Building nsanje port on shire zambezi waterway

Project Description

Malawi is a landlocked country that relies on Mozambican ports on the Indian Ocean for transportation of imported and exported goods. The project will open new doors for Malawi and reduce transport costs. Currently Malawi uses Beira and Nacala port in Mozambique from which transporters cover a return distance of about 1700km from Blantyre. Using Nsanje port, transporters now will cover a distance of 238 km for a return journey to Blantyre as opposed to Beira port. Reduction in transport costs may lead to reduction of other goods such as agricultural inputs. This will be a benefit to the Malawians who depend on agriculture for their economy and it will also improve food security in the country.

The project will also provide Malawi with a multimodal transport linkage to other land locked countries of Zimbabwe and Zambia; the people of Nsanje district will be empowered socially and economically due to new infrastructure and markets that will be established to support the services of the port; the visual scenery of Nsanje district will improve with the building of the port; creation of temporary and permanent jobs; time saving and reduction on wear and tear of vehicles due to reduced travel distance.

Though the project will have positive effects but will also have negative impacts such as loss of fishing area and income for fishermen who used to fish along the shire river; air and water pollution due to construction work that will take place on the site; the project will affect the water species found along this area of the Shire river; empowerment of people socially and economically may increase the spreading of HIV and AIDS as this districts already has high percentage of HIV patients due to cultural beliefs;

urbanization due to viable environment for small scale and large scale businesses; natural visual scenery will be affected by new built structures, risk to flooding along the Shire river; conflicts with hosting communities and negative influences on religion and local culture.

Location

The project will be located at Nsanje District in Malawi. Malawi is located between latitudes of 09Ës and 17Ës south and longitudes of 33Ës and 37Ës east. Malawi is bordered by Zambia in the East, Tanzania in the North and Mozambique in the South and West. Nsanje District Assembly is found at the tip of Southern Malawi where Malawi shares borders with Mozambique. It is at this place that the shire river passes along the boundary between Malawi and Mozambique flowing into Zambezi river and then to Indian Ocean through Chinned Port. The site was selected because of the wider width of the river as it connects to Zambezi River offering a better place for the port. Location map is shown in relation to the Shire River and location for the proposed port.

Malawi Map showing location of Nsanje, Imagery showing location of the port, Shire River and Nacala corridor from Mozambique.

MALAWI'S EIA LEGISLATURE

In Malawi the Environmental Act enacted in 1996, provides the legal framework for the protection and management of the environment, the conservation and sustainable utilization of natural resources. EIA processes are outlined on section 24 of the Act to which all private and public developers must adhere to. The Act has outlined projects for which EIA is

mandatory before implementation of the project as gazetted in section 24. The section also stipulates all activities that must be carried out by the developer before any implementation. The developer has to submit a project brief to the Environmental Affairs Department (EAD) who administers the environmental Act. The Director assesses the project and is supported by expertise from the technical committee of environmental affairs (TEC) which participate in the Environmental Impact Assessment (EIA) requirements; project briefs reviews; Terms of Reference (ToRs) and EIA reports; develop and monitor project auditing programme and recommended course of action to the Director though the director is not bound by the TEC report. The act also stipulates that only the EAD is mandated to issue out certificate under section 26(3) for which an EAI is required.

For thorough evaluation of project activities that might have significant impact on the environment by the port developer, the EIA is supported by various Malawi government Acts and policies as indicated in table 1 and other international legislatures as attached on appendix I.

Malawi legal documents

4. 2 EIA Process

The EAI process is carried out in phases in a project cycle in which EIA requirements are integrated within the cycle (EMA, 1996). The project cycle is carried out in phases and begins with a concept then pre-feasibility and feasibility studies before a detailed design and implementation phase. The objective of the cycle it to provide detailed and up-to-date environmental information at key stages in the cycle. This helps the developer to identify early results from an EIA and able to take action on any significant changes

and adopt them during project implementation. The project cycle also provides opportunity to the developer, consultant, relevant authorities, interested parties and the general public to assess the impacts of the project on the environment and provide alternatives on adverse effects. The project cycle focuses on identification of negative impacts, reasonable alternatives and assessing the relevant issues so as to ensure that the EIA becomes a useful to decision makers. All the activities in the project cycle are done through screening and scoping.

4. 1 Screening

Screening allows a project to be assessed whether an EIA is required or not and establishes the basis for scoping (Theodorsdouttir, 1999). In Malawi, screening is done through a project brief which is a document that highlights critical issues prepared by the developer and in this case the Malawi Government and is submitted to the Director of Environmental Affairs Department and who is supported by TEC to assess whether it requires EIA or not. Building of an inland port is among the projects that EIA is mandatory in Malawi therefore an EIA is to be carried out (EMA, 1996).

4. 2 Scoping

Scooping ensures that all relevant issues to be addressed in an EIA are established and makes sure that all relevant authorities, interested and affected parties are involved, alternatives to the project are identified and to make sure that the resources are conserved and used wisely. In Malawi, comprehensive identification of the significant impacts are based on the Terms of Reference (ToRs) which are prepared by the developer and

approved by the director (EMA, 1996). ToRs are identified in the scooping process. The figure I below outlines all the EIA process in Malawi.

4. 3 ASSESSMENT METHOD

There are various methods of assessing environmental project impacts such as checklist, network diagrams, graphical comparisons overlays and matrices (FAO, 1995) In this assessment matrices as shown in figure 2 have been used to come up with the most significant impacts as matrices easily identify impacts in a summary form and provides better bases for evaluating most significant ones Leopold et al. (1971).

4. 4 Environmental Plan

Impacts identified in the matrices are further assessed by Stakeholders, EAD, TEC, general public and the developer to evaluate the impacts and also identify mitigation measures. In the environmental plan potential project impacts are identified in regard to project phases as indicated in Appendix II

The most significant impact – Water Pollution

The most significant environmental impact on this project is water pollution. Water pollution is the contamination of water bodies through pollutants which are discharged directly into water bodies without adequate measures to remove harmful compounds. Water pollution may take place due to effluents derived from soil erosion, accidental spills, waste oil, fertilizers and detergents, heavy metal and pesticides, heat and micro-organisms (JICA/GOK, 1992).

5. 1 Significant Impacts

Drinking Water: Water is considered safe if it can be used by human beings and other living creatures without any effect (UNEP, 1999). Polluted water is not safe for drinking for the communities living along the river and can easily wipe away a large population of human beings and animals as the birds shown in figure3.

Odour: Sediments in the water under the structures may cause water stagnation and after sometime the water may produce odours that may be nuisance to the people working around the area

Impact on irrigation: Water polluted with chemicals and oil spills may affect irrigated crops.

Recreation: Polluted water will not be good for swimming or recreation as it may affect the people in contact with polluted water.

To reduce water pollution, there is need to provide mitigation and monitoring measures as shown in table III below.

Significant impact

Project Activity

Possible Mitigation measures

Prediction and Monitoring measures

Water pollution

Landfills and site development

Careful site selection and layout design is important to reduce stagnation. Dredging should be carried out to remove any deposits and sediments in the water

Enhance the water law Act to punish offenders who deliberately pollute water

Construction of break waters, bays and terminals

Make a fence around the construction area

Quarterly meetings during the construction phase should be held to monitor the negative environmental impacts. TEC and EAD to monitor the activities

Dredging and disposal of dredged materials

Proper disposal of dredged material plays an important role in preserving the environment.

Monitor sediment deposits and use Secchi disk to check depth and visibility (United Nations, 1992).

Waste Management

Encourage recycling and devise proper means of disposing both solid and liquid waste

District Assembly to monitor all dumping sites and advise residents accordingly.

Transportation of construction materials

Proper handling of raw materials is required i. e.

Cover cement and sprinkle water frequently on dusty roads

Monitor handling of the raw materials.

Vessel traffic operations

Appropriate regulations should be put in place to cater for ship discharge, emissions and oil from cargo, ship spills and disposal of waste

Use of Microwave remote sensing satellites and receivers aboard ship vessels to monitor ship movements, oil spills and grease and ship leakage in the river (Woodhouse, 2006).

Use predictions models to monitor water quality such as Artificial Intelligence models, Artificial Neural Network models and Mathematical assimilations (Najah et al., 2009)

Cargo handling and storage

Special equipment should be provided for handling cargo and transportation of goods and Provision should be made for periodical clean-up of floats and wastes

Developer to monitor that cargo handling equipment is regularly serviced

Waterfront and cargo operations

Provide regulations on effluent from waterfront industries and monitoring of water quality

TEC to monitor all activities probably by employing a full time environmental specialist.

Transportation of goods

All roads leading to the port must have bitumen to avoid dust which may pollute the water.

Stakeholders to monitor where they there expertise is required.

5. 2 Acts that govern the legislature for water are;

Environmental Management Act 1996 which stipulates the conservation and sustainability of utilization of natural resources and water is one of the natural resources.

Water Resources Act 1969

The act governs the control conservation, apportionment and use of water resources in Malawi.

Water Works Act

The act makes an offence if any person willfully and negligently causes water pollution.

5. 3 Baseline data

Baseline data is the collection of relevant information proposed in the project with the purpose of determining the status and trends of environmental factors (e. g., water pollutant concentrations). This offers opportunities to predict changes in terms of importance and provide for means of detecting actual changes once the project is initiated. Baseline data plays an important

role in EIA assessment and monitoring of environmental effects (Wathern, 1988).

Alpha (1995) recommends the following data to be collected for checking water pollution:

- Dissolved Oxygen
- Water conductivity
- Water salinity
- Turbidity
- Temperature
- PH

Use of questionnaire to get more information from the communities around the district Assembly on the activities that take place along the river

Measurements on sediments.

Maps showing river catchments area

5. 3. 1 Parameters for checking water quality

UNEP prescribes measurement of various parameters for assessing, water quality and these include:-

Temperature – recommended is between 25 and 35

Suspended solids – it is recommended is 30mg/l

Biochemical oxygen Demand (5-day at 20 C) Clean water is between 4mg/l to 10 and more than 10 is considered polluted

Heavy metal concentration should not exceed 0. 1mg/l in combination

Lead (PB) less than 0. 1mg/l

Mercury (Hg) less than 0. 005 mg/l

Silver (Ag) , Zinc(Zn), Chromium (Cr), Arsenic (As) less than 0. 05 mg/l

Nickel (nI) less than 0. 3 mg/l

Copper (Cu), Cyanides (CN), Hydrogen Sulphide (S) less than 1. 0mg/l

Free Ammonia (NH 3) less than 0. 2mg/l

Phenolic Compounds (Phenol) 0. 001 mg/l

Nitrates (N) 10mg/l

Phosphates

Floating materials oils foam and greases.

Bhardwaj, 2005, suggest water quality criteria as shown in the table below:

5. 4 GAPS

Measurement of water quality can only be undertaken by people with special expertise and with special equipment which cannot be used by a local person and the water measuring instruments are not up-to-date and not enough to cover all water bodies in the country (UNEP, 1999).

Conclusion

This project has a significant impact on water which is critical to water species and human beings therefore mitigation measures have to be followed to reduce water pollution in the Shire river which its impacts may have an effect over a long distance and all the way to the Indian ocean and affect so many people and all water habitats.