



DRAFT EIA REPORT

FOR

THE PROPOSED MULTIPURPOSE JETTY

IN

**ONNE PORT COMPLEX
ELEME, PORT HARCOURT, RIVERS STATE**

BY

**INDORAMA ELEME PETROCHEMICALS LTD,
PORT HAROURT, RIVERS STATE**

SUBMITTED TO

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List of abbreviation

| | |
|-------------------|--|
| % | Percentage |
| µg/l | Microgram per litre |
| µg/m ³ | Microgram per Cubic Meter |
| µM | Micro Meter |
| AIDS | Acquire Immune Deficiency Syndrome |
| API | American Petroleum Institute |
| ASTM | American Standard Testing Material |
| BAT | Best Available Technology |
| BOD | Biological Oxygen Demand |
| CF | Condition factor |
| CHEW | Community Health Workers |
| Co | Carbon-Monoxide |
| COD | Chemical Oxygen Demand |
| CPT | Cone Penetration Testing |
| CpUE | Catch per Unit Effort |
| CRP | Central Reference Point |
| CxHy | Hydrocarbon |
| dB | Decibel |
| DG | Diesel Generator |
| DO | Dissolved Oxygen |
| DPR | Department of Petroleum Resources |
| DR | Doctor |
| E' | Evenness or Equitability Index |
| EA | Environment Assessment |
| EAR | Environmental Audit report |
| EC | Electrical Conductivity |
| EER | Environmental Evaluation Report |
| EIA | Environmental Impact Assessment |
| EMP | Environmental Management Plan |
| EP | Equator Principle |
| IEPL | Eleme Petrochemicals Company Limited |
| EPFI | Equator Principle Financial Institution |
| ERP | Emergency Respond Plan |
| ESMS | Environmental and Social Management System |

| | |
|--------------------|---|
| ETP | Effluent Treatment Plant |
| EU | European Union |
| FEPA | Federal Environmental Protection Agency |
| FGN | Federal Government of Nigeria |
| FLT | Federal Lighter Terminal |
| FMENV | Federal Ministry of Environment |
| FOT | Federal Ocean Terminal |
| GDP | Gross Domestic Product |
| GFD | Group Focus Discussion |
| GPS | Global Positioning System |
| H | Hydrogen |
| H' | Shannon Diversity Index |
| H ₂ S | Hydrogen Sulphide |
| HCL | Hydrochloric Acid |
| HIA | Health Impact Assessment |
| HIV | Human Immune Deficiency Syndrome |
| HNO ₃ | Nitric Acid |
| HQ | Head Quarters |
| HSE | Health Safety and Environment |
| HUB | Hydrocarbon Utilizing Bacteria |
| HUF | Hydrocarbon Utilizing Fungi |
| IEFCL | Indorama Eleme Fertilizer Company Limited |
| IEPL | Indorama Eleme Petrochemicals Limited |
| IFC | International Finance Corporation |
| IITA | International Institute of Tropical Agriculture |
| ISO | International Standard Organization |
| ITD | Inter tropical Discontinuity |
| K | Potassium |
| Kg | Kilogram |
| Kg/cm ² | Kilogram per centimetre squared |
| Kg/hr | Kilogram per hour |
| KN/M ² | Kilo Newton Per Meter Square |
| Kpa | Kilo Per Annum |
| LGA | Local Government Area |
| LTR | Litre |

| | |
|--------------------|---|
| MC | Master of Ceremony |
| MDG | Millennium Development Goal |
| mg/l | Milligram per liter |
| mg/m ³ | Milligram per meter cube |
| mmg/m ³ | Milligram per meter cube |
| mT | Tropical Maritime |
| MTP | Metric Tons Per day |
| MW | Mega Watt |
| N | Nitrogen |
| NCC | Nature Conservancy Council |
| NE | North Easterly |
| NEPA | National Electric Power Authority |
| NESREA | National Environmental Standards Regulatory Agency |
| NG | Natural Gas |
| NGL | Natural Gas Liquid |
| NGO | Non-Governmental Organization |
| NH ₃ | Ammonia |
| NH ₃ | Ammonia |
| NNDC | Niger delta development Commission |
| NNPC | Nigerian National Petroleum Company |
| NOx | Nitrogen Oxide |
| NPA | Nigerian Ports Authority |
| NPC | Nigeria Population Commission |
| O ₂ | Oxygen |
| °C | Degree Celsius |
| OECD | Organization for Economic Cooperation and Development |
| PAC | Project Actualization Committee |
| PCUS | Passenger Car Units |
| PCV | Parked Cell Volume |
| PE | Polyethylene |
| pH | Potency of Hydrogen |
| PHCN | Power Holding Company of Nigeria |
| PID | Pelvic Inflammatory Disease |
| PIU | Project Implementation Unit |
| PP | Propylene |

| | |
|------|--|
| Ppm | Part Per million |
| Ppmv | Part per million by volume |
| PPP | Public Private Partnership |
| PVC | Polyvinyl chloride |
| RH | Relative Humidity |
| RSME | Rivers State Ministry of Environment |
| RSPM | Respiratory Suspended Particulate Matter |
| SOx | Sulphur Oxide |
| SPDC | Shell Petroleum Development Company |
| SPM | Suspended Particulate Matter |
| SPT | Standard Penetration Test |
| STI | Sexual Transmitted Infection |
| SW | South Westerly |
| SWL | Static Water Level |
| TDS | Total Dissolve Oxygen |
| TF | Total Fungi |
| THC | Total Hydrocarbon Content |
| TOR | Terms of Reference |
| TSPM | Total Suspended Particulate Matter |
| UES | Uniform Effluent Standard |
| USD | United State Dollar |
| VOC | Volatile Organic Compound |
| Vol | Volume |
| WAS | Western Atlantic Shipyard |
| WHO | World Health Organization |
| WMO | World Meteorological Organization |
| Wt% | Weight by Percent |
| WTP | Water Treatment Plant |
| ZnO | Zinc oxide |

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EXECUTIVE SUMMARY

Proponent

Indorama Eleme Petrochemical Limited (IEPL) is the proponent of the proposed Multipurpose Jetty located within the Onne Oil and Gas Free Zone. The fieldwork was undertaken from 16th to 23rd April, 2012 (beginning of rainy season). The sampling range was 2km radius from the centre of the proposed project site.

Need for the EIA

This project has been categorized as category two project by the Federal Ministry of Environment who confirmed the need to conduct a full blown EIA. Field work was carried out in one season on the basis of approval received from the Federal Ministry of Environment (FMENV).

Terms of reference (TOR)

During the EIA scoping phase, the Federal Ministry of Environment approved on 19th March 2012, the Terms of Reference for the said project submitted by IEPL.

The TOR included the plan of environmental investigations to be carried out to identify the baseline condition of the study area, the format and contents of the EIA report and the description of the team charged to prepare the EIA report.

EIA Objective

The objectives of the EIA are:

- To describe the physical, chemical, biological and socio-economic features of the environment that may be potentially affected by the Project identifying the environmentally sensitive areas within the project area.
- Identifying in the design, construction, commissioning, operation and decommissioning phases of the Multipurpose Jetty where environmental impacts (both positive and negative) may occur.
- To superimpose all aspects of the project on the environment and evaluate the impacts of the project on the environment.
- To highlight particularly and recommend any measures that could be used to avoid, and if not avoidable, mitigate/ameliorate any negative hazardous impacts as well as promote beneficial effects of the project.
- To use results of the investigations to develop project specific ameliorating plans/measures during execution.

- To define an Action Plan, which foresees also the adoption of an Environmental and Social Management System (ESMS) for the project lifespan as defined by the Equator Principle n.4
- To serve as an advance notification to the regulatory agencies especially the Federal Ministry of Environment.
- To provide necessary answers to questions from stakeholders, host communities, regulators and other interested parties.

Scope of work of the EIA

The scope of the EIA included review of laws, regulations and guidelines (National and International), fieldwork, laboratory analysis, literature research to assess the impacts expected and mitigation/compensation measures against negative impacts. In order to achieve this, also informal and formal consultations were held with all interested parties. Finally an EIA Report including comprehensive project/social and environment components description and a Management Plan was produced and submitted to FMENV which is the competent authority to process the report.

Regulatory Framework

The Legal basis for environmental permitting, applicable National and International Legislative and Administrative framework including local laws and conventions pertaining to this project were reviewed and documented. The whole EIA Report's documentation was drafted taking into account the following national and international documents:

- Guidance on EIA, EIS review, June 2001, European Commission;
- Equator Principles, June 2006, Equator Principles Association;
- International Finance Corporation (IFC) Sustainability Framework, 2012 Edition, Performance Standards;
- Environmental, Health and Safety Guidelines, April 30 2007, World Bank and IFC;
- IFC Environmental, Health and Safety Guidelines for Port, Terminal and Harbour 30, July, 2007
- EIA Procedural Guidelines, 1995, Federal Environmental Protection Agency of Nigeria;
- EIA Sectoral Guidelines, infrastructure Projects, Federal Environmental Protection Agency of Nigeria;

Justification of the project

The project proponent must require a new Port facility as the proposed multipurpose jetty to be able to service a new fertilizer (urea) production plant through export of the product (urea) as well as import and export of containerized cargoes and break bulk cargoes.

The proposed jetty development is therefore set to reduce activities in the existing jetties within the Port and promote economic business activities in the Port.

Project Alternative

A range of alternatives are evaluated to facilitate identification of the most appropriate means of meeting the purpose and need for this project. The benefits of evaluating alternatives are for the selection of the best project design, selection of the best project location, most efficient use of resources; avoidance of adverse impacts; and achievement of sustainable development goals only achievable through consideration of new ways of doing business. Bearing on the above factors, the following alternatives were appraised: no project alternative; delayed project alternative; alternative location or site; and alternative technology.

Project Location

The project site is located about 20km south east of Port Harcourt and about 14km from Eleme Petrochemicals Complex Onne Creek, in which the project is sited links south ward with the Bonny River and 42NM from Fair Buoy, which in turn empties into the Atlantic Ocean. Geographically, it is bounded within latitude 4°50'52.703" and longitude 7°02'52.158

Project Description

The multipurpose jetty shall comprise of two sections (Berths). Berth one is for Urea Export with design capacity of 1.0MMTPA and vessels size of 30-35,000 Mt (DWT)

The second Berth is for Container/Break Bulk Cargo. The project will have the following facilities and components:

- 320m long quay
- Flat store for Urea storage
- Truck unloading station
- Container and break bulk storage yard
- Material handling system for Urea
- Gantry type ship loader

- Utilities (eg Power generation, raw water bore wells or sea water system, lighting, fire fighting, offices, amenities, control room, workshop with small storage room, water storage and diesel storage, drainage system)

Existing Environment

Hydrogeology/Geology

The proposed project site is located within the national grid between Latitude 4°50'52.703" and Longitude 7°02'52.158 on a plot of land approximately 6.1 hectares.

The study site is a brackish water ecosystem located in the rainforest belt within the equatorial climate region. Based on the Geological Map of Nigeria, published by the Geological Survey Department of Nigeria, the geological unit of the proposed project site and their surrounding falls under the Niger Delta and continental deposit, geologically, the site is underlain by costal plain sands, which in this area is overlain by firm – stiff sandy clay sediments belonging to the pleistocenic formation. Beneath the sandy clay layer is a deposit of fine-medium dense sand.

Surface Water

The proposed site is located within the Industrial Complex of the Oil and Gas free Zone of Onne Port. All effluent discharge from the project area is received by the water

Six (6) locations were chosen for the surface water sampling i.e. upstream, downstream of the project site, two samples taken towards the Bonny channel. Besides *in-situ* water quality measurements, which were undertaken, grab samples were collected for laboratory analysis.

The water quality indicates little anthropogenic interferences considering that is mostly compliant with the FMENV Water Quality Criteria for discharge into surface water defined for Irrigation/ Reuse Standards and Fisheries/Recreation standards.

Ground Water

The project area which falls in the Niger Delta region is reputed for its very high ground water recharge rate. Groundwater chemical analyses shows that all parameters complied in comparison with FMENV and WHO maximum permissible limits for drinking water, except for pH which is below the tolerated rate. It has to be considered that ground water is acidic in Niger delta region, due to high content of dissolved CO₂. ground water flow is southerly towards the Bonny channels.

Air Quality

The results of ambient air monitoring reveal that all pollutant's levels recorded at all the sites were well below the recommended Nigerian Air Quality Standards and the WHO/IFC standards, with the only exception of SPM exceeding values registered in stations along the FOT and Atlas cement boundary sites probably due to vehicular and cement operations respectively.

Ambient Noise Level

Noise monitoring stations were established at each air quality station. The noise sources were mostly as a result of vehicular movement, wind blowing and human activities around the project site. The project area is in compliance with the noise exposure limit for workers defined by the Nigerian standards and with the IFC Standards for industrial areas at the premises of the proposed project complex. Noise level measurements ranged from 40.5 dBA to 56.2 dBA with a mean of 49.3 dBA for all stations.

Meteorology

Five microclimatic variables were monitored and their mean measurements were 28.2 °C, 84%, 2.7m/s, 960mbar and 6 oktas for ambient temperature, relative humidity, wind speed, pressure and cloud cover, respectively. The prevailing wind direction was south-westerly. The dispersive potential of the atmosphere within the study area based on the wind profile is moderate. The micro weather station was set up in the open site plot and monitored for 24 hours, while long term data were acquired from a close synoptic station. The weather condition during the course of field measurements indicated mostly cloudy, slightly sunny and moderately windy condition. Onne features a coastal climatic condition that is similar to the rest of the Niger-Delta. Although rainfall is observed throughout the year, there are two rainy seasons, with the heaviest rains falling from March to September and a weaker rainy season in October to early December. There is a brief relatively dry period in August and a longer dry season from December to early February. Monthly rainfall between May and September averages over 347 mm, while from December to February it is down to 38 mm. The main dry season is accompanied by harmattan winds from the Sahara Desert, which between December and early February can be quite strong. The average temperature in January is 32°C and for July it is 28°C. On average the hottest month is February; with a mean temperature of 33.4°C; while July and September is the coolest months.

Land Use

The project area (about 5km radius) is covered by a mixture of primary, secondary vegetation and forests. A little creek divides the project site into a ratio of 80% to 20% and flows to the front of the site, during neap tide.

The site is close to the road and accessed via a well tarred road leading to Federal Ocean Terminal. The ecologically sensitive areas include the river systems, the tidal flooded creeks, ponds, creeks, mangrove vegetation, and creek-lets therein.

Soil

Soil stations were selected both within the proposed project site and >200m away from the perimeter of the project site in all directions (North, West, East and South) based on operations/activities in the area. Evaluation of the field and laboratory analytical results of the soils shows that the texture of soils in the field was mainly sandy loamy with sand particles dominating the aggregates. Soils in the sampling area are slightly acidic to neutral (pH 5.60 to 7.40). The nutrient content in the soils of the entire area were generally low. This trend can be attributed to the swampy nature of area and considering that most of the area was initially sand filled (reclaimed)

The values of metals were low except iron concentrations which were slightly high indicating that there are pyrites in these soils and common in soils of the Niger Delta.

Aquatic Environment

Phytoplankton, zooplankton and benthos samples were collected from the channel and towards the Bonny channel as control samples (2 points). Sample points (6 points) were distributed along the water body from the project site area down to the Federal Lighter Terminal and Federal Ocean Terminal quays. From the results of the phytoplankton investigation it could be deduced that the water body is averagely stable in organisms considering the fact it is brackish water.

Socio_Economic and Cultural Environment

The aim of the SIA was to collect baseline information across a wide spectrum of social environmental domains as a prelude to the full-blown SIA. Prior to the baseline data collection, traditional rulers and key community leaders were consulted in order to obtain the Social Licence to Operate (SLTO). At this focal group meeting, opportunity was seized to describe the scope of the EIA exercise.

Data collection relied on a largely pre-coded household questionnaire administered face-to-face to a probability sample of household respondents at one point in time by trained assistants;

discussions with Focus Groups (especially occupational sub-groups); interview of Key Informants (knowledgeable persons within the community); observations and measurements of key community features undertaken by trained assistants; as well as photography. Data analysis mainly entailed use of univariate summary statistics and population projection models. The study belongs to the class described as “passive-observational”, in the sense that subjects were studied *in situ*, without any form of experimental manipulation.

Age-Sex Distribution, Population Structure and Demographic Ratios

The population did not exhibit the true pyramidal (bottom-heavy) structure characteristic of developing areas; instead, it was loaded in the middle and older age cohorts. There were 89 dependents for every 100 members of the active population, and 102 males for every 100 females; the corresponding national averages are 82 dependents to 100 members of the active population, and 104 males for every 100 females.

Socio-demographic Conditions

Modal educational attainment was “Tertiary Uncompleted” for males (17.6%); “Primary Completed” for females (18.2%) and “Tertiary Uncompleted” (16.1%) overall. Literacy levels for males, females, and for the overall sample stood at 48.5%, 36.8% and 43.1%, suggesting that the community was educationally disadvantaged considering the corresponding national averages of 75.7%, 60.6% and 68%. Employment and unemployment rates stood at 55% and 21.6%, respectively for the overall sample; employment was higher among females (56.2%) than males (53.4%). Thus, the overall unemployment rate was much higher than the published national average of 4.9%.

Livelihoods and Income

For the total sample, modal occupation was farming, accounting for 19.5% of the distribution. However, non-farm activity accounted for 71.1% of the distribution, underlining the increasingly urban character of the community. Mean, median and modal monthly income stood at ₦65, 944, ₦72, 500 and ₦100, 000, respectively; with a standard deviation of ₦37, 008. The median monthly household income of ₦72, 500 converts to US\$ 15.60 per day, i.e. one half of the households in the sample fell well above the poverty line of US\$1.25 per day, announced by the World Bank in 2008, therefore better-off than the 70% of Nigerians that fall below the poverty line.

Transportation Facilities

The major roads that served the area were the old Onne Road (presently in poor condition) and the relatively new Federal Ocean Terminal (FOT) Road. A vehicular traffic volumetric survey carried

out at a location close to the proposed project site beside the FOT Road revealed that over the 7-day survey period (Monday, 14th May, 2012 to Sunday, 20th May, 2012), the highest volume of traffic was recorded on Monday -- 10,416.6 PCUs, and the lowest was on Sunday -- 3,588.3 PCUs. The weekly average hourly volume of traffic was highest between 11:00 and 11.59 hrs -- 1,447.17 PCUs; and lowest between 7:00 and 7: 59 -- 998.6 PCUs.

Social Infrastructure

Modal residential house type was “block of flats (multi-family)”, accounting for 34.5% of the distribution; For walling material, roofing material, type of foundation and house condition, the modes were “sandcrete blocks” – 73.5%; “corrugated iron sheets”-- 59.3%; “strip” -- 45.9%; “fairly good” (needs minor repair) – 54.1%, respectively. Owner-occupied housing accounted for 48.9% of the distribution; renters: 45.7% and other tenure arrangements: 5.3%. Rent for 1-bedroom, 2-bedroom, and 3-bedroom flats, for instance, stood at ₦200, 000, ₦250, 000, and ₦300, 000 per annum, respectively. On the average, renters paid ₦108, 047 per annum; 44.9% and 55.1% of renters were of the opinion that rent was “too high” and “about right”, respectively. Landlords were mostly individuals (93.9%); others: 6.1%.

The available recreational facilities in the study area were open spaces/fields attached to educational and religious centres, while others were communal play grounds. The modal method of disposal of household waste was “tipping into family-designated dump site” -- 42.1% and the most popular method of disposing of human waste was by the use of water closet, which accounted for 80% of the distribution. There was near total absence of social-welfare-related facilities, but reasonable provision of schools and especially churches. There was a sprinkling of institutional infrastructure items in the study location, with ample provision of banks, especially at Alejor and Ogoloma. Government-provided electricity was present in all 4 Sections of Onne, but public pipe-borne water was absent; rather there was reliance on private commercial boreholes and on such unhygienic sources as hand-dug wells, water bodies and rainwater.

It is traditional to divide an economy into two sectors: a *basic* sector (sometimes called an *export* sector) whose income is derived from transactions which take place across the boundaries of the area under consideration; and a *non-basic* (sometimes called *local or service*) sector whose income is derived from transactions within this area.

Traditional Governance, Social Organization and Culture

Onne is a part of Odido, one of the two groups of communities that make up Eleme. The community comprises four villages: Ogoloma, Agbeta, Alejor and Ekara. Origins of the first dwellers cannot be traced, but there is information about the first settlers in each of the villages.

It was found that 38.3% of the present population were recent in-migrants, 57.4% of whom had moved in from communities within Rivers State, while 42.6% had in-migrated from communities outside Rivers State. Of the in-migrants, 71.1% and 15.8% had moved in for job- and security-related reasons, respectively; while 13.1% claimed to have in-migrated for “change of environment” reasons. The paramount ruler of Onne was found to be a Third Class Chief, by Rivers State Government classification. He usually emerged by election. There was no royal house. For a person to be chosen, he must be an indigene of Onne with proven integrity and mature in age. The election would normally be ratified by the Land Priest of Ogoloma - Onne (Head of all Land Priests in Onne). The paramount ruler presided over a Council of Chiefs (Heads of the component villages), the Community Development Committee (CDC) as well as age grades, and youth and women groups that assisted in traditional governance.

Social controls took the form of rewards and punishments. The former comprised award of traditional titles and grants of land, among other tokens of respect and appreciation, to community members who had distinguished themselves in their fields of endeavor and/or brought honour to the community. Evil doers, on the other hand, were punished with cash fines, denial of farmland or, sometimes, by ostracism.

Land was owned by family groups. Strangers could obtain land by purchase, while indigenes acquired land through gifts, inheritance or family allocations. There were many festivals e.g. the New Yam Festival, often associated with worship of traditional deities, and increasingly Christian festivals – Easter, Christmas, etc. Cultural property included sacred forests and shrines for the worship of traditional deities (since there were still adherents of traditional religion) as well as artefacts in the custody of the traditional rulers.

Institutional Stakeholders

A questionnaire was prepared and submitted to institutional stakeholders -- companies proximate to the proposed project, in order to obtain their opinions and concerns. The response was poor, but Atlas Cement Company Ltd., one of them, did express their views. Key positive effects of the proposed project were adjudged to be the sharing of security arrangements, maritime safety and harbour operations; while negative aspects included congestion of the environment and contribution to environmental hazards, such as air, water and noise pollution. The company concluded that the project should proceed because it would provide employment for youths, patronage for Atlas products and entail sharing of social welfare obligations.

Community Stakeholders

The primary concern of community stakeholders during consultation was employment – it was hoped that the project would provide employment for some of the jobless youths. There was also concern about safety of residents in the course of movement of IEPL inputs/products – in this regard, community respondents requested adequate care in the handling of all potentially injurious materials.

Perceptions of the beneficial and adverse effects of the proposed project and expectations of community stakeholders were tapped by questionnaires administered face-to-face to household respondents. Among the first, second and third mentioned benefits, “Employment Opportunity” (76.3%); “Provision of Hospital/Health Centre” (24.6%) and “Provision of Good Roads” (22.9%) emerged as the modes, respectively; “Noise Pollution” (56.1%); “Water Pollution” and again “Water Pollution” (62.5%) were the corresponding modal perceptions of adverse effects; while the mode among the first and third mentioned expectations was “Employment”, accounting for 53.1% and 35.1% of the distributions, respectively. For second mentions, “Scholarships” emerged as the mode.

Health Assessment

The Health Assessment of the project area was conducted in and around the facilities and the communities to determine the baseline characteristics of the health status of the project area against which future impacts of the project can be compared. Secondly to determine the probable/potential impacts of the project on the health of the workers within the project area (FOT). Members of the communities were sampled by the health personnel to obtain information regarding mortality and morbidity rates, types of health hazards, most prevalent diseases, disease vectors, nutrition, health facility infrastructure capability and usage, average family size, sexual reproductive health, immunization status and coverage, sewage and waste management system, air quality, water quality, radiation sources and levels. The state of health delivery facilities/services in the area is average most especially since the area is highly industrialized. The principal communicable diseases in the area are Malaria, Diarrhea, skin rashes, upper respiratory tract infections and STIs. While prevalent non-communicable diseases in the area are hypertension, food poisoning and occupational injury.

Vegetation and Wildlife

From the data collected from the field, the following findings were made. Eighteen herbaceous species were identified under seven families. In the same vein, eight tree/shrub species were

observed under four families. Furthermore, a total of eighteen wildlife species were identified out of which seven species were mammals and reptiles respectively, while four species were avian. Moreover, the vegetation health was seen to be fairly alright. However, three isolated pathogen were responsible for the diseases associated with vegetation such as *oedecephallum spp Botrylis Linerea* and *Curvullaria*.

In sum, the vegetation and wildlife composition of the area considering the prevailing environmental condition was seen to be okay. Therefore, potential environmental impacts are outlined and recommendation made to help ameliorate the problems in the near future (during and after construction).

Associated and Potential Impact Evaluation after the implementation of dedicated Mitigation/Compensation Measures

For all project phases (Construction, including recruitment phase and site preparation, Operation & Maintenance and Decommissioning) activities that can affect the environmental and social components have been identified, together with potential and associated impacts. Also the Health & Safety issues have been similarly considered.

A list of criteria has been used, when applicable, to explain whether a project impact is likely to be significant or not for the associated environmental components. These criteria define:

- Character of the impact (beneficial/detrimental);
- Geographic Extension of the impact (direct, local, regional);
- Duration of the impact (from short to long term);
- Magnitude of its potential effects (from low to high);
- Frequency of its occurrence (continuous or temporary);
- Probability of occurrence (from low to high);
- Reversibility of its effects (reversible or not reversible).

By the virtue of the identified impacts, prior to the beginning of each project phase, the proponent is committed to implement dedicated mitigation/compensation measures to ensure that the project will be sustainable. A dedicated action plan has been prepared to achieve the above mentioned scope.

For the same reason IEPL will adopt an Environmental and Social Management System (ESMS) for the Multipurpose Jetty project.

The evaluation of impacts in the different phases of the initiative considered the predicted implementation of the above mentioned actions and it is briefly reported hereinafter.

Construction Stage

During construction phase IEPL will put in place all the necessary measures to ensure health of workers and environmental safeguard and to minimize the risk of possible incidental events.

The slight increase in dust emissions from construction activities will be properly addressed by spraying water in construction sites to reduce powder dispersion

The construction activities will be carried out, also, in accordance with applicable regulations on noise.

The major increment in vehicular movements will occur during construction phase, however, the Project will have minor effects on the existing vehicular transit on main road axes around FOT complex.

Temporary and occasional impacts on vibrations are expected, but considering the distance between the project site and other premises and nearness to water body there are limited sensitive receptors at risk of project vibrations

Risk of ground water/soil contamination due to accidental spills during construction activities is a minor concern that will be minimized through the adoption of dedicated management measures into the ESMS.

The construction activities will take into account the soil geological and geotechnical characteristics avoiding the execution of the main foundations during the wet season in order to exclude possible soil erosion concerns.

During this phase, IEPL will make adequate accommodation arrangements for expatriates to reduce pressure on local houses.

Minor impacts on wildlife are expected and time limited, associated to diurnal hours. Current fruition of the existing fauna will not change.

Waste production during construction phase will be managed by the regulatory procedures. A negligible population increase by the near host communities associated to the realization of the Project is expected. Dedicated policies and actions will be adopted by IEPL to safeguard the host

communities from impacts due to the influx of workers, however the host communities will particularly benefit of the increase of both direct and indirect employment.

Operation & Maintenance Stage

During operation & Maintenance phase, IEPL will put in place all the necessary measures to ensure health of workers and environmental safeguard and to minimize the risk of possible incidental events. No significant effects are expected on air quality during operation phase, since the pollutants concentrations at ground level will be in compliance with air quality regulatory/standards guidelines and with occupational exposure limit values. The initiative will not positively increase air pollutants emissions into the atmosphere likely to negatively affect the existing quality of ambient environment around the complex.

Night-time vehicular movements will be minimized as much as possible.

IEPL will ensure that the operation of the Multipurpose Jetty will be in accordance with applicable regulations on noise.

Water effluents going to sea will increase due to the operation of the Multipurpose Jetty. This is not likely to generate an additional deterioration of surface water and its hydrobiology/sediment because compliance with regulatory limits at discharge point will be ensured through the implementation of waste water treatment limits in the site

The project does not have negative health impacts on host communities. The same population increment by the near host communities will be managed in a proper manner to safeguard the health of host communities deriving from possible exposure to infective/transmissible diseases.

Also an acceptable increase of vehicular traffic is expected and will be adequately managed with established Traffic management plan in order to minimize possible socio economic impacts and potential associated hazards. There are no socio-economic activities that are going to be negatively affected by the project and the activities in the Jetty will not interfere with cultural/social elements present in the study area.

Decommissioning phase

At the end of the life span of the project, or otherwise, if proponent and or government decides to decommission the project, a plan would be drawn by the proponent and approved by all concerned

Regulators and stakeholders before the plan is executed. All possible measures will be taken in order to ensure health of workers and environmental safeguard and to minimize the risk of possible incidental events during decommissioning phase. IEPL commits itself to restore the environmental conditions existing before the realization of the Multipurpose Jetty project.

Management Plan (MP)

IEPL defined a plan for managing the proposed project and associated impacts related to environmental and social impact and occupational health and safety concerns.

The MP includes strategies to enable proactive resolutions of the environmental and social impacts expected, procedures for training, development of adequate capacity; plans for monitoring environmental, social, occupational and health issues as well as management of the effects of the impacts and minimisation of the risks, parameters to be measured/monitored, frequency and location of monitoring. Interface with supervising regulatory authorities are enshrined in the environmental monitoring programme.

The plan is aimed at adopting an Environmental and Social Management System in accordance with the IFC Performance Standard n° 1.

The ESMS will be adopted conforming with ISO 14001 (Environmental Issues) and OHSAS 18001 (Occupational Health and Safety) taking into account that the proponent is already accredited to IMS (Integrated Management Company) covering ISO 14001, OHSAS 18001 & ISO 9001, for its mother complex in IEPL facility.

Conclusion

Evaluation of EIA data, found that the project is environmentally feasible and will not cause any serious negative effect to the environment, provided that the existing and proposed mitigation and compensation measures are implemented. Residual issues associated with the project are expected to be minor and not likely to have long-term significance or cumulative effect on the environment.

Recommendation

Mitigation and compensation measures are to be addressed according to the proposed action plan. All its monitoring programs are to be religiously implemented and periodically reviewed and revised as necessary to take into consideration changes made to the project during its operation. Vibrant and dynamic company-community relations will be maintained to ensure sustainability of the project.

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Thank you

Management of IEPL