Landscape Development Interventions

Semi Annual Report

Volume II: Cyclone Recovery Program

July 2000 - December 2000

CONTRACT N° : **687-C-00-98-00160-00**

SUBMITTED TO : **USAID/Madagascar/SO3**
BY : **Chemonics International**
Cornell International Institute for Food, Agriculture and Development
Pact Madagascar

February 9, 2001

ACRONYMS

AUE	Association des Usagers de l'eau (Water Users Association)
AUP	Association des Usagers des Pistes (Road Users Association)
AGERAS	Appui à la Gestion Régionalisée et à l'Approche Spatiale
AGEX	Agence d'Execution
ANAE	Association Nationale pour les Actions Environnementales
ANGAP	Association Nationale pour la Gestion des Aires Protégées
AQUALMA	Aquaculture de Mahajamba
ATS	Association Tefy Saina
BEST	Bureau d'Expertise Sociale et de Diffusion Technique
BRF	Bois Rameaux Fragmenté
BTM	Bankin'Ny Tantsaha Mpamokatra
BOA	Bank of Africa
CAF	Cellule d'Appui Forestier
CANFOR	Cantonnement Forestier
CANFORET	Forest Service Cantonment
CAP	Commercial Agricultural Promotion
CDC	Comité de Développement Communal
CDD	Departmental Development Committee
CCEE	Centre Culturel pour l'Education à l'Environnement
CCV	Centres Culturels Villageois
CDIA	Centre de Diffusion pour l'Intensification Agricole
CE	Conservation Enterprises
CEIF	Conservation Enterprises Investment Funds
CEM	Caisse d'Epargne de Madagascar
CGS	Community Granary Storage
CIIFAD	Cornell International Institute for Food, Agriculture and Development
CIIFOR	Cornell International Institute for Forestry
CIM	Centre d'Interpretation de Moramanga
CIRAGRI	Circonscription de l'Agriculture
CIREL	Circonscription de l'Elevage
CIREF	Circonscription des Eaux et Forêts
CIRPECH	Circonscription de la Pêche et des Ressources Halieutiques
CITE	Centre d'Infromation Technique et Economique
CJPM	Comité Jean Pain Madagascar
CLB	Comité Local de Base
COPIL	Comité de Pilotage
CPSE	Comité de Planification et de Suivi & Evaluation
CPF	Counterpart Funds
COP	Chief of Party
CRD	Comité Régional de Développement
CTA	Cellule d'appui Technique (AGERAS)
DPV	Direction de la Protection des Végétaux
DIREF	Direction des Eaux et Forêts
EAM	Entreprendre à Madagascar
EASTA	Ecole d'Application des Sciences Techniques et Agricoles
ECOCERT	Enterprise de Certification Organique/biologique
EFE	Entreprises Favorables à l'environnement
EIA	Environmental Impact Assessment
EJ	Expert Junior
EP II	Environmental Program 2
ESSA	Ecole Supérieure des Sciences Agronomiques
ETN	Eco-Tourisme Nord
FENU	Fonds d'équipements des Nations Unies
FMG	Malagasy Francs
FCE	Fianarantsoa Cote Est Railroad
FID	Fonds d'intervention pour le Développement
FIEFE	Fonds d'investissement pour les entreprises favorables à l'environnement
FITIM	Filature et Tissage de Madagascar (Spinning and Weaving of Madagascar)
FOFIFA	Foibe Fikarohana ho amin'ny Fampandrosoana ny eny Ambanivohitra
GAIM	Groupement Agro-Industriel de Moramanga
GCRN	Gestion Communautaire des Ressources Naturelles
GCV	Greniers Communautaires Villageois (Community Grain Storage Facilities)
GELOSE	Gestion Locale Sécurisée
GIS	Geographic Information System
GPF	Gestion Participative des Forêts
GPS	Global Positioning System
GTDR	Grpoe de Travail pour le Développement Régional (PADR)
GR	Génir Rural
IPNR	Institut pour la Promotion Nationale de la Riziculture
IR	Intermediate Result

IRRI	International Rice Research Institute
ISC	Input Supply Centers
KH	Kolo Harena
LDI	Landscape Development Interventions
MARP	Méthode Accélérée de Recherche Participative
M&E	Monitoring & Evaluation
MEF	Ministère des Eaux et Forêts
MIRAY	Consortium PACT – Conservation International – WWF
MSC	Malagasy Seafood Company
NRM	Natural Resources Management
NGO	Non-Government Organization
ODAI	Opération de Développement Agricole Intégré
ODASE	Opération de Développement Agricole du Sud Est
ONE	Office National de l'Environnement
OTIV	Mutuelle d'Epargne et de Crédit
PACT	Private Agencies Collaborating Together
PCR	Plan de Communication Régional
PE1	Programme Environnemental #1
PDRAB	Projet de Développement Régional d'Ambato Boeni
PPIM	Programme Pilote Intégrée de Mahajanga
PLAE	Programme de Lutte Anti-Erosive
PMF	Participatory Forest Management
PNLCP	Programme National de Lutte Contre la Pauvreté
POLFOR	Politique Forestière
PRA	Participatory Rural Appraisal
PRB	Projet Rizicole de Betsiboka
RFPD	Regional Forestry Plan Director
RN	Route Nationale
RRA	Rapid Rural Appraisal
RS	Ressources Vertes
SAF/FJKM	Sampan'Asa Fampandrosoana de l'Eglise Protestante
SFR	Sécurisation Foncière Relative
SO3	Strategic Objective # 3
SR	Sub-Result
SRI/SRA	Système de riziculture Intensif/Système de riziculture amélioré
SZI	Strategic Zone of Intervention
WWF	World Wide Fund
YNC	Young Naturalist Clubs
ZSI	Zone(s) Stratégique(s) d'Intervention
ZIE	Ecotourism Investment Zones

1. Fianarantsoa Region

1.1. Rail infrastructure strengthening and stabilization of the FCE

The FCE railroad rehabilitation effort commenced through an initial investment of $51,000 of LDI Fianarantsoa funds in opening the railroad immediately following the cyclones Gloria and Eline. These initial funds enabled the FCE to open to full traffic on June 1 in time to transport coffee to the coastal port city of Manakara. Between June and September, LDI set up a management unit, called the Unité FCE, to work with the RNCFM and FCE to design a technical plan to restore 15 most seriously affected areas along the tracks and to devise a strategy to wo444 rk with local communities to protect the railway embankments. The detailed meter-by-meter assessment of the work to be carried out is documented in a highly detailed technical strategy paper prepared by the Unité FCE railroad engineer M. Gilles Rasoamanana and the chief engineers of the RNCFM.

By the end of September, an additional $500,000 was received through the special Congressional supplemental funding. Of this sum, a total of $360,000 is being invested through the Intervention Fund for track rehabilitation. This fund is to be totally spent by March 31, 2001. The rapid expenditure of the majority of funds occurring between the time of the contract amendment in late September and the arrival of the rains in late December. A race against time thus occurred because most track rehabilitation had to be completed before the impossible working conditions associated with the rainy season. An additional $$ 45,000 was allocated for the community rehabilitation program under the two year Tranche I Cyclone Recovery funding allocated under a separate contract amendment to LDI with a second similar amount scheduled for allocation under Tranche II funding.

1.1.1. Main results

The Unité FCE effectively carried out on schedule the track rehabilitation and community components of the FCE cyclone rehabilitation program during this initial reporting period. The detailed report of these activities is described in greater detail by Unité FCE coordinator Gilles Rasoamanana in his "Rapport de Mission" of December 2000. The majority of work was completed just prior to the arrival of the rainy season at the end of December. The project did not anticipate carrying out much additional construction work between January and March as the threat of heavy rains and cyclones precludes work along the tracks. Even though most of the rehabilitation objectives needed to be carried out before the rains, both LDI and the FCE clearly recognized that the arrival of the rainy season would most likely bring additional landslides, gullying of newly placed embankments, and probably some erosion along the newly laid tracks. If extremely heavy rains or cyclones were to hit the line between January and March, extensive damage would certainly occur.

(a) Technical Component

Track Rehabilitation: The track rehabilitation work at 15 "points noirs" and two other minor sites was carried largely completed in the majority of the 15 pre-selected sites by the end of December. The detailed engineering studies were carried out by the senior RNCFM and FCE engineers between July and September in association with the Unité FCE staff. The detailed site visits led to a highly detailed meter-by-meter estimation of labor needs and cost considerations. By the time the supplemental USAID cyclone recovery funds arrived, LDI was able to move quickly into full operation.

The table below indicates the state of advancement of work prior to the cessation of activities at the end of December. Among 10 of these sites, 63,400 "touffes" of vetiver will be planted on 6, 340 linear meters through a contract with the Société MacDonald.

Site in Kilometer Points	Percentage of Work Completed	Observations
Zone I: Andrambovato-Manampatrana		
PK 046+350	20 %	Work not advanced due to delays in provision of cement and other materials by the FCE.
PK 045+050	100%	Complete except for vetiver plantings
PK 75 + 750	80%	
PK 75 + 900	80%	
Zone II: Manampatrana – Mahabako		
PK 80 + 500	20%	Work not advanced due to delays in provision of cement and other materials by the FCE.
PK 87 + 400	100%	Complete except for vetiver plantings
PK 94 + 900	100%	Complete except for vetiver plantings
Zone III: Mahabako – Sahasinaka		
PK 98 + 500	85%	
PK 100	70%	
PK 102 + 500	80%	
PK 102 + 900	100 %	Complete except for vetiver plantings
PK 103 + 840	100%	Complete except for vetiver plantings
PK 107 + 300	80%	
Zone IV: Sahasinaka – Antsaka		
PK 112 + 350	100%	Complete except for vetiver plantings
PK 115 + 600	100%	Complete except for vetiver plantings
PK 119 + 350	100%	Complete except for vetiver plantings
PK 121 + 00	80%	Top of tunnel surfacing needs to be strengthened with vetiver and water control devices. One additional set of support structures needs completion

Track Clearing: The cyclone recovery program engaged local labor to carry out a general cleaning of the 163 km length of the track. At one moment, over 300 villagers were employed to clear away the luxuriant overgrowth of trees, shrubs, and grasses that had nearly blocked the tracks and thousands of cubic meters of soil along the sidings. But in addition, the work consisted of digging out mud filled drainage canals, uncovering culverts, and digging drainage canals at the tops of slopes along the line. Much of this work resembled archeological excavation for hundreds of meters of buried canals and culverts were surprisingly discovered during the course of the clearing. Advancement along the line was slowed down considerably because it was decided to focus on clearing out these drains in order to prevent landslides during the coming rainy season. Roughly 153 km of track was indeed cleaned with varying degrees of completeness by December 31 with only about 10 km remaining in a section between the stations of Ionilahy and Fenomby.

Removal of landslides and building of cemented ditches long the PK 119

Track Replacement: The cyclone recovery program contributed to the replacement of 2.2 kilometers of track between Fianarantsoa and Manakara. Following several very severe and time-consuming derailments, it was decided to invest some funds in hiring a specialized track replacement crew from the RNCFM crew in Antsirabe to replace rotten and damaged wooden ties that were contributing to the separation of tracks and subsequent derailments. The derailments significantly slowed down delivery of cement and other materials to work sites and thus investment in the laying of steel ties contributed

through previous gifts from private Swiss railroad interests and new ballast significantly improved the safety and efficiency of rail transport.

Locomotive Rehabilitation: The LDI Fianarantsoa program contributed $7000 to repair the third FCE locomotive - BB 245. This locomotive entered into full service in November despite considerable difficulties encountered in obtaining parts and clearing key supplies through customs. Revenue increased substantially for the FCE with the arrival of this reconditioned locomotive with even some fuel being transported from the SOLIMA depots Manakara to Fianarantsoa. Unfortunately, the weak and ancient tracks caused several severe derailments that subsequently closed down the railway for several weeks at a time. Further contracts are now expected with SOLIMA, Star, Macoma, and other companies though considerable investment must be made to keep the other two locomotives functioning properly.

Management Structure: The LDI Fianarantsoa regular Intervention Fund budget and the Cyclone Recovery program invested considerable time and resources in promoting improvements in management structures, accounting, and financial monitoring. Cabinet Fivoarana provided training to FCE staff to institute a monthly "Tableau de Bord" that allows the FCE to monitor key monthly performance indicators such as revenues, expenses, freight tonnage, passenger numbers, station revenues, and other factors. Cabinet R Conseil conducted a three day team building program for senior management of the FCE that led to a much stronger sense of solidarity among the FCE staff and with the LDI Unité FCE. Throughout this period, LDI Fianarantsoa senior staff worked with the Ministry of Transport to develop a privatization strategy for the Port of Manakara coupled with the privatization/concession of the FCE. Technical studies conducted by the Cabinet Fivoarana under regular Intervention Fund monies led to a protocol with the Ministry of Transport expressing commitment to privatization. By the end of December, the Ministry had moved forward dramatically on privatization and recommended management improvements by converting the FCE to a "Direction" and granting it greater financial autonomy. Just prior to the Christmas holidays, a new FCE management team was put in place of very dynamic, committed, and energetic senior staff. These changes represented extraordinary achievements by both the LDI and FCE teams.

Wall in gabion at PK 100 to protect the embankment from erosion.

Other Donor Support: Throughout the cyclone recovery period, LDI Fianarantsoa received very generous support from other donor sources. The United Methodist Church Committee on Relief (UMCOR) contributed $16,000 to the reconstruction effort. This flexible source of funds permitted the purchase of some much needed parts for the dresine, medical supplies for workers, and other key materials. In addition, a private donor contributed $1000 cash just following the cyclones that contributed greatly to track clearing. In addition, the Rotary Club of Lausanne held a Gala for the FCE on November 17th that generated not only extensive publicity for the rehabilitation effort among Swiss railroad interests but approximately $4000 for future use by the FCE. LDI received the visit of a Swiss documentary film crew that spent two weeks filming the line and the rehabilitation effort. The film director, M.Claude Stedelmann will show the film on Swiss and European television in the spring of 2001. A gala is planned in Antananarivo and Fianarantsoa with the director for later in the year.

(b) *Community Component*

The two-year community rehabilitation component started prior to the reporting period through a series of activities launched immediately following cyclones Eline and Gloria. By a late June conference in Manampatrana between the ADI-FCE and the local communities living along the line, a strategy had been conceived to work through the farmers cultivating annual field crops immediately next to the tracks. The overall strategy advanced at a rapid pace thereafter. Public relations with the communities along the line continue to be excellent. LDI is now a very well known entity up and down the tracks.

Round-Table to Define Community Rehabilitation Strategy: In late June, LDI worked with the ADI-FCE railroad users association to organize a conference to define a strategy to involve the local communities in the protection and restoration of the railway tracks. Through an extensive planning process emerging out of this conference, 85 farmers were identified who live along the line and contribute to extensive damage of the tracks by their cultivation of annual field crops. The Unité FCE put into place a program of training modules and provision of technical advice through 17 "animateurs villageois" to convert annual field crop production of upland rice and manioc into permaculture cropping of vetiver, coffee, citrus, cinnamon, and other tree crops. These crops will eventually be transported by the FCE and thus contribute not only to environmental stabilization, increased revenues for local farmers, but also new revenues for the FCE.

Slope Rehabilitation with Village Agents: The Unité FCE completed the management plans for all participating farmers in November and placed orders for fruit trees through Pepinière de la Mania and other providers. The orders for the following plants were made in November and the deliveries will be completed during the first weeks of December.

The Unité FCE completed the management plans for all participating farmers in November and placed orders for fruit trees through Pepinière de la Mania and other providers. The orders for the following plants were made in November and the deliveries were completed during the first weeks of December. By the arrival of steady rains at the end of the month all trees had been planted according to technical norms taught during training programs provided to all 95 participating farmers.

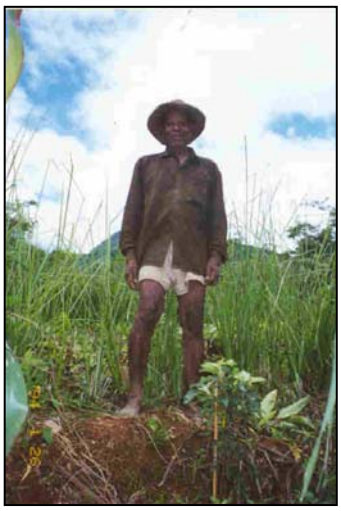
The RNCFM sent down the chief legal officer to work with the FCE and the Unité FCE to renegotiate the leasing contracts with villagers participating in the community component. Through a small protocol with the RNCFM, LDI pays the per diem costs of the legal specialist from Tana and two FCE legal officers to first assess the overall situation of land leases for buildings and agricultural holdings. Throughout the month of November and December, the team will work with M. Etienne of the Unité FCE to survey the parcels of the 95 farmers participating in the program and to write up lease agreements. By the end of November, the team had assessed the building leases and found a generally chaotic and alarming situation. By early December, the team hopes to sign new leases with all participating farmers.

Vetiver Distribution: The first step in rehabilitating slopes along the railway is to plant vetiver along the contour. Because the vetiver needs to be planted by November to assure that it will correctly hold the soil by the time of the heavy rains, and because November is the driest month of the year on the eastern side of the corridor, it was decided that each farmer would create his own vetiver nursery, and plant the vetiver slips in poly-bags to hasten root development before outplanting and to endure greater resistance against drought. This part of the community strategy proved to be the most problematic due to the logistical challenge of distributing massive quantities of vetiver and sacks into areas where transport was extremely limited. But, by the end of December all of the participating farmers had planted their allocated amounts of vetiver in their fields. Over 320,000 soil stabilizing vetiver plants have been planted successfully despite innumerable difficulties. Jean Randriamanantsoa, the Unité FCE vetiver specialist, did a magnificent job of reorganizing the community vetiver component. This vetiver planting program is now probably one of the most extensive efforts in Madagascar.

Reinforcement of the ADI-FCE: The Unité FCE carried out a wide range of institutional strengthening efforts for the ADI-FCE leading to the provision by the end of December of an "expert junior" by the LDI program financed under regular Intervention Fund activities. A self-financing mechanism was set in place consisting of the sale of a tourist brochure on the FCE. The Unité FCE received the 500 English and 500 French copies of the "Voyageurs Guide to the FCE." Three hundred copies were immediately sold in Switzerland for the Rotary Club Gala organized by Frank West. Several hundred other copies were instantly sold for publicity and information purposes. The funds from the sale of the brochures will

go into an account handled by the ADI-FCE. 10,000 FMG from the sale of each brochure will go toward financing the operational expenses of the association and the salary of an ADI-FCE executive secretary. The Pact/ILO program is contributing considerable assistance to the ADI-FCE to strengthen its ability to work with the thousands of users of the FCE railway.

Creation of an OPCI Governance Structure: The Unité FCE and the Pact ILO program worked together to support the establishment of the OPCI – a complementary organization of elected local leaders (mayors of 16 communes abutting the rail line) that will have the institutional capacity to enforce measures such as the *dina* resource management agreements halting slash-and-burn agriculture next to the tracks. The first meeting of the OPCI was held in Manakara from October 10-13. Approximately 50 people attended this meeting which agreed upon the first steps for the creation of the OPCI. A follow-up meeting was held at the end of the month with the 16 mayors along the line and this lead to the pronouncement of support for the *dina* and *dinabe* resource management agreements. Recognized by the Government of Madagascar under law 60-133, this local legislation and set of sanctions will go a long way to reducing the damaging practice of annual field crop production on the lands immediately adjacent to the tracks.



Implementation of the Dina and Dinabe: The Unité FCE community organizer worked closely with the ADI-FCE to devise the *dina* and *dinabe* agreements. Assisted greatly by the Pact/ILO project, these innovative agreements set out a number of stipulations designed to protect the railway tracks against damage caused by local communities. Conceived through a large number of participatory meetings with communities up and down the line, the *dina* are now published and posted in all of the railway stations along the tracks.

Public Education Campaign: Throughout the initial months of the program, LDI Fianarantsoa developed a number of Power Point presentations for use in meetings with elected officials, local leaders, and villagers. “The Railway is our Heritage, Let’s Protect It!” has become a popular presentation. Translated into Malagasy, this Power Point show has been shown to as many as 500 villagers at a time to great acclaim. The Unité FCE has also developed a number of posters used for training purposes and public education. Throughout the month of November, a public education campaign was carried out on the OPCI. The consulting firm Actions sans Frontières (ASF) was engaged to work with ILO/Pact to carry out informational meetings in all 16 participating communes to describe the purposes of the OPCI. Brochures and wall charts describing the *dinabe* were prepared and distributed. The educational campaign ceased at the middle of the month because of the impending elections for regional counselors.

The press campaign was completed by mid-November. Several articles on the FCE were published in the national newspapers. For instance, the Midi-Express did a fine article for the November 8th edition.

The FCE song continued to be broadcasted extensively over the regional radio stations and from time to time on the national station. The theme of the song is “This railroad is ours, let’s take care of it.”

1.1.2. Major constraints

The technical plan for the restoration of the line was carried out more or less on schedule, though some severe problems did occur that lead to considerable delays in the execution of activities.

- Delays in Delivery of Materials: Frequent derailments and breakdowns of the locomotives (prior to the rehabilitation of BB 245) led to considerable delays in

the delivery of cement, stone, and other construction materials. This set back the construction schedule.

- Lack of FCE Transport to Supervise Work: Breakdowns of the two dresines and an inability to rehabilitate "moto lorries" led to great difficulties in supervising construction work along the line.

- Broken Down Machinery: Breakdowns in bulldozers owned by both private owners and the RNCFM and FCE led to constant set-backs in the track cleaning schedule. High intensity labor arrangements replaced the use of bulldozers.

- Financial Insolvency of the FCE: The constant financial crisis of the FCE led to frequent delays in train operations and hence transport of materials. The continual crisis mode generated a demoralized atmosphere at the FCE and considerable frustrations between LDI and FCE staff engaged in track rehabilitation.
- Embankment Stabilization with Vetiver: The lack of water in the late dry season prevented planting of vetiver on restored track embankments and even contributed to the death of some vetiver plants in nurseries and along farmer's plots.

The community component was carried out with considerable success. Some problems did surface during the course of the work. These problems consisted of:

- Poor Performance by Vetiver Specialist: Despite experience working with LDI the previous year, the vetiver specialist was not able to organize adequately the purchase and delivery of thousands of vetiver plants. LDI Fianarantsoa asked the individual to resign and immediately hired a new vetiver specialist. M. Jean Ramanantsoa has performed brilliantly in succeeding in planting over 360,000 vetiver with the 95 farmers involved in the program.
- Poor Performance Public Education Specialist: The Unité FCE engaged an NGO specialized in public media campaigns to work with the ADI-FCE and other actors along the railway to publicize the new "dina" enacted through the OPCI structure and to carry out a public education campaign. The NGO was unable to organize effectively a press campaign on LDI and FCE achievements due to various organizational and logistical difficulties, but it did succeed in bringing national attention to the OPCI process.

1.1.3. Performance analysis

(a) Qualitative analysis

The overall objectives of the FCE rehabilitation effort are being met on time though some performance indicators will not be met because of unforeseen circumstances. Roughly 80% of the planned activities were carried out by December 31. By this period, roughly $11, 500 remained of the $360,000 fund to be invested in completing the remaining 20% of the work from January – March 31, 2001. While the LDI Unité FCE hopes to complete this work during the rainy season, much hinges on whether exceptionally heavy rains or cyclones damage the infrastructures this rainy season.

(b) Quantitative analysis

The quantitative analysis below indicates the measurable achievements obtained by the end of December 2000.

Indicators	Situation in July 2000 - December 2000
163 km of railroad cleaned (LDI indicator)	153 km cleaned. In several sections between Manampatrana and Sahasinaka bush was so thick that this slowed down work crews significantly.
Number of meters of gabionage installed : 1800 m^3	1402 m^3 Lack of means of transport for rock blocks significantly constrained the ability of workers to completed work on time before arrival of rains.

Number of meters of retaining walls/drainage ditches constructed : 1300m^3	1090 m^3 Sufficient cement and rock purchased, but lack of transport of materials to work sites constrained timely completion of work before onset of rainy season.
Number of ballast placed : 5000 m^3	None for the moment, but 1500 m^3 ordered for the anticipated placement this year of 2000 m^3
Number of meters of remaining landslides removed : 50,000 m^3	39,800 m^3 This represented the totality of landslides cleared away from tracks.
Number of ha of vetiver planted : 30 ha	32.8 ha
Indicators	**Situation in July 2000 - December 2000**
Number of tunnel braces installed : 5	Purchase of braces not effectuated, but other engineering work commenced at 1 tunnel
Number of kilometers of new track aligned : 5 km	2.2 km replaced
No. of Perennial Plants Planted (LDI Indicator)	3437 plants planted
No. of Participating Farmers (85 anticipated) (LDI Indicator)	95 participating farmers

1.2. Rehabilitation of agricultural infrastructure and revitalization of rural production

1.2.1. Principal results

The agricultural component of the cyclone recovery program advanced on schedule without encountering serious difficulties. The program-spending schedule for Tranche I fund is on target with additional expenditures planned for 2001.

Gabion Dam and a 60 meters long cement lined canal in Ambohimahamasina

(a) *Irrigation Infrastructure Rehabilitation*

The rehabilitation of 5 small-scale dams and dikes occurred on schedule and 100% of the expected results were obtained by December 2000. As with the FCE railway, one of the central fears is that another round of heavy rains or a cyclone could affect the fragile embankments. Vetiver and other protective devices must be put in place during the rainy season, but until these are effective, serious damage could occur to the infrastructures. Achievements obtained between the arrival of cyclone recovery funds at the end of September and December 31 were:

- Rehabilitation of the Irrigation Network in the commune of Sendrisoa: construction of a 250 meters long cement lined canal and protection of a *lavaka* eroded spot. A portion of this construction was paid through funds from the US Embassy Cyclone recovery funds.

- Construction of a Gabion Dam and a 60 meter long cement lined canal in the commune of Ambohimahamasina

- Construction of a small deviation dike and water flow structures in the village of Tsimbahambo in the commune of Tolongoina ;

- Construction of a small deviation dike, canals, and associated water flow devices in Malazamasina village in the commune of Tolongoina ;

- Construction of a small cement dam, energy dissipating structures, and associated canals in the village of Ambatandrano in the commune of Androy on the western side of Ranomafana National Park.

Illustrations of Dam Construction Sites

Dam in Ambatandrano - Ranomafana

Ouvrage de franchissement in Malazamagina - Tolongoina

Vetiver are planted to strengthen fish ponds embankments

(b) *Rehabilitation and expansion of fish culture*

The rice-pisciculture program continued to advance rapidly. In conjunction with the US Embassy Cyclone funds, orders were placed for 2300 Royal Carp fingerlings from the decentralized fingerling nurseries set up by Kolo Harena rural associations. The project purchased from Road User's Associations and a private entrepreneur 20,000 vetiver plants to strengthen pond embankments. The US Embassy will purchase fingerlings for 47 farmers who lost fish in last year's cyclone, but the USAID Cyclone Recovery funds are used to pay the salary and associated transport costs of the LDI staff.

(c) *Rehabilitation and Expansion of Beekeeping*

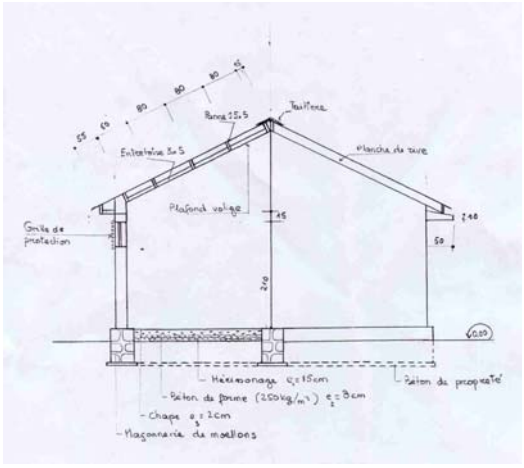
The cyclone recovery apiculture program completed its strategy and assessment of cyclone damage caused to the Kolo Harena members involved in beekeeping. The heavy winds had not only damaged hives but in some cases the bee swarm was lost. Orders have been placed through local manufacturers for two types of beehives that will be given to those farmers that lost hives and bees. To encourage the expansion of bee keeping in other sites along the corridor, LDI will sell kits of prefabricated beehives at a highly reduced price to Kolo Harena members of 40,000 FMG. New hives cost about 120,000 FMG, a major constraint to small farmers suffering income losses from the cyclones. 150 "Langstroth" model hives have been contracted by the *Scierie de Betsileo* and 100 "Dadant" have been ordered from several local manufacturers. The "Langstroth" model is portrayed in the accompanying photo. Over the next two months these hives will be built and disseminated to farmers using both US Embassy and USAID cyclone recovery funds. If this subsidized sale of hive generates significant and sustained revenues for farmers, this program will be expanded significantly in the coming months.

(d) *Construction of Village Granaries*

The cyclone recovery program will commence construction of village granaries in February 2001 in those sites where villagers have already exhibited committed interest through providing as their contribution some construction materials. Cyclone recovery funds will be used to build a structure that can stock 10 metric tons of paddy rice and revenues for generating credit of approximately $6500 for use by Kolo Harena to finance small agricultural and conservation enterprise activities like bee keeping or dry season

agriculture. Construction firms have been identified and awards granted for construction at 5 sites using plans designed these past six months.

(e) *Agricultural Supply Centers*



The cyclone recovery funds will be used to construct 4 Agricultural Supply Centers to be managed by federations of Kolo Harena. Four supply centers will be built in the communes of à Miarinarivo, Alatsinainy-Ialamarina, Ikongo et Tolongoina beginning at the end of the rainy season in March 2001. Awards have been tendered to the firms responsible for building the centers. Over the past six months the LDI staff has been investing most of its time in setting up and formalizing the *Fédération de Kolo Harena* that will manage the agricultural supply centers.

(f) *Seed Distribution*

The cyclones Eline and Gloria severely affected the seed availability situation in Fianarantsoa though in a somewhat spotty fashion. In some parts of the region, the heavy rains and wind caused severely flooding at just the time of seed formation and flowering on rice stalks. In these situations, crops were lost and reserves of seed were severely depleted. In other instances, the particularly geographical and hydrological features of a valley contributed to very little damage to the rice harvests and subsequent seed supply. In order to respond on a case-by-case basis to a patchwork effect of seed availability and shortage, LDI Fianarantsoa set up an innovative seed distribution system for high quality rice and other seeds.

Immediately after the cyclones, LDI Fianarantsoa worked with the leadership and Kolo Harena of our strategic zones of intervention to identify the 10 most severely affected families by cyclone damage. LDI field agents set up a committee of elders, commune representatives, and project staff to make a list of the families who were victim of the cyclones. With a grant of $25,000 from the US Embassy, LDI purchased 4.5 metric tons of improved varieties of rice, corn, potato, and bean seeds for distribution just prior to the growing season for each crop. The LDI field agents then worked with each family (most non-Kolo Harena members) to demonstrate improved seed planting and fertilization techniques. This grant of about $550 per family avoided distress sales of seeds just prior to the respective planting season.

Following this initial distribution of free seed to the most severely affected families in the six LDI Strategic Zones of Intervention, LDI Fianarantsoa set up a complementary system to assist a more general segment of the population. Through the Agricultural Supply Centers, LDI sold at highly subsidized prices, about 50% less than the market cost, 16 metric tons of improved varieties of rice, corn, and bean seeds. Government agricultural services encouraged strongly this selling mechanism, rather than rather than provision of outright gifts, in order to demonstrate clearly that seed provision was not tied to the campaign gifts occurring at the same time by the major political parties preparing for the November elections of members for the regional assembly of the Provinces Autonomes. Revenues from the seed sales are then deposited in an account of the federation of Kolo Harena of the particular site to be reinvested in a credit system to promote income generation activities or purchase of further seed on credit. Fifteen percent of these revenues are used to cover operating costs of the Agricultural Supply Centers. LDI agents provide technical assistance to those Kolo Harena members purchasing the seed.

While the distribution system functions adequately, LDI encountered severe difficulties in purchasing high quality varieties of rice like X 265 and improved corn varieties. Seed shortages occurred at the national seed distribution centers and in some cases ordered supplies were delivered late. Stocks of rice seed are currently being purchased by the project to contribute to the second rice season and to the dry season crops of potatoes and vegetable crops. LDI will continue to offer the subsidized seed distribution and

credit schemes for the next seasons though it monitors closely the sale of seeds to assure that speculative purchases are minimized.

(g) *Rehabilitation of Kianjavato FOFIFA Station*

The Tranche II cyclone funds are to contribute to the rehabilitation of the Kianjavato FOFIFA Station through providing some financial support for the rehabilitation of dilapidated buildings damaged by years of neglect. LDI Fianarantsoa believes that the partial rehabilitation of the center will contribute greatly to infusion of improved varieties of cash crops like citrus, coffee, pepper, cinnamon, and other tropical perennial crops suited to the lowland humid tropics of the eastern side of the corridor. Over the past six months, LDI Antananarivo and Fianarantsoa staff worked closely with FOFIFA and the Cabinet ECR to develop a plan for privatizing a portion of the center. The intention is to tender out through a bidding process a concession for 20 hectares of prime land so that a commercial producer of plant material will be able to grow high quality root stock, grafting materials and seeds for sale to Kolo Harena and others farmers throughout the eastern part of the region. Cabinet ECR held an informational meeting with interested concessionaires in Antananarivo and at the site in Kianjavato.

1.2.2. Major constraints

The major constraint encountered in all cyclone recovery components these past months has been the difficulty of access to work sites and especially along the key Ifanadiana – Ikongo road. The heavy damaged and fragile RIP 4 is scheduled to be rehabilitated through the RAISE-Roads program, but until then, access is extremely difficult and especially following the onset of early rains in November. The early arrival of rains nearly halted construction of small dams in Ranomafana and Tolongoina.

1.2.3. Performance analysis

(a) Qualitative analysis

The implementation of the dam rehabilitation works observed the technical norms required for solid and durable works, due to the good performance of the construction firms and the strict control from the LDIs staff and the research firms hired. No delay in comparison with the initial timing was recorded during the works. There were no extra cost engaged out of the initial budget.

During the implementation phase, the firms hired local labor who could benefit from economic impacts of these projects in terms of revenues and job creation. Some 150 persons were recruited in the villages to reinforce the firms' personnel. The adoption of this High Intensity of Labor system has generated $6,500 of wages among villagers. On the other side, the entrepreneurs provided on-site training about the techniques of building and maintaining small dams to 2 local agents hired among villagers in each site.

The beneficiaries have actively participated in the provision and transport of the construction materials (sand, boards, rubble stones…etc.). The estimation of the beneficiaries' contributions attained $7,500, which represents about 10% of the total investment cost of the rehabilitation.

The process of transferring the management of the infrastructure has been activated by the LDIs' *socio-organisateurs* who mobilized over 635 beneficiaries to carry out the maintenance of these infrastructure. The clearing out of drainage ditches, the stone-bedding along the dams or the preparation of the work site have been done by the villagers as the expression of their total implication within the construction phase.

(b) Quantitative analysis

Two rice cultures per year are now guaranteed by the dams rehabilitation. Over the 960 ha of rice fields to be irrigated, the half have been irrigated and planted during the 2000 campaign. In the next season, it will be possible for farmers to catch up with the agricultural calendar to cultivate the total area to be irrigated.

Indicators	Situation in July 2000 - December 2000
Number of hectares of irrigated systems rehabilitated : 1,400 ha	- Work Completed 100% : 4 dams for 960 ha irrigated
Number of beneficiaries	635 persons
Number of tons of short-cycle seeds distributed to farmers : 256 tons	16.173 metric tons

1.3. Road repair and stabilization work on cyclone damaged roads

1.3.1. Principal results

(a) *CAP Roads*

The identification of the rehabilitation works to carry out along the CAP roads and the estimation of the rehabilitation cost were completed. Following the organizational support from Lalana NGO, the AUP were able to benefit from the *Fonds d'Entretien Routier* (FER). The condition required for granting the financial assistance to the AUP was the contribution of 10% of the total cost from the beneficiaries. An invitation to tender was launched to select the firms which will implement the maintenance works. However, the starting-up of activities within the cyclone recovery program is waiting for the finalization of the rehabilitation works financed through FER in order to avoid the double use of the funds. These works under FER funding will commence by the beginning of January and will last for a month.

Bekatra – Lokomby Road: Further cost estimations were conducted for key parts of this road. The AUP has sold tens of thousands of vetiver plants to the FCE rehabilitation project and with these funds this has contributed to the reconstruction of the road. However, with the arrival of the litchi season with the new rains, the AUP has encountered tremendous difficulties controlling access of heavy trucks to the litchi selling points. As the area is suffering considerable food insecurity because of last year's cyclone damages, the local communities are desperately trying to sell the litchi harvest in order to obtain cash to buy food. As only 4-6 hours can transpire between the time of collecting the litchis and the commencement of sulfur preservation in Manakara, trucks have not waited for the rain barriers to be opened up. The already weakened condition of the road is made much worse by the transport of litchis by heavy trucks. Rather than investing immediately scarce funds in repairs, LDI and the AUP are holding talks with the merchants who have damaged the roads in order to recover some of the maintenance costs. Meanwhile, the program LDI supported the AUP through Lalana NGO in collecting the 10% beneficiaries' contribution in the rehabilitation cost. Funding from the FER (*Fonds d'Entretien Routier*) has been received to finance the preliminary rehabilitation phase and the contract has been accorded to an enterprise.

Bac at Ambahive: The cost repair of the bac was 50 million Fmg ($7,300) as initially estimated. This amount of money was used to acquire a cable and to repair the barge. The works were implemented on time without exceeding the initial budget.

Ambalavao – Namoly Road: LDI invested 1.3 million FMG immediately to engage the AUP to clear out drainage ditches as part of preventative maintenance. The AUP's currently have no funds as their

contributions of 30 million FMG to the *Fonds d'Entretien Routier* liquidated savings needed for hiring labor. With the arrival of the rains, it is now clear that construction will not take place this season. LDI Fianarantsoa will invest primarily in the difficult section between Sendrisoa and Namoly near PK 34. Approximately 280 million FMG ($41,000) is required for this section to rebuild drainage canals, strengthen the road base, and stabilize abutting slopes.

Other CAP Roads: The US military Pacific Command is still interested in discussing the possibilities of contributing to the rehabilitation of the banks of the submersible bridge at Ambinanintromby. The rough estimations of costs for road rehabilitation and bridge repairs is $88,000.

(b) *Other Roads*

Ifanadiana – Ikongo RIP 4: Given that additional fund from the RECAP project will be allocated to the rehabilitation of the Ifanadiana-Ikongo road, LDIs interventions are limited to the treatment of the "pints noirs" along this section, in order to facilitate the traffic during rainy season between January and March. The selection of the firm that was given the contract is done, the works commence in February 2001.

Tolongoina bridge : the infrastructure coordinator for LDI Fianarantsoa and the head of the Ifanadiana Travaux Publics visited the site to consider different technical options. LDI is prepared to hire a bulldozer to build a temporary embankment across the river and to build a rock ford so that light 4 X 4 trucks can pass during the rainy season. If the metallic bridge is hauled from PK 62 near Manampatrana and reinstalled at the PK 47 of the RIP 4 near Tolongoina, the cost would have been about 140,600,000 FMG ($20,600). This temporary bridge would only withstand the weight of a 5 metric ton truck due to the rusted nature of the bridge. In light of the high cost of even this temporary solution, LDI Fianarantsoa is more inclined to try to encourage the US military team to invest its funds in this effort. Alternatively, if the bridge were to be built of reinforced cement to carry a 15 metric ton load, the cost would be about 500 million FMG ($73, 500) for the 18.6 meters long bridge of 8 meters in height. After the consultation of price, one firm was selected to build the road deviation near the Tolongoina bridge. The works will start in February.

1.3.2. Major constraints

Apart from the coming of the rainy season which disturbed the timing of all the implementation phase, no other major constraints were encountered by the road rehabilitation component. The works financed by LDI will continue after the first repairs conducted by FER.

1.3.3. Performance analysis

Quantitative analysis

Indicators	Situation in July 2000 - December 2000
Number of kilometers of road stabilized and rehabilitated : 156 km	- Signed contracts : 2 purchase orders for contractor services - Work started : commencement of the treatment of points noirs in Ifanadiana-Ikongo and road deviation in Tolongoina - Work Advancement : none - Work Completed in 100%: 1 bac in Ambahive

Fianarantsoa Cyclone Recovery Program – Budget situation as of December 31, 2000

ACTIVITIES	Indicators (september 2000-august 2002)	Budget (september 2000-August 2002)	Obligated amounts	Balance
Seeds	128 Tons	$49,000	$10,081	$38,919
Granary	5 silos	$30,234	$0	$30,234
Ag Supply center	4 centers	$20,000	$0	$20,000
FCE Community work	85 families	$48,786	$21,144	$27,642
Mini grants Communes	14 communes	$25,000	$0	$25,000
Beekeeping/pisciculture	14 communes	$10,000	$0	$10,000
CAP and other roads	156 km	$75,000	$7,379	$67,621
Dams	6 dams - 1400 ha	$91,980	$82,715	$9,265
TOTAL		**$350,000**	**$121,319**	**$228,681**

2 Moramanga

2.1 Rehabilitation of agricultural infrastructure and revitalization of rural production

2.1.1 Principal results

The principal accomplishments during these first three months in the field are as follows :

- Construction of 5 agricultural input supply centers, buildings with a total value of 179.500.000 fmg. These centers are entirely managed by Kolo Harena association members.
- Rehabilitation of the hydro-agricultural infrastructure of Lovoka, upstream and downstream totalling 870 ha irrigable surface.
- Beginning construction of a dam at Antandrokomby and an accompanying irrigation system for a surface area of 8 ha.
- Acquisition of a total of 144 tons of rice, corn and bean seeds which were made available to KH members for cultivation in the 2000-2001 growing season.
- Rehabilitation of a 790 meter section of road between RN2 and CDIA, and repair of a semi-permanent bridge on the same section of road
-

Kolo Harena associations in Ambohimiarina have got their first rice production since 4 years. Rice yields average 3.43Ton/ha in 120 ha of Lovoka perimetre after its rehabilitation.

2.1.2 Major constraints

Due to an increased workload for the regional team and central office of LDI, it has become necessary to clarify the responsibilities of each.

In the implementation and follow-up of rehabilitation work, it is necessary to be strict and rigorous in elaborating the work plan because a few times a technical incompatibility has been noted after the project has already started. In such cases, the field team is hampered having been given the technical data already calculated in the cahier de charge.

2.1.3 Analyse qualitative

With an eye to attaining its objectives and optimizing the chances of success with the Kolo Harena, LDI undertook the rehabilitation of existing agricultural infrastructures in order to maximize their usefulness (e.g. the construction of a new dam for the Kolo Harena d'AntandrokombyII) and made it possible for KH partner associations to acquire improved seeds at a moderate price. However, certain considerations require some attention :

- LDI's actions are prompt and precise which reminds our partners and the local authorities of the seriousness with which we seek to achieve our objectives and elicits a similar attitude from them.
- Looking at the construction market, LDI was able to find service providers who proposed a relatively moderate cost, but given the price quoted, we were concerned about the durability of the construction. In effect, the constructors built visibly fragile and questionable buildings. It is necessary to carefully evaluate the difference between a cheap price and reasonable value.
- We have also often noted an eagerness in carrying out the work. This will have a certain influence on the quality and finishing of the work, as well as durability if the follow-up is not strict. When setting-up the management committees for the supply centers, it is important that members establish a permanent accountability system, to be implemented by the officers, in order to avoid any misappropriation of funds

at the core of the group. This system will also permit the committee to master good general business procedures.

2.1.4 Quantitative Analysis

First Quarterly accomplishments compared with the 2 year targets

Two year targets September 2000 – August 2002	First quarter accomplishments	Observations
Rehabilitate 1200 ha of perimeters	Completed 100% rehabilitation of 870 ha	These activities include the infrastructures of Lovoka (2 lots), 1 hydroagricultural dam at Antandrokomby Beforona. This second activity is in progress but the contractor is waiting for his contract to be finalised.
Construction of 5 input supply centers.	Constructed 5 input supply centers.	The CA are now operational and are managed by community members chosen by KH members.
Make 125 tonnes of seeds available to farmers.	144 tons of seeds were made available to farmers.	These were rice, corn and bean seeds.
Rehabilitation of the RN2 – CDIA road and bridge	Rehabilitated 790 meters of road. Rehabilitated a semi-permanent bridge	Waiting for the constitution of a committee to maintain these structures.

2.1.5 Summary of the results

Name of Structure	Characteristics, content of work	Number of beneficiaries	Observations
Barrage du Lovoka	Perimeters to irrigate Surface : 869 ha (427 ha upstream, 442 ha downstream) Construction firm :EGECA (Lot1) E/se Ramarojaona (lot2) Control firm : BRL Cost of the rehabilitation : 342.4 Million FMg	500 families affected, 13 KH upstream, 15 KH downstream (in training: 2 AUE, one for each lot)	Ist lot received 01/12/00 subject to some modifications. 2nd lot received 20/12/00 also subject to some modifications.
Agricultural input supply center	Constructed in the villages of Manorita, Ambatomanga, Bekatsaka, Ambohimanarivo et Beforona. Total cost of construction : 179.5 millions. Construction firm : E/se Ramarojaona. Control firm : E/se Mamokatra	Manorita : 3 KH, 1 AUE Ambatomanga : 6 KH Ambohimanarivo : 13 KH, 1 AUE Bekatsaka : 11 KH Beforona : 16 KH	The CA are directed by a duly trained management committee duly trained, originating from the KH federation.
Road and bridgeRN2 – CDIA	790 meters long road, semi-permanent bridge	5 KH use the bridge. 6 underserved Villages (Marolafa, Ambatomasina, Ambinanisavolo, Maromitety, AntandrokombyII, Ampasimaneva) whose total poulation is 2700	A AUP is being constituted by the local Mairie of Beforona
Dam and hydro-agriculture network at Antandrokomby	Surface affected: 8 ha Construction firm: ERASTMA Control firm: BRL Cost of construction : 40 Millions FMg	1 KH, 1AUE, 57 families affected	Beginning date of construction : 26 nov 2000 Expected date of completion: contract not yet finalized
Improved rice, corn and bean seeds	126.100 tons of riz, 6000 tons of corn et 12.000 tons of beans	50 KH in the Moramanga region	See table on seed distribution in the appendix

Moramanga Cyclone Recovery Program – Budget situation as of December 31, 2000

BUDGET CATEGORY	ACTIVITIES												TOTAL		
	Agricultural Intensification				Community Management of Natural Resources				Partner capacity Building						
	Activity	Budget	Obligated amount	Balance	Activity	Budget	Obligated amount	Balance	Activity	Budget	Obligated amount	Balance	Budget	Obligated amount	Balance
Technical Assistance	Irrigation system rehabilitation for remaining 3 strategic zones of intervention	$80,000	$0	$80,000	10 Management Plans	$10,000	$0	$10,000					$90,000	$0	$90,000
Direct Material support	Off season seeds	$60,000	$70,206	-$10,206	10 small grants for community resource management and disaster prepardness and response activities	$20,000	$0	$20,000	Agricultural input supply centers	$25,000	$26,438	-$1,438	$105,000	$96,644	$8,356
	Irrigation system rehabilitation	$90,000	$90,112	-$112									$90,000	$90,112	-$112
	Road Rehabilitation	$15,000	$14,071	$929											
TOTAL		**$245,000**	**$174,389**	**$70,611**		**$30,000**	**$0**	**$30,000**		**$25,000**	**$26,438**	**-$1,438**	**$300,000**	**$200,827**	**$99,173**