

Northeast Irrigation Project

Report Date: March 2000
Field Survey: February 2000

1 Project Summary and Japan's ODA Loan

This project aimed to expand the area of irrigated land in the Northeastern Brazil, a semi-arid region, and improve agricultural productivity and production volume in the region as a means of improving its social and economic position. As an element of the "Five-Year Plan for Irrigation in the Northeastern Brazil" (PROINE), the project built irrigation facilities and related infrastructure (roads, etc.) in three districts in the region (Maria Tereza, Estreit IV and Miroros) with the aim of expanding the irrigation area. Increased irrigation was intended to improve agricultural productivity and production volume, and consequently to improve the social and economic conditions in the region.

The ODA loan covered a portion of the cost of irrigation facilities (excluding dams) and other related infrastructure, such as roads, and the entire cost of a comprehensive consulting service for the project. Other costs were funded by the Brazilian government from its own source and financed by the Inter-American Development Bank (IDB).

2 Analysis and Evaluation

(1) Project Cost

The project scope in the Maria Tereza district was largely as planned. In the Estreit IV and Miroros districts, the projects exceeded their budgets and were scaled back (with reductions of 15% and 30% respectively from the planned irrigated area). At the detailed design stage after the start of the project it was judged that the geological condition of the project areas was worse than anticipated, and it became clear that project costs would have to exceed the planned amounts. Therefore reductions in project scope were unavoidable.

(2) Implementation Schedule

The irrigation project for the Maria Tereza district was completed on schedule without any significant



Borrower	Federative Republic of Brazil
Executing Agency	Compendio de Desenvolvimento do Vale do San Francisco (CODEVASF)
Loan Amount	¥7,596 million
Loan Disbursed Amount	¥7,316 million
Date of Exchange of Notes	November 1989
Date of Loan agreement	September 1991
Loan Conditions	
Interest Rate	4.0% (3.25% for consultant)
Repayment Period (Grace Period)	25 years (7 years)
Procurement	General Untied
Final Disbursement Date	December 1998

troubles. For the other two districts, the increases in project costs led to deferrals in government budget allocations (see (3) below) which delayed the implementation schedule by over one year. After that, the project execution proceeded without problems.

(3) Project Cost

Because the scope of the project was reduced to compensate for increased costs caused by adverse geology, the cost in Dollar terms overran by approximately 35% while the cost in Yen terms was largely as expected. The portion of the Dollar-based cost in excess of the planned amount was covered by the Brazilian government and JBIC (the approved amount of disbursement by JBIC was fixed at a Yen-based sum, so the rise of the Yen and the fall of the Dollar at the time inflated the amount when converted to Dollars).

Comparison of Original Plan and Actual

Item	Plan			Actual		
	Maria Tereza	Estreit IV	Miroros	Maria Tereza	Estreit IV	Miroros
1. Project Scope						
i) Civil works						
(1) Irrigation area	4,938 ha	6,821 ha	3,376 ha	4,724 ha	5,844 ha	2,332 ha
(2) Main canal	27 km	63 km	31 km	28 km	46 km	17 km
(3) Drainage canal	260 km	191 km	36 km	261 km	105 km	15 km
(4) Transmission network improvement	49 km	150 km	100 km	49 km	210 km	50 km
ii) Consulting Services	Total : 76M/M			Total : 93M/M		
2. Implementation Schedule						
(Start of construction to Completion of consulting services)	July 1992 to March 1997	July 1992 to March 1997	July 1992 to March 1997	July 1992 to March 1997	December 1992 to November 1998	December 1992 to July 1998
3. Project Cost						
ODA Loan portion	¥7,596 million			¥7,316 million		
IDB portion	\$55.6million			\$55.6 million		
Brazilian government	\$37.3million			\$74.9 million		
Total	¥20,046million			¥20,564 million		
(Equipment to \$)	(\$149.6million)			(\$202.6 million)		
Exchange Rate	US\$1= ¥134.0			US\$1= ¥101.5		
	(Rate at the time of appraisal)			(Weighted average rate during loan disbursement period)		

(4) Project Implementation Scheme

The executing agency was Compendia de Desenvolvimento do Vale do San Francisco (CODEVASF), which had experience of projects using finance from IDB. This experience contributed to the smooth running of the project. The consultants and contractors are reported to have performed well in the content of their services and the quality of the construction.

(5) Operations and Maintenance

The irrigation facilities in the Maria Tereza and Miroros districts have been working steadily since its completion. In the Estreit IV district the irrigation facilities were not provided with enough water for irrigation because the new irrigation dam (covered by IDB loan) did not contain enough water, so it has yet to begin operation. The main reason why the volume of water in the dam does not increase is due to an abnormal drought for the last three years. Rainfall totals for 1998 and 1999 were 487mm and 571mm respectively, far below the average of 640mm for the region between 1963 and 1983. Settlement was scheduled to begin in December 1998, immediately after the completion of construction, but the volume held in the dam was only 25% of capacity, so settlement was postponed. By March 2000 the water storage rate had risen to 50% and is increasing, albeit gradually. Therefore 116 households are scheduled to begin settlement in the first half of 2000. The executing agency, CODEVASF, is considering measures to make water usage more efficient in Estreit districts I~III to bring the water in the dam to an adequate level, and it is now conducting a detailed survey.

After construction the responsibility for maintenance of the irrigation facilities was transferred from CODEVASF to the farmers using it. In the approximately 120,000ha of irrigated land in the San Francisco River basin, around 24 irrigation management cooperatives (irrigation districts) have been set up under CODEVASF direction. The irrigation districts carry out group management of the irrigation facilities and provide technical support to small farmers. In the Maria Tereza and Estreit IV districts, the facilities are managed by the existing irrigation districts. In the Miroros district, new irrigation district was set up after the completion of the project. Taking the Nilo Coelho irrigation district which manages the Maria Tereza

district, as an example, 295 directors chosen from the membership manage the district, of which 100 work on maintaining the irrigation equipment.

All the irrigation districts collect water usage charges easily from the farmers and use it for pump electricity charges, improvements to irrigation equipment and other applications. All new settlers will receive technical support on farm management from CODEVASF at the time of settlement, with continuing support after that from their irrigation district. Thus the irrigation districts are performing well as an autonomous operation and maintenance system for irrigation equipment.

(6) Environmental Impact

No adverse environmental impact due to this project has been reported.

As a preventive measure to guard against environmental degradation, water quality, plants and animals are monitored, and in areas where construction caused problems such as soil erosion, the affected areas have been designated as conservation areas to enable their ecological recovery. Thus, appropriate environmental measures are being taken.

(7) Project Effects and Impacts

The current impact of this project is described below in Tables 1 and 2. At present the planned crop yields and numbers of settlers have not reached the planned levels. The irrigation facilities have only just been completed and settlement is still under way, which makes it impossible to evaluate recorded results at this stage. However, if settlement continues and farming activity makes steady progress, the project can be expected to yield the planned results.

Much greater progress in settlement is anticipated as a means of encouraging the realization of project effects, and the executing agency and other related government agencies should provide indirect support (organizational assistance and farming guidance to irrigation districts, financial assistance through farming finance etc.) to make sure the existing settlers stay on the land. Furthermore, urgent steps should be taken to obtain irrigation water for the Estreit IV district.

Table 1 Crop Yields and Areas Under Each Crop^(note)

	Maria Teresa						Miroros					
	1998			1999			1998			1999		
	Planting acreage (ha)	Crop (t)	Yield (t/ha)									
Banana	89	N.A.	N.A.	991	404	0	43	413	10	340	2,138	6
Coconut	55	N.A.	N.A.	550	N.A.	N.A.	75	N.A.	N.A.	45	N.A.	N.A.
Beans	231	26	9	494	532	1	1,421	2,046	1	945	559	1
Guava	41	N.A.	N.A.	469	N.A.	N.A.	-	-	-	9	N.A.	N.A.
Water Melon	110	1,936	18	237	3,795	16	43	298	7	39	244	6
Tomato	4	144	36	209	3,011	14	2	13	7	4	N.A.	N.A.
Pumpkin	30	N.A.	N.A.	191	2,273	12	13	11	1	10	132	13
Mango	19	N.A.	N.A.	189	N.A.	N.A.	3	N.A.	N.A.	20	N.A.	N.A.
Grape	-	-	-	56	N.A.	N.A.	-	-	-	-	-	-
Passion fruit	-	-	-	53	N.A.	N.A.	-	-	-	-	-	-
Corn	7	26	4	46	81	2	9	23	3	24	48	2
Onion	20	N.A.	N.A.	27	189	7	70	318	5	2	23	12
Acerola	10	N.A.	N.A.	18	N.A.	N.A.	-	-	-	-	-	-
Custard apple	-	-	-	8	N.A.	N.A.	74	N.A.	N.A.	57	N.A.	N.A.
Melon	-	-	-	8	38	5	-	-	-	2	20	10
Carrot	8	16	2	3	45	15	8	49	6	1	20	20
Chili	-	-	-	3	17	6	0	3	10	-	-	-
Beet	-	-	-	-	-	-	15	185	12	-	-	-
Sugarcane	-	-	-	-	-	-	6	N.A.	N.A.	3	210	70
Coffee	-	-	-	-	-	-	-	-	-	1	N.A.	N.A.
Total	579	-	-	3,549	-	-	1,600	-	-	1,498	-	-

Source: Executing agency materials.

Note :1) There are no recorded values for the Estreit IV district.

2) 1998 was the first year after completion of the project for which yield figures were recorded. N.A. refers to crops that were not harvested.

Table 2 Progress in Settlement

The state of settlement (as of December 1999) is as shown below.

	Plan ⁽¹⁾			Actual (as of December 1999)		
	Maria Teresa	Estrait IV	Miroros	Maria Teresa	Estrait IV ⁽²⁾	Miroros
Settled farmers (No. of households)	395	370	150	417	(116)	150
Settled agricultural companies	46	226	86	35	-	7
Total number of settlers	2,437	4,110	1,610	N.A	-	N.A

Source : JBIC materials for both plan and actual.

Note : 1) From the plan after the 1998 revision.

2) As mentioned above, the settlers who are to move into the Estrait IV district have been determined, but they have not started to move in for permanent settlement. Therefore the number is not still realized.

(8) Internal rates of return (IRR)

As mentioned above, construction of the project has only just finished, and the available records on crop yields and other indicators are extremely limited. Therefore we have not recalculated internal rates of return for this evaluation.



Pumping Station in Maria Tereza



Channel seen from the newly constructed Dam in Estrait IV



The Main Channel in Miroros