

Socio – Economic Baseline Survey For Proposed Mining Of Niobium And Rare Earth Elements At Mrima Hill, Kwale County.

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ABSTRACT

The overall aim of this survey is to provide baseline information on the socio-economic conditions of the communities living in Dzombo Location, the environs of Mrima Hill. The survey seeks to enhance understanding of the livelihood strategies these communities employ in meeting their livelihood needs. It also seeks to improve understanding of the problems they face in their efforts to secure food, education, health and a sustainable living. It further seeks to understand the perceptions of these communities with respect to the economic/livelihood opportunities linked to the proposed mining of Niobium and Rare Earth Elements in Mrima Hill. Background information on Mrima Hill and its environs that was considered to be of socio-economic relevance was obtained from various government offices at Dzombo and Msambweni. Information on the current socio-economic characteristics and conditions was obtained through administration of two sets of questionnaires. One was filled by community leaders while a more detailed one was filled by household heads. The data collected from primary sources was processed with aid of the Statistical Packaged for Social Sciences (SPSS) software.

Keywords: Socio- Economic Baseline and Niobium plus Rare earth

1. INTRODUCTION

Mrima Hill, from which mining of Niobium and other rare earth elements has been proposed, is found in Malamba Sub – Location, Dzombo Location, Lungalunga Division, Msambweni District in Kwale County. This area is in the southern coastal region of Kenya. Mrima Hill itself, which is about 4.2 kilometres square, is covered with a natural forest and is without human settlement, having been gazetted as a forest reserve (Mrima Forest Reserve) by the government of Kenya in 1961 and a nature reserve in 1989. However, its environs, which include the whole of Dzombo Location, are fairly settled; hence the need for this socio-economic survey. The aim of this survey was to provide baseline information which would enhance understanding of current social and economic circumstances of the communities living around Mrima Hill.

The specific objectives of the socio-economic baseline survey are to provide information on:-

- The current socio-economic conditions of the communities around Mrima Hill (Dzombo Location);
- Livelihood sources of Dzombo Location communities; and
- Perceptions with respect to livelihood and employment opportunities linked to mining of Niobium and Rare Earth Elements on Mrima Hill.

Since Mrima Hill is located almost at the centre of Dzombo Location, with villages all around it, the area covered by the socio-economic baseline survey was the whole of Dzombo Location.

Table 2.1: Mombasa (04° 3' South): Mean Monthly Rainfall and Temperature

Months of the year	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Temperature in °C	28	28	28	28	26	25	24	24	25	26	27	27
Rainfall in mm	33	15	56	163	240	80	70	66	72	97	92	75

Summary of Climatic Conditions

Information Category	Statistics
Temperature range - Lowest	22.7 ⁰ C
- Highest	33.1 ⁰ C
- Average	27.9 ⁰ C
Rainfall Average per annum	1,025 mm
Long rains	April to July
Short rains	October to December
Average relative humidity at noon	65%

2.4 Topography and Rock Type

This part of the coastal region is known as the low plateau and lies to the west of the coastal plain at altitudes ranging between about 30 to 135metres above sea level. GPS elevation readings for some points in this area are as follows:-

Mwabovo market centre	60metres
Mamba market centre	97metres
Chief's office at Mwananyamala	126metres

Though most of this region is low lying and very gently rising towards the west, the Mrima Hill (290), the Dzombo Hill (471metres) and Kiruku Hill all arise from this low plateau.

Geologically, this area is underlain by old sedimentary rocks (from Karroo sediments) of Mesozoic Age. However, associated with the rifting and volcanic activity that formed the East African Rift Valley during the Tertiary Period, alkaline plutonic intrusions cut into these Karroo sediments forming carbonatite-bearing complexes. These include Mrima Hill and Dzombo Hill (Jombo). There was fenitisation of these sedimentary rocks in the nearby Kekonde area. Hot springs found at Maji Moto are also associated with this volcanic activity.

2.5 Soils and Drainage

The old sedimentary rocks mentioned above have weathered to produce mainly sandy loams and deep sandy soils which are generally loose – grained, porous and with low water retention capacity. At the foothills of the Mrima, Dzombo and Kiruku hills are red soils resulting from the weathering of the alkaline plutonic intrusions. There are alluvial soils along Ndzovu River and the other small rivers in the area. There are patches of black cotton soil in the poorly drained areas such as those to the east of Mrima Hill. While the red soils, the alluvial soils and the sandy loams are fairly fertile, the sandy soils are infertile.

2.6 Natural Vegetation

Coastal lowland rainforest is found on Mrima Hill and the eastern slopes of Dzombo (Jombo) Hill. In the lower areas are scattered trees and scrub. However much of this natural vegetation has been cleared. While the forests have been reduced considerably by lumbering and replaced in many places by scattered tree grasslands, much of the original scattered trees and scrub have been cleared for settlement and cultivation.

2.7 Population and Settlement

Dzombo Location, which has only one sub-location known as Malamba, has an area of 223.5 square kilometers and a total population of 41,509, comprised of 19,489 male and 22,020 female. There are 6476 households making an average of 6.4 persons per household. Overall the area has a population density of about 186 persons per square kilometer and is the second densely populated in Msambweni District, after Diani Location.

Table 2. 2: A summary of population statistics for Dzombo Location

Area in sq. km	223.5
Male	19,489
Female	22,020
Total	41,509
Density	186
No. of persons per household	6.4

However the population density is even higher at the trading centres, the main ones being Mrima, Mamba, Mwananyamala, Gugu, Mwanguda, Makambani and Menzamwenye.

The area has a mixed population composition. It is mainly composed of the Digo and the Duruma who belong to the Mijikenda group and the Kamba. All are Bantu speakers. But while much of the population follows the Muslim religion, there are Christians as well. So there are mosques and churches near the more densely settled areas.

2.8 Economic Activities

2.8.1 Crop Farming

Many people in this area are smallholder farmers with most people owning between 5 and 10 acres of land. However, these farms are becoming smaller and smaller as they are sub-divided and passed on to the male children.

The basic food crops are maize and cassava. Sweet potatoes, cow peas and bananas are also grown. Rice is grown in small flash flood areas.

Many cash crops are grown in this area. They include coconuts, cashew nuts, bixa, mangoes and oranges. The demand for poles in the coastal beach hotels and cottages has led to the planting of fast growing exotic trees by many farmers. They are generally grown in woodlots consisting of pure stands. These are mainly casuarina/whistling pine (*casuarina equisetifolia*).

2.8.2 Livestock Farming

Very few farmers keep large numbers of cattle due to lack of grazing area, lack of water supplies, especially during the dry season, and the incidence of diseases, including East Coast Fever and nagana (trypanosomiasis). The animals kept are the traditional. Goats and poultry are found in almost every household.

2.8.3 Industry

This area lacks any manufacturing or processing industry. Even the cash crops grown here are sold to middlemen (agents) who then deliver to factories which are outside the area for processing (e.g. bixa is taken to Tiwi). However, there are many small businesses dealing in general provisions, especially in the market centres. Few people have also engaged in the transport business, providing minibuses (matatus), medium-sized lorries (canters) and motor bikes (boda bodas) to transport people, agricultural produce and goods.

2.9 Transport and Communication

The roads here are all earth roads, and while those connecting the main market centres (Mrima, Mwabovo, Dzombo, Mamba, Mwananyamala, Gugu, Mwanguda, Makambani and Menzamwenye) are all weather roads due to a murrum surface, the roads to most other parts are frequently impassable in the rainy season. Examples are sections of Mwananyamala – Nguluku road and the road to Mugome market centre. Communication is

mainly through mobile telephone. However, there are still many areas where connections (networks) are unavailable.

2.10 Social Amenities

2.10.1 Power

The main source of power in institutions is diesel generators and solar power while kerosene lamps are the main source in homes. However there seems to be plans to supply the area with electricity as evidenced by electric posts with wires going to Mwananyamala market centre.

2.10.2 Water Supply

Although a large part of the region receives high rainfall, the value of the rainfall is reduced by high evaporation rates. Also, in some of the areas, the rainfall rapidly sinks through the porous sandy soil leading to surface water deficit, especially during the dry season. Thus the main source of water is wells and boreholes, some of which dry up during the dry season forcing residents to travel long distances or to wait for long hours to fetch water. Moreover some of the water is saline. Also most of the sources are uncovered and unclean containers are used. So there is serious scarcity of water in general and of clean water in particular.

2.10.3 Schools

There are 14 government primary schools, 3 registered secondary schools and 2 youth polytechnics. Pupils and students are forced to walk long distances as some villages are without upper classes. For example, Mwabovo Primary School has only class 1 to 3. Those pupils in class 4 and above have to go to Mrima, Kikonde, Mamba or Kiruku, all about one to five kilometers away. So walking the long distances is a big problem, both during the rainy season and the dry season when the sun is usually very hot. Parents are trying to address this problem by constructing more schools and more classrooms in the already existing schools. For example there are new secondary schools, such as the one at Gugu, being run by parents but the government has posted teachers only to the three registered ones leaving these new ones without qualified teachers. Also due to the high level of poverty, some of the additional classrooms are in a dilapidated state as they are constructed of cheap materials, as seen in Plate 8 below. Most of them lack enough desks forcing pupils to sit on the floor. Other amenities such as latrines and play grounds are undeveloped.

2.10.4 Health Facilities

The whole of Dzombo Location is served by five (5) government dispensaries. These are at Mwananyamala, Maji Moto, Mamba, Vitsangalaweni and at Mwanguda. There are maternity wards in these dispensaries. However, in case of complications one has to be moved to Msambweni District Hospital, which has only two ambulances serving the whole district.

2.10.5 Security

There is one police post with only four (4) officers serving over 41,000 people. So lack of security is of major concern to many people in the area.

3. METHODOLOGY OF STUDY

3.1 Sample Size and Sampling Strategy

The villages where the questionnaires were administered were selected randomly with the intention of selecting villages that would reflect a wide range of socio-economic conditions around Mrima Hill. Ultimately, however, the villages visited were largely determined by logistical factors such as time constraints and road access to the villages as the field trip coincided with the area's main rainy season.

On average eight to twelve (8 – 12) households were randomly selected from each of the four villages nearest to Mrima Hill. These are Mrima T.M., Mwabovo, Dzuni and Bumbuni villages. Then a further four to five (4 – 5) households on average were randomly selected from the remaining thirty two (32) villages in Dzombo Location to make the sample size representative of the area. A hundred and one (101) households were interviewed in

nineteen (19) villages out of the total thirty six (36) villages in Dzombo Location, and another six households from Mwandeo in Kikoneni were also interviewed. In total, a hundred and seven (107) households were interviewed in twenty (20) villages.

Table 3.1: NUMBER OF QUESTIONNAIRES ADMINISTERED

NO.	NAME OF VILLAGE	NO. OF HOUSEHOLDS	NO. OF LEADERS	TOTAL IN VILLAGE
1.	Mrima T. M.	9	1	10
2.	Mwabovo	8	-	8
3.	Dzuni	12	-	12
4.	Bumbuni	5	2	7
5.	Mwanguda	4	1	5
6.	Gandini	5	-	5
7.	Maaro	5	1	6
8.	Kitungure	4	1	5
10.	Mwananyamala A	4	1	5
11.	Kikonde	4	1	5
12.	Nkonje (Mkonjwe)	6	2	8
13.	Mamba A	5	-	5
14.	Mkuduru	5	1	6
15.	Maji Moto	5	-	5
16.	Makambani	5	-	5
17.	Rilla (Rira)	6	-	6
18.	Mwananyamala B	5	2	7
19.	Nguluku	4	1	5
20.	Mwandeo (Kikoneni Location)	6	1	7
	TOTAL	107	15	
	GRAND TOTAL			122

3.2 Data Collection Instruments and Procedure

Information on socio-economic situation was gathered by the following methods:-

- 1) Field visits and Observations
- 2) Questionnaires
- 3) Interviews
- 4) Discussions
- 5) Global Positioning Systems (GPS)
- 6) Secondary Data.

The survey concentrated on gathering information on the following issues:-

- Population in the area around Mrima Hill (Dzombo Location);
- Literacy rates
- Access to education
- Access to healthcare
- Number of acres of cultivated land
- Number of domestic animals
- Access to market
- Employment
- Incidence of poverty

- Incidence of insecurity

3.2.1 Community Key Informants Survey

A survey questionnaire was used at village level to collect information about schools, health facilities, employment situation, and other available amenities in the village. This questionnaire was enumerated through interviews with village leaders or any senior member in the community. The main respondents were chairmen of villages (village elders) though some leaders of institutions also gave information. In total 15 Community key informants were interviewed.

3.2.2 Household Survey

The above issues were categorized into five (5) major groups of indicators. These are Population Indicators, Literacy/Education Indicators, Health Indicators, Employment Indicators and Household and Amenities Indicators. These formed the basis of the structured household questionnaire administered to facilitate gathering of the baseline social and economic situation of the communities in the environs of Mrima Hill, guided by the understanding that households are an important and fundamental socio-economic unit in Kenya. Thus, information was collected through interview with the senior member of the family or household head.

The original intention was to gather information from household heads and community key informants using English, but during the questionnaires' pre-test it was found out that the local interviewers lacked enough understanding of the English language to translate adequately, in real time, the questions into Kiswahili. Therefore the questionnaires were translated, printed and administered in Kiswahili.

3.2.3 Targeted Information Informants' Interviews and Discussions

The study team obtained views and opinions of the key informants on social and economic issues by meeting with government officials. In particular the team held interviews with the area chief and sub – chief, officials in the Ministry of Education, Ministry of Public Health and Sanitation, Ministry of Forestry and Wildlife and Ministry of Youth Affairs and Sports. An official from a local Non-governmental Organisation and a Community Based organization were also interviewed.

3.2.4 Enumeration

The fieldwork of baseline survey started with an orientation session for the enumerators / interviewers in the chief's office at Mwananyamala on 10th May, 2011 and a practical session at Mwanguda village in the afternoon. The actual fieldwork baseline survey started on 11th May 2011, by deploying all the five (5) interviewers.

3.2.5 Sources of Primary Data

Thus the key sources of primary data for this survey are the questionnaires completed by household heads and by local leaders at various categories at village and sub-location level. Other sources of primary data include interviews of people in authority. Those interviewed included the chief of Dzombo Location, sub-chief of Malamba sub-location, a kadhi, a CBO administrator and a facilitator with an NGO.

3.2.6 Secondary Sources of Information

The team used available data providing background on socio-economic conditions in Dzombo Location. This was mainly from Provincial Planning Office and Provincial Survey Office, Coast Province.

3.2.7 Global Positioning System

Location of some randomly selected parts of Mrima Hill's environs was determined by the use of Global Positioning System (GPS) readings. These readings included latitude, longitude, elevation and Universal Transverse Mercator (UTM). These readings assisted in determining the general climatic characteristics of the area around Mrima Hill which have a fundamental influence on the socio-economic situation of the area.

3.3 Data Analysis and Presentation of Findings

The data collected from primary sources was processed with aid of the Statistical Packaged for Social Sciences (SPSS) software to determine and correlate the answers given with the survey objectives. Findings are presented using descriptive statistical tables and figures to interpret the data so as to form conclusions regarding the survey objectives.

4. FINDINGS

The main findings from the baseline survey are presented in line with the pre-designed objectives, that is, providing information on:-

- The current socio-economic conditions of the communities around Mrima Hill (Dzombo Location);
- Livelihood sources of Dzombo Location communities; and
- Perceptions with respect to livelihood and employment opportunities linked to mining of Niobium and Rare Earth Elements on Mrima Hill.

The survey study targeted accessing information from an aggregate of 36 villages in Dzombo Location. However, only a total of hundred and seven (107) households were interviewed in twenty (20) villages out of total thirty six (36) villages. In total 122 questionnaires were administered and used in final data analysis. Out of the 122 questionnaires, 107 were filled by the heads of the sampled household while the rest (15) were filled by leaders in the villages.

Key findings emerging from these interviews and questionnaires are presented in this report. The main findings are that, firstly, the area lacks job opportunities, and while both men and women lack paid employment, the youth is the most affected as they shun farm work which is the main form of employment in this area. Secondly, many more children are now going to school. This has led to many problems in the education sector in the area. These include schools having inadequate structures and facilities such as classrooms, resulting in too many pupils using one classroom, desk and latrine. Thirdly, health facilities and services are of major concern in the area. This is especially so to women who are said to experience high maternal deaths due to inadequate maternity wards, inadequate qualified birth attendants and lack of an ambulance or a system to transfer maternal emergencies to an appropriate health facility. Finally, perhaps the most pressing issue facing the community is access to clean water. Although the findings show borehole is the main source of water, and that there are many of them in the area, many are in a state of disrepair, have salty water and some dry up during the dry season forcing people to spend more than an hour to get water. With respect to the proposed mining of Niobium and Rare Earth Elements at Mrima Hill there is a general perception that the proposed project is going to provide the much needed employment opportunities and improve on the general infrastructure in the area, thus reducing poverty and raising the standard of living of the community living around Mrima Hill.

5. CONCLUSIONS

Key issues emerging from the research undertaken during this socio-economic baseline survey and the associated data analysis results point to useful conclusions. The four main issues emerging from this research are given below:

- i. Unemployment;
- ii. Lack of adequate education;
- iii. Inadequate health services; and
- iv. Water scarcity.

The findings show that the area lacks job opportunities, and while both men and women lack paid employment, the youth is the most affected as they shun farm work which is the main form of employment in this area. Reasons given for the lack of employment include general underdevelopment of the area with the area having neither industry nor processing factories, lack of proper education leading to lack of skills, and lack of guidance on how to invest and successfully start income generating activities. And though the government has established a Youth Fund Program, the youth here have yet to take advantage of it as they lack adequate counseling and mobilization into required groups in order to benefit from this government initiative.

With respect to education, the findings show that many children are now going to school. This has led to many problems in the education sector. These include schools in the area having inadequate structures and facilities such as classrooms resulting in too many pupils using one classroom, desk and latrine. In the case of secondary schools, schools are few - students are forced to walk long distances while others give up altogether. Other problems are lack of teachers and adequate teaching facilities, lack of money by the parents to pay for additional teachers, lack of water leading to poor hygiene, inadequate source of lighting, especially in secondary schools,

and tradition and culture leading to early marriages for girls. Moreover, the survey findings show that very few members attend middle level colleges to acquire skills while no member attends university.

Further, the survey findings indicate that health facilities and services are of major concern in the area. This is especially so to women who are said to experience high maternal deaths due to inadequate maternity wards, inadequate qualified birth attendants and lack of an ambulance or a system to transfer maternal emergencies to an appropriate health facility. This view is corroborated by the Kenya 2008/2009 Demographic Survey which noted that more than half of the births occur at home. It went on to affirm that complications of pregnancy and child birth are the leading causes of mortality among women. It also quoted hospital records and hospital – based studies to conclude that the majority of these deaths are due to one or more preventable complications like bleeding, rupture of the uterus, severe anaemia and obstructed labour, which can be sorted if the mother arrives in hospital in good time. Other problems pointed out are high charges for services and few health centres, which are poorly equipped, lack drugs and adequate qualified personnel, thus people have to travel many kilometers and endure long waiting time, to seek proper medical care. At village level dirty water and lack of latrines contribute towards poor health.

Perhaps the most pressing issue facing the community is access to clean water. Although the findings show borehole as the main source of water, and that there are many of them in the area, many are in a state of disrepair and some dry up during the dry season forcing people to spend more than an hour to get water. Moreover, many of the boreholes are uncovered and the water is untreated. During the rainy season water is fetched from rivers and ponds as well. This coupled with the fact that a considerable number of households have no latrines in their households vastly affect people's health and hence the ability to work and support themselves.

Finally the survey findings show that there is a general perception that the proposed mining of Niobium and Rare Earth Elements at Mrima Hill is going to provide the much needed employment opportunities, support secondary school education, health facilities and improve on roads in the area, thus reducing poverty and improving the standard of living of the community living around Mrima Hill.

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