
MICOA
Ministry for Coordination
Of Environmental Affairs

STRATEGIC
ENVIRONMENTAL
ASSESSMENT
OF TRANSPORT OPTIONS
FOR
CORRIDOR SANDS Ltda.

EXECUTIVE SUMMARY

BILENE WORKSHOP
30TH JULY - 2ND AUGUST 2003

ACKNOWLEDGMENTS

The Ministry for Coordination of Environmental Affairs (MICOA) the National and the National Directorate for Environmental Impact Assessment (DNAIA) wish to express their gratitude and appreciation to the Participants of the Strategic Environmental Assessment workshop held in Bilene from the 30th July to the 2nd of August 2003. The opinion of workshop participants and stakeholders reflected the development objectives of their respective Ministries and Authorities and was critical to the results and conclusions of this SEA procedure.

In addition, MICOA wishes to thank the staff of its Centre for Sustainable Development-Coastal Zones (CDS-ZC) for organisation and logistical support during this event, and the Royal Danish Embassy for its financial support.

MICOA appreciates the participation and contribution from Corridor Sands Ltda. and Rio Tinto Mines and hopes that the process undertaken together in Bilene was as valuable to the mining companies as it was to the Government of the Republic of Mozambique.

Dr. Felicidad Munguambe
National Director
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EXECUTIVE SUMMARY

Western Mining Resources (Australia) owners of the Corridor Sands Project and principal shareholders of Corridor Sands Limitada have identified significant deposits of titanium dioxide, iron, zircon and rutile in the vicinity of Chibuto in the Province of Gaza. Southern Mining Corporation originally carried out exploration of this deposit. Western Mining Corporation became involved in the project in 2000 and signed an agreement with the government of the republic of Mozambique to develop the mine at Chibuto in May 2002. During that period Southern Mining Corporation and Western Mining Corporation commissioned Environmental Impact Assessments of its proposed mine development at Chibuto which included:

- A dedicated rail link connecting the Chibuto Mine to the main Maputo to Zimbabwe railway at Barragem.
- An export facility at Matola Harbour (Maputo) adjacent to facilities currently servicing the Mozal Aluminium Plant
- The development of the Chibuto Mine including the mineral processing and smelting plant.

The environmental impact assessments were processed and approved by the National Directorate for Environmental Impact Assessments (DNAIA) of the Ministry for Coordination of Environmental Affairs (MICOA). Approval of the EIA studies carried out for the Chibuto Mine and its proposed export infrastructure led to the issuance of environmental licences, which, in principle, should have been sufficient for Corridor Sands Limitada and WMC to begin raising capital to open the Corridor Sands mine. The catastrophic flooding of Limpopo River basin in 2000 led WMC to reconsider the rail link option due to the inherent risk of future flooding and damage to critical export infrastructure. WMC commissioned a study to identify the best possible export option. The result of that study was the proposal for an Alternate Export Facility (AEF) consisting of:

- A 63km private long haul road from the smelter at Chibuto to Chongoene beach.
- A private bulk cargo facility (Materials and Stockpile Facility) behind the frontal dunes at Chongoene beach.
- A private open-lattice jetty, built perpendicular to the coastline, which would be 1.5 km long and approximately 20 meters above mean sea level.

The proposal for the alternate export facility was submitted to DNAIA for approval. DNAIA and MICOA recognised that the proposed solution would conflict with national tourism development plans and could pose a significant environmental threat to coastal resources and coastal tourism investments (current and future). Following a period of consultation DNAIA and MICOA decided that the CSL-AEF proposal should be considered in broader development terms and that the cumulative environmental, social and economic impacts of the proposal should be assessed using a Strategic Environmental Assessment procedure.

The Center For Sustainable Development-Coastal Zones (CDS-ZC) structured the procedure based on its experience from similar exercises carried out in the Province of Inhambane. The objective was to assess the two transport options proposed by Corridor Sands Limitada and to supplement these with variants that could meet the commercial and development objectives of both the Government of the Republic of Mozambique and those of the mining company. The variant options were formulated by MICOA through a consultative process with stakeholder institutions. The development of objectives and needs of the key economic sectors of Gaza Province (Tourism, Mining, Agriculture and Services) were taken into consideration in the formulation process and care was taken that the variants did not favour any one particular sector.

The transport options proposed to stakeholders and participants of the SEA workshop were:

- Option-1:** A dedicated rail link connecting the Chibuto Mine to the Maputo to Zimbabwe railway at Barragem and an export facility located in Maputo Harbour adjacent to facilities servicing the Mozal facility.
- Option-2:** A dedicated 63 km road designed to carry road trains (motorised mineral transporters) each capable of transporting 100 metric tonnes of mineral products to a holding area located 2 km inland of the coastline at Chongoene. The proposal also includes a dedicated jetty extending 1.5 km seaward and perpendicular to the coastline at Chongoene. The jetty and holding area would be connected through a network of closed conveyor belts and pipes feeding mineral products to bulk carriers and receiving essential process materials (anthracite, diesel, other fuels) for the mine at Chibuto.
- Option-3:** A north-south railway line connecting Maputo to Inhambane-Maxixe is proposed. The line could be extended north to the border with Tanzania thereby servicing coastal populations and providing a north-south transport link vital to the future economic development of Mozambique. The North railway link would service all proposed and future mining operations in both Gaza and Inhambane Provinces. The tabled option would also require the development of port facilities in both Maputo and Maxixe. The tabled option would be developed as a partnership involving the Government of the Republic of Mozambique, the Mining Companies having concessions in the area, bilateral donors and International Financing Institutions.
- Option-4:** A 4-lane trunk road linking Maputo to Inhambane-Maxixe servicing mining sector interests, the local population and other economic interests in the area (tourism, agriculture, manufacturing, etc.). Development of this infrastructure would be structured as a partnership similar to that described above. The proposed road would be extended north to the border with Tanzania as funds become available and in response to the country's development needs.
- Option-5:** The Government of the Republic of Mozambique agrees to the construction of dedicated roads and export facilities such as those proposed by Corridor Sands Ltda. for all mining operations in the same geographic area and the country.
- Option-6:** The Limpopo River Option. Mining concerns would develop stockpile facilities in a flood safe area adjacent to the banks of the Limpopo River. Mineral products would then be transported to an offshore loading area by towed barges and transferred to waiting bulk carriers.

THE ZERO OPTION: Consideration of the zero option is obligatory to the SEA process. As such, the option considers a situation where Corridor Sands Ltda. does not exercise its option to develop the mine at Chibuto. The result of that decision renders its proposal for either a dedicated rail link to Barragem or a dedicated road and export facility to and from Chongoene null and void. The zero option does not preclude the development of future mining operations in the area implemented by other mining companies.

Workshop participants and stakeholders considered all option and chose to retain Options 1, 2, 3, 4, for assessment and further discussion. Option 5, the Limpopo River Option barging proposal was rejected on the basis of insufficient water depth in the river to float barges loaded with mineral product. Option 6 was rejected on the basis that the Government could not possibly agree to install private facilities for each future mining operation or for each investor in the coastal area. Participants clearly understood that such a decision would fragment the coastline and permanently limit development opportunities.

THE ASSESSMENT

Participants unanimously selected options 3 and 4 as those that delivered maximum benefits to Mozambique. Of these, Option-4 the north-south road option was chosen as the option that offered the most flexibility benefited local populations and favoured all economic sectors equally. As such, option 4 was seen to have the most benefits to sustainable economic development and the most likely to contribute to national poverty alleviation objectives.

All options were recognised as having inherent environmental risks but it was considered that Option-2 the alternative export facility favoured by Corridor Sands Limitada posed the most serious threat to both the environment and to future economic development opportunities in Gaza Province. The principal recognised threat was to the tourism sector and to national tourism development strategies targeting the coastal zone of Gaza province from Zongoene to Chongoene.

Participants recognised that the time required for the realisation of either option-3 (north-south rail option) or option-4 (north-south road option) could not be accommodated within the development schedule of the Corridor Sands Mine and that insistence on the favoured solution threatened the actual development of the mine at Chibuto and the expected benefits to Gaza Province.

Participants were made aware of the extent of concessions held by Rio Tinto Mines in both Gaza and Inhambane Provinces. Rio Tinto Mines indicated that it had found substantial deposits in the Xai-Xai to Chongoene area and in the area from Quissico to Jangamo and that if these deposits were proven it was likely that they would seek to open a mine in Gaza Province between 2007 and 2010. Rio Tinto mines supported the participants' decision to favour options 3 and 4 and pledged its support to further exploration of these options. Notwithstanding, Rio Tinto also suggested that it would seek to enter into a commercial arrangement with Corridor Sands Limitada for shared use of the Option 2 solution should the government choose to accept the proposal.

Faced with a decision, the participants chose to propose a compromise solution that combined option 2 (the dedicated road and jetty option) with option 3 or 4 the north-south road or rail option. The logic for this decision was as follows:

1. The Government of Mozambique and Provincial Authorities of Gaza Province are supportive of Corridor Sands Ltda and its owners WMC to develop a mine at Chibuto.
2. The Chibuto Mine is due to be opened in 2005 with exports of mineral products at phase-1 levels due in 2007.
3. WMC, the current owners of Corridor Sands Ltda. must have a decision from the government by the end of 2003 to begin raising the capital necessary to open the mine and develop its infrastructure during 2004.
4. Rio Tinto Mines has concessions in Gaza and Inhambane Provinces that are showing promising quantities of high quality mineral deposits at locations described in Figure-1. On condition that these deposits continue to prove economic, Rio Tinto is likely to exercise its option to open a mine in the Xai-Xai –Chongoene area between 2007 and 2010.
5. The Government of the Republic of Mozambique cannot prepare, plan, design and build a north-south road with port facilities at Maputo and Inhambane-Maxixe before 2007. Assuming that the road option is selected by the State as a viable option, it is unlikely that this infrastructure can be completed before 2010-2015.
6. The export facility and jetty proposed by Corridor Sands Ltda. has a design life of 20 years. Safe operation of the jetty requires that Corridor Sands Ltda. completely replace the jetty at that time. This implies that jetty costs will have been fully amortised by this time and that the mining company could consider alternative export options. Jetty replacement would be required by 2026 at the latest.
7. Rio Tinto will have been operating in the area since 2007-2010 and will have been sharing CSL facilities. Sharing facilities will reduce the period of amortisation and a jetty could, in theory, be made redundant if alternate suitable facilities were available to the mining companies.
8. The Ministry of Tourism has designated the Xai-Xai to Chongoene Area and the coast of Inhambane as a Priority Areas for Tourism Investment. The northern segment of the Xai-Xai to Chongoene area lies in a Rio Tinto Concession with demonstrated deposits and includes the site selected by CSL for construction of its proposed alternative export facility. The Inhambane coastal area, which includes Jangamo, also lies within a Rio Tinto concession.
9. There is a clear conflict between Ministry of Tourism objectives and national objectives aiming to develop heavy sands mining activities in Gaza and Inhambane Provinces. Allocation of land for tourism investment and development in areas likely to be mined should not be considered.

10. Assuming that the allocation of land in an area contained by an area 5km north and south of the Chongoene site is not considered at the present, then direct conflicts between the mining sector and the tourism sector can be minimised and managed.
11. If land allocation for tourism is suspended in the area mentioned above until such time as Rio Tinto has completed its extraction and restored the site, then it could be considered possible for the State to consider Option-2, the dedicated road and jetty option preferred by CSL as a viable temporary alternative.
12. Any jetty constructed as a temporary export solution by CSL and shared by Rio Tinto would have to be dismantled and the site fully restored on completion of its agreed operational life.
13. The temporary solution would have a maximum period of validity of 20 years. The mining companies would undertake to use national road and port infrastructure at that time or sooner should it become possible to do so.
14. Roads infrastructure constructed by the various mining companies would be turned over to the state and would be configured to service tourism development in the Xai-Xai to Chibuto Area once the export facility was dismantled, Rio Tinto mining operations had moved on and all evidence of mining activity in the coastal area had been erased.

The logical sequence presented above formed the basis of the following compromise option that was agreed as viable and realistic by all workshop participants:

Compromise Option: Combination of Options 2 and 4.

Corridor Sands Ltda. is provided with a licence to construct its proposed alternate export facility consisting of a dedicated road linking the Chibuto mine to a stockpile facility located 2 km inland of the coast at Chongoene. The stockpile facility would be connected to jetty perpendicular to the coastline and extending offshore to a distance of 1.5 km (Option-2).

The licence provided to Corridor Sands Ltda. would have a maximum period of validity of 20 years after which time the export facility would have to be dismantled and the site restored.

The licence provided to Corridor Sands Ltda. would require that the facility be made available at fair commercial terms to other mining operators in the area.

The option requires that the Government of the Republic of Mozambique begin planning, financing procedures (structuring public-private partnerships) for a four-lane road (2 north lanes and 2 south lanes) linking Maputo to Inhambane-Maxixe with export facilities at both Maputo and Maxixe harbours (Option-4).

ENVIRONMENTAL CONSIDERATIONS AND RECOMMENDATIONS

Participants of the Bilene workshop highlighted the following environmental, policy and planning considerations resulting from group discussions and scenario building of the various transport options available to Corridor Sands Ltda. and subjected to Strategic Environmental Assessment:

- Environmental Management Capacity of both Gaza and Inhambane Provinces needs to be strengthened through targeted capacity building programmes.
- A robust Environmental Management Plan covering all aspects of the proposed transport option (**alternative export facility**) will be required and should be prepared by CSL. The Plan should be subjected to external review prior to acceptance by the government. The plan must include mitigation for all possible impacts that could affect maritime and terrestrial ecosystems, habitats and processes likely to be affected by any component of the proposed export facility
- Should the government of Mozambique accept the alternate export facility as the most suitable option, then it must ensure that the facility is made available to future mining operations at reasonable cost. It would be totally unacceptable for conditions to be set at such a level (for commercial reasons) that other mining concerns are forced to build private export facilities similar to those servicing CSL. Multiplication of private facilities would lead to coastal fragmentation and the implicit privatisation of national coastal resources.
- Operation of the proposed jetty at Chongoene has potentially serious environmental consequences. All maritime and jetty operations would have to be fully considered in an Environmental Management Plan that would have to be submitted to MICOA prior to any licensing agreement. MICOA would be advised to submit the plan to external verification and comment prior to any decision.
- The Government of Mozambique should structure its agreement with Corridor Sands Ltda. in the form of a **binding contract** that clearly defines the roles and responsibilities of all concerned parties including compliance to established environmental regulations. The contract would clearly define a mechanism to be used for the application of fines and would also provide guarantees to the mining concern. Contract arbitration should be in a neutral court (Belgium, Luxembourg, or other). The binding contractual agreement should include the jetty, its operations and liabilities. This contract should be an integral part of any licensing agreement.
- The jetty, if approved, would have to be removed and the site restored on completion of the government agreement in force. The Government agreement for transport and export of mineral product should not exceed the design life of the jetty (stated at 20 years by CSL management during the Bilene workshop).
- CSL and its concessionaires will have to be held liable if damages caused to either the environment, marine/terrestrial natural resources or private property are found to be due to negligence, management failures or other factors deemed to be within their contractual obligations.

- Jetty operations will have to be carefully monitored by MICOA staff or their designated representatives.
- CSL or its concessionaire will have to maintain a logbook recording all its operations.
- An oil spill contingency plan will have to be elaborated by CSL and agreed by MICOA.
- A maritime emergency plan will have to be developed and approved by the proper authority.
- CSL should liaise closely with tourism operators in the area to ensure that they are fully informed of its contingency plans and ready to receive information on and react to any incident damaging tourism investment or potential.
- CSL should introduce a regular beach monitoring procedure to record changes (physical or biological) that might be due to its activities in the area. MICOA (CDS-ZC) should initiate a similar procedure starting prior to construction of the proposed jetty and export facility.
- Solid waste management, and both domestic and industrial sewage treatment systems will be required for both Gaza and Inhambane Provinces. These must be planned at an early stage to avoid environmental impacts due to development of the various environmental sectors.
- **If a north south transport infrastructure** is considered by the Government of the Republic of Mozambique, then a full SEA and EIA of both the north-south railway option and the north-south road option would have to be carried out in conjunction with pre-feasibility and Feasibility studies. The feasibility studies will have to be completed by an accurate costing to 10% required to structure the financing package.
- Environmental frameworks and regulatory systems need to be developed for future development of a national transport infrastructure
- Environmental management measures will have to be prepared for areas adjacent to the road or rail corridor and for urban areas affected by the transport corridor.
- Contingency plans for the **port facilities** at Maputo and Inhambane-Maxixe will have to be elaborated or revised if already present.
- MICOA should coordinate closely with the Ministry of Tourism and the Mining Sector to ensure that priority development takes place in areas not likely to be directly affected by mining activities in the future (time frame to be decided in discussion with mining companies and CDS-ZC). Areas likely to be subjected to mining activity and having tourism potential should be allocated to investors once mining has taken place and the site has been fully restored.
- Environmental framework, environmental guidelines, project screening procedures and regulatory systems for **tourism development** need to be developed and used by all government authorities having a role in the allocation of land and the selection and monitoring of tourism development projects.

- Effluent discharge standards and regulation for the tourism industry must be developed.
- Conservation and management programmes targeting the tourism sectors need to be elaborated.
- Participants considered that environmental management measures need to be elaborated and enforced to ensure that expansion of the tourism sector does not lead to degradation of the natural environment.
- A mineral extraction and restoration plan will have to be elaborated by the mining company in close collaboration with government authorities (Ministry of Tourism, MICOA, Provincial Authorities).
- The extraction and restoration plan will also define a tourism development plan to include a schedule for allocation of land to investors. Land due to be mined should not be allocated until extraction activities have been completed and the land restored to its original state.
- **CDS-Coastal Zones must initiate discussions with the Ministry of Tourism, the Mining Companies and Provincial Government Authorities to define a Tourism Development Plan that considers and accommodates planned mining activity in designated tourism development areas (Priority Areas for Tourism Development).**
- **CDS-Coastal Zones should plan to implement its SEA based macro-zoning procedures to coastal areas from Vilancoulos (Inhambane Province) to Zongoene (Gaza Province).**
- National environmental regulations and standards will have to be systematically applied to the **agriculture sector** to reduce environmental impacts and deliver better products to the market.
- Water monitoring and testing programmes would have to be introduced to ensure compliance with environmental regulations and standards.
- MICOA would have to ensure that environmental management systems and regulations are sufficiently robust to mitigate any impacts due to **industrial development** of Gaza and Inhambane Provinces
- Environmental Management criteria and standards should be elaborated in preparation for the eventual development of a mining concession in the coastal area.
- The Government of Mozambique and CSL should have a binding contractual agreement concerning the jetty, its operations and liabilities. This contract should be an integral part of any licensing agreement.

Recognising that the Government of the Republic of Mozambique is strongly in favour of the proposed investment by WMC in the Corridor Sands Ltda. heavy sands mining project, and recognising that the economic benefits of that development project are essential to the economic

development, employment and poverty alleviation of Gaza Province, participants and stakeholders in this SEA process agreed that a compromise solution such as that discussed above would benefit both the country and the Mining company.

Participants accepted that the dedicated road and jetty option proposed by CSL as their alternate export facility was the most economic option for the company. Likewise, participants accepted the time frame forwarded by CSL was binding to the eventual development of the mine at Chibuto and therefore to the realisation of social and economic benefits expected from the development by government authorities. As such, participants and stakeholders were willing to accept the alternate export facility on a temporary basis pending the development of a national transport infrastructure that would service the population and benefit all sectors of the economy (including the mining companies).

Participants and stakeholders strongly supported the compromise option and the mining companies represented at the workshop committed themselves to assist the Government in the realisation of either a road or railway linking the country on a north-south axis. Participants recommended that the north-south rail option should be favoured over the north-south road option but that both should be considered at the pre-feasibility stage.

The results of the SEA process recommend that the Government of Mozambique endorse the compromise solution and issue directives to initiate preparatory actions required to develop a north-south transport corridor. Furthermore, participants strongly recommended that the necessary environmental, social and management safeguards be applied to the temporary solution to ensure that all possible environmental impacts linked to the alternate export facility are mitigated, managed and monitored by both MICOA and Corridor Sands Ltda.

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THE SEA REPORT

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1. INTRODUCTION

Corridor Sands Limitada (CSL) holders of a concession to mine heavy sand in the Chibuto area of Gaza Province identified deposits of titanium, iron, zircon and rutile in sufficient quantity to warrant development of a mine whose operational life exceeds 100 years. Its owners, the Southern Mining Corporation and Western Mining Corporation, prospected the mining concession issued to Corridor Sands Ltda. Once the deposit was proven, Southern Mining formulated a development plan for the Chibuto Mine that included a smelting plant, a rail link connecting the Chibuto Mine to the main CFM railway connecting Maputo to Zimbabwe, a high tension power connection and an export facility at Maputo (Matola) Harbour adjacent to the facilities currently servicing the Mozal Aluminium Plant. Southern Mining Corporation-CSL carried out Environmental Impact Assessments for all components of the Chibuto development project and these were received and accepted by the Ministry for Coordination of Environmental Affairs (MICOA) following the recommendation of its National Directorate in charge of Environmental Impact Assessments (DNAIA). An environmental license was issued by MICOA for development of the Chibuto Mine and its component infrastructure on the 16th of September 2002.

The quality and quantity of titanium deposits at Chibuto led WMC to purchase the Southern Mining Corporation shareholding in early 2003. As sole owners of Corridor Sands Ltda., its concession, and license to develop the Chibuto deposit, WMC decided to reconsider the transport option proposed by Southern Mining Corporation following a feasibility study that demonstrated that the risks inherent to the proposal (flooding of the Limpopo river basin) and its cost were, in effect, sufficiently serious to warrant withdrawal of its option to develop the Chibuto Mine.

WMC commissioned a study to identify alternatives to the licensed Chibuto rail link and decided on a dedicated road linking the Chibuto Mine to a stockpile facility located two kilometres from the coastline at Chongoene. The stockpile facility would be connected (by closed conveyor belts) to a dedicated jetty extending 1500 metres into the sea perpendicular to the coastline. The selected alternative transport option was presented to MICOA and DNAIA for approval. On receipt of the proposal DNAIA immediately recognised that the proposed alternative transport option presented sufficient risks to national development plans that it requested external assistance to fully consider and assess the proposal. An initial assessment was carried out with support from the Netherlands and its National Council for Environmental Impact Assessment (NCEIA). The assessment recommended that the proposed alternative export facility proposed by CSL and WMC be subjected to and Strategic Environmental Assessment (SEA) to determine the broader and cumulative impacts that could be expected from the proposal.

MICOA requested assistance from the Danish Government to carry out the SEA recommended by NCEIA on the alternative export facility and transport variants elaborated by MICOA and Officials of the Provincial Directorates of Gaza Province. The transport option variants were communicated to CSL who were invited to participate in the SEA procedure.

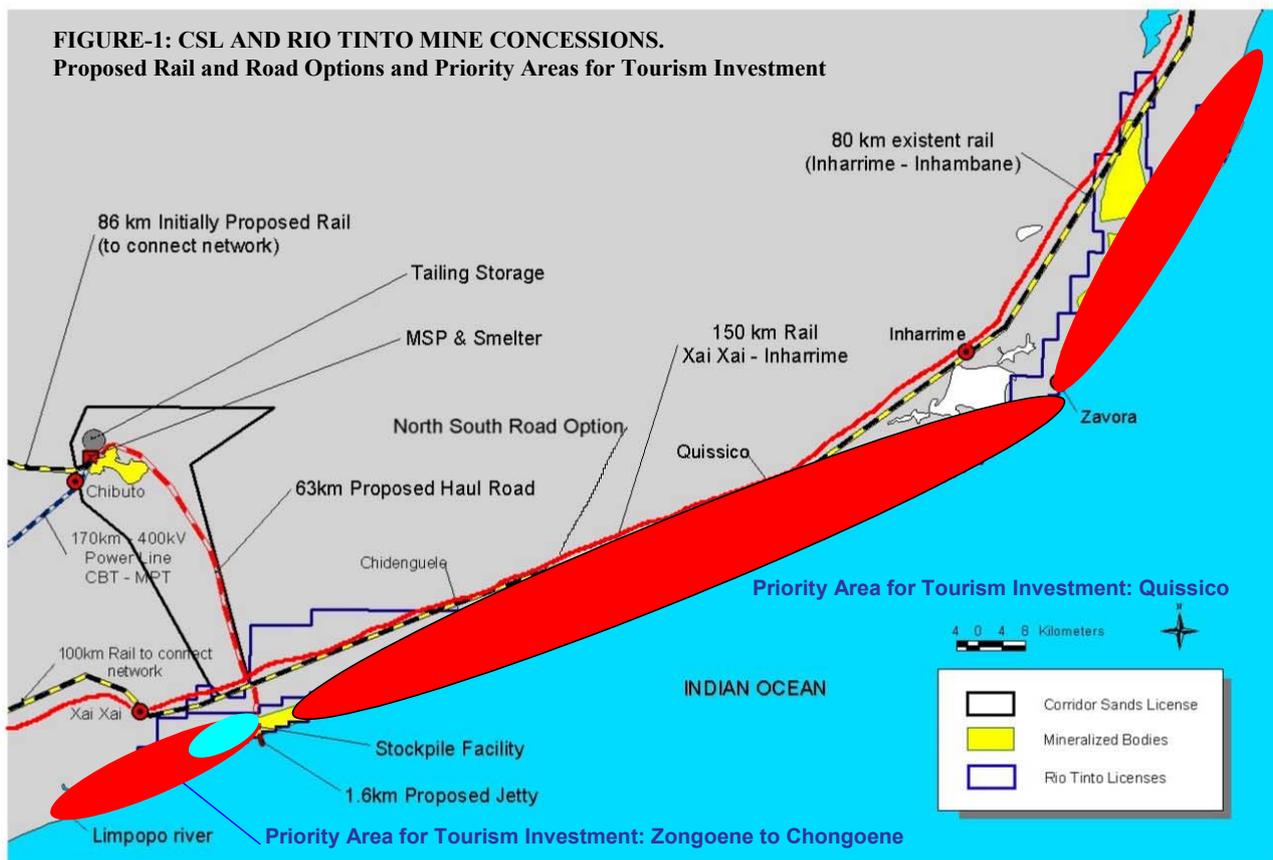
This document presents the results of the SEA process carried out in part during a stakeholder workshop held at Bilene from the 30th of July to the 2nd of August 2003. This document once approved by stakeholders and verified by NCEIA will be presented to the National Council for Sustainable Development for endorsement.

1.1 DEVELOPMENT CONTEXT

Gaza Province is recognised as one of the most disadvantaged Provinces in the Republic of Mozambique. Unemployment is high and unlikely to be reversed unless the Province attracts investment to develop potential opportunities in the tourism, mining, agriculture, manufacturing, industrial, services and nature conservation sectors. As such, Gaza Province and the Government of the republic of Mozambique are actively promoting investment in the Province to develop existing opportunities, create employment, improve the availability and delivery of social services and alleviate poverty.

1.2 MINING SECTOR

Gaza Province has proven titanium, iron, zircon and rutile deposits identified in concessions held by either WMC at its Corridor Sands concession or by Rio Tinto Mines that holds concessions at various points in both Gaza and Inhambane Provinces (Figure-1). Corridor Sands Ltda. has



completed its exploration and testing phase and is planning to develop its mine in 2005. Rio Tinto Mines has identified deposits of importance but is still in an exploration phase and has not yet tested the deposits to determine if these are of commercial value. Corridor Sands intends to mine an inland area. Rio Tinto Mines has identified an indication of high value deposits in coastal areas.

The presence of deposits in coastal areas and the proposed export facility at Chongoene are a threat to national tourism development objectives. Mining activities and tourism development are

generally considered as incompatible activities and as such demand that tourism development plans be closely coordinated with national plans for the development of the mining sector. The present SEA of transport options for the CSL mine at Chibuto should provide directives for actions leading to the requisite sectoral coordination and should benefit both the CSL project and any future Rio Tinto Mines activity in Gaza and Inhambane Provinces.

1.3 TOURISM AND NATURE CONSERVATION SECTOR

The National Tourism Strategy for Mozambique (KPMG, 2003) notes, “Mozambique has the potential to become a world-class tourism destination for regional and international tourism. The possibility to combine one of the finest beach experiences in Africa with the cosmopolitan life of the Country’s cities, the excellent opportunities for eco-tourism offered by the diverse flora and fauna and a rich history and culture offers an excellent base upon which to build a sustainable tourism destination.

The challenge now lies with the promotion and development of tourism as an engine for economic growth and the engagement of both the public and private sector as well the community in the delivery of services in the tourism sector a reality. It must be recognised though that Mozambique remains in the early stages of development as a tourism destination and that development is hindered by the lack of suitable infrastructure and facilities”.

The tourism strategy divides the country into three regions (South, Centre and North). The south region is of particular importance to the issue of Corridor Sands Ltda. and the development of heavy sands mining activities in both Gaza and Inhambane Provinces.

Tourism in the South is built primarily around the rich coastal assets of the three southern provinces. Conditions for water sports activities can be difficult but the presence of sheltered coastal lagoons provide opportunities to develop the sun and sea tourism line. In addition the existence of the Great Limpopo Trans-frontier Park between Mozambique, South Africa and Zimbabwe is considered a milestone for the development of tourism in Mozambique and is already attracting potential investors both to the Park and the coastal areas of Gaza and Inhambane Provinces. The park is likely to play an important role in the marketing and image building of Mozambique as a tourism destination (KPMG, 2003). The Park has connected the interior of the country to the coast as demonstrated by increasing interest in the development of “Bush-Beach” tourism products.

The tourism potential of the Xai-Xai to Chongoene area has been recognised and the national strategy designates the coast as a Priority Area for Tourism Investment (Figure-1). The development and economic potential of the area has been assessed as part of the preparatory work for the SEA and is presented as Annex-7 of this report.

1.4 INDUSTRY AND MANUFACTURING SECTOR

Industry and manufacturing capacity in Gaza Province is largely undeveloped. It is expected that development of the CSL mine at Chibuto will contribute positively to the development of this economic sector.

1.5 SERVICES SECTOR

Virtually absent at present in Gaza Province, the services sector is expected to expand rapidly with development of the CSL mine and expansion of the tourism sector stimulated by the existence of the Great Limpopo Trans-frontier Park and active promotion by the Ministry of Tourism. Expansion of the Services Sector would generate substantial employment and contribute significantly to the economic development and poverty alleviation of Gaza Province.

1.6 AGRICULTURE SECTOR

The agricultural sector is currently expanding with activities linked to the Limpopo Corridor (Strategic Development Initiative). Agriculture remains primarily centred on smallholdings and subsistence agriculture. The sector is likely to expand once the Chibuto mine is activated and its impact on the local economy begins to be felt. Likewise the sector will expand in response to demand from the tourism sector likely to become implanted in the area from 2005 onwards.

1.7 FISHERIES

The fisheries sector is unlikely to be directly affected by development of the Chibuto mine. Development of the proposed alternate export facility does pose a potentially serious threat to fish and invertebrate stocks. The proposed export jetty at Chongoene lies within the Limpopo fisheries reserve and any accidental diesel or fuel oil spill could damage shrimp nursery areas and result in catastrophic mortality of juveniles. Subsistence fisheries remain an important source of protein and nourishment for local populations.

1.8 THE CORRIDOR SANDS PROJECT

The first phase of the mining development will include the establishment of three smelter furnaces that will start production in 2007. Two production phases are planned, 2007-2010 and 2011-2019 (see table below for production figures).

Ore type	1 st Phase (2007-2010)	2 nd Phase (2111-2019)
Titanium Slag	375,000	1,000,000
High purity iron (in pigs)	195,000	520,000
Zircon	30,000	110,000
Rutile	12,000	32,500

In addition up to 200,000 tonnes of anthracite and diesel fuel to meet the needs of the mine is expected to be imported on an annual basis.

The environmental license was granted for the development using a rail link to Matola harbour. However, Corridor Sands Limited now proposes the development of a private, dedicated alternative export facility (AEF) that comprises:

- A 63km private long haul road from the smelter at Chibuto to Chongoene beach.
- A private bulk cargo facility (Materials and Stockpile Facility) behind the frontal dunes at Chongoene beach.
- A private open-lattice jetty, built perpendicular to the coastline, which would be 1.5 km long and approximately 20 meters above mean sea level.

Corridor Sands Ltd is in favour of the AEF, which, it indicates, would generate substantial savings in capital, and operational costs (transportation and export of products as well as import of inputs), facilitate further expansion, minimise risks of down time and enhance the company's control of operations.

2. METHODOLOGY

2.1 INTRODUCTION

Strategic Environmental Assessment was introduced to Mozambique as a means to achieve the necessary institutional collaboration essential Integrated Coastal Zone Management. The methods used are a distillate of several methods, manuals and reviews and structured to meet the needs and political context of the Republic of Mozambique. The process has been systematically applied by MICOA through its Center for Sustainable Development having specific responsibilities over the country's coastal zones (CDS-ZC). The SEA methodology developed for CDS-ZC is applied to coastal development plans, programmes and policies. The process has delivered cross-sectoral integration among government authorities having an interest in the coastal zone, it has involved civil society, it has led to the establishment of public sector/private sector technical committees advising provincial government and has delivered environmental frameworks serving to select and monitor coastal development activities. As a participatory process, the method applied by MICOA and CDS-ZC has been instrumental in raising institutional awareness regarding the cumulative environmental, social and economic consequences of actions, decisions, policies, plans and programmes. It is within this context that MICOA chose to apply its process to assess the cumulative impacts (positive or negative) of the transport options proposed by Corridor Sands Ltda. and variant options forwarded by: CDS-ZC, MICOA Stakeholder Government Ministries and their Provincial Directorates and Civil Society represented by investors in the affected area or NGO's.

2.2 DEFINITION AND DESCRIPTION OF THE SEA PROCESS

Sadler and Verheem (1996) drafted the generally quoted definition for Strategic Environmental Assessment (SEA):

“SEA is a systematic process for evaluating the environmental consequences of proposed policy, plan or programme initiatives in order to ensure they are fully included and appropriately addressed at the earliest appropriate stage of decision-making on par with economic and social considerations”. The Process includes a written report and the involvement of both stakeholders and the public throughout the process.

The SEA process by definition must therefore be an issues driven participative approach to the environmental assessment of plans and policies. Furthermore, it should contribute to sustainable development through the assessment of strengths and weaknesses and environmental resources, which can support or be detrimental to development.

The process is designed to:

- Be implemented pro-actively and should inform and be supportive of development proposals.
- Facilitate the design of environmentally sustainable policies, plans and development proposals.
- Consider a range of alternative options to the proposed policy, plan, programme or development proposal.

- Consider the cumulative effects of the proposed policy, plan, programme or development proposal on a local, sectoral, regional, national or global perspective.
- Define the environmental parameters within which a particular development proposal can be realised.
- Create a framework against which impacts and benefits due to a particular policy, plan, programme or development proposal can be measured.
- In the Mozambican context, the process is designed to be fully transparent, participatory and deliver cross-sectoral co-ordination essential to consistent decisions and rapid implementation of development proposals.

2.3 THE SEA PROCESS

The process applied in Mozambique and drawn primarily from: *The Manual on Strategic Environmental Assessment of Transport Infrastructure Plans – The European Commission DG Energy and Transport, 200*; *the CSIR Guidelines for Strategic Environmental Assessment in South Africa, 2000*; and *the European Review on SEA and Integration of Environment into Strategic Decision Making, EU- Commission-ICON, 2001* consists of the following steps:

2.3.1 SCREENING

Policies, programmes, plans and development proposals are screened by the Environmental Authority or by the source Authority responsible for the preparation of the programme, plan policy or development proposal to determine the need to subject the object to an SEA process. The screening process requires that the Environmental Authority, source Authority or similar question the object to determine whether:

- The Policy, Plan, Programme or Development Proposal is likely to have significant environmental, social or economic impacts that could be reduced by subjecting it to the SEA procedure.
- The Policy, Plan, Programme or Development Proposal sets a framework for further projects that will require an EIA according to national legislation.
- The Policy, Plan, Programme or Development Proposal is likely to have significant impacts on societal activities which themselves are likely to result in significant environmental, social or economic impacts (e.g. Expansion of infrastructure, urbanisation, transport, special development zones, settlement in the affected area, etc.).
- The Policy, Plan, Programme or Development Proposal is exempt from the SEA process following a clear demonstration that it will not have any environmental consequences.

Following receipt of the proposal for an Alternate Export Facility to service the Corridor Sands Development, MICOA recognised that the proposal was likely to have significant environmental, social and economic impacts and chose to subject the proposal and variants of it to its SEA procedure.

2.3.2 SCOPING

This phase of the SEA defines the information the SEA report should provide. It concentrates on relevant impacts and possible alternatives and includes:

- The environmental objectives and indicators (if any at this stage) that should be considered by the SEA
- The environmental impacts to be considered by the SEA including cumulative impacts.
- A decision on the alternatives to be considered by the SEA. Scoping will result in a listing of alternatives that will be considered and assessed by the process.
- An approach to the assessment (baseline studies and surveys, forecasting, back-casting, scenario building, expert judgement, etc.)
- A full justification for leaving issues out of the SEA that might have been proposed during the scoping phase.

The approach selected by MICOA for the SEA of transport options available to or proposed by Corridor Sands Ltda. was one that combined scenario building and expert judgement. Participants representing stakeholder institutions, civil society, the mining sector and Corridor Sands Ltda. (and its advisors) were treated as experts having detailed information regarding sectoral development objectives, business development objectives (CSL) or representing the best interests of society. The process selected by MICOA emphasised stakeholder participation and significant efforts were made throughout the process to ensure that bias was not injected at any stage.

2.3.3 IMPACT ASSESSMENT

Impact assessment normally relies on the availability of suitable data sets and environmental baseline determined for the defined study area. In the absence of robust data sets and baselines, the SEA can be effectively carried out on the basis of expert judgement, rapid surveys and existing data sets. CDS-ZC has an environmental and biodiversity baseline for the target area. The impact assessment of CSL transport options and its variants were assessed on the basis of scenario building and impact forecasting relative to a *do nothing-or zero option scenarios*. Forecasting was carried out on the basis of expert judgement.

Transport options were considered relative to sectors or policies that could be either directly or indirectly impacted. Participants recognised that sectors and policies are inter-related and that impacts and risks (positive or negative) recorded for any particular sector would clearly have knock-on and cumulative effects on other sectors or policies. Sectors and policies agreed by stakeholders and considered by the SEA process were:

- Transport and Communications including maritime transport
- Tourism sector (investment, services, policies and strategy)
- Agriculture sector
- Industrial sector
- Mining sector
- Health sector
- Environment sector

- Natural resources and conservation sector
- Fisheries sector
- Construction sector
- Social affairs, employment and poverty alleviation (PARPA)
- Financial sector
- Foreign Affairs
- Planning
- Monetary policy
- Sector policies
- Tax and Trade policies
- SME's and policies regarding micro-credits
- Investment and promotion policies (local, national, regional)

2.3.4 SEA REPORT AND TECHNICAL SUMMARY

The SEA Report is written to inform decision-makers on the environmental impacts of the programme, policy, plan or development proposal. The nature of the process applied by MICOA to assess the impacts expected from the CSL transport options also identifies social and economic impacts that in the opinion of participants are directly related to the presence and magnitude of forecasted environmental impacts. As such, the report also records social and economic impacts (positive or negative) identified by participants during workshop discussions.

2.3.5 TECHNICAL REVIEW

The Technical Review of the SEA process and Report is carried out by an external neutral body and provides a means for quality assurance of both the report and the process. The review determines whether the Report has addressed the issues raised during the scoping phase and determines and whether all options and alternatives have been fully discussed, forecasts accurately presented and determines whether the level of participation has been adequate. The review process concentrates heavily on the Executive Summary that must accurately reflect the contents of the Report.

2.3.6 RECORD OF DECISION

On completion of the Technical Review, the approved final SEA report is submitted to the proper authority for validation. Validation consists of a Record of Decision that, in effect, has a similar legal function to a Decree or Instruction. The validation sets out the environmental protection requirements (licensing, monitoring, inspection, fines, standards, etc.) to be used by different tiers of government in respect to the policy, plan programme or development proposal.

2.3.7 IMPLEMENTATION AND MONITORING

Once approved the decision will clear the way for implementation. All tiers of government and the initiating body (in this case CSL) are fully informed of the environmental standards and parameters that must be respected. Clear environmental management objectives are set, monitoring programmes are designed to ensure compliance, rapidly detect unexpected impacts and introduce corrective measures.

2.4 CORRIDOR SANDS LTDA: SEA OF TRANSPORT OPTIONS

2.4.1 Assessment of Impacts

As stated previously an environmental licence has been granted for the development to use the rail link option. An Environmental Impact Assessment (EIA) of the AEF is currently being undertaken and is due to be completed in October 2003. During the scoping phase of the EIA of the AEF, the National Directorate for Environmental Impact Assessment requested and received technical assistance from the Commission for Environmental Impact Assessment in the Netherlands (NCEIA). A mission from NCEIA visited Mozambique in February 2003 and held broad consultations with provincial and central government bodies and institutions, the proponent and the proponent's EIA consultant as well as visiting the proposed site of the AEF and the port of Matola and Maputo. The outcome of the mission was a set of advisory guidelines that recommends the undertaking of a Strategic Environmental Assessment (SEA) (this was also recommended by the Centre for Sustainable development of Coastal Zones (CDS-ZC) during the NCEIA mission) to help decision making of the transport options including siting and routing of transport infrastructure that would then be followed by a project EIA to assist decision making on design alternatives and mitigation of environmental impacts.

The rationale for a SEA of the transport option is based on the considerable bio-physical, social and economic impacts of the AEF as well as the relative cumulative impacts of the transport options on other economic forecasts, strategies and plans for the development of southern Mozambique's resources. The objective of the SEA will be to assist decision makers at Provincial and Central level to analyse the transport options and to make their choice of which option to develop based on its contribution to the sustainable economic development of Mozambique as a whole. More detailed justification is provided in the advisory guidelines prepared by NCEIA.

2.4.2 The Proposed SEA Process

The proposed SEA process presented in this section is based on the advice of NCEIA and work that has already been undertaken in SEA by CDS-ZC.

The proposed process is based on the following steps inherent in SEA:

SEA Stage	Description/Observation
Screening	This has already been completed as it is agreed that the use of SEA is appropriate for this development
Scoping	Definition of objectives and indicators to be accounted for in the SEA, environmental impacts to be considered including cumulative impacts, whether alternatives and/or type of alternatives should be considered by the SEA and the type of required data (consideration to be given to data availability, baseline studies and surveys, forecasting, scenario construction).
Baseline Survey	Collection of existing information as required by the scoping stage including biophysical and socio-economic surveys, verification of existing data, plans, policies and strategies. This stage will also include the presentation of information on baseline maps and map overlays for use in the Evaluation of Impacts.
Evaluation of	This will be undertaken using stakeholders (see NCEIA report) to

SEA Stage	Description/Observation
Impacts	identify impacts and formulate scenarios that follow sustainable development principles in a three-day workshop format. The outputs of the workshop will be one or two scenarios with associated social, economic and environmental impacts as defined by the scoping phase. These scenarios will be presented to the decision makers.
Report and Technical Summary	A technical report of the impacts of the scenario(s) produced by the process. A draft report will be produced and then reviewed by the agency(ies) involved in the scoping phase. After review a final version will be produced for consideration by the decision making body.
Decision Making	The final decision making body for the process will be the National Council for Sustainable development (CONDES) and its technical committee made up of national directors. The decision making process shall also include the Provincial Government of Gaza (Inhambane and Maputo?)

3. TRANSPORT OPTIONS

3.1 Background

Southern Mining Corporation of South Africa, the former owners of the Corridor Sands mining concession prepared and submitted Environmental Impact Assessments for its proposed mining development in Chibuto, its proposed export facility in Maputo Harbour adjacent to the MOZAL export facility and a proposal for a dedicated rail link connecting the Chibuto Mine to the main Maputo to Zimbabwe line at Barragem. MICOA, The Ministry for Coordination of Environmental Affairs received and evaluated the Environmental Impact Assessments and issued environmental licences for all components proposed by Southern Mining Corporation.

Western Mining Company (WMC Resources Ltd.) a major Australian mining company with global operations became involved in the Corridor sands Project in 2000 and moved to purchase the totality of shares held by Southern Mining Corporation during the first quarter of 2003. As sole proprietors of Corridor Sands Limitada, WMC carried out extensive feasibility studies of the proposed transport option agreed by the Government of the Republic of Mozambique. The study demonstrated that the rail link increased operational risks and costs due to management incompatibilities, unpredictable tariffs, flood risk, and export capacity of the Maputo Harbour facility (WMC-Corridor Sands presentation material). As such, the new owners proposed an alternate export facility to the Government of Mozambique consisting of a dedicated road linking the Chibuto mine to an export facility located 2kms from the coast at Chongoene and then to a dedicated 1.5km jetty capable of berthing 2 bulk carriers at its extremity. It is important to note that the jetty proposed by WMC/Corridor Sands Limitada has a 20-year operational expectancy and would have to be completely rebuilt at that time.

MICOA received the request for approval of the alternate export facility proposed by Corridor Sands Limitada and moved to question the proposal on grounds that the proposed alternative could result in potentially serious environmental impacts and could reduce the tourism development potential of the Xai-Xai to Chongoene coastal region. MICOA also considered the recent designation of the area as a Priority Area for Tourism Investment (PATI) and, according to its mandate was obliged to consider the interests of all concerned Line Ministries, Government Authorities and the Private Sector. As such, MICOA initiated an SEA procedure to consider the cumulative environmental, social and economic impacts expected from and due to the alternative export facility proposed by Corridor Sands Ltda and to forward alternative transport options which could serve the development objectives of both the mining company and the Government of the Republic of Mozambique.

Proposed transport options were presented and discussed with the mining company prior to stakeholder consultation. An additional option (a North-South Trunk Road option) was included in the list of possible options following consultations with representatives of the Provincial Directorates from Gaza Province on the 14th of July 2003 (Annex-9). Transport options listed below were presented to stakeholder participants and discussed in detail during the SEA Workshop held at Bilene from the 30th of July to the 2nd of August. Participants (Annex-8) were then asked to discard all options they considered either unrealistic or unfeasible.

3.2 Transport Options

The mineral transport options proposed by Corridor Sands Ltda. or tabled by either concerned stakeholders or MICOA are described below and presented in the format delivered to workshop participants as Annex-1.

3.2.1 Option-1: The original and licensed transport proposal presented by Corridor Sands Ltda.

A dedicated rail link connecting the Chibuto Mine to the Maputo to Zimbabwe railway at Barragem and an export facility located in Maputo Harbour adjacent to facilities servicing the Mozal facility.

The original proposal proposed by Corridor sands Ltda. and accepted by the Government of Mozambique. The proposal consisted of the construction of a dedicated rail link connecting the Chibuto Mine to the main CFM Maputo to Zimbabwe rail link at Barragem. A concessionaire on behalf of CSL management would operate the link and would have been responsible for all interaction with CFM and other concerned government authorities. An export facility would have been built in Maputo harbour adjacent to the facility currently servicing MOZAL. WMC the current owners of CSL considered that this option had inherent killer risks to their planned mining activities that included: Flood risk; Tariffs; Political risk; Insufficient harbour capacity; Cost; Management incompatibility; Insufficient axel loading; and others. As such, WMC proposed to discard the rail link option and moved to develop its alternated export facility option presented below as Option-2.

3.2.2 Option-2: The alternative export facility proposed by Corridor Sands Ltda.

A dedicated 63 km road designed to carry road trains (motorised mineral transporters) each capable of transporting 100 metric tonnes of mineral products to a holding area located 2 km inland of the coastline at Chongoene. The proposal also includes a dedicated jetty extending 1.5 km seaward and perpendicular to the coastline at Chongoene. The jetty and holding area would be connected through a network of closed conveyor belts and pipes feeding mineral products to bulk carriers and receiving essential process materials (anthracite, diesel, other fuels) for the mine at Chibuto.

The option proposed by CSL presented sufficient environmental, social, economic and development risks to the State that it chose to initiate the current SEA process to evaluate the cumulative consequences of the proposed alternative export facility. The option described above was given equal weight to all other options under consideration.

3.2.3 Option-3: The option was forwarded by MICOA for consideration by both stakeholders and Corridor Sands Ltda.

A north-south railway line connecting Maputo to Inhambane-Maxixe is proposed. The line could be extended north to the border with Tanzania thereby servicing coastal populations and providing a north-south transport link vital to the future economic development of Mozambique. The North railway link would service all proposed and future mining operations in both Gaza and Inhambane Provinces. The tabled option would also require the development of port facilities in both Maputo and Maxixe. The tabled option would be developed as a partnership involving the Government of the Republic of Mozambique, the Mining Companies having concessions in the area, bilateral donors and International Financing Institutions.

In response to the development needs of the country and taking into consideration the immediate needs of the mining sector and in particular the CSL mine development project at Chibuto, MICOA considered that this option could be tabled following agreement from stakeholders at the Bilene workshop. The proposal responds to national development objectives and could contribute significantly to development of the concerned provinces initially and the country when completed.

3.2.4 Option-4: The representative from the Provincial Directorate (Gaza Province) of the Ministry of Transport and Communications forwarded the option described below.

A 4-lane trunk road linking Maputo to Inhambane-Maxixe servicing mining sector interests, the local population and other economic interests in the area (tourism, agriculture, manufacturing, etc.). Development of this infrastructure would be structured as a partnership similar to that described above. The proposed road would be extended north to the border with Tanzania as funds become available and in response to the country's development needs.

MICOA considered that this option proposed by Provincial Director –Ministry of Transport could be tabled and considered following agreement from stakeholders at the Bilene workshop. The option, a variant of the north-south rail option responds to national development objectives and could contribute significantly to local and national development objectives.

3.2.5 Option-5: The option was proposed by MICOA for consideration by both Stakeholders and Corridor Sands Ltda.

The Government of the Republic of Mozambique agrees to the construction of dedicated roads and export facilities such as those proposed by Corridor Sands Ltda. for all mining operations in the same geographic area and the country.

The option considers the worst-case scenario in which all mining operations initiated in the republic of Mozambique are provided with authorisations to construct private export facilities. Given the spread of mineral deposits in the country (Figure-1 for Gaza and southern Inhambane Provinces) it would be possible that mineral products would be exported from loading jetties conveniently located adjacent to each extraction site. This would limit tourism development potential, fragment the coastline, increase the risk of shipping accidents and spills, limit future employment opportunities that would otherwise have been made available from the tourism and the tourism services sector, and others.

3.2.6 Option-6: The option was proposed by MICOA for consideration by both Stakeholders and Corridor Sands Ltda.

The Limpopo River Option. Mining concerns would develop stockpile facilities in a flood safe area adjacent to the banks of the Limpopo River. Mineral products would then be transported to an offshore loading area by towed barges and transferred to waiting bulk carriers.

The option considered the possibility of transporting mineral product to an offshore loading area equipped with a Single Buoy Mooring System (SBM). Motorised or towed barges could be used to load material from a location adjacent to Xai-Xai and move the product downstream to the loading area. Similarly offloaded material could be brought inland to the holding ground for transfer to the mine.

3.2.7 Option-7: The ZERO OPTION.

Consideration of the zero option is obligatory to the SEA process. As such, the option considers a situation where Corridor Sands Ltda. does not exercise its option to develop the mine at Chibuto. The result of that decision renders its proposal for either a dedicated rail link to Barragem or a dedicated road and export facility to and from Chongoene null and void. The zero option does not preclude the development of future mining operations in the area implemented by other mining companies.

The zero option considers a scenario whereby the CSL mine is not developed. Development of Gaza Province and its mineral resources continues. Tourism, stimulated by government policies and strategies and stimulated by the existence of the Great Limpopo Trans-boundary Park expands. Other mining concerns develop activities at a later date.

3.3 OPTIONS RETAINED BY THE WORKSHOP PARTICIPANTS

All options were described in detail to workshop participants. Participants were then requested to carefully consider the various options, discard options they considered unworkable or unfeasible, propose additional options for consideration by the floor and comment, as necessary, on the rationale for their decisions.

The unanimous choice of the participants was as follows:

Option-1: The dedicated rail link from Chibuto to Barragem.

The option was retained by the floor who considered that the original proposal licensed by MICOA was still valid and deserved due consideration by workshop participants. The option was deemed to contribute to the economic development of Gaza Province and would provide direct benefits to local populations.

Option-2: The dedicated road and jetty option linking the Chibuto Mine to Chongoene.

Workshop participants who all recognised that it was the mining company's favoured option retained the option for further discussion.

Option-3: The North-South railway connecting Maputo to Inhambane and Maxixe.

Workshop participants who recognised that it's potential to contribute significantly to both local and national development objectives retained the option. Participants considered the option costly but chose to consider the option and compare it to Option-4 the north-south road option.

Option-4: The North-South trunk road connecting Maputo to Inhambane and Maxixe.

Workshop participants who recognised that it's potential to contribute significantly to both local and national development objectives retained the option.

Option-7: The Zero option.

Participants, who all understood the value of building scenarios based on the premise that the Corridor Sands Chibuto project with its facilities at Chongoene would not be realised, retained the zero option.

3.4 OPTIONS REJECTED BY THE WORKSHOP PARTICIPANTS**The participants unanimously rejected the following options:**

Option-5: *The Government of the Republic of Mozambique agrees to the construction of dedicated roads and export facilities such as those proposed by Corridor Sands Ltda. for all mining operations in the same geographic area and the country.*

The option was rejected on the basis that participants did not accept that the government could consider a similar solution for future mining operations in the same geographic area or the country as a whole. There was recognition that such a solution would not benefit the country, its population or contribute to its development objectives. There was general recognition that a series of dedicated roads and jetties would limit future tourism development opportunities and reduce access to coastal resources.

Option-6: *The Limpopo River Option. Mining concerns would develop stockpile facilities in a flood safe area adjacent to the banks of the Limpopo River. Mineral products would then be transported to an offshore loading area by towed barges and transferred to waiting bulk carriers.*

Workshop participants considered the option difficult to realise and did not consider that the option would contribute significantly to the development of either Gaza Province or the country. Corridor Sands Ltda. who had carried out a bathymetric investigation of the river and concluded that the depth was insufficient to safely navigate barges to an offshore loading area rejected this option.

Scenarios were constructed and assessed on the basis of expert opinion expressed by workshop participants. The Scenarios and their assessment represent the collective opinion and vision of the participants and stakeholders present at the Bilene workshop held at Bilene from the 30th of July to the 2nd of August 2003.

4. IMPACT ASSESSMENT

4.1 GENERAL DESCRIPTION OF TRANSPORT OPTIONS AND FORECASTING TO YEAR 2025

Scenarios retained by workshop participants and stakeholders were constructed and assessed relative to a “do nothing” or *zero option* scenario. Results indicated that participants were not always clear on the cumulative environmental, social or economic consequences (positive or negative) of a particular option on the various sectors or policies under consideration. The impact of each transport option on individual sectors under consideration was expressed clearly by workshop participants and is presented below. It is hoped that the text accurately reflects the intended opinion of the participants.

4.2 THE ZERO OPTION

The Corridor Sands Project consisting of a mine at Chibuto and associated transport infrastructure is not developed. The zero scenario does not exclude the development of other mining concerns in the geographic area in the future.

Geographic Area of Impacts or Influence

Gaza Province

State at Time-0 (2004)

Current state of Gaza Province: Unemployment is high, investment in the province is low, public health issues (SIDA) are increasing and prevalent, access to social services for rural communities is limited, poverty levels are high and affect the natural resource base. The Limpopo trans-frontier park exists and is generating investor interest in the coastal area (demand for availability of coastal tourism development concessions). Infrastructure is insufficient; there are no facilities for regional air links.

State at Time+5 (2009)

Tourism development of the coastal areas and concessions within the Limpopo Trans-frontier Park has been initiated. The number of completed facilities is limited. Employment in the tourism sector is increasing. Employment in the construction sector is increasing to satisfy demand by tourism development. Access infrastructure is being improved to cater to increasing tourism. Negative impacts due to tourism become apparent and require improvement of solid waste management systems. Slight increase in the number companies servicing tourism (tour operators, guides, suppliers, transport, etc.). Increasing demand for services (water, electricity, communications etc) becomes apparent. Social services are vitalised and improved as the economy begins to expand.

State at Time+10 (2014)

Tourism is implanted and continues to expand. Tourism is limited by the availability of land suitable for development. A mining operation is initiated and generates additional employment. Service companies (tourism and mining increase in numbers). Employment in the service sector increases. Small and medium scale enterprises increasing as funding becomes available. Economy expands. Negative environmental and social impacts become apparent and demand specific management and mitigation (solid waste management, loss of biodiversity, waste water treatment,

prostitution, poverty, SIDA etc.) Population is more aware of the value of resources and participates in management. Improvement of natural resource conservation and management programmes deliver benefits to local populations. Transport infrastructure is improved (road, rail, regional air links are established). Agriculture servicing tourism and the mining sector expands. Social services more accessible and of better quality. Poverty reduction due to increased direct and indirect employment becomes apparent.

State at Time-+21 (2025)

Tourism now well established in the region (Gaza and Inhambane Provinces) and contributes substantially to local, regional and national economies. Environmental impacts due to tourism are well managed and reduced. Resource value is recognised by the population as essential to tourism and sustained employment. Tourism due to the trans-frontier parks is contributing to the economy. The mining sector is now well established and generates revenue to the state and the region. Transport infrastructure is sufficient to meet the needs of the population, mining, tourism, and other economic sectors. All sectors of economic activity are expanding in the geographic area of influence. Gaza Province contributes to the national economy. Investment in the province increases and associated environmental and social impacts are monitored and managed. Population has increased and services have improved to provide basic and essential services to that population. The regional airport facilities are expanded to receive larger aircraft possibly even international flights.

4.3 OPTION-1: A dedicated rail link connecting the Chibuto Mine to the Maputo to Zimbabwe railway at Barragem and an export facility located in Maputo Harbour adjacent to facilities servicing the Mozal facility.

Geographic Area of Impacts or Influence

The Chokwe, Guija and Chibuto Districts of Gaza Province.

State at Time-0 (2004)

Status quo and a situation similar to that described for the zero scenario. Unemployment remains high, social services are limited and do not reach all the population in the affected area. The rail line is constructed from 2005 and completion is expected in 2007 in time for commencement of phase-1 mining operations.

State at Time-+5 (2009)

Dedicated rail link is operational. Construction has followed agreed procedures and mitigation identified in the approved EIA has been followed. Rail link does not generate income to the state. Transport on the CFM Maputo to Zimbabwe line generates revenue to the state.

State at Time-+10 (2014)

Rail link is operational and three 30-wagon trains are operating daily. The line does not benefit local populations directly but agreement is made with CSL to interpose freight or limited passenger service. Development of the Mine has generated employment and begins to generate a mining-services industry. Industrial development and resulting environmental impacts become apparent. Increase in settlement in the area, urban expansion requires planning and environmental

management systems are introduced to deal with impacts that are becoming increasingly apparent. Expanding economy, and settlement improve the availability and delivery of social services. PARPA objectives at the local level in the area directly affected by the mine are being met.

State at Time+21 (2025)

The rail link and traffic on the CFM Maputo to Zimbabwe line are at full capacity. Nine 30-wagon trains are operating daily. Traffic is increased as other mining operations are brought on line. The CFM rail line is upgraded to meet increased traffic load. Settlement in the area continues to increase as employment opportunities in the mining sector, service industries or the tourism sector become available. Conflicts between the mining and tourism sectors become apparent and are mitigated through high-level development planning. Environmental management needs are acute to mitigate impacts to increased economic activity and settlement in the area. The mining and tourism sector participates actively in the implementation of management and mitigation measures according to the licensing conditionality.

4.4 OPTION-2: A dedicated 63 km road designed to carry road trains (motorised mineral transporters) each capable of transporting 100 metric tonnes of mineral products to a holding area located 2 km inland of the coastline at Chongoene. The proposal also includes a dedicated jetty extending 1.5 km seaward and perpendicular to the coastline at Chongoene. The jetty and holding area would be connected through a network of closed conveyor belts and pipes feeding mineral products to bulk carriers and receiving essential process materials (anthracite, diesel, other fuels) for the mine at Chibuto.

Geographic Area of Impacts or Influence

The geographic area affected by the option would be the region of Chibuto, Manjacaze, Xai-Xai and the coastal area adjacent to the jetty site at Chongoene. The mine and its infrastructure would affect tourism, agriculture and industry including the gas and electricity sectors.

State at Time-0 (2004)

There are no facilities in existence. If CSL receives authorisation to construct its proposed AEF facilities then it could be expected that preparatory activities for construction will be initiated in late 2004. Affected rural properties would be displaced and compensation paid. Tourism development activities in the Chongoene area in direct proximity of the planned export jetty would have to be arrested. Development of adjacent areas would have to be carefully planned and scheduled according to activities expected from the mining sector. Existing tourism or private sector investments in the affected area would have to be treated in an appropriate manner. Environmental management and regulatory measures will have to be defined and agreed prior to the commencement of construction works.

State at Time+5 (2009)

The road and jetty are under construction and construction is completed by 2007 (CSL Schedule). Tourism development and local populations in the area directly affected by the infrastructure and particularly in the coastal area extending from Xai-Xai to Chongoene becomes apparent.

Government authorities regularly inspect works and operations. Environmental Management is continuously verified and impacts are dealt with according to existing laws. Employment due to CSL activities increases resulting in expansion of the local economy. Migration to the area requires robust environmental management and specific mitigating measures as required. The Government and local authorities build local environmental management and inspection capacity. Tourism development as described in the Zero option scenario continues in areas not directly affected by mining activity. A second mining operation extracting mineral product from the Xai-Xai area is initiated. This mining operation uses CSL export facilities following an agreement reached between the two mining groups.

State at Time+10 (2014)

Mining activities by two operators continue. Employment due to both mining ventures contributes to the local and national economy. Tourism continues to expand in areas distant from the mining activity and not likely to be mined at a future time. Environmental management systems in place mitigate impacts due tourism, expansion of the mining and tourism services sectors and the mining sector. The agriculture sector expands to meet demand from increasing local population. Social services are improved according to the Zero scenario. Increase in the incidence of AIDS due to increased population and a possible migrant population.

State at Time+21 (2025)

CSL Mine has now reached maximum production capacity. An assumption is made that market demand for TiO₂ has not diminished, or that supply from the various mining concerns now implanted in Mozambique have not saturated the market. Pollution due to maritime activities at the export facilities are expected to have occurred by this time (Spillage, hydrocarbon pollution, Anthracite dust and particles on the beaches, ship accident, etc.) Mitigating measures and the legal process are tested. The Mining companies or shipping companies have paid compensation and damages to the State. The coastline and its resources are have been valued and are the basis for any compensation payment.

The jetty constructed completed prior to 2007 has now reached the end of its design life of 20 years. National infrastructure has been developed and the Government of the Republic of Mozambique enters into discussion and negotiation with the mining companies. Agreement is reached on the use of National Infrastructure for the movement and eventual export of mineral product. The Jetty is dismantled and the area restored. Tourism development is initiated in the Chongoene area following conclusion of the mining activities and the full restoration of the area. Roads infrastructure developed by the mining groups is turned over to the State, the State compensates the mining groups for the any infrastructure and uses the facilities to support tourism development activities.

4.5 OPTION-3: A railway line connecting Maputo to Inhambane-Maxixe. The line could be extended north to the border with Tanzania thereby servicing coastal populations and providing a north-south transport link vital to the future economic development of Mozambique. The North railway link would service all proposed and future mining operations in both Gaza and Inhambane Provinces. The tabled option would also require the development of port facilities in both Maputo and Maxixe. The tabled option would be developed as a partnership involving the Government of the Republic of Mozambique, the Mining Companies having concessions in the area, bilateral donors and International Financing Institutions.

Geographic Area of Impacts or Influence

The southern Provinces: Maputo, Gaza and Inhambane.

State at Time-0 (2004)

Xai-Xai and the coastal region from Zongoene (Limpopo estuary north and south) to Chongoene is classified as Priority Area for Tourism Investment (PATI) by the Ministry of Tourism according to its recently drafted Tourism Policy and Strategy (2003). Infrastructure critical to active development of the various economic sectors (tourism, mining, agriculture, manufacturing, services and others) is lacking and hinders development plans. Unemployment is high and social services are not adequate to meet the needs of local populations. Economic development of Gaza Province continues to be depressed. Poverty level in the Province is among the most important in the country. Subsistence use of natural resources is high and threatens local biodiversity. Dune erosion is increasing as a direct result of the removal of plant cover for fuel-wood and small agricultural holdings.

Interest in the area as defined in the Zero Option Scenario applies to this option and is driven by the existence of the great Limpopo Trans-Boundary Park and investment conditions established by the government and promoted by CPI. The rail link from Maputo to Zimbabwe is repaired and is operational.

State at Time+5 (2009)

The Government of the Republic of Mozambique decides to design, develop and finance a north-south railway link that will be developed progressively from the border with South Africa to the border with Tanzania. In response to the immediate needs of the tourism and mining sectors it develops, on a priority basis the segment from Maputo to Inhambane. Special provisions are made for the mining groups operating in Gaza Province and dedicated line segments are constructed. The mining companies construct spurs to connect their processing facilities to the main rail line.

Harbour facilities are developed in Maputo Harbour and in Maxixe (or other suitable site close to Inhambane) to meet the export needs of the mining groups and to serve local economic development needs.

Tourism is affected negatively during the construction phase of the north-south rail line. Tourism does not develop significantly in the area until the infrastructure is completed. Environmental impacts due to the rail development process become apparent and must be mitigated. Mitigation measures and an environmental management plan derived from an SEA of the rail transport option are developed and implemented. Development frameworks defining environmental management standards and norms are developed for the affected area and applied systematically by all tiers of government. Economy begins to expand as the CSL mine becomes operational and tourism is gradually implanted in the area.

State at Time+10 (2014)

Rail line is extended north towards the border with Tanzania and south from Maputo to the border with South Africa. Mozambique joins an East African rail network with links inland to neighbouring countries. Mining companies having developments in proximity to the line connect to it and transport material on this infrastructure. The existence of the rail line stimulates economic

development. Tourism expands and demands more robust environmental management to counter negative environmental impacts. Population settlement in areas adjacent to the line and in proximity to established stations increases. Demand on social services increases. Urban areas expand and government capacity to manage social and environmental impacts has to be developed. Mortality due to AIDS is likely to increase in line with settlement and migration to areas of opportunity. Public education methods have to be reinforced to counter the Aids impact.

The southern provinces become a tourism destination as described in the zero option scenario. The mining companies having activities in the area participate actively in their development.

State at Time+21 (2025)

The number of Titanium mines or mining areas has increased in the southern provinces. Developed rail infrastructure has contributed significantly to the development of all economic sectors. Poverty alleviation programmes and objectives set by the Government as part of its PARPA programme begin to show results. Reduced poverty and increased spending power attracts additional investment to the area. SME's increase in number and contribute both the local and national economies. Companies servicing the tourism, mining, agriculture, manufacturing, light industrial sectors and others increase in number resulting in increased employment. The environmental consequences of growth become apparent and lead to a revision of environmental legislation and regulations. The population is more aware of its surroundings and the need to protect and manage their environment.

4.6 OPTION-4: A 4-lane trunk road linking Maputo to Inhambane-Maxixe servicing mining sector interests, the local population and other economic interests in the area (tourism, agriculture, manufacturing, etc.). Development of this infrastructure would be structured as a partnership similar to that described above. The proposed road would be extended north to the border with Tanzania as funds become available and in response to the country's development needs. The first phase would be constructed either on the routing of the present EN1 or adjacent to it and should be completed by 2014.

Geographic Area of Impacts or Influence

The Southern Provinces of Maputo, Gaza and Inhambane.

State at Time-0 (2004)

The National Tourism Policy and Strategy developed in 2003 considers that the coastal area from Xai-Xai to Chongoene, the area adjacent to Quissico and Jangamo to Inhambane are tourism nodes and Priority Areas for Tourism Investment. Development to international standards required by the strategy requires the existence proper and efficient infrastructure. This infrastructure is not available at present and hinders the development in the affected provinces.

The economic situation is as described in the scenarios described above for 2004.

The Government decides to develop an effective north-south transport link capable of servicing all economic sectors and initiates the necessary planning and feasibility and design activities to realise this project. The Government launches an SEA procedure to fully assess the environmental social and economic implications of this transport corridor impact mitigation measures are introduced to the transport development plan. Steps are initiated to structure financial packages to realise the north-south road project.

State at Time+5 (2009)

Development of the road increases north-south transport difficulties during the construction phase. Disruptions limit development opportunities but these are temporary and reversed as road segments are completed. Construction generates employment and investor interest in the area increases. Benefits become apparent and the local economy expands. The CSL mine has begun its first phase of operation. Mineral product is being exported using temporary facilities agreed by the government.

Tourism facilities and capacity expands in areas not directly affected by mining operations. Environmental impacts are mitigated and an environmental management plan introduced by mining operations and agreed by the government of Mozambique are in place. Monitoring and verification procedures are introduced by the State and are carried out at regular intervals. Unpredictable impacts are corrected according to the government agreement with the respective mining companies.

Social impacts become apparent as a direct result of employment opportunities in the area. AIDS infection rates increase and lead to more effective public awareness campaigns. Poverty alleviation objectives described in PARPA begin to be addressed effectively. Social services are improved.

State at Time+10 (2014)

Road development from Maputo north to at least Inhambane-Maxixe is completed. At least two mining companies are now operating in the area. Development begins on export facilities at both Maputo Harbour or similar and Maxixe or similar. Economic development across all sectors is apparent in both Gaza and Inhambane Provinces. Unemployment declines and the service sector expands. Urban areas serviced by the road expand as population migrates towards employment and opportunity. Social services and education are more readily available. Expanding economy, additional mining operations, and increasing population demand more effective environmental management and resource conservation programmes. The Government launches a revision of environmental legislation and reinforces its conservation programmes. Coastal zone management delivers results and supports expansion of the tourism sector.

State at Time+21 (2025)

The north-south road and export facilities are completed and operational. Mineral product is exported through these port facilities, which also service other sectors of the economy. Temporary export facilities agreed by the government at the start of mining operations are dismantled as they become obsolete. Export facility sites are restored and returned to the State for alternative use (tourism development). Roads infrastructure developed by the mining companies are used to service the new tourism development areas.

The road contributes significantly to local, regional and national development. Legislation defining maximum permissible loads on public roads is revised and amended to accommodate the needs of the mining sector.

5. ASSESSMENT OF TRANSPORT OPTIONS

The assessment of transport options, either agreed by the Government (Option-1), proposed by CSL (Option-2), or its variants (Options-3 & 4) was carried out by workshop participants. The results of those discussions are presented in Section-4 as summaries for each time period considered. Group discussions summarized below are presented in their original form as Annexes-2, 3, 4 and 5.

5.1 TRANSPORT AND COMMUNICATIONS SECTOR INCLUDING MARITIME TRANSPORT

ZERO OPTION

Transport, infrastructure and communications will develop over the time period keeping pace with tourism development, increasing demand for efficient transport infrastructure by the population and the possible establishment of mining operations in the area after year +10.

Transport infrastructure and communications are expected to improve over the period. Environmental impacts are expected, social impacts are beneficial and negative (SIDA), economic impacts are positive

Environmental considerations

- Environmental framework and regulatory systems for tourism development need to be developed.
- Solid waste, domestic and industrial sewage treatment systems and management will be required and need to be considered for Gaza and Inhambane Provinces.
- Environmental framework and regulatory systems need to be developed for future development of transport infrastructure.
- Environmental Management Capacity of Gaza and Inhambane Provinces need to be strengthened.

OPTION-1

The dedicated rail link connecting to the main Maputo to Zimbabwe railway would provide revenue to the transport sector and in particular to CFM through tariffs charged per load or per axle transited. The dedicated segment from Chibuto to Barragem would not contribute to local development. Environmental impacts linked to this option have been described and mitigated in its EIA. The Government of Mozambique has licensed this option but the option itself has been rejected by WMC the current owners of the Corridor Sands Project.

OPTION-2

Workshop participants considered that the dedicated road linking the Chibuto Mine to an export facility and dedicated jetty at Chongoene would not contribute to the transport sector and would not contribute positively to local development (other sectors such as: tourism, agriculture, manufacturing, service industries, etc).

Relative to the Zero Option, the private road and jetty solution will affect tourism development in the area extending from Xai-Xai to Chongoene negatively manifested by reduced investment in the area concerned, fewer tourism establishments developed and the loss of 16,000 potential jobs by the year 2021 (Annex-7).

Environmental considerations

- A robust Environmental Management Plan covering all aspects of the proposed transport option would be required. The Plan would have to be subjected to external review prior to acceptance by the government. The plan would have to include mitigation for all possible impacts that could affect the maritime and terrestrial components of the export process.
- The Government of Mozambique should set out its agreement with Corridor Sands Ltda. in the form of a binding contract that clearly defines the roles and responsibilities of all concerned parties including compliance to environmental regulations. The contract would clearly define a mechanism to be used for the application of fines and would also provide guarantees to the mining concern. Contract arbitration should be in a neutral court (Belgium, Luxembourg, or other).
- The jetty would have to be removed and the site restored on completion of the government agreement in force. The Government agreement for transport and export of mineral product should not exceed the design life of the jetty (stated at 20 years by CSL management during the Bilene workshop).
- CSL and its concessionaires will have to be held liable if damages caused to either the environment, marine/terrestrial natural resources or private property are found to be due to negligence, management failures or other factors deemed to be within their contractual responsibilities.

OPTION-3

Workshop participants considered that this option would have negative environmental impacts during the construction phases but these would be either mitigated or reversed once the line was in operation. The participants did not consider the impacts that could be expected from the development of port facilities at either Maputo Harbour or Inhambane-Maxixe.

The social and economic impacts due to this option were positive and reflect the importance the participants placed on the option, its contribution to development of the transport sector and its potential contribution to national development objectives.

Environmental considerations

- A full SEA and EIA of the north-south railway option will have to be carried out in conjunction with pre-feasibility and Feasibility studies.

OPTION-4

Workshop participants considered that during the construction phase there would be often serious transport difficulties in the target area. This would require that the government consider a temporary alternative to the EN1 route. The mining sector would require a temporary alternative to transport its mineral products to an export facility. From year +5 the situation would improve, economic

activity and services would improve and expand along the transport route. The road would benefit all economic sectors positively. The road segment from Maputo to Inhambane should be completed by 2010 and mining companies operating both in Gaza and Inhambane Provinces should plan to use this infrastructure.

Environmental considerations

- A full SEA and EIA of this transport option will have to be carried out in conjunction with pre-feasibility and feasibility studies.
- Environmental management measures will have to be prepared for areas adjacent to the road corridor and for urban areas affected by the corridor.

5.2 TOURISM SECTOR (INVESTMENT, SERVICES, POLICIES AND STRATEGY)

ZERO OPTION

The tourism sector is likely to expand due to demand generated by the Trans-frontier Park and the value of coastal resources. Expansion is fuelled by recognition of the inherent tourism value of the area, the quality of its beaches, proximity to game viewing areas and relative proximity to Maputo and South Africa. The national tourism development policy and strategy of 2003 designates and promotes the area as a Priority Area for Tourism Investment.

Tourism expands from year +5 manifested by increased numbers of investments and the gradual opening of tourism facilities. Employment increases as shown in Annex-7 and generates a productive local economy. Environmental impacts (solid waste, domestic sewage, loss of biodiversity, habitat loss) are evident and require urgent mitigation. The tourism sector participates actively and impacts are mitigated through management programmes, regulatory measures and public awareness campaigns.

Environmental considerations

- MICOA coordinates closely with the Ministry of Tourism and the Mining Sector to ensure that development takes place in areas not likely to be directly affected by mining activities in the future. Areas likely to be subjected to mining activity and having a tourism potential should be allocated to investors once mining has taken place and the site has been fully restored.
- Environmental guidelines for tourism development must be prepared.
- Effluent discharge standards and regulation for the tourism industry must be developed.
- Conservation and management programmes targeting the tourism sector needs to be elaborated.
- Environmental management standards for the tourism industry need to be developed in collaboration with the Ministry of Tourism and hospitality service providers.

OPTION-1

Workshop participants did not consider that this transport option would have any direct impact on the tourism sector. As such, the zero option scenario would apply.

OPTION-2

The transport option would have a negative effect on the tourism development potential of the area affected by construction of the road and jetty. Participants considered that tourism development potential of the Chongoene area would be reduced both during the construction and operational phases of the transport option.

Relative to the Zero Option, the private road and jetty solution will affect tourism development in the area extending from Xai-Xai to Chongoene negatively. This will be manifested by reduced investment in the area concerned, fewer tourism establishments developed and the loss of 16,000 potential jobs by the year 2021 (Annex-7). Stakeholders considered that the economic impacts and social impacts of the option on the tourism sector were null (0) given that development of facilities in the affected area was unlikely to take place.

Environmental considerations

- Jetty operations will have to be carefully monitored by MICOA staff or their designated representatives.
- CSL or its concessionaire will have to maintain a logbook recording all its operations.
- An oil spill contingency plan will have to be elaborated and agreed by MICOA.
- A maritime emergency plan will have to be developed and approved by the proper authority.
- CSL should liaise closely with tourism operators in the area to ensure that they are fully informed of its contingency plans and ready to receive information on and react to any incident damaging tourism investment or potential.
- CSL should introduce a regular beach monitoring procedure to record changes (physical or biological) that might be due to its activities in the area. MICOA (CDS-ZC) should initiate a similar procedure starting prior to construction of the proposed jetty and export facility.

OPTION-3

Tourism in the affected area would be impacted negatively during the construction phase of the north-south rail solution. The sector would rapidly expand once the rail infrastructure was completed and operational.

Environmental considerations

- Participants recommended that environmental management measures need to be elaborated and enforced to ensure that expansion of the tourism sector does not lead to degradation of the natural environment.

OPTION-4

As with the previous option, participants considered that tourism would be negatively affected during the construction phase of the proposed north-south road. Once completed the road would stimulate investment in the area resulting in the expansion of all economic sectors and in particular the tourism and tourism services sector.

- Participants considered that environmental management measures need to be elaborated and enforced to ensure that expansion of the tourism sector does not lead to degradation of the natural environment

5.3 AGRICULTURE SECTOR

ZERO OPTION

Agriculture sector will expand with the arrival of tourism, the future mine, improved infrastructure and increasing wealth of the local population. Agriculture may diversify to meet the specific needs of the tourism sector. Employment opportunities in the area will lead to migration and expand urban areas. Agricultural land could be reduced as a result of urban expansion or even squatting of land by new arrivals.

Environmental impacts due to expansion of agriculture sector from year+5 could be expected (pesticides, fertilizers, monocultures, etc.)). Social and economic impacts are positive.

Environmental considerations

- National environmental regulations and standards will have to be systematically applied to the agriculture sector to reduce environmental impacts and deliver better products to the market.

OPTION-1

The rail link option will affect agricultural land and crops along the chosen routing. Agricultural land directly beneath the rail or embankment footprint will be lost permanently. The movement of vehicles during the construction phase could damage adjacent land. Participants considered that the dedicated rail link would not have any beneficial consequences to the agricultural sector to the affected area and for that matter would not have any impact on agriculture.

Environmental considerations

- Environmental impacts expected from the rail link option have been described in detail in the EIA document and have been accepted by MICOA.

OPTION-2

The dedicated road and jetty option will not have significant effects on the agricultural sector of Gaza province. Agricultural land will be lost along the route chosen for the road. The road could assist local farmers to get their product to market once they understand how to use the road correctly and not impede the 100-tonne road trains transiting from either the mine in Chibuto or the export facility at Chongoene. Road accidents and mortality could affect the sector directly (manpower, income, social fabric of rural communities)

Environmental considerations

- The full and verified Environmental Management Plan discussed in the previous sections.

OPTION-3

Access to agricultural areas could be negatively affected during the construction phase of the north-south railway option. This would be reversed once the line was completed. The agricultural sector including its workers would be direct beneficiaries of this transport option. The agricultural sector would expand in response to market demand. An export market could be developed now that product could be transported efficiently to export facilities.

Expansion of the agriculture sector would increase demand for land as new farms are established. The environmental consequences are loss of biodiversity and habitat, pollution of watercourses by fertilizers and pesticides, public health concerns resulting from consumption of tainted water.

Environmental considerations

- National environmental regulations and standards will have to be systematically applied to the agriculture sector to reduce environmental impacts and deliver better products to the market.
- Water monitoring and testing programmes would have to be introduced to ensure compliance with environmental regulations and standards.
- Capacity building programmes targeting the specific needs of the agriculture sector and local government will have to be initiated.

OPTION-4

Access to agricultural areas could be negatively affected during the construction phase of the north-south road option. This would be reversed once the road was completed. The agricultural sector including its workers would be direct beneficiaries of this transport option. The agricultural sector would expand in response to market demand. New agricultural areas located in regions lateral to the road would be developed. An export market could be developed now that product could be transported efficiently to export facilities.

Expansion of the agriculture sector would increase demand for land as new farms are established. The environmental consequences are loss of biodiversity and habitat, pollution of watercourses by fertilizers and pesticides, public health concerns resulting from consumption of tainted water.

Environmental considerations

- National environmental regulations and standards will have to be systematically applied to the agriculture sector to reduce environmental impacts and deliver better products to the market.
- Water monitoring and testing programmes would have to be introduced to ensure compliance with environmental regulations and standards.

- Capacity building programmes targeting the specific needs of the agriculture sector and local government will have to be initiated.

5.4 INDUSTRIAL SECTOR

ZERO OPTION

The industrial sector remains seminal until the arrival of a future mine. Any future mine is external to the scenario and would be developed according to presence and quality of mineral resources. Industrial sectors could be present with a mine from year +10. Impacts from this sector would be expected from this time.

Environmental considerations

- MICOA would have to ensure that environmental management systems and regulations are sufficiently robust to mitigate any impacts due to industrial development of Gaza and Inhambane Provinces.

OPTION-1

The rail link option would stimulate activity in the gravel and aggregates industry. Similarly it would provide revenues to contractors building the rail link and associated infrastructure. Participants considered that the industrial sector of Gaza Province would not be affected by the rail link itself but would be positively impacted by the development of the mine at Chibuto.

OPTION-2

The road jetty option would temporarily expand the construction services sector during the building phase. A limited number of companies could be implanted in the area to service the facilities during the operational phase.

OPTION-3

As in option 2, the north-south rail option would temporarily expand the construction services sector during the construction phase. Once completed the existence of the railway would stimulate the establishment of industrial and manufacturing facilities in proximity to the mines (service industries) or in urban areas where the facilities can benefit from a ready source of manpower. The copra industry would benefit directly from the existence of a north-south railway line and the proposed port facilities at both Maputo and Inhambane-Maxixe.

Environmental considerations

- MICOA would have to ensure that environmental management systems and regulations are sufficiently robust to mitigate any impacts due to industrial development of Gaza and Inhambane Provinces.
- Contingency plans for the port facilities at Maputo and Inhambane-Maxixe will have to be elaborated or revised if already present.

OPTION-4

As in option 3, the north-south road option would temporarily expand the construction services sector during the construction phase. Once completed the existence of the north-south road would stimulate the establishment of industrial and manufacturing facilities in proximity to the mines (service industries) or in urban areas where the facilities can benefit from a ready source of manpower. Industry would benefit directly from the existence of a north-south railway line and the proposed port facilities at both Maputo and Inhambane-Maxixe.

Environmental considerations

As in Option-3.

5.5 MINING SECTOR

ZERO OPTION

Development of a heavy sands mine or similar in the future is external to the scenario and would be developed according to the presence and quality of mineral resources.

From year +10 negative environmental impacts are present but mitigated through management. Social impacts are both positive and negative (employment, SIDA, mitigation reduces impact). Economic impact is significant and high. Though the presence of a mine in the geographic area is possible from year 2007 onwards (Rio Tinto exploration of its concessions in Gaza and Inhambane Provinces has demonstrated high quality deposits but these have yet to be fully verified), development would only take place if global market conditions made such a development feasible.

Development of a mine other than CSL would have to be carefully monitored by the Government of Mozambique to ensure that this development does not affect other economic sectors of value to the development of both Gaza and Inhambane Provinces.

Environmental considerations

- An extraction and restoration plan will have to be elaborated by the mining company in close collaboration with government authorities (Ministry of Tourism, MICOA, Provincial Authorities).
- The extraction and restoration plan will also define a tourism development plan to include a schedule for allocation of land to investors. Land due to be mined should not be allocated until extraction activities have been completed and the land restored to its original state.
- Environmental Management criteria and standards should be elaborated in preparation for the eventual development of a mining concession.

OPTION-1

The proposed rail link would only benefit CSL and not the sector likely to develop in Gaza Province if all concession holders exercise their option to develop a mine. The link is likely to have environmental impacts but these have been considered and mitigated as part of the EIA submitted to and accepted by MICOA and the Government of Mozambique.

OPTION-2

The dedicated road and jetty option proposed by CSL as its alternate export facility would only benefit CSL. CSL has stated that it would be willing to share the facilities with other mining concerns on condition that a suitable commercial arrangement could be found.

Environmental considerations

- Should the government of Mozambique accept the alternate export facility as the most suitable option, then it must ensure that the facility is made available to future mining operations at reasonable cost. It would be totally unacceptable for conditions to be set at such a level (for commercial reasons) that other mining concerns are forced to build private export facilities similar to those servicing CSL. Multiplication of private facilities would lead to coastal fragmentation and the implicit privatisation of national coastal resources.
- Operation of the jetty has potentially serious environmental consequences. All maritime and jetty operations would have to be fully considered in an Environmental Management Plan that would have to be submitted to MICOA prior to any licensing agreement. MICOA would be advised to submit the plan to external verification and comment prior to any decision.
- As noted previously the Government of Mozambique and CSL should have a binding contractual agreement concerning the jetty, its operations and liabilities. This contract should be an integral part of any licensing agreement.

OPTION-3

The north-south rail option would benefit all mining operations. Likewise the state would benefit from increased transport revenues (opinion of the participants). Whether the state would extract revenues from a railway constructed in partnership with the private sector (including the mining companies) is an issue to be discussed. Normally this would not be the case. As participants in the construction and financing of the railway, the mining companies would in effect be contributing directly to national development objectives and as such would be exempted from paying transport tariffs to the state. The state would benefit from revenues generated by the expansion of all economic sectors beneficiaries of the new infrastructure.

OPTION-4

The north-south road option would benefit all current and future mining operations. The same conditions would apply as in option-3. For the road to benefit the mining companies the State will have to review and amend current legislation limiting axle loads on national roads to **20 tonnes** (please verify loading).

5.6 HEALTH SECTOR

ZERO OPTION

Services remain insufficient and distant. SIDA, infant mortality remains at current levels until either national economy expands or tourism/mine/service company investments expand local economy and services.

As local populations increase following the opening of mines, increase in the number of service companies, increasing number of tourism establishments it is likely that there will be an improvement in the health sector particularly in the delivery of services. SIDA will increase and the

disposal of hazardous materials could become an issue requiring attention, disposal of hospital wastes in general will have to be addressed.

OPTION-1

During the construction phase there could be work related accidents. The elevated number of workers in the area could result in increased levels of sexually transmitted diseases including AIDS. Once construction is completed the number of workers will reduce significantly and impacts will be virtually nil.

OPTION-2

AIDS is expected to increase in the area as a result of the influx of construction workers.

OPTION-3

AIDS is expected to increase in the area as a result of the influx of construction workers.

OPTION-4

AIDS is expected to increase in the area as a result of the influx of construction workers. Incidence of cholera and similar diseases are likely to decrease once the road is completed, economy expands and health services become more accessible.

5.7 ENVIRONMENT SECTOR

ZERO OPTION

Environment and biodiversity is negatively affected by poverty, and lack of information regarding the value of resources. This trend is reversed as tourism is developed in the province, the impact of the Limpopo Park is recognised by the local communities, and the local economy expands.

Zero scenario impacts environment negatively from the present to T+5. The situation improves with investment in the tourism sector, environmental degradation begins to be reversed through public awareness campaigns, employment and reduced demand on fuel wood and subsistence gathering.

OPTION-1

During the construction phase it is expected that there will be environmental impacts particularly related to the degradation of soils and the possible contamination of water supplies by human waste and spilled fuels. There would be minimal impacts on completion of the rail link.

OPTION-2

Construction of the jetty at Chongoene will affect marine flora and fauna negatively. Coastal long shore currents could be affected and could alter beach accretion and sedimentation patterns. On completion the jetty will continue to be a risk to the environment and will demand that stringent environmental management measures be implemented and monitored.

OPTION-3

During the construction phase the option will affect the environment, and impact habitats and biodiversity. Once completed the option will be beneficial to the environment (opinion of the participants). Increased settlement, development and agricultural activity along the transport corridor will continue to reduce biodiversity and impact habitats and ecosystems.

ENVIRONMENTAL CONSIDERATIONS

- Robust environmental management procedures combined with targeted public awareness campaigns will be required to mitigate potential impacts.
- Biodiversity and ecosystem monitoring systems will have to be introduced and implemented.

OPTION-4

The road option will affect the environment and biodiversity negatively during construction. It will also have a negative effect as settlement along the corridor becomes apparent. The development of new mines in the area stimulated by the existence of the transport infrastructure will further compound environmental degradation. Development of the tourism sector will tend to counter this trend. Environmental degradation is reduced through public awareness campaigns, management campaigns and regulatory measures.

5.8 NATURAL RESOURCES AND CONSERVATION SECTOR

ZERO OPTION

The Great Limpopo Trans-frontier Park exists and is increasingly recognised as an economic driver in the region. Local conservation efforts become apparent as the tourism sector expands. Restoration efforts by mining companies establish green belts or similar conservation areas. Social impacts are negative due to displacement of populations from the Limpopo Park and possible displacement resulting from future conservation efforts. The economic value of natural resources are increasingly recognised by local populations as demand for nature increases with expansion of the tourism sector.

OPTION-1

The rail link option has neither a direct or indirect effect on the natural resources and conservation sector.

OPTION-2

The rail link option has neither a direct or indirect effect on the natural resources and conservation sector.

OPTION-3

Local conservation efforts are likely to be affected during the construction phase of the north-south rail option.

OPTION-4

The north-south road option initially impacts conservation and natural resources negatively but later will contribute significantly to conservation efforts and the sector in general.

5.9 FISHERIES SECTOR

ZERO OPTION

Demand for fish and marine products increases with the development of the tourism sector, expanding economy and greater spending power of local populations. The effect is slightly positive given the possibility of over-utilisation of resources without suitable management.

Expansion of local economy from y+5 will generate increased demand for fisheries products. Employment and income increase. The fisheries sector contributes to the local economy.

OPTION-1

Construction of the rail link would not have a significant impact on the fisheries sector

OPTION-2

The fisheries sector is likely to be affected during the construction phase of the export jetty.

OPTION-3

The participants did not comment

OPTION-4

The north-south road option would have an indirect but positive impact on the fisheries sector from year+5 onwards. The sector would benefit from increased level of investment that would result in increased catches that could be transported efficiently to distant markets. The road corridor would improve the distribution and sale of fisheries products to local populations. The fisheries sector would therefore expand. Expansion of the sector must be accompanied by a consequent monitoring and management plan.

5.10 CONSTRUCTION SECTOR

ZERO OPTION:

Construction will initially remain at current levels. It increases as tourism facilities and tourism service companies become established. Further expansion to service demands of a future mining operation. Contracting companies established in the area.

Negative impacts likely due to increasing construction, changes in land use, loss of biodiversity. Positive social and economic impacts.

OPTION-1

The participants did not consider that the option would have any impact on the construction sector once the construction phase of the link was completed.

OPTION-2

The option was considered to have positive impacts on the construction sector during the build phase. Participants considered that the option could result in increased investment in the construction sector in the geographic area of influence.

OPTION-3

The option was considered to have positive impacts on the construction sector during the build phase. Participants considered that the option could result in increased investment in the construction sector in the geographic area of influence.

OPTION-4

The option would benefit the sector directly through investments and the creation of new enterprises aiming to benefit from this significant national project. From year +10 the sector benefits directly from the existence of the new transport corridor and services economic expansion in areas lateral to the corridor. Increase in tourism investment in the geographic area stimulates the construction sector further. Construction becomes a major employer and the sector contributes to local, regional and national economy.

Environmental Considerations

- It will be necessary to develop environmental management guidelines and a regulatory system for the construction sector. Increasing activity will require planned disposal areas and the increasing use of chemical products in the industry will require special disposal and treatment procedures.

5.11 SOCIAL AFFAIRS, EMPLOYMENT AND POVERTY ALLEVIATION (PARPA)**ZERO OPTION:**

Current poverty and lack of services remain an issue of concern until investment in tourism, mining and other sectors increases employment and individual wealth. Poverty reduction is directly linked to investment, employment and the provision of services.

Employment prior to development of the tourism sector will remain depressed. Direct and indirect employment increases as the tourism sector expands and a future mine develops after year +10. Employment in the agriculture sector is secured as demand for agricultural products increases.

Poverty alleviation in the geographic area becomes apparent as a result of expansion and development of the various economic sectors.

OPTION-1

During the construction phase, 185 families will be displaced and would have to be relocated and compensated. During the operational phase of the rail link effects on poverty alleviation will be null. Employment at the mine will have a positive effect on poverty alleviation.

OPTION-2

Development of the option will create employment and temporary poverty alleviation. Some employment may be created once the facilities are completed for maintenance of the road and jetty. Employment at the mine will have a positive affect but this could be reduced if mortality due to AIDS increases.

OPTION-3

Construction of the north-south rail option will displace a substantial number of families. These will have to be relocated and provided with alternate income generating opportunities. Increased investment and employment opportunities as well as improved access to services will have a significant positive impact on PARPA objectives.

OPTION-4

Construction of the north-south road option will result in significant displacement and relocation of local populations. The construction phase will generate significant employment opportunities that will reduce poverty levels. The road will lead to increased lateral infrastructure, increase the number of schools, hospitals and dispensaries, and improve the level and availability of basic services. The impact on development and poverty alleviation will be significant.

5.12 FINANCIAL SECTOR

ZERO OPTION

Development of tourism and other sectors could lead to revision of fiscal and investment policies. New funding instruments could be made available.

Expansion of local economy from y+5 will generate social and economic benefits from employment, SME's, and service companies.

OPTION-1

Participants did not consider that the option would have a direct impact on the financial sector. They did consider that the option would deliver revenues to the rail concessionaire and CFM even though these were not considered to be significant.

OPTION-2

The option would deliver some revenues to the State.

OPTION-3

The option would increase opportunities for investment in multiple economic sectors. Access to credit for enterprises delivering products and services to the construction and other areas of economic expansion would be facilitated.

OPTION-4

The north-south road option would increase investment opportunities for business servicing the road development programme. Increased activity in the business sector will be reflected by increased revenues to the State for taxation. The road will attract investment and individuals will identify opportunities and structure business entities from year +10 onwards. The expanding economy in the region will make credit more readily available.

5.13 FOREIGN AFFAIRS

ZERO OPTION

Existence of LTP leads to opening of borders and for movement of people, goods and services. Demand for Gaza as a destination will also lead to a revision of entry regulations (Visa requirements).

OPTION-1

The option would not have any impact on foreign relations or impact national foreign affairs policies.

OPTION-2

The option would not have any direct or indirect effect.

OPTION-3

The option would not have any direct or indirect effect.

OPTION-4

Construction of the north-south road option is not only a national imperative but also has significant international implications and consequences.

The development project will require substantial international financial assistance and could lead to new international cooperation accords, partnerships, and business ventures with external partners. The road would improve trade links with neighbouring countries and would require the elaboration of new trade accords.

The road will increase traffic from neighbouring countries and a revision of border crossing procedures will be required. Likewise, increased traffic and shifting populations will have to be addressed through trans-boundary judicial accords. The road would be prestige project that would greatly benefit Mozambique and its neighbours.

5.14 TAX, TRADE AND MONETARY POLICIES**ZERO OPTION:**

Tax and trade policy (national) may be adjusted due to demand from the various economic sectors developing in the geographic area.

Monetary and fiscal policies (national) may be adjusted due to demand from the various economic sectors developing in the geographic area

OPTION-1

The line would not have an impact on national monetary policies.

OPTION-2

The line would not have an impact on national monetary policies.

OPTION-3

Participants did not consider that the option would have a significant impact on monetary policy and chose not to respond.

OPTION-4

Economic expansion due to development of the north-south road option would benefit all sectors of the economy including the currency. Participants considered that the currency would strengthen and inflation would be brought under control. Fiscal stability would encourage investment. Increased investment in the

various economic sectors would demand that environmental safeguards specific to those sectors are present, effective and regularly monitored.

5.15 SME POLICY AND AVAILABILITY OF MICRO-CREDITS

ZERO OPTION:

Funds for micro-credits and growth of SME's will become available and apparent as the tourism sector is developed and a future mine is established in the geographic area.

Negative impact due to increased numbers of small and medium enterprises. Assumes that Management measures are in place to mitigate. Positive social and economic impacts

OPTION-1

The option would not have an impact on the sector.

OPTION-2

Development of the dedicated road and jetty option might stimulate the establishment of small and medium scale enterprises in the area. These would receive temporary benefits and revenues during the construction phase but, would have to wait for development of the tourism sector or the opening of new mines to be assured sufficient and consistent activity. This uncertainty could hinder expansion of the SME sector.

OPTION-3

Service related SME's could become established along the transport corridor and in urban areas expanding as a result of the existence of the railway. The Chibuto mine would stimulate growth of the SME Sector.

OPTION-4

As in the previous option but with the added bonus that the road would be more accessible than the railway (access or exit at any time and at multiple locations). Accessibility would be a key factor in the establishment of diverse SME's along the transport route. The expanding economy would make micro-credit facilities more readily available.

5.16 INVESTMENT AND PROMOTION POLICIES (LOCAL, NATIONAL, REGIONAL)

ZERO OPTION:

The geographic area contributes to the promotion of Mozambique as a destination and an investment opportunity from year +5 as tourism sector expands. Promotion as an expansion area as a future mine is established.

Development of the area has a positive impact on promotion and investment both at the local and national levels. Promotion can have a negative environmental impact due to increasing influx of population seeking employment and opportunity

OPTION-1

The rail line would provide positive benefits for a number of national enterprises (local and national) such as aggregate quarries and suppliers, transport companies. Once the line is operational

it will not have any impact and will not have any value to national, local or regional investment and promotion policies.

OPTION-2

Participants reformulated the issue as a component of the transport sector.

OPTION-3

The option could lead to the revision of planning policies in view of the economic diversification stimulated by the existence of the north-south railway corridor. The option would stimulate investment in the tourism and agriculture sectors.

OPTION-4

The option could lead to the revision of planning policies in view of the economic diversification stimulated by the existence of the north-south railway corridor. The option would stimulate investment in the tourism and agriculture sectors.

5.17 TABLE-1: Impact assessment of the transport options on the sectors and policies considered by workshop

SECTOR - POLICY	ZERO OPTION				OPT-1: RAIL LINK				OPT-2: ROAD & JETTY				OPT-3: N-S RAIL				OPT-4: N-S ROAD			
	T-0	T-5	T-10	T-21	T-0	T-5	T-10	T-21	T-0	T-5	T-10	T-21	T-0	T-5	T-10	T-21	T-0	T-5	T-10	T-21
TOURISM	0	1	2	3	0	0	0	0	0	-2	-2	-2	0	-1	1	2	0	-1	2	3
TRANSPORT-COMMUNICATIONS	0	0	1	2	0	1	1	1	0	0	0	0	0	-1	1	1	0	-1	1	3
AGRICULTURE	0	1	2	3	-1	0	0	0	0	0	0	0	0	-1	1	1	0	-1	1	1
INDUSTRIAL	0	0	1	2	1	0	0	0	0	1	1	1	0	1	1	1	0	1	1	1
MINING	0	0	1	1	0	1	1	1	1	3	3	3	0	0	3	3	0	0	2	2
ENVIRONMENT-BIODIVERSITY	-2	-1	1	2	-1	0	0	0	0	-1	0	1	0	-1	1	1	0	-1	0	1
HEALTH	-2	-2	1	2	-2	0	0	0	0	-2	0	0	0	/	0	1	0	-2	-1	1
FINANCE	0	1	2	2	0	1	1	1	0	1	1	1	0	1	2	2	0	1	2	2
FOREIGN AFFAIRS	1	1	2	2	0	0	0	0	/	/	/	/	/	/	/	/	0	1	1	1
FISHERIES	0	1	1	1	-1	0	0	0	0	-1	0	0	0	0	1	1	0	0	1	1
EMPLOYMENT	0	1	2	3	3	0	0	0	0	2	1	1	0	2	1	1	0	2	1	1
PLANNING	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
NATURE CONSERVATION-PARKS	2	2	3	3	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1
SOCIAL AFFAIRS-PARPA	-3	-1	1	2	-2	0	0	0	0	2	1	1	0	1	2	2	0	1	2	2
SECTOR POLICIES	0	1	1	2	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
MONETARY POLICIES	0	0	1	1	0	0	0	0	/	/	/	/	/	/	/	/	/	/	/	/
TAX AND TRADE POLICIES	0	0	1	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
INFRASTRUCTURE COSTS	/	/	/	/	0	0	0	0	0	0	0	0	0	-3	2;1	2;3	0	-3	2;1	2;3
SERVICE COSTS	0	0	1	2	0	0	0	0	0	0	0	0	0	-1	1	1	0	-1	1	1
SME's AND MICRO-CREDIT	-2	0	1	2	0	0	0	0	0	1	1	1	0	1	1	1	0	1	1	1
INVESTMENT AND PROMOTION	0	1	2	2	1	0	0	0	0	0	1	2	0	0	1	2	0	0	1	2
CONSTRUCTION	0	1	2	3	2	0	0	0	0	3	1	0	0	3	1	2	0	3	1	2

participants

Classifications recorded by workshop participants clearly indicate that Option-3 the north-south rail option and Option-4 the north-south road option were the preferred solution. Both of the options impact positively on the sectors and policies considered once construction has been completed. Participants concluded that Options 3 and 4 contributed significantly to national regional and local development objectives and would contribute significantly higher benefits to poverty alleviation and sustainable development than options 1 and 2 proposed by CSL Ltda.

5.18

TABLE-2: Environmental, social and economic impacts of the transport options on sectors and policies.

IMPACTS/BENEFITS	ZERO OPTION			OPT-1: RAIL LINK			OPT-2: ROAD & JETTY			OPT-3: N-S RAIL			OPT-4: N-S ROAD		
	ENV.	SOC.	ECO.	ENV.	SOC.	ECO.	ENV.	SOC.	ECO.	ENV.	SOC.	ECO.	ENV.	SOC.	ECO.
TOURISM	(2);3	(2);3	3	nc	nc	nc	-1	0	0	0	1	1	0	2	2
TRANSPORT-COMMUNICATIONS	-2	3	3	nc	nc	nc	-1	0	0	-1	2	2	-1	2	2
AGRICULTURE	-2	2	2	nc	nc	nc	-1	0	0	-1	2	2	-1	2	2
INDUSTRIAL	-2	(2);2	3	nc	nc	nc	0	0	0	-1	1	1	-1	2	2
MINING	(3);2	(2);3	3	nc	nc	nc	0	0	0	0	2	2	0	2	2
ENVIRONMENT-BIODIVERSITY	(2);2	1	2	nc	nc	nc	-1	0	0	-1	-1	1	-2	-1	1
HEALTH	-1	2	1	nc	nc	nc	0	0	0	0	-1	2	-1	-2	2
FINANCE	0	2	3	nc	nc	nc	0	nc	nc	0	nc	nc	0	nc	nc
FOREIGN AFFAIRS	/	/	/	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
FISHERIES	1	2	2	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
EMPLOYMENT	-1	3	3	nc	nc	nc	0	1	1	0	1	1	0	1	1
PLANNING	/	/	/	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
NATURE CONSERVATION-PARKS	3	(2);2	3	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
SOCIAL AFFAIRS-PARPA	0	2	2	nc	nc	nc	0	0	0	0	1	1	0	1	1
SECTOR POLICIES	/	/	/	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
MONETARY POLICIES	/	/	/	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
TAX AND TRADE POLICIES	/	/	/	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
INFRASTRUCTURE COSTS	/	/	/	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
SERVICE COSTS	0	0	0	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
SME's AND MICRO-CREDIT	-1	3	3	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
INVESTMENT AND PROMOTION	-1	2	2	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
CONSTRUCTION	-1	2	2	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc

Workshop participants concluded that Option-3 the north-south rail option and Option-4 the north-south road option would deliver benefits to all sectors under consideration once completed. Environmental impacts are likely during construction of either option but these were considered both manageable and acceptable when considered against the social and economic gains expected from both options. Participants considering Option-1, the rail link option, did not record any opinion. Participants considering Options 2, 3 &4 did not express opinions or did not consider that the deliberation was relevant for a number of sectors. These are marked as (nc).

6. CONCLUSION AND RECOMMENDATIONS

The Strategic Environmental Assessment of transport options proposed by Corridor Sands Ltda. and their variants has demonstrated that stakeholders are in favour of Options 3 the north-south rail option and Option-4, the north-south road option. Both of these options were preferred on the basis of the benefits accrued to both the mining company and the State. Though favouring both options 3 and 4, participants in the Bilene workshop clearly preferred Option-4 given that it provided greater flexibility and delivered benefits to local populations and to all sectors of the economy.

Participants and stakeholders recognised that the north-south road and export facilities at both Maputo and Inhambane-Maxixe harbours could not be constructed within the time frame (completion by 2007) required by Corridor Sands Ltda. As such, though clearly preferring Option-4 participants recognised that the Chibuto mine could not be developed if this was the option selected. Participants, together with MICOA proposed a compromise option that would ensure that development of the Chibuto mine would continue on its present schedule and that the development objectives of the State would be accommodated. The proposed compromise solution was structured on the basis of the following rationale:

15. The Government of Mozambique and Provincial Authorities of Gaza Province are supportive of Corridor Sands Ltda and its owners WMC to develop a mine at Chibuto.
16. The Chibuto Mine is due to be opened in 2005 with exports of mineral products at phase-1 levels due in 2007.
17. WMC, the current owners of Corridor Sands Ltda. must have a decision from the government by the end of 2003 to begin raising the capital necessary to open the mine and develop its infrastructure during 2004.
18. Rio Tinto Mines has concessions in Gaza and Inhambane Provinces that are showing promising quantities of high quality mineral deposits at locations described in Figure-1. On condition that these deposits continue to prove economic, Rio Tinto is likely to exercise its option to open a mine in the Xai-Xai –Chongoene area between 2007 and 2010.
19. The Government of the Republic of Mozambique cannot prepare, plan, design and build a north-south road with port facilities at Maputo and Inhambane-Maxixe before 2007. Assuming that the road option is selected by the State as a viable option, it is unlikely that this infrastructure can be completed before 2010-2015.
20. The export facility and jetty proposed by Corridor Sands Ltda. has a design life of 20 years. Safe operation of the jetty requires that Corridor Sands Ltda. completely replace the jetty at that time. This implies that jetty costs will have been fully amortised by this time and that the mining company could consider alternative export options. Jetty replacement would be required by 2026 at the latest.
21. Rio Tinto will have been operating in the area since 2007-2010 and will have been sharing CSL facilities. Sharing facilities will reduce the period of amortisation and a jetty could, in theory, be made redundant if alternate suitable facilities were available to the mining companies.

22. The Ministry of Tourism has designated the Xai-Xai to Chongoene Area and the coast of Inhambane as a Priority Areas for Tourism Investment. The northern segment of the Xai-Xai to Chongoene area lies in a Rio Tinto Concession with demonstrated deposits and includes the site selected by CSL for construction of its proposed alternative export facility. The Inhambane coastal area, which includes Jangamo, also lies within a Rio Tinto concession.
23. There is a clear conflict between Ministry of Tourism objectives and national objectives aiming to develop heavy sands mining activities in Gaza and Inhambane Provinces. Allocation of land for tourism investment and development in areas likely to be mined should not be considered.
24. Assuming that the allocation of land in an area contained by an area 5km north and south of the Chongoene site is not considered at the present, then direct conflicts between the mining sector and the tourism sector can be minimised and managed.
25. If land allocation for tourism is suspended in the area mentioned above until such time as Rio Tinto has completed its extraction and restored the site, then it could be considered possible for the State to consider Option-2, the dedicated road and jetty option preferred by CSL as a viable temporary alternative.
26. Any jetty constructed as a temporary export solution by CSL and shared by Rio Tinto would have to be dismantled and the site fully restored on completion of its agreed operational life.
27. The temporary solution would have a maximum period of validity of 20 years. The mining companies would undertake to use national road and port infrastructure at that time or sooner should it become possible to do so.
28. Roads infrastructure constructed by the various mining companies would be turned over to the state and would be configured to service tourism development in the Xai-Xai to Chibuto Area once the export facility was dismantled, Rio Tinto mining operations had moved on and all evidence of mining activity in the coastal area had been erased.

The logical sequence presented above formed the basis of the following compromise option that was agreed as viable and realistic by all workshop participants:

6.1 COMPROMISE OPTION: COMBINATION OF OPTIONS 2 AND 4.

Corridor Sands Ltda. is provided with a licence to construct its proposed alternate export facility consisting of a dedicated road linking the Chibuto mine to a stockpile facility located 2 km. inland of the coast at Chongoene. The stockpile facility would be connected to jetty perpendicular to the coastline and extending offshore to a distance of 1.5 km (Option-2).

The licence provided to Corridor Sands Ltda. would have a maximum period of validity of 20 years after which time the export facility would have to be dismantled and the site restored.

The licence provided to Corridor Sands Ltda. would require that the facility be made available at fair commercial terms to other mining operators in the area.

The option requires that the Government of the Republic of Mozambique begin planning, financing procedures (structuring public-private partnerships) for a four-lane road (2 north lanes and 2 south lanes) linking Maputo to Inhambane-Maxixe with export facilities at both Maputo and Maxixe harbours (Option-4).

6.2 ENVIRONMENTAL CONSIDERATIONS AND RECOMMENDATIONS

Participants of the Bilene workshop highlighted the following environmental, policy and planning considerations resulting from group discussions and scenario building of the various transport options available to Corridor Sands Ltda. and subjected to Strategic Environmental Assessment:

- Environmental Management Capacity of both Gaza and Inhambane Provinces needs to be strengthened through targeted capacity building programmes.
- A robust Environmental Management Plan covering all aspects of the proposed transport option (**alternative export facility**) will be required and should be prepared by CSL. The Plan should be subjected to external review prior to acceptance by the government. The plan must include mitigation for all possible impacts that could affect maritime and terrestrial ecosystems, habitats and processes likely to be affected by any component of the proposed export facility
- Should the government of Mozambique accept the alternate export facility as the most suitable option, then it must ensure that the facility is made available to future mining operations at reasonable cost. It would be totally unacceptable for conditions to be set at such a level (for commercial reasons) that other mining concerns are forced to build private export facilities similar to those servicing CSL. Multiplication of private facilities would lead to coastal fragmentation and the implicit privatisation of national coastal resources.
- Operation of the proposed jetty at Chongoene has potentially serious environmental consequences. All maritime and jetty operations would have to be fully considered in an Environmental Management Plan that would have to be submitted to MICOA prior to any licensing agreement. MICOA would be advised to submit the plan to external verification and comment prior to any decision.
- The Government of Mozambique should structure its agreement with Corridor Sands Ltda. in the form of a **binding contract** that clearly defines the roles and responsibilities of all concerned parties including compliance to established environmental regulations. The contract would clearly define a mechanism to be used for the application of fines and would also provide guarantees to the mining concern. Contract arbitration should be in a neutral court (Belgium, Luxembourg, or other). The binding contractual agreement should include the jetty, its operations and liabilities. This contract should be an integral part of any licensing agreement.
- The jetty, if approved, would have to be removed and the site restored on completion of the government agreement in force. The Government agreement for transport and export of

mineral product should not exceed the design life of the jetty (stated at 20 years by CSL management during the Bilene workshop).

- CSL and its concessionaires will have to be held liable if damages caused to either the environment, marine/terrestrial natural resources or private property are found to be due to negligence, management failures or other factors deemed to be within their contractual obligations.
- Jetty operations will have to be carefully monitored by MICOA staff or their designated representatives.
- CSL or its concessionaire will have to maintain a logbook recording all its operations.
- An oil spill contingency plan will have to be elaborated by CSL and agreed by MICOA.
- A maritime emergency plan will have to be developed and approved by the proper authority.
- CSL should liaise closely with tourism operators in the area to ensure that they are fully informed of its contingency plans and ready to receive information on and react to any incident damaging tourism investment or potential.
- CSL should introduce a regular beach monitoring procedure to record changes (physical or biological) that might be due to its activities in the area. MICOA (CDS-ZC) should initiate a similar procedure starting prior to construction of the proposed jetty and export facility.
- Solid waste management, and both domestic and industrial sewage treatment systems will be required for both Gaza and Inhambane Provinces. These must be planned at an early stage to avoid environmental impacts due to development of the various environmental sectors.
- **If a north south transport infrastructure** is considered by the Government of the Republic of Mozambique, then a full SEA and EIA of both the north-south railway option and the north-south road option would have to be carried out in conjunction with pre-feasibility and Feasibility studies. The feasibility studies will have to be completed by an accurate costing to 10% required to structure the financing package.
- Environmental frameworks and regulatory systems need to be developed for future development of a national transport infrastructure
- Environmental management measures will have to be prepared for areas adjacent to the road or rail corridor and for urban areas affected by the transport corridor.
- Contingency plans for the **port facilities** at Maputo and Inhambane-Maxixe will have to be elaborated or revised if already present.
- MICOA should coordinate closely with the Ministry of Tourism and the Mining Sector to ensure that priority development takes place in areas not likely to be directly affected by mining activities in the future (time frame to be decided in discussion with mining companies and CDS-ZC). Areas likely to be subjected to mining activity and having tourism

potential should be allocated to investors once mining has taken place and the site has been fully restored.

- Environmental framework, environmental guidelines, project screening procedures and regulatory systems for **tourism development** need to be developed and used by all government authorities having a role in the allocation of land and the selection and monitoring of tourism development projects.
- Effluent discharge standards and regulation for the tourism industry must be developed.
- Conservation and management programmes targeting the tourism sectors need to be elaborated.
- Participants considered that environmental management measures need to be elaborated and enforced to ensure that expansion of the tourism sector does not lead to degradation of the natural environment.
- A mineral extraction and restoration plan will have to be elaborated by the mining company in close collaboration with government authorities (Ministry of Tourism, MICOA, Provincial Authorities).
- The extraction and restoration plan will also define a tourism development plan to include a schedule for allocation of land to investors. Land due to be mined should not be allocated until extraction activities have been completed and the land restored to its original state.
- **CDS-Coastal Zones must initiate discussions with the Ministry of Tourism, the Mining Companies and Provincial Government Authorities to define a Tourism Development Plan that considers and accommodates planned mining activity in designated tourism development areas (Priority Areas for Tourism Development).**
- **CDS-Coastal Zones should plan to implement its SEA based macro-zoning procedures to coastal areas from Vilancoulos (Inhambane Province) to Zongoene (Gaza Province).**
- National environmental regulations and standards will have to be systematically applied to the **agriculture sector** to reduce environmental impacts and deliver better products to the market.
- Water monitoring and testing programmes would have to be introduced to ensure compliance with environmental regulations and standards.
- MICOA would have to ensure that environmental management systems and regulations are sufficiently robust to mitigate any impacts due to **industrial development** of Gaza and Inhambane Provinces
- Environmental Management criteria and standards should be elaborated in preparation for the eventual development of a mining concession in the coastal area.

- The Government of Mozambique and CSL should have a binding contractual agreement concerning the jetty, its operations and liabilities. This contract should be an integral part of any licensing agreement.

Recognising that the Government of the Republic of Mozambique is strongly in favour of the proposed investment by WMC in the Corridor Sands Ltda. heavy sands mining project, and recognising that the economic benefits of that development project are essential to the economic development, employment and poverty alleviation of Gaza Province, participants and stakeholders in this SEA process agreed that a compromise solution such as that discussed above would benefit both the country and the Mining company.

Participants accepted that the dedicated road and jetty option proposed by CSL as their alternate export facility was the most economic option for the company. Likewise, participants accepted the time frame forwarded by CSL was binding to the eventual development of the mine at Chibuto and therefore to the realisation of social and economic benefits expected from the development by government authorities. As such, participants and stakeholders were willing to accept the alternate export facility on a temporary basis pending the development of a national transport infrastructure that would service the population and benefit all sectors of the economy (including the mining companies).

Participants and stakeholders strongly supported the compromise option and the mining companies represented at the workshop committed themselves to assist the Government in the realisation of either a road or railway linking the country on a north-south axis. Participants recommended that the north-south rail option should be favoured over the north-south road option but that both should be considered at the pre-feasibility stage.

The results of the SEA process recommend that the Government of Mozambique endorse the compromise solution and issue directives to initiate preparatory actions required to develop a north-south transport corridor. Furthermore, participants strongly recommended that the necessary environmental, social and management safeguards be applied to the temporary solution to ensure that all possible environmental impacts linked to the alternate export facility are mitigated, managed and monitored by both MICOA and Corridor Sands Ltda.

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8. PROCESS ACTION PLAN

The Process Action Plan detailed below describes a series of steps considered essential to future actions aimed at delivering a proper and sustainable solution to the issue surrounding Corridor Sands Limitada, its mineral transport solution and its export facility.

The Plan is structured on the assumption that the Government of the republic of Mozambique agrees to the Compromise Transport Option recommended by the participants of the SEA Workshop held at Bilene in the Province of Gaza from the 30th of July to the 2nd of August.

The Compromise Option foresees that the Government will approve the Alternate Transport Facility proposed by Corridor Sands Ltda. consisting of: A dedicated road from its mine at Chibuto to a stockpile facility located adjacent to the frontal dunes at Chongoene. The Stockpile would be linked by closed conveyor to an open latticed jetty extending 1500metres into the sea. The Government approval would set a time limit for the use of the jetty that should not exceed the design life of the structure (20 years). The jetty and stockpile facility would have to be dismantled at the end of that period and the sites restored to their original state. The mining companies would then be obliged to use national infrastructure to transport and export their mineral product.

IMMEDIATE ACTIONS:

1. The SEA Report is received by MICOA, subjected to a Technical Review and approved by the Decision Group.(October,2003)
2. The SEA Report is submitted to CONDES for discussion and a decision. (November, 2003)
3. MICOA receives the EIA Report for the Alternate Export Facility and subjects it to an external review procedure. (November, 2003)
4. MICOA receives an Environmental Management Plan for the Alternate Export Facility and submits it for external verification and comments (December, 2003)
5. MICOA approves the proposal for the Alternate Export Facility and issues an Environmental Licence according to the decision of CONDES. (December, 2003)
6. A Monitoring Plan is elaborated by CDS-ZC and staff are trained as required to implement the Plan. CDS-ZC trains Provincial Government personnel to implement these activities. (February, 2004)
7. CDS-ZC initiates an SEA procedure to define tourism development Macro-Zones and development criteria for the area extending from Vilancoulos (Inhambane Province) to Zongoene (Gaza Province). December, 2003 onwards).
8. MICOA coordinates a working group consisting of CDS-ZC, the Ministry of Tourism, Provincial Authorities and the Mining Companies to define a tourism development strategy for areas likely to be mined. (November, 2003)

9. MICOA together with the Ministry of Transport requests assistance to elaborate the north-south transport options described in the SEA Report. (January, 2004)
10. A pre-feasibility study is carried out of the transport options with external assistance of a team of specialists (March, 2004)
11. The results of the pre-feasibility study are assessed and a decision to proceed is made. The preferred transport option is selected. (June, 2004)
12. A Strategic Environmental Assessment of the chosen north-south transport option is carried out. (June, 2004)
13. The transport route is planned and a full feasibility study is commissioned. A 10% costing of the proposed infrastructure is determined and financing mechanisms are explored. (September, 2004)
14. A financing package is structured and a Tender for design of the transport corridor and port facilities is launched. (July, 2005)
15. A tender for construction works of both the transport corridor and the port facilities is launched. (July, 2006)

9. ANNEXES

9.1 ANNEX-1: TRANSPORT OPTIONS CONSIDERED BY WORKSHOP PARTICIPANTS

9.2 ANNEX-2: OPTION 7 – THE ZERO OPTION. CORRIDOR SANDS LIMITADA DOES NOT DEVELOP ITS MINING CONCESSION.

9.3 ANNEX-3: OPTION 1 – A DEDICATED RAIL LINK CONNECTING THE CHIBUTO MINE TO THE MAPUTO TO ZIMBABWE LINE OPERATED BY CFM

9.4 ANNEX-4: OPTION 2 – A DEDICATED ROAD LINKING THE CHIBUTO MINE TO AN EXPORT FACILITY AND DEDICATED JETTY AT CHONGOENE.

9.5 ANNEX-5: OPTION 3 – A NORTH-SOUTH RAILWAY LINKING MAPUTO TO INHAMBANE AND LATER NORTH TO THE BORDER WITH TANZANIA.

9.6 ANNEX-6: OPTION 4 – A NORTH-SOUTH TRUNK ROAD LINKING MAPUTO WITH INHAMBANE AND LATER NORTH TO THE BORDER WITH TANZANIA.

9.7 ANNEX-7: POTENTIAL TOURISM DEVELOPMENT IN THE XAI-XAI TO CHONGOENE REGION. GAZA PROVINCE, REPUBLIC OF MOZAMBIQUE

9.8 ANNEX-8: BILENE WORKSHOP PARTICIPANTS.

9.9 ANNEX-9: XAI-XAI ROUND TABLE DISCUSSIONS-LIST OF PARTICIPANT

9.1 ANNEX-1 TRANSPORT OPTIONS PRESENTED TO AND CONSIDERED BY WORKSHOP PARTICIPANTS.

OPCOES DE TRANSPORTE PROPOSTAS: Corridor Sands Limitada	
OPCAO – 1	Linha ferrea privativa ligando as Minas de Chibuto a linha dos CFM Maputo-Zimbabwe
Opcao – 2	Estrada privativa ligando as Minas de Chibuto a area de armazenagem situada a 2 Kms da costa de Chongoene e daqui para uma Ponte-Cais privativa.
VARIANTES EM RELACAO AS OPCOES DE TRANSPORTE	
OPCAO – 3	Uma opcao de Linha ferrea Norte-Sul: Uma linha ferrea e construida ligando Inhambane-Maxixe a linha dos CFM Maputo-Zimbabwe. Esta linha seria financiada atraves de uma parceria publica-privada, envolvendo o Governo, Instituicoes Financeiras Internacionais, Consorcio de Doadores, Sector Privado (Companhias Mineiras, Agentes Turisticos e Grupos de Gestao, etc). As concessionarias mineiras iriam-se conectar a esta linha para transportar os seus materiais para os Portos de Maputo, Maxixe, ou outros. A Linha Ferrea poderia ser a primeira fase de uma linha futura ligando a fronteira Norte (Tanzania) a fronteira Sul (Africa do Sul).
Opcao – 4	Uma estrada Norte-Sul com faixas privativas para fretes e construida, usando o mesmo arranjo de financiamento publico-privado. A estrada iria ligar inicialmente Maputo-Inhambane e posteriormente se estenderia para o Norte ate a fronteira com a Tanzania
Opcao – 5	O Governo concorda na construcao de uma estrada privativa. Todas as concessionarias de areias pesadas na mesma area geografica e no Pais deveriam construir as mesmas facilidades privativas
Opcao – 6	A Opcao do Rio Limpopo: os minerais processados sao transportados ao longo do rio ate cargueiros localizados no mar ao largo do rio.
Opcao – 7	A Opcao ZERO. Sem Estrada; Sem Linha Ferrea; Sem Mina.
OUTRAS OPCOES APRESENTADAS PELOS PARTICIPANTES	
Opcao – 8	
Opcao – 9	
Opcao - 10	
OPCOES ACEITES	
OPCAO 7: A Opcao ZERO (Obrigatoria)	

Opcao - 2. Estrada privativa ligando as Minas de Chibuto a area de armazenagem situada a 2 Kms da costa de Chongoene e daqui para uma Ponte-Cais privativa.

Opcao - 3. Uma opcao de Linha ferrea Norte-Sul: Uma linha ferrea e construida ligando Inhambane-Maxixe a linha dos CFM Maputo-Zimbabwe. Esta linha seria financiada atraves de uma parceria publica-privada, envolvendo o Governo, Instituicoes Financeiras Internacionais, Consorcio de Doadores, Sector Privado (Companhias Mineiras, Agentes Turisticos e Grupos de Gestao, etc). As concessionarias mineiras iriam-se conectar a esta lin. ha para transportar os seus materiais para os Portos de Maputo, Maxixe, ou outros. A Linha Ferrea poderia ser a primeira fase de uma linha futura ligando a fronteira Norte (Tanzania) a fronteira Sul (Africa do Sul).

Opcao – 1. Linha ferrea privativa ligando as Minas de Chibuto a linha dos CFM Maputo-Zimbabwe

Opcao - 4. Uma estrada Norte-Sul com faixas privativas para fretes e construida, usando o mesmo arranjo de financiamento publico-privado. A estrada iria ligar inicialmente Maputo-Inhambane e posteriormente se estenderia para o Norte ate a fronteira com a Tanzania

9.2 ANNEX-2: OPTION 7 – THE ZERO OPTION. CORRIDOR SANDS LIMITADA DOES NOT DEVELOP ITS MINING CONCESSION

IMPACT OR EFFECT CLASSIFICATION	Extremely Negative	Very Negative	Negative	Null	Positive	Very Positive	Extremely Positive
NUMERIC RANGE	-3	-2	-1	0	1	2	3
OPTION-7: THE ZERO OPTION (No Mine and related infrastructure)							
BRIEF DESCRIPTION OF THE SCENARIO	The Corridor Sands Project consisting of a mine at Chibuto and associated transport infrastructure is not developed. The zero scenario does not exclude the development of other mining concerns in the geographic area in the future.						
STATE AT TIME-0 (2004)	Current state of Gaza Province: Unemployment is high, investment in the province is low, public health issues (SIDA) are increasing and prevalent, access to social services for rural communities is limited, poverty levels are high and affect the natural resource base. The Limpopo trans-frontier park exists and is generating investor interest in the coastal area (demand for availability of coastal tourism development concessions). Infrastructure is insufficient; there are no facilities for regional air links.						
STATE AT+5 YEARS (2009)	Tourism development of the coastal areas and concessions within the Limpopo Trans-frontier Park has been initiated. The number of completed facilities is limited. Employment in the tourism sector is increasing. Employment in the construction sector is increasing to satisfy demand by tourism development. Access infrastructure is being improved to cater to increasing tourism. Negative impacts due to tourism become apparent and require improvement of solid waste management systems. Slight increase in companies servicing tourism (tour operators, guides, suppliers, transport, etc.). Increasing demand for services (water, electricity, communications etc). Social services are improved as the economy begins to expand.						
STATE AT+10 YEARS (2014)	Tourism is implanted and continues to expand. Tourism is limited by the availability of land suitable for development. A mining operation is initiated and generates additional employment. Tourism service companies (tourism and mining increase in numbers). Employment in the service sector increases. Small and medium scale enterprises increasing as funding becomes available. Economy expands. Negative environmental and social impacts become apparent and demand specific management and mitigation (solid waste management, loss of biodiversity, waste water treatment, prostitution, poverty, SIDA etc.) Population is more aware of the value of resources and participates in management. Improvement in the management and conservation of resources. Transport infrastructure is improved (road, rail, regional air links are established). Agriculture servicing tourism and the mining sector expands. Social services more accessible and of better quality. Poverty reduction due to increased direct and indirect employment becomes apparent.						

STATE AT+21 YEARS (2025)	Tourism now well established and contributes to the economy. Environmental impacts due to tourism are well managed and reduced. Resource value is recognised by the population as essential to tourism and sustained employment. Tourism due to the trans-frontier parks are contributing to the economy. The mining sector is now well established and generates revenue to the state and the region. Transport infrastructure sufficient to meet the needs of the population, mining, tourism, and other sectors expanding in the geographic area of influence. Gaza province contributes to the national economy. Investment in the province increases and associated environmental and social impacts are monitored and managed. Population has increased and services have improved to provide basic and essential services to that population. The regional airport facilities are expanded to receive larger aircraft.						
GEOGRAPHIC AREA: INFLUENCE/IMPACT	Gaza Province.						
SECTORS-ISSUES-POLICIES Affected by Scenario	Direct	Indirect	T-0	T+5	T+10	T+21	COMMENTS
Tourism Sector	Y	Y	0	1	2	3	The tourism sector is likely to expand due to demand generated by the Trans-frontier Park and the value of coastal resources
Transport Sector-Infrastructure-Communications	Y	Y	0	0	1	2	Transport, infrastructure and communications will develop over the time period keeping pace with tourism development, increasing demand from the population and possible establishment of mines after year +10.
Agriculture Sector	Y	N	0	1	2	3	Agriculture sector will expand with the arrival of tourism, the future mine, improved infrastructure and increasing wealth
Industrial Sector	N	N	0	0	1	2	The industrial sector remains seminal until the arrival of a future mine. Any future mine is external to the scenario and would be developed according to presence and quality of mineral resources.

Mining Sector	N	N	0	0	1	1	Development of a heavy sands mine or similar in the future is external to the scenario and would be developed according to the presence and quality of mineral resources.
Environment-Biodiversity Sector	Y	Y	(2)	(1)	1	2	Environment and biodiversity is negatively affected by poverty, and lack of information regarding the value of resources. This trend is reversed as tourism is developed in the province, impact of the Limpopo Park is recognised, local economy expands.
Health Sector and Public Health	Y		(2)	(2)	1	2	Services remain insufficient and distant. SIDA, infant mortality remain at current levels until either national economies expand or tourism/mine/service company investments expand local economy and services.
Finance Sector	Y	N	0	1	2	2	Development of tourism and other sectors could lead to revision of fiscal and investment policies. New funding instruments could be made available
Foreign Affairs	Y	N	1	1	2	2	Existence of LTP leads to opening of borders and for movement of people, goods and services. Demand for Gaza as a destination will also lead to a revision of entry regulations (Visa requirements).

Fisheries Sector	Y	Y	0	1	1	1	Demand for fish and marine products increases with the development of the tourism sector, expanding economy, greater spending power. The effect is slightly positive given the possibility of over-utilisation of resources without suitable management.
Employment	Y	Y	0	1	2	3	Little employment prior to development of the tourism sector. Direct and indirect employment increases as tourism sector expands and a future mine develops after year +10.
Planning	N	N					The scenario does not affect planning given that it will exist regardless of the presence or absence of the CSL project.
Nature Conservation and Trans-boundary Parks	Y	Y	2	2	3	3	LTP exists and is increasingly recognised as an economic driver in the region. Local conservation efforts become apparent as the tourism sector expands. Restoration efforts by mining companies establish green belts or similar conservation areas.

Social Sector-Local - Regional Develop. PARPA	Y	Y	(3)	(1)	1	2	Current poverty and lack of services remain an issue of concern until investment in tourism, mining and other sectors increases employment and individual wealth. Poverty reduction linked to investment, employment and provision of services.
Sector Policies	Y	N	0	1	1	2	Sector policies are unlikely to be affected initially. As investment in the various sectors becomes apparent, sector policies may be adjusted to meet the demands of those sectors.
Monetary Policy	N	Y	0	0	1	1	Monetary and fiscal policies (national) may be adjusted due to demand from the various economic sectors developing in the geographic area.
Tax and Trade policy	N	Y	0	0	1	1	Tax and trade policy (national) may be adjusted due to demand from the various economic sectors developing in the geographic area.
Infrastructure Costs	N	N					
Service costs	N	Y	0	0	1	2	Cost of services may be affected by foreseen development in the geographic area. Availability of services should improve and cost sharing with investors could reduce costs and improve delivery of services.
SME's and Micro-Credit	Y	N	(2)	0	1	2	Funds for micro-credits and growth of SME's will become available and apparent as the tourism sector is developed and a future mine is established in the geographic area.

Investment and Promotion Local-National	Y	Y	0	1	2	2	The geographic area contributes to the promotion of Mozambique as a destination and an investment opportunity from year +5 as tourism sector expands. Promotion as an expansion area as a future mine is established.
Construction	Y	N	0	1	2	3	Construction will initially remain at current levels. It increases as tourism facilities and tourism service companies become established. Further expansion to service demands of a future mining operation. Contracting companies established in the area.
ENVIRONMENTAL-SOCIAL -ECONOMIC IMPACTS/BENEFITS EXPECTED FROM OR DUE TO THE OPTION AND SCENARIO							
	ENVIRONMENTAL		SOCIAL		ECONOMIC		COMMENTS
Tourism Sector	(2), 3		(2), 3		3		Tourism expands from year +5. Impacts are both positive and negative for environment and social. Economic impacts are positive
Transport Sector-Infrastructure-Communications	(2)		3		3		Transport infrastructure and communications are expected to improve over the period. Environmental impacts are expected, social impacts are beneficial and negative (SIDA), economic impacts are positive
Agriculture Sector	(2)		2		2		Environmental impacts due to expansion of agriculture sector from year+5 could be expected (pesticides, fertilizers). Social and economic impacts are positive.

Industrial Sector	(2)	(2), 2	3	Industrial sectors could be present with a mine from year +10. Impacts from this sector would be expected from this time.
Mining Sector	(3), 2	(2), 3	3	From year +10. Negative environmental impacts are present but mitigated through management. Social impacts are positive and negative (employment, SIDA, mitigation reduces impact). Economic impact is significantly high
Environment-Biodiversity Sector	(2),2	1	2	Zero scenario impacts environment negatively from T-0to T+5. Situation improves with investment in the tourism sector.
Health Sector and Public Health	(1)	2	1	
Finance Sector	0	2	3	Expansion of local economy from y+5 will generate social and economic benefits from employment, SME's, and service companies.
Foreign Affairs	NR	NR	NR	
Fisheries Sector	1	2	2	Expansion of local economy from y+5 will generate increased demand for fisheries products. Employment and income increase. Contribution to local economy.
Employment	(1)	3	3	Employment increases as tourism sector and mining sector expands. Negative environmental impacts could be expected from increasing local population due to available employment.
Planning	NR	NR	NR	
Nature Conservation and Trans-boundary Parks	3	(2), 2	3	Social impacts negative due to displacement but positive due to employment
Social Sector-Local - Regional Develop. PARPA	0	2	2	Poverty alleviation in the geographic area apparent due to expansion of the various economic sectors.

Sector Policies	NR	NR	NR	
Monetary Policy	NR	NR	NR	
Tax and Trade policy	NR	NR	NR	
Infrastructure Costs	NR	NR	NR	
Service costs	0	0	0	
SME's and Micro-Credit	(1)	3 (Local)	3 (Local)	Negative impact due to increased numbers of small and medium enterprises. Assumes that Management measures are in place to mitigate. Positive social and economic impacts
Investment and Promotion Local-National	(1)	2	2	Development of the area has a positive impact on promotion and investment both at the local and national levels. Promotion can have a negative environmental impact due to increasing influx of population seeking employment and opportunity
Construction	(1)	2	2	Negative impacts likely due to increasing construction, changes in land use, loss of biodiversity. Positive social and economic impacts.

RISK IDENTIFICATION AND MAGNITUDE TO THE OPTION OR SCENARIO

Type Of Risk	Likely	Unlikely	T-0	T+5	T+10	T+21	COMMENTS
Political Instability	N	Y					Political instability in the country is a risk and could affect development in the geographic area.
Geopolitical Issues	Y	N					Political instability in Zimbabwe is affecting the region at present. Similar instability could affect future investments in the geographic area.
Markets and Demand for Products	Y						Demand for the area as a destination or fluctuating demand for mineral resources can be a risk to development as forecasted in the scenario.
Labour Relations, Strikes, etc.	NR	NR					

Fiscal Policies	Y	Y					Changes in fiscal policies would be likely to affect investment in the geographic area negatively
Operational Risks (Internal and External)	NR	NR					
Flood Risk and Natural Disasters	Y						Flood risks are and remain a risk to developments in the area (tourism, mining, SME', Service providers, etc.)
Public Opinion	Y						Negative public opinion or social/economic exclusion leading to a negative public opinion can become a destabilising factor affecting all economic sectors in the geographic area.
Management Failures (Internal or External)	Y						Management failure of the Xai-Xai Beach Lodge have closed the hotel and damaged the tourism potential of the area. Similar risks could be expected in the future until the tourism sector expands, infrastructure is present and markets have been captured.
Competition and Pricing		Y					Non-competitive pricing of goods and services in the geographic area will limit the development potential.
Climate and Oceanographic Conditions		Y					Climate is a potential risk (tropical storms, flooding, erosion due to waves action, etc.)
Ship Accidents	NR	NR					
Hydrocarbon Spills		Y					From external sources or a future mine could affect watercourses or coastlines. A potential ship accident could severely affect coastal tourism, fisheries resources water supplies etc.
Fines and Compensation Payments	NR	NR					
Accidents and Spills	Y						Road accidents remain a risk to any future economic activity dependent on external clients and services.
Social Issues (Exclusion, Resentment, etc.)	Y						Negative public opinion or social/economic exclusion leading to a negative public opinion can become a destabilising factor affecting all economic sectors in the geographic area.

Tariffs				NR										
Availability of Suitable Harbour Facilities				NR										
Dependable/Consistent Supply Chain				Y										Implicit
COMPATIBILITY MATRIX														
	Tourism	Transport	Infrastructure	Agriculture	Mining	Environment	Conservation	Health	Societal	Employment	Investment	Promotion	Construction	SME's
Tourism		2	3	3	(3), 2	(2), 2	3	(2), 2	3	3	3	2	3	2
Transport			3	3	2	(1)	(1)	2	3	3	3	2	3	2
Infrastructure				2	3	(2), 2	(1)	2	(2), 2	3	3	3	3	2
Agriculture					(3), 2	(2), 2	(1)	1	2	3	2	0	0	2
Mining						(2), 2	(3), 2	2	(2), 2	2	3	2	3	3
Environment							3	(1), 2	2	1	1	3	1	1
Conservation								1	2	1	2	3	1	1
Health									3	2	1	2	2	1
Societal										3	2	1	1	3
Employment											3	2	3	3
Investment												3	3	3
Promotion													3	2
Construction														2
SME's														0
CONTRIBUTION TO SUSTAINABLE DEVELOPMENT					TIME + 5 YEARS			Time +10 Years		Time + 21 Years		Comments		
					1			2		3				
					LOCAL			REGIONAL		NATIONAL		Comments		
					YES			YES		YES				

9.3 ANNEX-3: OPTION 1: A DEDICATED RAIL LINK LINKING THE CHIBUTO MINE TO THE MAPUTO-ZIMBABWE RAIL LINE OPERATED BY CFM.

CLASSIFICACAO DOS IMPACTOS OU EFEITOS	Extremamente Negativo	Muito Negativo	Negativo	Nulo	Positivo	Muito Positivo	Extremamente Positivo	
VALOR NUMERICO	-3	-2	-1	0	1	2	3	
OPCAO-1:								
BREVE DESCRICAO DO CENARIO	Uma linha privativa operada por um concessionario denominado pela CSL e aprovada pelo CFM. A CSL apenas paga o uso da linha ferrea publica, Maputo-Zimbabwe assim que a usarem. Apos o fecho da mina, a linha ferrea pode passar para os CFM, sem custos, assim como pode ser desmantelada a custo da CSL.							
ESTADO NO PERIODO-0 (2004)	Status Quo construcão planeada para começar em 2005 e a finalizar em 2007.							
ESTADO NO PERIODO+5 ANOS (2009)	Linha ferrea operacional							
ESTADO NO PERIODO+10 ANOS (2014)	Linha ferrea operacional, com cerca de tres comboios por dia com 30 vagoes por comboio							
ESTADO NO PERIODO+21 ANOS (2025)	Linha ferrea na maxima capacidade, com cerca de 9 comboios diarios							
AREA GEOGRAFICA: IMPACTO/INFLUENCIA	Area circunvizinhas por onde passara a linha)distritos de Chibuto, Guija e Chokwe=							
SECTORES-ASPECTOS- Afectados pelo Cenario	Directo	Indirecto	T-0	T+5	T+10	T+21	COMENTARIOS	
Sector do Turismo			0	0	0	0	A Linha Ferrea nao tem nenhum impacto sobre o sector de turismo	
Sector de Transportes, Infra-estruturas e Comunicacoes	Y		0	1	1	1	A linha ferrea ira trazer receitas ao sector de transporte pelo pagamento de taxas pelo uso da linha dos CFM Maputo Zimbabwe (taxa pelo peso da locomotiva, vagoes e da carga "areias pesadas". Na linha privada, de Chibuto ate a linha de Zimbabwe-Maputo, a CSL nao ira pagar nenhuma taxa. Assume-me se que as taxas a pagar nao serao muito significativas para o sector de transporte.	

Sector Agricola	Y		(1)	0	0	0	A construcao da linha afectara de certa forma os campos agricolas na altura de construcao (perda de campos agricolas, morte de culturas com o movimento de viaturas e maquinas). Depois da construcao da linha ferrea, nao havera nenhum beneficio para a agricultura pois os camponeses nao poderao usar a linha para exportarem os seus productos. Para alem disso, apos a sua construcao, a linha ferrea nao ira ter nenhum impacto sobre a agricultura
Sector Industrial		Y	1	0	0	0	Havera apenas algum impacto positivo na altura da construcao para o sector industrial, nomeadamente pedreiras, e outras empresas sub-contratadas
Sector Mineiro	Y		0	1	1	1	A Linha Ferrea nao beneficiara o sector mineiro durante a construcao. Na altura da operacao, havera algum impacto para o sector ambiental, mas apenas para a parte mineira representada pela CSL e nao para todo o sector como um todo.
Sector Ambiental	Y		(1)	0	0	0	Na altura da construcao havera alguns impacto ambientais, nomeadamente a degradacao dos solos, possivel contaminacao localizada dos solos e aguas. Durante a fase operacao, nao existiraos impactos ambientais significativos
Sector de Saude e Saude Publica	Y		(2)	0	0	0	Na altura de construcao poderao haver alguns acidentes de trabalho. Para alem disso, a presenca de um elevado numero de trabalhadores podera resultar numa subida da ocorrencia de doencas de transmissao sexual, incluindo a SIDA. Durante a operacao da linha, o numero de trabalhadores vai diminuir drasticamente e espera-se que o impacto seja insignificante.
Sector Financeiro	Y		0	1	1	1	As receitas a serem colhidas na conexao com a linha publica, e as pessoas a se beneficiarem sao a concessionaria da CSL e os CFM, mas nao nos primeiros cinco anos (fase de construcao) mas sim na fase de operacao. As taxas a serem colhidas pelos CFM nao serao assim tao grande

Negocios Estrangeiros			0	0	0	0	A Linha ferrea nao ira ter nenhum impacto nas relacoes externas. E pequeno demais para ter algum impacto significativo alem fronteiras
Sector Pesqueiro			(1)	0	0	0	A linha ferrea tera um podera ter um pequeno impacto no sector pesqueiro na fase de construcao. A area onde a linha devera ser erguida nao tem praticamente nenhuma actividade pesqueira. Na fase de operacao, praticamente nao tera nenhum efeito.
Emprego	Y		3	0	0	0	Na fase de construcao serao contratadas 800 pessoas, o que trara impacto muito significativo para o emprego localmente, contudo, na fase de operacao, o numero vai baixar drasticamente para algumas dezenas de trabalhadores o que vai anular na pratica o impacto da linha no emprego
Planificacao			0	0	0	0	A linha ferrea nao tera nenhum impacto no planeamento
Conservacao Natural e Parques			0	0	0	0	Por a zona a ser atravessada pela linha ferrea nao ter nenhum Parque ou Area Natural (toda a area e agricola) nao havera nenhum impacto
Sector Social-Local-Desenvolvimento Regional. PARPA	Y		(2)	0	0	0	Na fase de construcao, havera uma deslocao de 185 familias do local onde a linha vai passar. Isto tera um impacto negativo, mas localizado em termos temporarios. Na fase de operacao os impactos serao nulos
Sector de Politicas			0	0	0	0	A linha nao tera nenhum impacto
Politica Monetaria			0	0	0	0	A linha nao tera nenhum impacto
Politica de Impostos e Comercio			0	0	0	0	A linha nao tera nenhum impacto
Custos de Infra-estruturas			0	0	0	0	A linha nao tera nenhum impacto
Custos de Servicos			0	0	0	0	A linha nao tera nenhum impacto
Micro-creditos			0	0	0	0	A linha nao tera nenhum impacto
Promocao e Investimento Nacional e Local			1	0	0	0	A linha ferrea ira produzir alguns impactos positivos para as empresas mocambicanas (a nivel local e nacional) na altura de construcao, por exemplo pedreiras, empresas de transporte etc. Mas na altura de operacao, praticamente nao havera nenhum impacto da linha ferrea para o empresariado nacional, pois ela e estrictamente de uso privativo

Construcao			2	0	0	0	
IMPACTOS/BENEFICIOS AMBIENTAIS, SOCIO-ECONOMICOS ESPERADOS DE OU DEVIDOS A OPCAO E CENARIO							
	AMBIENTAIS	SOCIAIS	ECONOMICOS	COMENTARIOS			
Sector do Turismo							
Sector de Transportes, Infra-estruturas e Comunicacoes							
Sector Agricola							
Sector Industrial							
Sector Mineiro							
Sector Ambiental							
Sector de Saude e Saude Publica							
Sector Financeiro							
Negocios Estrangeiros							
Sector Pesqueiro							
Emprego							
Planificacao							
Conservacao Natural e Parques							
Sector Social-Local-Desenvolvimento Regional. PARPA							
Sector de Politicas							
Politica Monetaria							
Politica de Impostos e Comercio							
Custos de Infra-estruturas							
Custos de Servicos							
Micro-creditos							
promocao e Investimento Nacional e Local							
Construcao							
IDENTIFICACAO DOS RISCOS E MAGNITUDE DA OPCAO OU CENARIO							
Tipo de Risco	Provavel	Improvavel	T-0	T+5	T+10	T+21	COMENTARIOS

Instabilidade Política														
Assuntos Geopolíticos														
Mercados e demanda de Produtos														
Relacoes de Trabalho, Greves														
Políticas Fiscais														
Riscos Operacionais (Internos e Externos)														
Risco de Cheias e Desastres Naturais														
Opinio Publica														
Insucessos de Gestao (Internos e Externos)														
Precos														
Condicoes Climaticas e Oceanograficas														
Acidentes de navios														
Derrame de Hidrocarbonetos														
Multas e Pagamento de Compensacoes														
Acidentes e Derrames														
Aspectos Sociais (Exclusao, etc)														
Tarifas														
Disponibilidade de facilidades Portuarias adequadas														
Cadeia de Fornecimento Consistente														

MATRIZ DE COMPATIBILIDADE

	Turism o	Transp orte	Infra- estrutura	Agricultur a	Minas	Ambiente	Conser vacao	Saude	Social	Empre go	Investm ent	Promoc ao	Construcao	
Turismo		Y	Y	Y\N	Y\N	Y	N	Y	Y	Y	Y	Y	Y	
Transporte			Y	Y	Y	N	N	N	Y	Y	Y	Y	Y	
Infra-estrutura				Y	Y	N	N	Y\N	Y\N	Y	Y	Y	Y	
Agricultura					N	Y\N	N	Y	Y	Y	Y	Y	Y\N	
Minas						Y\N	Y\N	Y\N	Y	Y	Y	Y	Y	
Ambiente							Y	Y	Y	Y	Y	Y	Y	
Conservacao								Y	Y	Y	Y	Y	Y	
Saude									Y	Y	Y	Y	Y	
Social										Y	Y	Y	Y	

Emprego												Y	Y	Y	
Investimento													Y	Y	
Promocao														Y	
Construcao															

9.4 ANNEX-4: UNA ESTRADA PRIVATIVA LIGANDO AS MINAS DE CHIBUTO PARA UMA POTE-CAIS PRIVATIVA NA REGIAO DE CHONGOENE

IMPACT OR EFFECT CLASSIFICATION	Extremely Negative	Very Negative	Negative	Null	Positive	Very Positive	EXTREMELY POSITIVE
NUMERIC RANGE	-3	-2	-1	0	1	2	3
OPCAO-2. Estrada privativa ligando as Minas de Chibuto a area de armazenagem situada a 2 Kms da costa de Chongoene e daqui para uma Ponte-Cais privativa							
BRIEF DESCRIPTION OF THE SCENARIO	Consiste na construcao de uma estrada dedicada com um armazen a 2km da costa de chongoene ligando-se a uma ponte cais privada						
STATE AT TIME-0 (2004)	Nao existencia de uma facilidade de escoamento						
STATE AT+5 YEARS (2009)	Fase de construcao da estrada, assentamento da populacao e turismo afectado negativamente na regio de Chongoene e Xai-Xai. Estrada e facilidade portuaria e jety concluidos. Inicio do escoamento de minerio.						
STATE AT+10 YEARS (2014)	Escoamento de minerio em actividade continua,						
STATE AT+21 YEARS (2025)	Capacidade maxima de escoamento atingida, expansao da facilidade de ancoragem, duplicacao da capacidade de trafico						
GEOGRAPHIC AREA: INFLUENCE/IMPACT	Regiao de Chibuto, Manjacaze, Xai-xai, ate a costa de chongoene. Impacto nas minas, turismo agricultura e industria, industria energetica, industria de gaz						
SECTORS-ISSUES-POLICIES Affected by Scenario	Direct	Indirect	T-0	T+5	T+10	T+21	COMMENTS
Tourism Sector	y		0	(2)	(2)	(2)	Potencial turistico nao explorado ao acesso e outras infra-estruturas basicas nao existentes na regio. Turismo nao facilitado nas areas de accao do projecto, particularmente regio de Chongoene devido aos trabalhos de construcao e a fase de operacao que cria incerteza no investidor turistico.
Transport Sector-Infrastructure-Communications			0	0	0	0	
Agriculture Sector			0	0	0	0	
Industrial Sector	y	y	0	1	1	1	Oportunidade de negocio na fase de construcao e operacao (directo); assentamento de outras industrias de prestacao de servicos durante a fase de construcao e operacao
Mining Sector	y	y	1	3	3	3	Beneficios directos para CSL. Icentivos para implatacao de mais industrias. Receitas para o Estado
Environment-Biodiversity Sector	y		0	(1)	0	1	Fase de construcao afecta a biodiversidade costeira e marinha.negativamenet. Seguido de uma fase de reposicao da estabilidade na regio e eventual melhoria em T+21
Health Sector and Public Health	y	y	0	(2)	0	0	Aumento de Sida e DTS na fase de construcao
Finance Sector		y	0	1	1	1	Receitas para o Estado
Foreign Affairs							
Fisheries Sector		y	0	(1)	0	0	Afectada durante a fase de construcao

Employment	y	y	0	2	1	1	Aumento de emprego na fase de construcao, e emprego estavel na fase de operacao
Planning							
Nature Conservation and Trans-boundary Parks			0	0	0	0	
Social Sector-Local - Regional Develop. PARPA		y	0	2	1	1	Vai gerar oportunidades de emprego, na fase da construcao e operacao
Sector Policies	y		1	1	1	1	A construcao da Estrada afectara politica de transporte e minas
Monetary Policy							
Tax and Trade policy		y	1	1	1	1	Imposto e taxas sobre a estrada
Infrastructure Costs			0	0	0	0	
Service costs			0	0	0	0	
SME's and Micro-Credit	y		0	1	1	1	Novas empresas de prestacao de servicos com inicio da construcao da estrada e fase de operacao
Investment and Promotion Local-National	y		0	0	1	2	Reformulada a politica sectorial (transporte)
Construction	y		0	3	1	0	Inicio da construcao da estrada atrai outras iniciativas de investimentos de construcao
ENVIRONMENTAL-SOCIAL -ECONOMIC IMPACTS/BENEFITS EXPECTED FROM OR DUE TO THE OPTION AND SCENARIO							
	ENVIRONMENTAL		SOCIAL		ECONOMIC		COMMENTS
Tourism Sector	(1)		0		0		Requer boa gestao para atenuar a degradacao do ambiente devido a construcao e operacao do jety
Transport Sector-Infrastructure-Communications	(1)		0		0		Construcao, aumento de circulacao de viaturas e actividade portuaria podera afectar negativamente o ambiente.
Agriculture Sector	(1)		0		0		Perda de areas agricolas devido a abertura da estrada
Industrial Sector	0		0		0		
Mining Sector	0		0		0		
Environment-Biodiversity Sector	(1)		0		0		Biodiversidade afectada significativamente pela construcao da ponte e da estrada
Health Sector and Public Health	0		0		0		
Finance Sector	0						
Foreign Affairs							
Fisheries Sector							
Employment	0		1		1		Mais oportunidades de emprego
Planning							
Nature Conservation and Trans-boundary Parks							
Social Sector-Local - Regional Develop. PARPA	0		0		0		

Sector Policies							
Monetary Policy							
Tax and Trade policy							
Infrastructure Costs							
Service costs							
SME's and Micro-Credit							
Investment and Promotion Local-National							
Construction							
RISK IDENTIFICATION AND MAGNITUDE TO THE OPTION OR SCENARIO							
Type Of Risk	Likely	Unlikely	T-0	T+5	T+10	T+21	COMMENTS
Political Instability		y	0	1	1	1	
Geopolitical Issues			0	0	0	0	
Markets and Demand for Products			0	0	0	0	
Labour Relations, Strikes, etc.	y		0	(2)	(1)	(1)	Greves como consequencia de actividades de construcao; sindicatos gradualmente se tornam independentes do Estado e aumenta o risco de greve
Fiscal Policies							
Operational Risks (Internal and External)							
Flood Risk and Natural Disasters							
Public Opinion	y			(1)	(1)	(1)	Populacao vedada ao uso da estrada e porto
Management Failures (Internal or External)		y	0	(1)	(1)	0	Possiveis erros de gestao na fase de construcao e inicio da fase de operacao
Competition and Pricing							
Climate and Oceanographic Conditions							
Ship Accidents		y	0	0	0	0	Possiveis devido a localizacao do Ponte cais em mar aberta (ventos, ondas fortes)
Hydrocarbon Spills		y					Possiveis devido a localizacao do Ponte cais em mar aberta (ventos, ondas fortes)
Fines and Compensation Payments		y					
Accidents and Spills	y		0	(1)	(1)	(1)	Risco relativamente alto devido a localizacao e capacidade de controle do acidente
Social Issues (Exclusion, Resentment, etc.)	y		0	(1)	(1)	(1)	Ressentimento pela vedacao do acesso
Tariffs							
Availability of Suitable Harbour Facilities							

Dependable/Consistent Supply Chain														
COMPATIBILITY MATRIX														
	Tourism	Transport	Infrastructure	Agriculture	Mining	Environment	Conservation	Health	Societal	Employment	Investment	Promotion	Construction	SME's
Tourism		2	3	(1)	(1)	0	3	0	1	3	3	3	2	3
Transport			3	3	3	(1)	(1)	1	(1)	3	2	3	3	3
Infrastructure				2	3	(1)	(1)	0	2	3	3	3	3	3
Agriculture					(1)	(2)	(2)	(1)	2	2	2	2	1	2
Mining						(1)	(1)	(1)	2	3	3	3	3	3
Environment							3	3	3	0	0	3	0	0
Conservation								2	2	1	3	3	1	3
Health									2	3	3	3	2	3
Societal										3	3	3	3	3
Employment											3	3	3	3
Investment												3	3	3
Promotion													3	3
Construction														3
SME's														
CONTRIBUTION TO SUSTAINABLE DEVELOPMENT					TIME + 5 Years		Time +10 Years		Time + 21 Years		Comments			
					2		2		2					
					LOCAL		REGIONAL		NATIONAL		Comments			
					2						Areas de contribuicao directa, Xai-xai e Chongoene			

9.5 ANNEX-5 OPTION 3: NORTH-SOUTH RAIL OPTION LINKING INHAMBANE-MAXIXE TO MAPUTO. MINING CONCERNS LINK TO THIS LINE AND EXPORT MINERALS THROUGH FACILITIES IN MAPUTO

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IMPACT OR EFFECT CLASSIFICATION	Extremely Negative	Very Negative	Negative	Null	Positive	Very Positive	Extremely Positive		
NUMERIC RANGE	-3	-2	-1	0	1	2	3		
OPCAO-3:Uma opcao de Linha ferrea Norte-Sul: Uma linha ferrea e construida ligando Inhambane-Maxixe a linha dos CFM Maputo-Zimbabwe. Esta linha seria financiada atraves de uma parceria publica-privada, envolvendo o Governo, Instituicoes Financeiras Internacionais, Consorcio de Doadores, Sector Privado (Companhias Mineiras, Agentes Turisticos e Grupos de Gestao, etc). As concessionarias mineiras iriam-se conectar a esta linha para transportar os seus materiais para os Portos de Maputo, Maxixe, ou outros. A Linha Ferrea poderia ser a primeira fase de uma linha futura ligando a fronteira Norte (Tanzania) a fronteira Sul (Africa do Sul).									
BRIEF DESCRIPTION OF THE SCENARIO	Consiste na construcao de uma Linha Ferrea, com ramais privados de acesso, e facilidades de construcao de um porto na provnincia de Inhambane num local adequado. Construcao podera nao estar finalizada em 2014								
STATE AT TIME-0 (2004)	Noh de desenvolvimento turistico, acesso, escoamento de produtos agricolas e transporte deficientes.								
STATE AT+5 YEARS (2009)	Situacao mais dificil devido a fase de re-construcao da Linha Ferrea. Turismo afectado negativamente								
STATE AT+10 YEARS (2014)	Estrada ampliada. Escoamento de minerio por estrada, incentivo para abertuda de outras minas, I.e., maior actvidade de propecao. Melhoramento do escoamento, turismo, aumento de desenvolvimento Agricola.								
STATE AT+21 YEARS (2025)	Novas minas e mais desenvolvimento indirecto. Industria de turismo, agricultura em expansao. Trafico melhorado, negocios ao longo da estrada, maior oportunidade de negocios.								
GEOGRAPHIC AREA: INFLUENCE/IMPACT	Regiao sul do pais e sul da provincia de Inhambane. Impacto nas minas, turismo agricultura portos e industria, industria de gaz, copra								
SECTORS-ISSUES-POLICIES Affected by Scenario	Direct	Indirect	T-0	T+5	T+10	T+21	COMMENTS		
Tourism Sector	y		0	(1)	1	2	durante a fase de construcao haverá dificuldade de transitio		
Transport Sector-Infrastructure-Communications	y		0	(1)	1	1	durante a fase de construcao haverá dificuldade de transitio		
Agriculture Sector		y	0	(1)	1	1	Acesso as areas de agricultura dificultado pela construcao de estrada, podendo melhorar com a finalizacao da mesma		
Industrial Sector	y	y	0	1	1	1	Equipamento de construcao com oportunidade de negocio na fase de construcao (directo); industria de copra e outras melhora acesso ao mercado (ind)		
Mining Sector	y		0	0	3	3	Directo nas minas existentes e novas.Taxas comercias mais competitivas		
Environment-Biodiversity Sector	y		0	(1)	1	1	Fase de construcao afecta a biodiversidade; fim da construcao beneficia a biovidersidade		

Health Sector and Public Health	y	y	0		0	1	Aumento de Sida e DTS durante a fase de construcao; colera reduzida
Finance Sector		y	0	1	2	2	Aumento de oportunidades de negocio de empresas da area de construcao e fornecimento de materia prima; acesso ao credito bancario
Foreign Affairs							
Fisheries Sector		y	0	0	1	1	
Employment	y	y	0	2	1	1	
Planning							
Nature Conservation and Trans-boundary Parks		y	0	0	1	1	Conservacao afectada na Fase de Construcao.
Social Sector-Local - Regional Develop. PARPA	y	y	0	1	2	2	Problemas de reassentamento. Vai gerar oportunidades de emprego, tanto na fase da construcao como com o surgimento de negocios.
Sector Policies	y		1	1	1	1	A construcao da Linha Ferrea afectara todas politicas sectoriais
Monetary Policy							
Tax and Trade policy		y	1	1	1	1	Revisao de politicas comerciais, Maior movimento de mercadoria, taxas sobre mercadorias
Infrastructure Costs	y	y	0	(3)	2;1	2;3	Mobilizacao de fundos para a construcao e fundos de construcao elevados, ; Menor custo de construcao de outras infraestruturas, estabilizacao de custos de energia e comunicacoes

Service costs	y	y	0	(1)	1	1	Aumento de precos durante a fase de construcao devido ao aumento de disponibilidade de fundos por operarios. Importacao de servicos. Custo de servicos reduzidos com entrada em funcionamento da Linha Ferrea
SME's and Micro-Credit	y		0	1	1	1	Novas empresas de prestacao de servicos com inicio da construcao da LF.
Investment and Promotion Local-National	y		0	0	1	2	Reformulada a politica de planeamento territorial. Custo de estabelecimento de industria relativamente menor, desenvolvimento rapido e diversificado de certos sectores relacionados com o sector mineiro agricola e menor grau o turistico.
Construction	y		0	3	1	2	Inicio da construcao da LF atrai outras iniciativas de investimentos de construcao

ENVIRONMENTAL-SOCIAL -ECONOMIC IMPACTS/BENEFITS EXPECTED FROM OR DUE TO THE OPTION AND SCENARIO

	ENVIRONMENTAL	SOCIAL	ECONOMIC	COMMENTS
Tourism Sector	0	1	1	Requer boa gestao para atenuar a degradacao do ambiente devido a construcao
Transport Sector, Infrastructure, Communications	(1)	2	2	Inicio da construcao e operacao de nova LF
Agriculture Sector	(1)	2	2	Deflorestamento devido a abertura de novas farmas e degradacao de vido ao uso de fertilizantes e pesticidas requer boa gestao; Agricultura sustentavel devido ao melhoramento de acesso permitindo maior acesso a tecnologia agricola e mercados; maior emprego
Industrial Sector	(-1)	1	1	Policao de aguas proximo aos lagos e rios bem como subterranea e do ar. Emprego, servicos, receitas fiscais, aumento do PIB
Mining Sector	0	2	2	Mais minas devido a LF e consequentemente mais beneficios sociais, mais receitas para o Estado

Environment-Biodiversity Sector	(1)	(1)	1	Com a LF haverá porto e há mais investimentos. Biodiversidade afectada significativamente pela construção da ponte e estabelecimento de outras indústrias e serviços ao longo da LF e ao redor do porto causarão deflorestamento
Health Sector and Public Health	0	(1)	2	População adulta a participar em actividades socio-económicas, menor risco devido ao SIDA; extensão serviços de saúde;
Finance Sector	0			
Foreign Affairs				
Fisheries Sector				
Employment	0	1	1	Mais oportunidades de emprego estável
Planning				
Nature Conservation and Trans-boundary Parks				
Social Sector-Local - Regional Develop. PARPA	0	1	1	Melhor saúde, comércio de produtos agrícolas, rede comercial melhorada e por consequência os rendimentos; melhor serviço de educação;
Sector Policies				
Monetary Policy				
Tax and Trade policy				
Infrastructure Costs				
Service costs				
SME's and Micro-Credit				
Investment and Promotion Local-National				
Construction				

RISK IDENTIFICATION AND MAGNITUDE TO THE OPTION OR SCENARIO

Type Of Risk	Likely	Unlikely	T-0	T+5	T+10	T+21	COMMENT
Political Instability		y	0	1	1	1	
Geopolitical Issues	y		0	(2)	(1)	0	Tendência de regionalismo pelo facto da construção da LF ser iniciada no sul de Moc.
Markets and Demand for Products	y		0	0	(1)	(1)	Flutuação de preços no mercado internacional; mudança na cultura e estilo de vida como resposta de mudanças de mercado

Labour Relations, Strikes, etc.	y		0	(2)	(2)	(1)	Greves como consequencia de actividades de construcao; sindicatos gradualmente se tornam independentes do Estado e aumenta o risco de greve
Fiscal Policies	y						
Operational Risks (Internal and External)							
Flood Risk and Natural Disasters		y					Improvel mas caso aconteca podera tornar a operacao onerosa.
Public Opinion							
Management Failures (Internal or External)		y	0	(2)	(3)	(2)	Erros de gestao na fase de construcao e inicio da fase de operacao podera por em risco o investimento.
Competition and Pricing		y	0				Ver Tarifas. Nao ha competicao
Climate and Oceanographic Conditions	y						Maxixe com problemas de sedimentacao
Ship Accidents		y					
Hydrocarbon Spills		y					
Fines and Compensation Payments		y					
Accidents and Spills		y	0	(1)	(1)	(1)	Acidentes em LF, Acidentes podem ser catastroficos
Social Issues (Exclusion, Resentment, etc.)		y	0	0			
Tariffs		y	0	(3)	0	0	Risco de agravamento de tarifas que podera afectar significativamente o sector mineiro, turistico e Governo e concessionarios.Recomenda-se negociacao. Risco e maior no inicio da implementacao do projecto. O mesmo aplica-se ao Porto
Availability of Suitable Harbour Facilities	y		0	(3)	0	0	Risco de nao encontrar areas com profundidade desejado
Dependable/Consistent Supply Chain		y					

COMPATIBILITY MATRIX

	Tourism	Transport	Infrastructure	Agriculture	Mining	Environment	Conservation	Health	Societal	Employment	Investment	Promotion	Construction	SME's
Tourism		2	3	(1)	(1)	0	3	0	1	3	3	3	2	3
Transport			3	3	3	(1)	(1)	1	(1)	3	2	3	3	3
Infrastructure				2	3	(1)	(1)	0	2	3	3	3	3	3
Agriculture					(1)	(2)	(2)	(1)	2	2	2	2	1	2
Mining						(1)	(1)	(1)	2	3	3	3	3	3
Environment							3	3	3	0	0	3	0	0
Conservation								2	2	1	3	3	1	3
Health									2	3	3	3	2	3
Societal										3	3	3	3	3
Employment											3	3	3	3
Investment												3	3	3
Promotion													3	3
Construction														3
SME's														

CONTRIBUTION TO SUSTAINABLE DEVELOPMENT

TIME + 5 Years	Time +10 Years	Time + 21 Years	Comments
0	3	3	
LOCAL	REGIONAL	NATIONAL	Comments
3	3	3	Projectos importante poderao contribuir para o Desenvolvimento Sustentavel ao longo do tempo a todos os niveis

9.6 ANNEX-6 OPTION 4: MAJOR TRUNK ROAD LINKING MAPUTO AND INHAMBANE AND LATER THE COUNTRY. MINING CONCERNS EXPORT MINERALS THROUGH FACILITIES IN MAPUTO OR MAXIXE HARBOURS

IMPACT OR EFFECT CLASSIFICATION	Extremely Negative	Very Negative	Negative	Null	Positive	Very Positive	Extremely Positive	
NUMERIC RANGE	-3	-2	-1	0	1	2	3	
OPTION-4:Uma estrada Norte-Sul com faixas privadas para fretes e construída, usando o mesmo arranjo de financiamento público-privado. A estrada iria ligar inicialmente Maputo-Inhambane e posteriormente se estenderia para o Norte até a fronteira com a Tanzânia								
BRIEF DESCRIPTION OF THE SCENARIO	Consiste na ampliação/reabilitação da EN1, com ramais privados de acesso, e facilidades de construção de um porto na província de Inhambane num local adequado. Construção poderá não estar finalizada em 2014. Quanto ao porto existem duas alternativas, Melhorar ponte cais existente ou construir uma nova.							
STATE AT TIME-0 (2004)	O Plan director do turismo considera a área de Xai-Xai-Chonguene, Quissico e Jangamo, Nos de desenvolvimento turístico. Contudo atualmente, o acesso, escoamento de produtos agrícolas e transporte são extremamente deficientes. Durante este período, o principal trabalho em relação a esta opção poderá consistir na fase preparatória dos acordos e contratos para construção da estrada.							
STATE AT+5 YEARS (2009)	Situação mais difícil devido a fase de re-construção da estrada. Turismo afectado negativamente devido a dificuldade de acesso causada pela reconstrução. Estabelecimento de empresas de apoio e prestação de serviços a construção							
STATE AT+10 YEARS (2014)	Estrada ampliada. Escoamento de minério por estrada, incentivo para abertura de outras minas, i.e., maior actividade de prospecção. Melhoramento do escoamento, turismo, aumento de desenvolvimento Agrícola, desenvolvimento urbano, saúde educação, etc. Ter em conta pontes aéreas para travessia dos peões nas diferentes regiões							
STATE AT+21 YEARS (2025)	Novas minas e mais desenvolvimento indirecto. Indústria de turismo, agricultura em expansão. Tráfego melhorado, negócios ao longo da estrada, maior oportunidade de negócios.							
GEOGRAPHIC AREA: INFLUENCE/IMPACT	Região sul do país e sul da província de Inhambane. Impacto nas minas, turismo agricultura e indústria, indústria de gás, copra no entendimento de que com a entrada em funcionamento da estrada todos os sectores seriam afectados positivamente.							
SECTORS-ISSUES-POLICIES Affected by Scenario	Direct	Indirect	T-0	T+5	T+10	T+21	COMMENTS	
Tourism Sector	y		0	(1)	2	3	durante a fase de construção haverá dificuldade de trânsito para zona costeira em particular o que afecta negativamente o período T+5. Estabelecimento de Infraestruturas ao longo da estrada para acomodar trabalhadores construtores da estrada numa primeira fase e posteriormente (a partir de t+10), conversão destas facilidades e construção/estabelecimento de outras facilidades transitórias para turistas viajando longas distâncias. Com o funcionamento pleno da estrada há um aumento substancial de negócios no tempo T+21.	

Transport Sector-Infrastructure-Communications	y		0	(1)	1	3	durante a fase de construcao haverá dificuldade de transito, será necessária a abertura de uma rota melhorada alternativa a EN1. Necessidade de solucao transitoria para o minerio. Implantacao de infra-estrutura de apoio a construcao de estrada incluindo comunicacoes no ano t+5 no ano concorre positivamente para este ssectores contudo o feceito global ainda ae negativo devido aos transotronos causados pela cosntrucao e ao facto de ainda haver pouco desenvolvimento no geral. A pos t+5 a situacao melhora gradualmente p[ois os servicos insitalados ao longo da estrada expandem , ha mais estradas a ligarem a EN1 e mais prestacao de servicos em todos sectores
Agriculture Sector		y	0	(1)	1	1	Acesso as areas de agricultura mais dificultado pela construcao de estrada pois desencoraja a aatividade de escoamento de produtos, o reasentamento de populacoes implica provavelmente reducao temporarea de area de cultivo .Com finalizacao da construcao, há mais vias vias de acesso as areas de producao agricola que sao abertas como resultado da facilidade de escoamento que se apresenta, aumenta a producao agricola podendo ate partir se para a producao dustrializada no ano t+21.
Industrial Sector	y	y	0	1	1	1	Equipamento de construcao com oportunidade de negocio na fase de construcao (directo); industria de copra e outras melhora acesso ao mercado (ind); provavel instalacao de industria de processamento de citrinos a custos relativamente competitivos devido a estrada melhorada que permite facil acesso ao mercado de maputo, etc;
Mining Sector	y		0	0	2	2	Directo nas minas existentes. Estimulo para abertura de novas minas. Taxas comercias mais competitivas. Solucao transitoria de escoamento de minerio cria beneficios logo no inicio da operacao.

Environment-Biodiversity Sector	y		0	-1	0	1	Fase de construcao afecta a biodiversidade pela necessidade de desmatamento, mineracao de areia para a construcao bem como a poluicao sonora que irDirecto nas minas existentes. Estimulo para abertuda de novas minas. Taxas comercias mais competitivas. Solucao transitoria de escoamento de minerio cria beneficios logo no inicio da operacao.a afastar definitivamente alguma fauna ao redor da estrada;no ano t+5 o efeito e nulo pois a situacao normaliza e em termos de flora nao disturbo significativo, mas e altura de reposicao natural da mesma. fim da construcao beneficia a biodiversidade pois assume-se que a mesma permanesse intacta.
Health Sector and Public Health	y	y	0	-2	-1	1	Aumento de Sida e DTS; colera reduzida
Finance Sector		y	0	1	2	2	Aumento de oportunidades de negocio de empresas da area de construcao e fornecimento de materia prima o que implica mias impostos para o Estado. As receitas irao crescer no tempo t+10 pois a estrada abre uma oportunidade de estabilidade propria do negocio o que ira aumentar ainda ainda nao apenas as empresasa de negocios ao longo da estrada e suas ramificacoes como tambem comecam a aparecer oportunidades de acesso ao credito bancario mais fiaveis.
Foreign Affairs	y		0	1	1	1	A construcao da estrada Norte-sul e um assunto nao apenas nacional mas tambem regional e internacional. Ha todo um processo de estruturacao do negocio em que sera necessario contactar entidades financeiras internacionais para participarem no financiamento, ha questoes contratuais e de negociacao, acordos internacionais, concursos internacionais, e uma grande oportunidade de negocios e aberta pela construcao da estrada que ira atrair ainda mais investidores estrangeiro que veem na estadra mais um acomponente do ambiente favoravel de negocios. O pais reconquista o prestigio internacional pois a construcao de uma estrada norte-sul constitui a base da visao estrategica de desenvolvimento do pais

Fisheries Sector		y	0	0	1	1	O Impacto e indirecto e positivo a partir do ano t +5 pois este sector ira beneficiar de mais investimentos no sector para a garantia de mais capturas e mais escoamento por via rodoviaria bem como abertura de mais pontos de distribuicao do pescado aumentado deste modo as receitas do sector
Employment	y	y	0	2	1	1	No ano t+5 o sector do emprego mobiliza empregos directos na construcao da estrada e indirectos na instalacao de servicos de apoio a construcao de estrada, contudo estamobilizacao contem trabalhadores permanentes e eventuais. Com o fim da construcao, so os trabalhadores permanentes continuam empregados estabilizado com o tempo. Empregos indirectos provavelmente demonstram uma tendencia crescente a partir do ano t+10 pois mais sectores se vao instalar e mais servicos se vao criando como resultado do melhoramento de vias de acesso e creiacao de outras vias que ligam a EN1.
Planning							
Nature Conservation and Trans-boundary Parks		y	0	0	1	1	Em paralelo com desenvolvimento do turismo
Social Sector-Local - Regional Develop. PARPA	y	y	0	1	2	2	Problemas de Reassentamento devido a necessidade de ampliacao da estrada e estabelecimento de servicos de apoio a construcao da estrada. Vai gerar oportunidades de emprego, tanto na fase da construcao como com o surgimento de negocios ao longo da estrada nacional e novos pontos e arterias da EN1. instalacao de outros servicos e infra-estruturas sociais tais como escolas, hospitais abastecimento de agua e energia. As condicoes encontram-se estabelecidas para a implementacao rapida do PARPA devido a facilidades de escoamento que irao estimular o incremento da producao nos diversos sectores. Acesso educacao melhora oportunidades de emprego e condicoes de saude e saneamento em geral. Disponibilidade rapida de insumos para o sector agricola familiar no interior do pais e facilitado pelo desenvolvimento de arterias da EN1 melhora o sector familiar.

Sector Policies	y		1	1	1	1	A construçao da Estrada afectara todas politicas sectoriais
Monetary Policy							Implementaçao efectiva da politica monetaria vigente. Com o funcionamento da EN1 e suas arterias, ha um estabelecimento e desenvolvimento de todos sectores economicos directos e indirectos, por conseguinte o METICAL, torna-se mais forte, aumenta a possibilidade de controlar a inflaçao da moeda, maior estabilidade da moeda o traZ CONSIGO MAIOR SEGURANCA NO INVESTIMENTO EXTERNO SOBRETUDO. INTERNAMENTE, A ESTABILIZACAO DA MOEDA ESTIMULA A BANCA A AUMENTAR A POSSIBILIDADE DE CREDITO EM AREAS DE MAIOR RISCO NO SECTOR AGRICOLA E A TAXAS MAIS BAIXAS E ESTAVEIS. HAVERA UMA REVISAO DA POLITICA MONETARIA PARA ADEQUALA AO NOVO RITMO DE DESENVOLVIMENTO.
Tax and Trade policy		y	1	1	1	1	Revisao de politicas comerciais, Maior movimento de mercadorias, maior movimento transfronteirico, taxas de portagens POR PROVINCIA PARA GANAR DA MANUTENCAO DA ESTRADA E RETORNO DOS CUSTOS DE CONSTRUCAO.
Infrastructure Costs	y	y	0	-3	2;1	2;3	Mobilizacão de fundos para a construção e fundos de construção elevados devido a tendência de especulação que é características do tipo de oportunidades que se apresenta com a construção de uma estrada de maiores dimensões e extensão. Com a expansão dos serviços de apoio devido ao fim da construção da estrada há uma estabilização dos preços a partir do ano t+10 e que chega a reduzir devido ao crescente estabelecimento de mais serviços e maior diversidade dos mesmos. Isso implica menor custo de construção de outras infraestruturas, estabilização de custos de energia e comunicações e mesmo de preços dos próprios serviços.

Service costs	y	y	0	-1	1	1	Aumento de preços durante a fase de construção devido ao aumento de disponibilidade de fundos por operários que não é imediatamente seguida de um aumento de disponibilidade a preços competitivos. Tentativa de especulação agrava aos preços dos serviços a de apoio encarecendo as obras numa fase inicial recorrendo-se muitas vezes à importação de serviços por serem relativamente mais seguros e fiáveis. Custo de serviços reduzidos com entrada em funcionamento da estrada que estimula a implantação de mais serviços e indústrias ao longo da EN1 e suas arterias.
SME's and Micro-Credit	y		0	1	1	1	Novas empresas de prestação de serviços com início da construção da estrada. Outras novas empresas de prestação de serviços de natureza diversificada são atraídas a se estabelecerem ao longo da estrada e suas arterias pois a estabilidade dos negócios estimula o Banco a melhorar as facilidades de crédito.
Investment and Promotion Local-National	y		0	0	1	2	Reformulada a política de planeamento territorial. Custo de estabelecimento de indústria relativamente menor, desenvolvimento rápido e diversificado de certos sectores relacionados com o sector mineiro e turístico.
Construction	y		0	3	1	2	Início da construção da estrada atrai outras iniciativas de investimentos de construção em t+5 que criam empresas de prestação de serviços a construção da estrada. Em t+10 o sector de construção deixa de beneficiar directamente da construção da EN1 mas presume-se que o desenvolvimento de mais arterias da EN1 e o aumento de negócios ao longo da EN1 reformulada a política de planeamento territorial. Custo de estabelecimento de indústria relativamente menor, desenvolvimento rápido e diversificado de certos sectores relacionados com o sector mineiro e turístico. atrai outras obras de construção noutros sectores de desenvolvimento. Em t+21 há estabilidade política e nomeyaroa e no investimento aumenta devido ao surgimento de novas oportunidades de negócios e a mineração duplica o escoamento necessitando para tal mais instalações.

ENVIRONMENTAL-SOCIAL -ECONOMIC IMPACTS/BENEFITS EXPECTED FROM OR DUE TO THE OPTION AND SCENARIO

	ENVIRONMENTAL	SOCIAL	ECONOMIC	COMMENTS
Tourism Sector	0	2	2	Requer boa gestao para atenuar a degradacao do ambiente devido a construcao
TRANSPORT SECTOR-INFRASTRUCTURE-COMMUNICATIONS	(1)	2	2	Construcao e aumento de circulacao de viaturas ira aumentar a poluicao.
Agriculture Sector	(1)	2	2	Deflorestamento devido a abertura de novas farmas e degradacao de vido ao uso de fertilizantes e pesticidas requer boa gestao; Agricultura sustentavel devido ao melhoramento de acesso permitindo maior acesso a tecnologia agricola e mercados; maior emprego, desenvolvimento comunitario, sustentabilidade alimentar
Industrial Sector	(-1)	2	2	Policao de aguas proximo aos lagos e rios bem como subterranea e do ar. Emprego, servicos, receitas fiscais, aumento do PIB
Mining Sector	0	2	2	Mais minas devido a estrada e conseqentemente mais beneficos sociais, mais receitas para o Estado
Environment-Biodiversity Sector	(2)	(1)	1	Com estrada haveria porto e ha mais investimentos. Biodiversidade afectada significativamente pela construcao da ponte e estabelecimento de outras industrias e servicos ao longo da estrada e ao redor do porto causaram deflorestamento
Health Sector and Public Health	(1)	(2)	2	Menor populacao adulta e menor capacidade de participar em actividades socio-economicas devido ao SIDA; extensao servicos de saude;
Finance Sector	0			
Foreign Affairs				
Fisheries Sector				
EMPLOYMENT	0	1	1	Mais oportunidades de emprego
Planning				
Nature Conservation and Transboundary Parks				
Social Sector-Local - Regional Develop. PARPA	0	1	1	Melhor saude, comercio de produtos agricolas, rede comercial melhorada e por consequencia os rendimentos; melhor servico de educacao;
Sector Policies				
Monetary Policy				
Tax and Trade policy				

Infrastructure Costs							
Service costs							
SME'S AND MICRO-CREDIT							
Investment and Promotion Local-National							
CONSTRUCTION							
RISK IDENTIFICATION AND MAGNITUDE TO THE OPTION OR SCENARIO							
Type Of Risk	Likely	Unlikely	T-0	T+5	T+10	T+21	COMMENTS
Political Instability		y	0	1	1	1	
Geopolitical Issues	y		0	(2)	(1)	0	Tendencia de regionalismo pelo facto da construcao da estrada ser iniciada no sul de Moc.
Markets and Demand for Products	y		0	0	(1)	(1)	Flutuacao de precos no mercado internacional; mudanca na cultura e estilo de vida como resposta de mudancas de mercado
Labour Relations, Strikes, etc.	y		0	(2)	(1)	0	Greves como consequencia de actividades de construcao; sindicatos gradualmente se tornam independentes do Estado e aumenta o risco de greve
Fiscal Policies	y						
Operational Risks (Internal and External)							
Flood Risk and Natural Disaters		y					Improvavel mas caso aconteca podera tornar a operacao onerosa.
Public Opinion							
Management Failures (Internal or External)		y	0	(2)	(2)	(1)	Erros de gestao na fase de construcao e inicio da fase de operacao podera por em risco o in vestimento.
Competition and Pricing		y	0				Ver Tarifas. Nao ha competicao
Climate and Oeonographic Conditions	y						Maxixe com problemas de sedimentacao
Ship Accidents		y					
Hydrocarbon Spills		y					
Fines and Compensation Payments		y					
Accidents and Spills	y		0	(1)	(1)	(1)	Acidentes em estrada
Social Issues (Exclusion, Resentment, etc.)	y		0	0	(1)	(1)	Ressentimento pelo pargamento de portagem pela populacao

Tariffs		y	0	(3)	0	0	Risco de agravamento de tarifas de Portagem que podera afectar significativamente o sector mineiro, turistico e Governo e concessionarios.Recomenda-se negociacao. Risco e maior no inicio da implementacao do projecto. O mesmo aplica-se ao Porto
Availability of Suitable Harbour Facilities	y		0	(3)	0	0	Risco de nao encontrar areas com calado desejado
Dependable/Consistent Supply Chain		y					

COMPATIBILITY MATRIX

	Tourism	Transport	Infrastructure	Agriculture	Mining	Environment	Conservation	Health	Societal	Employment	Investment	Promotion	Construction	SME's
Tourism		2	3	(1)	(1)	0	3	0	1	3	3	3	2	3
Transport			3	3	3	(1)	(1)	1	(1)	3	2	3	3	3
Infrastructure				2	3	(1)	(1)	0	2	3	3	3	3	3
Agriculture					(1)	(2)	(2)	(1)	2	2	2	2	1	2
Mining						(1)	(1)	(1)	2	3	3	3	3	3
Environment							3	3	3	0	0	3	0	0
Conservation								2	2	1	3	3	1	3
Health									2	3	3	3	2	3
Societal										3	3	3	3	3
Employment											3	3	3	3
Investment												3	3	3
Promotion													3	3
Construction														3
SME's														

CONTRIBUTION TO SUSTAINABLE DEVELOPMENT	TIME + 5 Years		Time +10 Years		Time + 21 Years		Comments
	0		3		3		
	LOCAL		REGIONAL		NATIONAL		COMMENTS
3		3		3		Projectos importante poderao contribuir para o Desenvolvimento Sustentavel ao longo do tempo a todos os niveis	

OPÇÃO IV – CONSTRUÇÃO DE ESTRADA SUL-NORTE COM FAIXAS PRIVATIVAS

Fase inicial: Maputo-Inhambane

Sectores	Comentários
<p>Turismo</p> <p>Transportes</p> <p>Agrícola</p> <p>Industrial</p> <p>Mineiro</p> <p>Ambiental</p>	<p>+ , pq a estrada é uma infra estrutura que facilita a circulação de pessoas, e estas por sua vez facilitam a circulação de bens e serviços.</p> <p>Idem</p> <p>- , por causa da movimentação, alguns pessoas chegam a abandonar a actividade agricola, pra dedicarem-se ao comercio e ou hotelaria.</p> <p>+ , pq apesar de as populações passarem a ter machambas em zonas distantes da estrada, haverá grande possibilidade de escoamento dos produtos.</p> <p>+ , pq haverá densev. Da indústria hoteleira de uma forma directa. Densev. De indústrias complementares de embalagens, serviços de oficina, entre outros.</p> <p>+ , pelo escoamento dos produtos resultantes da exploração de recursos naturais.</p> <p>- , haverá degradação do meio, através da pressão causada pelos utilizadores da estrada e dos arredores.(redução das áreas verdes).</p> <p>- , aumento de doenças infecto contagiosas pela concentração de pessoas e maior circulação de dinheiro.</p> <p>+ , expansão da rede sanitária.</p>

<p>Saúde</p>	<p>+ , devido aumento do volume de negócios.</p> <p>+ , a infra estrutura estrada, facilita a ligação com os países vizinhos e a entrada de IDE.</p>
<p>Financeiro</p>	<p>+ , haverá melhor escoamento do produto.</p> <p>+ , maior possibilidade de emprego para os jovens dos arredores.</p>
<p>Neg. Estrangeiros</p>	<p>+ , reavaliacao dos planos directores e urbanisticos, ordenamento territorial moderno...</p>
<p>Pesqueiro</p>	<p>- , pela reducao das areas verdes, pressao populacional e de carga...em relacao aos parques haverá reducao das areas para os animais, pois estes irao concentrar-se em zonas distantes da estrada.</p>
<p>Emprego</p>	<p>+ , haverá desenv. Socio-cultural devido ao movimento de pessoas e bens, crescimento de vilas satelites...</p>
<p>Planificacao</p>	<p>+ , as politicas de # sectores do estado (ex: transportes) serao analisadas e adequadas a regioao.</p>
<p>Conservacao</p>	<p>Idem</p>
<p>Social</p>	<p>Depende do tipo e de onde sao solicitados, (ex: o custo de transporte pode reduzir), mas o custo de construcao nas vilas ao longo da estrada, pode aumentar pq a procura sera maior...</p>
<p>Politicis</p>	<p>+ , c IDE os bancos facilitarao os mrico creditos p que o sector privado rural possa fazer parcerias p o desenv de negocios nas vilas.</p>
<p>Politicis</p>	<p>+ , (infra estruturas) neste caso a estrada e a consequente circulacao de pessoas e bens é como que deixar cair uma gota de jam p convidar formigas.</p>

<p>Monetaria, impostos...</p> <p>Ifra estruturas e servicos</p> <p>Micro creditos</p> <p>Promocao de invest.</p>	
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9.7 ANNEX: 7

**TOURISM DEVELOPMENT PROJECTIONS:
THE COASTAL SEGMENT EXTENDING FROM
XAI-XAI TO CHONGOENE.**

Potential Tourism Development in Xai-xai to Chongoene Mozambique

Financial and Economic analysis

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BACKGROUND AND INTRODUCTION

This report is part of the SEA currently being undertaken for the transport options in relation to the Corridor Sands project. In particular this report relates to the suggested transport option, which includes a dedicated road from the mining site in Chibuto to the coast of Chongoene, from where a 1,5 km jetty is suggested built. The SEA however shows that this transport option have a number of adverse effects on local development, an important one of which being the impact on future potential tourism development. This report is based on the recent Tourism Strategy by KPMG, and on previous strategy work by Dangroup.

The purpose with this brief report is to explain the assumptions and present the results of financial and economic analyses carried out with respect to the tourism development potential on the 10 km coastline between Xai-xai and Chongoene, which will be affected.

GENERAL ASSUMPTIONS

INPUT DATA

The financial and economic analyses are based on the spreadsheet model. Based on a number of inputs and assumptions the model evaluates a 30 years horizon with respect to financial and economic impact.

The model is developed as a strategic level assessment tool, and is generally based on availability of data and transparency of outputs. For this reason a fixed price approach has been chosen, with a real discount rate on 3%. This assumption implies that the relative price level is fixed throughout the regarded period, which generally is a scenario with a probability as good as any other scenario.

The model includes three central categories of input variables which in combination characterise the future development on the beach. These are:

- Kinds of hotels
- Number of rooms constructed, and when
- Occupancy rates

Hotels can be constructed in three categories: Low, middle, and high. For each hotel category three central assumptions needs to be made:

- How large a share of the total number of rooms falls in the category in question
- What are the investment costs per room
- What are the operating costs per room

For the future development in the area it has been assumed that a split on 20% low level, 50% middle range, and 30% high end will apply. The relative emphasis on the higher quality categories is in accordance with the general recommendations in the recent tourism strategy with regard to this particular area.

The investment costs per room has been estimated based on experience to USD 20.000 for a low level room, USD 35.000 for a middle level room, and USD 65.000 for a high level room.

Background for operating costs per room has been difficult to obtain, and estimation of these have been based on what is perceived as being very conservative (i.e. costs in the model is believed to be higher than what probably would be the case). In the base calculation the following figures apply for operating costs: low end: USD 6.000 per year, Middle USD 10.000 per year, and high level USD 14.000 per year.

The model includes three construction periods: 2004, 2012, and 2020. In each of these years the number of rooms can be changed. In the base calculation it is assumed that the total number of rooms constructed in year 2004 is 200. This is increased in 2012 by 300 to 500 totally. In 2020 it is assumed that another 400 rooms is constructed, so the area in total have 900 rooms. This development corresponds with WTO's tourism forecast for Africa, where international tourist arrivals are forecasted to increase 5,5% annually, which is more than a doubling of the current level in 2010, and an increase by a factor 4 by 2020. Also, in relation to the work that was done in relation to the tourism strategy of 1998, an area plan was elaborated for the beach between Xai-xai and Chongolene. In this plan it is recommended that the area can host appr. 3.000 tourists in a sustainable way. With a total of 900 rooms in 2021, the number of tourists will be in that range.

Occupancy rates have been assumed to be 70% throughout the period.

Based on the above inputs financial and economic key figures have been calculated. This is described in the following sections.

FINANCIAL CALCULATIONS

Based on the above inputs a financial calculation has been carried out. Based on total investments, operating costs, and operating turnover, the total profit is calculated. Out of total profit 30% is paid in profit tax, and the rest is operating profit accruing to investors. Internal Rate of Return (IRR) is calculated for the investors on investment compared to operating profit.

Table 1: Financial key figures

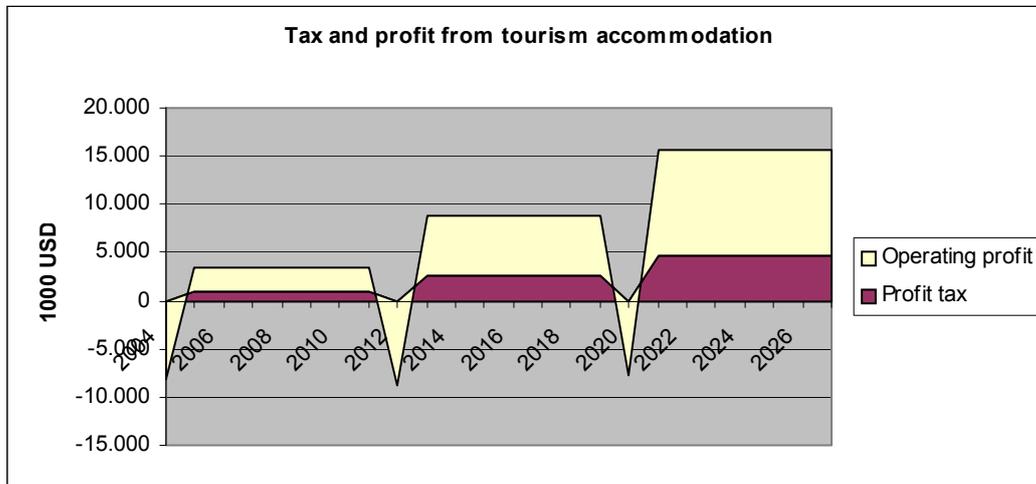
'000 USD	2004	2005	2012	2013	2020	2021
Investment	8.200		12.300		16.400	
Turnover		5.570		13.925		25.065
Costs		2.080		5.200		9.360
Profit		3.490		8.725		15.705
Profit tax		1.047		2.617		4.711
Operating profit		2.443		6.107		10.993

In the base calculation total investments are 8.2 Mio. USD in 2004, 12.3 Mio. USD. in 2012, and 16.4 Mio. USD in 2020.

Operating costs are appr. 2 Mio USD per year in the period 2005 to 2012. From there on annual operating costs increase to 5.2 Mio. USD. Finally from 2020 onwards the annual costs are 9.4 Mio. USD.

With an annual turnover on 5.5 Mio USD from 2005, increasing to 25 Mio. USD in 2021, the annual profit is calculated to 3.5 Mio USD in 2005. This figure also increases, to the range of 15.7 Mio. USD in 2021 onwards. In the below figure the financial results are shown.

Figure 1: Financial results



With a 30% profit tax The Net Present Value (NPV) of the profit tax for the regarded period is 37.7 Mio. USD. Correspondingly the NPV of the operating profit is 66 Mio. USD.

ECONOMIC MODULE

The purpose with the economic part of the model is to evaluate the impact of the above mentioned tourism development on the broader economy. Economists talk about the so-called multiplier effect, which refer to what happens in the economy when a tourist spend money. The money spent provides the investors and workers directly employed in the tourism industry with income. This income is spent in the economy, providing people and businesses in other sectors with salaries and profit, and so on. So the multiplier captures the broader economic effects of tourism spending.

In the table below the main assumptions made in the economic part of the model is shown.

Table 2: Economic assumptions

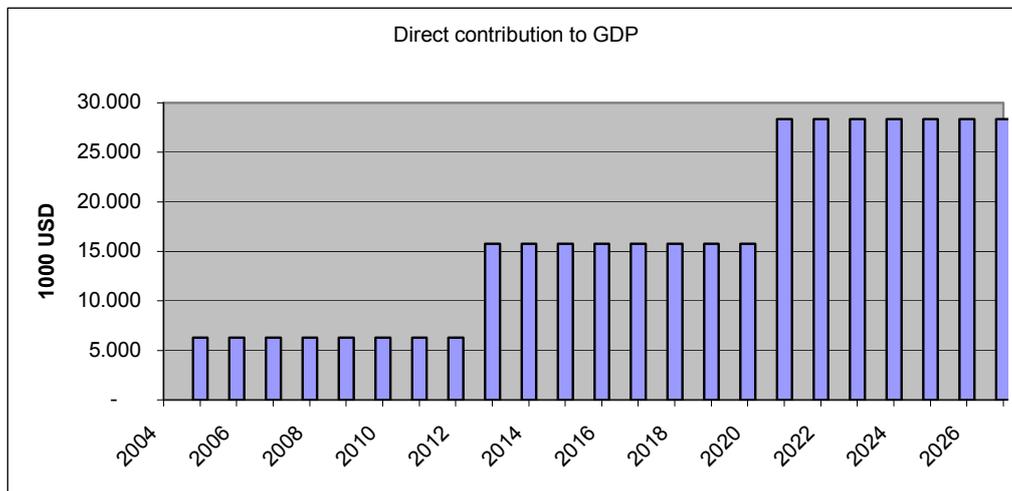
GDP 2001 (1000 USD)	3.078.742
Contribution of tourism, % of GDP	2,0%
Contribution of tourism (1000 USD)	61.575
Total number of beds in Mozambique 2001	5.667
Contribution to GDP per bed (1000 USD)	11
Direct financial contribution per bed (1000 USD)	6
Economic multiplier	1,81
Tourism multiplier	1,8
Number of jobs created in tourism industry 2001	36.500
Number of beds 2001	5.667
Jobs created in economy per bed	6,4

As can be seen from the table three types of multipliers are dealt with in order to capture the broader economic effects of tourism: The economic multiplier, the tourism multiplier, and the job multiplier.

The economic multiplier is a measure that is based on the direct GDP contribution of tourism, i.e. the impact on other sectors is not included. Estimation of the economic multiplier is based on the GDP of Mozambique, which according to the Statistical Bureau was app. 3.1 billion USD in 2001. From World Tourism Organisation (WTO) it is known, that the tourism contribution to GDP in the Southern African countries is about 3-4% on average. Assuming that Mozambique due to the floods currently is slightly below that level, it is assumed that tourism contributes with 2% of GDP, i.e. 61.6 Mio. USD per year. The number of beds in the three categories considered in this analysis was according to Ministry of Tourism in 2001 5.667. On average each bed contributed 11.000 USD to GDP from the tourism sector in a narrow sense, which corresponds to a factor 1,81 to operating profit. For the purpose of this analysis this has been defined as the economic multiplier.

The direct tourism sector contribution to GDP as defined above is shown in the below figure.

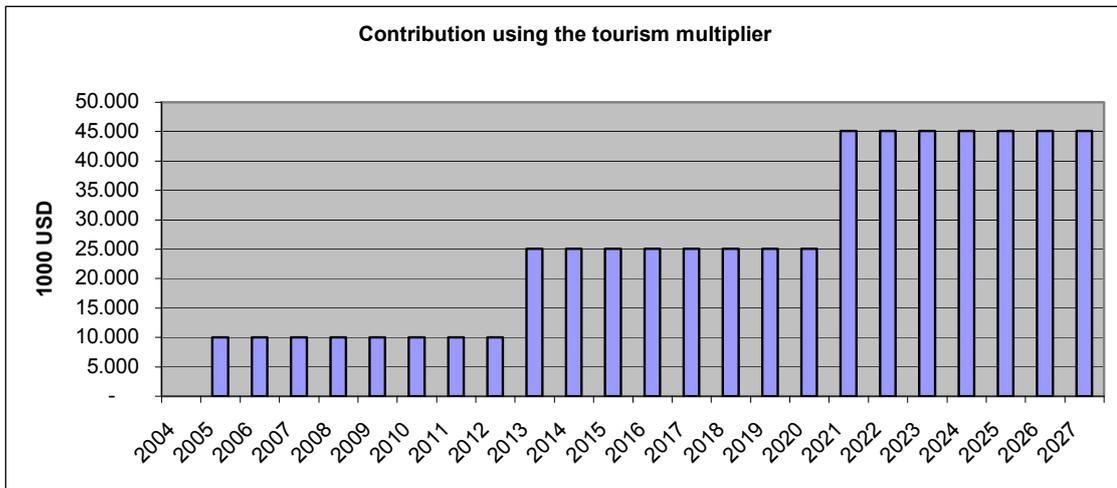
Figure 2: Direct tourism sector contribution to GDP



The NPV of the direct tourism sector contribution to GDP has been calculated to 234 Mio. USD.

Based on experience the tourism multiplier (how much effect a 1 USD spending have in the wider economy) in Southern Africa is 1.8. Contrary to the economic multiplier, the tourism multiplier is defined on tourism spending. There are however no known recent studies of tourism spending in Mozambique, so in this analysis the tourism multiplier has been applied directly on hotel turnover. This is an underestimation of the full effect, as money will be spend on other features than accommodation. Keeping that in mind, the figure below show the full impact on the Mozambique economy of the described development.

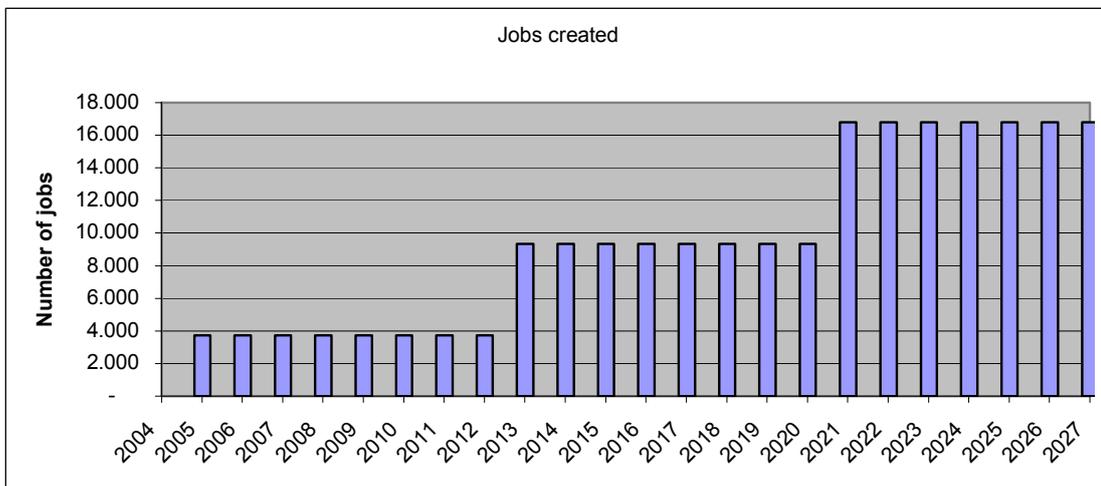
Figure 3: Broad contribution to the economy



The calculation show that the contribution increases with the number of beds constructed, from an initial annual 10 Mio. USD contribution to 45 Mio. USD when the full potential is being unlocked in 2021.

Finally the number of jobs created has been calculated. Working from the 36.500 jobs currently employed in the tourism sector gives an average on 6.4 jobs per bed. IN this context, the number of jobs created is shown in the below figure.

Figure 4: Number of jobs created



Increasing from just below 4 thousand jobs in the beginning of the regarded period to more than 16 thousand jobs from 2021 onwards.

BROADER PERSPECTIVES

The above analysis focuses on potential tourism development in the Xai-xai to Chongoene area. As was mentioned in the introduction it has been the aim to produce strategy level information, and hence the analysis do not pretend to be accurate. Also the input data can be discussed, although emphasis has been made to put as much background and reality into the figures as possible.

The analysis shows a potential development – the no-jetty situation. It has not been attempted to estimate the impact of the jetty, but the area will certainly be impacted negatively by a jetty, and most probably the development will find other areas, should the jetty be built.

Even if the figures turn out to be overestimated the analysis show that tourism has the potential of being a main economic driver for the area and for Mozambique in general, and as such the resource behind this development – the beautiful beaches, may not be diluted as it is put in the recent tourism strategy.

It is important to stress that the Xai-xai area is critical to the overall tourism strategy in the sense that this is the beach area with a potential that are closest to Maputo and as such to the existing market. If the potential in this area is destroyed other areas with good potential is found further north. But distance increases and thereby reduces the overall attractiveness of Mozambique as a tourism destination.

CONCLUSIONS

The above analysis focuses on potential tourism development in the Xai-xai to Chongoene area. As was mentioned in the introduction it has been the aim to produce strategy level information, and hence the analysis do not pretend to be accurate. Also the input data can be discussed, although emphasis has been made to put as much background and reality into the figures as possible.

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From an economic and financial perspective it is recommended to be extremely careful with the nature resource, as this is the basis for future tourism, which, as the analysis show can have a very beneficial impact on the economy, hereunder job creation. Solutions should be sought, which do not compete – Mozambique cannot afford to mine on the cost of tourism and vice versa. Solutions should be found, which allows these activities to co-exist and potentially benefit from one another.

From a financial perspective it is recommended to focu

9.8 ANNEX-8: BILENE WORKSHOP PARTICIPANTS LIST

9.9 ANNEX-9: XAI-XAI ROUND TABLE DISCUSSIONS: PARTICIPANTS LIST