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STAFF APPRAISAL REPORT

MADAGA SCAR

THIRD RAILWAY PROJECT

Volume I

March 28, 1986

Transportation Division Eastern and Southern Africa Regional Office

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CURRENCY EQUIVALENTS

Unit	=	Malagasy Franc (FMG)
US\$1.00	=	FMG 650
FMG 1 million	=	US\$1,538

WEIGHTS AND MEASURES: METRIC

l meter (m)	=	3.28 feet (ft)
l cubic meter (m3)	=	35.29 cubic feet (cu.ft)
l kilometer (km)	=	0.62 mile (mi)
l square kilometer (km2)	=	0.386 square mile (sq.mi)
l hectare (ha)	=	2.47 acre (ac)
l kilogram (kg)	=	2.2 pounds (1b)
l metric ton (m ton)	=	2,204 pounds (1bs)
l liter (l)	=	0.26 US gallons (gal)

ABBREVIATIONS

-	Caisse Centrale de Cooperation Economique
-	Complexe Industriel du Bois d'Andasibe
-	Director General of Planning
-	Ministry of Commerce
-	Ministere des Travaux Publics (Ministry of Public Works)
-	Ministere des Transports, du Ravitaillement et du Tourisme (Ministry of Transport, Supplies and Tourism)
-	Reseau National des Chemins de Fer Malagasy (Madagascar National Railway)
-	Societe d'Exploitation du Port de Toamasina (The Toamasina Port Authority)
-	Societe Francaise d'Etudes et de Realisations Ferroviaires
-	Transport Sector Memorandum

Railway Lines:

TCE	-	Antananarivo - Cote Est Line
MLA	-	Moramanga - Lac Alaotra Line
TA	-	Antananarivo - Antsirabe Line
FCE	-	Fianarantsoa - Cote Est Line

Fiscal Year

January 1 - December 31

MADAGASCAR

THIRD RAILWAY PROJECT

STAFF APPRAISAL REPORT

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MAP

1. Madagascar - Transportation Network (IBRD # 13645R).

DEMOCRATIC REPUBLIC OF MADAGASCAR

THIRD RAILWAY PROJECT

I. THE TRANSPORT SECTOR

A. Geographic and Economic Setting

1.01 Madagascar is a large and diverse island with good natural endowments for agriculture. Ecological zones are varied and the agricultural sector is equally diverse. Rice and cassava are the main food crops, while cattle raising is common in most areas. Most exports, of which coffee, cloves and vanilla are the most important, are of agricultural origin though some minerals, mainly graphite, chromite and mica, are also exported. The country's mineral resources are limited, but recent exploration indicates good possibilities that petroleum may be found in economically exploitable quantities. Manufacturing consists almost entirely of consumer goods industries catering to local demand and agro-industries.

1.02 Fourth largest island in the world, Madagascar covers an area of about 590,000 km². The topography is generally rugged and a central mountain range traverses the country from north to south. The climate is marine tropical with cyclones and heavy rainfall particularly frequent on the east coast. The country is sparsely populated (about 15 per km²) and the population is unevenly distributed, with about one half of all inhabitants occupying the central one-quarter of the island. Total population is estimated at 9.5 million and growing at 2.5% p.a. Ninety percent of the population work in the agricultural sector; their output accounts for 40% of the Gross Domestic Product. Industry accounts for 14% of GDP and annual per capita income is about US\$290. Madagascar is thus at an early stage of development.

1.03 Prompted by economic stagnation and a resultant 12% decline in per capita income in the 1970's, significant investments were made in all sectors of the economy in 1979. Financed largely by foreign borrowing, the spending boom left the country with a debt servicing burden that is straining the economy. Economic developments over recent years reflect the need to correct serious imbalances on external account and in the Government budget. With generally declining exports the imbalance on external account has had to be corrected through cutting back imports. Imports declined steadily from 1981 through 1983; the volume of imports in 1983 was approximately 35% lower than in 1978. Imports of raw materials and spare parts have been particularly affected with disrupting consequences for the economy's production. The volume of GDP declined by about 9 percent in 1981, by about a further 2 percent in 1982 and estimates for 1983 and 1984 suggest a growth of close to 1 percent and 2 percent respectively. Industrial output has particularly declined and there are now serious shortages of a number of basic goods such as soaps, candles, oils, etc. Shortages of new equipment and spare parts have affected the transport system and greatly diminished its capacity.

B. The Transport Sector

1.04 Development of the transport sector has been influenced by: (i) rugged topography and a tropical climate with heavy rains and frequent cyclones; (ii) an unevenly distributed population concentrated in a few isolated regional centers; and (iii) the lack of suitable construction materials in some parts of the island. As a result, road construction and maintenance is costly and less populated regions remain relatively isolated. Transport needs are relatively well served on the central plateau where half of the population is concentrated.

1.05 Government policy towards transport development is to: (i) connect regional capitals by all-weather roads; (ii) improve communications between the centrally located capital and main seaport (the Antananarivo-Moramanga-Toamasina road/rail corridor); (iii) improve road maintenance; and (iv) improve the transport organizations and services. An overriding objective is to satisfy the country's quantitative and qualitative transport requirements at reasonable cost, respecting balance of payments difficulties. IDA is in general agreement with these objectives. A program of action to better coordinate measures relating to infrastructure and means of transport has been established for the 1984-1987 period. It seeks to: (i) coordinate and plan transport, with regard to services, complementarity, infrastructure, and pricing; (ii) improve the quality of service by introducing competition between the different types of transport and, where possible, between different operators of a given type of transport; (iii) reorganize training of infrastructure specialists and transport company personnel; (iv) rehabilitate transport companies by importing sufficient quantities of spares and tyres and through regular upkeep of infrastructure; and (v) replace obsolete transport material and keep the fleet properly maintained. Other objectives relate to the general development of Madagascar. The overall policy goals are to provide transport at lower cost and to reduce regional isolation through rehabilitation of the secondary road network.

1.06 Several ministries and Government organizations share responsibility for the transport sector: the Ministry of Transport, Supplies and Tourism (Ministere des Transports, du Ravitaillement et du Tourisme, MTRT) and the Ministry of Public Works (Ministere des Travaux Publics, MTP) play the most important role. MTRT is responsible for road, rail, air and water transport, and oversees several autonomous Government agencies, including the Madagascar Railway, Air Madagascar, the Port of Toamasina, and the shipping companies. MTP is responsibile for planning, building and maintaining highways, ports and airports.

1.07 Other Government agencies whose responsibilities affect transport policy include: the Ministry of Commerce (MC), the Ministry of Agriculture (Ministere de la Production Agricole et de la Reforme Agraire, MPARA), the Director General of Planning (Direction Generale du Plan, DGP), and the regional governments. MC's responsibility to collect and market crops significantly affects road transport capacity and its price control of basic commodities influences transport tariffs. The supply of transport services is also affected by MC, through its establishment of policies on the importation and assembly of motor vehicles, as well as its determination, with the Central Bank, of foreign exchange allocations for import. MPARA and the military operate large state-owned road transport enterprises. Also, each regional government has established a regional trucking company in the last four years.

As of early 1984, MTRT's Director of Planning is charged with 1.08 transport sector planning. The director's main task is to coordinate transport investment plans with other agencies, which also prepare project and investment proposals. Pending the completion of a National Transport Plan expected in 1986, the DGP began to establish a Public Investment Program (PIP) with assistance primarily from MTRT and MTP for the transport sector. IDA and other bilateral and multilateral aid agencies have helped improve sector planning, but more assistance is needed. Under the Sixth Highway Project, planning has improved through the establishment of a planning department in the MTRT with technical assistance partly financed by French aid and partly by IDA. After consulting with other sectors such as agriculture, the planning effort yielded a priority "Economic Road Network" list of about 10,000 km (4300 km paved roads, 3300 km engineered earth roads and 2400 km of feeder roads). This was the agreed basis for the IDA Sixth Highway Project.

C. The Transport Network

1.09 Madagascar is naturally dependent as an island upon mainline shipping for its transport link with the outside world. There are four main ports, 18 lighterage ports and a navigable canal along the east coast. The country's internal transportation infrastructure includes an extensive but poor road network, two rail sections of considerable length and a well-developed air network. Nevertheless Madagascar's transportation infrastructure is inadequate in that it fails to provide access to all productive areas of the country. The country's lifeline, between the port of Toamasina and the central plateau area where most of the population lives, consists of a railway line and a badly maintained old road of modest original specifications. This road is currently being partially replaced by a new highway. Costly transport construction, poor road maintenance and inadequate overland communications has led to the development in Madagascar of an extensive system of ports and coastal shipping as well as an air transport network denser than in most comparable countries.

Road Transport

1.10 About 5,200 km. of Madagascar's nearly 50,000 km. of roads are paved. The paved highway network now consists of a main north-south link connecting Mahajunga on the west coast with Antananarivo (the capital) and Fianarantsoa in the highlands (parts of which can sustain use by heavy vehicles), and an east-west road (RN2) linking Moramanga, Antananarivo and Toamasina. A new paved section of the Toamasina-Moramanga road is providing all-weather transit between Moramanga and Brickaville on the coast. While this recent development has greatly improved road communications between Antananarivo and Toamasina, heavy truck traffic will continue to be constrained because the highland Moramanga-Antananarivo (115 km) road, as most of the island's roads, is of low standard, narrow, badly aligned and in poor condition. The Bank is assisting in rehabilitating the Mahajunga-Antananarivo road, RN 4, under the Sixth Highway Project.

Total vehicles in 1984 numbered 42,000, of these some 13,000 or 1.11 31% are trucks and pickups. By contrast, in 1976 there were 104,000 vehicles, 47% of which were commercial. Passenger transport is provided by cooperative and individual carriers and regulated by MTRT and provincial authorities. Entry to the industry for passenger transport is nominally screened by the Government on the basis of supply and demand, but in practice is generally open for capable applicants. Transport tariffs have been determined within a minimum-maximum rate system established by MTRT. MTRT on the basis of these rates determined official rates for interprovincial traffic, and intraprovincial rates were set by provincial authorities. Since these rates have been lagging behind cost inflation, particularly the rates for transport of goods have generally not been enforced by the government. Under the Sixth Highway Project, the Bank has urged further liberalization, which has been studied by MTRT through its new planning directorate. The government, at negotiations, confirmed the importance of the road transport sector as well as its support for the vital agriculture sector. The government objective, based on the above studies, is to create sound competition between transporters taking into account the present limiting factors such as a run-down road actwork, an ageing transport fleet, and lack of spare parts. Concerning route restrictions the only present constraints, those concerning RN2, the main road between Antananarivo and Toamasina, will be removed. The Government also reaffirmed the principle of free transport of goods. Concerning tariffs, the principle is liberty by transporters to establish rates. Nevertheless the government reserves the right to intervene in exceptional circumstances, such as on services or routes without free competition. To assist transporters in their ratesetting the government will begin to publish average operating costs for different vehicles. The government will also improve compliance with measures of vehicle weight control and redefine the role of joint transport operators.

Air Transport

1.12 By regional standards, Madagascar has developed a dense domestic air transport network in response to the distance between population centers, the rugged terrain, costly construction and the poor condition of surface transport. There are 56 airports, 17 of which are built to allweather standards and five of which are suitable for international flights; the remainder are gravel or grass strips. The international airport at Antananarivo handles 50% of all traffic; 15 small airports generate 30% of the traffic; and 40 very small airports share the remaining 20% of total traffic. Service to many small airports is not financially profitable but ensures access to otherwise isolated areas.

1.13 Air Madagascar, 80% owned by the Government, 18% by Air France and 2% by private shareholders, provides international service to Paris, Marseilles, several countries in East Africa and all domestic service. Aircraft in its fleet include a B-747 (combination cargo/passengers) for European service, two B-737s for domestic and regional service, two HS-748s and five Twin Otters for domestic service, and several smaller aircraft for air-taxi and charter services. In 1984, Air Madagascar's successfully renegotiated maturities on its long term debt obligations to foreign banks, and in 1985 began a financial recovery program.

Ports and Coastal Shipping

1.14 Madagascar relies on maritime shipping for foreign trade but coastal shipping is also important. Indeed, shipping by water is the only means of transporting freight between many areas of the country with no access to all-weather roads. There are four main ports: Tozmasina, the main international port serving the populated central highlands via the railway, handles 55% of the total traffic; Mahajunga handles 11%; Antseranana in the north 5%; and Toliara in the south, about 4%. The remaining 25% of traffic is handled by smaller coastal shipping ports. The port of Toamasina has adequate capacity to handle present traffic, but operations are hampered by low labor productivity and lack of spare parts for equipment. This port is administered by a separate agency, Societe d'Exploitation du Port de Toamasina (SEPT), whereas other parts are under the direction of MTRT. The increasing constraints on the railway's transport capacity has led to the diversion of some international traffic to the port of Mahajunga. Capacity there is limited, however, as the port requires lightering and the subsequent transfer inland of goods is restricted by the condition of the road connecting Mahajunga to the capital (RN4). Rehabilitation of the worst sections of RN4 is included in the ongoing Sixth Highway Project.

1.15 The Societe Malgache des Transports Maritimes (SMTM), the state controlled international shipping line, operates three cargo vessels for the country's externally traded merchandise. Coastal shipping is handled primarily by the Compagnie Malgache de Navigation (CMN), 92% state-owned, and private ship owners.

1.16 Government objectives toward coastal shipping and ports are to improve efficiency. A survey of shipping services was performed in 1983 with French aid in order to work out a policy to rehabilitate and develop the country's ports. The survey will be supplemented by ongoing engineering studies to better forecast capital expenditures. Additionally, replacement of port handling equipment in the secondary ports has begun and will continue, chiefly with assistance from the Federal Republic of Germany. In future, a series of measures and actions, such as port rehabilitation and renewal of navigational aids, are recommended for the 1986-1990 period. The Bank is preparing a Ports Rehabilitation Project, which was appraised in 1985. Portions of the intracoastal waterway on the East Coast are now being rehabilitated with AfDB financing but traffic is expected to be light.

D. Present and Future Role of the Railway

1.17 The railway consists of two unconnected single track systems (Map IBRD #13645R). The northern system (about 700 track km) revolves around the capital and includes (i) a line -TCE- between Antananarivo, the capital, and Tosmasina, the principal port (375 km); (ii) a line -TA- from Antananarivo to Antsirabe, an industrial and population center south of the

capital (154 km); and (iii) a section -MLA- north from Moramanga to the agricultural gregion of Lake Alaotra and the chromite mines (167 km). The southern system -FCE- (163 km) connects the regional center of Fianarantsoa and the agricultural areas in the southern plateau to the port of Manakara. The Antananarivo-Toamasina line is the most important link, since it is still the most reliable means of surface transport between the country's main seaport and the capital city. The railways are operated by the Reseau National des Chemins de Fer Malagasy (RNCFM), a parastatal agency unde: the supervision of MTRT, described in more detail in chapter II. MTRT's paramount aim with respect to rail transport is to ensure that the existing network is rehabilitated before any expansion of capacity is undertaken. Other aims are to improve network managment and monitoring of capital expenditures.

1.18 The railway's role is fundamental to Madagascar's transportation needs. Rail is the main mode of transport, both for cargo and passengers, between the most populated and economically developed parts of the country. Almost half the island's population lives in areas directly served by the railway and the railway has, until now, been virtually the sole carrier of freight imports from the main port to the main population centers located in the highlands. Completion of a new all-weather road from Brickaville to Moramanga, however, has brought competition for the railway along part of the TCE line and this has been taken into account in designing the proposed project.

1.19 The long term prospects are that the railway will continue to be the most economical mode of transport for a large proportion of the railway's present traffic: bulky and heavy commodities such as petroleum products, ores, grain, fertilizer, wood, etc. Even with the improvements, competing roads will not be built to standards that would eliminate the need for rail transport. Diversion to road of railway cargo and passenger traffic will also be affected by the deteriorated condition of Madagascar's road vehicles. Replacement of present vehicles requires foreign exchange that will be difficult to obtain given the present constrained economic situation.

1.20 Also favoring the railway over the long term is the climate and topography of Madagascar. Heavy rains and frequent cyclones often cause landslides and inundation of roadworks. First of the modes to be established, the railway was built on the route best aligned and least vulnerable to landsides. Furthermore, the railway has developed the institutional and technical capacity to maintain, service, and repair its infrastructure in a reasonably efficient way. Rail, therefore, is likely to remain the most reliable mode.

1.21 The Southern line (FCE), from the port of Manakara to Fianarantsoa, also faces competition from a recently built road on the coastal plain. The road is not entirely new; however, a 35 km section is in poor condition and at least another 50 km needs rehabilitation. The needed repair work is estimated to cost about US\$4.0 million and is included in the MTP road investment plan but it has a relatively low priority. The road between Fianarantsoa and the coast is poorly aligned and is 100 km longer than the railway. Yet traffic density on the FCE is still light and likely to remain so; a study concluded that the most economical long-term solution would be to close this link. Until adequate road transport can be provided, however, operation of the FCE will continue. Transport planning for the area now served by the Southern line has been studied under a Project Preparation Facility requested by the Government. Based on the study, the Government has submitted an Action Plan satisfactory to the IDA regarding the Southern line (para. 7.01).

E. Bank Group Role in Transport

1.22 Bank involvement in the transport sector in Madagascar is substantial. Between 1974 and 1984 the Bank supported nine transport projects with IDA Credits totalling just over US\$100 million, six in highways, one in ports, and two in railways. The Bank has and should continue to play a critical role in improving the railway's institutional capacity and policy framework. The Bank has supported two projects in the rail sector.

1.23 The Madagascar First Railway Project (Credit 488-MAG, approved in 1972, called for the expenditure over a three year period of US\$6 million for 62 km of track renewal, purchase of rolling stock and provision of consulting services to improve managerial, operational and financial policies and practices. As described in the June 26, 1984 Project Performance Audit Report, the Project was a "holding operation" that "successfully benefited the people of Madagascar by keeping the railway operational." At the same time, underestimated costs and delays in implementation resulted in a scaling downward of the initial project; completion took 3 years longer than estimated; the overall estimated return was less than 10%, and RNCFM's financial and institutional performance was poor.

1.24 The Madagascar Second Railway Project (Credit 903-MAG), approved in 1979, involved the expenditure over a five year period of US\$43.7 million. The Bank Group provided US\$13 million of this total while the Caisse Centrale de Cooperation Economique (CCCE) provided US\$20.5 million. Objectives of this project were: (1) renewal and improvement of 284 km of track; (ii) replacement of 7 locomotives and purchase of 1 rail car, 10 coaches and 76 freight wagons; (111) improvement of telecommunications; (iv) replacement of workshop equipment; (v) improvement of the railway's financial management; and (vi) implementation of more market-based pricing strategies. Delays and lower than anticipated ballast and sleeper production resulted in fewer lines being rehabilitated than planned (123 km vs. 180 km) and low cost estimates reduced the number of wagons and coaches actually purchased. Track renewal totalling 60 km out of 74 km initially planned was accomplished on the TCE line while only 63 km out of 106 km initially planned were renewed on the MLA line.

1.25 During the course of Railway II the Government continued to be reluctant to institute tariff reform until the Bank suspended disbursement of the Credit between March and October 1982. As described elsewhere (para. 6.01), RNCFM increased tariffs and made a significant financial turnaround. Government has now agreed to more efficient rail operations