

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN SUMMARY

Project Title: NIGERIA: WATER & SANITATION FOR OYO AND TARABA STATES
Project Number: P-NG-E00-004 **Country:** NIGERIA
Department: OWAS **Division:** OWAS.1

a) Brief description of the project and key environmental and social components

The project was categorized as Category 2 on 11 November 2008 according to the ADB Environmental and Social Policies and Procedures. The categorization is justified on the basis of considerable positive impact envisaged by the project which components are: 1) rehabilitation and extension of water production and distribution networks, 2) Construction of sanitation facilities in public places such as public schools, hospitals, market places and car parks. Since Ibadan is a very large town (population 2.5 million), requiring extended sanitation facilities, an update study of the sanitation needs and approaches for the town's public facilities and solid waste will be carried out, which will lead to a separate Sanitation Project; and 3) Reforms and Capacity Building and, 4) Project Management.

b) Major environmental and social impacts

A major positive impact on the local population is that they are likely to be employed during the construction phase. This will boost the local economy. Improved access to drinking water and better sanitation would also be an added positive impact in the post-construction era, especially on health. An improvement in the quality of life due to improved water supply and new economic opportunities is anticipated. Sanitation will also be promoted with its attendant improvement in the health of the people.

For both cities the most severe adverse impacts expected are those resulting from the environment itself negatively affecting the project and its results, rather than the reverse. Severe accumulation of all kinds of liquid and solid wastes, especially in Ibadan, is a serious threat for water systems with very high risks of contamination and recontamination of water sources and distribution networks. The Environmental and Social Impact Assessment (ESIA) conducted in Jalingo and Ibadan show that the project has both positive and negative environmental and social impacts. Negative impacts are more likely during construction phase of the project and could easily be mitigated by the implementation of the mitigation measures described in the ESIA reports and through a strict environmental monitoring program. These measures have been discussed with the concerned officials of the states and the mitigation measures had been agreed upon and firm commitments have been obtained for implementing them.

In Jalingo, Taraba, the topographic configuration of the site causes most runoff from town, carrying all sorts of wastes (liquid and solid), wash directly into the borehole field that is shallow (25 m deep at most) hence exposed to risk of contamination by germs and chemicals leached from town. As a result, water produced from the source, the Magami and Saminaka borehole fields, is contaminated, requiring effective protection. It was therefore recommended and integrated in the project a number of mitigation components to alleviate this issue: (1) construction of diversion dike/wall (1250 m length at Magami and 1300 m at Saminaka) and fencing with tree-belt planting (1250m x 30 m at Magami) to filter sub-surface runoff, (2) collection/cleaning of garbage littering the borehole fields at Magami borehole field, 3) the relocation of the abattoir and decommissioning of the old abattoir require adequate selection of the site and management, and rehabilitation of the old site to a standard compatible with its location in the middle of town (cleaning, evacuation of all the waste accumulated in situ for years, rehabilitation and reallocation of buildings); and 4) reconstruction of a key culvert in the Magami area to ease runoff diversion flow. A Sanitation Day (last Saturday of every month) is currently instituted and well adopted by population that can be integrated in the project and maximized.

Potential adverse impacts from the project are: (1) rehabilitation and construction of boreholes may become, with the increase in water demand, insufficient, it is therefore recommended that alternative and more sustainable sources be comprehensively examined (the study is integrated into the project); (2) stand-by generators (new and existing) will result in CO₂ emission, but globally the release in the atmosphere is negligible; (3) construction and rehabilitation of transmission mains, networks and reservoir will have minor/temporary adverse impacts on people's activities and properties during construction phase; (4) storm drainages and culverts, constructed by the local government should be appropriately refurbished with proper maintenance; (5) waste collection and disposal in the city and in public facilities are intended to reduce adverse impacts of the environment on the project; (6) installation of new municipal dump sites will require a higher attention by the Government with careful selection of the new sites by local authorities. For both the abattoir and dump sites, it is recommended to avoid depressions and sandy soils hence avoid pollution of groundwater resources, avoid upwind locations relative to town and riversides and floodplains, etc. The Ministry of Environment, in collaboration with the Implementing Agency will select the appropriate sites.

In Ibadan, Oyo: Less than a quarter of the city population (22.6%) has access to potable water supply while only about a third (32.5%) has access to sanitation facilities. With a population of 2.5 million people (representing about 41% the state total), the city of Ibadan deserves to be given special attention in terms of water supply and sanitation by the state government. The city (and its environs) has 1,426 public schools and 613,547 students in these public schools apart from almost equal number of private schools. The students constitute a significant group of the population vulnerable to sanitation problems and health risks in the city as most of these infrastructures do not have sanitation facilities.

The ESIA report was prepared using African Development Bank's environmental and social policies and guidelines requirements and in conformity with the Nigeria environmental protection laws; in particular the Nigerian Environmental Impact Assessment Decree (1992), which made it mandatory to have an ESIA study for any major development project likely to have adverse effects on the environment. The report was duly carried out with the in-put of all the concerned stakeholders. Two public fora and youth forum were held to create awareness and obtain contributions from the people who would be beneficiaries of the water supply and sanitation project and to solicit their cooperation for the successful implementation of the project.

Ibadan area has a typical tropical climate, high humidity with heavy rainfall and thick clouds all the year round. The climate is characterized by moderate maximum temperatures. The mean monthly average daily maximum of the warmest month is 33.5°C. The mean monthly maximum temperature for Ibadan is about 32°C (+/- 2.32°C). The hottest months are February and March while the lowest temperature occurs in July and August. Relative humidity averages about 80% in the rainy season and about 50% in the dry season. This high relative humidity encourages the growth of disease organisms while the high rainfall with improper sanitation poses the risk of cholera and diarrhea outbreaks. The onset of the rainy season is March and cessation of rainy season is October. The rainfall regime is characterized by two maxima in July and September, with a short "August break". The expected duration of rainy season lasts for about 220 days. Annual potential evapo-transpiration is about 1330 mm, thus giving humidity index of about 0.78 over the annual cycle. Climate change has not significantly altered the total amount of rainfall per annum with the catchment basin, but only its distribution within the year.

River Osun that feeds the Asejire Lake is perennial and the water level in the Lake has been filled to its peak since inception. The water height at the Asejire dam site is 81 meters and this level has been maintained even at the peak of the dry season. The spillway has always been fully opened during the rainy season to allow excess runoff downstream; hence total volume of water in the lake has not reduced. Consequently, raw water supply to the treatment plant has not been a problem and is not expected to be a problem in the future. The reservoir is not threatened by erosion or silting. This is because farming activities are totally banned from the catchment basins of the reservoir, while trees were planted along the banks of the reservoir when constructed in the late 1960s.

The ESIA findings determined that the project area is drained by two main rivers: Ona and Ogunpa rivers which contain high levels of organic pollutants. Untreated wastes from industries and residential quarters are discharged into the rivers. Temperature, conductivity, pH, total alkalinity and dissolved oxygen of the waters of the rivers were higher during the dry season. Levels of heavy metals in the rivers were relatively high while the predominance of iron (Fe) and manganese (Mn) in the waters was associated with high levels of these metals in Ibadan soil. With poor city sanitation, both surface and ground water sources are susceptible to contamination. This justifies that a separate comprehensive sanitation project is highly needed. A study exists but it needs to be updated. Ibadan city compounds did not develop in a planned manner capable of supporting modern development like a central water supply system and modern sanitation infrastructure. Consequently, the city centre is dirty and sanitation is very poor. The city is characterized by solid wastes and refuse dumps which often take over parts of motorable roads, build up on river banks and swamps, emit foul odour as well as serve as breeding grounds for pathogenic agents. Consequently, Ibadan city environment is severely degraded and is characterized by serious health and aesthetic degradation. Hospitals and other health institutions in the city (public or private) generate special wastes. These wastes are toxic, infectious and often contain sharp objects (e.g. needles and broken bottles).

A major positive impact of the project on the local populace is that they are likely to be employed during the construction phase. This will boost the local economy. Improved access to drinking water and better sanitation, which is a key objective of the project, will be a positive impact in the post-construction era, especially on health. An improvement in the quality of life due to improved water supply and new economic opportunities are anticipated. Adequate and sustainable sanitation behavior will also be promoted with its attendant improvement in the health of the people.

Apart from the dumping sites located near the tributaries of the rivers and streams, human feces and refuse (solid waste) including leaves, waste food items, sheets of polythene wrappers, disposed cartons, tins and bottles, waste paper, scrap metals and automobile parts, old tires, plastic and clothing materials were dumped indiscriminately into the rivers especially within the high density areas of the town. The practice of washing vehicles and clothes along the banks of the rivers in the outskirts and centers of the town was noticed. Liquid waste from these activities conveys sand and silt into the rivers. Other observed sources of pollutants discharged into the rivers were liquid waste from laundries, bathrooms, kitchen, slaughter houses, motor garages (i.e. Oil spills), and industries. During the rainy season (April-October), run-offs wash more refuse and silt into the rivers making the water more turbid and brown as the water levels and current increased. Prolific algal growth and organic decomposition therefore give rise to offensive stench in the lake and in many parts of river courses.

c) Enhancement and mitigation program

In Jalingo

- Study an alternative and sustainable water source to alleviate effects of water resources on the amounts of water resources available for the town (the study was integrated into the project);
- Generators (new and existing) will result in globally negligible CO₂ release in the atmosphere; this will be mitigated through installation of CO₂ filters and optimization the use of the generators;
- Construction and rehabilitation of transmission mains, networks and reservoir will have minor/temporary adverse impacts on people's activities and properties during construction phase, that will be mitigated by specific environmental protection clauses in the construction contract documents and enforcing compliance during construction through supervision consultant. Any costs for reconstruction/reinstatement of damaged property will be part of the construction contract;
- Storm drainages and culverts, constructed by the local government should be properly refurbished; this is being financed and implemented by the government;
- The town is littered with waste that creates high potential for polluting the water source. The improvements in waste collection and disposal in the city and in public facilities are included as part of the project and intended to reduce adverse impacts of the environment on the project;
- Installation of new municipal dump sites and relocation of the abattoir are being carried out by local authorities. The Ministry of Environment, in collaboration with the Implementing Agency will select the appropriate sites. Key selection criteria include: (i) avoid depressions and sandy soils hence avoid pollution of groundwater resources, (ii) avoid upwind locations relative to town and (iii) avoid riversides and floodplains.

In Ibadan

- Social: (i) Give preference to local people in employment; (ii) Implement affordable water fees/tariffs, (iii) Implement demand management measures to avoid the wastage of water.
 - Environment: (i) Restrict noisy construction works during daytime especially near the residential areas e.g. during construction of booster station at Erunmu and elevated water tank at Lalupon; (ii) Ensure that vehicles and machinery are maintained in good condition in order to minimise gas emissions and noise; (iii) At the end of construction works, level off the soils to prevent soil erosion and facilitate vegetation re-generation; and (iv) Minimize forestland clearing to protect trees and wildlife along right-of-ways.
 - Population: (i) Whenever possible employ local people from nearby families to minimise sexually transmitted diseases; (ii) Involve local authorities (like Chiefs and 'Baales' - head chiefs) in mitigation measures proposed and monitoring of implementation activities.
 - Health Outcomes: (i) Implement safety and preventive measures for the population (such as provision of traffic police/wardens) to prevent road traffic accidents during construction activities; (ii) Provide and plan for accident and emergency (e.g. Provision of first aid treatments) and ensure prompt evacuation of injured worker to hospitals.
 - Gender: (i) Offer project employment opportunities to men and women to boost the local economy; (ii) Involve women in the determination of water tariffs; (iii) Facilitate the creation of women groups for better organization and representation.
 - Participation: Consult all stakeholders (men and women) at all phases of the project, including the establishment of tariff rates.
 - Other Externalities: Good governance and poverty alleviation policies should be promoted by local authorities to prevent social instability in Ibadan city and Oyo State in general, as these can lead to water contamination, intermittent supply, injuries, epidemics and mortality.
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d) Monitoring program and complementary initiatives

Monitoring will include monitoring of the implementation of the mitigation measures to assess their efficiencies and eventually develop other mitigation measures if the expected results are not reached. The other aspect of monitoring activities is the evolution of the environment that includes climate change.

e) Institutional arrangements and capacity building requirements

The water agencies and state institutions responsible for environment and social actions will supervise project implementation units to insure implementation of the mitigation measures and monitoring. Results of the monitoring will be used to improve project implementation, and provide information for project supervision.

f) Public consultations and disclosure requirements

Public consultation has been fully undertaken in both Jalingo and Ibadan during environmental and social impacts assessment exercises. Inputs from local populations and other stakeholders have been integrated. The ESIA reports are available at the water agencies. This ESMP is posted at the ADB PIC and made available to the ADB Board 30 days prior to project submission.

g) Estimated costs

KEY IMPACTS REQUIRING MITIGATION	MITIGATION MEASURES	COST OF MITIGATION In Millions UA	OBSERVATIONS
I - JALINGO, TARABA			
1.1 - Stand alone mitigation measures with separate budget line			
The topographic configuration of the Jalingo city site causes most runoff from town, carrying all sorts of wastes (liquid and solid), wash directly into the borehole field that is very shallow (25 m deep at most) hence gets contaminated both by germs and chemicals leached from town. As a result, water produced from the only source, the Magami Borehole field is contaminated. Both the currently available Magami field and the newly identified Saminaka borehole fields require effective protection.	1) construction of diversion dike/wall (1250 m at Magami and 1300 m at Saminaka) and fencing, tree-belt planting (1250m x30 m at Magami) to filter sub-surface runoff, and 2) collection/ cleaning of garbage littering the borehole fields at Magami borehole field in Jalingo; 3) Redesign and reconstruction of key culvert.	0.86	
Water resources in Jalingo appears to be sensitive to climate change, and the limited resources currently available may not be enough very soon for the town.	A study is included in the project to investigate alternative resources able to cover the needs for the town.	0.2	
TOTAL COST OF STAND ALONE MITIGATION FOR JALINGO		1.06	
1.2 - Mitigation measures imbedded in project components			
The relocation of the abattoir and decommissioning of the old abattoir require adequate selection of the site and management, and rehabilitation of the old site to a standard compatible with its location in the middle of town (cleaning, evacuation of all the waste accumulated in situ for years, rehabilitation and reallocation of buildings).		0.7	For both the abattoir and dump sites, it is recommended to avoid depressions and sandy soils hence avoid pollution of groundwater resources, avoid upwind locations relative to town and riversides and floodplains, etc... The Ministry of Environment, in collaboration with the Implementing Agency will select the appropriate sites
Work place safety and treatment of injuries (imbedded in construction contracts).	Provision of first aid kits and serum for snake venom. The areas crossed by the main pipeline is a rural zone hosting a lot of poisonous snakes that may bite workers	0.01	
Partial or full destruction of shops, wall/parts of houses and other assets during construction. For example: construction and rehabilitation of transmission mains, networks and	Reinstatement of affected structures.	0.22	Note that this activity is not relocation/ compensation but reimbursement of damages to assets, and included in construction contracts.

reservoir will have minor/temporary adverse impacts on people's activities and properties during construction phase (imbedded in construction contracts);			
Limited environmental capacity of staff of institutions involved in the project; as well as of the population involved in the project (imbedded in construction contracts).	Environmental capacity building for the project implementation unit and the institutions involved in the project. Environmental capacity building will also cover local population awareness.	0.18	
Fencing of 3 dump sites (one 400 m and 2 of 300 m perimeter).	Fencing and securing of 3 dump sites	0.29	Installation of new municipal dump sites will require a number of measures such as careful selection of the new sites by local authorities

II - IBADAN, OYO			
2.1 - Stand alone mitigation measures with separate budget line			
The water treatment plants do not currently have facilities for treating and properly disposing of sludge resulting from production of drinking water.	Construction of sludge disposal basins at 3 treatment plants.	0.37	
TOTAL COST OF STAND ALONE MITIGAGATION FOR IBADAN		0.37	
2.2 - Mitigation measures imbedded in project components			
Work place safety and treatment of injuries. As an example, risks are related to construction such as snake bites in areas outside urban settlements, injuries, and also railway crossing. Measures have been taken to mitigate such risks.	Provision of first aid kits and serum for snake venom. The areas crossed by the main pipeline is a rural zone hosting a lot of poisonous snakes that may bit workers	0.0131	
Pipeline crossing the railway inducing high risks.	Set up working arrangements in collaboration with the Railway Authorities	0.0125	
Partial or full destruction of shops and wall/parts of houses during construction.	Damaged properties to be reinstated	0.8775	This is to be included in construction contracts.
Severe accumulation of all kinds of liquid and solid wastes and poor sewage disposal, especially in Ibadan, is a serious threat for water systems with very high risks of contamination and recontamination of water sources and distribution networks.	Since the budget dedicated to Ibadan will not be able to finance solid waste management, a study has been included and financed by the project to assess sanitation in Ibadan, and will serve to prepare a comprehensive sanitation program.	0.50	
Limited environmental capacity of staff of institutions involved in the project; as well as of the population involved in the project.	Environmental capacity building for the project implementation unit and the institutions involved in the project. Environmental capacity building will also cover local population awareness.	0.15	
Population / Poverty / Gender:			
Despite rampant poverty, local people may not benefit from the jobs offered by the project.	(i) Give preference to local people in employment issues (men and women alike). (ii) Whenever possible employ local people with nearby families to control sexually transmitted diseases; (iii) Involve local authorities (like Chiefs and 'Baales' -	No mitigation cost related to these potential social impacts. These are management issues to be resolved with contractors and the Water Board. Arrangement to avoid these negative effects during construction will be made with contractors in contract technical specifications. Also local government and youth organizations may play a significant role in more efficient involvement of women in the project	

	head chiefs) in mitigation measures proposed and monitoring of implementation activities. (iv) Offer project employment opportunities to men and women to boost the local economy; (v) Involve women in the determination of water tariffs; (vi) Facilitate the creation of women groups for better organization and representation.	implementation and operation.
Environment:		
Risk of noise and pollution during construction phase of the project	(i) Restrict noisy construction works during daytime especially near the residential areas e.g. during construction of booster station at Erunmu and elevated water tank at Lalupon; (ii) Ensure that vehicles and machinery are maintained in good condition in order to minimise gas emissions and noise;	Arrangement to avoid these negative effects during construction will be made with contractors in contract technical specifications.
Risk of vegetation clearing and erosion during construction phase of the project	(iii) At the end of construction works, level off the soils to prevent soil erosion and facilitate vegetation re-generation; (iv) Minimize forestland clearing to protect trees and wildlife along right-of-ways	
Health Outcomes:		
Risks of accidents and injuries related to the project both for project workers and for local population	(i) Implement safety and preventive measures for the population (such as provision of traffic police/wardens) to prevent road traffic accidents during construction activities; (ii) Provide and plan for accident and emergency (e.g. Provision of first aid treatments) and ensure prompt evacuation of injured worker to hospitals.	Arrangement to avoid these negative effects during construction will be made with contractors in contract technical specifications.
Participation:		
Risk of lack or inefficient local population participation in the project	Consult all stakeholders (men and women) at all phases of the project, including the establishment of tariff rates.	Arrangement to avoid these negative effects during construction will be made with contractors in contract technical specifications. Also local government and youth organizations may play a significant role in more efficient involvement of women in the project implementation and operation.

h) Implementation schedule and reporting

All mitigation measures will be implemented along side with the implementation of project components as required and planned in the project implementation schedule.