rurales et urbaines.⁵ Au moment de la post-évaluation, la situation socio-économique dans les deux wilayas s'est globalement améliorée et aucune preuve de l'aggravation de la pauvreté ou de situation d'inégalité n'a été enregistrée, ce qui laisse supposer une forte probabilité que ce projet et les projets de reconstruction post-séisme ont eu les impacts positifs prévus.

3.3.2 Autres impacts

Lors de l'évaluation, ce projet n'a pas été soumis à l'évaluation d'impact environnemental, car il était simplement recherché la reconstruction des établissements touchés par le séisme, comme la réinstallation ou la relocalisation des résidents qui n'ont pas été impliqués, le projet a été considéré comme ayant un impact minimal naturel ou social sur l'environnement. Selon les informations obtenues sur place au moment de la post-évaluation⁶, sur les 36 écoles secourues, toutes ont été équipées de manuels pour les catastrophes naturelles, et 26 ont déjà mené des exercices relatifs aux catastrophes du tremblement de terre. Le manuel a été rédigé en collaboration avec le Conseil de l'Éducation de la ville de Kobe et traduit en français et en arabe par la JICA, lors des séminaires anti-catastrophes et des classes de modèles ont été tenues à Alger en Avril 2008. Ces mesures ont contribué à une sensibilisation accrue des catastrophes naturelles et aideront à atténuer la panique quand une autre catastrophe a effectivement lieu.

Il a été dénombré 7 écoles pour lesquelles de nouvelles propriétés foncières devaient être acquises, en raison de la mobilité de la population locale et les transferts des élèves inscrits et à l'emplacement de la construction de nouveaux immeubles d'habitation. Certaines de ces propriétés sont des domaines privés, et les propriétaires ont été correctement indemnisés en termes de propriétés de substitution ou de compensation financière ; selon le ministère, il n'y a pas eu de conflits majeurs par rapport à la délocalisation.

En conclusion, ce projet a largement atteint ses objectifs et, par conséquent, son efficacité et son impact peuvent chacun être considérés comme élevés.

⁵ Réponses au questionnaire de l'évaluateur.

⁶ L'enquête sur les écoles cibles a été effectuée en Juin 2013 par le consultant local, parce que l'enquête sur le terrain par l'évaluateur a été annulée.

3.4 Efficacité (note : ①)

3.4.1 Résultats du projet

Le plan initial était de reconstruire 36 établissements scolaire du primaire, du moyen et du secondaire, dont 26 écoles primaires (6 à Alger, 20 à Boumerdes), 4 collèges (4 à Alger), 6 lycées (4 à Alger, 2 à Boumerdes). Les établissements scolaires, ont tous été achevés tel que prévu. Il faut toutefois noter que les effectifs élèves d'une école primaire à Alger, ont été absorbés par une autre école, reconstruite. En outre, 6 écoles primaires de la ville de Boumerdès, ont été fusionnées en trois écoles en tant qu'entité, cependant étant donné que chaque école fonctionne en deux groupes scolaires, il y a effectivement six bâtiments scolaires réhabilités tel que prévu (voir tableau 3). En outre, 3 collèges et 4 lycées ont été reconstruits dans des propriétés foncières de substitution, car elles n'étaient pas appropriées pour la construction de bâtiments compte tenu des terrains impropres à la construction. La réhabilitation des établissements scolaires a été supervisée par l'Organisme de Contrôle Technique de la Construction (CTC) pour le contrôle technique et par l'inspection des travaux public pour l'approbation des constructions.

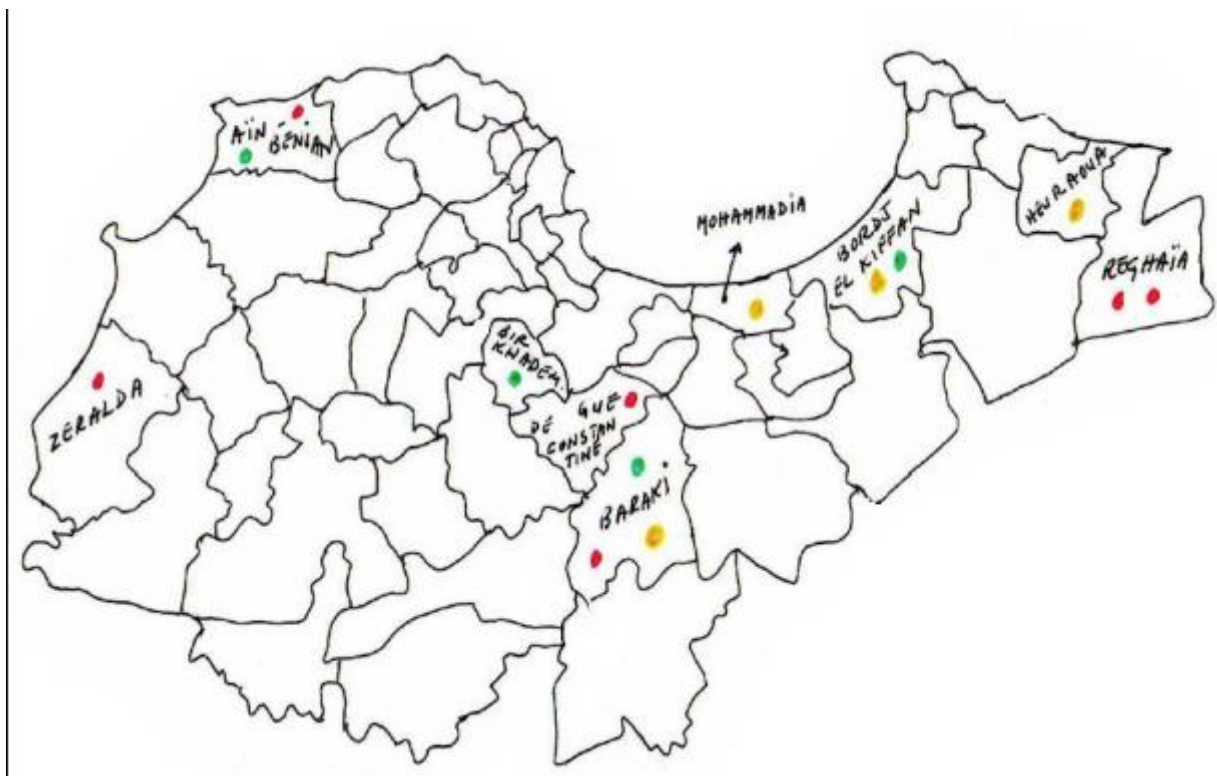


Figure 2 les établissements reconstruits à Alger

Note : la localisation des écoles primaires est colorée en rouge, les collèges en vert et les lycées en jaune

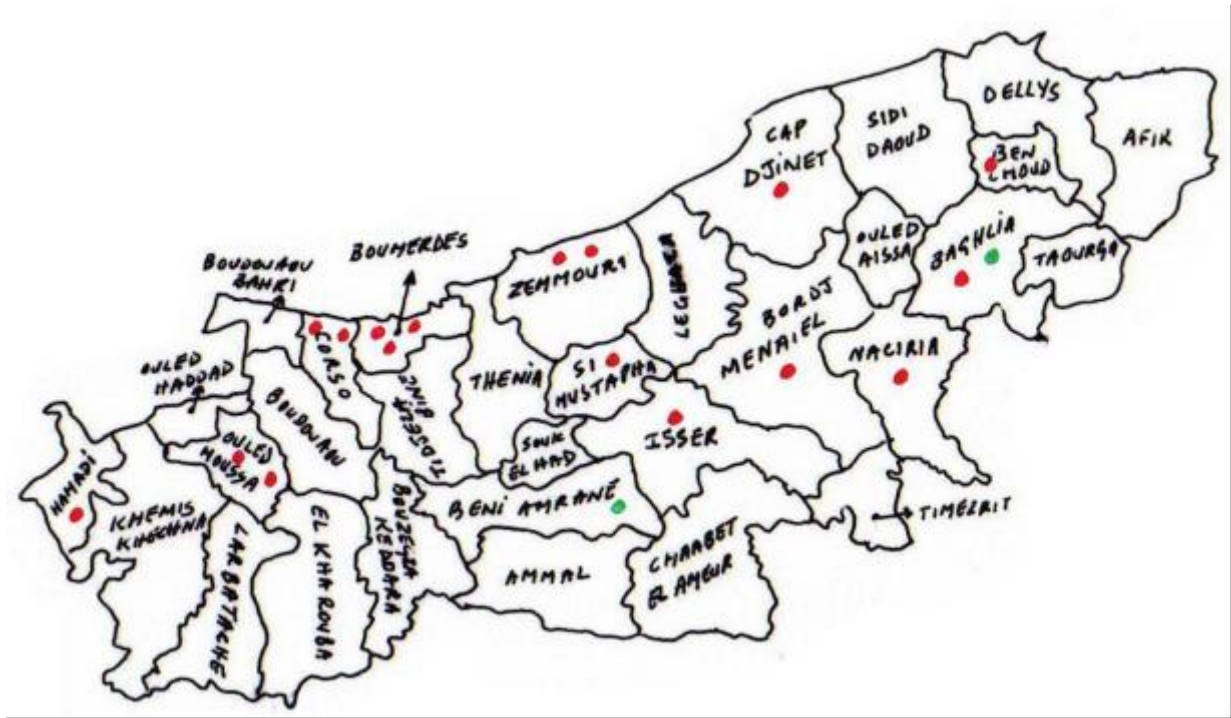


Figure 3 les établissements reconstruits à Boumerdès

Note : la localisation des écoles primaires est colorée en rouge, les collèges en vert.

Tableau 3 Liste des établissements scolaires reconstruits

Wilaya /Commune		Nom de l'établissement scolaire		achèvement			
				Initial	réel		
Ecoles primaires	Alger	Zeralda	Quartier 1000 logements		2007	2009	
		Reghaïa	Abdehamid Ben Badis		2007	2009	
		Reghaïa	Frères Messaoudi		2007	2009	
		Ain Bénian	Cité Belle Vue 1		2007	2010	
		Gué de Constantine	Moufdi Zakaira		2007	2010	
		Baraki	Mohamed Laïd Khalifa intégrée dans l'école Essalam		2007	2010	
	Boumerdès	Ouled Moussa	Koudiate Ahcène		2006	2007	
		Ouled Moussa	1er Novembre		2006	2006	
		Boumerdès	Les Sablières 1	Intégrés en 1 seule école du Figuier FAD 450 logements	2006	2011	
		Boumerdès	Les Sablières 2				
		Boumerdès	Boumerdès centre 1	Intégrés en 1 seule école Ali Hamdane	2006	2006	
		Boumerdès	Boumerdès centre 2				
		Boumerdès	Boumerdès centre 3	Intégrés en 1 seule école Bourmerdassi Ibrahim	2006	2006	
		Boumerdès	Boumerdès centre 4				
		Corso	Guedouari		2006	2006	
		Corso	Corso 232 chalets		2006	2009	
		Isser	Ounouagha		2006	2008	
		Si Mustapha	V.A. Si Mustapha Djadida		2006	2007	
		Bordj Menaïel	Ecole Site 1, rebaptisé Ecole Site Jolie Vue		2006	2008	
		Hamadi	Ben Hamza Djadida		2006	2007	
		Zemmouri	Douar Boussarah		2006	2008	
		Zemmouri	Douar Bendou, rebaptisé Ryal Ali		2006	2007	
		Cap Djinet	Haouch Ben Ouali		2006	2008	
		Benchoud	Benchoud		2006	2007	
		Nacira	Naciria, rebaptisée Thala Koufi		2006	2007	
	Baghila	Colonel Amirouche – Baghila		2006	2007		
	Lycées	Alger	Bordj-El-Kiffan	Dergana Janoubia		2008	2009
			Baraki	Djemaa Bachir-Bentalha		2008	2009
Mohammadia			Dr. Abdelmajid Meziane - Les Bananiers		2008	2009	
Herraoua			Malika Gaïd - Heuraoua centre		2008	2009	
Collèges	Alger	Bordj-El Kiffan	Bordj El Kiffane-Cité Faizi		2007	2009	
		Baraki	Ahmed Hamani- Bentalha		2007	2008	
		Birkhadem	Brikhadem, rebaptisé Mustapha Ourari		2007	2011	
		Ain Bénian	Ain Bénian 1600 logements		2007	2010	
	Boumerdès	Béni Amrane	Béni Amrane Djadida		2007	2011	
		Baghlia	Baghlia		2007	2010	

Source: Ministère de l'Education Nationale

3.4.2 Investissements

3.4.2.1 Coût du projet

Le coût total du projet a atteint le cout de 3.180 millions de yens (soit 2.255 millions de DA), ce qui représente 149% du coût estimatif initial de 2.128 millions de yens (soit 1.438 millions de DA). Par conséquent, le coût du projet est significativement plus élevé que prévu.

Tableau 4 : Comparaison des couts du projet

Unité : Million de DA

	Initial	Réel
Ecoles primaires Boumerdes	361	274
Ecoles primaires Alger	132	181
Collèges Alger	265	493
Lycées Boumerdes	243	410
Lycées Alger	437	897
Total	1.438	2.255
Equivalent en Yen	2.128 million yen	3.180 million yen
Taux de change (1DA=)	1,48 yen (Février 2004)	1,41 yen (Juin 2006~Août 2011 moyenne)

Source: Ministère de l'Education Nationale

Note : Le coût du projet initial a été remanié en fonction des catégories de réorganisations signalées tel que le délai de post-évaluation

Selon les autorités algériennes⁷, les raisons ayant motivé l'augmentation des coûts sont dues à : 1) l'inflation, en particulier pour les matériaux et le coût du travail, 2) les fluctuations des taux de change (par exemple, la dévaluation du DA), 3) la modification de l'emplacement des projets et les études géologiques supplémentaires qui en ont résulté, 4) la réévaluation de l'approbation de la construction des établissements scolaires, et 5) les frais supplémentaires dus à la qualité des sols - les problèmes d'assiette de terrain.

3.4.2.2 Durée du projet

Depuis la signature de l'accord de prêt (Juin 2005) jusqu'à la réception du dernier établissement scolaire (Août 2011), 75 mois se sont écoulés. Cela représente 182% de la période initiale prévue qui était de 41 mois (Décembre 2004 à Avril 2008). Par conséquent, la durée du projet est significativement plus longue que prévue.

Les raisons de ce retard sont les suivants: 1) Près de la moitié des établissements ont nécessité la garantie d'acquisition des nouvelles propriétés foncières compte tenu de la réinstallation des résidents locaux et des modifications de l'effectif scolaire en raison de la construction d'appartements, 2) certaines écoles, initialement prévues qui devaient être reconstruites dans le même lieu, a nécessité de rechercher de nouvelles propriétés vu que la qualité de l'assiette foncière n'était pas appropriée, 3)

⁷ Réponses au questionnaire de l'évaluateur.

certaines processus d'appel d'offres ont été annulés et de nouveaux annoncés, prolongeant ainsi l'ensemble du processus, et 4) l'élaboration d'une nouvelle loi sur la gestion des biens publics a retardé les procédures commerciales et administratives.

En résumé, tant le coût du projet que sa durée ont nettement dépassés ceux prévus dans le plan, en conséquence, il est estimé que l'efficacité du projet est faible.

3.5 Durabilité (Note: ③)

3.5.1 Aspects structurels des opérations et de maintenance (O&M)

Depuis le lancement du projet, il n'y a pas eu de changement organisationnel dans le projet O&M. En effet, l'agence d'exécution reste le ministère de l'Education nationale, tandis que le O&M de chaque école est pris en charge par les services locaux de wilaya (Boumerdes et Alger). Les enseignants (écoles primaires, collèges et lycées) ainsi que les personnels des directions de wilaya de l'éducation sont considérés comme des fonctionnaires dépendants du ministère.

Selon les lois algériennes, la maintenance et la réparation des bâtiments scolaires sont pris en charge par le ministère seulement après que 5 années se soient écoulées après leur réception. Les communes gèrent l'entretien de base des écoles primaires (comme la peinture, et réparation des fenêtres, etc.). L'entretien quotidien (balayage et sécurité) est pris en charge par les communes dans les écoles primaires, et par le personnel des services de wilaya dans les collèges et lycées (le personnel d'entretien est techniquement un fonctionnaire du ministère). Aucun problème majeur n'a été relevé pour l'O&M.

3.5.2 Aspects techniques des O&M

Dans les 36 établissements scolaires reconstruits, un entretien régulier est effectué quotidiennement. En fonction de la taille de l'école, il y a entre 2 à 7 personnels d'entretien dans les écoles primaires, entre 3 à 7 dans les collèges, et entre 7 à 12 dans les lycées. Dans les collèges et les lycées, ils sont en charge du nettoyage et de la sécurité ainsi que la réparation de base (par exemple, le changement d'ampoules défectueuses, réparation de vitre), cependant les réparations majeures nécessitant des compétences spécialisées y compris les infiltrations d'eau de pluie ou de réparations électriques sont prises en charge par des entrepreneurs payés sur les budgets de la commune ou de la wilaya. L'exploitation quotidienne et la maintenance (nettoyage et sécurité notamment) ne nécessitent aucune formation particulière, et aucun problème majeur n'a été relevé jusqu'à présent.

3.5.3 Aspects financiers d'O&M

Le budget d'équipement du ministère de l'Education nationale prévoit, 50 milliards de DA (ou quelque 60 milliards de yens) budgétisés sur une période de cinq ans 2010-14, dont 3 milliards de DA (ou 3,6 milliards de yens) sont affectés pour la wilaya d'Alger et 2 milliards de DA (ou 2,4 milliards

de yens) pour la wilaya de Boumerdès. Cela signifie que sur une base annuelle, les établissements scolaires d'Alger recevront ¥ 720 millions (représentant 0,61 millions de yens par établissement scolaire) et ¥ 400 millions (ou 0,95 millions de yens par établissement scolaire⁸), pour les établissements de Boumerdès. Ceci est suffisant pour couvrir quotidiennement O&M. En cas de besoin, un budget complémentaire sera alloué pour les frais d'entretien et de fonctionnement spécifique par wilaya ou par commune sur rapport de leurs conseils d'orientation assistés des services technique locaux.

Cependant, ces budgets ne sont pas "pré-affectés" par année et ne spécifient pas les établissements concernés, tous les frais sont couverts par le budget national en cas de besoin des wilayas et des communes, ce qui ne permet pas de pouvoir garder une trace des charges financières affectées à chaque établissement scolaire pour les O&M, et aussi parce que le coût des réparations, etc. dépend de facteurs incertains (tel que leur fréquence et les perturbations) et, par conséquent, les établissements ne connaissent généralement pas les coûts réels consacrés à ces articles. D'autre part, dans les collèges et les lycées le budget alloué pour l'entretien quotidien (changement d'ampoules, achat de matériel de balayage, peinture, etc.) est mis à leur disposition (tableau 5).

Tableau 5 Les coûts de maintenance courante dans les collèges et les lycées

Unité: DA

		Nom des établissements		Budget Annuel de Maintenance
Collèges	A	Bordj-El-Kiffane	Dergana Janoubia	100,000
		Baraki	Djemaa Bachir-Bentalha	200,000
		Mohammadia	Dr. Abdelmajid Meziane – Les Bananiers	140,000
		Herraoua	Malika Gaïd - Heuraoua centre	417,000
Lycées	A	Bordj-El Kiffane	Bordj El Kiffane-Cité Faizi	650,000
		Baraki	Ahmed Hamani- Bentalha	734,000
		Birkhadem	Mustapaha Ourari	632,203
		Ain Bénian	Ain Bénian 1600 logements	575,000
	B	Béni Amrane	Béni Amrane Djadida	800,000
		Baghlia	Baghlia	939,000

Source : après enquête auprès de chaque établissement

Note : A = Alger ; B = Boumerdes.

3.5.4 Etat actuel des O&M

Les 36 établissements scolaires ont été visités dans le cadre de la post-évaluation, ce qui confirme que tous les bâtiments et installations ont été maintenues quotidiennement et de façon appropriée, aucun problème majeur n'a été soulevé. Après la réalisation du projet, deux écoles primaires (à

⁸ Calculé en employant donnée du 1.187 écoles en Alger et 421 écoles en Boumerdes (Tableau 1).

Boumerdes) et un dortoir de lycée (à Alger) ont procédé à l'étanchéité de la terrasse et une salle des professeurs d'un collège (à Boumerdes) a été réhabilitée. Ces exemples montrent que, lorsqu'une situation l'exige, un budget suffisant est alloué pour couvrir les réparations, même au-delà du niveau de l'entretien quotidien.



Figure 4 quelques établissements scolaires reconstruits

- (a): école primaire Brahim Boumerdassi (Boumerdes)
- (b): collège Malika Gaïd Heuraoua Centre (Alger)
- (c) lycée : Mustapha Ourari (Alger)
- (d): école primaire Abdelhamid Ben Badis (Alger)

Aucun problème majeur n'a été observé dans le système O&M, donc la durabilité de l'effet du projet est élevée.

Conclusion, les expérience tirées et recommandations

4.1 Conclusion

Ce projet visait à reconstruire les écoles primaires, collèges et lycées en Algérie, pays touché et gravement endommagé par le séisme de mai 2003, afin d'atteindre le niveau de services d'éducation d'avant le séisme. Il s'agissait de réaliser des établissements scolaires avec des installations antisismiques prenant en compte l'expertise et l'expérience du tremblement de terre japonais. La pertinence de ce projet est considéré comme élevée, car il reflète la politique et les besoins du secteur de l'éducation constituant la base principale du développement humain et est également compatible avec la politique de l'aide japonaise. L'efficacité ainsi que l'impact du projet sont considérés comme élevés, parce que le projet a été effectivement réalisé presque comme prévu, mais aussi parce que la structure physique des écoles primaires, collèges et lycées touchés par le tremblement de terre sont devenus nettement résistantes aux séismes, permettant ainsi aux enfants de rejoindre leurs établissements scolaires, la qualité des services éducatifs tels que la taille des classes a été ramenée à son niveau d'avant le séisme. Néanmoins, l'efficacité de ce projet est jugée faible, car la durée de réalisation du projet a été trop longue et le coût plus élevé que prévu initialement. D'autre part, le développement durable est considéré comme élevé, parce qu'il n'y a pas eu de problème institutionnel, technologique ou financier majeur soulevé par les O&M.

Considérant ce qui précède, ce projet est considéré comme satisfaisant.

4.2 Recommandations

4.2.1 Recommandation à l'agence d'exécution

aucune

4.2.2 Recommandation à la JICA

aucune

4.3 Expériences acquises

Il est très important pour le Japon de fournir son aide aux pays touchés par le séisme, compte tenu de sa propre expérience en tant que pays touchés par des tremblements de terre. Inutile de dire que pour que l'aide soit efficace, il est impératif qu'il y ait une bonne coordination entre l'aide financière et technique. Une bonne expérience a été tirée de l'opération concernant les séminaires anti-catastrophe qui ont été efficaces et bénéfiques aux classes modèles organisées, en collaboration avec le Conseil Education de la ville de Kobe, dans le cadre de ce projet.

Comparaison entre la portée initiale et réelle du projet

Item	initial	Réell
1. Résultats du projet	La reconstruction de 36 écoles primaires, collèges et lycées dont (1) 26 écoles primaire (6 à Alger, 20 à Boumerdes), (2) 4 collèges (4 à Alger), (3) 6 lycées (4 à Alger, 2 à Boumerdes).	Tel que planifié
2. durée du projet	Décembre 2004-Avril 2008 (41 mois)	Juin 2005-Août 2011 (75 mois)
3. coût du projet		
Montant payé en monnaie étrangère	2.128 million yen	3.180 million yen
Montant payé en monnaie locale	0 million yen	0 million yen
Total	2.128 million yen	3.180 million yen
Partie Japonaise d'Aide publique au développement (APD)	1.943 million yen	1.943 million yen
Taux de change	1DA = 1,48 yen à partir de février 2004)	1DA = 1,41 Yen (Juin 2006~Août 2011 moyenne)