

**CUTS INVESTMENT FOR DEVELOPMENT PROJECT(IFD):
STUDY ON
INVESTMENT REGIMES IN SELECTED DEVELOPING
COUNTRIES**

***INTERNATIONAL INVESTMENT AND ENVIRONMENTAL
ISSUES:
THE CASE OF KENYA'S KWALE MINERAL SANDS PROJECT***

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INTERNATIONAL INVESTMENT AND ENVIRONMENTAL ISSUES: THE CASE OF KENYA'S KWALE MINERAL SANDS PROJECT¹

1. BACKGROUND TO THE KWALE MINERAL SANDS PROJECT

1.1. The mineral deposits

Geological definition of an area containing mineralization is called a resource. When there has been enough work done to assess the mining & extraction process, the mineralization that can be economically mined is termed an ore reserve. In the Kwale project, the total resource tonnage is around 200 million tonnes of mineralised sands while the ore reserves are closer to 140 million tonnes. An ore grade of 5-6% is the content of economic minerals found in the sands. The economically recoverable minerals from the Kenyan mineral sand deposits are:

- Ilmenite which is a mineral which contains 49/51% TiO₂ (the balance is iron oxides);
- Rutile which contains around 95/96% TiO₂; and
- Zircon which is a zirconia silicate.

Ilmenite is the dominant mineral present which currently sells for around US\$ 65/tonne while rutile normally sells around US\$ 450/tonne. To make titanium metal, one starts with a rutile concentrate which is processed in a highly specialized toxic and energy consuming refining process. Minerals similar to those found at Kwale have been sold to producers of pure white titanium pigment which is used in paints and as filler in plastics, paper, toothpaste, many medicinal tablets and in sunscreens. Nearly 95% of all such minerals are the feedstock to the pigment industry but a small percentage of all titanium produced (~3%) is used to produce titanium metal of which the cost to produce since the cost of production is very high, sells for about US\$8500/9000 per tonne. Today the world's production is in the range 120, 000 to 140 000 tonnes per annum. In contrast, the proposed output of material from Kwale equates to about twice the world's titanium metal needs annually. In addition, three deposits have also been discovered to the north of Mombasa that contain much larger mineral resource tonnages though these deposits are suspected to be of lower mineral grade than Kwale.

1.2. Tiomin Resources Inc. of Toronto Canada

Tiomin Resources Inc. of Toronto Canada is a transnational corporation (TNC) with various mining operations all over the world. It is listed on the Toronto Stock Exchange with shares actively trading on the exchange. Indeed in January 2001, Tiomin Resources Inc announced that it has raised US\$5 million (approximately Sh400 million) to finance its Kwale titanium-mining project. The firm confirmed that it had filed its final prospectus with the Ontario Securities Commission for the sale of Special Warrants which were offered at a price of US\$0.85, with each being exercisable for one common share. In a statement signed by Tiomin's President, J C Potvic and Vice President of Finance, Ian MacNeily, "The proceeds of the issue were to be applied towards funding the pilot plant test work for the Kwale project and in the acquisition of additional surface rights at Kwale and completion of the detailed engineering and design work for the project as well as for general corporate purposes".

The firm applied for and was granted a number of Exploration Leases in Kenya in the mid-1990's. Exploration work subsequently defined a number of large but low-grade mineral sands resources. After the basic exploration phase, there was sufficient confidence in the Kwale project to commence discussions with the Government of Kenya to understand the approval process required to see investment in a successful project. For the Kenya operations, the parent company founded **Tiomin**

¹ This presentation provides the case of the Kwale Mineral Sands project in Kenya for which Tiomin Resources Inc. of Canada is currently battling a Court case restraining the firm from proceeding with mining activities. Since the case is in Court, this presentation is meant purely for discussion purposes and does not seek to infer any opinions on what the Court outcome should be.

Kenya Limited & Kenya Titanium Limited which are Kenyan based companies being 100% subsidiaries of Tiomin Resources Inc.

1.2. Economics of the Kwale Project

According to Tiomin Resources Inc, the real revenue that can be expected from the Kwale project is about Ksh. 50 billion **over** the full 14 years projected operational life. Deducting Ksh. 11 billion project establishment cost, including plants, roads, warehouses, etc, and Ksh. 30 billion forecast operating costs, leaves about Ksh. 10 billion in cash flow for Tiomin shareholders: about a 20% rate of return in financial terms.

1.2.1. Employment - It is planned that the peak workforce required will be close to 1000 employees. The construction phase should take about 20 months. The estimate for sustained operations is 200 to 250 employees. During the construction phase, the wages distributed in the coastal community would be around KSh. 65 million per month.

1.2.2. Economic Multiplier Effects - Disposable income available to employees generates further work in the immediate community and the coastal economy. For each direct employee, there is likely to be at least 4 to 5 additional jobs created in the wider service industry resulting in a further injection of KSh. 600-700 million shillings in wages/salaries per annum into the community.

1.2.3. Operational Expenditure - The forecast operational costs over the proposed 14-year operation would be around Ksh.30 billion. Tiomin's assessment is that some 75% of this expenditure will be in the immediate local area or coast province. The balance is taxes, royalties to the Government of Kenya and those goods/services that may not be available locally.

1.2.4. Land Title - The squatter families in the mining area are likely to achieve a resettlement solution that can lead to title for the squatter families to ensure they have a genuine and secure future.

1.2.5. Infrastructure - Tiomin Kenya will need to construct all weather quality roads from the site to the coastal highway then onto the proposed marine terminal near Shimoni. Water quality for the residents near the proposed mine site is likely to improve from Tiomin Kenya water monitoring revelations that in some areas it contains five (5) times the recommended World Health Organization level of *E-coli* bacteria.

4. THE ISSUE OF THE ENVIRONMENTAL LICENCE

4.1. Requirements

For the statutory Mining Licence to be issued, Tiomin were given four substantive criteria to be met.

- i. The operation must be undertaken by a Kenyan based company with rules set for the number of Kenyan Directors;
- ii. Completion of a full engineering feasibility study ;
- iii. Grant of Environmental licences after a comprehensive review ; and
- iv. Title for the land to be mined to be held by the Government of Kenya for the duration of the mining activity.

The environmental work was undertaken in parallel with the engineering study. Coastal Environmental Services (CES), an firm with extensive experience in mineral sands, undertook the Environmental Impact Assessment Study (EIA) for the Kwale Project on behalf of Tiomin. CES made use of local Kenyan consultants for many aspects of the overall study. This extensive environmental study alone required the investment of KSh. 75 million with about 25 percent of the cost paid by Canadian International Development Agency (CIDA), a Government of Canada agency.

This EIA was tabled to the Government in April 2000 and was subsequently reviewed by government technical specialists then submitted to the statutory 3 month public comment period. Comments /criticisms/ support, was then passed to Tiomin for a final analysis and response. This response was tabled to the Government during November 2000.

To meet the fourth criteria for the issuance of a Mining Licence, Tiomin has entered into agreements with many landowners in the proposed mining area. The matter is complicated by land that is part of the defunct Ramisi Sugar estate and some farmers do not have title to the land.

4.2. Environment Impact Assessment

Environmental and social impact studies are now the standard practice prior to any new development, and is an integral part of the decision making process. For the proposed project in the Kwale district, Tiomin has consulted with relevant authorities at the national and district levels, as well as with the local communities in the proposed mining area and the ship loading facility sites. From 1996 to 1999, there were a total of about 100 meetings. These were with National government (43), Provincial government (8), District government (84), Local government (24), Community representatives (31), Local communities (25), Parastatal organisations (41). The EIA report is in 8 volumes. Vol. 1 –TORs, Vol. 2 –Baseline Studies, Vol. 3 -Baseline information for the mining and plant areas in the Kwale region, Vol. 4 - Key environmental issues, Vol. 5 - Baseline information on the ship loading facilities and associated impacts, Vol. 6 - Environmental Impact Report, Vol. 7 - Summary report Vol. 8 - Comments report).

4.3. Findings from the EIA Report

4.3.1. *Mining Method* - The different steps during the mining process will involve: clearing the vegetation ahead of the area to be mined; stockpiling the topsoil for further use in the rehabilitation process; dry mining by an excavator such as Bucket Wheel Excavator (BWE) or scraper; and transporting the sand by conveyor belt to the Wet Plant for further processing.

4.3.2. *Mineral processing* - At the Wet Plant, the ore-bearing sand is first mixed with water to produce a slurry. The material is passed through a series of cyclones and spirals, which separate the slimes and the heavy minerals from the sand. This wet separation process uses only water and gravity to produce the heavy mineral concentrate, so no chemicals are involved. The water consumption with efficient recycling is estimated between 540-1000m³ /hour. The heavy mineral concentrate is transported to the Mineral Processing Plant (MPP) for further processing.

4.3.3. *Settlement* - The people that will be affected by the proposed mining project are landowners located in Mwaweche and Kidiani locations and squatters located on the Ramisi Sugar Estate. It is estimated that there are about 450 households that may be affected. Of these, 25% are landowners with title deeds and 75% are squatters. The average household size is about seven people per household, which means that approximately 3000 individuals may be affected over a period of 10-15 years by the proposed project. In general, families have well-developed shambas. Although the size of the various shambas differs, plot sizes range between 4-8ha (10-20 acres) for landowners, while squatters have plots of about 2ha (5 acres).

4.3.4. *Social & cultural environment* - The main ethnic groups in the proposed mining area are the Digo, the Duruma and the Kamba. The latter were moved into the district by a government settlement scheme a few decades ago. Christianity and Islam are the dominant belief systems in the area, with Digo being pre-dominantly Moslem and the Kamba being Christian. Almost half the households in the study area had one or more graves on their shamba, which are recognised as sites of particular spiritual importance, as they are associated with ancestral spirits. Men are generally the heads of households and about 70% of them are farmers, 10% businessmen, 4% teachers and 2% civil servants.

4.3.5. *The ship loading facility.* - The minerals separated at the Mineral Processing Plant will be transported by road to a ship loading facility located in Shimoni about 35km from the mine site. A maximum of 470 000 tonnes of minerals per year will be transported by 40-tonne trucks. An area of approximately 5-10ha will be required for the storage and ship loading facility. A 200m long jetty will extend into the water, which would be located near Shungilanzi rock. From the storage area, minerals will be transported by conveyor belt along the steel pile jetty, which will be elevated 7m above mean sea level. Ships will dock against a series of breasting and mooring structures called dolphins, equipped with high energy absorbing rubber fenders. Minerals will be transported abroad by bulk carrier ships of up to 30 000 tonnes dead weight (about 200m long) at an average frequency of about 1-1.5 ships per month. .

4.3.6. *Impacts on the terrestrial environment* - The EIA report states that the development of a ship loading facility and access road will have a moderate impact on plant species diversity, as the coral rag forest is relatively diverse and a portion of it will need to be cleared. It will cause a high negative impact on habitat diversity because the cleared area may include a number of plant species of special concern. Clearing areas for the facilities and access roads will cause a loss of forest habitat and the fragmentation of the forest, which will cause impacts of high significance on fauna.

4.3.7. *Impacts on the marine environment* - The construction of a jetty may cause a low impact on the benthic habitat, but any substantial spillage of heavy mineral, which is unlikely to occur because the conveyor will be enclosed, could cause a localised moderate impact. The effects of propeller wash on channel edge communities and the effects of opportunistic species are unknown, while invasive marine species could cause moderate impacts on species composition. There will be no dredging in the channel. In the event that a ship going aground or an oil spill there would be an impact on the benthic, inter-tidal and sub-tidal habitats. However, assessments of navigation and manoeuvring requirements at Shimoni combined with the design of the dock have determined that the risk of shipping accidents is extremely low.

In summary, the report indicates that the development of the mineral sands mine will impact on the physical, natural and socio-economic environments at Kwale. The mining operations will result in permanent changes to the topography of the Central and South dunes and the tailings dam area. The proposed mitigation measures will maintain the agricultural potential of the Central and South dunes and will improve the land capability of the tailings dam area. The operations will have no effect on the soil hardness or its susceptibility to erosion. Changes to the topography will affect the local surface drainage pattern. The mining operations will probably not affect the main deep aquifer in the mining area, but some of the springs may experience a change in yield, change position or disappear.

Planned mitigation measures including a rehabilitation and management programme should reduce the overall eco-logical impacts. Employment resulting from mining operations and associated services will be the main socio-economic benefit for the affected community. The resettlement of people living in the mining area and the relocation of community infrastructure are the most negative impacts on the community.

Clearing an area of 5-10ha of coastal forest for the construction of a ship loading facility and access road in Shimoni will impact on the vegetation and the fauna. This will result in a loss of forest habitat and the fragmentation of the forest. No dredging will be done in Wasini channel, but the construction of a jetty will slightly affect the benthic habitat of the area.

The report therefore recommends the establishment of an environmental management plan, which will include a detailed rehabilitation plan, and a resettlement plan. Implementation of these plans will ensure that the overall benefits of the project exceed the costs.

5. CURRENT POSITION

In February 2001, a coalition of local communities, conservation and human rights organizations called the Coast Mining Rights Forum filed legal proceedings in the High Court of Mombasa seeking, an injunction against Tiomin on the grounds that it had illegally commenced mining operations and that dire environmental disasters would affect local residents. An ex-parte injunction was initially granted i.e. in the absence of any representation by Tiomin.

During September 2001, after hearing the parties, the High Court confirmed the injunction restraining Tiomin from carrying out any action of mining pending the full hearing of the legal proceedings filed in Mombasa.

The High Court found that Tiomin had not submitted to the Government of Kenya a Project Report and an Environmental Impact Assessment Report as required by Kenyan Law.

Tiomin has since sought the opinion of Senior Counsel in Nairobi, Kenya, to seek to overturn and/or discharge this Court Order.