PROJECT: **Lekki Tolaram Port Project**

COUNTRY: **Nigeria**

SUMMARY OF THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

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Project SAP number: P-ND-D00-005

1. *Introduction*

The Lekki Port and Captive Power Plant Environmental and Social Impact Assessment (ESIA) Report presents the findings of the technical studies conducted to evaluate the proposed project's environmental and social impacts. The ESIA report defines and characterizes the affected environment, identifies anticipated and potential environmental and social impacts, and provides recommendations for impact mitigation. The report also includes a detailed synopsis of the proposed Environmental and Social Management Plan (ESMP) that will govern the construction and operation of the port facility throughout its life cycle. The ESIA and the ESMP will apply to all marine and terrestrial environments within the project's Area of Influence (AOI). Although the size of the AOI varies for each resource, in general it encompasses the proposed site and the immediate surrounding which contains the primary stakeholder communities. The African Development Bank is considering financing the Lekki Tolaram Port Project. The proposed Lekki Tolaram Port Project meets the threshold for classification as Category "1" and Category "A" Project under the African Development Bank (AfDB) and Equator Principles and criteria, respectively. Accordingly, the ESIA has been prepared to meet all relevant requirements associated with those project categories and the environmental and social standards of the AfDB, the European Investment Bank (EIB), the Multilateral Investment Guarantee Agency (MIGA) and commercial banks applying the Equator Principles.

This Executive Summary of the ESIA follows the AfDB's prescribed format, including an overview of the project justification and description; policy, legal, and administrative framework; description of project environment; project alternatives; potential impacts and mitigation/enhancement measures; environmental hazard management; monitoring program; public consultations; and complementary initiatives.

2. *Project Description and Justification*

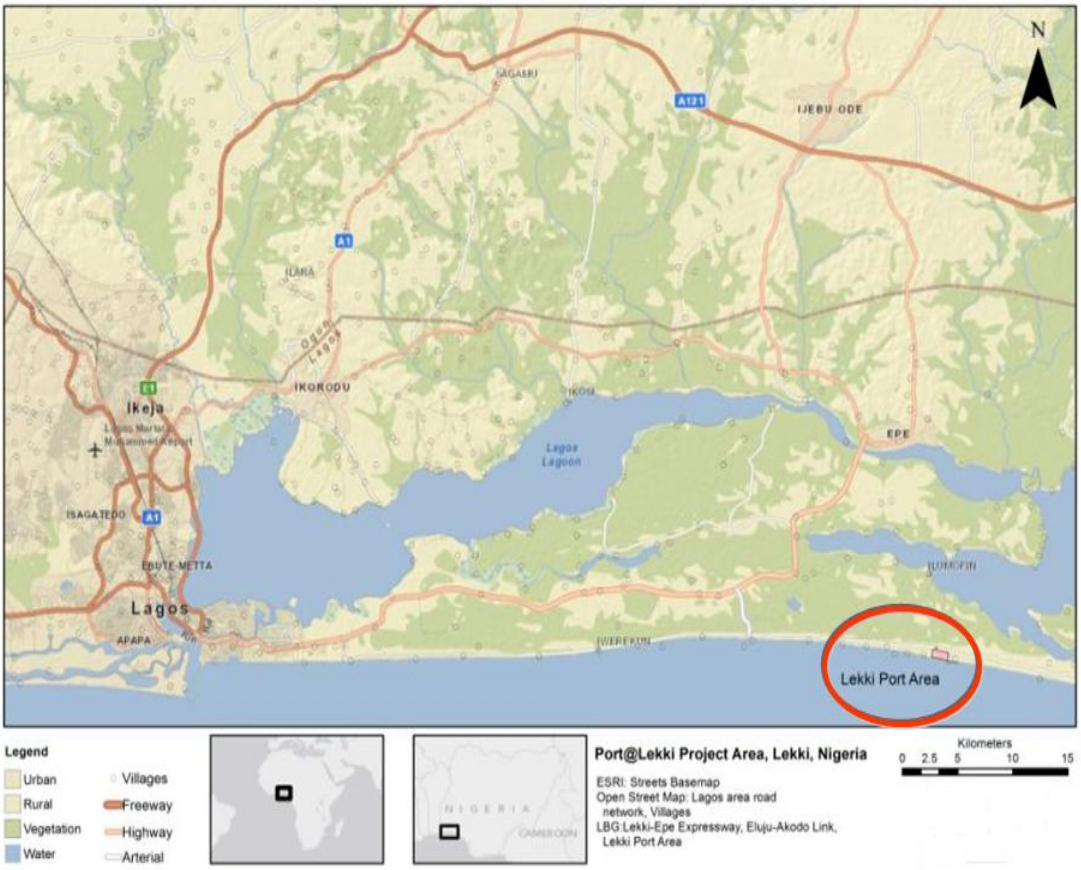
The purpose of the proposed Lekki Port is to serve the robust growth in demand for container port infrastructure. In recent years, container demand has increased at a rate 2.5 times Nigeria's GDP growth, or around 13 percent annually. As a result, total projected demand for the Lagos region is expected to reach two million Twenty-Foot Equivalent Containers (TEUs) by 2015; however, land availability and transport constraints will limit expansion of existing port capacity to 1.4 million TEUs. Building Lekki Port would allow for the efficient development of modern port infrastructure and provide new capabilities for Nigeria to serve the newest container ships. The Lekki location would also enable the new port to serve other parts of Nigeria more efficiently by avoiding the traffic congestion of

downtown Lagos. Upon completion of the final development phase, the port would handle large modern vessels including container carriers with a capacity of up to 8,000 TEUs.

2.1 Port Area Location

The proposed Lekki Port site is located on the southeastern Nigerian Coast in the Ibeju-Lekki Local Government Area (LGA) of Lagos State, about 60 kilometers (km) from Lagos. The area proposed for the port is 90 hectares (ha) and is part of the Lagos Free Trade Zone (LFTZ), which includes a northern land parcel of about 130 ha. To the west of the proposed project site is Magbon Segun Village, and the eastern perimeter of the project site borders the village of Itoke. Four other villages are situated nearby, and together they constitute the primary stakeholder communities. Figure 2.1 shows the general project area.

Figure 2.1: Lekki Port General Area Map



2.2 Port Configuration

The proposed port would encompass both marine and land infrastructure. The port site would occupy about 90 ha. The utility corridor to the north of the port area will include a water treatment plant and a power plant and require an additional 1 ha.

2.2.1 Marine Infrastructure

Two breakwaters, a main breakwater and a secondary breakwater are planned to protect the port harbor and berths from ocean wave action. The shoreline to the east of the secondary breakwater would be shifted seawards resulting in the formation of a new beach. The main breakwater (western) would be 1,645 meters long constructed of rubble mound type with concrete armor blocks on the outer layer to dissipate wave energy. The eastern breakwater would be 320 meters (m) long. To the east of this breakwater, beach would be reclaimed, protected by a groyne 225-m-long on its eastern side. The reclaimed beach will be designed to mitigate erosion of this area that would be accelerated due to the disruption of normal sediment transport patterns from construction of the main breakwater.

The overall quay length would span 1,523 m with 1,200 m dedicated for the container terminal. Under the current design, the approach channel would extend for about 6 km, reach 150-m wide and would be dredged to a depth of 14 m. The planned turning circle would be 670 m in diameter and dredged to a depth of 14 m. The Inner Basin would be 270-m wide dredged to a depth of LAT-13.5 m. These depths and turning diameters will set limitations on size and capacity of ships using the port.

2.2.2 Land Infrastructure

In the paved container storage and handling area, containers would be stacked in blocks within the terminal to a maximum stacking height of six laden containers. The broad operating concept for the container terminal comprises Ship-To-Shore (STS) container cranes at the quay and Rubber Tyred Gantry stacking cranes in the yard. Several new buildings would be required at the terminal, and each building would fill a specific function in port operations. The existing buildings include two warehouses that would be removed.

Port operations would require installation of a utility infrastructure including water supply and distribution, wastewater treatment, communications networks, and electrical distribution and lighting, as well as firefighting facilities. A 30 MW power plant, which would have 10 MW of emergency standby power capacity, would be fully dedicated to supply electricity needed to operate the port facility. The power plant is required because the national grid lacks the reliability needed to operate a modern and efficient port. Located on a 1-ha parcel of land situated to the north of the main port site, the power plant would initially use diesel fuel but be designed to use natural gas when and if such a supply becomes available. The power plant will be designed to meet all national regulations and standards for both air emissions and noise levels.

2.3 Port Construction and Operation

Port construction is expected to require 41 months and entail harbor and channel dredging, construction of marine structures, site preparation, and construction of landside structures. Dredged material would consist of sand from the ocean bottom and existing beach. The estimated total dredging volume is approximately 13 million cubic meters. Approximately 4.5 million cubic meters of this material would be used for reclamation and beach protection in the area between the eastern breakwater and the groyne and to the east of the groyne. Remaining dredged material would be placed in an offshore dump site. Construction for the landside portion of the port would encompass the following key activities:

- Removal of vegetation and general site grading;

- Construction of administrative, control and other support buildings;
- Paving of open container storage areas; and
- Installation of utilities including water intake pipe and treatment plant, water distribution system, storm water and sanitary sewer pipes, electrical distribution network, and lighting.

The entire project site would be graded, paved, lighted, and surrounded by a steel perimeter fence. Most existing vegetation within the project site would be removed. Use of paving blocks for some paved sections would allow for some permeability to rain water. Peak construction workforce is estimated to reach up to 800 workers with about 175 non-native workers and 625 Nigerian workers.

Port operations would be conducted by terminal operating companies that enter into subconcession agreements with the project sponsor. The operational port workforce would initially require about 355 full-time employees, steadily increasing to more than 1,700 employees spread over three shifts when the terminal reaches full capacity. The total number of indirect and induced jobs generated by port activities is expected to be significantly higher than the number of direct employees. Port container traffic is expected to generate approximately 7,500 daily truck trips and 2,500 daily car trips.

3. *Policy, Legal, and Administrative Framework*

The Federal Government of Nigeria enacted the Environmental Impact Assessment (EIA) Act No. 86 of 1992 as a demonstration of its commitment to the Rio Declaration. It makes an EIA mandatory where proposed projects or activities are likely to cause significant environmental effects. The EIA Act gave the Federal Ministry of Environment (FMEnv) the implementing mandate and requires mandatory application of the EIA process in all major development projects right from the planning stage. Note that the FMEnv gave its approval to a Lekki Port and Harbor facilities EIA prepared for the Ministry in October 2012. A second EIA prepared to address the proposed power plant is currently under review. Concurrently, the Federal Government of Nigeria has already issued most of the permits required to build the port.

The current ESIA has been prepared to meet the specific performance standards, guidelines, and safeguards issued by the AfDB and Equator Principles Financial Institutions (EPFIs). The applicable AfDB environmental and social policies and guidelines are as follows: the Policy on Poverty Reduction; the Policy on the Environment; the Gender Policy; the Policy on Disclosure and Access to Information; the Cooperation with Civil Society Organizations – Policy and Guidelines; and the Policy for Integrated Water Resources Management.

The ESIA follows the most stringent requirements where AfDB and EPFIs differ. The EPFIs requirements are modelled on the environmental and social standards and policies of the World Bank and the International Finance Corporation (IFC). Upon approval of the ESIA from AfDB, EIB, MIGA and the EPFIs, construction and operation of the port would be required to comply with the environmental safety and health conditions set by these institutions as well as with the laws, regulations, and policies of the Nigerian Federal, State, and local governments.

4. *Description of the Project Environment*

The proposed port and utilities corridor would occupy about 91 ha (i.e., 90 ha for port and 1 ha for the utilities and the power plant). The land parcel that would be used to develop Lekki Port consists primarily of cleared land with scrub brush and ground vegetation; a small freshwater embayment; and a narrow, low-lying, sandy beach. The site is uninhabited, and no physical resettlement action would be required.

4.1 Physical Environment

4.1.1 Climate, Air Quality, and Noise

The climate of the proposed project site in the southern region of Nigeria is tropical with a wet season and a dry season, bordering on a tropical monsoon climate. Monitoring data from the site during December 2012 show generally good air quality as expected due to the absence of any major industrial activity and good coastal air circulation. Only particulate concentrations reached levels of concern during the monitoring period and this was due to the substantial open burning of household waste in the area by villagers. Noise levels monitored during the same period were well below FMEnv standards and WHO guidelines. The highest average noise levels were near the ocean, with higher isolated noise events near the Itoke Village to the east and along the road.

4.1.2 Soil

Soil field studies were conducted and generated the following observations:

- Soils are largely in their pristine, natural conditions and consist mostly of sand;
- There is no evidence of adverse human-induced impacts;
- Drainage on the surface and within the soils systems is unimpaired; and
- Good drainage (internally, in particular) predisposes groundwater, which is at or close to the surface, to contamination if spillage of lubricants and other liquids should occur.

These characteristics have consequences for flooding, groundwater contamination and, to some extent, engineering usability. The site would be free of flooding given the high permeability of the entire soil body. This property along with the sandy nature of the soils also predisposes groundwater to contamination if liquids are spilled.

4.1.3 Geology and Hydrology

The proposed site is located in a very low hazard zone for seismic activity and therefore there is a very low potential for a tsunami striking the port. The site lies above a multi-layered aquifer system of three major aquiferous zones separated by thick layers of clay aquiclude. The upper aquifer is used for domestic water supplies via dug wells. Due to the sandy nature of the soil and the proximity of the upper aquifer to the surface, the aquifer is susceptible to contamination from external influences.

4.1.4 Oceanography and Hydrodynamics

Waves reaching the West African coast are of two origins: sea waves generated by the local weak south-westerly winds and swells generated by storms in the southern part of the Atlantic Ocean. Nearshore currents are controlled by both breaking waves and tides. Along the Lekki barrier, lagoon coast waves have a south-westerly approach and break obliquely with breaker angles ranging from 15 to 25 degrees, to the shore normal. This results in a long shore current that transports sediments from west to east. The persistent nature of the waves from the ocean and their oblique approach angle results in high sediment transport rates along the West African coast. The analysis of the marine water samples indicates a clean environment without high levels of toxic metals or pollutants. This is expected given the open ocean conditions. Coastal erosion has been widespread along most of the West African coastline, including the Nigerian coast. Causes for erosion include low-lying coastal topography, intensity of waves, vulnerable soil characteristics, the nature of shelf width and harbor and shoreline protection structures, such as moles.

4.1.5 Water Resources

There are no freshwater surface water bodies within the project site, although a freshwater pond to the north of the site would be used to supply potable water. Field studies of the pond show high connectivity with Lagos Lagoon and good water quality for use as a source of port drinking water. ESIA field studies also indicate no contamination of the marine environment or the groundwater used by villages for household uses.

4.2 Biological Environment

4.2.1 Soil Microbiology

Soil microbiology field investigations indicated a distribution of organisms normal for similar environments. Coliforms were absent in almost all the samples analyzed, and petroleum-consuming bacteria were also present in very low densities, indicating no contamination at the project site.

4.2.2 Marine Biota

Marine biota populations investigated included plankton (phytoplankton and zooplankton) and benthic (bottom dwelling) organisms. The results indicated high levels of phytoplankton, poor levels of zooplankton, and no bottom dwelling organisms. High sand deposits and intense wave action would likely make the settlement of larval stages of the macro benthos untenable. Additionally, the sediment type is mainly sand and contains little or no nutrient matter that would sustain the animals.

4.2.3 Fisheries

The fisheries resource constitutes a major source of livelihood for a substantial number of stakeholder community residents. Household survey responses indicated that most the commonly caught species include bonga, sardines, shad, barracuda, and mackerel. The most commercially important species are croakers, bonga, shad, catfish, and sole. Shellfish resources of Nigerian marine waters include shrimp, crab, lobster, and mollusks. Within the

AOI and among species observed, clupeids (herrings, shads, sardines, hilsa and menhadens) were the most abundant species observed; followed by mullets, tilapias, and croakers.

4.2.4 Marine Turtles and Marine Mammals

Marine turtles are present in the West African sea waters and nest in the coasts from Congo to Sierra Leone stretching about 4,000 km. The 1.5 km long proposed project site (out of which vessel movement and dredging activities will be confined to a 150 meter width of channel) is within the West African nesting distribution area that stretches for about 4,000 km, but no information was available about the nesting density in the AOI. Limited field studies together with interviews with villagers initially conducted for the ESIA indicated that marine turtles are present in the surrounding area but their frequency and distribution as well as nesting activity was not confirmed. To make a more precise determination of nesting activity in the AOI and update the ESIA baseline, a three-month marine turtle survey and monitoring program was undertaken beginning in late December 2013. The results will be used to inform the marine turtle management plan that will support the port's overall environmental management system. There has been limited research on marine mammals in Nigerian waters. One study observed humpback whales within Nigerian waters that were approximately six to nine kilometers from the maritime border with Benin or about 148 kilometers from the proposed site. There are no research studies or reports indicating that whale migratory routes or breeding areas are located in or around the AOI.

4.2.5 Vegetation

The project site contains flora habitats of low biodiversity with the exception of the small inundated area in the project site and the small forested habitat traversed by the water pipeline from the raw water source to the water treatment plant. Because much of the natural habitats within the project site were altered by past clearing and grading activity, the present conditions represent a mostly modified assemblage of habitats of low biodiversity that offer few ecosystem services.

4.2.6 Fauna

Wildlife populations within the project site are sparse and of low diversity. Human activity has significantly reduced the presence of wildlife to only a few species with rodents such as grasscutters, African Grass Rats, porcupines, and squirrels the dominant mammals. No known threatened or endangered species reside on the proposed site, nor is the site classified as an important bird area.

4.3 Human Environment

The Lekki Port and Harbor site is located within the Ibeju Lekki Local Government Area of Lagos State, Nigeria. The village of Magbon Segun is to the west of the project site, and Itoke village is to the east. The AOI covers about a 5-km radius of the project site and includes the villages of Lekuru, Oke Segun, Lujagba, and Idotun. These are all Ibeju communities.

4.3.1 Land Use

The AOI is rural, similar to the rest of the LGA. There are no heavy industrial activities in the proposed Lekki Port AOI. Residents from surrounding communities engage in agricultural cultivation of a variety of cash and subsistence crops including cassava, plantain, corn, yam, sweet potato, and mango. A mixture of residential and agricultural land uses were observed within the resident communities. Lands around the residential properties are cultivated with a variety of farm produce primarily as a form of subsistence farming.

4.3.2 Population, Demographics and Income

A household baseline survey was conducted during January and February 2013 for the stakeholder villages surrounding the proposed port site that constitute the AOI. A full census of all households was taken yielding an estimated stakeholder population of 6,305. Magbon Segun is the largest village with a population of 1,280. More than half of the stakeholder population is under 18 years old. The indigenous Yoruba people represent the main ethnic group in the Ibeju-Lekki LGA and in the AOI.

As in other parts of Nigeria, the population in the AOI is often multilingual: 97 percent of the population speaks Yoruba or the Yoruba dialect Ibeju, 77 percent speak English, and 10 percent speak another Nigerian language. The religions of the people of Ibeju-Lekki are predominantly Islam and Christianity. The majority of the population combines Islam or Christianity with African traditional religions. This may underscore the religious accommodation and tolerance among different religious groups. Almost half of the adult stakeholder population works in sales and services (45 percent) followed by 25 percent who work in professional, technical, or managerial positions, and 21 percent who gain income as farmers or fishermen.

4.3.3 Education and Infrastructure

Two primary schools are located at Idotun and Itoke. The Community High School has its junior secondary school located in Idotun and the senior secondary school located in Magbon Segun. Modern potable water facilities are limited in the AOI with about four percent of AOI households reported to have a private water connection. Other sources of water include public wells, public hand-pumps, and public boreholes. All villages are currently connected to the national grid; however, the power provided is not reliable, averaging only between 5 and 10 hours of service per day. AOI village communities have limited access to primary healthcare services and facilities. There is a dispensary in Idotun and a general hospital at Akodo.

The primary road close to the proposed project site is the tarred Akodo – Akodo Ise Trunk road which runs parallel to the coastline. The Akodo-Akodo Ise road is the only tarred road that traverses the area near the project site. Other roads or streets in the neighborhoods of the resident communities are generally not tarred and without established roadway drainage.

5. *Project Alternatives*

Alternatives to the Lekki Port considered and dismissed include:

Alternative	Action	Negative Outcomes/Reason for Dismissal
No Action Alternative	The Lekki Port would not be developed, nor would other initiatives be undertaken to expand container capacity in the Lagos Region.	• Congestion at existing ports would worsen. • Delays in loading and offloading shipments would impact the transport cost of shipped goods. • Increased port congestion could increase risk of accidents and spills. • Negative outcomes would lead to reduced economic growth for the country of Nigeria and hinder the country's development both economically and politically.
Expansion of an Existing Port	Expand an existing port to accommodate demand, such as the Apapa Port in Lagos.	• Ability to expand existing ports severely constrained by lack of land and access to transport. Urban density precludes land acquisition. • Efficiencies would diminish because of extreme traffic congestion. • Existing ports are located in shallower sea beds and cannot accommodate large container vessels. • Existing ports cannot be retroactively reconfigured to achieve the efficiencies of a new port, especially in terms of storage.
Expansion of Non-Port Capacity (e.g., land, freight, or air cargo)	Increase the import and export of goods through land and/or air transport.	• The cost of air transport to substitute for container shipments would be prohibitive. • Nigeria's rail system is in extremely poor condition and lacks the capacity to absorb the growth in demand for transporting internationally traded goods. • The poor state of road infrastructure in Nigeria and the lack of reliability in transhipping goods by road through ports in neighboring countries such as Benin. • Land/air transport could not meet the projected growth in demand for container imports.

6. *Potential Impacts and Mitigation/Enhancement Measures*

Environmental and social impacts arise during both the construction/development phase and the operational phase of a project. In general, operation impacts tend to be of greater magnitude than those arising from construction, largely because of the long-term nature of operation impacts. Many construction impacts such as noise and air quality impacts are temporary and reversible. Although the port's construction permanently alters the land and marine environment within the 90 ha development, the absence of critical biological habitats along with the fact that the land has been long modified by human activities means that

there would be no loss of a unique or significant ecosystem. Long-term operation impacts, including the induced impacts, would likely catalyze changes in land use patterns, economic activities, biological habitats, air quality, and noise levels of the AOI. Nonetheless most impacts would be moderate or less. Mitigation measures would ensure that all residual adverse impacts would be less than significant. For example, mitigation measures are prescribed to reduce lighting impacts from significant to minor. The mitigation measures employed to address anticipated project impacts would also reduce overall community risks as well as reduce risks and impacts to ecosystem services such as fisheries.

6.1 Construction-Related Impacts

6.1.1 Human Environment

Construction impacts to the human environment both beneficial and adverse include:

- Moderate beneficial impacts to the economy from employment of work force from within host communities during construction phase and from increased demand for services;
- Adverse impacts to land use, visual characteristics, and transportation;
- Minimal but possible increased demand for housing, water, and electricity;
- Adverse impacts to health and safety, archaeological resources, and public services;
- Adverse impacts to traditional livelihoods; fishing would likely be restricted from operating in the channel area during dredging and marine infrastructure construction; and
- Adverse impacts due to disturbance from increased noise from trucks and construction activities and equipment.

6.1.2 Physical and Biological Environment

Overall impacts to the physical and biological environment during the construction phase are projected to be moderate, mainly caused by the construction of structures (both landside and marine) and dredging activities. Impacts include:

- Adverse impacts to soil due to permanent removal and paving of site;
- Adverse impacts to terrestrial ecosystem from removal of project site vegetation, soil, and removal of wildlife habitat from the 90 ha project site;
- Adverse impacts to marine ecosystem from dredging of harbor and access channel, construction of marine infrastructure, and disposal of dredged material;
- Adverse impacts to marine water quality from dredging;
- Adverse impacts to air quality from dust generation and equipment emissions;
- Adverse impacts from temporary generation of solid waste and wastewater;
- Adverse impacts to marine sediment from an imbalance in sand movement along the coast caused by the construction of marine structures and dredging resulting in accretion on the western side and erosion on the eastern side of the facility;
- Adverse impacts to biodiversity from transformation of port site; and
- Adverse impacts to surface freshwater and groundwater.

6.2 Operation-Related Impacts

6.2.1 Human Environment

Impacts to the human environment range from moderate to significant, both beneficial and adverse, which include:

- Significant beneficial impacts to the economy from direct, indirect, and induced economic activities in the AOI from port operations;
- Adverse impacts to visual characterization from nighttime lighting and overall facility configuration;
- Adverse impacts from noise and air pollution from unloading/loading of vessels, trucks, traffic and equipment necessary for port operations;
- Adverse impacts to transportation from increase traffic;
- Adverse impacts to land use from long-term induced urbanization; and
- Adverse impacts to health and safety from increased traffic and worker inflow to the area.

6.2.2 Physical and Biological Environment

Operation impacts are generally greater than for construction. Cargo operations and waterfront industries, including ship traffic and discharges, are the major sources of impacts, which include:

- Adverse impacts to air quality from ships, land vehicles, port equipment, and power plant;
- Adverse impacts to marine sediment from periodic dredging and ship activities;
- Adverse impacts to terrestrial ecosystem primarily from induced urbanization;
- Adverse impacts to marine ecosystem from ongoing marine shipping activity ;
- Adverse impacts to biodiversity primarily from induced urbanization;
- Adverse impacts to marine water quality from marine shipping and discharges; and
- Adverse impacts to surface freshwater and groundwater.

6.3 Community Health and Safety Risk and Impact Assessment

Based on a scoping process conducted via public consultations with AOI stakeholders, seven resources were scoped into the Community Risk Assessment (CRA): air quality, noise, traffic (pedestrian safety), visual (lighting), water quality (groundwater), fishing and traditional livelihoods, and community health. The CRA evaluates potential risks to valued environmental components, their magnitude, frequency, extent, and nature and prescribes mitigation measures. Each resource was assigned a pre-mitigation risk ranking for both construction and operation phases based on the severity and probability of potential risk. Prescribed mitigation measures would reduce all community risks to medium or lower, and most residual risks post-mitigation would be very low (7 out of the 13 scoped risk rankings).

6.4 Ecosystem Services Assessment

The ecosystem services assessment identified 21 ecosystem services within the AOI. Through scoping, each was assessed for its importance and value to beneficiaries to determine the anticipated magnitude of impact to each ecosystem service. Of the 21 ecosystem services

assessed, four were assessed as having moderate impacts: food from wild-caught fish, soil quality, water drainage and flows, and water purification. Mitigation measures, including wetland area enhancement and contributions to the Nigerian Conservation Foundation, were prescribed to offset the residual impacts.

6.5 Cumulative Impacts

Cumulative impacts from past, present, and foreseeable future projects were assessed qualitatively. The prominent future projects that would likely contribute to cumulative impacts are the Lekki Free Zone and the Lekki-Epe International Airport. Numerous other projects are planned under the Lekki Master Plan, but they remain concepts on paper and are too uncertain to include in the cumulative impacts assessment. The Free Zone and Airport projects would contribute to regional traffic congestion, air quality degradation, marine water quality impairment, and land use pattern changes. Expected impacts are moderate in magnitude. Note that these projects would act synergistically to promote economic development in the region and generate substantial long-term economic benefits.

6.6 Mitigation Measures

The following table summarizes mitigations prescribed to reduce moderate and significant impacts and potential impacts to the human, physical and biological environments.

Impacts	Mitigations
Construction Impacts	
Human Environment	
Increased demand for housing, water and electricity	Worker camp to be established for non-native construction workers.
Increased traffic and road use	Equipment and materials to be transported by water when possible.
Increased population could lead to more disease	Health screenings of employees, including documenting and reporting on existing diseases. Also strict rules of conduct will be enforced at worker construction camp. Health professional to work with the local community and temporary workers on health-related issues.
Increased noise from construction activities	Conduct noisier operations during the day; reduce night-time construction; fit vehicles with effective exhaust silencers and mufflers.
Disturbance from increased lighting	Cluster temporary lighting away from perimeter areas near villages. Angle lights in a manner to minimize spill over effects.
Physical and Biological Resources	
Reduced air quality	Minimize vehicle idling; apply speed restrictions; prohibit open burning; and purchase low CO_2 emission machinery, equipment,

Impacts	Mitigations
due to dust and noise	vehicles and materials when possible.
Destruction of vegetation and wildlife habitat	Maintain landscaping to minimize bare areas; use native vegetation to the extent practicable; monitor for the presence of any threatened or endangered species and, if such a species is discovered, coordinate with the government of Nigeria to determine appropriate mitigation measures.
Re-suspension of sediments within water column	Use appropriate silt curtains and other appropriate approaches to minimize the development of a plume of suspended sediment.
Sea turtles	Sea Turtle Management Plan will be prepared to protect turtles at sea or on land (including nesting turtles) from construction activities.
Coastal erosion and sand imbalances	Develop an Erosion and Sediment Control Plan prior to construction that identifies specific measures to reduce impacts from soil erosion.
Operation Impacts	
Human Environment	
Disturbance from noise pollution.	Conduct truck operations during the day to minimize impacts to residents; use exhaust silencers; use acoustic insulation in areas where noisy operations occur.
Disturbance from increased lighting	Set light fixture angles so that unnecessary spread of light is kept to a minimum; switch off unnecessary lighting to minimize impacts to nearby residents; creating a buffer zone with vegetation could also reduce light pollution.
Increased traffic and possible accidents	Apply demand management to minimize use of roads during morning and afternoon peak hours. Coordinate planning with Lagos State Government and Federal Ministries on the improving overall road network in the AOI. Conduct training programs for truck drivers to drive at slower speeds; installation of pedestrian barriers on road segments heavily used by school children or heavy pedestrian crossing.
Communicable Diseases	Emphasize prevention of STDs during health and safety trainings provided to employees, truck drivers, and community members.
Physical and Biological Resources	
Air quality degradation	Monitoring equipment and emissions to ensure emissions standards are not exceeded; prohibit open burning; minimize vehicle idling and unnecessary trips.
Marine water quality and bottom sediment	Appropriate measures used during maintenance dredging to minimize the development of a plume of suspended sediment,

Impacts	Mitigations
contamination	including the use of appropriate silt curtains; regular maintenance of the oil/water separator to prevent oil from entering the outfall and into the ocean.
Marine biota losses	Ongoing good housekeeping to prevent litter and other wastes associated with site activities from entering offshore areas; develop contingency measures and emergency response procedures to allow immediate response to accidental spillage/release of chemicals or other hazardous materials; care taken to minimize damage to marine habitat and fauna during dredging and excavation activities through adequate planning and execution.
Sea turtles	Sea Turtle Management Plan will be prepared to protect turtles at sea or on land (including nesting turtles) from port operations.
Terrestrial flora and fauna losses	Maintain landscaping where possible to minimize bare areas; use native vegetation to the extent practicable; monitor for the presence of any threatened or endangered species and, if such a species is discovered, coordinate with the government of Nigeria to determine appropriate mitigation measures.
Soil and groundwater quality degradation	Develop a spill prevention contingency control plan with standard operating procedures in the event of a release; remove solid wastes from facilities and dispose of properly in an environmentally sound manner; ensure concrete structures of facilities are intact to minimize seepage into the ground

7. *Environmental Hazard Management*

The ESMP and the resultant Environmental and Social Management System (ESMS) are designed to minimize risks of environmental hazards during the construction and operation of the port. The Hazard Risk Analysis (HRA) presented in the ESIA identifies and ranks risks of concern in terms of overall likelihood of occurrence and magnitude of consequences. The environmental and social management system will include the preparation of detailed standard operating procedures for all port activities as well as comprehensive emergency preparedness and response plans to deal with accidents that could threaten the health and safety of workers, nearby residents, and the environment.

8. *Monitoring Program*

The ESMP establishes a comprehensive monitoring plan to ensure that construction and operation of the proposed port would remain fully compliant with performance standards, guidelines, and safeguards established by the lenders as well as the laws and regulations of

the Nigerian government. A key objective of (performance) monitoring will be to identify any unanticipated changes to the biophysical, health, and social environment brought about by the proposed project. Baseline information, against which development and post-development impacts and mitigation measures can be measured and compared, has been established. Monitoring also serves to identify environmental, health, and safety issues before they become significant and allows for more effective corrective action. Lekki Port's ESMP requires monitoring for all aspects of the project including but not limited to water quality (marine, surface, groundwater), air quality, noise levels, marine sediments, and terrestrial biology. The monitoring plan also encompasses monitoring of the health and safety of port employees and the socioeconomic and health wellbeing of the stakeholder community.

LPLE will develop specialized plans and systems to support its environmental and social management and monitoring efforts. LPLE will develop an ESMS to ensure that there is consistency in its approach to assessing and managing environmental and social issues. LPLE will also develop management plans centred on: Ambient Air Quality Monitoring; Noise Monitoring; Marine Water and Sediment Quality Monitoring; Freshwater Pond Water Quality Monitoring; Sill Prevention Contingency Control; Groundwater Quality Monitoring; Marine Outfall Monitoring; Potable Water Monitoring; Terrestrial Environmental Monitoring; Ballast and Blige Water Management; Invasive Species Management; Solid and Hazardous Waste Management and Monitoring; Integrated Pest Management; Socio-economic Monitoring; Resource Conservation Management; Erosion and Sediment Control; Ship Garbage Management; Port Facility Security; and Traffic Safety Management. LPLE will also develop a Supply Chain Management Plan, a Labour Management Plan, an Influx Management Plan, a Community Development Plan, an Occupational Health and Safety Plan; a Dredging Management Plan; and a Biodiversity Action Plan (containing a management and monitoring plan). LPLE has developed a Stakeholder Engagement Plan, which will be further strengthened. All of the specialized environmental and social management and monitoring plans must be developed to the satisfaction of the Bank and must be submitted for the Bank's review and clearance. The development of these specialized plans will be conditions precedent to first disbursement. LPLE has allocated USD 7.5 million to develop and implement the specialized management plans.

In terms of organization of the ESMP, LPLE, as the project developer, would retain the primary responsibility of ensuring that environmental commitments are met throughout the life cycle of this project. The management team of the Port would include an environmental safety and occupation health (ESOH) division with several subordinate departments responsible for managing the environmental, health, and safety of the port's workers and stakeholder communities and protecting the environmental resources of the affected area.

9. *Public Consultations and Public Disclosure*

Public consultations have been ongoing since October 2004, when a series of public meetings were held with primary stakeholder communities. From 2004 to 2012, there were numerous ongoing informal consultations with stakeholder communities. A formal public consultation process recommenced in November 2012, and the first public forum was held on December 4, 2012, with more than 60 participants. Two more large formal public meetings were held

on February 14 and 15, 2013, respectively. The first meeting involved more than 200 participants. During the same period, a major public information campaign was initiated with project information disseminated through various media. About 1,000 information leaflets in English and Yoruba were distributed to the communities before the February public meetings. About 20 focus group discussions and small village meetings were also held with the stakeholder communities to supplement the large forums. Discussions were held with vulnerable groups including women and fishermen. Meetings were also used to scope issues related to ecosystem services and perceptions of community risks. Public consultations are a vital aspect to project implementation, and there will be continuing engagement with the public throughout the life of the project.

The various consultative forums enabled different stakeholders to raise their concerns and/or seek clarifications. Issues discussed included, for example, compensation paid by the Nigerian government for the land acquired to establish the free trade zone; the potential impact of the project on fishing activities; the need for direct and indirect employment opportunities; benefits sharing and community development initiatives for the local communities; empowerment issues for women; the need for the consultations to be continuous; the lack of electricity in the surrounding communities; demands for infrastructural development for the benefit of the local communities; and support for entrepreneurship. The design and implementation modalities of the project have been informed by the vast array of perspectives shared during the course of the consultations.

10. *Complementary Initiatives*

Previous Resettlement Activity and Site Acquisition

The land proposed for development as the Lekki Port and the Lagos Free Trade Zone (LFTZ) was acquired by the Lagos State Government in 2002 with full compensation to eligible residents. Parcel D, constituting about 5.1 ha, was acquired from stakeholder families in the village of Idotun by the Lekki Export Processing Zone Enterprise in 2005. Land acquisitions involved only one resettlement action. Under initial acquisition, Lekuru village was resettled by Lagos State Government.

In 2011, LFTZC (Sub-lessor) and LPLE (Sub-lessee) signed a sublease agreement to execute the sublease of Parcel A and Parcel C for development of Port Facilities. An additional 1 ha of land is demarcated for the proposed captive power plant in the land area north of the Lekki port site.

11. *Conclusions*

Anticipated impacts from construction and operation of the proposed Lekki Port and Captive Power Plant would be adverse. Anticipated adverse impacts to the physical and biological environment would be managed and mitigated through implementation of a comprehensive

ESMP that would conform to and comply with the requirements of AfDB and the other lenders.

12. *References and Contacts*

References cited in the ESIA are presented at the end of the document. The details for the relevant contact persons are as follows:

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