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PERFORMANCE AUDIT REPORT

MADAGASCAR

FOOD SECURITY AND NUTRITION PROJECT
(CREDIT 2474–MAG)

June 21, 2000

Sector and Thematic Evaluations Group
Operations Evaluation Department

Currency Equivalents (annual averages)

Currency Unit: Malagasy Franc (FMG)
(Period average)

1989: US$1.00 = FMG 1603	1994: US$1.00 = FMG 3067
1990: US$1.00 = FMG 1494	1995: US$1.00 = FMG 4266
1991: US$1.00 = FMG 1835	1996: US$1.00 = FMG 4061
1992: US$1.00 = FMG 1864	1997: US$1.00 = FMG 5091
1993: US$1.00 = FMG 1914	1998: US$1.00 = FMG 5441

Abbreviations and Acronyms

ACN	*Agents Communautaires de Nutrition* (community nutrition worker)
BPS	*Bureau d'Exécution du Sécurité Alimentaire et Nutrition Élargie* (SECALINE project office)
FID	*Fond d'Intervention Pour le Développement* (Social Fund)
ICR	Implementation Completion Report
IDD	Iodine deficiency disorder
IEC	Information, education, communication
ILO	International Labour Organisation
NGO	Nongovernmental organization
OED	Operations Evaluation Department
PAR	Performance Audit Report
ppm	Parts per million
SAR	Staff Appraisal Report
SECALINE	*Sécurité Alimentaire et Nutrition Élargie* (Food Security and Nutrition Project)
UNICEF	United Nations International Children Emergency Fund
WFP	World Food Programme

Fiscal Year

Government of Madagascar: Janurary 1—December 31

Director-General, Operations Evaluation	:	Mr. Robert Picciotto
Director, Operations Evaluation Department	:	Mr. Gregory K. Ingram
Acting Manager, Sector and Thematic Evaluations	:	Mr. Ridley Nelson
Task Manager	:	Ms. Chorching Goh

The World Bank
Washington, D.C. 20433
U.S.A.

Office of the Director-General
Operations Evaluation

May 21, 2000

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

SUBJECT: Performance Audit Report on Madagascar
Food Security and Nutrition Project (Credit 2474-MAG)

Attached is the Performance Audit report prepared by the Operations Evaluation Department (OED) on the Food Security and Nutrition Project that supported the Madagascar's Social Fund (*Fond d'Intervention Pour le Développement,* or FID) and its Community-based Nutrition Program (*Sécurité Alimentaire et Nutrition Élargie,* or SECALINE). The project was partially financed by IDA Credit of US$21.3 million. It was approved on March 18th 1993, and closed on December 31st 1998. At closing, US$4.9 million IDA credit was cancelled because of lower realized costs. The World Food Programme (WFP) contributed US$9.2 million in parallel financing. Other co-financiers included the government of Japan for US$0.5 million and UNICEF for US$0.4 million. The government of Madagascar co-financed US$1.1 million while community health centers and FID contributed US$0.4 million.

The objective of the project was to reduce food insecurity and malnutrition in Madagascar's two most food-insecure provinces. To achieve its objective, the project undertook income generating activities, and nutrition interventions. The former included (i) an autonomous social fund, and (ii) a food-for-work program targeted at urban poor in Antananarivo; the latter consisted of (i) a community nutrition program, (ii) a national iodine deficiency disorders control program, and (iii) institutional strengthening, aimed at supporting an information, education, and communication program, and developing a national food security strategy.

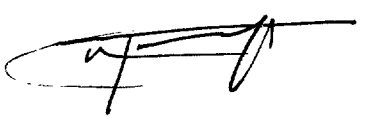
Similar to ratings in the ICR, this performance audit rates the Bank and Borrower performances as satisfactory, overall outcome as satisfactory, and sustainability as likely. The audit finds that institutional development accomplished more lasting impact than reported in the ICR, and upgrades its institutional development to substantial (from *modest* in the ICR).

The Food Nutrition and Security project met its objectives, reducing malnutrition between 48 and 58 percent in the project areas, and improving nutrition behaviors in the target population. Iodine deficiency disorders control efforts have reduced total goiter rates nation-wide from 45.1 percent in 1992 to 7.1 percent in 1999. The food-for-work program increased interim food security while infrastructure constructed under social funds has effected positive impacts in most communities, including increased access to water supply, better services at communal health centers, and increased acreage for agricultural cultivation. The National Food Security Strategy, adopted by the government in 1997, was under development.

Despite the project's achievement, several areas could be improved in its design to enhance sustainability. For example, benefits from the infrastructure will not be lasting without continual maintenance; thus, incentives to motivate maintenance among beneficiaries must be in place in the

project's design at the onset. While physical targets (e.g., number of mothers receiving iodine capsules) may proxy for a project's objectives, they contribute little to the measurement of outcomes. A monitoring system that also includes quantifiable and analytical outcome variables will be more meaningful. Such a system can also develop borrower capacity to evaluate, learn, adjust, and fine-tune its program. Even though the national iodine deficiency control program has achieved near-universal coverage of iodized salt, its quality and iodine content still vary widely; hence, sustainable elimination of iodine deficiency is only feasible with more regular monitoring and stricter quality control.

The major lesson emerging from the project is that a program design which incorporates the right incentives will enhance likelihood of success and sustainability. In the short duration of most nutrition programs, supplementary feeding creates the wrong incentives. The cause of malnutrition is not just related to food insecurity, but to behavior, social norms, and lack of knowledge about nutritional needs. Thus, creating informed mothers is a cost-effective alternative which bears longer lasting impacts on improving children's malnutrition. Similarly, communal infrastructure is well-maintained when beneficiaries have the proper incentives. Such infrastructure tends to be indispensable to the community or serves well-defined beneficiaries. Other effective incentives to motivate maintenance include awarding new construction of infrastructure only to communities which have kept their existing FID infrastructure in good condition.



Attachment

Contents

This report was prepared by Chorching Goh, who audited the project in February/March 2000. William Hurlbut edited, and Pilar Barquero provided administrative support.

Principal Ratings

	ICR	*Audit*
Outcome	Satisfactory	Satisfactory
Sustainability	Likely	Likely
Institutional Development	Modest	Substantial
Borrower Performance	Satisfactory	Satisfactory
Bank Performance	Satisfactory	Satisfactory

Key Staff Responsible

	Task Manager	*Division Chief*	*Country Director*
Appraisal	Qaiser Khan	Alain Colliou	Francisco Aguirre-Sacasa
Midterm	Eileen Murray	Ok Pannenborg	Michael Sarris
Completion	Eileen Murray	Avril Van Adams	Michael Sarris

Preface

This is the Project Performance Audit Report (PAR) for the Madagascar's Food Security and Nutrition Project (Credit 2474-MG) that supports the Madagascar's Social Fund (*Fond d'Intervention Pour le Développement,* or FID) and its Community-based Nutrition Program (*Sécurité Alimentaire et Nutrition Élargie,* or SECALINE). The credit for US$21.3 million equivalent was approved on March 18, 1993. Lower realized costs resulted in the cancellation of US$4.9 million of IDA financing. The credit closed in December 1998, six months behind schedule. The World Food Programme (WFP) contributed US$9.2 million in parallel financing. Other cofinanciers included the government of Japan for US$0.5 million and UNICEF for US$0.4 million. The government of Madagascar cofinanced US$1.1 million and the FID and community nutrition centers contributed US$0.4 million.

The PAR is based on the Staff Appraisal Report (Report no. 11301-MAG, February 18,1993), Implementation Completion Report (Report no. 19282, May 17 1999), credit agreements, project documents, sector and economic reports, the midterm review, discussion with Bank staff, and meetings with local officials and beneficiaries during a field visit in February/March 2000.

The ICR provides a comprehensive account of the project's implementation and lessons. This PAR examines, in depth, three aspects in each subprogram: outcomes, capacity-building, and sustainability. It investigates beyond the project's physical achievements by analyzing the outcomes of those achievements. The report also looks into factors related to the prospect of sustainability, and those contributing to local capacity-building.

Following customary procedures, copies of the draft PAR have been sent to the relevant government officials and agencies for review and comments, but no comments were received. The author is grateful for the cooperation and assistance given, in particular by staff of the Madagascar Country Office of the World Bank, officials in the Ministry of Health and the Ministry of Commerce, staff of FID and SECALINE at both regional and national levels, UNICEF officers, the WFP country representative, local nongovernmental organizations involved, as well as community beneficiaries in Toliary and Antananarivo.

1. Background

1.1 While the per capita GDP of Madagascar was at about the same level as that of Thailand and Indonesia in the early 1960s, the country has since dropped well behind. Per capita income declined consistently throughout the 1970s, and by 1985, in real terms, it was only half the figure for 1970. Economic conditions have remained fragile and have periodically been worsened by economic shocks such as those delivered by the cyclones that swept over the island in February and March 2000.

1.2 Madagascar's recent economic and social indicators (Table 1) rank it among the least developed countries in the world. In 1996, per capita GNP was less than half the average for low-income countries.[1] Continued high population growth and declines in schooling attainment, nutrition, and life expectancy impeded more rapid development. Infant mortality rates were among the highest in sub-Saharan Africa. Access to water and sanitation lagged far behind the regional average, and remained below the coverage level for its income group. Disease bred by poor sanitation, low nutritional standards, and lack of access to safe water were the leading causes of illness and death.

Table 1. Social Indicators: Mean Estimates for Madagascar, Sub-Saharan Africa and Low-Income Countries in 1996

	Madagascar	*Sub-Saharan Africa*	*Low-Income*
Per capita GNP (US$)	240	490	500
Annual population growth rate (%), 1990–96	3.1	2.7	1.7
Life expectancy at birth (years)	52	52	63
Infant mortality (per 1000 live births)	89	92	69
Access to safe water (% population)	32	47	53

Source: The World Bank, *Madagascar Poverty Assessment*, Report #14044-MAG, June 1996

1.3 The deteriorating economic conditions have been accompanied by worsening of the nutritional status of Malagasy children. Serious nutritional problems from chronic food inadequacy are reflected in indicators such as weight-for-height and weight-for-age. A 1992 Demographic and Health Survey[2] reported that stunting (low height-for-age) was extremely high compared to other African countries and most serious among children 12–23 months old (weaning period). Over 45 percent of children above 6 months old in Madagascar were 2 standard deviations below the normal mean weight-for-age. As many as a third of children 3–60 months old were 3 standard deviations below the normal mean height-for-age.

1.4 The World Bank, together with the International Monetary Fund, began a dialogue with the government of Madagascar in 1985, focusing on liberalizing agriculture, industry, and trade. Several years later, with Bank assistance, the government implemented an Economic Management and Social Action Project (Cr. 1967-MAG, approved December 6, 1988) to increase food security among the poor. Although managerial weaknesses kept the results from meeting expectations, the experience provided useful lessons for the next project, Food Security and Nutrition (Cr. 2474-MAG), which the government requested in 1990.

1. Madagascar is classified as a low-income country. Information and statistics for this paragraph are drawn from the World Bank, Madagascar Poverty Assessment, Report #14044-MAG, June 1996.

2. World Bank, Madagascar Poverty Assessment, Report #14044-MAG, June 1996.

1.5 The project objective was to increase food security and reduce malnutrition in Toliary and Antananarivo, the provinces with greatest need. The three components of the project were to be carried out under Madagascar's national SECALINE program.

1.6 *Income-generating activities and construction and rehabilitation of basic infrastructure* were to be conducted through the social fund (41% of the credit) and the food-for-work program (30%). *Nutrition interventions* included a national iodine deficiency disorders control program (3% of the credit) and a community nutrition program (23%) that provided health and nutritional education, (selective) supplemental feeding, and hospital referral for severely malnourished cases. *Institutional strengthening* (3% of the credit) was to facilitate the execution of an effective information, education, and communication (IEC) program and the development of a national food security strategy.

2. Findings

2.1 The Food Nutrition and Security project met its objectives, reducing malnutrition in the project areas, and improving nutrition behaviors in the target population. Iodine deficiency disorders control efforts have reduced total goiter rates nationwide. The food-for-work program increased interim food security, while the majority of infrastructure constructed under social funds has effected positive impacts in communities. The National Food Security Strategy, adopted by the government in 1997, was under development.

Lessons

2.2 The lessons from this project are as follows:

- ***Educating mothers is an efficient way to improve nutrition.*** The cause of malnutrition is not just related to food insecurity, but to behavior, social norms, and lack of knowledge about nutritional needs. In the short duration of most nutrition programs, direct approaches to inform and educate mothers work best, but supplementary feeding creates the wrong incentives. The most cost-effective channel to improve children's malnutrition is through informed mothers. To succeed, however, a behavioral change program needs to capture, disseminate, and exchange experiences and lessons between communities. Rural women, bound by discriminating traditions and customs, are more motivated to adopt better food-preparation and sanitation practices if they learn that their peers elsewhere in the country are changing.

- ***When the incentives are right, infrastructure will be maintained.*** Well-constructed infrastructure can enhance the quality of life in poor communities, but maintenance is essential. Infrastructure that serves a well-defined set of beneficiaries is more likely to be maintained. Where this is the case, inhabitants often take initiatives to collect annual contributions for maintenance or impose usage fees. Where the beneficiaries are less clearly defined, infrastructure that requires minimal maintenance, such as concrete walkways and raised dikes will be more durable than infrastructure such as canal drainage, which needs regular weeding and cleanup to function properly.

- ***Outcomes can most readily be assessed where performance indicators serve the broader goal of monitoring and capacity-building.*** While physical targets (e.g., number of mothers receiving iodine capsules) may proxy for a project's objectives, they contribute little to the measurement of outcomes. A monitoring system that includes some quantifiable and analytical outcome variables also helps to develop borrower capacity to evaluate, learn, adjust, and fine-tune its program. For example, besides tracking the number of iodine capsules distributed, it would be useful to record the proportion of capsule recipients who are aware of iodine deficiency disorders and the source of their knowledge. Such information would help the borrower to evaluate progress, measure the program's impacts, learn, and adjust during implementation. This evaluating-and-modifying procedure is essential to enhance a project's success, and more important, its sustainability.

- ***Iodine deficiency disorders, albeit a public health problem, can only be effectively eliminated with strong private sector commitment.*** When people have sustained access to *adequately* iodized salt, iodine deficiency can be eliminated. The success and sustainability of an iodine deficiency disorder (IDD) control program depend on enforcement and quality control on a reliable supply of iodized salt. While governments may appropriately oversee compliance with established production standards, the industry's producers, distributors, and retailers ultimately must police themselves. A competitive industry can be better mobilized and more efficient in effecting changes. For example, the government has not managed to make small producers comply with iodization; however, if the government aligns incentives, vis-à-vis producers' profitability, to motivate wholesalers to demand adequately iodized salt, the small producers may begin to fall into line.

- ***Decentralized service delivery by independent agencies tends to improve efficiency without necessarily undermining the roles of line ministries.*** Independent agencies involved in this project have functioned like private firms and managed to recruit competent staff by offering competitive salaries. They have displayed responsiveness to bottlenecks and consciousness of cost-saving throughout. The agencies were also sensitive to the constraints and roles of respective ministries. As this project shows, with proper incentives in place, independent agencies and line ministries can complement each other's roles. Health officials, for example, reported that SECALINE, by producing better-fed and heavier babies, has facilitated doctors' treatment.

Ratings

2.3 The audit report agrees with the ICR that the project outcome is satisfactory: that the project was relevant to the country's needs and its sectoral priorities; execution was effective in bringing positive impacts to the project areas; its efficiency was reflected in substantive cost-saving in the community nutrition program.

2.4 Borrower performance is rated satisfactory based on compliance with agreed covenants and on borrower commitment to the project. This commitment was exemplified by several instances when BPS turned down expatriate technical assistance in order to maximize its experiential learning. Another example was a comprehensive study, prepared by national experts, that led to the National Food Security Strategy of 1997.

2.5 Bank performance is rated satisfactory. Bank staff have been responsive and flexible in making necessary changes during execution. Lessons have also been incorporated into the subsequent Social Funds II, and III, and Community Nutrition II (SEECALINE) projects.

2.6 The audit also agrees that sustainability is likely. Impacts from SECALINE are likely to be sustainable as it has created informed mothers whose increased knowledge on nutrition lasts beyond the duration of the project. Many, with new knowledge, have changed their feeding practices and food preparing methods. Regarding the National Food Security Strategy, the government has undertaken several projects based on its recommendations. Sustainability in eliminating iodine deficiency is promising as coverage of iodized salt is almost universal, and the current focus is to reduce variability in quality. Benefits from infrastructure constructed under FID and the food-for-work program are likely to be sustainable. Positive impacts (e.g., increased access to water sources, increased acreage for cultivation, better services in communal health posts, and more transportation choices) from a significant proportion of communal infrastructure have been lasting. Nevertheless, a small proportion of infrastructure was not properly constructed or maintained, and the communities were unable to enjoy its potential benefits fully.

2.7 On institutional development impact, the audit upgrades the rating from modest to substantial. The audit mission finds that the institutional development component accomplished more lasting influence than reported in the ICR. The project has enhanced the institutional capacity of not only the two implementing agencies, but also their partnering enterprises, and local NGOs. One of the supporting evidence is management information systems at BPS (SECALINE office or *Bureau d'Execution du Sécurité Alimentaire et Nutrition Élargie*) and FID (Social Fund unit or *Fond d'Intervention Pour le Développement)* which are functioning effectively as screening, monitoring, and self-evaluating tools beyond the remit of the project. The project has also trained and enhanced managerial and implementing capacity of FID's partnering enterprises. In addition, principles of community-based development and participatory techniques were also imparted under the project. Some local NGOs (e.g., FAM d'Ambohidratrimo) have applied their experience from SECALINE to other projects.

2.8 There has been concern that autonomous, and more efficient, agencies such as FID and BPS may potentially undermine capacity-building in local government or line ministries by diverting away resources and manpower. In the case of Madagascar, however, independent agencies seem to alleviate the burden of line ministries by playing complementary roles. Health officials, for example, have reported that SECALINE, by producing better-fed and heavier babies, facilitates doctors' treatment. Similarly, while the local government can only focus on major infrastructure, FID is involved in poor and remote communities.

Box 1. Project Achievements

FID activities. Met most targets: executed 348 infrastructure projects, 36 income-generating activities, and 10 training session that generated nearly 2 million person-days of temporary employment; involved 431 contracts with small enterprises, and 76 contracts with NGOs, which helped to produce 100 subcontractors, ready to implement future activities. The Bank has since supported FID in ongoing Credit 2778-MAG (FID II), and Credit 3180-MAG (FID III). FID IV is currently under preparation.

Food-for-work programs. Mostly benefited poor women (70 percent of the beneficiaries), often female heads of household. Met only 40 percent of target to create over 3 million person-days of employment benefiting over 60,000 workers because of the shortfall of food supply from WFP.

SECALINE: the community nutrition program. The concept, involving community participation, is a model for Senegal's Community Nutrition Project and Benin's Food Security and Nutrition Project. The nutrition interventions exceeded their original targets for number of community nutrition centers served and beneficiaries reached. The number of children referred for nutritional rehabilitation was substantially below the target due in part to inadequate coordination between the implementing agency and the ministry of health. The rates of reduction in children's malnutrition, during 1993–98, in targeted SECALINE neighborhoods in Toliary, and Antananarivo, were 48 percent and 58 percent, respectively.

IEC and the National Food Security Strategy. The IEC program was developed and tailored regionally by Malagasy NGOs using results from local knowledge, attitude, and practice (KAP) surveys and beneficiary assessment. BPS and national experts have also successfully prepared the National Food Security Strategy, which was adopted by the government in 1997.

IDD Control. The presence of goiter in pregnant women and schoolchildren decreased from 45 percent in 1992 to 15 percent in 1997 as a result of iodine supplementation and introduction of iodized salt.

Source: ICR, Report no. 19282, May 17 1999

3. Analysis

3.1 This credit enabled the government of Madagascar to develop a decentralized and contractual mechanism outside of its central administration to implement community-based projects, with active involvement of the private sector and local NGOs. The project was implemented with substantial knowledge transfer and capacity-building at the local level, which permitted some activities to continue beyond the project. The project has re-affirmed the importance of strong government commitment and community participation to project success. Equally critical are the dedication and competence of local implementing agencies and their partners. The successes of this project have fed into subsequent projects that extend the concepts to other parts of country. Following a brief review of the project's design features, this section analyzes the outcomes, capacity-building, and sustainability of each component.

Project Design

3.2 The project was implemented outside of the central administration, under the overall guidance of a national coordinator who directly reported to the prime minister. It set up two independent organizations, BPS (the SECALINE office or *Bureau d'Exécution du projet SECALINE*) and FID (social fund unit or *Fond d'Intervention Pour le Développement*).

3.3 *FID.* The FID operated under a board of directors and provided grants for construction and rehabilitation of basic infrastructure and for income-generating activities that met specific criteria.[3] The organization received funds through a financing agreement with the government. FID had a financing and monitoring role with local enterprises and operators as implementing partners.

3.4 *Food-for-work program.* This program targeted the 90 poorest *fokontany* (neighborhoods) in Greater Antananarivo by giving the poorest population (identified in a 1990–91 survey) food rations in exchange for their work on maintaining and rehabilitating community infrastructure in their neighborhoods. WFP provided the food, and the International Labour Organisation helped with execution.

3.5 *Community nutrition program.* This program involved substantial community participation. BPS screened and selected local NGOs, and the communities elected agents, known as *Agents Communautaires de Nutrition* (ACNs). Each local NGO oversaw ACNs in a few nearby communities. The ACNs, who received in-kind payment (usually rice) for their services, helped with supplementary feeding, monitoring the weight and nutrition status of children 0–5 years of age, and encouraging mothers to attend weekly educational sessions.

3.6 *Iodine deficiency disorder (IDD) control.* This component was primarily executed by UNICEF and the ministries of health and commerce, with support from SECALINE. The Ministry of Health has developed an action plan and designated a national IDD coordinator in its Nutritional Services Division. The strategy was to provide iodized oil capsules through the health system until nationwide salt iodization could begin in 1995.

3.7 *Institutional strengthening.* Two main activities in this category are the preparation of a National Food Security Strategy and the development of a communication strategy. The latter was used not only to inform and educate the public but also to raise awareness and support among national policy-makers and local authorities.

3.8 Assessing the outcomes of the project is hindered by limitations of the indicators used to monitor progress against the project objectives. As is often the case, the indicators were based on meeting physical targets rather than achieving impacts. Among the indicators used were (a) number of contracts with small enterprises for labor-intensive infrastructure projects financed by FID; and (b) number of children and mothers of child-bearing age receiving iodine capsules. If those indicators had also included some analytical information, they would have been useful to monitor the program's progress and impact, and also to allow implementing agencies to learn, modify, and improve the implementation of the program. For example, the above indicators can be supplemented with (a) the percentage of contracted projects delivered on time, poorly implemented, or well-maintained, and their reasons; and (b) the proportion of iodine capsule-recipients who are aware of iodine deficiency and how have they learned about it.

3.9 Remarkably, the BPS and FID have taken initiatives to study activities' impacts at targeted communities. Their incentives to self-evaluate reflected in part their preparation for a subsequent Bank credit to continue their activities; such initiatives also reflected the commitment and competence of the agencies.

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3. FID targeted the most vulnerable segments of society in the provinces of Antananativo and Toliary. It financed projects costing less than 100 million FMG (about US$55,000). Recurrent activities, emergency projects, projects already receiving funding from other sources or eliminated by the government, and complex or machine-intensive projects were not eligible. For details, see Annex I of the Staff Appraisal Report.

Social Fund

3.10 ***Outcomes.*** Most subprojects funded by the FID had positive outcomes. For example, the construction of pebbled roads has made many areas accessible during rainy seasons and inhabitants have gained more choices of transportation as buses and vans began passing the vicinity. In Anosimanjaka, a pebbled road brought tourists to their annual festival (*la fête de l'Alahamadibe*).

3.11 Motivating maintenance of pebbled road, a classic example of public good with its free-riders' problems, is extremely difficult. Unlike some bridges whose beneficiaries were well-defined and willing to pay a "passage fee" (e.g., Manerinerina), pebbled roads near a township or marketplace (e.g., Antrafonomby) attracted traffic but no revenue. Despite the difficulty, some communities were better mobilized to carry out maintenance. The local committee of the Beroy-Fotadrevo pebbled road set up a managerial association to oversee maintenance and collect some money from families during harvest. In contrast, the Sakamena-Rianambo pebbled roads were in bad condition even though the local committee had discussed setting up several collection points. Nothing has yet been done since the first (November 1998) and subsequent inspections.[4]

3.12 Other benefits from FID projects include better school performance, improved services at rehabilitated health centers, and higher agricultural productivity from micro-irrigation perimeters.

3.13 For example, additional floor space in Anena primary school of Toliary, that allows five additional classes, has increased total enrollment by 73 percent, and reduced the dropout rate from 13.08 percent in 1995/96 to 3.22 percent in 1998/99. The grade-repetition rate also fell from 49.5 percent to 37.5 percent after the construction.[5] Similar improvement was also noted in other primary schools with additional floor space (e.g., Ampanasana in Antananarivo).

3.14 Users at the Amborompotsy health center in Toliary expressed greater satisfaction with the availability of medication and equipment after its rehabilitation. This center served its surrounding communities of about 14,000 inhabitants. The improvement included a delivery room, some storage space for medicine, an office for health workers, a consultation room, a dispensary, and a resting room for mothers after delivery. Users interviewed three years after the rehabilitation noted that personnel's attitude and motivation have also improved. They have also expressed their willingness to pay a fee to maintain the health center.[6]

3.15 The construction of micro-irrigation perimeters usually increased agricultural productivity, and communities' revenue. In Andohariana, Antananarivo, the community's production increased from 192 tons to 450 tons during the dry season.[7] In Andriandampy, Toliary, areas for cultivation increased from (index) 100 to 225. Their annual rice production also augmented from 20.47 tons to 47.02 tons. Consequently, Andriandampy farmers could sell as much as 38.2 percent of their produce in the market, compared to only 19.6 percent before.[8]

3.16 The outcomes of some subprojects have been somewhat less encouraging. For example, the water adduction of Behenjy, Antananarivo, and the well at Ankatsakatsa, Toliary, were

4. Fonds d'Intervention pour le Développement, Evaluation Auprès des Beneficiares et Evaluation d'Impact des Sous-Projets Financés par le FID, Deuxieme Partie, November 1999, p.157-170.

5. *ibid*, p.97.

6. *ibid*, p.108-119.

7. Fonds d'Intervention pour le Développement, Evaluation Auprès des Beneficiares et Evaluation d'Impact des Sous-Projets du FID, Rapport Provisoire, August 1999, p.41.

8. *ibid*, p.139.

intended to improve sanitation. The Behenjy water adduction, however, has never functioned well, and the community lacked the expertise to repair it.[9] In both communities, diarrhea cases did not decrease as anticipated, but this might be due to other unhygienic living conditions.[10] Nevertheless, inhabitants have been satisfied with the additional source of water. In Ankatsakatsa, households even contributed money to employ a guard to ensure proper usage of the well.

3.17 ***Capacity-building.*** The social fund component has built substantial capacity in managerial and executing skills not only in FID but also in its local partners. Those partners include about 100 local engineering firms (subcontractors), which undertake feasibility studies on approved requests and draw up execution plans and schedules, and local enterprises, which implement the work on site.

3.18 The FID has a comprehensive management information system that keeps data on every stage of a grant request. Each entry includes the subproject's objectives and rationale, a profile of beneficiaries, the composition of the beneficiaries' contribution, feasibility, potential problems, and confirmation letters from ministries to supply personnel to the new schools or health centers.

3.19 ***Sustainability.*** Infrastructure visited by the audit mission just after cyclone Eline and tropical storm Gloria hit the country appeared unaffected. Even though many trees and houses had been toppled, mini-irrigation perimeters and wooden bridges have endured the ferocious river flooding without damage. Rural pebbled paths were always constructed with drains alongside, and those drains have proved especially useful during flooding.

3.20 FID has established a strong incentive to encourage maintenance of the infrastructure it funds. Communities that failed to maintain their existing FID infrastructure were sanctioned, with no future projects until the existing ones were put back in good condition. This threat appeared to be effective as Table 2 indicates a significant improvement in the conditions of infrastructure between the initial and subsequent inspections.

Table 2. The Condition of Infrastructure During the First and Second Inspections

	Antananarivo		*Toliary*	
% of infrastructure with:	*FID first inspection: Late 1998*	*FID second inspection: Mid 1999*	*FID first inspection: Late 1998*	*FID second inspection: Mid 1999*
Excellent maintenance	18%	51%	9%	20%
Acceptable maintenance	39%	30%	14%	36%
Poor maintenance	43%	19%	77%	44%

Source: Dinika International S.A., Projet d'Appui à l'Entretien des Infrastructures de Base — Phrase 3, Antananarivo: FID, May 1999.
Note: All 201 sites in Antananarivo and 153 sites in Toliary were visited.

9. Fonds d'Intervention pour le Développement, Evaluation Auprès des Beneficiares et Evaluation d'Impact des Sous-Projets Financés par le FID, Deuxieme Partie, November 1999, p.121; and Fonds d'Intervention pour le Développement, Evaluation Auprès des Beneficiares et Evaluation d'Impact des Sous-Projets du FID, Rapport Provisoire, August 1999, p.6.

10. Diarrhea cases in Behenjy, Antananarivo, have only reduced from 240 to 206 while in Ankatsakatsa, Toliary, incidents of diarrhea and other infectious diseases have not reduced much.

3.21 In general, FID infrastructure has improved the living standard of its population, and communities appreciated it. Often, contrary to the written assurances of ministries, the authorities have failed to staff the schools and health centers after construction. To solve this problem, some communities have demanded that local leaders intervene on their behalf. In other cases, the communities have paid out of their own pockets for someone from the district to teach in the schools. As of 1998, about 15 health centers and schools were under-staffed, but by end-1999, all FID-constructed schools and health centers were adequately staffed.

3.22 Although rigorous analysis and evidence are not available, Table 3 also suggests that infrastructure with (i) well-defined beneficiaries (e.g., micro-irrigating perimeters or schools *vs.* rural roads), and (ii) durable structure (e.g., buildings *vs.* water supply) tend to be in better condition. In the former case, it is easier to motivate maintenance among beneficiaries, while in the latter, a more durable structure simply lasts longer even without maintenance. If all constructed infrastructure is assumed to have been equally indispensable and needed, then priority should be given to those structures that could serve the communities longer.

Table 3. The Proportion of Infrastructure with Poor Maintenance, by Type

Types of Infrastructure	*% of infrastructure in poor condition*
Buildings: e.g., additional floor space to school buildings or health centers, communal storage space for agricultural products, community market	18
Micro-irrigating perimeters: e.g., mini-dam for irrigation	21
Transporting: e.g., walkway, pebbled paths, bridges, rural roads	32
Water supply: e.g., well, adduction	42

Source: Dinika International S.A., Projet d'Appui à l'Entretien des Infrastructures de Base — Phrase 3, Antananarivo: FID, May 1999.

Food-for-Work Program

3.23 ***Outcomes.*** During the audit mission's site visit, beneficiaries-cum-workers expressed much pride in their work. Female workers, in fact, preferred in-kind (rice) payment to cash because there was less competition for the jobs, and their families needed the rations. Some women could also sell (between 10 and 50 percent of) their unconsumed food rations at the market. At some sites, SECALINE had set up a medical tent where a doctor offered services and medication. On-site records indicated a reduction of diarrhea from 73 to 33 cases per 1,000 person-days, and of colic (stomach cramp) from 41 to 15 cases per 1,000 person-days, between 1996 and 1997.[11]

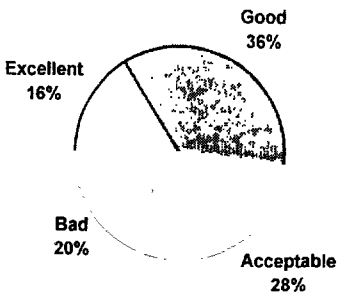
3.24 Figure 1 indicates that the majority of infrastructure was still in an acceptable (or better) condition at the end of 1998. The condition was not categorized by infrastructure type, but the local engineer in charge of the program believed that most of those in poor condition were canals. When they were not regularly cleaned or weeded, canals ceased to perform their drainage function. The condition of the canals visited varied according to their size and location. Larger canals nearer to town were periodically cleaned up by municipal agencies,[12] whereas smaller ones within communities were filled with water hyacinth and garbage. In the neighborhood (e.g.,

11. Bureau d'Exécution du Projet SECALINE, Rapport d'Avancement: Volet Vivres-contre-travail — travaux Communautaires à Haute Intensité de Main d'Oeuvre en Zonnes Urbaines, December 1998, p,14.

12. The municipality of Antananarivo, with aid from the European Union and several French corporations, created two agencies in 1999 to manage and improve infrastructure in urban areas. APIPA (Autorité Protection contre les Inundations dans la Plaine d'Antananarivo) is in charge of all primary, secondary, and tertiary canals while SAMBA (Société Autonome pour la Maintenance de la ville d'Antananarivo) is in charge of garbage collection in the city.

Ampanotokana) where canals could still drain, the community benefited immensely. Flooding after a downpour that used to last over 6 hours had been reduced to less than 30 minutes.

Figure 1. Condition of Food-for-Work Infrastructure in 1998



Source: Bureau d'Exécution du Projet SECALINE, *Rapport d'Avancement: Volet Vivres-contre-travail — travaux Communautaires à Haute Intensité de Main d'Oeuvre en Zonnes Urbaines*, December 1998.

3.25 As for FID-funded infrastructure (para. 3.21), the audit mission found that infrastructure benefiting well-defined communities has been maintained well. For example, each family in the communities in Andavamamba contributes about 500 MGF (US$0.08) yearly to the communal maintenance fund, and their 800-meter-long bridge has been rehabilitated several times. Similarly, where the beneficiaries were less clearly defined, more durable infrastructure was generally in better condition. This included stone steps linking different parts of a neighborhood, cement or stone walkways, and elevated dikes. Not only did this type of infrastructure require little maintenance it was also among the most useful and beneficial. Cement walkways and elevated dikes were often the only "dry paths" in lowland areas, linking houses, neighborhoods, and communities.

3.26 ***Capacity-building and Sustainability.*** Maintenance committees were provided training and communities were allowed to keep their working tools after construction to facilitate repair work. Given the difficulty in fund collection, treasurers of maintenance committees in several communities were given a small commission proportional to their collection. Many maintenance committees are functional, but funds were not necessarily used to maintain SECALINE's infrastructure if there were other items with higher priority that needed repair.

3.27 The audit mission visited several sites five days after cyclone Eline, with winds of up to 120km/hour, has passed through Antananarivo. Concrete pebbled pathways, and steps (linking communities) were intact, and even wooden bridges and raised dykes, which were less sturdy, were unaffected by the cyclone. Areas with non-functional canals were still muddy and flooded, but those with functional canals were no longer flooded.

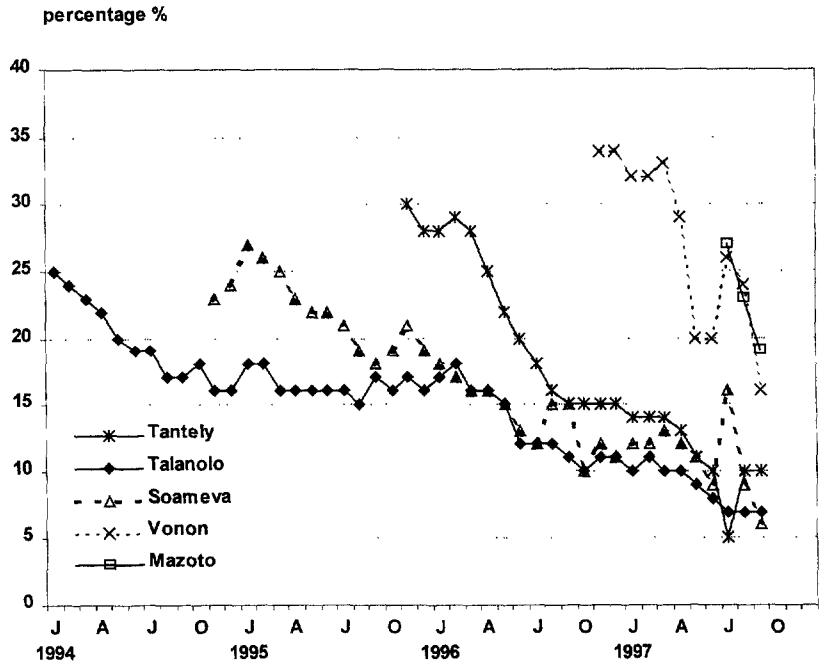
3.28 This component was discontinued and the WFP has shifted its activities to Toliary and Finanarantsoa to join several European donors and NGOs (e.g., Catholic Relief Services). Currently, Care International, an NGO with USAID funding, plans to begin a community-based food-for-work program sometime in the year 2000 in Antananarivo.

3.29 BPS expressed to the audit mission their frustration over the discontinuation of the *food-for-work* element in SEECALINE without any reason. The agency's national director indicated that the Bank's negotiating team did not consult with local authorities on the component's pros and cons even though the BPS had expressed a wish to do so.

Community Nutrition Program

3.30 ***Outcomes.*** Post-SECALINE communities have experienced a consistent reduction in malnutrition rates over time. Figure 2 shows the total percentage of malnourished (weight-for-age below 80% of median) children in groups of communities, sorted by their dates of entry into the SECALINE program. It indicates that at any given time, communities without SECALINE (can be extrapolated to show that they) had higher malnutrition rates.[13]

Figure 2. Percentage of Malnourished Children (weight-for-age below 80% of median) in SECALINE Communities, 1994–97



Source: From Figure 4 in Marek, T, I. Diallo, B. Ndiaye, and J Rakotosalama, "Successful Contractig of prevention services: fighting malnutrition in Senegal and Madagascar," *Health Policy and Planning*, vol 14(4), 1999

3.31 ***Capacity-building and Sustainability.*** Interviews the audit mission conducted with mothers found that many continued to monitor their babies' weight and that many still met with their former ACNs to seek advice. Health officials also found that better-fed and heavier SECALINE babies were easier to treat.

3.32 The most important contribution of SECALINE is the education instilled in mothers. Besides weekly demonstration on how to prepare wholesome food from their own agricultural products, and educational sessions on weaning, feeding practices, and general health, quizzes and contests between communities and learning trips for ACNs also took place. The purpose of the learning trips was to exchange experiences, encourage learning, and motivate behavioral change for healthier habits among SECALINE women.

13. Talanolo, Soamevav, Tantely, Vonon, and Mazoto are names given to respective groups of communities that started the SECALINE program on the same date.

3.33 Findings from a BPS evaluation[14] of SECALINE communities, ex-ante and ex-post, as well as a comparison between SECALINE and non-SECALINE communities with similar socio-economic background in the same *faritany* are summarized in Table 4. It indicates that the proportion of mothers weaning their babies before 6-months old has improved, decreasing from 51.9 percent to 37.7 percent.[15]

3.34 Because babies tend to become malnourished during weaning period, SECALINE focused on teaching mothers how to prepare nutritionally balanced weaning diets. While only 2.9 percent of mothers in non-SECALINE communities fed their weaning babies protein-enriched broth (e.g., legume, peanut, or other type of protein), some 26 percent of post-SECALINE mothers did. In parallel, as much as 51 percent of non-SECALINE mothers fed their weaning babies with plain broth compared to 36 percent of SECALINE mothers.[16]

3.35 Peanuts, although cultivated and sold, are not usually consumed in the household and are mistakenly believed to cause diarrhea and intestinal parasites in children. While only 28.9 percent of non-SECALINE mothers introduced peanuts into the diets of their babies,[17] as many as 61.3 percent of post-SECALINE mothers did, and about half of whom admitted that they had never before included peanuts.[18] Similarly, some 17.3 percent of post-SECALINE mothers now fed their children (1 year or older) with carbohydrates, enriched with legumes, other proteins, and oil, whereas only 2.8 percent of non-SECALINE mothers did.[19] Given that superstition and traditional habits are rooted in rural communities, SECALINE has been very successful in educating and effecting behavioral changes among a substantive proportion of women.

14. Evaluation de l'Intervention IEC sur l'Alimentation du Jeune Enfant by the SECALINE Regional Office of Toliary, November 1997.

15. SECALINE has encouraged mothers to breastfeed their babies for a longer period, but due to their needed help in the field, they were unable to do so.

16. See Table 7 in the report, Evaluation de l'Intervention IEC sur l'Alimentation du Jeune Enfant, by the SECALINE Regional Office of Toliary, November 1997: p.10.

17. The peanuts are ground into powder and cooked into congee with other ingredients, such as rice or maize and greens.

18. See Tables 13 and 15 in the report, Evaluation de l'Intervention IEC sur l'Alimentation du Jeune Enfant, by the SECALINE Regional Office of Toliary, November 1997: p.16-17.

19. See Table 9 in the report, Evaluation de l'Intervention IEC sur l'Alimentation du Jeune Enfant, by the SECALINE Regional Office of Toliary, November 1997: p. 13.

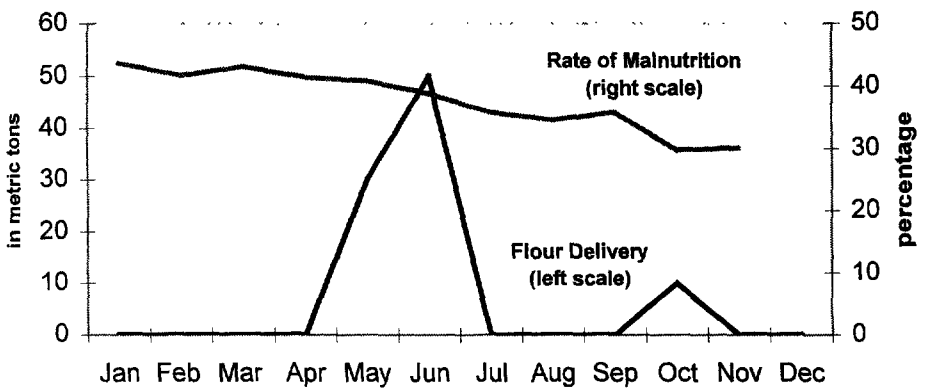
Table 4. Attitude of Mothers, their Weaning Practices, and Feeding Habits by Treatment (pre- and post-SECALINE) Group and Control (without SECALINE) Group

Attitude, Weaning Practices, and Feeding Habits of Mothers	*Treatment group = SECALINE Comm in Toliary before SECALINE: (n = 693)*	*Treatment group = SECALINE Comm in Toliary after SECALINE (n = 693)*	*Control group = non- SECALINE Comm in Toliary (but with similar socio-economic background) (n=176)*
Babies weaned prior to 6-months old	51.9%	37.7%	41.2%
Weaning food given:			
Plain Broth	35.7%	36.4%	51%
Broth with legume or other protein	8.5%	25.9%	2.9%
Consider peanut a favorable ingredient in the baby's (6-month or older) diet	29.0%	61.3%	28.9%
Consider oil a favorable ingredient in the baby's (6-8 month-old) diet	–	76.6%	53.4%
Give carbohydrate as well as legume, other protein, and oil to children over 1-year-old	–	17.3%	2.8%

Source: SECALINE Regional Office of Toliary, *Evaluation de l'Intervention IEC sur l'Alimentation du Jeune Enfant*, Toliary, Madagascar, November 1997.

3.36 In contrast, supplementary feeding, the other major component of the program, seemed less successful even in addressing short-term malnutrition. Available information on malnutrition and delivery of food rations to SEECALINE communities in Toliary suggested that monthly delivery of food rations either never arrived or fell short of the pre-assigned quota of 100 metric tons. Figure 3 shows that despite the erratic delivery of flour to Toliary in 1999, the malnutrition rate (measured by weight-for-age) in SEECALINE communities has fallen consistently. Supplemental feeding could also introduce the wrong incentives: it encouraged mothers to rely on the program to feed their children, and appeared to reward mothers who did not take good care of their children.

Figure 3. Percentage of Malnourished Children in all 7 *Fivodronana* of Toliary (with SEECALINE) and Tons of Food Ration Received in Toliary, January–December 1999



Source: Regional Office of Toliary.

3.37 Although details are not readily available, the crude calculation in Table 5 indicates that supplementary feeding (provided by the WFP) constituted about half of the total realized costs of

the component. The approximated costs per-child *fed* were extremely high compared to the per-child non-feeding costs. Marek et al. (1999) reports a study in Senegal which shows that out of the 100 grams of supplementary food per day received by a malnourished child, the child only consumes 25 grams.[20] Therefore, a program that emphasizes education and behavioral changes is more cost-effective and sustainable in combating malnutrition.

Table 5. Total and Per-child Costs in the Community Nutrition Program (PCN)

	Toliary Province	***Antananarivo Province***
Total Costs	US$3,144,400	US$2,671,700
IDA Credit	US$1,598,100	US$1,396,800
(% of total costs)	(51%)	(52%)
World Food Program	US$1,546,300	US$1,274,900
(% of total costs)	(49%)	(48%)
Total Number Children Covered	228,568	261,538
Total Number Children Fed	31,450	42,233
Per-child Total Costs [a]	***US$12.0***	***US$11.7***
Per-child Feeding Costs [b]	***US$49.2***	***US$30.2***
Per-child non-feeding Costs [c]	***US$7.0***	***US$5.3***

Source: Annexe B: The *Rapport d'Achèvement du Projet SECALINE par l'Emprunter* in the Implementation Completion Report.
Note:

[a] Per-child total costs are calculated by dividing total costs by total number children covered.

[b] Per-child feeding costs are calculated by dividing WFP's contribution by total number children fed.

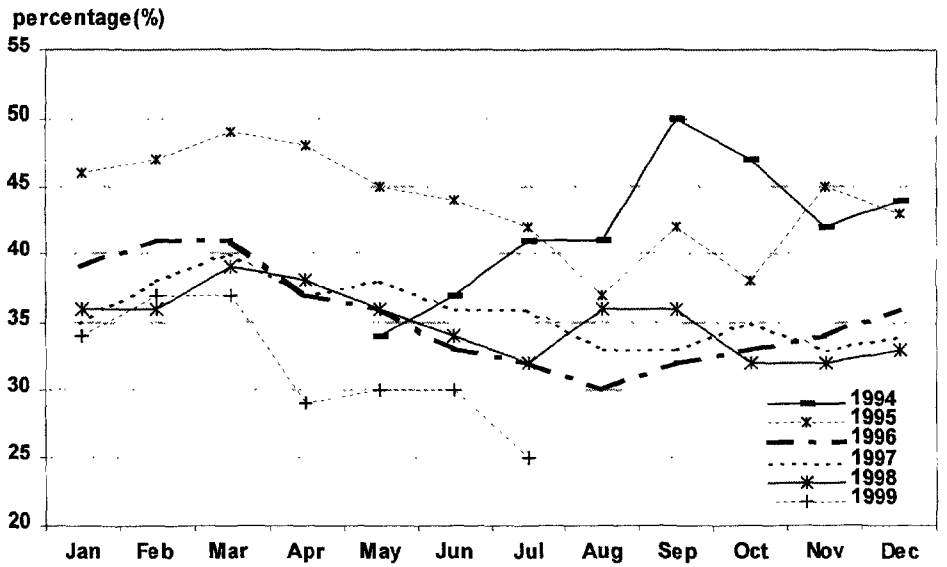
[c] Per-child non-feeding costs are calculated by dividing IDA credit by total number children covered.

National Food Security Strategy

3.38 ***Outcomes.*** Figure 4 shows a gradual but noticeable decline in malnutrition rates (weight-for-age) in recent years. Malnutrition rates after 1996 were significantly lower than those earlier, and they were even lower by 1999. However, the reasons are not documented. The figure also indicates that the rates of national malnutrition tend to be higher between September and March, which roughly corresponds with the dry season (December through February). This implies that if agricultural productivity could be increased (e.g., with better irrigation) during the dry months, nutritional status might also improve.

20. Marek, T, I. Diallo, B. Ndiaye, and J Rakotosalama, "Successful Contracting of prevention services: fighting malnutrition in Senegal and Madagascar," Health Policy and Planning, vol 14(4), 1999, p. 382:389.

Figure 4. National Rates of Malnutrition, 1994–99



Source: Minister of Health, *Raport Triennal, 1997-1999*, Madagascar: Div of Nutrition Services, December 1999.

3.39 ***Capacity-building and Sustainability.*** Madagascar's first Food Security Strategy was completed in December 1997. Based on the National Food Security Strategy, several projects with multilateral donors have begun, e.g., the National Health Project between UNICEF and the Ministry of Health, and another project between the Food and Agriculture Organization, and the Ministry of Agriculture. Several components in the World Bank's SEECALINE are also based on the strategy.

3.40 Initially, expatriate experts would be hired to develop the strategy, but the borrower has suggested a team of local professors and specialists. The strategy was formulated after a comprehensive study that encompassed food and nutritional situations in every province. Analyses in the study focused on (a) the population's food consumption: pattern, composition, fulfillment in calories and micro-nutrients, hygiene and food preparation; (b) food availability: by types, agricultural productivity, and storage; (c) accessibility: purchasing power, volume, prices, inflation, transportation, and distribution network.

3.41 Such a comprehensive study serves well as groundwork for many potentially fruitful programs. The government should draw on local expertise productively, and bring more national experts into involvement with the national programs because they have the knowledge, and a better understanding of their country.

Iodine Deficiency Disorder Control

3.42 ***Outcomes.*** Table 6 shows various indicators for national progress in controlling iodine deficiency disorders between 1992 and 1999. Coverage of iodized salt at the household level increased from zero in 1992 to 98.3 percent in 1999. Levels of iodine in urinary excretion of monitored children have also risen: the proportion of children with less than 50 μg/l of urinary iodine has fallen from 70.7 percent to zero. Total goiter rates among primary school children have declined from 45.1 percent to 7.1 percent during this period.

Table 6. Indicators of National Progress in Iodine Deficiency Disorders Control, 1992–99

	1992	*1995*	*1996*	*1997*	*1998*	*1999*
Coverage of Iodized Salt (%) at Household Level	0.0	0.0	83.1	92.0	96.6	98.3
Level of Iodine in Urinary Excretion of School Children (6-12 years old):						
Average level (in µg/l)	41.5	74.1	170.3	160.0	--- [a]	--- [a]
Median level (in µg/l)	---	70.2	161.2	148.3	156.8	--- [b]
% with < 20µg/l	16.0	5.0	0.9	0.7	0.0	--- [b]
% with < 50µg/l	70.7	25.8	3.8	0.7	0.0	--- [b]
% with >100µg/l	0.0	23.8	78.8	85.7	91.2	--- [b]
Total Goiter Rates by Palpation (%) of School Children (6-12 years old)	45.1	22.4	16.0	15.1	8.7	7.1

Source: Ministry of Health (Services de la Nutrition), *Rapport d'Activités 1998 du Projet TDCI*, 1998; Ministry of Health (Services de la Nutrition) *Rapport d'Activités 1999 du Service de la Nutrition*, Jan 2000; Lantum, Dani, *National Programme for the Control of Iodine Deficiency Disorders in Madagascar*, Mar 1998, Antananarivo: OMNI/USAID, and Ministry of Health.

Note: Nationwide salt iodization began in 1995, and iodized salt reached the market by December 1995.

[a] Averages are not calculated since 1998. Instead, only the medians are reported to better reflect the distribution.

[b] Data on urinary iodine content for 1999 were sent to the Division of Nutrition Services in Antananarivo in early 2000 and analysis was not available as of April 2000.

3.43 ***Capacity-building.*** Local production of iodized salt has been sufficient to support nationwide consumption. Table 7 displays the estimated annual production, and market shares for various producers. Because many small firms do not produce continually, the actual market share of large- and medium-sized producers is over 80 percent. Under the national IDD control program, training and educational workshops were held for salt producers, potassium iodate solution is given free of charge until year 2000, and iodizing equipment is distributed to all producers. While each medium- and large-sized producer receives individual iodizing units, small producers are grouped into teams by location to share seven units.

Table 7. Estimated Annual Iodized Salt Production

	Percentage or Share (total estimated production per year)	*Estimated Production Capacity in 1998 (tons/year)*
Total Estimated Annual Production		101,500
Total Estimated Annual Demand		91,000
Large Producer:	50%	
La Companie Salinière de Madagascar		50,000
Medium-sized Producers:	25%	
Salinen/Sebemer (Morondava)		8,000
GSM and C1,C2 Ampataka (Morondava)		8,000
Ifaty (Toliary)		5,000
Manombo (Toliary)		5,000
Small Producers:	25%	
At least 25 known producers scattered in 2 zones of Tuléar, and in Ihodo/Tsihombe and Tongobory.		25,500

Source: Table IV from Lantum, Dani, *National Programme for the Control of Iodine Deficiency Disorders in Madagascar*, March 1998, Antananarivo: OMNI/USAID, and Ministry of Health, p.17.

3.44 A 1992 national prevalence of goiter survey identified goiter endemic areas in Madagascar. Seven sentinel sites (the source of the data in Table 6) have since been established in all six provinces to monitor progress in controlling iodine deficiency.[21] Sentinel sites are in charge of collecting samples of salt and urine from primary school children and sending them to be tested in the capital once a year. Four of the six provinces (Toliary, Antananarivo, Toamasina, and Finanrantsoa) also have laboratories (Ministry of Health) to test salt samples from production sites and marketplaces. By year-end 2000, laboratories will be set up in the two remaining provinces (Mahajanga and Antsiranana). The Ministry of Health, UNICEF, and SECALINE have launched an IEC campaign to educate the public about iodine deficiency disorders, and training was given to personnel at the laboratories. Field kits to test the presence of iodine in salt are regularly distributed to producers, local health officials, village chiefs, and schools.

3.45 A sustainable campaign against iodine deficiency disorders requires a coordinated multi-sectoral effort. This has been facilitated in Madagascar by two factors. First, the responsibilities of data collection and analysis, iodine laboratories, epidemiological surveillance, and impact-monitoring were all consolidated under the Nutrition Services of the Ministry of Health by the prime minister in March 1997. Second, compliant (and easily monitored) salt producers are supplying over 80 percent of its national consumption. They are large and medium-sized enterprises that have the capacity and incentives to produce quality iodized salt.

3.46 ***Sustainability.*** The coverage of iodized salt is almost universal, and the control of iodine deficiency has been significant. However, a large proportion of iodized salt has not met the officially defined standard. Iodine content in salt varies widely, and Table 9 suggests that barely half of salt samples are qualified for the interval of 30-60ppm iodine. For example, in Antananarivo, the minimal iodine content in its samples is only 7.4ppm whereas the maximum reaches 209ppm.

3.47 Poor-quality salt has come mainly from Toliary's small producers who iodize their salt manually (or not at all) when their iodizing equipment breaks down. Unlike their larger-sized counterparts, small producers have no incentive to repair their collectively owned equipment.[22] The prevalence of inadequately iodized salt is threatening national efforts to eliminate iodine deficiency disorders because a large proportion of Toliary's poorly iodized salt is sold in goiter-endemic highland regions, whose population's consumption of goitrogenous cassava has further exacerbated the situation.

3.48 *La Companie Salinière de Madagascar,* the only plant with internal quality control units, is rarely monitored by the government and indeed, in its home province of Antsiranana where it provides most of the salt, the quality is consistent: salt samples were well within the interval of 27-48ppm of iodine. On the other hand, in the neighboring Mahajanga, where *la Companie Salinière de Madagascar* also supplies most of the salt, iodine content in samples taken from Bealanana marketplace has ranged from 21ppm to 70ppm (see Table 8). Whether this is because of infiltration by poor quality salt from other suppliers, tampering by distributors, or the result of quality inconsistency at *la Companie Salinière de Madagascar* is unclear.

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21. Sentinel sites are in Betroka (Toliary), Belazao and Ambohidratrimo (Antananarivo), Fandriana (Fianarantsoa), Ranomafana-Est (Toamasina), Bealanana (Mahajanga), and Maroabihy-Est (Antsiranana).

22. Although there is a National Workshop for Maintenance, in charge of repairing all iodizing equipment, it is unresponsive and tardy.

Table 8. Quality Indicators of Iodized Salt in 1998 for various provinces: Proportion of Salt Samples with 30-60ppm iodine and the Range of Iodine Content in Salt Samples

Provinces in Madagascar	*Antananarivo*	*Toliary*	*Fianarantsoa*	*Toamasina*	*Antsiranana*	*Mahajanga*
Proportion of Salt Samples[a] tested positive with iodine, *by field test-kits*	94.8%	85.2%	93.5%	96.5%	98.6%	99.7%
Proportion of Salt Samples[b] tested with 30-60ppm iodine, *by titration at laboratory*	58.9%	33.3%	55.9%	35.0%	80.0%	---
Salt samples with:						
Min level of iodine (ppm)	7.4	1.9	11.1	18.7	27.4	20.63
Max level of iodine (ppm)	209.9	35.4	55.5	66.5	48.1	69.83
Mean iodine level (ppm)	46.9	21.3	30.3	29.5	35.8	26.54

Source: Ministry of Health (Services de la Nutrition), *Rapport d'Activités 1998 du Projet TDCI.*

Note:

[a] Salt samples are collected monthly from school children in sentinel sites by District Nutrition Services Division.

[b] Salt samples are collected by officials at the Ministry of Health laboratories several times a year. Laboratories in the provinces of Antsranana and Mahajanga were recently (1999) established. There has been no data yet from the laboratory of Mahajanga.

[c] Though there is no data for the entire province of Mahajanga, information in this column is obtained from salt samples at marketplace in Bealanana in Mahajanga.

3.49 To address their remaining problems, the authorities should concentrate on three areas. First, samples of salt at all production sites should be collected more frequently to be tested by titration at the laboratories. Thus far, most of the salt classified as "iodized" has only been tested by field test kits where as little as 5ppm of iodine is sufficient for a positive reading. A large percentage of samples, when tested again by titration, have either too much or too little iodine.

3.50 Second, large- and mid-sized producers should also be monitored regularly. Evidence suggests that a significant number of salt samples have not conformed to the required standard, even in provinces where small producers are unlikely to reach. Moreover, since mid-sized producers only depend on field test kits and automated iodizing equipment, and do not intend to set up internal quality-control units in the near future, the authorities will need to continue collecting samples regularly, at every production site, and test them via titration.

3.51 Third, the authorities should shift their focus from non-complying small producers to wholesale distributors. Since the authorities must shoulder the heavy responsibility of overseeing the whole industry, incentives must be given to players within the industry, whenever possible, to police and regulate one another. In this case, wholesale distributors may be an effective tool to monitor and motivate small producers to iodize their salt adequately. Given that the names of wholesale distributors for each producer are available, their number is manageable, and all producers go through the wholesale channel, the authorities should confiscate and impose penalties on wholesale distributors found with non-iodized salt. A persistent demand for adequately iodized salt from wholesale distributors may be a more effective approach. After all, five years of persuasion, education, and even threat from the authorities have not resulted in proper iodization.

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Basic Data Sheet

MADAGASCAR—FOOD SECRITY AND NUTRITION PROJECT

Key Project Data

	Appraisal estimate	*Actual or Current estimate*	*Actual as % of appraisal estimate*
Total project costs (US$)	32.4	28.8	89
Loan amount (US$)	21.3		
Cancellation (US$)		4.9	

Date physical components completed: June 30, 1998

Cumulative Estimated and Actual Disbursements *(US$ million)*

	FY94	*FY95*	*FY96*	*FY97*	*FY98*	*FY99*
Appraisal estimate	3.4	9.0	13.6	18.6	21.3	21.3
Actual	2.9	6.4	13.9	17.8	18.7	17.8
Actual as % of estimate	85.3	71.1	102.2	95.7	87.8	83.6

Date of final disbursement: November 13, 1998

Project Dates

Steps in project cycle	*Original*	*Actual*
Identification	--	July 1990
Preparation	--	1990–1992
Appraisal	--	November 1992
Negotiations	--	January 1993
Board presentation	--	March 18, 1993
Signing	--	April 9, 1993
Effectiveness	July 1993	July 29, 1993
Special Account		
Midterm Review	June 1996	June/July 1996
Project Completion	January 31, 1998	June 30, 1998
Credit closing	July 31, 1998	December 31, 1998

Staff Inputs (staff weeks)

Stage of project cycle	*Staff Weeks*			*US$000*		
	Orig. Plan	*Rev. Plan*	*Actuals*	*Orig. Plan*	*Rev. Plan*	*Actuals*
To Appraisal	N.A.	N.A.	141.2	N.A.	N.A.	294.2
Appraisal to Board Approval	N.A.	N.A.	99.8	N.A.	N.A.	274.1
Board Approval to Effectiveness	N.A.	N.A.	11.3	N.A.	N.A.	33.4
Supervision	94.6	83.0	79.2	236.2	273.3	265.2
Completion	6.3	7.2	6.6	17.4	31.5	15.7
Total	100.9	90.2	338.1	253.6	304.8	882.6

Mission Data

Stage of project cycle	*Date (month/year)*	*No. of staff in field*	*Duration of mission(# of days)*	*Specializations represented*[a]*	*Performance ratings*		*Types of problems*[c]
					Implement. Status	*Develop. Objectives*	
Through Appraisal	Several missions in 1991 & 1992				--	--	
Appraisal	11/92	6	16	EC, IMP, IEC, NUT, FA, MIS	--	--	
Supervision 1	7/93	7	14	EC			None
Supervision 2	10–11/93	3	13	NUT, IMP, IEC			None
Supervision 3	3/94	3	12	EC, NUT, IMP	S	S	None
Supervision 4	7–8/94	3	25	NUT, IMP, SF			None
Supervision 5	4–5/95	4	20	EC, IEC, IMP, MIS	HS	HS	None
Supervision 6	6–7/95	3	22	EC, NUT, PO	HS	HS	None
Supervision 7	11–12/95	5	17	PO, NUT, SF, IMP, MIS	S	S	None
Supervision 8	6/96	3	18	PO, NUT, PRO	S	S	None
Supervision 9	11–12/96	2	20	PO, NUT	S	S	None
Supervision 10	7–8/97	2	14	PO, NUT	S	S	None
Supervision 11	2/98	3	5	PO, NUT	S	S	None
Supervision 12	12/98	2		PO, NUT	S	S	None
Completion							

* EC = Economist; fa = Financial analyst; IEC = IEC Specialist; IMP = Implementation specialist; MIS = MIS specialist; NUT = Nutritionist; PO = Project officer; PRO = Procurement specialist; SF = Social fund specialist;

Other Project Data

Borrower/Executing Agency: Bureau d'Exécution de sécurité alimentaire et nutrition élargie

Related Bank Credits

Credit title	*Credit*	*Year of approval*	*Status*
Preceding operations			
Education Sector Reinforcement Project (CRESED)	2094	1990	Closed
Livestock Project	2243	1991	Ongoing
National Health Sector (CRESAN)	2251	1991	Ongoing
Following Operations			
Antananarivo Urban Works Project	2591	1994	Closed
Second Irrigation Rehabilitation Project	2644	1994	Ongoing
Social Fund II (FID)	2778	1995	Ongoing
Urban Infrastructure	2968	1997	Ongoing
Rural Water Supply Project	3025	1997	Ongoing
Education Sector Development	3046	1998	Ongoing
Community Nutrition II	3060	1998	Ongoing
Social Fund III (FID)	3180	1999	
Second Manpower Development		1999	
Micro Finance Project		1999	