



1. Project Data:		Date Posted : 08/15/2001	
PROJ ID: P006370		Appraisal	Actual
Project Name: Northeast Irrigation Jaiba	Project Costs (US\$M)	158.0	151.3
Country: Brazil	Loan/Credit (US\$M)	71.0	71.0
Sector(s): Board: RDV - Irrigation and drainage (56%), Agricultural extension and research (19%), Central government administration (14%), Other social services (11%)	Cofinancing (US\$M)		
L/C Number: L3013			
	Board Approval (FY)		88
Partners involved :	Closing Date	06/30/1997	06/30/2000

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2. Project Objectives and Components

a. Objectives

The SAR objectives were to:

1. Increase agricultural production and rural employment opportunities in the poor Minas Gerais area of Northeast Brazil.
2. Further institutional development for future expansion of the irrigation sub -sector, through the creation of a private irrigation district to operate the project.

A decision to develop 100,000 hectares for irrigation along the Sao Francisco Rive had been made by the Federal Government in the 1970s. Major infrastructure works were completed but the project was abandoned because of financial difficulties. In 1986 preparation of the project began as a joint effort between the state and federation . At appraisal 4150 hectares were cultivated by two private farms (for high value crops and seed), and a further 1,000 ha were devoted to a gravity-fed public irrigation scheme with a net cultivated area of around 600 hectares, producing beans and cotton..

b. Components

The original components were:

1. **Construction of a sprinkler Irrigation system** - this would include electrification and access roads .
2. **Establishment and initial operation of the Jaiba Irrigation District (DIJ)**
3. **Operation and maintenance of the irrigation systems**
4. **Applied agricultural research .**
5. **Technical Assistance, Training and Studies** - this was for the staff of the three main implementing agencies : CODEVASF(Sao Francisco Valley Development Company); DIJ and RURALMINAS (the Coordinating agency for services from the State of Minas Gerais.)

Realized costs of \$151.3 million comprised:

- Jaiba Irrigation Scheme (80%)
- Jaiba Irrigation District (13%)
- Applied Agricultural Research (2%)
- Technical Assistance, Training and Studies (6%)

Jaiba Irrigation Scheme/District refers to components 1-3 shown above.

c. Comments on Project Cost, Financing and Dates

The ICR does not categorize the expenditures by the original components, or break down the expenditure categories by proportion of government and Bank funding . This project covers the first of what is envisaged to be a three-phase development. Up to 100,000 ha can be irrigated potentially; by project completion in June 2000 9,800 ha was operational and is expected to reach 17,000 ha by the end of the year, compared to a first phase target of 23,600 ha. Potentially 33,000 ha could be developed in conjunction with existing main system works .

3. Achievement of Relevant Objectives:

Overall achievement of objectives was satisfactory - agricultural production increased in a poor and drought-prone area. The project pioneered a new institutional form (DIJ), which it supported and strengthened over an extended implementation period. Beneficiaries participated through the creation and training of the irrigation district, and procedures have been set up for more communication and better overall governance. The project provided social infrastructure, which was later transferred to State Government for operation and maintenance. After inevitable friction and adaptations, the mix of small, medium and large farmers, the core feature of the design of this poverty-focused project, has been made to work. Despite relatively slow achievement of area expansion and settlement, the overall outcome is satisfactory. By component:

1. **Construction**. At loan closing 9,800 hectares of irrigated area were functioning and 1370 small, 63 entrepreneurial and 2 large commercial farms were in operation. The area is expected to reach 17,000 ha by the end of 2001.
2. **Initial Operation**. Operations have been firmly established with services provided to farmers and high-value cropping patterns adopted. Problems remain with the fragility of the financial position of small farmers in the wake of inevitable fluctuations in fruit and vegetable prices. There are limits to what debt capital supplied by a healthy banking system can do to alleviate these problems. CODEVASF began to address this more seriously in 2000.
3. **Operation and Maintenance of Irrigation System and Water Charges** - DIJ carries out all routine O&M on canals, structures, pumping equipment, feeder roads and drains. USBR (US Bureau of Reclamation) criteria are used to determine needs, and periodic preventive maintenance activities are rigorously implemented.
4. **Applied Agricultural Research** - this was highly satisfactory, providing practical recommendations on sustainable irrigation practices, linked with adequate management of water and the sandy soil. Banana cultivation has been particularly successful and fish cultivation in irrigation channels and cattle breeding have recently been introduced.
5. **Technical Assistance, Training and Studies** - Services have been provided and a transition to demand-driven services completed, although many of the small farmers have complained about the services. Research and extension boosted production, with income per family increasing from \$ 1,000 in 1990 to \$5600 by 1996, followed by a decline to \$3300 in 1998 because of increased settlement. Fruit and vegetables rose from occupying 25% to 60% of the cultivated area between 1992 and 1999.

The extensive main systems works completed in the 1970s were treated as a sunk cost. An intensive analysis of farm models with attribution of new development costs, was used to estimate a project ERR of 19%, comparing favourably to the 12% rate at appraisal. Financial analyses show 16-36% rates of return on farm models, but the build of benefits was overestimated at appraisal, and full development levels will not be attained until 2007, 11 years later than envisioned at appraisal. These results conceal the problems of variations in external farmgate prices which have caused returns to fluctuate from 11% below full development levels in 1996 to 56% below in 1999.

4. Significant Outcomes/Impacts:

1. The development and subsequent performance of DIJ, a private nonprofit organization, has pioneered the transfer of public sector responsibilities to the private sector in Brazil. The new model of administration, operation and maintenance has now been adopted all over the country as the most efficient alternative for irrigation development.
2. The actions DIJ has taken to increase the quality of life of the population have been essential for overall project progress. Primary and technical education, health services and project demand-induced commercial services development have enhanced the impact of the targeted physical interventions.
3. There will be considerable economies of scale if and when the first phase development is expanded to its full 33,000 ha potential. In the absence of this new development, the full brunt of cost-recovery for fixed overheads must be borne by the present project.
4. A major achievement has been farmer acceptance that water fees have to be paid to cover O&M costs. Cost recovery has gone from insignificant early in the project, to 95% in 1999. This has only been accomplished by strict enforcement - 21% of settled small-farmers have no water supply because of nonpayment.
5. CODEVASF consistently exercised effective management of the project in all its aspects, including settlement disputes and broad environmental mitigation actions.
6. A major effort at finding alternative solutions to the challenges facing small farmers in the project area has been catalyzed by the ICR preparation process. The Bank-Netherlands Partnership Program and CODEVASF bought a wide range of partners together for a consultation workshop and this in turn has led to ongoing working groups, with clearly assigned tasks and responsibilities, to resolve priority issues identified during the meeting.

5. Significant Shortcomings (including non-compliance with safeguard policies):

1. Major environmental mitigation was required and only satisfactorily implemented after protracted pressure from national, international and local NGOs. Waterborne diseases have only now been belatedly addressed.
2. Farmer organizations are relatively weak, having been established primarily as a means of gaining access to investment funds. These are not yet autonomous institutions able to fulfill all their anticipated functions. By becoming too involved for an extended period in aspects such as credit, marketing and social issues, JIB may have inadvertently inhibited the creation of strong farmers associations. Lately too much of the ATER

(Agricultural Development and Rural Extension) effort has been directed to providing assistance in finding finance, rather than providing technological support and organizational advice to farmer organizations .

3. Credit limits and repayment terms are not compatible with cropping patterns and many farmers have become uncreditworthy. Indiscriminately increasing directed or subsidized credit will not provide a solution either, and likely have the added defect of discouraging the development of rural financial markets . The alternatives are capitalizing the farmers so they have their own reserves or developing an independent but dedicated credit system with a much more active financial management policy for its borrowers . The borrower suggests a type of rotating fund for all borrower types .
4. Implementation was adversely affected by lack of coordination between Government and Bank policies and procedures for procurement and bidding . Significant social, economic and political change led to frequent changes further frustrating the timely and adequate allocation of counterpart funds . The project had to be extended for 3 years.
5. An attempt by landless families to preempt use of land allocated to entrepreneurial farmers, may lead to problems in future although the dispute is expected to be resolved . The prospects for these families when they are resettled elsewhere in the district remain uncertain .
6. O&M costs are high and one reason for this is the failure to irrigate at night when energy costs (51% of O&M) are much lower. Drip or mini-sprinkler systems, that can be easily operated unattended at night, would also reduce water consumption significantly .
7. The monitoring system was not properly set up to monitor other critical elements besides physical and financial progress.

6. Ratings :	ICR	OED Review	Reason for Disagreement /Comments
Outcome :	Satisfactory	Satisfactory	
Institutional Dev .:	Substantial	Substantial	
Sustainability :	Likely	Likely	
Bank Performance :	Satisfactory	Satisfactory	
Borrower Perf .:	Satisfactory	Satisfactory	
Quality of ICR :		Satisfactory	

NOTE: ICR rating values flagged with '*' don't comply with OP/BP 13.55, but are listed for completeness.

7. Lessons of Broad Applicability:

1. Over-designed infrastructure has a significant impact on O&M costs and affects financial viability; the DIJ is only likely to be self-sustaining when the other 75% of the first phase irrigable area is exploited .
2. The project should have been seen as one of regional development from the start and not just a work of engineering. Implementation of works demanded too high a proportion of CODEVASF's attention leaving little time for attention to broader settlement, agricultural and social issues . This should be corrected in future irrigation project designs .
3. It is extremely important to maintain a well balanced mix of farm sizes - small farmers supply labor to larger farms, and benefit from technologies and market development by medium and larger farmers . While medium-large farmers could achieve higher levels of efficiency, they spend most of their income outside the project area, while small farmers spend it within, generating demand for other goods and services and maximizing the development impact of irrigation .
4. A definitive registry of land titling should be a condition for project start -up.
5. Bank support and supervision should be adequately funded at the end of the irrigation project, when assistance should be greatest if sustainability is to be achieved .
6. Rules should be thoroughly thought out and then applied equitably - the application of different selection criteria for different types of settlers, and special dispensation from paying of water charges, creates inequities within the community which undermine the establishment and successful operation of the irrigation district .

8. Assessment Recommended? Yes No

9. Comments on Quality of ICR:

Satisfactory. The farm economics is particularly well-executed and comprehensive.