



ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK For Mozambique Competitiveness & Private Sector Development Project



Ministério da Indústria e Comércio
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ABBREVIATIONS AND ACRONYMNS

AfDB	African Development Bank
C	Centigrade
CE	Categorical Exclusion (Also referred to as CATEX)
CEPAGR	Centre for Promotion of Commercial Agriculture
CEPAGRI	Center for the Promotion of Agriculture
DANIDA	Danish International Development Assistance (Denmark's Aid Agency)
DINAIA	The National Directorate of EIA (Environmental Documentation)
DNDR	Directorate of Rural Development
DNFFB	National Directorate of Forestry and Wildlife
DNOT	National Directorate for Land Planning
DPADER	Provincial Directorate of Agriculture and Rural Development
DPAIA	Provincial Directorate of Environmental Impact Assessment
DPCOA	Provincial Directorate for the Coordination of Environmental Affairs
EA	Environmental Assessment
EAR	Environment Assessment Regulations
EFP	Environmental Focal Point
EFP/GP	Environmental Focal Point/Governor's Office
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ESMF	Environmental and Social management Framework
F	Fahrenheit
FAO	Food and Agriculture Organization
ft	Foot
FIAS	Investment Climate Team for Africa
FUNDEC	<i>Fundo para o Desenvolvimento de Competências Profissionais</i> (Skills Development Fund)
GDP	Gross Domestic Product
GOM	Government of Mozambique
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (German Aid Agency)
HSEMP	Health, Safety and Environmental Management Plan.
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
IEE	Initial Environmental Examination
IPEX	Institute of Export Promotion
INNOQ	National Institute for Standardization and Quality
m	Meter
MADER	Ministry of Agriculture and Rural Development
MCPSD	Mozambique Competitiveness and Private Sector Development (Project)
MEC	Ministry of Education and Culture
MIC	Minister of Industry and Commerce/Ministério da Indústria e Comércio
MICOA	Ministry for the Coordination of Environmental Affairs
MISAU	Ministry of Health

NCSD	National Commission for Sustainable Development
NEP	National Environmental Policy
NEMP	National Environmental Management Programme
NGO	Non governmental organization
NO_x	Nitrogen Oxides
PARPA	Action plan for the reduction of absolute poverty
PIREP	Mozambique Integrated Professional Reform Program
PEPA	Environmental Quality Standards of Mozambique Projects
PRS	Poverty Reduction Strategy
RAP	Resettlement Action Plan
ROD	Record of Decision
RPF	Resettlement Policy Framework
RSA	Republic of South Africa
SADC	Southern African Development Community
SME	Small and Medium Enterprise
SO_x	Sulphur Oxides
TBT	Technical Barriers to Trade
TOR	Terms of Reference
UNIDO	United Nations Industrial Development Organization
WB	World Bank

background

Mozambique has shown good economic growth since the end of the civil war in 1992. For instance, the per capita 2006 Gross Domestic Product (GDP) at U.S. \$320 is a significant increase over the mid-1980s GDP annual averages of U.S. \$120. And, unlike most African countries, Mozambique is resource rich, endowed with a huge coastline, vast tracts of virgin arable land, and no landless peasants.

Notwithstanding the above and other advantages, the country suffers extreme poverty: over 18 million people, out of a total 2006-estimated population of 19.7 million¹ are classified as poor. Future economic growth requires regulatory reforms, major foreign direct investment, and continuing resurrection of the agriculture, transportation and tourism sectors. The domestic commerce, mostly operated by Small Business Enterprises (SME's), also needs considerable reform.

The proposed World Bank Competitive and Private Sector Development (MCPSD) project aims to improve business environment and efficiency of Small and Medium Enterprises (SME's). SME's are considered major backbone of domestic commerce. MCPSD will also implement strategic interventions in tourism industry and horticulture. A number of areas in the country are scenically spectacular and are tropical paradise of white beaches, coral reefs and palm trees etc. and offers strong tourism potential. Likewise, expansion of tropical fruits² offers significant opportunities for private sector led growth, including exports. These activities will also help create immediate local employment and build local capacity.

Mozambique Ministry of Industry and Commerce (MIC) during 2009-2013 will implement the MCPSD under its two components: Component 1 focuses on Improving Competitiveness in Targeted Sectors (SME's, tourism and horticulture—tropical fruits). Component 2: Improving the Business Enabling Environment. Additional information including on various sub-components is synopsized under this study's Section 2.0: MCPSD and its Components.

An Environmental and Social Management Framework (ESMF) for MCPSD activities has been developed under this study. The Framework is of particular relevance to the projects rehabilitation—fixing roofs, adding fence(s) etc.—of training institutes and some government building; road rehabilitation, as relevant—repaving, fixing potholes etc., primarily to improve access to tourism—and a horticulture training institute in Nampula province.

As part of the horticulture institute, a 100-ha horticulture farm will be established in Nampula. To accommodate the environmental aspects of the farm, under *Annex 8: Pest Management Plan*, has been developed.

The Government of Mozambique (GOM) and MCPSD's funding agency, the World Bank, requires adherence to ESMF to properly assess the environmental and social issues that may arise during MCPSD's implementation. Environmentally, MCPSD has been classified under the World Bank Category B³, meaning insignificant environmental impacts.

¹ Estimated for 2006; US State Department; <http://www.state.gov/r/pa/ei/bgn/7035.htm>

² The current major *cash crops* are: Cashew (*Anacardium occidentale*), the leading cash crop, Coconut (*Cocos nucifera*), Mafurra (*Trechilia emmetica*), Mango (*Mangifera indica*) and citrus spp. Current production, however does not meet quality standards such as those required by EuroGap.

³ *Category B*, under World Bank classification, is a project where potential adverse environmental impacts on human populations or environmentally important areas—including wetlands, forests, grasslands, and other natural habitats—are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigatory

mcpsd components

MCPSD's strategic interventions are aimed to reduce the cost of Doing Business (DB) and also enhance SME's competitiveness. Other interventions will help develop tourism and horticulture, in particular tropical fruits (initially bananas) growth and export.

The project's overall objective is to improve the business environment and enhance the competitiveness, primarily of targeted SMEs through: (i) reducing the cost of doing business through support to GoM reforms and capacity building of key public sector agencies (ii) developing and strengthening the capacity of local intermediaries to deliver business services in targeted sectors; (iii) establishing forward and backward linkages for SMEs to existing and new local and foreign buyers and investors; and (iv) enhancing access to finance for business expansion and investment.

MCPSD's two components, listed earlier under Section 1.0, have been developed to be complementary⁴ and should be viewed in an integrated fashion. Also, to achieve the intended synergies, the project's implementation arrangements must be flexible with adequate capacity, open communications, and clear accountabilities for all the stakeholders involved. MCPSD implementation (See Sections 4.0 and 6.0) takes these into consideration, for example, incorporating mitigating and capacity building measures, as and where needed. Moreover, the private sector being an equal project partner will be an integral element during the project's implementation.

The Ministry of Industry and Commerce (MIC) will implement MCPSD. In addition, the Ministry of Coordination and Environmental Affairs (MICOA), the Ministry of Tourism, Center for the Promotion of Agriculture (CEPAGRE), the Ministry of Finance, the World Bank, the financial institutions and the private sector will also participate.⁵ The project's various sub-components are as follows:

1. Component One: Improving Competitiveness in Targeted Sectors and Regions

This component would enhance the competitiveness of SMEs in targeted sectors and promote broad based growth in selected regions through the following three sub-components:

Access to Business Development Services for SMEs:

This sub-component aims to enhance SMEs growth and competitiveness in the tourism, agribusiness, and export-oriented manufacturing sectors. Its implementation will help build the capacity of business

measures can be designed more readily than for Category A projects.

⁴ For example, SMEs that benefit under the matching grant program from advice and training would be able to access the credit guarantee scheme; both the matching grant program and credit guarantee facility will target priority sectors being supported through the regional sub-components. Further, the regional tourism and horticulture sub-components would inform the policy.

⁵ Specific outline along with other information is available in the World Bank's *Project Appraisal Document*, September 2008. For example, SMEs that benefit under the matching grant program from advice and training would be able to access the credit guarantee scheme; both the matching grant program and credit guarantee facility will target priority sectors being supported through the regional sub-components. Further, the regional tourism and horticulture sub-components would inform the policy.

⁵ Specific outline along with other information is available in the World Bank's *Project Appraisal Document*, September 2008.

services providers to deliver consultancy, advisory, and linkage services to SMEs through a second-generation matching grant program.

The matching grant program will operate in an iterative, demand-driven basis responding to proposals from the private sector, utilizing and building the capacity of Mozambican providers (such as business associations, local training providers, local consultancy, accounting, and legal firms) to deliver needed services to SMEs in the targeted sectors. Moreover, using the recently completed value chain studies as a starting point, a market assessment will be conducted during project preparation to inform the optimal design and delivery mechanisms for this program.

Promoting Tourism Sector in Inhambane Province

This sub-component will support tourism-related job creation and income generation, based on the existing large opportunity to develop backward linkages with local entrepreneurs as well as the country's growing tourism industry. It will use tourism as a strategic entry point. The project proposes to pilot this regional approach in Inhambane province of Mozambique.

The sub-component will implement interventions in two main areas: improved public sector service provisions in the tourism sector, and expanding the tourism-related private sector supply chain⁶ capacity. To improve the business environment and public sector service delivery in key tourism locales, the project will strengthen the Inhambane 1-stop-shop facility to provide a similar service in Vilanculos, to service the key tourism hubs of Vilanculos, Inhassoro and Bazaruto.

Inhambane has the country's most attractive tourism resources and with the highest growth rates in terms of investments and tourists numbers. Also, this sub-component's output will create synergy with two other World Bank Group projects currently under implementation related aspects of tourism development in the province. Of the two projects, one, the Trans-frontier Conservation Areas and Tourism Development Project (TFCATDP), is supporting specific conservation areas in the province.

The other project, the International Finance Corporation's (IFC's) Anchor Investment Program, is targeting and promoting Inhambane Province as an investment opportunity for the private sector. In addition, the Trans-frontier Conservation Areas and Tourism Development Project (TFCATDP) are also supporting specific conservation areas in the province. This sub-component will also provide much needed training and capacity building for tourism industry. Various interventions will help achieve broader development impacts, namely, locally increased employment and income generation.

The light infrastructure activities would include rehabilitation of existing government facilities, supporting the final hook-ups/distribution of utilities (especially electricity connections), repaving and rehabilitation of existing roads to provide key access to tourism sites, solid waste management, etc.

In the private sector, the scarcity of local skills relevant to the tourism supply chain will be addressed through building the capacity of local training institutes (through curriculum development, training of trainers, learning equipment etc.) to provide training in needed areas (such as languages, tour operations, boat operations, diving, fishing, artisanal and crafts development, vocational hospitality skills, language, business development, business operations, marketing, catering, construction, carpentry, and maintenance, etc).

⁶ In recent years, value chain studies have been completed for the horticulture, tourism, cotton, woodworking, and textile sectors in Mozambique

The sub-component will also support local tourism sector association, helping increase their relevance to their constituency, help provide technical support including legal advice etc. and help link with the matching grant program.

Tropical Fruits Training Institute in Nampula

This sub-component will support the establishment of a national quality training center in Nampula specialized in tropical fruit operations. The training center will initially be focused on banana production and handling but will eventually diversify into other tropical fruits once the model has been tested. The training center, a public-private sector partnership, will collaborate intensively with Chiquita, a U.S.-based major grower and exporter of bananas, worldwide. Chiquita recently announced a major investment in the province on the development of training material and the provision of trainers.

Horticulture has been identified as a sector of high future export potential⁷ as well as of interest for the domestic high end market due to growing demand of the middle class in cities as well as from the tourism industry. Quality is an essential part of a strategy to target these markets alongside other factors such as supply consistency, input availability and access to finance. Currently, in the Bierra corridor various investors—Dutch South African, Zimbabwean and Mozambican—have already set up six high-value horticulture farms producing vegetables, paprika, roses, bananas and mangos.

The sub-component will support the investment in buildings, facilities, equipment, materials for the training center itself, as well as the establishment of a 100-ha banana farm, which will constitute the training grounds of the center. Furthermore support will be given to management and personnel resources of the training center including scholarships. The project will also support the banana farm operating costs in the first year.

2. Component Two: Improving the Business Enabling Environment

Supports to Business Environment Reforms

Working in partnership with the Investment Climate Team for Africa (FIAS), this sub-component would support reforms envisioned in the GOM's business environment reform strategy through initially working on (i) supporting reforms to improve Mozambique's Doing Business (DB) indicators; (ii) broader systemic reforms improving the business environment such as improving business start-up procedures, streamlining the business licensing regime and business tax administration; and facilitating trade.

The component will also help streamline the licensing regulations and implementation for businesses; incorporate licensing review and facilitate trade logistics among its strategic interventions aimed at helping streamlining Doing Business (DB) reforms.

Quality/Standards Infrastructure Support

This sub-component will support the provision of standards-related services by the National Institute of Standardization and Quality (INNOQ) in a way that is private-market led and that promotes exports in

⁷ Recent published studies suggest that Mozambique has good potential to develop its horticulture sector and become a counter-seasonal exporter, with high quality produce such as oranges, grapefruits, mangos and bananas, paprika, roses, and summer flowers.

key sectors. A twinning arrangement with a middle-income country institution will build INNOQ's capacity to assess demand for its services and to make priorities in service provision.

Accountancy and Audit services for SMEs

This component will support GOM's effort to improve the business-enabling environment. Specifically, the component will advance specific reforms based on the Business Environment Strategy, build the capacity of key agencies that will play a catalytic role in improving service provision for exports, and strengthen and broaden public-private dialogue.

Strengthening Public-Private

This sub-component would strengthen local business and industry associations to promote greater private sector participation in the policy reform process, especially from outside Maputo. The core activities within this sub-component will include: Undertaking a detailed diagnostic of the current dialogue structure and the existing advocacy programs of the industry associations in Mozambique; and preparing a strategic plan: The above assessments will be used as a guide to design initial project activities and provide baseline for measuring progress.

Biophysical and Socio-economic Environment of Mozambique

Mozambique is extremely variable in all areas of the physical, biologic and socio-economic environment⁸. The republic is located at the southeast of African Continent. Mozambique borders it at the North; Mozambique, Zambia, Zimbabwe and Swaziland at the West; South Africa at the South and Indian Ocean at the East. Mozambique has approximately 799,380 km² of national territory including inland bodies of water.

The country is relatively flat particularly in the coastal regions. From the coasts to the interior in an east-west direction, there is a *coastal plain* (40% of the territory and has the highest population density); *plateaus* with altitudes of 200 to 1,000 meters and finally *high plateaus* and mountains over 1000 meters high. Mozambique's Indian coastline stretches for approximately 2,500 km. The proximity of the sea and the richness of the Mozambican River basins favour small scale and industrial fisheries. The country is rich in wildlife and natural resources, such as coal and natural gas. The following provides an overview of relevant parameters.

3. The Project Area

MCPSD activities will have activities in two Mozambique provinces, Nampula, in the Northern Mozambique and Inhambane. In Nampula, summer (October-March) temperature averages 35⁰C and during winter (May-August) average is 20⁰C. The rain usually starts in December and lasts until the end of April. In these regions, dense woodlands and forests cover over 75% of their territory. Soils generally vary from low to good fertility.

The Nampula province is the most densely populated province in Mozambique with a population of 3.6 millions. However, the province's infrastructure is badly damaged primarily by the now-ended civil war. For example, the bridges are down and roads are full of potholes—and need serious rehabilitation. Given the annual rainfall of 900 mm, with muddy and slippery roads, mobility becomes difficult.

4. Soils

Soils in Mozambique are generally old and, in many areas, nutrient-poor. Northern Mozambique, which includes Nampula province and some parts of the central and western areas have red soils of varying texture (from light sandy soils to clay loams).

Low fertility red soils occur in Sofala province north of Beira. Alluvial soils occur in the Zambezi river basin. Though prone to salinisation, particularly in delta areas, these soils have a high potential for agriculture. Due to slope, shallowness of soil and high rainfall there is a high potential for soil erosion in these areas. Generally speaking, river valley and delta soils are rich and fertile, but southern and central Mozambique has poor and sandy soils, and parts of interior are dry.

There are seven major soil groups according to the National Soils Map of the National Institute of Agronomic Research. In general, soils (except for fluvisols, which are found in river floodplains) have low to medium fertility. The fertile fluvisols make up only about 6% of the soils of Mozambique. In high

⁸ For example, in a biologic overview, 22 broad vegetation types have been identified. They do not necessarily correlate with other factors such as topography, climate or underlying topography

altitude and rainfall areas, acidic ferralsols and acrisols are found; these soils relatively have a relatively low fertility. Arenosols have very low fertility and low water storage capacity, and occur principally in the southern part of the country.

Fertile soils are found in the northern and central provinces. These soils have greater water-holding capacity as compared to those in the South of the country, where sandy, infertile soils prevail. The northern soils, whose qualities allow agricultural potential to extend beyond the river valleys, have a higher content of red clay, and wide range of fertility. In contrast, the central region has a broad expanse of rich alluvial soils along the Zambezi delta. South of Beira, fertility is largely limited to alluvial soils in the valleys of the Save, Limpopo, Incomáti, Umbelúzi, and Maputo rivers, although several pockets of fertile but heavy soil occur southwest of Inhambane.

5. Climate

Mozambique is essentially a hot country, as it is mostly situated at low elevation and is almost entirely within the tropics. The climate is strongly influenced by altitude, proximity to the sea and latitude. In the south, it is semi-arid and subtropical. In the north it is tropical with strongly seasonal rainfall. There are two distinct seasons, a warm, wet season from November to March, and a cooler, dry season from April to October. Rainfall varies between about 1,400 millimeters a year near the Zambezi Delta to about 300 millimeters a year in the lowlands of the southern interior. The hot rainy season is from November to March and the dry winter months are cooler but still quite hot during the day; especially along the northern coast.

Of the country's two main seasons, one wet and the other dry, the wet season is from November to March, average monthly temperature between 26.6°C and 29.4°C (80°F and 85°F); the cooler temperatures is in the interior uplands. The dry season lasts from April to October and has June and July temperatures averaging 18.4° to 20°C (65°-68°F). The average annual rainfall is greatest (about 56 inches) over the western hills and the central areas, and lowest in the Zambezi lowlands averaging 16 to 32 inches. The driest areas lie in the interior of Gaza Province. Mountains are in the north and west and have around 2,000 millimeters of rainfall a year. Yearly precipitation variations are significant.

There is great variation in mean annual rainfall across the target area. Most of the coastline receives 750 to 1,000 mm of rain per year. The interior of the Zambezi Valley, in Tete province, is semi arid, receiving less than 600 mm average annual rainfall. There are a series of very humid pockets associated with mountains areas e.g., Mt. Binga (Manica Province), Mt. Gorongosa (Sofala Province) and Mt. Namuli (Zambezia Province) that receive more than 2,000mm of rainfall per year.

6. Topography

Mozambique is 44% coastal lowlands, rising toward the west to a plateau 150 to 610 m (500–2,000 ft) above sea level and on the western border to a higher plateau, 550 to 910 m (1,800–3,000 ft), with mountains reaching a height of nearly 2,440 m (8,000 ft). The lowest point is the Indian Ocean; the highest point is Monte Bingaz, 436 meters. The highest mountains are Namuli (2,419 m/7,936 ft) in Zambézia Province and Binga (2,436 m/7,992 ft) in Manica Province on the Zimbabwean border.

7. Hydrology

Mozambique comprises some thirty-nine major rivers that drain into to the Indian Ocean along the country's 2,700 km coastline. The most important ones are: the Zambezi (flowing southeast across the

center of Mozambique into the Indian Ocean), the Limpopo in the south, the Save (Sabi) in the center, and the Lugenda in the north. The most important lake is the navigable Lake Malawi (Lake Niassa).

The major perennial rivers of Zambezia province are the Licungo (Lugela), Raraga, M'lela, Molocue, Ligonha and Meluli. The Zambezi River enters Mozambique at Zumbo where it immediately swells into the impoundment of Lake Cahora Bassa., lake formed by the impoundment of the Cahorra Bassa Dam. The most important tributary of the Zambezi is the Shire River, which drains Lake Mozambique via the Rift Valley. Under MCPSD, availability of adequate water for irrigation, such as from rivers, is important for its horticulture component.

Hydrological connections have important implications for international rivers, a large number of which flow through Mozambique from their watersheds in neighboring countries. For example, the generally flat topography and slow drainage that are characteristic of the *miombo* eco-region mean that forest cover and land use in neighboring countries in many cases, determine the flow of Mozambique's rivers.

Forest cover is considered important in maintaining soil structure and water holding capacity (Lawson, 2000). Depending on what happens in Zambia and Zimbabwe, for example, floods may become more common on the Zambezi, Pungwe, or Save Rivers.

8. Natural Vegetation

In Mozambique the main broad vegetation type, is savannah woodland⁹ mainly *miombo* woodland of various types. There are several different types of miombo, determined by variations in rainfall and soils. Together these two types of woodland cover approximately 70% of Mozambique.

Woodlands and forests cover approximately 78% of the country, concentrating in much of Niassa, Cabo Delgado, Nampula, Zambezia, Sofala, Manica and Inhambane provinces. The second most extensive woodland is "mopane" woodland occurring in the Limpopo- Save area and in the mid-Zambezi Valley. Most woodland is largely inhabited and any farming is based on shifting cultivation. The following *Table1: Forest Reserves in the Project Area* shows key species.

Table 1: Forest Reserves Including in the Project Area

Designation	Provinces	Districts	Areas (km2)
Mepalué	Nampula	Ribaué	42,5
Ribaué	Nampula	Ribaué	37,5
Mecuburi	Nampula	Mecuburi	2.300,0
Matibane	Nampula	Nacala	199,0
Baixo Pinda	Nampula	Memba	196,0

Other vegetation types include: Acacia woodland. There are two extensive areas of Acacia woodland, a southern; formation (in the area of Moamba, Magude and Guija) and a central formation; running approximately in a northeast direction through Manica and Sofala provinces.

Natural resources supplied by forests and woodlands make a major contribution to the Mozambican economy. Wood supplies more than 80% of Mozambique's energy demands. About 10 percent of the

⁹ A ground covered by grasses, with some trees interspersed, characterizes Savannah woodlands. Savannahs are open canopied habitats, intermediate between grasslands and forests. In general, as available moisture increases in a terrestrial system, the density and complexity of the vegetation also increases. Little or no rain yields desert. A lot of rain yields rainforest. Intermediate prevailing rainfall amounts result in the formation of grasslands, savannahs, and other forests types.

5,700 plant species found in Mozambique are used in traditional medicine and conservation of forests, woodlands and other natural habitats will allow local people to continue to benefit from this traditional pharmacopoeia. Forests also provide “bushmeat” a source of protein for over 80% population.

Use and management of natural resources such as forests and wildlife makes a major contribution to rural livelihoods in Mozambique, and so natural resource management (NRM) should be treated as an integral part of rural agriculture.

9. Fauna

Mozambique has rich diversity of mammal fauna; 211 terrestrial mammal species and 11 marine mammals have been recorded. Only one mammal species is considered endemic to Mozambique, a white-bellied red squirrel confined to Namuli Mountain (Zambezia province) is considered endemic to Mozambique.

Approximately 900 species have been recorded for southern Africa; of these 581 have been recorded in Mozambique. There are a number of near endemic and restricted range species, mostly associated with isolated mountains habitats such as Gorongosa (Sofala), Chimanimani (Manica), Chipirone and Namrri (Zambezia) Mountains.

The proposed training facilities are located in the urban and semi-urban areas and unlikely to have any significant environmental impacts on the Mozambique’s fauna. In the C. Delgado province, there is national park called PN das Quirimbas. It covers approximately 7,500-km² area.

10. Wildlife

Wildlife populations include water Buffalo, Elephant, Warthog, Leopard, Baboon, Giraffe, Lion, Zebra, antelope, and numerous species of ungulate and cat. Crocodiles and Hippopotamus are still found in slow-moving waterways. Snakes, including impressive pythons and dangerous puff adders, cobras, and vipers, are found throughout the territory.

Flamingos, cranes, storks, herons, pelicans, ibis, and other tropical water birds exist throughout Mozambique but are more numerous in the moister areas of the northeast. Scavengers include crows, vultures, and buzzards, and game birds include guinea fowl, partridge, quail, and a range of geese and ducks.

Game reservations and national hunting areas are located largely in the central and southern areas, with the exception of the important Niassa reserve on the Tanzanian border and the Gilé reserve southwest of Nampula. The largest game areas are just south of the Zambezi bordering the Chimoio highlands. The nation’s five hunting reservations are Niassa, Gilé, Marromeu, Pomene, and Maputo.

11. National Parks and Reserves

Various national parks possess the conditions suitable for safaris and other similar activities. Outstanding because of their importance are Gorongosa (Sofala), Zinave (Inhambane/Gaza), Banhine (Gaza) and Bazaruto (Inhambane). There are also several hunting reserves, such as the Elephant Reserve (Maputo), Pomene (Inhambane), Gile (Zambezia), Marromeu (Sofala), and Niassa (Niassa), as well as other designated hunting areas scattered throughout the country.

The Gorongosa National Park (3,770 sq. km), once regarded as among the richest in Southern Africa, is currently benefiting from rehabilitation work on its infrastructure and restocking of the animal population. The Bazaruto National Park, located on the island of the same name in Inhambane province, is the only marine park and constitutes an important tourist attraction due to the enormous possibilities it offers for diving and underwater fishing.

12. Land Quality, Productivity and Degradation

Less than 20% of Mozambique's land is wooded. Dense tropical rainforest is found in the river valleys, while a more open woodland-grassland cover dominates in the drier regions and uplands. Current land degradation, primarily caused by one or more factors includes: (i) loss of soil fertility, which is intrinsically linked¹⁰ to itinerant agriculture and its shifting cultivation system prevalent across all provinces; (ii) soil erosion—the area of great risk is in the central provinces of Manica, Tete and Zambezia; (iii) soil salinisation; (iv) soil acidification; and (v) loss of vegetation cover.

The practice of shifting cultivation is a major cause of damage to forests.

13. Socio-economic Environment

Of Mozambique's estimated population of approximately 19.7 million, the natural growth rate is estimated at 2.4%. Administratively, the country is divided into 10 provinces and Maputo City, the national capital, has the status of a province.

The proportion of children under 15 years old, projected for 2006, is 43.5% of the population. Of the total population, about 75% lives in rural areas. However, during the past 10 to 15 years, there has been significant migration to urban centres due to protracted civil war (1997-1992) and lack of economic opportunities. The unplanned and uncontrolled migration severely strained the existing inadequate and weak urban infrastructure, in particular water supply, housing and sanitation.

In spite of significant economic growth, as indicated earlier, over 80 percent of Mozambique's total population of 19.7 million remains poor, according to the World Bank. Key factors that continue contributing to poverty are: (i) low educational level of economically active household members, particularly women; (ii) low agricultural productivity; (iii) lack of work opportunities; and (iv) poor development of infrastructure, particularly in rural roads where poverty levels, compared with urban areas, are high, 72.2 percent versus 62 percent.

¹⁰ Shifting cultivation is a cyclical agricultural system that involves clearing of land—usually with the assistance of fire—followed by cultivation until the area's fertility is exhausted? Shifting cultivation *per se* is not destructive and can be sustainable if rotation cycles are sufficiently long so that natural vegetation recovery can take place before clearing is done again.

Administrative, Legal and Institutional Frameworks

Administrative, legal and institutional frameworks, in the context of GOM, are provided below, as they may apply to MCPD. Under the broad mandate for environmental protection, the over-arching resources and development sustainability fall under Ministry of Coordination of Environmental Affairs (MICOA), which is also the government's lead environmental regulator.

14. Administrative Interface

While MIC will take the lead in administrative interface for MCPD, a number of other organizations will also participate in the project and may need to be interfaced. Among these are:

Interface with MICOA

MIC will closely coordinate and seek guidance from MICOA, where needed, on environmental matters. At the national level, MICOA is responsible for implementing the National Environmental Management Program, NEMP, and associated environmental policy and legislation. The Ministry, as indicated by its title, primarily has a co-coordinating role—including for MCPD activities. Also, all ministries share environmental management, and GOM requires that sector policies must incorporate environmental dimensions. To summarize, MICOA's key responsibilities include:

- Revising and developing, as necessary, policies and sustainable, inter-sectoral development plans;
- Promotion of sectoral legislation;
- Creating regulations (such as for EIAs);
- Co-coordinating policy implementation; and
- Educating and promoting public awareness.

MICOA regulates Environmental Impact Assessment (EIA) procedures through the National Directorate for EIA (DINAIA). All proposed projects that are likely to have adverse environmental impacts are obliged by the new EIA Regulations to register with MICOA for the determination of relevant environmental Category (A, B or C).

Other MICOA responsibilities include: enforcement of Environmental Quality Standards and of Emissions and Effluents legislation and for territorial planning MICOA has established Provincial Directorates in all the Provincial capitals and is represented at the District level by the infrastructure and environment directorates. The level of organization and capacity varies from province to province. The Provincial Directorates are responsible for overseeing the EIA process with regards to Category B and C projects.

Interface with the Ministry of Tourism

The National Directorate for Conservation Areas under the Ministry of Tourism (MITUR) is responsible for the management of Protected Areas (National Parks, Wildlife Reserves and Controlled Hunting area). The Directorate is required to ensure that conservation objectives, envisioned in the laws for national parks and reserves be attained based on a high degree of self-sufficiency.

Interface with Public Utility Companies

MCPSD road improvement—fixing pot holes, paving etc.—in each province may require interaction with public utilities for: (i) Shifting water supply lines; (ii) Shifting/raising of electric poles/overhead lines; and (iii) Shifting telephone lines, among others.

15. Environmental Policies and Regulations

Generally speaking, while Mozambique has much environmental legislation in place, institutional capacity to implement environmental policies, laws and regulations, overall is weak. The institutional roles and competencies are not well defined resulting in gaps and overlaps in environmental management especially in coastal and marine management. In addition to weak institutional capacity within sectors, there is also a lack of inter-institutional coordination between higher and lower levels of the government.

At the national level, there are various laws and other instruments to safeguard nation's environment and human health. The country's Constitution requires that the Government must promote initiatives in order to guarantee ecological equilibrium, conservation and preservation of environment, aiming a better quality of life for all citizens. In addition, GOM has developed a National Environmental Program (NEMP), which includes a Master Plan that seeks to promote and implement a sound environmental policy. The Master Plan includes a National Environmental Policy, Framework Environmental Legislation and Environmental Strategy.

The country's environmental regulations prohibit commencing an "undertaking" without prior registration and define the relevant stages of the procedures for EA. Where potential environmental and social impacts are significant—based on the Screening Process—an Environmental Impact Assessment (EIA) is required for the proposed project. For MCPSD, as also stated earlier, given the nature and magnitude of rehabilitation activities, it is unlikely that an EIA will be required.

In addition, MICOA also uses Strategic Environmental Assessment (SEA) to help in its environmental planning. SEA is a combination of different tools—biophysical and social, combined with policy—which helps evaluate potentially significant environmental effects of different development options.

To implement its policies, the key instruments used by GOM are:

- The National Environmental Management Program (NEMP);
- The Environmental laws: environmental law n° 20/97, of October 1;
- The Land Law N°19/97 of 1 October 1997;
- EIA regulations: The decree number 45/2004 of September, 29, related on the process of IEA; and
- Environmental Impact Evaluation (EIE) guidelines: The decree number 32/2003 of August 12, concerning the Environmental Audit; Environmental quality standard.

A number of interrelated policies, laws, and programs of the GOM may have a bearing on MCPSD. Of particular relevance are the National Environmental Policy (1995); the Environmental Framework Law (1997); the Land Policy; the Land Law (1997); the Forest Law (1999); and Regulations (2002). Also relevant are the National Policy for Tourism (1995), and the Municipalities Law.

In addition, as a member of the Southern African Development Community (SADC), Mozambique participates in various SADC protocols; in particular those related to shared watercourses and wildlife conservation. Finally, Mozambique is a party to the United Nations Convention on Biological Diversity (CBD); UN Convention to Combat Desertification; the Convention on International Trade in Endangered Species (CITES); and the Ramsar Convention on Wetlands of International Importance.

The key environmental protection and management tools for MCPSD include: (i) Environmental Screening; (ii) Environmental Impact Assessment (EIA) system for proposed projects, programs, or investments, etc; (iii) Environmental Management Systems (EMS) including Environmental Management Plan (EMP) and others, as applicable; and (iv) Environmental quality and effluent guidelines, procedures and instruments as provided under the Mozambique's laws and the World Bank's environmental guidelines. A synoptic view of *key laws* is given below:

The Environmental Law Number 20/97, of October 1

The key objective of the Environmental Law, approved by the Parliament on October 1st, 1997, is to achieve *sustainable development* and environmental management in the country. The law among its key provisions requires preparation of an Environmental Impact Assessment (EIA) for projects and programs that have the potential of significant environmental impact.

The Environmental Law is applicable to all public or private activities, which may influence the environment, either directly or indirectly. Salient features of the Law include:

- Those who pollute, or in any way degrade the environment, are liable and under obligation to rehabilitate the environment or to compensate for the resulting damage;
- The Law forbids the pollution of the soil, subsoil, water or atmosphere by any polluting substances, or any other form of degradation of the environment, which fall outside the limits stipulated by the Law;
- That projects and operations that are likely to have a negative impact on the environment are subject to an environmental impact assessment by independent assessors; .
- Protection of environmental components that have a recognized ecological and socioeconomic value; and
- Creation of Environmental Protection Zones.

As per this Law, activities that are liable to cause significant environmental impacts require an Environmental License. The issuance of an environmental license is dependent on an appropriate level of environmental impact assessment being completed and accepted.

The Environmental Law of 1997 (also called Act of 1997) imposes strict liability on anyone who causes material damage to the environment. The State exercises its right to assess the damage, fix the amount of compensation, and to take countermeasures at the expense of the person causing the damage. The provision, however, do not relate to hazardous wastes specifically.

The procedure for conducting an EIA is overviewed under *Section 4.3: Environmental Impact Assessment Regulations*. MICOA, the government's environmental arm, provides elaborate directives for EIA, including the main component of the study and the approval procedure. In this respect, the environmental law is directly relevant to the MCPSD activities.

The Land Law and Regulations 19/97 of 1 October 1997

The Land Law stresses that all the land belongs to the State, and no private land rights exist, and all holdings are secondary rights. It also maintains a bias toward land use planning for the good of society, rather than market mechanisms and decentralized control over resources. Under this law, two types of land rights are possible. One type is land leased from the State as a concession. To obtain title, the applicant must follow a legally described process. The second type of land right is based on traditional occupation and customary norms and practices, if not contrary to the Constitution.

Both individuals and legally defined collective bodies (profit and no-profit associations and cooperatives) may obtain land titles for up to 50 years, renewable thereafter. The occupation rights of communities are supposed to have as much weight as rights acquired through formal titling procedures.

The Land Law also specifies the responsibilities of different levels of government to grant rights in land. Provincial governors can approve land concessions or titles up to 1,000 hectares; Ministry of Agriculture and Rural Development (MADER) must approve land rights from 1,000 hectares up to 10,000 hectares, and the Council of Ministers must approve titles to areas of 10,000 hectares or more.

Forestry Law and Regulations

According to the Forest Law (Act n° 10 of 7th July 1999), all the forest and wildlife resources in Mozambique belong to the State. The main objectives of this law are to protect, conserve, develop and utilize the forest and wildlife resources of the country in rational and sustainable ways for economic, social, and ecological benefits for current and future generations.

The Law and its Regulations also stress that the State may delegate the power of forest resource management, including the objectives of replanting forests and restocking wildlife, to local communities, associations or to the private sector. The Forest Regulations give a list of protected species of animals and plants (see Appendix 14), and lists fines for hunting, killing, or other exploitation.

Water Law (1991)

The Water Law establishes general water management principles and rules for water utilization, priorities, rights, and obligations of water users. The Water Law establishes all the water bodies in the public domain as:

- Inland waters, both surface and groundwater, belonging to the State;
- All dams, hydraulic equipment and other infrastructure built or funded by the State for
- Public utility also belong to the State;
- All public domain watercourses are State propriety and they cannot be alienated;
- and
- The State water public domains and its management policy.

National Tourism Strategy and Policy (1995)

The National Policy for Tourism and the Strategy for Tourism Development provide guidelines for reinvigorating the tourism industry. The National Directorate of Tourism and the National Directorate for Conservation within the Ministry of Tourism manage and regulate tourism operations in Mozambique. The latter is responsible for national parks and conservation areas, except for the forest and game reserves that remain under the jurisdiction of MADER.

The policy recognizes that Mozambique possesses a variety of natural resources that could form the basis for developing high quality tourism. The policy recognizes the need to develop tourism while conserving the country's natural resource base. It identifies and recommends the creation of partially protected tourism zones, mostly located along the coast. In 1997, the Ministry of Tourism designed a Tourism Master Plan for four coastal areas of Mozambique, which identifies poles of development in these areas.

The Municipalities Law

This law aims at decentralization of authority to district level. The Municipalities Law stipulates that mechanisms should be developed for involving traditional authorities as well as any future community institutions in local administration.

16. Environmental Impact Assessment (EIA) Regulations

An EIA is of key importance to assess the potential of *significant* environmental including social impacts of a project. The Country's law requires that, at the start, all development projects are subjected to environmental screening. Prior to granting permission to proceed with a project, the proponent is obliged to complete a Pre-evaluation Form ("*Ficha de Pre-Avaliacao*") developed by the Ministry for Coordination of Environmental Affairs (MICOA).

New Environmental Impact Assessment Regulations were passed by the Council of Ministers in July 2004. The Regulations have been published in the Government Gazetted (*Boletim da Republica, 1 Series, Number 39, of 29 September 2004*). The new Regulations will revoke the EIA Regulations of Decree N^o 76/98. The new Regulations will revoke the EIA Regulations of Decree number 76/98. Three categories of project are defined by the *new* Regulations (Article 3).

The Regulation requires licensing of any activities liable to cause significant environmental damage. Included is issuance of an Environmental License, which is contingent upon level of EIA being completed and accepted by MICOA. The Act also requires that all sectoral legislation in Mozambique be revised such that it is in conformity with the Act. The EIA regulations prescribe the range of development projects requiring an EIA, the process to be followed, and the contents of the EIA report.

The nature, type and location of the project are described in the pre-evaluation (environmental) screening form with a preliminary indication of potential socio-economic and biophysical impacts (number of people/communities affected, sensitive habitats, threatened species, etc).

Based on the screening exercise, MICOA makes a decision on whether an EIA is required or not. In the event of an EIA is not being required the proponent is still obliged to describe methods and procedures for proper environmental management (storage of semi-hazardous materials, solid waste disposal, etc). *Article 3* of the Law defines the following three categories of projects:

Category A: Activities are considered to have significant adverse impacts on the environment and are subject to an Environmental Impact Assessment (EIA); also called Environmental Impact Statement (EIS).

Category B: Activities listed in Annex 11 of the EIA Regulations are those for which potential environmental impacts are less adverse than those of Category A projects.

A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas are less adverse than those of Category A projects. These impacts are irreversible; and in most cases mitigation measures can be easily formulated / implemented.

Category C: Activities listed in Annex III of the EIA Regulations are exempted from an EIA but still require observance of good management practices.

In addition, a project is classified as Category A if it affects sensitive areas, directly or indirectly. Included are impacts on:

- Coral reefs;
- Mangroves;
- Natural forests;
- Small islands;
- Zones of potential erosion, including dunes along the coastline areas exposed to desertification
- Conservation or protected zones or areas;
- Wetlands;
- Zones where the habitats and ecosystems are in danger of extinction;
- Zones of outstanding landscape beauty, zones of archaeological, historical and cultural value that should be preserved, zones where plant or animal species are threatened with extinction are located;
- Ground waters used for public consumption; and
- Areas for the protection of spring and water sources.

Annex 6: Proposed Terms of Reference for an Environmental Impact Assessment lists generic EIA terms for potential use for future MCPSD sub-projects. The EA's are subject to Mozambique's EA procedures. As stated earlier, these reports should include and Environmental and Social Management Plan: See Section 4.3.3

EIA and MICOA Process

An EIA is a detailed and rigorous analysis of the impacts of the proposed action and all reasonable alternatives. An EIA examines an activity that significantly affects the quality of the human and natural environment. It also requires formal public involvement, such as a public hearing.

To obtain an environmental license, the project proponent must submit project proposal along with an Initial Environmental Examination (IEE) describing project categorization and scoping for further study. MICOA, in turn, will review the project based on existing legislation and regulations and confirm or re-categorize the project and accordingly finalize the scoping.

The above process takes about five days to be completed. If a detailed impact assessment is needed, the terms of reference are drawn to identify the potential impacts resulting from the implementation of the project. At this stage, the local people and other stakeholders and affected parties are involved in the

process, to gain a sense of their needs and preoccupations about the project and to share the knowledge on the probable impacts of the project in a socio-economic or physical environment.

The involvement of different stakeholders, including local communities has a potential to assess wider information on the resource base and generate cumulative knowledge of their local environment.¹¹ It is the responsibility of MCPSD sub-project implementers to undertake the EIA if required—based on the review and analysis of completed ESSF for the sub-project—and carry on public consultations during the scoping and review phases of the EIA process.

Conducting an EIA

In order to register the EIA process (*Instrucao de Processo*), the following documents must be submitted to the EIA Authority (MICOA), either at the central level or provincial level:

- Description of the MCPSD;
- Description of the MCPSD sub-project;
- Justification of the activity;
- Applicable legal framework of the activity;
- Summary on biophysical and socio-economical characteristics of the area;
- Current land use patterns in the area;
- Information regarding the environment in the area;
- Information regarding the steps to be taken for formulating an EIA;
- Submission of TOR, Scoping, EIA and SEA; and.
- Completing Environmental and Social Screening Form (in case of MCPSD). MICOA also has a similar form that is considered inadequate for MCPSD.

Based on evaluation, the environmental authority may:

- Reject the implementation of the activity
- Categorize the project as Category A (requiring an EIA) or B (requiring an SEA) or
- Category C (no study required but good environmental practices must be adhered to).

In the event that the environmental and social screening process recommends that an EIA be carried out, the implementers should refer to Mozambique's EIA procedure.

Review and Approval of the Environmental Impact Assessment Report

MICOA's regional representative as well as its authorized representative at the Governor's office would review an Environmental Impact Assessment (EIA) prepared for a sub-project. This review should also include determination whether any landowner(s) have been adversely impacted—such as loss of land, loss of livelihood etc.—as a result of the sub-project's implementation.

Where applicable, these should be dealt under the provisions of Resettlement Policy Framework (RPF), prepared separately for MCPSD. Following this, EIA will be submitted to the EFP/MIC, who, in concurrence with MICOA will review the EIA. If the EIA is acceptable, relevant EFP/GO will apply for needed permits to MICOA, as outlined in the EIA.

¹¹ See: SMEC, The National Roads Administration, Mozambique, EIA and EMP for APL, RBMMP (Roads 3)

The EIA report should include an easy to use, Environmental and Social Management Plan (ESMP), prepared in accordance with the requirements of OP 4.01 of the World Bank. This ESMP should be a practical; an action-oriented plan specifying measures to be taken to address the negative environmental and social impacts.

The Plan should also specify the actions, resources, and responsibilities required to implement the agreed actions and details on key social and environmental management, monitoring, and monitoring indicators. Further, the ESMP should ensure that the costs of implementing the recommendations of the EIA report are budgeted into the total sub-project costs.

Responsibility for the preparation of the ESMP, a part of EIA, will be with qualified and competitively selected Mozambique contractor. The firm (See Section 4.4.1) will work with the EFP/GO and, to the extent practical, seek participation of community leader(s) to develop the ESMP. The ESMP, at a minimum should include: (i) Summary of environmental and social impacts; (ii) description of the mitigation measures; (iii) A monitoring plan including monitoring indicators; (iv) Institutional arrangements; and (v) Capacity building needs to ensure effective implementation (vi) Implementation schedule and reporting procedures and (vi) Cost estimates. EFP/GO will assist with the details required for the preparation of the ESMP, in accordance with GOM's requirements. Where ESMP format for sub-projects is not known, MCPSD's format will be used.

17. MCPSD Institutional Framework

The main technical counterpart for the project is the Ministry of Industry and Commerce (MIC). MIC is the focal point—the requestor of MCPSD—for business policy reforms. Within MIC, the main interlocutor for the project has been the private sector support unit. While MIC would be the project's main focal point, the project would also collaborate with other ministries such as Ministry of Planning and Development, Ministry of Tourism, the Ministry of Agriculture, and others, as acceptable, to help it achieve its objectives.

In the first phase of the project, a Project Implementation Unit (PIU) would be established and would consist of a project coordinator, procurement specialist, a financial management specialist, and a monitoring and evaluation specialist. The PIU would be located within MIC. It would have two mandates: to carry out the project management functions (in accordance with the World Bank guidelines) and to build the capacity of MIC in these areas. As implementation of MCPSD progresses, a satellite PIU, appropriately located, will also be established. Specific institutional responsibilities are indicated below.

Institutional Responsibilities

A Project Steering Committee (PSC) at the national level will be established. It would include representatives from MIC, Ministry of Planning and Development, Ministry of Tourism, Center for the Promotion of Commercial Agriculture, the Bank of Mozambique, as well as private sector representatives in equal number. The Committee would provide strategic oversight and direction to the project. It is envisaged that an SME institute would be established by GOM to oversee the implementation of the MCPSD's SME strategy.

The activities under components 1 and related to the matching grant program and the credit would implement guarantee scheme. Dedicated focal points will be recruited for the sub-components that support tourism and agribusiness in Inhambane and Nampula; provincial level advisory committees would also be established to promote ownership and provide guidance to the project's activities in these two provinces. The provincial coordinators would report to the PIU coordinator in Maputo.

An environmental Monitoring and Evaluation (M&E) system is proposed for MCPSD components to provide ongoing feedback on results and lessons and allow for adjustments. Monitoring and evaluation indicators are currently being developed and will incorporate indicators at the output, outcome, and PDO levels. These indicators would be further elaborated and validated during appraisal.

The main institutions with key roles and responsibilities for environmental and social management are:

- For MCPSD's environmental including social aspects, an Environmental Focal Point (EFP) will be appointed by MIC (referred in the report as EFP/MIC) to help coordinate, and provide guidance and other related services for MCPSD. This individual must have adequate authority and environmental background to cover project's needs. However, MCPSD will provide training, as needed, to execute the above duties.

EFP will be responsible for *overseeing*: (i) Environmental screening of sub-projects including with professional assistance at provincial levels, (ii) Develop the *Terms of References* (TOR) for EIA, where needed—again, based on the results of ESSF; (iii) Help recruit qualified firm(s) to conduct Environmental Impact Assessment (EIA), as needed; (iv) Review reports and documents generated in partnership with the Ministry of Coordination and Environmental Affairs (MICOA) and; (v) coordinate with other agencies, as needed, for MCPSD. The sub-projects budget will pay for any required EIA.

- EFP/MIC will appoint qualified representative(s)—more than one, should the workload demands—referred as EFP/GO, and place them at the provincial Governor's Office to manage sub-projects at provincial and local levels, as needed.

EFP/GO will be responsible for completing the Environmental and Social Screening Form (*Annex 1: Proposed Environmental and Social Screening Form*); and the environmental and the Social Checklists (*Annex 2: Checklist for Environmental and Social Assessment*), both in coordination with MICOA's local representative. He/She will also lead the monitoring of MCPSD impacts.

Based on the results of ESSF, an Environmental Category—in line with the Bank guidelines for the sub-project—will be assigned. This will include any applicable environmental mitigation measures that may be needed during the activity's field implementation. The category and the mitigation measures will be presented to the local MICOA representative, with information to the EFP/MIC and the (GOM's) PIU, central or Satellite, if the later is in place at that time.

- During the activity's field implementation, the local EFP/GO (where training facilities or roads are to be rehabilitated) will be responsible for environmental monitoring and also overseeing the implementation (by the private, civil works contractor hired for rehabilitation work) of required mitigation measures. The Contractor will follow environmental guidelines under *Annex 4: Environmental Guidelines for Contractors*. The relevant EFP/GO will conduct applicable monitoring.

Likewise, identified social issues will be managed, as required by ESMP. Given the role and importance of these measures, it is important that the field individual, hired, as indicated earlier, has proper qualifications and is trained in environmental areas.

- Costs related to the appointment and training, particularly for environmental and social aspects, costs of deployment of EFP/MIC, EFP/GO would be borne by MIC; however, MIC should

discuss this aspect with the Bank's PIU for MCPSD to explore alternative ways to finance, should MIC consider it necessary.

To assist at the provincial level, EFP/GO, as stated earlier, may need additional qualified manpower. As MCPSD sub-project activities go through final planning for implementation, MIC should assess all such needs to ensure timely and qualitative completion of various activities. Where in-house qualified staff exists, they should be preferred for delegation and mobilization to save training time and costs.

- Where the ESSF results indicate the need to conduct an Environmental Impact Assessment (EIA), given the significance of environmental issues, a qualified Mozambique consulting firm may have to be (competitively) recruited since an EIA may require diversified assessments. Cost to conduct and EIA will be borne by MIC.

18. World Bank Safeguard Policies¹²

The bank has ten Safeguard Policies and a Disclosure Policy. The objective of these policies is to: (i) Ensure that Environmental and Social issues are evaluated in decision-making; (ii) Reduce and manage Risk of project/program; and (iii) Provide a mechanism for Consultation and Disclosure of Information; In addition, BP17.50 is Public Disclosure Policy. It requires timely disclosure (and accessible public places in Mozambique and the Bank's Info-Shop) of information and document such as MCPSD's ESMF. The *ten policies* are listed below:

- OP/BP 4.01 Environmental Assessment (EA);
- OP/BP 4.04 Natural Habitats;
- OP 4.09 Pest Management;
- OP/BP 4.10 Indigenous Peoples;
- OP/BP 4.11 Physical/Cultural Resources;
- OP/BP 4.12 Involuntary Resettlement;
- OP/BP 4.36 Forests;
- OP/BP 4.37 Safety of Dams;
- OP/BP 7.50 Projects on International Waterways; and
- OP/BP 7.60 Projects in Disputed Areas.

In addition to the GOM's environmental and social regulations, the World Bank's safeguard policies will also apply. The Bank's Operational Policies further requires that GOM and the World Bank, as a condition for project funding, must disclose the ESMF as a separate and standalone document before Bank's Appraisal of the proposed project. A review of Mozambique's EIA laws indicates that they are less comprehensive than those of the World Bank. Application of the Bank's Safeguard Policy OP 4.01 to MCPSD will help ensure the environmental and social soundness of the projects, in addition to integrating the project's environmental and social aspects into decision-making process.

The Bank's OP.4.01 Environmental Assessment, an umbrella policy, requires Environmental and Social Screening of all Bank-financed projects. If there are differences between the national legislation and OP 4.12, the requirements of OP4.12 will prevail for the duration of MCPSD implementation. Based on screening, an applicable environmental category is assigned. The Categories range from: Category A (significant negative impacts); to Category B (impacts less significant than those of category A project,

¹² See: www.worldbank.org

and which can be mitigated effectively); to Category C (no significant environmental impacts, and hence, no additional environmental assessment).

Assigning an environmental category for MCPSD sub-projects, based on the Bank's OP 4.01, as indicated above will also accommodate GOM's applicable requirements including need to screen sub-projects for potential environmental and social impacts. Thus, environmental and social work for future MCPSD activities will be carried out based on the results of the screening process, as shown under *Annex 1: Proposed Environmental and Social Screening Form*. Notwithstanding this, an assigned category for MCPSD sub-projects must meet concurrence of GOM.

The Screening output may require implementation of simple mitigation measures or where impacts potentially are significant, further assessment through an EIA, following GOM's procedures.

MCPSD Triggered Safeguard Policies

Based on the environmental screening process as per OP 4.01, MCPSD has triggered three safeguard policies, namely, OP 4.01 Environmental Assessment; OP 4.09 Pest Management; and OP 4.12 Involuntary Resettlement.

OP 4.01 has been triggered due to the planned (i) rehabilitation of existing government facilities in the Inhambane Province: (ii) the construction of a Training Center and establishment of a 100 ha banana farm for training purposes in the Nampula Province under component 1. The ESMF prepared for MCPSD outlines the environmental and social screening process for identifying, mitigating and monitoring the potential adverse environmental and social impacts of future sub-projects. The ESMF also includes an Environmental and Social Management Plan (ESMP) for MCPSD.

OP 4.09 has been triggered due to the planned training activities related to banana production under component 1. This training activity is likely to require the increased use of pesticides. To ensure safe management of pesticides, the MCPSD has prepared a pest management plan (annex 8 of the ESMF) to be applied to activities on the banana farm. Given the importance of safe pesticide management not only for domestic consumption, but also for exports, the curriculum of the Training Center will include relevant pest management training, initially for banana production, to be expanded later on to the production of other fruits.

OP 4.12 has been triggered due to the potential loss of livelihoods and/or land due to (i) the construction of the Training Center; (ii) the establishment of the banana farm (iii) and possibly the planned rehabilitation activities under component 1. A separate RPF has been prepared for MCPSD to ensure that potential adverse impacts due to land acquisition (loss of access to economic assets, loss of land, loss of livelihoods) are properly mitigated prior to the commencement of any civil works. The RPF outlines the policies and procedures to be followed for the preparation of Resettlement Action Plans (RAPs) as required under OP 4.12. Where there are differences between Mozambique's legislation and OP 4.12, the requirements of OP 4.12 will prevail for the duration of the implementation of MCPSD.

Annex 4 of the ESMF presents a summary of the Bank's ten safeguard policies and makes recommendations for consideration during sub-project planning. It will be of critical importance

that these policies be complied with during the planning and implementation of future sub-projects; EFP/GO will ensure that these policies are taken into account.

Potential Environmental and Social Impacts of MCPSD

Majority of MCPSD's potential environmental and screening impacts are likely to come from implementation of sub-projects under *Component 1: Improving Competitiveness in Targeted Sectors and Regions* (Section 2.1). The proposed interventions include: (i) Rehabilitation including repaving of roads and training institutes; (ii) Minor upgrades and final hook-up for utility connections, in particular electricity connections but could also include water supply; (iii) and establishment of a 100-ha horticulture farm in Nampula province. The activities under the business environment component would include: rehabilitation of the existing customs facilities, which carries administrative functions.

As indicated earlier, the environmental laws of Mozambique and the Safeguard Policies of the World Bank—the funding agency for MCPSD—require that all projects be screened for potentially adverse environmental and social impacts. Consistent with these guidelines, an ESMF for MCPSD has been prepared to minimize adverse, including any cumulative impacts.

19. Potential Environmental Impacts of MCPSD

The following lists key potential environmental impacts that may be associated with training institutes and rehabilitation/repaving of roads, as proposed under MCPSD.

- Possible soil erosion as a result of construction/rehabilitation activities (clearing of vegetation, soil excavation etc.);
- Improper management of construction debris and wastes—wastewater, solid wastes, and oils among others;
- Potential pollution and/or contamination of nearby water bodies through improper disposal of construction wastes (lubricants, cements, paints and fuels);
- Increased noise levels since construction equipment, usually is noisy;
- Dusts and emission of pollutants (NO_x, SO_x etc.) from construction equipment etc.; and
- Potential transmission of diseases such as HIV/AIDs by and among construction workers

For example, air quality may deteriorate during construction mainly due to fugitive dust emission and exhaust emission from construction vehicles and equipment. However, this will likely have only short term and moderate impact on human populations. Such impacts however, could be fully mitigated through strict implementation of proper management and mitigation measures. No project induced adverse impact on air quality is expected during MCPSD's implementation.

Civil works related to rehabilitation may require (temporary) occupation of lands to store equipment, park machines and similar other activities associated with construction. In addition to inconvenience, this could lead to, possibly temporary, degradation of impacted lands or even can cause loss of revenue and livelihoods for their owners and users in terms of exploitation or/valorization.

In addition, the establishment of the Farm may lead to increased agricultural chemicals use. This, in turn, may cause *induced impacts*—agricultural runoff, water pollution etc. Other potentially adverse impacts may: (i) relate to impaired health and safety particularly of farm workers due to improper use and management of pesticides, (ii) removal of large quantities of vegetation for banana farm, potentially resulting in the loss of (area's) biodiversity; (iii) increased pest resistance (over time) to pesticides used; and (iv) others, as identified under *Annex 8: Pest Management Plan*.

Timely identification of potential impacts would help plan measures to avoid them through good project design, and incorporate appropriate measures to mitigate them, both during project planning and its implementation (See: *Annex 8: Pest Management Plan*). Under *Annex 8: Pest Management Plan* has been included.

In line with the requirements of OP 4.01, MCPSD sub-projects will have to be screened for potential environmental and social impacts. Towards this end, the government has prepared an Environmental and Social Management Framework (ESMF) which outlines the environmental and social screening process for sub-projects.

20. Potential Social Impacts

Potentially adverse social impacts of MCPSD are likely to be minimal, and like environmental impacts, manageable. Potential social impacts include: the non-use of local resident qualified manpower during the rehabilitation and construction of the infrastructures, potential loss of livelihoods, access to economic assets and land as adverse social impacts due to land acquisition. This could cause some frustrations and social tensions at the local level, potentially leading to social conflicts. It is of relevance to note that unemployment is widespread, particularly during the dry season. To the extent possible, employment of locals should be encouraged. This will also encourage local buy-in for the project.

Vehicles transporting the building materials etc. to a rehabilitation site may hold up the traffic, causing mobility problems and unsafe conditions for the community, in addition to exposing population to increased noise, dust etc. Also, stored cement, sand and other construction materials may cause public nuisance and irritation, if not properly managed. The different pollution and nuisances associated with the works could have some, most likely temporary, effects on the health of neighboring populations, individually and/or collectively becoming an irritant for the areas community.

Poor maintenance, following rehabilitation of the training institutes, may lower intended impacts in the community resulting in disillusionment with such projects. This may occur due to a lack of funds, negligence of staff, poor supervision, or failure during the monitoring stage.

On the positive side, rehabilitation works can contribute to creating jobs in the towns where rehabilitation work is initiated. It can increase local employment and hiring of skilled workers—masons, carpenters, building workers, plumbers, electricians, and others. Increased employment will help increase the incomes of the local populations, improve their living conditions, and contribute to the fight against poverty.

Furthermore, to accommodate involuntary resettlement and related issues, the project's preparation and implementation, MCPSD has separately prepared, a *Resettlement Policy Framework* (RPF) to help guide the implementation of mitigation measures related to land acquisition should this become necessary. RFP's implementation, where applicable, will assure the community that they have been fairly treated. This in turn can positive impacts.

Environmental and Social Management Framework (ESMF)

The Environmental and Social Management Framework (ESMF) has been prepared to facilitate the screening of future sub-projects for potential adverse environmental and social impacts. Please refer to chapter 7 for the detailed steps involved in the implementation of the environmental and social screening process for sub-projects. The screening process will also identify potential adverse social impacts due to land acquisition which will require the implementation of the RPF as appropriate. To ensure efficient implementation of MCPSD, the ESMF also includes an Environmental and Social Management Plan (ESMP). The ESMP (Annex 5) identifies the potential adverse environmental impacts of future construction and rehabilitation activities under component 1, and proposes institutional arrangements for the implementation of mitigation and monitoring measures, including related time horizons and cost estimates.

The methodology used to develop the ESMF is based on review of relevant project documents including Mozambique and the World Bank's environmental guidelines, Aide-Memoirs, Integrated Datasheet and environmental and social screening process, as listed under World Bank's ESMF guidelines for PIREP.¹³ The contents of the ESMF are consistent with the requirements of the Bank's OP 4.01. However, no field visits or consultations with stakeholders were conducted to prepare MCPSD's ESMF.

21. Rationale for Preparing ESMF

The rationale for preparing the ESMF is as follows:

- The actual locations and potential adverse environmental and social impacts of future sub-projects could not be determined prior to the appraisal of MCPSD; therefore, the proposed environmental and social screening process (ESMF) has been prepared.
- Mozambique's environmental legislation does not require the screening of small-scale sub-projects for potential adverse environmental and social impacts; therefore, to comply with the requirements of OP 4.01, the proposed environmental and social screening process will be applied to future sub-projects.

MIC found it useful to have a document that outlines principles and procedures that will govern the implementation of future MCPSD sub-projects, and to share it with other relevant stakeholders.

22. Purpose of the ESMF

The key purpose is to determine whether a sub-project has: (i) minor environmental and social impacts (Category B1); (ii) significant impacts (Category B2); and (iii) insignificant impacts (Category C). These categories will be established based on the result of the Screening Process. ESMF will provide a process to guide the sub-project implementers to meet their specific requirements. Category A sub-projects will not be funded because MCPSD has been assigned the environmental category B.

The Environmental and Social Screening Form (ESSF) can enable MCPSD sub-project implementers to timely assess potential—including localized, cumulative and *induced*—environmental and social impacts.

¹³ Environmental and Social Management Framework for World Bank's Mozambique Integrated Professional Reform Program (PIREP), September 20, 2005 b M. Mbengue; Email: fayeconseil@sentoo.sn

The Form will allow (future) sub-project implementers determine the characteristics of the prevailing local biophysical and social environment of proposed interventions such as rehabilitation of training institutes. The process may require carrying out of an EIA as per GOM's requirement. As mentioned earlier, any resettlement and/or compensation measures will be implemented in accordance with the project's Resettlement Policy Framework (RPF), and will be completed before any rehabilitation activities can begin.

Key elements of the MCPSD ESMF are: Annex 1: Proposed Environmental and Social Screening Form; EIA Terms of reference (TOR), as shown under Annex 6: Proposed Terms of Reference for an EIA; Annex 2: Environmental and Social Checklist; Annex 3: Environmental Guidelines for Contractors; Annex 4: Summary of the Bank's Safeguard Policies; Annex 5: Summary of Environmental and Social Management Plan (ESMP) ; Annex 8: Pest Management Plan. The major purpose of these documents is to ensure that environmental and social aspects of MCPSD activities are appropriately identified and timely mitigated.

Based on the results showing in the Environmental and Social Screening Form (ESSF – Annex 1 of the ESMF), a sub-project will be assigned either (i) category B 1 – limited environmental and social impacts that can be easily mitigated via the application of simple mitigation measures as per Annex 2; (ii) category B 2 – more complex environmental and social impacts have been identified during the screening process and therefore a separate EIA report will need to be prepared; or (iii) category C – insignificant environmental and social impacts which will not require any additional environmental work and sub-project implementation can proceed immediately.

It should be noted that sub-projects assigned the environmental category A will either have to be redesigned and rescreened, or they will have to be dropped. These sub-projects could not be funded because MCPSD has been assigned the environmental category B.

23. Environmental and Social Management Plan (ESMP)

The ESMP process for MCPSD will involve a series of steps to ensure that all its subprojects are screened to ensure conformance with safeguard policies and planned and carried out in a participatory manner. The ESMP:

- Draws together the measures proposed to mitigate negative, and to maximize positive, environmental and social impacts, and group them logically into components with common themes;
- Defines a proposed institutional structure to govern the implementation of the ESMP;
- Defines the specific actions required reason for these actions, timetables for their implementation, and associated costs; and
- Describes capacity building and training requirements for its implementation.

During the preparation of sub-projects, a site specific Environmental and Social Management Plan (ESMP) will be prepared by EIA team in order to comply with the MCPSD's applicable EIA regulations (Section 4.0). MCPSD potential environmental and social impacts along with their mitigation measures should be timely recognized during a sub-project's screening (Section 7.0). The potential environmental

impacts can be effectively mitigated by following the guidelines under *Annex 3: Environmental Guidelines for Contractors*. The ESMP may also include: a program of actions that may be required to provide support to local communities in the project area in order to lessen any negative socio-economic impacts to maximise economic opportunities arising as a result of MCPSD's implementation. The contractor may consider recruiting an NGO provide to community liaison services, where the size of the MCPSD sub-project may suggest.

For mitigation of environmental impacts, the ESMP for a sub-project will include: assessment of all potential impacts; mitigation measures required such as for debris and wastes, review of legislation and others. For mitigation of social impacts, EFP/GO may have to work with the contractor and local community leaders and others. In this aspect, a sub-project's pre-information via village chief, town hall, and TV and radio, as feasible, to the community may prove useful. .

Annex 2: Checklist for Environmental and Social Assessment of MCPSD lists key adverse impacts along with their mitigation measures. This process will also ensure the compliance of the MCPSD sub-projects with the Bank's Safeguard Policies.

Overall, the ESMP approach will: (a) identify the set of responses to potentially adverse impacts; (b) determine requirements for ensuring that the measures are implemented effectively and in a timely manner; and (c) describe the means for meeting those requirements. More specifically, the ESMP includes: (i) Monitoring; (ii) Capacity Development and Training; and (iii) Implementation Schedule and Costs.

The ESMP will be disclosed in Portuguese to the affected locations covered by the plan.

6.3 Monitoring Plan

As indicated in Annex 5, monitoring of the implementation of mitigation measures will be largely the responsibility of EPF/GO with support from MICOA; the costs for these activities are included either in the project costs or in the contractors' contracts.

Monitoring indicators such as soil degradation, dust or accidents will be incorporated into the MCPSD M&E system and will be part of the regular reporting in this regard.

24. Capacity Building and Training for MCPSD and its Components

The technical and management capacity to execute MCPSD's components at best is weak at the central, provincial and local levels. Even MICOA, as indicated before, has limited qualified staff to meet its environmental mandates. Availability of qualified and well-trained personnel is crucial to effective implementation of MCPSD and its components.

The EFP/GO should define such needs with input from MIC/EFP and regional MICOA representative. Potential trainees may include:

- (i) The EFP/GO and EFP/MIC on use and application of ESSF, Environmental Checklist and other aspects of ESMF;
- (ii) Selected staff of municipalities where training facilities are to be rehabilitated; and

- (iii) Key members of the MIC Project Steering Committee (PSC) to help review environmental screening results and environmental reports to make appropriate recommendations for the approval/disapproval of construction and rehabilitation activities to the Provincial Directorate of MICOA.

Detailed technical training for participants overall should focus on the need to analyze potentially adverse environmental impacts, to prescribe mitigation approaches and measures, and to prepare and supervise the implementation of management plans. This training should address such matters as community participation needs and methods; environmental analysis; with the use of environmental screening and other checklist, reporting; and subproject supervision and monitoring that is the implementation of the environmental and social screening process outlined in the ESMF.

Proposed Training Elements

The following provides some general items for MCPSD training. These can be changed to accommodate any site-specific needs.

Duration	Item
<u>Environmental and Social Management Process to Include:</u>	3 days
	<ul style="list-style-type: none"> • Review of Environmental Social Management Process; • Use of Screening form and Checklist to determine adverse impacts from sub projects activities; • How to measure cumulative adverse impacts? • How to manage social issues within the MCPSD? • How to review and clear the sub projects? • The importance of public consultations ESMF process; • How to monitor sub projects performance vis-à-vis MCPSD objectives? • How to monitor sub projects mitigation measures.?
<u>Environmental and Social policies, procedures and guidelines</u>	3 days
	<ul style="list-style-type: none"> • Review and discussion of Mozambique’s national environmental policies, procedures, and legislation. • Review and discussion Bank’s safeguards policies. • Review of Mozambique’s policies, laws and requirements for poverty reduction, post-war social protection. • Strategies for consultation, participation and social inclusion
<u>Selected topics on environmental protection</u>	One Day/Course
	<ul style="list-style-type: none"> • National Resource Management, sustainable soil conservation and prevention of Deforestation; • Pollution of Water resources; and • Soil Erosion

25. Cost of Implementation of ESMP

Proper implementation of mitigation measures for social and environmental impacts require qualified personnel with necessary skills and training. The cost associated with implementing ESMP include: labour costs associated with information dissemination, local travel costs for community members, cost of information materials, use of radio, TV, and the training costs referred to in the previous section.

It is assumed that the Civil Works Contractors' mitigation costs will be included in each contractor's negotiated final cost for a project.

The cost of deployment including salary etc. for the EFP's will be borne entirely by MIC. However, MCPSD will provide any relevant training (Section 6.4.1) to these and other individuals associated with sub-project implementation. The cost of conducting an EIA for any sub-project will be part of the total cost of hiring a specialized sub-contractor, and paid by MIC. Also, such costs as (limited) analysis of pesticides and soils that may be required as part of monitoring as indicated under *Annex 8: Pest Management Plan*, will be part of \$2.75 million MCPSD's implementation budget, an amount set aside by the World Bank.

The following cost estimates are based on the assumption that the training will be held at the District levels with one training session in Maputo. Potential trainees are likely to come from other parts of Mozambique. They will require travel allowances. Participants may come from the MIC, MICOA, provincial municipalities and village and/or local councils. Local trainees will only receive per diem and no travel allowance.

Other cost components may include an allowance for travel expenses. Also, some costs have been included to accommodate any training sessions in Maputo, in case, unexpectedly, they are needed. It is proposed that the training program is implemented in each participating District and only one training session in Maputo. Proposed training, after carefully defining needs and venues etc., should be carried out by one or more competitively selected national firms specializing in environmental assessments and environmental legislation. It can be envisaged that the process of rehabilitation of training facilities will also add to available technical capacity.

MCPSD during the final year of implementation (2009-2013) anticipates hiring a qualified Environmental Staff, one person, for a year to provide environmental review and input to the project. Cost of such services for one year, based on a qualified Mozambique national, is estimated at \$60,000. Combined with \$90,000 cost for the training and awareness raising activities, the total cost is estimated at \$150,000.

The Environmental and Social Screening Process

The purpose of the screening process is to determine whether future sub-projects are likely to have potential negative environmental and social impacts; to determine appropriate mitigation measures for activities with potentially adverse impacts; to incorporate mitigation measures into sub-project design; to review and approve sub-project proposals; and to monitor environmental parameters during a sub-project's implementation.

The extent of environmental work that might be required for sub-projects prior to rehabilitation and/or minor construction, road rehabilitation and associated utility upgrade will depend on the outcome of the screening process described below. Also, the checklist will be periodically updated, as needed, by qualified persons, as reviewed and approved by MIC/EFP and MICOA's provincial or central representatives. The extent of planned infrastructure investments is listed under Section 2:0

- **Step 1: Environmental and Social Screening of Sub-projects**

The initial environmental and social screening will be carried out, in accordance with the provisions of the Bank's Safeguard Policy, OP 4.01, through the use of *Annex 1: Proposed Environmental and Social Screening Form*. The process will lead to classification such as B1, B2 or C, as indicated below under Step 2. This form will be completed by an EFP/GO at the provincial level, in participation with the MICOA's provincial representative. Also, the village community leader, as relevant, and the MPCSD's satellite office, if established, at the time of the activity, should be involved.

- **Step 2: Assigning Appropriate Environmental Category**

Based on the ESSF screening results, the EFP/GO, with oversight (and input, if needed from the local MICOA representative) from EFP/MIC will be responsible for assigning the appropriate environmental category to the proposed sub-projects. Such assignments must be in accordance with the requirements of OP 4.01. The local representative of MICOA should be kept in the loop during this process. The sub-projects need to be filtered through the following Environmental Categories.

((a) Category A: A proposed project is classified as Category A if it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works. EA for a Category A project examines the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives (including the "without project" situation), and recommends any measures needed to prevent, minimize, mitigate or compensate for adverse impacts and improve environmental performance. For a Category A project, the borrower is responsible for preparing a report, normally an EIA (or a suitably comprehensive or sectoral EA) that includes as necessary, elements such as environmental audits or hazard or risk assessments.

As regards MCPSD funded sub-projects, any sub-project assigned the environmental category A as a result of the environmental and social screening process will have to be either redesigned or dropped because the parent project has been assigned the environmental category B. Therefore, category A sub-projects cannot be funded under MCPSD.

(b) Category B: A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas - including wetlands, forests, grasslands, and other natural habitats - are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigatory measures can be designed more readily than for Category A projects. The scope of EA for a Category B project may vary from project to project, but it is narrower than that of Category A. Like Category A, it examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.

Since not all category B sub-projects are likely to require a separate EIA report, the screening process will recommend the assignment of (i) category B1 to sub-projects requiring only the application of simple mitigation measures (using the Environmental and Social Checklist – Annex 2 of the ESMF); and (ii) B2 for those sub-projects requiring a separate EIA report due to the severity of their potential adverse environmental and social impacts (using the generic EIA Terms of Reference – Annex 6 of the ESMF).

(c) A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required for a Category C project.

In cases where the results of the screening process indicate that the sub-project will not have significant adverse environmental and social impacts, if any, no additional environmental work will be required and sub-project implementation can proceed immediately

(d) Category FI: A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary, in subprojects that might result in adverse environmental impacts

This environmental category will not apply to any of the MCPSD funded sub-projects as it will not involve the investment of Bank funds through financial intermediaries.

- **Step 3: Conducting an EIA**

EFP/MIC, in coordination with EFP/GO and MICOA, will competitively recruit a qualified Mozambique consultancy firm to carry out the EIAs. The completed EIA will be reviewed by EFP/GO and EFP/MIC and provide comments provided to the Contractor. The updated EIA will be submitted to MICOA for review and acceptance.

The completed EIA should identify and assess the potential environmental impacts for the applicable sub-project, assess alternative solution and included mitigation, management and monitoring measures, as applicable. All these measures should be included in the Environmental and Social Management Plan (ESMP) for the sub-project.

- **Step 4: Review and Approval of EIA**

With participation of the local representative of MICOA, the EFP/GO, with EFP/MIC providing oversight, will review the environmental and social screening results as well as the environmental checklists (Annexes 1 and 2) that were completed in the course of a sub-project's preparation to ensure that all environmental and social impacts have been identified and successfully mitigated. The local community/village leader should be informed of the results.

If the screening form includes “Yes” entries, or unjustified “No” entries, the EFP/GO should (adequately) explain and demonstrate from its design that the issues raised earlier have been appropriately addressed and/or mitigated.

The EFP/GO and EFP/MIC must also ensure that the sub-project designs include monitoring and institutional measures to be taken during implementation and operation. MICOA and the PIU should be informed of all outcomes and their opinions considered. The EIA report will be sent to the Bank and MICOA for review and clearance *prior* to any commencement of civil works.

Based on the results of the above review process, EFP/GO will make recommendations—accepted, rejected, or need more work—to the MICOA representative for the approval of the ESSF results and the EIA report. If the EIA, including the results of the Screening Process, is approved, MICOA will issue environmental permits, as applicable, to EFP/GO, who in turn will communicate the same to EFP/MIC, the MCPSD Steering Committee and the PIU.

For cleared sub-projects, the MICOA may give a conditional approval for detailed planning, construction and operation of the investment. These conditions may include, for example, such measures as public involvement, siting or routing restrictions, implementation of the required construction and operation practices, restoration of disturbed areas, the complete implementation of a Resettlement Action Plan (RAP), and construction supervision to ensure the approval conditions are being followed.

If MICOA finds that the submitted design is not consistent with the findings of the environmental screening form and the environmental checklist, the EFP/GO would be requested to re-design (e.g. make modifications and/or choose other sites), re-screen the project and re-submit for review.

MICOA will then review the revised application and, if acceptable, will recommend for consideration for approval. If it is not acceptable for the second time, it would be referred back to EFP/GO, with information to PIU, to conduct more work e.g. carry out a sub-project EIA, in cases where one was not done before or denied clearance altogether.

- **Step 5: Public Consultation and Disclosure**

Public consultations are critical in preparing effective and sustainable MCPSD sub-projects. This requirement supports the participatory planning process as required by GOM. It also applies to local level governments when sub-projects covering local areas are being identified. MCPSD, being a participatory project, it is important that beneficiaries are involved in the project cycle, from the design to

implementation and monitoring. The same applies to relevant stakeholders including: village councils and municipality departments where the sub-project is located.

The first step in this process is to hold public consultations with the local communities and all other interested/affected parties during the screening process and where needed, when preparing an EIA. These consultations should identify key issues and determine how the concerns of all parties will be addressed in the Terms Of Reference (TOR) for the EIA for a sub-project.

To facilitate meaningful consultations, the local governments through their MCPSD sub-project implementers—e.g., EFP/GO—should be provided with all the relevant material and information in a timely manner, and in a form and language that are understandable. Also, location of the relevant documents should be advertised through commonly used media. Depending on the public interest in the potential impacts of the sub projects, a public hearing may be required to better convey concerns. The results of the public consultations will be incorporated into the design of the sub-project as appropriate.

Once the sub-project has been reviewed and cleared by the relevant local community, including the municipality, EFP/GO, will inform the public about the results of the review. The Village Government or Village Leader(s), as applicable, will be responsible for taking the minutes of the public disclosure meeting. Also, for information communication and distribution, it may be useful to seek help from the local Agriculture Extension Agent of the Ministry of Agriculture and Rural Development.

It is important to note that any affected or interested individual or group has the right of appeal, if dissatisfied with the decision reached at any stage in the EIA process. The appeals process will be according to the Mozambique Environment Act and others, as applicable. The EFP/GO should seek guidance from EFP/MIC.

To ensure that an appropriate public consultation mechanism is developed, the following are relevant items:

- (i) The environmental and social screening process outlined in the ESMF includes such a requirement;
- (ii) Development of an individual sub-project's ESMP and RAP should be properly disseminated. These documents should include public input during preparation;
- (iii) For cleared sub-projects, the EFP/GO will inform the public about the results of the review; and
- (iv) Beneficiary communities will undertake review of both compliance monitoring and effects monitoring throughout the sub-project cycle. The ESMF and RPF will be translated into local language, as applicable, *in addition* to Portuguese and English.

• **Step 6: Monitoring and Reporting**

The objectives for monitoring are: (i) to alert project authorities by providing timely information about the success or otherwise of the EIA process as outlined in this ESMF in such a manner that changes to the system can be timely made, if required; (ii) to make a final evaluation in order to determine whether the mitigation measures designed into the sub-projects have been successful in such a way that the pre-subproject environmental and social condition has been restored, improved upon or are worst than before.

Environmental monitoring needs to be carried out during the rehabilitation/construction as well as operation and maintenance of MCPSD sub-projects in order to measure the success of the mitigation measures implemented earlier. A number of indicators would be used. Indicators may include: how many people are employed than before; are marginalized groups being included; have the biophysical environmental conditions of the area improved? And is there greater commerce due to road rehabilitation and others? For banana plantations, indicators are shown under *Annex 8: Pest Management Plan*.

It may be useful to institute monitoring milestones and provide resources, as necessary, in order to carry out the monitoring activities. Also, the proposed indicators may be further elaborated and validated to accommodate any significant site-specific needs, in each case with input and oversight of MICOA.

Representative community members—after training—should also participate in monitoring activities. This should be done throughout the sub-project cycle including, for example: (i) During the planning phase, the communities should participate in the identification of indicators for monitoring the mitigating measures; (ii) During implementation (such as rehabilitation/construction) phase. Included in monitoring is verification of (civil works) Contractor compliance, as required; and (iii) During operation and maintenance phase, the overall environmental monitoring and alerting on any emerging environmental hazards in conjunction with the ongoing sub-project activities.

Monitoring activities in the field will be carried by EFP/GO—the designated, qualified person in the Governor’s office—again with oversight of the local MICOA representative (See also Section 4.1). The results would be discussed with the EFP/MIC and also the Project Coordinator at PIU. Any changes in monitoring parameters must have the concurrence of: EFP/MIC, the Project Steering Committee and the local community representative. The communities will be enabled to pass on their observations and concerns through the acceptable mechanisms to the local government/council and EPF/GO, EFP MIC and MICOA.

- **Step 7: Monitoring indicators**

The following are some of the pertinent parameters and verifiable indicators that can be used to measure ESMF process, mitigation plans and performance.

- Have improved roads resulted in increase commerce, better living standards of the impacted community?
- Number of people in local community councils that have successfully received ESMF training in screening methods etc.,
- Number of communities who have adopted ESMF process as required for their sub-projects’ implementation;
- How has the adoption of the ESMF requirements improved the environmental health and biophysical state of the participating District?
- Has ESMF adoption resulted in sustainable land use and for other resources as well?
- Improved efficiency of maintenance and operating performance of rehabilitated training institutes
- Are periodic monitoring reports being completed and sent to EFP/MIC?
- Are processes defined in the ESMF working well?
- Final Question: Based on the results of monitoring, what, if any changes to the ESMF are needed? Should there be additional training/capacity building measures to increase performance of participating including community leaders?

Table 3: Proposed Environmental Monitoring Mitigation Measures provides a synoptic view. The following parameters and verifiable indicators will be used to measure the EIA process, mitigation plans and performance.

Table 3: Proposed Environmental Monitoring and Mitigation Measures

<p>Potential Negative Social and Environmental Impacts</p>	<ul style="list-style-type: none"> • Soil degradation, as a result of uncontrolled storage of product or materials for rehabilitation; • Unsafe disposal of asbestos, if generated as a result of rehabilitation of (usually older) buildings; • Dust, emissions, noise/vibration • Accidents such as those caused by rehabilitation equipment; • Training institutes toilets poorly maintained • Risk of outbreak of social conflicts (such as from non-use of local resident for employment) • Spread of HIV/AIDS due to worker congregation.
<p>Mitigation Measures</p>	<p>Fully implement the provisions of ESMF; Use screening form and checklist in Annex 1 and 2). Use Personal Protective Equipment—masks, gloves, respirators etc., Maintain equipment; Civil works contractor to following Environmental Guidelines.</p>
<p>Monitoring Measures</p>	<p>Periodic monitoring and evaluation of verifiable indicators for all impacts identified in the sub project ESMP (See also Step7 above)</p>
<p>Phase/ Stage</p>	<p>On- going throughout the life of the project</p>
<p>Responsibility</p>	<p>EFP/GO with participation of local community leaders and MICOA representative; EFP/MIC should be kept in loop..</p>

RECOMMENDATIONS

The MCPSD is a program that contributes to economic development in Mozambique. The multi-year project's aim is to improve business environment and efficiency of Small and Medium E (SME's) enterprises, considered to be a major backbone of the domestic economy. MCPSD's tourism sub-component offers potential to increase tourism and investments. The Project's pilot 100-ha horticulture farm aims to help increase export of tropical fruits by setting training infrastructure required to meet export quality; Mozambique could be an excellent source of off-season fruit exporter.

Project's potential environmental impacts are likely to be insignificant, easily manageable and/or reversible. In line with this, the World Bank has classified MCPSD as a Category B project. Thus, all sub-projects must fall within this or lower Category. An Environmental and Social Management Plan (ESMP) included in this study provides measures to help classify and mitigate any potential environmental and social impacts that may arise as a result of sub-projects implementation.

In defining the potential of environmental and social impacts, as well as help environmentally categorize MCPSD sub-projects, an Environmental Screening Process, as indicated under *Annex A: Proposed Environmental and Social Screening Form*, which meets the requirements of the World Bank Safeguard Policy OP 4.01 will be used. A sub-project that falls outside Category B will not be funded by MCPSD.

It is recommended that MCPSD, including its civil works contractor: (i) identify and adhere to good environmental practices; (ii) MCPSD/EFPs/MICOA conduct regular environmental supervision missions of project's activity sites to ensure that the mitigation measures are being carried out; and (iii) conduct training and environmental awareness activities, as recommended in the ESMF to help assure use of sound, state-of-the-art measure. Any displacement of the people must follow the guidelines in the RPF

During MCPSD implementation, evaluation missions should include environmental experts, including Environment Focal Points (EFPs) at MIC and the provincial governor's office, as well as MICOA representative. These individuals should document progress as it related to ESMP. It should include documenting rehabilitation contractor's performance and need for any corrective action. Effective monitoring would help in assuring a win-win situation for all MCPSD participants. The cost of evaluation mission(s) will be borne by the MCPSD budget; it is not included in the ESMF.

ANNEXES

Annex 1: Proposed Environmental and Social Screening Form (ESSF)

The MICOA Pre-assessment Form called “*Ficha De Pre-Avaliacao*” for environmental and social screening is considered inadequate for MCPSD needs. To fill the gap, an *Environmental and Social Screening Form (ESSF)* has been designed to assist in the evaluation of planned construction and rehabilitation activities under MCPSD, ESSF will help MCPSD implementers and reviewers in assessing its sub-project’s potential environmental and social issues and also propose mitigation measures, if any. The Form can also help identify the level of environmental assessment, e.g., EA or EIA, which may be required for the MCPSD sub-projects.

The ESSF will allow reviewers to determine the characterization of the prevailing local biophysical and social environment and will also help identify potential socio-economic impacts that will require mitigation measures and/or resettlement and compensation. It is important that all the following sections of ESSF are fully and accurately completed by qualified environmental individual(s).

Name of sub-project:
Sector.....
Name of the region/community in which the construction and rehabilitation of training facilities is to take place
Name of Executing Agent.....
Name of the Approving Authority
Name, job title, and contact details of the person responsible for filling out this ESSF:

Name: -----
Job title: -----
Telephone numbers: -----
Fax Number: -----
E-mail address: -----
Date: -----
Signature: -----

PART A: BRIEF DESCRIPTION OF THE PROPOSED ACTIVITIES

Please provide information on the type and scale of the construction/rehabilitation activity (area, required land, approximate size of total building floor area) for rehabilitation under MCPSD.

Provide information about actions needed during the construction of facilities including support/ancillary structures and activities required to build them, e.g. need to: excavate borrow materials, lay pipes/lines to connect to energy or water source, access road etc.

Describe how the construction/rehabilitation activities will be carried out, including support/activities and resources required to operate for example roads, disposal site, water supply, and others, as applicable to MCPSD’s sub-projects.

PART B: BRIEF DESCRIPTION OF THE ENVIRONMENT AND IDENTIFICATION OF ENVIRONMENTAL AND SOCIAL IMPACTS

Describe the Training Facility's (existing or proposed) location, sitting; surroundings (include a map, even a sketch map)

Describe the land formation, topography, and vegetation in/adjacent to the training facility's area

Estimate and indicate where and what type(s) of vegetation might need to be cleared.

Environmentally sensitive areas or threatened species

Are there any environmentally sensitive areas or threatened species (specify below) that could be adversely affected by the project?

- (i) Intact natural forests: Yes _____ No _____
- (ii) Revering Forest: Yes _____ No _____
- (iii) Surface water courses, natural springs Yes _____ No _____
- (iv) Wetlands (lakes, rivers, swamp, seasonally inundated areas) Yes _____ No _____
- (v) How far is the nearest wetland (lakes, rivers, seasonally inundated areas)?
_____ Km.
- (vi) Area of high biodiversity: Yes _____ No _____
- (vii) Habitats of endangered/threatened or rare species for which protection is required under the Mozambique's national law/local law and/or international agreements. Yes _____ No _____
- (viii) Others (describe). Yes _____ No _____

Rivers and Lakes Ecology

Is there a possibility that, due to construction and operation of the training facility, the river and lake ecology will be adversely affected? Attention should be paid to water quality and quantity; the nature, productivity and use of aquatic habitats, and potential variations of these over time.

Yes _____ No _____

Protected areas

Is the Training Facility (or parts of it) located within/adjacent to any protected areas designated by the government (national park, national reserve, world heritage site etc.)?

Yes _____ No _____

If the training facility is outside of, but close to, any protected area, is it likely to adversely affect the ecology within the protected area areas (e.g. interference with the migration routes of mammals or birds etc.)

Yes _____ No _____

Geology and Soils

Based upon visual inspection or available literature, are there areas of possible geologic or soil instability (prone to: soil erosion, landslide, subsidence, earthquake etc)?

Yes _____ No _____

Based upon visual inspection or available literature, are there areas that have risks of large scale increase in soil salinity?

Yes _____ No _____

Based upon visual inspection or available literature, are there areas prone to floods, poorly drained, low-lying, or in a depression or block run-off water

Yes _____ No _____

Contamination and Pollution Hazards

Is there a possibility that the Training Facility will be a source of contamination and pollution (from latrines, dumpsites, industrial discharges etc?)

Yes _____ No _____

Landscape/aesthetics

Is there a possibility that the Training Facility will adversely affect the aesthetic attractiveness of the local landscape?

Yes _____ No _____

Historical, archaeological or Cultural Heritage Site

Based on available sources, consultation with local authorities, local knowledge and/or observations, could the education facility alter any historical, archaeological, cultural heritage traditional (sacred, ritual area) site or require excavation near same?

Yes _____ No _____

Resettlement and/or Land Acquisition

Will involuntary resettlement, land acquisition, relocation of property, or loss, denial or restriction of access to land and other economic resources be a result of the construction/ rehabilitation of training facilities?

Yes _____ No _____

If “Yes” OP 4.12 Involuntary Resettlement is triggered. Please refer to the separately prepared Resettlement Policy Framework (RPF) for MCPSD’s appropriate mitigation measures to be undertaken.

Loss of Crops, Fruit Trees and Household Infrastructure

Will the construction/rehabilitation of the training facility result in the permanent or temporary loss of crops, fruit trees and household infrastructure (such as granaries, outside toilets and kitchens, livestock shed etc)?

Yes _____ No _____

Blockages of access, routes or disruption of normal operations in the general area

Will the training facility interfere with or block access, routes etc (for people, livestock and wildlife) or traffic routing and flows?

Yes _____ No _____

Noise and Dust Pollution during Construction and Operation

Will the operating noise level from the operation of equipment, machinery etc. used during rehabilitation exceed the allowable noise limits?

Yes _____ No _____

Will the operation result in emission of copious amounts of dust, hazardous fumes?

Yes _____ No _____

Degradation and/or Depletion of Resources During Construction and Operation

Will the operation involve use of considerable amounts of natural resources (construction materials, water usage/spillage, land, energy from biomass etc.) or may lead to their depletion or degradation at points of source?

Yes _____ No _____

Solid or Liquid Wastes Generation

Will the Training Facility generate solid, liquid or hazardous wastes? (Including human excreta/sewage, asbestos)

Yes _____ No _____

If “Yes”, does the architectural plan include provisions for their adequate (environmental) collection and disposal, particularly asbestos?

Yes _____ No _____

Occupational health hazards

Will the construction/rehabilitation of the training facility require large number of staff and labourers; large/long-term construction camp?

Yes _____ No _____

Are the construction/rehabilitation activities prone to hazards, risks and could they result in accidents and injuries to workers during construction or operation?

Yes _____ No _____

Will the Training Facility require frequent maintenance and/or repair?

Yes _____ No _____

Public Consultations

Has public consultation and participation been sought?

Yes _____ No _____

PART C: General Mitigation Measures

For all “Yes” responses, describe briefly the mitigation measures taken in order to meet the compliance requirements of the World Bank and/or GOM, whichever are more stringent.

Once the Environmental and Social Screening Form is completed, it is reviewed and analysed by the Environmental Focal Points at the Governor’s Office (referred to as MIC/GO) and at MIC (referred to as EFP/MIC) an appropriate environmental category based on ESSF will be assigned. If EFP/GO deems it necessary, the individual may seek assistance from the local MICOP representative.

RECOMMENDATIONS:

Based on the above, the proposed sub-project will fall under:

(a) Category C and it will not require any environmental work; sub-project implementation therefore can precede immediately_____

(b) Category B 1 and it will require the implementation of simple mitigation measures as per Environmental and Social Checklist (Annex 2)_____

(c) Has been categorized as category B 2 and will require preparation of a separate EA report; (for generic EA terms of reference refer to Annex 6)_____

As regards MCPSD funded sub-projects, any sub-project assigned the environmental category A as a result of the environmental and social screening process will have to be either redesigned or dropped because the parent project has been assigned the environmental category B. Therefore, category A sub-projects cannot be funded under MCPSD

Annex 2: Checklist for Environmental and Social Assessment OF MCPSD

For each activity—rehabilitation of road, training institutes, establishment of 100-ha horticulture farm etc.—as proposed, fill the corresponding section on the checklist by checking Yes or No and filling, as applicable, column 5. This Environmental and Social Checklist will be adapted to the requirements of individual sub-projects by qualified personnel as necessary.

MCPSD Activity	Potential Issues	Yes	No	If Yes
Renovation/Rehabilitation of training institutes	<ul style="list-style-type: none"> • Are there cultivated or non-cultivated lands, natural resources, structures or other properties, used or non-used for any purpose, and in any way? • Will there be any vegetation loss during construction/renovation? • Is there appropriate department(s) within the relevant municipality or other body, for the collection of scheduled waste during construction/renovation works? • Will the construction/renovation equipment, machinery etc. be often cleaned? • Where will the wastewater or any other kind of waste be deposited after proper collection? • Will the refuse generated during works collected and safely disposed? • Will the above indicated or any other materials and assistance facilities be available during construction/ renovation works? 			Refer to general mitigation measures as synopsized in the ESMF.
Rehabilitation of Roads Involving Use of Heavy Equipment, Construction Machinery etc.	<ul style="list-style-type: none"> • Will the activity cause high noise levels or air pollution? • Will the construction work be done during daytime rather than late evening or at night to minimize impact on the surrounding community? • Will adequate safety measures be put in place? • Will there potential adverse impact on area's cultural resources, protected and sensitive areas including Prime Farmlands etc.? • Will the activity offer potential of increased spread of HIV/AIDS or STD's due to worker congregation? 			If yes, consult with EFP/GO If yes, consult with EFP/GO and Community Leaders. Incorporate appropriate mitigation measures
Operation of	<ul style="list-style-type: none"> • Are there pollution risks of groundwater by 			If yes, see the

Training Institutes and associated infrastructure.	<p>work sites activities?</p> <ul style="list-style-type: none"> • Are there ecologic and sensitive zones in the neighboring areas of the infrastructure that could be adversely impacted? • Are there potentially adverse impacts on the health of the populations living next to the infrastructure scheduled to be build /renovated? • Are there visual impacts caused by work site installations but also during the transport and discharge of work site wastes • Are there (bad) odors coming from the discharge of work site wastes? • Are there human settlements and land uses (such as agriculture, recreational areas) next to the (existing or new) training infrastructures, or sites of cultural, religious or historic importance? 		<p>Plan for the appropriate mitigation and monitoring measures under EMP</p>
Establishment of the 100-ha Horticulture Farm	<ul style="list-style-type: none"> • Will the proposed farm need to acquire land? • Will the operation of the farm offer the potential to introduce invasive species in the area? • Will the farm's operation adversely impact economically, socially or otherwise local farmers, communities and/or area farmers? • Will the farm properly include environmental, health and safety measures in the procurement, storage and use of agro-chemicals such as fertilizers, insecticides etc.? • Are there any medical clinics in close proximity to the farm? 		<p>If yes, follow RPF guidelines.</p> <p>For all others, consult with EFP/GO and follow applicable regulations</p>

Annex 3: Environmental Guidelines for Contractors

Contractor(s) hired for MCPSD civil works would be required by MIC to incorporate applicable environmental mitigation measures. In addition, as applicable, contractors will also adhere to the following guidelines. These Environmental Guidelines for Contractors (Annex 3 of the ESMF) will be attached to the bidding documents to ensure that environmentally and socially sustainable construction methods are used

General:

1. These general environmental guidelines apply to any work to be undertaken under MCPSD's sub-projects. For certain work sites entailing specific environmental and/or social issues, a specific Environmental and Social Management Plan (ESMP) has been prepared to address relevant issues, in addition to these general environmental guidelines.

In addition to these general Environmental Guidelines, the Contractor shall therefore comply with any specific ESMP, as applicable. The EPF/MIC or EFP/GO (referred to as the Client) will inform the Contractor about such an ESMP, as prepared for applicable work sites. The Contractor is required to prepare his/her work strategy and plan to fully take into the provisions of the ESMP. If the Contractor fails to implement the approved ESMP after written instruction by the works supervisor to fulfill his obligation within the requested time, the Client reserves the right to arrange for execution of the missing action by a third party on account of the Contractor.

2. Notwithstanding the Contractor's obligation under the above clause, the Contractor shall implement all measures necessary to avoid undesirable adverse environmental and social impacts, wherever possible, restore work sites to acceptable standards, and abide by any environmental performance requirements specified in an ESMP, as applicable.

3. These Environmental Guidelines, as well as any specific ESMP, as applicable, apply to the Contractor, as well as any sub-contractors hired, with pre-approval of EFP/GO, for work.

General Environmental Protection Measures

4. In general, environmental protection measures to be taken at any work site shall include but not be limited to:

(a) Minimize the effect of dust on the environment resulting from earth mixing sites, vibrating equipment, construction related traffic on temporary or existing access roads, etc. to ensure safety, health and the protection of workers and communities living in the vicinity of work sites and access roads.

(b) Ensure that noise levels emanating from machinery, vehicles and noisy construction activities (e.g. excavation, blasting) comply with Mozambique and the World Bank Environmental Standards and are generally kept at a minimum for the safety, health and protection of workers within the vicinity of high noise levels and nearby communities.

(c) Ensure that existing water flow regimes in rivers, streams and other natural or irrigation channels are maintained and/or re-established where they are disrupted due to works being carried out.

- (d) Prevent any construction-generated wastes, including bitumen, oils, lubricants and wastewater used or produced during the execution of works, from entering into rivers, streams, irrigation channels, nearby agricultural fields, and other natural water bodies/reservoirs.
- (e) Avoid or minimize the occurrence of standing water in holes, trenches, borrow areas, etc.
- (f) Prevent and minimize the impacts of quarrying, earth borrowing, piling and building of temporary construction camps and access roads on the biophysical environment including protected areas and arable lands; local communities and their settlements. Restore/rehabilitate all sites to acceptable standards.
- (g) Upon discovery of graves, cemeteries, cultural sites of any kind, including ancient heritage, relics or anything that might or believed to be of archeological or historical importance during the execution of works, immediately report such findings to the Client so that the Mozambique Ministry in charge of Culture Affairs is expeditiously contacted for fulfillment of the measures aimed at protecting such historical or archaeological resources.

In the event that the Contractor encounters chance finds during construction and/or rehabilitation activities, he/she will contact (a) responsible Ministry, via, as indicated above, EFP/GO. The Contractor, if need arises, should also seek EFPMIC help in identifying the applicable government organization. Should there be no Regional Bureau of Culture and Tourism; the Contractor will contact the EFP at MIC and/or EFP/GO in a timely manner.

- (h) Prohibit construction workers from engaging in the exploitation of natural resources such as hunting, fishing, and collection of forest products or any other activity that might have a negative impact on the social and economic welfare of the local communities. Prohibit explicitly the transport of any bush meat in Contractor's vehicles.
- (i) Prohibit the transport of firearms in Project-related vehicles.
- (j) Prohibit the transport of third parties in Project-related vehicles.
- (k) Implement soil erosion control measures in order to avoid surface run off and prevent siltation, etc.
- (l) Ensure that garbage, sanitation and drinking water facilities are provided in construction workers camps.
- (m) Ensure that, in as much as possible, local materials are used to avoid importation of foreign material and long distance transportation.
- (n) Ensure public safety, and meet Mozambique traffic safety requirements for the operation of work to avoid accidents.
- (o) Ensure that any trench, pit, excavation, hole or other hazardous feature is appropriately demarcated and signposted to prevent third-party intrusion and any safety hazard to third parties.
- (p) Comply with Mozambique's speed limits, and for any traffic related with construction at MCPSPD Project sites, comply with the following speed limits unless Mozambique speed limits are lower.

Inhabited areas: 50 km/h, and Open road: 90 km/h. These need to be checked for relevance to site-specific areas of activity.

(q) Ensure that, where unskilled daily-hired workforce is necessary, such workers are hired from area and/or neighboring communities and properly trained before deployment.

(r) Generally comply with all applicable requirements of Mozambique law and regulations.

5. Besides the regular inspection of the sites by the supervisor appointed by MIC, the Client for adherence to the Contract conditions and specifications, MIC, the Client may also appoint an environmental inspector to oversee the compliance with these environmental conditions and any proposed mitigation measures. State or Regional Environmental Authorities may carry out similar inspection duties. In all cases, as directed by the Client's supervisor, the Contractor shall comply with directives from such inspectors.

Drilling

6. The Contractor will make sure that any drilling fluid, drilling mud, mud additives, and any other chemicals used for drilling at any Project construction site complies with Mozambique health and safety requirements. In general, only biodegradable materials will be used. Also, the Contractor may be required to provide the detailed description of the materials he intends to use for review and approval by the Client. Where chemicals are used, general prescriptions of the World Bank's safeguard policy OP 4.09 "Pest Management" shall be complied with.

7. Drilling fluids will be recycled or disposed of in compliance with Mozambique regulations in an authorized disposal site. If drilling fluids cannot be disposed of in a practical manner, and if land is available near the drilling site and is free of any usage rights, the Contractor may be authorized to dispose of drilling fluids near the drilling site. In such a situation, the Contractor will be required to provide to the Client due evidence of their total absence of potential environmental impacts, such as with use of leachate tests conducted by a GOM certified laboratory. In this case, drilling fluids will be dried at site, mixed with earth and spread at site.

8. Any site affected by drilling work will be restored to its initial condition. This applies to drilling pads, access roads, staging areas, etc. Topsoil will be stripped ahead of any earthmoving, stored near the construction site, and replaced in its original location after the re-contouring of the area affected by the works.

9. Where successive aquifers are intersected by the drilling works, and upon order by the work supervisor, the Contractor may be required to take measures to isolate aquifers from contamination by each other.

10. The Contractor will take all measures to avoid bacteriological or chemical contamination of the intersected aquifers by the drilling equipment. Similarly, the Contractor will take all measures to avoid bacteriological or chemical contamination of the intersected aquifers from the surface by providing an adequately sealed wellhead.

11. When greasing drilling equipment, the Contractor will avoid any soil contamination. In the event of a limited hydrocarbon spill, the Contractor will recover spilled hydrocarbons and contaminated soils in sealed drums and dispose of them in an authorized waste management facility.

12. Unless duly requested by the Contractor and authorized by the supervisor, no servicing of drilling equipment or vehicles is permitted at the drilling site.

Pipelines

13. No trench shall be left open for more than 7 days, unless duly authorized by the Client upon Contractor's request. Trenches and other excavation works shall be demarcated and/or signposted to avoid third party intrusion.

14. General conditions related with topsoil stripping, storage and restoration apply.

15. The Contractor will take measures to dispose of water used for pressure tests in a manner that does not affect neighboring settlements.

Waste Management

16. All drums, containers, bags, etc. containing oil/fuel/surfacing materials and other hazardous chemicals shall be stored at construction sites on a sealed and/or bonded area in order to contain potential spillage. All waste containers, litter and any other waste generated during the construction shall be collected and disposed off at designated disposal sites in line with applicable Mozambique government waste management regulations.

17. All drainage and effluent from storage areas, workshops, housing quarters and generally from camp sites shall be captured and treated before being discharged into the drainage system in line with applicable government water pollution control regulations.

18. Used oil from maintenance shall be collected, properly stored in sealed containers, and either disposed of appropriately at designated sites or be re-cycled.

19. Entry of runoff into construction sites, staging areas, campsites, shall be restricted by constructing diversion channels or holding structures such as berms, drains, dams, etc. to reduce the potential of soil erosion and water pollution.

20. Construction waste shall not be left in stockpiles along the road, but removed and reused or disposed of on a daily basis.

21. Where temporary dumpsites for clean excavated material are necessary, they shall be located in areas, approved by the Client's approved supervisor, where they will not result in supplemental erosion. Any compensation related with the use of such sites shall be settled prior to their use.

22. Work areas for temporary storage of hazardous materials such as contaminated liquid and solid materials shall be approved by the supervisor and appropriate local and/or relevant national or local authorities before the commencement of work. Disposal of such waste shall be in existing, approved sites.

Quarries and Borrow Areas

23. The Contractor shall obtain appropriate licenses/permits from relevant authorities to operate quarries or borrow areas. The location of quarries and borrow areas shall be subject to review and approval by relevant local and national authorities.

24. New extraction sites:

- a) Shall not be located less than 1km from settlement areas, archaeological areas, cultural sites – including churches and cemeteries, wetlands or any other valued ecosystem component, or on high or steep ground.
- b) Shall not be located in water bodies, or adjacent to them, as well as to springs, wells, etc.
- c) Shall not be located in or near forest reserves, natural habitats or national parks.
- d) Shall be designed and operated in the perspective of an easy and effective rehabilitation. Areas with minimal vegetation cover such as flat and bare ground, or areas covered with grass only or covered with shrubs less than 1.5m in height, are preferred.
- e) Shall have clearly demarcated and marked boundaries to minimize vegetation clearing and safety hazards for third parties.

25. Vegetation clearing shall be restricted to the area required for safe operation of construction work. Vegetation clearing shall not be done more than two months in advance of operations.

26. Stockpile areas shall be located in areas where trees or other natural obstacles can act as buffers to prevent dust pollution, and generally at a distance from human settlements. Wind shall be taken into consideration when siting stockpile areas. Perimeter drains shall be built around stockpile areas.

27. The Contractor shall deposit any excess material in accordance with the principles of these guidelines, and any applicable ESMP, in areas approved by local authorities and/or the supervisor.

Rehabilitation of Work and Camp Sites

28. Topsoil shall be stripped, removed and stored for subsequent rehabilitation. Soils shall not be stripped when they are wet. Topsoil shall not be stored in large or high heaps. Low mounds of no more than 1 to 2m high are recommended.

29. Generally, rehabilitation of work and camp sites shall follow the following principles:

- (i) To the extent practicable, reinstate natural drainage patterns where they have been altered or impaired. Remove toxic materials and dispose of them in designated sites. Backfill excavated areas with soils or overburden that is free of foreign material that could pollute groundwater and soil.
- (ii) Ensure reshaped land is formed so as to be stable, adequately drained and suitable for the desired long-term land use, and allow natural regeneration of vegetation, and:
- (iii) Also, minimize erosion by wind and water both during and after the process of reinstatement. Compacted surfaces shall be deep ripped to relieve compaction unless subsurface conditions dictate otherwise.

Management of Water Needed for Construction Purposes

30. The Contractor shall at all costs avoid conflicting with water needs of local communities. To this effect, any temporary water abstraction for construction needs from either ground or surface water shall be submitted to the following community consultation process:

- Identification of water uses that may be affected by the planned water abstraction;
- Consultation with all identified groups of users about the planned water abstraction; and
- In the event that a potential conflict is identified, report to the supervising authority.

This consultation process shall be documented by the Contractor (minutes of meeting) for review and eventual authorization of the water withdrawal by the Client's supervisor.

31. Abstraction of both surface and underground water shall only be done with the consultation of the local community as mentioned and after obtaining a permit from the relevant authority.

32. Abstraction of water from wetlands is prohibited.

33. Temporary damming of streams and rivers is submitted to approval by the supervisor. It shall be done in such a way as to avoid disrupting water supplies to communities downstream, and to maintain the ecological balance of the river system.

34. No construction water containing spoils or site effluent, especially cement and oil, shall be allowed to flow into natural water drainage courses. Similarly, wash water from washing out of equipment shall not be discharged into watercourses or road drains. Washing bays shall be sited accordingly. Unless site conditions are not favorable, it will generally be infiltrated through soak pits or similar.

35. Site spoils and temporary stockpiles shall be located away from the drainage system, and surface run off shall be directed away from stockpiles to prevent erosion.

Traffic Management and Community Safety

36. Location of temporary access roads shall be done in consultation with the local community and based on the screening results, especially in important or sensitive environments. Temporary access roads shall not traverse wetland areas or other ecologically sensitive areas. The construction of any access roads shall be submitted to a prior consultation process with potentially affected communities that will have to be documented (minutes of meetings) for supervisor's review and approval.

37. Upon the completion of civil works, all temporary access roads shall be ripped and rehabilitated.

38. Measures shall be taken to suppress dust emissions generated by Project traffic.

39. Maximum speed limits for any traffic related with construction at MCPSD sub-project sites shall be the following, unless the local speed limits are different:

- Inhabited areas: 50 km/h
- Open road: 90 km/h.

Salvaging and Disposal of Obsolete Components Found by Rehabilitation Works

40. Obsolete materials and construction elements such as electro-mechanical equipment, pipes, accessories and demolished structures shall be salvaged and disposed of in a manner approved by the supervisor. The Contractor has to agree with the supervisor, which elements are to be surrendered to the Client's premises, which will be recycled or reused, and which will be disposed of at approved landfill sites.

41. Any asbestos cement material that might be uncovered when performing rehabilitation works will be considered as hazardous material and disposed of in an designated facility.

Compensation of Damage to Property

42. Compensation of land acquired permanently for Project purposes will be handled under Client responsibility based on the provisions of the RPF. However, in the event that the Contractor, deliberately or accidentally, damages property, he shall repair the property to the owner's satisfaction and at his own cost. For each repair, the Contractor shall obtain from the owner/user a certificate that the damage has been made good satisfactorily in order to indemnify the Client from subsequent claims.

43. In any case where compensation for inconveniences, damage of crops etc. are claimed by the owner, the Client has to be informed by the Contractor through the supervisor.

Contractor's Health, Safety and Environment Management Plan (HSE-MP)

44. Within 6 weeks of signing the Contract, the Contractor shall prepare an HSE-MP to ensure the adequate management of the health, safety, environmental and social aspects of the works, including implementation of the requirements of these general conditions and any specific requirements of an ESMP for the works. The Contractor's EHS-MP will serve two main purposes:

45. The Contractor's HSE-MP shall provide at least:

- A description of procedures and methods for complying with these general environmental management conditions, and any specific conditions specified in an ESMP;
- A description of specific mitigation measures that will be implemented in order to minimize adverse impacts;
- A description of all planned monitoring activities and the reporting thereof; and
- The internal organizational, management and reporting mechanisms put in place for such.

46. The Contractor's HSE-MP will be reviewed and approved by the Client before start of the works. This review should demonstrate if the Contractor's HSE-MP covers all of the identified impacts, and has defined appropriate measures to counteract any potential impacts.

HSE Reporting

47. The Contractor shall prepare bi-monthly progress reports and provide them to the Client on compliance with these general conditions, the sub-project ESMP if any, and his own HSE-MP. The Contractor's reports will include information on:

- HSE management actions/measures taken, including approvals sought from local or national authorities;
- Problems encountered in relation to HSE aspects (incidents, including delays, cost consequences, etc. as a result thereof);
- Non-compliance with contract requirements on the part of the Contractor;
- Changes of assumptions, conditions, measures, designs and actual works in relation to HSE aspects; and
- Observations, concerns raised and/or decisions taken with regard to HSE management during site meetings.

48. The reporting of any significant HSE incidents shall be done as soon as practicable. Such incident reporting shall therefore be done individually. The Contractor should keep his own records on health, safety and welfare of persons, and damage to property. It is advisable to include such records, as well as

copies of incident reports, as appendixes to the bi-monthly reports. Details of HSE performance will be reported to the Client.

Training of Contractor's Personnel

49. The Contractor shall provide sufficient training to his own personnel to ensure that they are all aware of the relevant aspects of these general conditions, any project ESMP, and his own HSE-MP, and are able to fulfill their expected roles and functions. Specific training will be provided to those employees that have particular responsibilities associated with the implementation of the HSE-MP. The Client will document training activities for potential review.

50. Amongst other issues, training will include an awareness session for all employees on HIV-AIDS addressing the following topics:

- What is HIV/AIDS?
- How is HIV/AIDS contracted?
- HIV/AIDS prevention measures and treatment.

Annex 4: Summary of the World Bank's Safeguard Policies

Policy Number	Key Objectives	Tools/Implications
OP/BP 4.01 Environmental Assessment	The objective of this policy is to ensure that Bank-financed projects are environmentally sound and sustainable, and that decision-making is improved through appropriate analysis of actions and of their likely environmental impacts. This policy is triggered if a project is likely to have potential (adverse) environmental risks and impacts on its area of influence. OP 4.01 covers impacts on the natural environment (air, water and land); human health and safety; physical cultural resources; and trans-boundary and global environment concerns.	MCPSD has prepared an ESMF to ensure that the potential adverse environmental and social impacts of future sub-projects are identified and mitigated appropriately.
OP/BP 4.04 Natural Habitats	This policy recognizes that the conservation of natural habitats is essential to safeguard their unique biodiversity and to maintain environmental services and products for human society and for long-term sustainable development. The Bank therefore supports the protection, management, and restoration of natural habitats in its project financing, as well as policy dialogue and economic and sector work. The Bank supports, and expects borrowers to apply, a precautionary approach to natural resource management to ensure opportunities for environmentally sustainable development. Natural habitats are land and water areas where most of the original native plant and animal species are still present. Natural habitats comprise many types of terrestrial, freshwater, coastal, and marine ecosystems. They include areas lightly modified by human activities, but retaining their ecological functions and most native species.	<p>This policy is triggered by any project (including any sub-project under a sector investment or financial intermediary) with the potential to cause significant conversion (loss) or degradation of natural habitats, whether directly (through construction) or indirectly (through human activities induced by the project).</p> <p><i>For MCPSD</i>, no adverse impacts are expected. For the banana farm, there may be some vegetation removal; the land for the proposed farm is classified as an agricultural land.</p> <p>Sub-projects that will have negative environmental and social impacts on natural habitats will not be funded.</p>
OP/BP 4.36 Forests	The objective of this policy is to assist borrowers to harness the potential of forests to reduce poverty in a sustainable manner, integrate forests effectively into sustainable economic development and protect the vital local and global environmental services and values of forests. Where forest restoration and plantation development are necessary to meet these objectives, the Bank assists borrowers with forest restoration activities that maintain or enhance biodiversity and ecosystem functionality. The Bank assists borrowers with the establishment of	This policy is triggered whenever any Bank-financed investment project (i) has the potential to have impacts on the health and quality of forests or the rights and welfare of people and their level of dependence upon or interaction with forests; or (ii) aims to bring about changes in the management, protection or utilization of natural forests or

	<p>environmentally appropriate, socially beneficial and economically viable forest plantations to help meet growing demands for forest goods and services.</p>	<p>plantations.</p> <p>In terms of MCPSD, no forestland is involved. Sub-projects that will have negative environmental and social impacts on natural habitats will not be funded.</p>
<p>OP 4.09 Pest Management</p>	<p>The objective of this policy is to (i) promote the use of biological or environmental control and reduce reliance on synthetic chemical pesticides; and (ii) strengthen the capacity of the country's regulatory framework and institutions to promote and support safe, effective and environmentally sound pest management. More specifically, the policy aims to (a) Ascertain that pest management activities in Bank-financed operations are based on integrated approaches and seek to reduce reliance on synthetic chemical pesticides (Integrated Pest Management (IPM) in agricultural projects and Integrated Vector Management (IVM) in public health projects. (b) Ensure that health and environmental hazards associated with pest management, especially the use of pesticides are minimized and can be properly managed by the user. (c) As necessary, support policy reform and institutional capacity development to (i) enhance implementation of IPM-based pest management and (ii) regulate and monitor the distribution and use of pesticides.</p>	<p>The policy is triggered if: (i) procurement of pesticides or pesticide application equipment is envisaged (either directly through the project, or indirectly through on-lending, co-financing, or government counterpart funding); (ii) the project may affect pest management in a way that harm could be done, even though the project is not envisaged to procure pesticides. This includes projects that may (i) lead to substantially increased pesticide use and subsequent increase in health and environmental risk; (ii) maintain or expand present pest management practices that are unsustainable, not based on an IPM approach, and/or pose significant health or environmental risks.</p> <p>For MCPSD, a Pest Management Plan has been included as an Annex to its ESMF.</p>
<p>OP/BP 4.11 Physical Cultural Resources</p>	<p>The objective of this policy is to assist countries to avoid or mitigate adverse impacts of development projects on physical cultural resources. For purposes of this policy, "physical cultural resources" are defined as movable or immovable objects, sites, structures, groups of structures, natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings, and may be above ground, underground, or underwater. The cultural</p>	<p>This policy applies to all projects requiring a Category A or B Environmental Assessment under OP 4.01, project located in, or in the vicinity of, recognized cultural heritage sites, and projects designed to support the management or conservation of physical cultural resources.</p> <p>For MCPSD, no cultural resources are likely to be</p>

	<p>interest may be at the local, provincial or national level, or within the international community.</p>	<p>involved. Nevertheless, the civil works contractor has been provided with comprehensive guidelines, in case any cultural aspects are involved during rehabilitation. Further, EFP/GO will provide additional directions, in case of a positive outcome. Sub-projects that will have negative environmental and social impacts on natural habitats will not be funded.</p>
<p>OP/BP 4.10 Indigenous Peoples</p>	<p>The objective of this policy is to (i) ensure that the development process fosters full respect for the dignity, human rights, and cultural uniqueness of indigenous peoples; (ii) ensure that adverse effects during the development process are avoided, or if not feasible, ensure that these are minimized, mitigated or compensated; and (iii) ensure that indigenous peoples receive culturally appropriate and gender and inter-generationally inclusive social and economic benefits.</p>	<p>The policy is triggered when the project affects the indigenous peoples (with characteristics described in OP 4.10 paragraph 4) in the project area.</p> <p>For MCPSD, no indigenous people are involved. Sub-projects that will have negative environmental and social impacts on natural habitats will not be funded.</p>
<p>OP/BP 4.12 Involuntary Resettlement</p>	<p>The objective of this policy is to (i) avoid or minimize involuntary resettlement where feasible, exploring all viable alternative project designs; (ii) assist displaced persons in improving their former living standards, income earning capacity, and production levels, or at least in restoring them; (iii) encourage community participation in planning and implementing resettlement; and (iv) provide assistance to affected people regardless of the legality of land tenure.</p>	<p>This policy covers not only physical relocation, but also any loss of land or other assets resulting in: (i) relocation or loss of shelter; (ii) loss of assets or access to assets; (iii) loss of income sources or means of livelihood, whether or not the affected people must move to another location.</p> <p>This policy also applies to the involuntary restriction of access to legally designated parks and protected areas resulting in adverse impacts on the livelihoods of the displaced persons.</p> <p>For MCPSD, separately, a comprehensive RPF has been prepared.</p>

<p>OP/BP 4.37 Safety of Dams</p>	<p>The objectives of this policy are as follows: For new dams, to ensure that experienced and competent professionals design and supervise construction; the borrower adopts and implements dam safety measures for the dam and associated works. For existing dams, to ensure that any dam that can influence the performance of the project is identified, a dam safety assessment is carried out, and necessary additional dam safety measures and remedial work are implemented.</p>	<p>This policy is triggered when the Bank finances: (i) a project involving construction of a large dam (15 m or higher) or a high hazard dam; and (ii) a project which is dependent on an existing dam. For small dams, generic dam safety measures designed by qualified engineers are usually adequate.</p> <p>No dams are impacted, either directly or indirectly, by MCPSD's sub-projects.</p>
<p>OP 7.50 Projects in International Waters</p>	<p>The objective of this policy is to ensure that Bank-financed projects affecting international waterways would not affect: (i) relations between the Bank and its borrowers and between states (whether members of the Bank or not); and (ii) the efficient utilization and protection of international waterways.</p> <p>The policy applies to the following types of projects: (a) Hydroelectric, irrigation, flood control, navigation, drainage, water and sewerage, industrial and similar projects that involve the use or potential pollution of international waterways; and (b) Detailed design and engineering studies of projects under (a) above, include those carried out by the Bank as executing agency or in any other capacity.</p>	<p>This policy is triggered if (a) any river, canal, lake or similar body of water that forms a boundary between, or any river or body of surface water that flows through two or more states, whether Bank members or not; (b) any tributary or other body of surface water that is a component of any waterway described under (a); and (c) any bay, gulf strait, or channel bounded by two or more states, or if within one state recognized as a necessary channel of communication between the open sea and other states, and any river flowing into such waters.</p> <p><i>Under MCPSD, no International Waterways are involved or impacted.</i></p>
<p>OP 7.60 Projects in Disputed Areas</p>	<p>The objective of this policy is to ensure that projects in disputed areas are dealt with at the earliest possible stage: (a) so as not to affect relations between the Bank and its member countries; (b) so as not to affect relations between the borrower and neighboring countries; and (c) so as not to prejudice the position of either the Bank or the countries concerned.</p>	<p>This policy is triggered if the proposed project will be in a "disputed area". Questions to be answered include: Is the borrower involved in any disputes over an area with any of its neighbors. Is the project situated in a disputed area? Could any component financed or likely to be financed as part of the project be situated in a disputed area?.</p> <p><i>Under MCPSD, no sub-project</i></p>

Annex 5: Summary Environmental and Social Management plan (ESMP)*

Project Activity	Mitigation Measures	Responsible Implementing Agency	Monitoring Responsibility	Time Horizon	Cost estimates (US\$)*
Investments in Infrastructure Sub-projects	Environmental and Social Screening	EFP MIC (Lead), followed by EFP/GO & regional MICOA	EFP/GO with local MICOA support	At planning stage	Included in project
	Public Consultations/sensitization.	EFP MIC (Lead), followed by EFP/GO & regional MICOA	EFP/GO with local MICOA support	Throughout project cycle	Included in project
	Prepare RAP, as necessary	EFP MIC (Lead), followed by EFP/GO & regional MICOA	EFP/GO with local MICOA support	After screening results	Included in project
	Complete Environmental and Social Checklist	Qualified member of Planning Team	EFP/GO with local MICOA support.	At planning stage	Included in project
	Carry out EIA	Private, MIC hired contractor	EFP/GO with local MICOA support	As required	Included in project
	Construction/Rehabilitation Stage	Environmental Guidelines for Contractors/Implementers	Civil Works Contractor	Civil Works Contractor with Oversight by EFP/GO	Ongoing
Operation and Maintenance	Regular Maintenance of sub-projects.	MIC	EFP/GO with EFP MIC support	Ongoing	Included in project
	Environmental Education Awareness Raising	MIC, in participation of local including village bodies.	MIC EFP	Ongoing	Included in project
Capacity Building	- EIA Training for existing District, regional and other staff regions; - Train the Trainer: (TOT) -Dissemination	N/A	EFP MIC (Lead), followed by EFP/GO & regional MICOA	Quarterly	90,000
Agro-chemicals: Pesticides and Fertilizer Use Management	Training Needs Assessment	MIC, MICOA, and MADER	MIC, if monitoring of progress needed.		Included in Nampula Institute Budget
				TOTAL	\$90,000*

- These costs relate to the travel costs for training and the costs for dissemination. In addition, the project will recruit a local environmental specialist to provide capacity in the first year of activities with a salary estimate of US\$60,000.

ANNEX 6: Proposed Terms of Reference for an Environmental IMPACT Assessment (EIA)

1. Introductions and Context

This part will be completed at time of sub-project (referred to as project below) implementation. It will include necessary information related to the context and methodology to carry out the study.

2. Objectives of Study

This section will indicate (i) the objectives and the sub-project activities; (ii) the activities that may cause environmental and social negative impacts and needing adequate mitigation measures.

3. Mission /Tasks

The consultant should do the following:

- Describe the biophysical characteristics of the environment where the project activities will be realized; and underline the main constraints that need to be taken into account at the field preparation, during the implementation and mobilization/maintenance of equipments;
- Assess the potential environmental and social impacts related to project activities and recommend adequate mitigation measures, including costs estimation;
- Assess the need and approach utilized for solid and liquid collection and waste management and suggest recommendation for their safe disposal, including safe disposal of asbestos, all in the context of GOM's and the World Bank's applicable laws;
- Review political, legal and institutional framework, at national and international level, related to environmental, identify the constraints and suggest recommendations for reinforcement;
- Identify responsibilities and actors for the implementation of proposed mitigation measures;
- Assess the capacity available to implement the proposed mitigation measures, and suggest recommendation in terms of training and capacity building, and estimate their costs;
- Develop an Environmental Management Plan (EMP) for the project using OP 4.01, Annex C outline. The EMP should underline (i) the potential environmental and social impacts resulting from project activities (ii) the proposed mitigation measures; (iii) the institutional responsibilities for implementation; (iv) the monitoring indicators; (v) the institutional responsibilities for monitoring and implementation of mitigation measures; (vi) the costs of activities; and (vii) the calendar of implementation; and
- Public consultations. The EIA results and the proposed mitigation measures will be discussed with the impacting and other citizenry, NGOs, local administration and other organisations mainly involved by the project activities. Recommendations from this public consultation will be include in the final EIA report. If only EFP/MIC requires an Environmental Assessment (EA) as compared to an EIA for the project, public consultation may be eliminated. The EFP/MIC will provide directions in consultation with MICOA.

4. Table of Contents of the EIA report

- Cover page
- Table of contents

- List of acronyms
- Executive summary
- Introduction
- Description of project activities
- Description of environment in the project area
- Description of political, legal and institutional framework
- Description of methodology and techniques used in assessment and analyse of project impacts.
- Description of environmental and social impacts for project activities
- Environmental Management Plan (EMP) for the project including the proposed mitigation measures; the institutional responsibilities for implementation; the monitoring indicators; the institutional responsibilities for monitoring and implementation of mitigation; Summarized table for EMP
- Recommendations
- References
- List of individuals and institutions contacted

5. Qualification of the Consultant

The Consultant will be agreed by the MICOA in carrying out EIA studies.

6. Duration of Study

The duration of study will be determined according to the type of activity and the extent of environmental documentation—EA or EIA—as required.

7. Production of Final report

The consultant will produce the final report one (1) week after receiving comments from MIC and MICOA services and MCPSD project. The final report will include all the comments on the previously submitted draft report from these institutions.

8. Supervision of Study

The Environmental Focal Point at MIC will supervise the consultancy in participation of MICOA.

Annex 7: Key References

- The World Bank Operational Manuel Bank Procedures Environmental Assessment BP 4.01 January 1999
- The World Bank Operational Manuel Bank Procedures Environmental Assessment BP 4.01 Annex A January 1999
- The World Bank Operational Manuel Operational Policies OP 4.01 Environmental Assessment January 1999
- The World Bank Operational Manuel Operational Policies OP 4.01 Annex C Environmental Management Plan January 1999
- The environmental Law number 20/97, of October 1
- The decree n°45/2004 of September, 29, related on the process of IEA
- The decree n°32/2003 of august, 12, concerning the Environmental Audit
- The Land Law N°19/97 of 1 October 1997

- The forestry law, of July 10, 1999, which is relates on protection, conservation and use of fauna and vegetal resources;
- The Water Law, of August 3, 1991, related to water resources (protection, conservation and use);
The Mining Law, of June 26, 2002,
- Project Appraisal Document of MCPSD (Draft), the World Bank.
- Aide-memoirs of mission – MCPSD, The World Bank
- Pest Management Strategic Plan for Banana Production in Hawaii; University of Hawaii, March 3, 2003.

Annex 8:

PEST MANAGEMENT PLAN

(Environmental and Social Management Framework)

Mozambique Competitiveness and Private Sector Development Project



Ministério da Indústria e Comércio
(The Ministry of Industry and Commerce)
Republic of Mozambique
Maputo, Mozambique

October 17, 2008

1.0 Introduction

Economic growth is the key to reducing widespread poverty in Mozambique and it must come from increased production and marketing in the agricultural sector to benefit most directly the poor. At present, about 80% of the population relies on agriculture for income, but only produces about 25% of the GDP. Although constraints exist, Mozambique possesses the fundamentals to realize its considerable agricultural potential. Moreover, agriculture strengthening and diversification will also help diversify Mozambique's economy, attracting investment, especially in labor-intensive exports such as cashews and potentially bananas.

MCPSD project proposes to help establish a 100-ha horticulture¹⁴ farm in Nampula—a high population and high potential agriculture province (See Section 2.3). Banana cultivation under MCPSD's farming operation involves use of agro-chemicals including pesticides and fungicides to control banana pest and plant disease, their use poses potential environmental risks and triggering, particularly of the World Bank's Safeguard Policy, OP 4.09.

Currently, Mozambique currently exports about 20,000 tons of bananas, mostly grown by small-scale growers. However, due to poor grading, these exports have limited market. Recently, Republic of South Africa (RSA) banned import of Mozambique bananas following the discovery of a fruit fly¹⁵ infestation (in Niassa and Manica provinces). The Ministry of Agriculture is taking measure to prevent the spread of infestation.

Also, it is of relevance to note that pests and diseases of crops and tropical fruits often infest usually over wide range of regions, districts or communities. Implementation of the MCPSD pest management plan therefore must be based on a wider coverage rather than only in the Nampula's project region. The approach can help minimize pest infestation in areas surrounding relevant MCPSD Nampula horticulture farm.

Furthermore, the Nampula horticulture project is conceived as a demonstration mechanism, with a potential aim of long-term sustainability. It requires (i) an appropriate institutional structure and capacity that should operate beyond the end of the project, (ii) mechanisms that will provide an on-going flow of funds to finance payments to participating land users and operating cost of the program; given the export element of the farm's produce, potential profits, in later years, may be able to contribute to needed funds.

M&E activities are key element to long-term sustainability as well as to ensure that leased land for the farm does not suffer land degradation as a result of the proposed crops.

The aim of this Pest Management Plan (PMP) is to address the concerns relating to the risks associated with potential increases in the use of pesticides for agricultural production, increases in disease vector populations which may arise from the possible construction of dams and irrigation schemes and to strengthen national capacities to implement mitigation measures to minimize the risks. The PMP also identifies national agencies and international partners that could effectively collaborate in, as well as the institutional arrangements for implementing the plan.

MCPSD is not expected to finance the implementation of national-level recommendations for pest management which are beyond the scope of the PMP provisions for the Nampula Institute, the MCPSD

¹⁴ The horticulture sector is defined as the production and marketing of highly perishable products destined for fresh consumption, with relatively high-value per unit.

¹⁵ The fruit fly species concerned attacks a variety of fruit and vegetables, including citrus fruit, bananas, guavas, mangoes, melons, avocados, tomatoes and pumpkins.

would coordinate with other departments in the Bank such as Agriculture and Rural Development to advance the needed policy dialogue in these areas and explore financing possibilities. Additionally, the implementation of the pest management plan at the training institute farm could act as a model to be replicated in other parts of the country.

1.1 Growing Bananas

Bananas are grown on a variety of soil types but do best in well drained soils with a pH range of 6.0 – 6.5. Nutrition requirements are high because of the fast growing nature of the plant. Banana roots are extensive but shallow so frequent fertilization with nitrogen (N) and potassium (K) fertilizers are needed because these nutrients are leachable and move out of the root zone with the heavy irrigation (or high rainfall) requirement of the plant.

Damage to the roots is extensive when cultivating for weed control because of the shallow root systems. Weed control is maintained in banana fields by a combination of herbicides and ground cover (crop residue or cover crop or both).

1.2 Banana Pests and Pesticides

The most important insect pests of bananas affecting production in Mozambique are: the banana aphid (*Pentalonia nigronervosa*), banana weevil (*Cosmopolites sordidus*), thrips, and sugarcane bud moth (*Decadarchis flavistriata*). Coconut scale (*Aspidiotus destructor*) is also a serious pest that can affect bananas quality required for exports. Presence of one live insect can lead to the rejection of an entire shipment under EuroGap.

Banana aphid has major pest status because it is a vector of the banana bunchy top virus. In addition, nematodes also infest bananas, attacking systems of the plant and impair water and nutrient uptake. In extreme cases, root systems are so weakened that heavily fruit laden banana plants will topple over in high winds. The key banana diseases are: banana bunchy top virus, Wilt and Black leaf streak.



Photo 5. Banana Bunchy Top Virus disease of newly emerged "keiki".

Weed control in banana is especially critical during the establishment period. The shallow roots of the banana plant make it difficult to compete with weeds for nutrients, moisture, and sunlight. Additionally, weeds can harbor banana mosaic virus which has many alternate weed and cultivated crop hosts. Once the banana plantings have become established there is adequate crop residue and deep shade from the canopy to effectively eliminate weed competition. Extra care is therefore needed during the early stages of banana growth.

2.0 Environmental Impacts of Banana Cultivation

The banana is an ecologically demanding species that requires abundant humidity, high temperatures and soil with diverse nutrients. If bananas are cultivated without rotation—on the same land—over a given period, in many places, serious mineral deficiencies, particularly of calcium, iron, magnesium, nitrogen, phosphorus, potassium and zinc have often been noticed.

Nampula horticulture farm proposes to grow bananas, a crop that generally requires the following

- Large amounts of land;
- Vigorous control over the amount of ground water;
- Shallow systems of canals and drainage ditches;
- High levels of fertilisers and pesticide application;
- Careful attention to plant de-leafing, de-suckering and maintenance; and
- A substantial labour-force.



Photo 4. Banana bunch nearing harvest. Bunch is composed of "hands". Hands are composed of "fingers" or individual bananas.

The potential environmental impacts of banana plantation include: contamination of the soil, atmosphere, and ground- and subterranean waters deriving from the high application of artificial fertilisers and high-grade toxins that persist in the air.¹⁶

Deterioration of surface and groundwater quality from diffused source pollution in the irrigated areas occurs due to: Inefficient irrigation water use (10 to 30 percent efficiency in some cases); on farm practices such as excessive/ ineffective use of agricultural chemicals (fertilizers, pesticides, herbicides, and weed killers); poor maintenance of surface drainage system; existence of extensive areas of hard pan (gypsum and limestone); inadequate subsurface drainage and other factors.

2.1 Pesticide Use and Environmental Aspects

The pesticides used on the plantations include pre- and post-harvest fungicides, nematicides, herbicides and insecticides. Pesticides used in banana production may enter watercourses and pose ecological risks for aquatic ecosystems.

¹⁶ Other impacts may include: (i) the loss of ground-water resources, owing to the diversion or transformation of ravines or rivers into drainage canals for the plantations; (ii) the generation of high volumes of artificial and solid vegetal waste; (iii) regular and irregular discharges of contaminated waste water; (iv) acute and chronic effects on the health of plantation workers; (negative) agro-ecological effects; (v) impairment of health due to direct and indirect exposure to pesticides; an increase in the resistance of pest populations due pesticides, thereby reducing their efficacy and consequently causing pest outbreaks; and the (vi) likely reduction of beneficial insects like pests and predators.

Pesticides, by design, are biocides. Their utility lies in their ability to kill noxious and unwanted organisms, but they are rarely selective. Most pesticides act by interfering biochemical and physiological processes that are common to wide range of pests and non-target organisms—especially bees, birds, domestic animals, and natural enemies of pests. Assessing the hazards of pesticide use relies on a balance of evidence accumulated through different lines of inquiry. Thresholds are set and codes of safe practice established on the basis of biochemical studies, toxicity tests on a limited number of organisms, and field monitoring.

For Nampula Farm, field monitoring may be of relevance. Occurrence and effects of runoff or a stream draining banana plantation can monitored by taking, at various intervals, soil and water samples; providing details are beyond the scope of this study. The EFP/GO should work with MADER’s Agriculture Extension Agent and MICOA’s local representative to devise a monitoring plan for pesticides and fertilizers.

The migration of fertilizer from banana plantations to other areas potentially is a serious problem. While there are not universal solutions, the problem can be mitigating by reducing the amount of fertilizer exposed on the surface of the land—applying only the amount of fertilizer that the bananas need reduces the excess amount in the environment that is available for leaching. Use of IPM, as recommended by the World Bank, also provides meaningful help.

Environmental and human health impacts of banana cultivation relate to potential contamination of the soil, atmosphere, and ground- and subterranean waters deriving from the high application of artificial fertilisers and high-grade toxins that persist in the air; high volume of vegetative wastes, regular and irregular discharge of contaminated wastewater and, given labour intensive operation, there is a greater likelihood of chronic worker injury. Also, there may be potential loss of native flora, fauna and biodiversity.

Overall, the agro-ecological consequences of intensive monoculture, (e.g. banana plantation) causes serious alteration of the biological properties—e.g. loss of organic properties—of the soil, and the effects of the pesticides on the natural enemies of the pests, carry a high price both in terms of the regeneration of the soil and in terms of the appearance of secondary pests.

2.2 Environmental Aspects of Banana Pest Management

The pesticides used on the banana plantations include pre- and post-harvest fungicides, nematicides, herbicides and insecticides. Fungicides are sprayed from generally between 40 and 50 times per year. Others like Thiabendazol and Imazalil are used in banana

Call Box: *List of Insecticides and Chemicals Banned*¹⁷

- | | |
|------------------------|--------------------------|
| 1. Aldrin | 10. Nitrofen |
| 2. Dieldrin | 11. Captafol |
| 3. DDT | 12. Toxapene |
| 4. Dinoseb | 13. Endrin |
| 5. Fluoroacetamide | 14. Phenol, pentachloro- |
| 6. HCH (mixed isomers) | 15. Ethylenedibromide |
| 7. Chlordane | 16. Heptachlor |
| 8. Chlordimeform | 17. Oxirane |
| 9. Cyhexatin | 18. Lindane, and others |

Source: www.epa.gov

¹⁷ A "banned" pesticide is defined as a pesticide for which all registered uses have been prohibited by final government action or for which all requests for registration or equivalent action for all uses have, for health or environmental reasons, not been granted.

packing plants. The nematicides are sprinkled directly onto the soil once or twice a year. The herbicides are applied in cycles of approximately 8 to 10 weeks. Call Box: *List of Pesticides and Chemicals Banned* provides this list (See also PMP Annex 3: *WHO Pesticide Classification Lis*). The plastic bags that are used to protect the roots of the banana tree are impregnated with the insecticide Chlorpiriphos.

Common pesticides used include: Chlorpiriphos, Diazinon, and Azadirachtin (Insecticide), Carbamate Nematicides, Carbofuran, and Oxamyl; Herbicide, Paraquat, and Organo-phosphate Nematicides include: Terbuphos, Cadusaphos, Phenamiphos, and Ethoprophos.

To assess pesticide hazards, the World Health Organization (WHO) has developed the following four categories, based on the direct hazard from toxicity, to classify human health effects:

- Class I A is “extremely hazardous” and class I B is “highly hazardous”
- Class II is “moderately hazardous”
- Class III is “slightly hazardous”
- Class IV is “unlikely to present an acute hazard in normal use;

A list of pesticides banned and allowed for use including for MCPSD is provided under Annex 2: *WHO Pesticide Classification List*, under Annex 8: *Pest Management Plan*.

2.3 Mitigation Measures to Reduce Risks

Several measures can be adopted at the Nampula farm (and also in other areas) to reduce the risks. Included are:

- Spray monitoring to ensure that spraying of toxic chemicals is not conducted near water sources, and working with areas farmers and village leaders to enforce this;
- Use of pesticides with low residual half-lives;
- Awareness training of village leaders, farmers and chemical resellers in the likely environmental impacts of specific chemicals and recommended spraying methods and equipment;
- Procurement of approved safe spray equipment under the project;
- Procurement of sound (preferably mobile) equipment for safe incineration of combustible containers or unused pesticides;
- Minimizing use of chemical pesticides near areas with rare or endangered fauna; and

Use of a range of pest control techniques (agricultural/physical, biological, chemical) to ensure that pest resistance to chemical pesticides does not build up. In addition, *Annex 3: List of Monitoring Indicators* is provided.

24 Pesticide Use and World Bank Guidelines

Depending upon the level of risk posed by use of agro-chemicals at the MCPSD horticulture farm, the farming operation under World Bank guidelines could be classified under Category A, B, C or FI. It could trigger OP 4.09, which applies to all Bank lending¹⁸.

¹⁸Whether or not the loan finances pesticides, the policy applies. Even if Bank lending for pesticides is not involved, an agricultural development project may lead to substantially increased pesticide use and subsequent environmental problems.

World Bank Safeguard Policy OP 4.09 stipulates that "in assisting borrowers to manage pests that affect either agriculture or public health, the Bank supports a strategy that promotes the use of biological or environmental control methods and reduces reliance on synthetic chemical pesticides", and "in appraising a project that will involve pest management, the Bank assesses the capacity of the country's regulatory framework and institutions to promote and environmentally sound pest management.

As necessary, the Bank and the borrower incorporate in the project components to strengthen such capacity". Furthermore, "The Bank does not finance formulated products that fall in WHO classes IA and IB, or formulations of products in Class II, if (a) the country lacks restrictions on their distribution and use; or (b) they are likely to be used by, or be accessible to, lay personnel, farmers, or others without training, equipment, and facilities to handle, store, and apply these products properly".

To mitigate, the Bank finance projects require the use of the following criteria for selection and use of pesticides:

- (a) They must have negligible adverse human health effects;
- (b) They must be shown to be effective against the target species;
- (c) They must have minimal effect on non-target species and the natural environment. The methods, timing and frequency of pesticide application are aimed to minimize damage to natural enemies. Pesticides used in public health programs must be demonstrated to be safe for inhabitants and domestic animals in the treated areas, as well as for personnel applying them; and
- (d) Their use must take into account the need to prevent the development of resistance in pests.

3.0 Pest Management Approach in Mozambique

Mozambique has immense agricultural potential, with an estimated 36 million hectares of arable land, of which only 10 percent is presently in productive use. The wide diversity of soil types and the diverse climatic conditions in the country are suitable for a large variety of crops. Most of the agriculture practiced in Mozambique is non-irrigated. Among the key crops are sugar, cotton, cashews, lentils, cassava, sunflower and vegetables. Most farming however is on subsistence level.

3.1 Current Pest Management Approaches

In Mozambique, pests and diseases attack are widespread on cereals, cowpea and vegetables, which suffer heavy crop losses. The main method of pest control is the application of chemical pesticide. For example, malathion and propoxur are used for the control of pests while aerial and ground spraying with pesticides are used against migratory pests. The Ministry of Agriculture and Rural Development (MADER) conduct Pest management activities in Mozambique. Broadly speaking, the operations are divided into two major kinds namely (i) management of general pests and (ii) control of migratory pests.

MADER's Agriculture Extension agents and other field staff assist in Pest management. In addition, Mozambique periodically suffers from invasion by the desert locust and the migratory and their control is beyond the resources and competence of the MADER, which seeks help from FAO and other international organizations. Call Box provides a list of banned pesticides.



Photo 7. Bagging of banana bunch for control of fruit pests.

3.2 Pesticide Registration in Mozambique

Pesticide regulation came into effect in March 2002. It requires registration of pesticides, approval of containers and labeling in Portuguese. Ministry of agriculture and rural development in partnership with other relevant ministries including MICOA carries the registration process. Ministry of health and commodity farms imports all the pesticides used in the countries. There is a strong desire to monitor all cycles of pesticides but lack of enough trained manpower has hampered this effort.

Also, according to FAO, Mozambique currently has about 340 metric tons of obsolete pesticides that require resources for disposal. Some private companies have initiated efforts to re-cycle containers. There is a Waste Treatment Station in Matola involved in the re-export of obsolete pesticide for safe disposal.

While some pesticide regulations exist, there is no formal pesticide registry in Mozambique. The situation implies no control over what is allowed into the country or regulations on pesticide labeling and usage. Pesticides such as DDT are banned in most countries but can be found in Mozambique. The lack of government regulation on pesticides has led non-governmental organizations to press for conformity with international standards.

MICOA has initiated some efforts in this regard. Included in this aspect are: setting up a joint operational platform between GOM's MINAG, MISAU, the Custom Authorities and the private sector to monitor the import and the distribution of pesticides within the country.

3.3 Infrastructure, Capacity, Institutional Arrangements and Collaboration

Since potential pesticide contamination may not be restricted to the farm, and MCPSD's scope does not cover, such areas, it is of relevance to indicate that the regional and national authorities such as MICOA should look into developing and implementing policies for fertilizer, pesticides and other hazardous chemicals use and management. Included is developing agreements particularly for pesticides, with manufacturers or suppliers about return of outdated pesticides, as well as metal and plastic containers to prevent their misuse. In addition, strengthening of the basic plant protection infrastructure and institutional control on distribution and use of pesticides under the Project will be undertaken through:

- Training of plant protection and quarantine specialists, extension agents, and farmers;
- Establishment of a monitoring program to assess pest management and application of IPM techniques in project implementation;
- Making an agreement with pesticides manufacturers and resellers about return of the metal and plastic containers for project activities;
- Working with research institutions, such as the Academy of Agricultural Sciences, in orienting their research and extension programs towards IPM;
- Establishment of collaborative links with national universities to strengthen cooperation, local capacity and knowledge in the country of IPM techniques for project-specific crops;
- Disseminating knowledge on benefits of crop rotation and testing alternative cropping patterns
- Promoting support and collaboration in promoting safe pest management measures and IPM approaches where relevant; and
- Promoting the project approach of reduced use of toxic pesticides and encouraging
- IPM approaches to the private sector particularly the agro-chemicals sector.

Use of sound agronomic practices, for example, those encouraging health and profuse rooting will reduce runoff. Application of humic acid, substance found in and extracted in liquid form from compost and well-decomposed organic matter, has stimulated root health and development, when properly and timely applied.

3.3.1 Training

Training is an important component of pesticide risk reduction activities and improving farmers' competence in its use. However, it is important to design training programs to reach as broad an audience as possible, because the hazards associated with pesticides are not limited to the farmer/applicator or end user.

For example, while the importance of proper storage of pesticides is a component of training programs in safe use, there are continuing problems owing to the fact that many farmers store pesticides in their living quarters, often in close proximity to food preparation areas and within the reach of children.

One training model, proven particularly suitable for training farmers is Farmers Field School (FFS), a group-based learning process¹⁹. The IPM farmer field school has become a model approach for farmer education in Asia and many parts of Africa and Latin America. The approach has been used with a wide range of crops including fruits, cotton, tea, pepper, vegetables, small grains, and legumes.

3.4 Use of Integrated Pest Management (IPM)

IPM refers to a mix of farmer-driven, ecologically based pest control practices that seeks to reduce reliance on synthetic chemical pesticides. It involves: (a) managing pests (keeping them below economically damaging levels) rather than seeking to eradicate them; (b) relying, to the extent possible, on non-chemical measures to keep pest populations low; and (c) selecting and applying pesticides, when they have to be used, in a way that minimizes adverse effects on beneficial organisms, humans, and the environment.

Mozambique's banana industry is small and combined with the inability to compete qualitatively for export markets production is mostly consumed domestically. Also, economic reasons add to currently limited agro-chemical including pesticide use. Use of an integrated pest management (IPM) approach to control pest may provide an effective approach.

In Bank-financed agriculture operations, pest populations are normally controlled through IPM approaches, such as biological control, cultural practices, and the development and use of crop varieties that are resistant or tolerant to the pest. The Bank may finance the purchase of pesticides when their use is justified under an IPM approach.

IPM according to the World Bank, IPM involves:

- Managing pests (keeping them below economically damaging levels) rather than seeking to eradicate them;
- Relying, to the extent possible, on non-chemical measures to keep pest populations low; and
- Selecting and applying pesticides, when they have to be used, in a way that minimizes adverse effects on beneficial organisms, humans, and the environment.

Implementation of IPM, given the lack of experience even with conventional pest control practices is not recommended for the proposed horticulture farm. Over time, in few years, as the current pesticide regulatory system is revising and experience with demonstration farm takes a foothold, IPM use may be considered.

Call Box: Management Options for IPM

Biological Control:

- Release and/or rely on natural enemies and beneficial organisms
- Create a situation favorable to beneficial organisms

Cultural Control:

- Crop rotation and cover crops
- Cultivation, tillage, and mowing
- Trapping animal pests
- Proper landscape design
- Destruction of pest habitat
- Proper sanitation

Chemical Control:

- Insect pheromones
- Biologically produced toxins
- Pesticides

Genetic Control:

Resistant plant varieties

Legal:

Quarantines

Source: Minnesota Department of Agriculture, St. Paul, MN, USA

¹⁹ Key activities involve simple experiments, regular field observations and group analysis. The knowledge gained from these activities enables participants to make their own locally-specific decisions about crop management practices. IPM Farmer Field Schools were started in 1989 in Indonesia to reduce farmer reliance on pesticides in rice.

3.5 National Capacity to Develop and Implement IPM

Currently, no integrated pest management approach exists in Mozambique. There appears to be a general lack of awareness about IPM including among the technical field staff. Significant efforts to develop and strengthen pesticide procurement and use including under IPM, as needed, and other measures will be required.

Such measures may include: (i) activities of the Integrated Pest Management Plan, (ii) key participants including private sector, (iii) Institutional arrangements for implementation, and (iii) Cost estimates. Mandatory IPM programs, either state or federal, can be difficult to implement in Lesotho given the technical, budgetary and non-existence of the IPM legislation and other issues.

The success of IPM depends largely on developing and sustaining institutional and human capacity to facilitate informed decision making by farmers, and empower farmers to integrate scientific and traditional knowledge to solve location-specific problems, and respond to market opportunities. Poor communication between farmers, extension agents and researchers has often led to poorly targeted research or to poor adoption of promising options generated by research. The full benefits of investments in agricultural research thereby remain untapped under these circumstances.

4.0 Environmental Consequences of Pest Management Practices

Pesticide use often includes its misuse and can result in the following impacts:

- Contamination of the soil and water bodies,
- Destruction of pollinators of crop plants leading to poor crop yields,
- Elimination of the natural enemies of crop pests and consequent loss of natural pest control that keeps the population of crop pests very low,
- Development of pest resistance to pesticides, encouraging further increases in the use of chemical pesticides,
- Pesticides poisoning of farmers and deleterious effects on human health,
- Unacceptable levels of pesticides residues in harvested produce and in the food chain; and
- Loss of bio-diversity in the environment, particularly of aquatic non-target species.

While IPM does not entirely exclude the use of pesticides, it does advocate their rational use in the context of environmentally sound pest management practices. While MCPSD is not designed or funded to implement IPM requirements and policies at the national level, *Table 1: Key Issues and Actions Required* is provided to highlight relevant items as a general guide for potential national follow up

Table 1: Key Issues and Actions Required.

<i>Key Issues</i>	<i>Actions Required</i>
1. Increased use and reliance on chemical pesticides.	(a). Promote adoption of IPM practices through farmer education and training; (b) Move farmers away from pesticide-dependent pest control practices and promote use of botanical pesticides and biological control
2. Change current pest management practices	(a). Allocate adequate resources to implement National Plant Protection Policy; (b). Increase IPM awareness amongst policy makers and farming community; (c). Abolish free or subsidized distribution of pesticides to farmers and promote safe handling and application of pesticides.
3. Enforcement of legislation	(a). Strengthen institutional capacity of MADER to effectively supervise compliance with pesticide legislation.
4. IPM research and Extension	(a). Strengthen IPM research at MADER; (b) strengthen IPM extension; (c) Strengthen collaboration between MADER and MICOA for field implementation of IPM; (d) involve NGOs in promoting IPM activities
5. Environmental hazards of pesticides.	(a). Create public awareness of pesticide misuse. The hazards of pesticide misuse through public awareness campaigns; (b) regular assessment of pesticide residues in irrigated agricultural production systems and in harvested produce.(c) monitoring of pesticide poisoning in the farming and rural communities.

While selecting an insecticide, in addition to the cost and availability, environmental issues should also be considered. Several pesticides are currently banned for use in agriculture.

4.1 Risk of Agricultural Chemicals Use

Agricultural chemicals pose a particular risk to people and environment. Women are particularly exposed to the risks of handling plant protection products.

Potential Risks of agricultural chemicals include: improper storage, poor labels including lack of information about the substance, human health dangers due to inhalation (including from drifts from neighboring fields) or skin contact without adequate personal protective equipment (such as masks) and from contamination of soil surface water, the atmosphere and clothing. Some of these issues are particularly serious on small farms where spraying equipment and plant protection products are expensive.

There is a need for a coherent Government of Mozambique (GOM) policy that ensures that the requirements of the World Bank, and also objectives of Agenda 21 (UNEP)²⁰, such as integrated pest management, and the relevant conventions are developed. At the farmer level, therefore, among regulatory and other mitigation measures, education and awareness, including through training are essential.

4.2 Availability of Acceptable Quality of Pesticides

In Mozambique, currently, there are minimum control on the importation and use of pesticides. Anecdotal evidence shows that often, inferior quality (and sometimes of unknown quality) pesticides are procured and used. Some of these pesticides came under donor programs and over time, gotten deteriorated, given poor storage and management. They often contain a lower level of active ingredient than is listed on the label, encouraging the farmer to apply the product more frequently than recommended on the label.

Included are the quantities of fertilizers and pesticides to be applied, and more importantly, their proper storage, use and environmental management. Given the environmental and health dangers associated with pesticides, it is very important that such aspects are well understood by the farmers and well disseminated by the authorities. To highlight its important, one teaspoonful of spilled pesticide concentrate could pollute the water supply of 200,000 people for a day.²¹

The majority of pesticide application for agriculture and tropical fruits is by spraying. Pesticide spray can drift and vaporize, causing non-target effects. Incorrect application in windy conditions, or using equipment that is not properly calibrated, often results in the pesticide may not reach its intended target. But a large proportion even of a pesticide that is properly applied will vaporize into the atmosphere. Many people have been affected by spray drift.

Given the very high illiteracy levels of Mozambique farmers, development of innovative training programs would be required. It may include use of audio-visual tools and hands-on demonstrations. In addition, a more "holistic" approach to training may also be needed where entire community is involved, as part of the training programs. Training techniques have proved more useful where they have focused on identified local needs and use of local dialects during training.

²⁰Key International Conventions and Standards include: (i) Agenda 21, Chapter 19: www.un.org/esa/sustdev/documents/agenda21/; (ii) Basel Convention (wastes) : www.basel.int, (iii) Code of Ethics on the International Trade in Chemicals (voluntary commitment by the world's industries). (iv) World Summit for Sustainable Development: www.johannesburgsummit.org, (v) www.chem.unep.ch/ethics, (v) Flower-label: www.fian.de/fian/downloads/pdf/blumen/guidelines-dt.pdf

²¹ <http://www.pan-uk.org/briefing/tgwu.pdf>; See background paper on the control of pesticides.

5.0 Policy, Regulatory and Institutional Framework

The general pest control objectives in the agricultural policy for Mozambique are to:

- Control, and/or eradicate and maintain good surveillance of the major economic pests whose outbreaks are responsible for large-scale damage/loss to agricultural production; and
- Provide protection to man and animals against vectors of deadly diseases.

5.1 The Environmental Laws

A listing of relevant environmental laws has been provided earlier in the Report (ESMF).

5.2 The Institutional Setup

Mozambique Ministry of Agriculture and Rural Development (MADER) is the main body in-charge of pesticide usage and information dissemination. MADER however works closely with MICOA, the Customs Ministry and the Health Ministry to environmental implications, pesticide imports and health aspects of storage, use and distribution, respectively. In addition, the Provincial and District Directorates for Agriculture and Fisheries also participate in these efforts along with Maputo Provincial Directorate for Agriculture.

The Key Ministries responsible for management of pesticides in Mozambique include:

1. Ministry of Coordination of the Environmental Affairs (MICOA)²²

The Ministry is responsible for all policy matters related to the protection of the Environment. The Environmental Law n^o 20/97, of October 1 is applicable to all public and private activities. The law forbids pollution of soil, sub-soil, water, atmosphere by any polluting substance, or any other form of degradation of the environment, which falls outside the limits stipulated by the law. MCPSD's ESMF provides more information on this law.

In general terms, the Environmental Law of 1997 imposes strict liability on persons who cause material damage to the environment. The State has the right to assess the damage, fix the amount of compensation, and to take counter measures at the expense of the person causing the damage. The provision does not relate to hazardous wastes specifically.

Based on the relevant provision of the Constitution, the Environmental Law of 1997 provides a general framework for environmental protection, including management of hazardous wastes. The purpose of the law is “to define the legal basis for the proper use and management of the environment and its elements in order to establish a system of sustainable development” in the country. The law includes several provisions addressing this issue. There is as yet no specific legal instrument on the management of hazardous wastes, or on export and import of such wastes. Work is underway to develop several regulations under the law.

MICOA has set up a National Directorate for Environmental Impact Assessment that is responsible for overseeing hazardous wastes and toxic chemicals including pesticides. The Environmental Law of 1997 (definitions section) defines hazardous wastes and residues as substances destined for elimination, and posing a risk to human health or the environment due to one or more of the characteristics listed in the provision.

²² www.micoa.Gov.mz

2. Ministry of Agriculture and Rural Development

The Ministry, in partnership with MICOA and the Health Ministry is responsible for regulating pesticides among other duties. The Ministry is said to be a major importer of agro-chemicals used for pest control. However, at present, no reliable data exists on extent of pesticides used as well as their management.

This is in spite of the fact that Mozambique is a signatory of Stockholm Convention-- Mozambique signed the Stockholm Convention on 23 May 2001—and others. Lack of such data and information as well as other information is also not in line with the World Bank's safeguard policies²³ on pesticides.

3. Ministry of Health (MISAU)

The Ministry is concerned with the human health and safety issues related to pesticides among its other activities. Within the ministry, the Environment Health Section was established few years back to deal with risk factors, pest control and respond to incidences. The section therefore has the responsibility to acquire, store and develop measures for their responsible use for control of various pests in the country. The ministry under FAO's technical assistance is working with MICOA and MADER to build a national inventory of pesticide and preventing build up of stockpiles.

4. Ministry of Employment and Labor

The Ministry covers occupational health and safety issues related to generation, use, storage and handling and disposal of hazardous waste at workplaces. The ministry also administers the labor code and Labor regulations.

5. Ministry of Trade, Co-operatives and Marketing

It deals with the regulations of imports and exports issuing trading licenses and permits. It also houses standard offices. Hazardous waste imports, exports, licenses or permits will be dealt with, as they are issues.

6. Other relevant ministries include:

- (i) Ministry of Natural Resources;
- (ii) Ministry of Education;
- (iii) Ministry of Conservation and Forestry;
- (iv) Ministry of Local Government;
- (v) Ministry of Planning and Development (MPD);
- (vi) Ministry of Water and Public Works;
- (vii) Maputo Provincial Government authorities; and
- (viii) Others.

5.3 Implementation Issues and Actions Required

Various items are provided as broad guides and should be reviewed at the time of implementation.

²³ See: www.worldbank.org/safeguards

Table 2. Major Issues and Actions Required

MAJOR ISSUES	ACTIONS REQUIRED
Increased use and reliance on chemical pesticides	<ul style="list-style-type: none"> • Promote adoption of IPM practices through farmer education and training • Develop strategies to move farmers away from pesticide-dependent pest control practices and promote use of biological control
Change current pest management practices	<ul style="list-style-type: none"> • Allocate adequate resources to implement National Plant Protection Policy • Increase IPM awareness amongst policy makers and farming community; • Abolish free distribution of pesticides to farmers and promote safe handling and application of pesticides.
Enforcement of legislation	<ul style="list-style-type: none"> • Strengthen institutional capacity of MIC (to the extent needed) and MICOA to effectively supervise compliance with pesticide legislation
IPM research and Extension	<ul style="list-style-type: none"> • Strengthen IPM research at MADER • Strengthen IPM extension • Strengthen collaboration between MICOA and MADER for field implementation of IPM • Involve NGOs in promoting IPM activities
Environmental hazards of pesticide misuse	<ul style="list-style-type: none"> • Create public awareness of the hazards of pesticide misuse through public awareness campaigns • Regular assessment of pesticide residues in irrigated agricultural production systems and in harvested produce. • Monitoring of pesticide poisoning in the farming and rural communities.
Increase in vector populations and of vector borne diseases such as malaria	<ul style="list-style-type: none"> • Establish strong collaboration between Africa Stockpile Program and national malaria control project • Conduct regular vector surveillance.

5.4 Implementation Costs

The following *Table 3-3: Estimates for Developing, Strengthening and Disseminating IPM* provides various costs at the national level. Thus, GOM must participate and coordinate in this effort to optimize effectiveness. If that is not possible, MCPSD costs for this can be separated using the items mentioned. It is important to note that in the absence of relevant information, these are rough estimates and need a careful review. Also, some training is provided under M&E and can be combined with IPM for efficiencies.

Table 3. Cost Estimates for Developing, Strengthening and Disseminating IPM

	Item	Estimated Cost (\$)
1	Development of for the Nampula farm	\$3,000
2	(i) Farm Manager and Support Staff	Provided by MCPSD out of its \$1.75 million implementation budget
3	Training activities	10,000 (Included in the previous budget; excluded from the following total)
4	Monitoring and Surveillance (over 5-year)	\$10,000
6	Miscellaneous including contingency costs.	\$5, 000
TOTAL Cost (Covered by Nampula Training Institute; not included in the ESMP Costs)		\$18,000

The proposed activities should be phased over time, as appropriate. All efforts should be made to provide in-country training or in neighboring South Africa which has a sound IPM program. This work should be coordinated with the two South African partners, in addition to other stakeholders.

5.5 Monitoring and Evaluation

Since the mobility and decay rates of different agrochemicals result in a pattern of contamination in both space and time that is difficult to predict, a Monitoring and Evaluation (M&E) plan to safeguard environment and also improve crop productivity. It is suggested that the EFP/GO work with the relevant staff (upon recruitment)²⁴ of the Nampula Training Institute and develop a farm-specific M& E Plan. To help, a generic list of key indicators in provided in the study.

There is a chemically interactive relationship between fertilizers/pesticides with soil particles, which is strongly affected by the presence of air and water in the soil. Soil processes such as adsorption, desorption, decay rates and biological detoxification and transfer all play a part in determining how quickly and where a contaminant will move. For instance, most of the risks of biocide pollution come from the risk of these attaching to the soil particles.

Many activities can affect the above interactions. For example, short- and long-term application regimes of irrigation water can alter groundwater levels, soil oxygen availability, and the biological characteristics of the soil micro-fauna. These changes can impact nutrient leaching, pesticide decay, detoxification, bioaccumulation, and transfer to the groundwater aquifers. Soil pH management, for instance by the application or withdrawal of liming, can significantly affect the mobilization of agrochemicals.

²⁴ MCPSD will recruit a team of experts for training including those related to the operation of the proposed 100-ha horticulture farm (that will grow bananas) to act as a training ground.

Monitoring for agrochemical pollution is usually difficult to implement. It requires an understanding of the linkages of a chain that stretches from the underlying causes and consequent effects, through to perceptions and costs, including in the context of the region and its cultivation practices. Nevertheless, there is a need to invest in cost-effective techniques to identify problems before they become acute. Although in the short term problems are unlikely to occur, there is a need to create awareness among the areas farmers while strengthening the technical and training capacity of the official staff.

Evaluation on the other hand is the periodic assessment of the relevance, performance, efficiency, and impact (both expected and unexpected) of (development) intervention in relation to stated objectives. Evaluation measures achievements in relation to institutional policies, program's objectives, and the goals set for each operation.

Monitoring is a continuous function that uses systematic collection of data on specified indicators such as: plant growth, rates and applications of fertilizers and pesticides and the quality of each, movement of nutrients through soils profile, plant diseases, and others to provide management and the main stakeholder with information on the status of various activities. A regular tracking of inputs, activities, outputs, outcomes and impacts is therefore required at the levels.

The other part, evaluation is a process to determine the worth or significance of the intervention, including its design. Evaluation, a time consuming activity, is more detailed and can help enable the incorporation of lessons learnt as a result of an intervention. It is important to note that Monitoring and Evaluation (M&E) are synergistic. While monitoring information is necessary, by itself, is an insufficient input to the conduct of an (rigorous) evaluation. Call Box: *World Bank Requirements for Project and Program Monitoring and Evaluation* defines the World Bank's M & E. Using monitoring information and data alone has the potential to provide distorted information. M&E can provide a more balanced output.

At the beginning a comprehensive list of various parameters to be monitored, updated as needed, should be developed. The lead ministry, in this case, the Ministry of Agriculture and Rural Development (MADER) in participation with the organization²⁵ managing the demonstration farm, and other stakeholders should be involved.

Several activities under the program require M&E to provide accountability, efficiency and better management. For example, soil loss (suspended sediment), nutrients (fertilizers), and pesticides may need to be monitored to determine if they were getting into the (areas) streams.

Call Box: World Bank Requirements for Project and Program Monitoring and Evaluation

The World Bank Monitoring and Evaluation requirements of both program and project lending are presented in the Operational Directive 10.70 and Operational Policy (OP)/Bank Procedure (BP) 13.05. The Operational Directive (OD) 10.70 defines *Monitoring* as "the continuous assessment of project implementation in relation to agreed schedules and the use of inputs, infrastructure, and services by project beneficiaries. *Evaluation* is defined as "the periodic assessment of the relevance, performance, efficiency, and impact (both expected and unexpected) of the project in relation to stated objectives." In addition, OD 10.70 sets out the concept of M&E, and provides general guidance on the design and implementation of the information systems required for M&E activities. The OP 13.05 explains the rationale for Bank's supervision of Bank-financed projects, which include monitoring, and evaluative review and reporting. It also explains the responsibilities of Task Teams (TT), and requires that the borrower and the TT agree on implementation arrangements that include M&E arrangements, and use of appropriate performance indicators. Source: World Bank Operational Manual

²⁵ The entity responsible for managing the proposed horticulture farm in Nampula was not defined at the time of the study.

Pesticides and nutrients also can be flushed from the fields during storm runoff or can percolate into the soils; therefore, agrochemical migration in the soil should also be evaluated to determine if ground water has been affected. Thus, stream sampling may be necessary during rain events. Likewise, soil and ground water samples should also be collected after storm infiltration to see if the agrochemicals moved downward to the water table.

Furthermore, collecting and identifying aquatic organisms at numerous stream sites can help measure the biological health of the stream. Since farming by definition directly affects biodiversity, it is important to monitor for any related changes as a result of diversification²⁶ and introduction, in particular, of apples, cherries and Brussels sprouts, the last two generally are unknown in Mozambique and may be perceived as *Invasive Species*. Furthermore, Pesticides can reduce species diversity and cause ecological damage. Pesticides also have effects, often adverse, on an area's wildlife.

Given the diversity of requirements, it is important to define clearly the objectives of a monitoring and evaluation (M&E) program. EFP MIC should work with MICOA. At the time of this study, this information did not exist. Given the absence of information, in particular, the extent of M&E and institutional set up, it is not possible to provide cost of needed M&E activities.

5.6 Institutional Responsibility for Monitoring and Evaluation

Currently, institutional capacities to monitor, collect, and analyze data such as on the causal links between land uses and potential environmental degradation at best is very weak in Mozambique.. For their projects, various government organizations, (mostly given the mandates from the fund donors and international import organizations) carry (very) limited M&E activities. The situation is constrained by lack of skills, awareness, funding and enforcement of regulatory mandates. It is particularly true for Mozambique.

For the project, there is no defined responsibility, and it appears that it would be split between the Ministry of Agriculture and Rural Development (MADER), and MICOA, the Ministry of Environment. It is suggested that given the short- and long-term (potential for replication and wider adoption etc.) that a specialized unit under MADER, with technical strengths drawn from MICOA is established. Since the needed laboratory resources may not be available, the analytical and other services, as needed and cost effective, are contracted out to resources in Africa.

The lead organization, in participation with key stakeholders, should design a (strong) monitoring program. Included should be: the parameters to be monitored, their prioritization and monitoring frequency, data analysis and storage, and other specific needs, as identified.

The entity managing the Nampula horticulture farm should be actively involved. All result should be carefully analyzed since they can provide valuable guidance to other potential sites that may consider replication of the farm within Mozambique. Given the lack of information on the above issues, it is difficult to give cost estimates for monitoring and evaluation. Table 5: *Input, Activity and Impact Indicators for various M&E Activities*, as these relate to pesticides.

²⁶ Diversification, according to the World Bank's recommendations, also requires development of A pest management plan when there are significant pest management issues such as diversification into new crops in agriculture, and (b) new land-use development or changed cultivation practices in an area, (c) significant expansion into new areas.

Table 5: Input, Activity and Impact Indicators for various M&E Activities

Input	Activity	Impact
Collect information on soils, water quality, areas vegetation, topography, irrigation systems, and others.	Meet relevant agencies, do Internet and literature research, and other sources, including this study. Work with MICOA and MADER	Relevant baseline information for M&E identified. Team working together.
Develop <i>separate</i> M & E Plans with participation of key players, and in terms of project's objectives.	Identify monitoring parameters, frequency, and techniques for the horticulture (banana) farm, and responsible agencies, individuals. Inform/involve key stakeholders.	Helps assure proper progress; brings stakeholder together.
Develop a list of lab, technical, and other resources needed.	Work with the MICOA, MADER and MIC to secure needed resources	Needed resources for Monitoring in place.
Develop evaluation requirements for the horticulture farm.	Identify data analysis and interpretation and storage resources. Identify participating agencies.	Needed resources for evaluation in place. Concerned agencies informed.
Interact with farmers and other key stakeholders including government ministry (ies).	Invite key stakeholders for a tour of the farm, and review of the progress to date.	Helps in: getting (participating) farmers input/continued buy-in, provides some training to farmers etc.
Procure pre-approved pesticides: time of application according to each farm's needs. Procure personal protective equipment.	Develop and disseminate pesticide storage, use and management policy and training material to selected farmers Apply doses of pesticides, as needed at appropriate/as-needed time(s).	Farm workers are sensitized to the importance of safety in pesticides use. Community is aware of the activities.
Review Integrated Pest Management Practices (IPM) for potential use.	Use IPM to the extent practical; Train and sensitize farm workers and selected area farmers.	IPM is understood through information material and field demonstrations.
Measure soil runoff and soils leaching at pre-agreed intervals.	Install appropriate instruments, follow acceptable procedures, collect, secure and analyze data for interpretation/use and storage. Disseminate, as needed.	Any harmful impact of pesticides identified. Information disseminated. Any changes required incorporated.
Review Health and Safety Issues.	Conduct meetings with workers; resolve relevant issues, organize a refresher course covering pesticide use/safety.	Workers are monitored for any potential impacts; importance of health and safety issues reinforced.
Reporting and communication.	Develop quarterly, bi-yearly and other reports; disseminate as needed. Implement agreed upon changes in M&E.	Project's monitoring results analyzed, discussed and changes, if any implemented.

5.7 Monitoring and Evaluation Costs

Under proper project management, potential environmental impacts from the Nampula horticulture farm are likely to be insignificant. However, there is still a need to monitor the impacts, and if possible, get independent verification such as via community groups or NGO's can be requested and compensated.

Monitoring and Evaluation (M&D) costs for the horticulture project will depend on the number of indicators collected, the frequency and quality of information sought, and the comprehensiveness of the system proposed. Once these (practical) indicators are defined, M & E work plan developed, and field instruments needed installed, M&E work can start with data collection, analysis and reporting, skill for which minimum cost is budgeted in the total M&E costs indicated below. It is assumed that participating personnel have some level of knowledge and training. M & E in data collection and analyses should not only consider non-point runoff (pollution) from banana-applied fertilizers—both organic and inorganic, and pesticides, but also how soil type, slope, watersheds, and groundwater relate to surface runoff, drainage, and persistence in and leaching through the soil profile.

Furthermore, it is also important to base pesticide use at the horticulture farm against pests on established thresholds, pest forecast models, if available, weather conditions, established presence of the pest, and available history, such as from South Africa or Kenya or other regional country growing bananas.

Likewise records on herbicide rates and selections should be kept and based on weed surveys. While several types of sprayers are available, use of drift-reducing sprayers (tunnel, sensor, tower) or a sprayer modified to direct the air (towers, deflectors, angled fans, side baffle plate, air induction nozzles) is recommended.

The following M&E parameters and associated costs assume that: (i) tillage practices, as applicable, for each of the two farms were used (ii) judicious use of fertilizers and pesticides following requirements such as those on the (pesticide container) label, Mozambique or South African guidelines, as applicable, (iii) participating (field) personnel have some level of training, (iv) access to field instrumentation and laboratory services, as needed, will be provided by the project's two South African partners, and (v) where government is the implementing agency, no costs will be incurred.

Table 6: *Monitoring and Evaluation Costs* provides specific items. The total cost estimated is \$105,000. It does not include costs of pesticides, fertilizers including organic fertilizers, agrochemicals storage costs, cost of procuring and planting seedlings, cost of developing an M&E plan, and similar other project costs. It is assumed that the Mozambique government, thus, no cost to MCPD, will either cover these. Also, as per TOR, all costs relate to the M&E function. It is suggested that an environmental review be conducted mid term of the project to see what (significant) environmental problems, if any, have arisen and corrective action can be implemented. Table 6 costs were *not* included, given its national coverage, in costs under Section 8.2.1.

Table 6: Monitoring and Evaluation Costs (5-year period and, in US \$)

	Activity	Objective	Implementing Agency	Output	Cost (\$)	Remarks	
1.	Training: Participants from MIC, MADER, MICOA, and others Training in Mozambique.	Assure sound environmental management and help capacity building	Private firm: local or from S. Africa.	Trained personnel, at MADER, MICOA, and NGO's, others.	10,000	Carefully select participants, Cost includes per diems etc.	
3	Monitoring instrumentation procurement	To measure pre-defined M&E parameters.	MADER, MICOA, and MIC in that order.	For relevant data generation.	10,000	Source: South Africa.	
4	Sampling and chemical analyses, of soil and leaf tissues.	To maintain nutritional status primarily of trees; correct deficiency.	Private, approved Analytical Lab, Use applicable procumbent protocols.	Relevant analytical data/interpretation.	4,500	Mozambique or RSA lab. 85 analyses and their interpretations.	
5	Sampling and chemical analyses: irrigation water	To assess and monitor water quality during project period.	Private, approved, Analytical Lab, as above	Water Quality data.	2,500	25-30 samples.	
6.	Chemical analysis for Pesticides	To assure quality.	Private, approved, Analytical Lab.	Pesticide quality verifications	1,000	4-6 or more samples.	
7.	Chemical analysis for leachates.	Monitor groundwater	Private, approved, Analytical Lab	Groundwater data	2,000	15-20 samples at selected locations.	
8.	Oversight & review of M&E by Government Officials	Report on field program, assist in troubleshooting etc.	MICOA, assisted by Ministry of Health	Problem resolution and general oversight.	None	Costs borne by MIC; Use trained personnel	
9.	Oversight (by applicable and trained NGO).	Independent oversight provides community input.	Agriculture oriented, trained NGOs	Minutes from meetings, letters	NGO's cover their cost	Some (labor) compensation + indirect costs.	
10	Complaint Resolution Process	Document and resolve field problems.	MICOA, others, as needed.	Complaints Database, Lessons-learnt.	1,000	Potential costs; any mitigation measures.	
11	Miscellaneous management activities, review of Health/safety plans etc.	Administrative/logistics, information dissemination etc.	As needed or as indicated above	Information dissemination, Upkeep of instruments etc.	2,000	Misc. Labor, upkeep of instrumentation, Costs shared by MICOA, MIC.	
Total Cost		(Cost will be covered by MCPSD, therefore not included in ESMF)				\$105, 000	

6.0 Recommendations

This PMP, a part of the MCPSD ESMF, is consistent with the compliance requirements of the Bank's Safeguard Policies, OP 4.09 and BP 4.01. It is built on existing national institutions and relevant government policies, regulations and operations that can be strengthened by the MCPSD project. MICOA, in partnership with the Mozambique Ministry of Agriculture and Rural Development (MADER) will undertake supervision of the implementation of the PMP. Furthermore, the proposed structure dovetails into the approved MCPSD project management system.

To effectively implement the Pest Management Plan, several measures have been included in the Plan. GOM should implement these with qualified help. For the longer haul, and for national benefit, it would be useful to: (i) Review of current pest management practices in Mozambique to establish a base line; (ii) Identification of critical factors preventing more effective management of pesticides in Mozambique; (iii) improve pesticide registration process and pesticide quality control; (iv) Review of all laws and regulations related to pesticides in Mozambique; and (v) others.

GOM should use MCPSD's Nampual farm as a model for potential replication. This will require collection of relevant data and information and building technical and resource capacity in Mozambique, among other measures. *PMP Annex 1: Planning Matrix for the Pest Management Plan for Nampula Horticulture Farm* is meant to provide a general guideline for efforts at the national level. Its use for MCPSD is limited.

PMP ANNEXES

Annex 1: Planning Matrix for the Pest Management Plan for Nampula Horticulture Farm

Narrative Summary	<p>Goal: Empower tropical fruit and other farmers to contribute significantly to household and national economies through environmentally friendly pest management practices.</p> <p>Purpose</p> <ol style="list-style-type: none"> 1. In the immediate future, halt and reverse losses cause by pests in order to increase profitability of Nampula agriculture. 2. In the longer term, strengthen national and local capacity to reduce environmental and health risks associated with pest management practices in Nampula. 	
Expected Results	<p>Food security enhanced, environmental quality improved, crop and livestock productivity and farmers' income increased</p>	<p>Medium-term results/outcomes</p> <ul style="list-style-type: none"> • Farmers prioritize their pest problems and identify IPM opportunities to mitigate negative environmental and social impacts associated with pesticides.
Performance Indicators	<p>Evidence of improvements in food availability, level of poverty, and environmental protection.</p>	<ul style="list-style-type: none"> • Availability of sufficient food. • Perception of state agencies regarding the value of IPM in Nampula agriculture. • Level of compliance with World Bank etc. • Level of chemical control practices • Types and level of use of alternatives to synthetic pesticides
Assumptions/Risks	<ul style="list-style-type: none"> • National security remains stable • Government policies continue to support food security program 	

PMP Annex 2: WHO Pesticide Classification List

PMP Annex 2, Table 1. Extremely hazardous (Class I a): Active Ingredients of Pesticides (Common name): Use of These Pesticides - not permissible in the project

Aldicarb		Difethialone
	Parathion-methyl	
Brodifacoum		Diphacinone
	Phenylmercury acetate	
Bromadiolone		Disulfoton
	Phorate	
Bromethalin		Ethoprophos
	Phosphamidon	
Calcium cyanide		Flocoumafen
	Sodium fluoroacetate	
Captafol		Fonofos
	Sulfotep	
Chlorethoxyfos		Hexachlorobenzene
	Tebupirimfos	
Chlormephos		Mercuric chloride
	Terbufos	
Chlorophacinone		Mevinphos
Difenacoum		Parathion

PMP Annex 2, Table 2: Highly hazardous (Class I b) technical grade active ingredients of pesticides (common name) – Not Permissible Under MCPSP Project

Acrolein		Ethiofencarb
	Omethoate	
Allyl alcohol		Famphur
	Oxamyl	
Azinphos-ethyl		Fenamiphos
	Oxydemeton-methyl	
Azinphos-methyl		Flucythrinate
	Paris green {C}	
Blasticidin-S		Fluoroacetamide
	Pentachlorophenol	
Butocarboxim		Formetanate
	Pindone	
Butoxycarboxim		Furathiocarb
	Pirimiphos-ethyl	
Cadusafos		Heptenophos
	Propaphos	
Calcium arsenate		Isazofos
	Propetamphos	
Carbofuran		Isofenphos
	Sodium arsenite	
Chlorfenvinphos		Isoxathion
	Sodium cyanide	

3-Chloro-1,2-propanediol	Lead arsenate
Strychnine	
Coumaphos	Mecarbam
Tefluthrin	
Coumatetralyl	Mercuric oxide
Thallium sulfate	
Zeta-cypermethrin	Methamidophos
Thiofanox	
Demeton-S-methyl	Methidathion
Thiometon	
Dichlorvos	Methiocarb
Triazophos	
Dicrotophos	Methomyl
Vamidothion	
Dinoterb	Monocrotophos
Warfarin	
Edinofenphos	Nicotine
Zinc phosphide	

PMP Annex 2, Table 3. Moderately hazardous (Class II) Technical Grade Active Ingredients of Pesticides (Common name)—Pesticide Use in Not Permissible Under MCPDS

Alanycarb		Endosulfan
Paraquat		
Anilofos		Endothal-sodium
Pebulate		
Azaconazole		Esfenvalerate
Permethrin		
Azocyclotin		Ethion
Phenthoate		
Bendiocarb		Etrimfos
Phosalone		
Bensulide		Fenitrothion
Phoxim		
Bifenthrin		Fenobucarb
Piperophos		
Bilanafos		Fenpropidin
Pirimicarb		
Bioallethrin		Fenpropathrin
Prallethrin		
Bromoxynil		Fenthion
Profenofos		
Brobuconazole		Fentin acetate
Propiconazole		
Bronopol		Ferntin hydroxide
Propoxur		
Butamifos		Fenvalerate
Prosulfocarb		
Butylamine		Fipronil
Prothiofos		
Carbaryl		Fluxofenim
Pyraclofos		

Carbosulfan		Formothion
Cartap	Pyrazophos	Fuberidazole
Chloralose	Pyrethrins	Gamma-HCH
Chlordane	Pyroquilon	Guazatine
Chlorfenapyr	Quinalphos	Haloxypop
	Quizalofop-p-tefuryl	
Chlorphonium chloride		Heptachlor
Rotenone		
Chlorpyrifos		Imazalil
	Sodium fluoride	
Clomazone		Imidacloprid Sodium
	Hexafluorosilicate	
Copper sulfate		Iminoctadine
	Spiroxamine	
Cuprous oxide	Suiprofos	loxynil
Cyanazine	Terbumeton	loxynil octanoate
Cyanophos	Tetraconazole	Isoprocarb
Cyfluthrin		Lambda-cyhalothrin
	Thiacloprid	
Beta-cyfluthrin	Thiobencarb	Mercurous chloride
Cynalothrin	Thiocyclam	Metaldehyde
Cypermethrin		Metam-sodium
	Thiodicarb	
Alpha-cypermethrin		Methacrifos
	Triazamate	
Cyphenothrin		Methasulfocarb
	Trichlorfon	
Deltamethrin		Methyl isothiocyanate
	Tricyclazole	
Diazinon		Metolcarb
	Tridemorph	
Difenzoquat		Metribuzin
	Vernolate	
Dimethoate		Molinate
	Xylylcarb	
Dinobuton Nabam		
Diquat Naled		

PMP Annex 2, Table 3: Pesticide's Common Name): Use Permissible under IPM

Acephate		Chlormequat (chloride)
	Dichlorbenzene	
Acetochlor		Chloracetic acid
	Dichlorophen	

Acifluorfen		Chlorthiamid
Alachlor	Dichlorprop	Copper hydroxide
Allethrin	Diclofop	Copper oxychloride
Ametryn	Dienochlor	Cucloate
Amitraz	Diethyltoluamide	Cyhexatin
Azamethiphos	Difenoconazole	Cymoxanil
Bensultap	Dimepiperate	Cyproconazole
Dimethachlor		
Bentazone	Dimethamethryn	Dazomet
Bromofenoxim		Desmethryn
Dimethipin		
Butoxydim		Dicamba
Chinomethionat	Dimethylarsinic acid	Dichlormid
Diniconazole		

PMP Annex 2, Table 4: Technical Grade Active Ingredients of Pesticides Unlikely to Present Acute Hazard in Normal Use (Common name): Use Permissible Under MCPSD

Acephate		Mecoprop
Acetochlor	Bentazone	Mecoprop-P
Acifluorfen	Bromofenoxim	Mefluidide
Alachlor	Butoxydim	Mepiquat
Allethrin	Chinomethionat	Metalaxyl
Dinocap	Chloromequat (chloride)	Metamitron
Diphenamid	Chloroacetic acid	Metconazole
Dithianon	Chlorthiamid	Methylarsonic acid
Dodine	Copper hydroxide	Metolachlor
Empenthrin	Copper oxychloride	Myclobutanil
Esrocarb	Nuarimole	2-Naphthoxyacetic acid
Etridiazole	Octhilinone	Nitrapyrin
Fenothiocarb	N-octylbicycloheptene	Ametryn
	Dicarboximide	

Ferimzone		Amitraz
	Oxadixyl	
Fluazifop-p-butyl		Azamethiphos
	Paclobutrazol	
Fluchloralin		Bensultap
	Pendimethalin	
Flufenacet		Mecoprop
	Pimaricin	
Fluoroglycofen		Mecoprop-P
	Pirimiphos-methyl	
Flurprimidol		Mefluidide
	Prochloraz	
Flusilazole		Mepiquat
	Propachlor	
Flutriafol		Metalaxyl
	Propanil	
Fomesafen		Metamitron
	Propargite	
Furalaxyl		Metconazole
	Pyrazoxyfen	
Glufosinate		Methylarsonic acid
	Pyridaben	
Hexazinone		Metolachlor
	Pyridaphenthion	
Hydramethylnon		Myclobutanil
	Pyridate	
Iprobenfos		2-Napthyloxyacetic acid
	Pyrifenox	
Isoprothiolane		Nitrapyrin
	Quinoclamine	
Isoproturon		Ametryn
	Quizalofop	
Isouron		Amitraz
	Resmethrin	
Malathion		Azamethiphos
	Sethoxydim	
MCPA-thioethyl		Bensultap
	Simetryn	

Annex 3: Monitoring and Evaluation Indicators

1. Indicators to be monitored at the Nampula Farm:

a) Extent of Adoption of Non-Pesticide or IPM Control Measures:

- Intermittent Sampling and Analysis of Run-off Water
- Use of Pest Resistance Varieties
- Participation in Areas Community IPM program, to the Extent Active
- Number of farmers per sample adopting non-pesticide or IPM control measures

b) Pesticide Use Pattern:

Number of pesticide applications per crop/ha cropping season;

- Types/Quantity/Volume of pesticides used per crop/ha/Cropping season (checking for use of WHO Class non-registered chemicals or I);
- Cost of pesticide applications per crop/ha/cropping season;
- Extent of Safe Handling/Use/Management of Pesticides;
- Incidence of excessive pesticide residues on crop produce;
- Number of Instances/Complaints on pesticide residues on crop produce;
- Incidence of pest resistance (with MICOA participation);
- Incidence of pesticide poisoning in humans; and
- Incidence of other forms of environmental poisoning or contamination in domestic animals, wildlife, honey bees, water pollution, soil pollution, others;

c) Crop Production:

- Crop yields per hectare, fluctuation in crop yields from season to season
- Impact on Profits/hectare, profit fluctuation from season to season
- Agro-ecosystem:
- Number and type of pest outbreaks per crop/year
- Number of insect predators, parasitoids per unit per sampling area
- Abundance of beneficial insects (e.g. honeybees per unit sampling area) in terms of numbers and diversity