Summary of the Environmental and Social Impact Assessment (ESIA)

Country : MOROCCO
Project Number : P-MA-E00-011
Department : RDGN
Division: RDGN.2

1. Introduction

The African Development Bank (AfDB) received a request from the Moroccan authorities for the financing of the Water Access Sustainability and Security Programme - ADB 14. The programme is part of the strategy of the Kingdom of Morocco to mobilise and rationalise water use by 2030, primarily aimed at ensuring a rational management of water in the Zagora, Guercif, Al Hoceima, Tangiers and Beni Mellal development areas.

Based on the AfDB’s Integrated Safeguards System (ISS), the programme is classified in Category 1 in view of the large number of people (more than 200) whose private land will be expropriated. In accordance with Moroccan Law 12/03, drinking water supply (DWS) projects are not subject to an Environmental and Social Impact Assessment (ESIA). However, ESIA specific to the various sub-projects have been developed based on summary technical studies conducted in compliance with donor requirements. Moreover, due to the large number of private lands that may be impacted during the temporary occupation that will happen in the course of the works and the lack of finalised technical and plot studies, a Resettlement Master Plan has been prepared to take into account aspects related to land acquisition and compensation for agricultural losses. This document is the summary of the ESIA, and the summary of the Resettlement Master Plan has been provided separately.

2. Brief Description of the Programme and its Main Components

2.1 Programme Objectives

From a sector standpoint, the project aims to secure the supply of drinking water in sufficient quantity and quality, taking into account urban expansion and the pressures on groundwater resources, and to improve the people’s living conditions. More specifically, the programme is intended to strengthen the drinking water supply (DWS) system of Zagora, Beni Mellal, Gguercif-Debdou and Tangiers provinces, and to secure the supply of raw water from the Alhoceima treatment plant. The project cost, estimated at UA 194 million, will be financed by Office National de l’Electricité et de l’Eau Potable (ONEE) (National Electricity and Drinking Water Authority) and AfDB to the tune of 34.5% or UA 67 million.
2.2 Programme Components

The various components of each sub-project are presented in the following table:

<table>
<thead>
<tr>
<th>Sub-Project Presentations</th>
<th>Table 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Guercif</strong></td>
<td>Treatment plant: Conventional treatment plant of 2*150 l/s extensible to 450 l/s/</td>
</tr>
<tr>
<td></td>
<td>Raw water pipeline: FD DN600 steel pipeline covering 20 km</td>
</tr>
<tr>
<td></td>
<td>Treated water pipeline: BP DN 600 and 800 pipeline from the treatment plant to the Guercif intake reservoir over 60 km</td>
</tr>
<tr>
<td><strong>Al Hoceima</strong></td>
<td>Raw water supply: FD DN700 and 600 steel pipeline covering 31 km</td>
</tr>
<tr>
<td><strong>Zagora</strong></td>
<td>Treatment plant: Conventional treatment plant of 2*125 l/s extensible to 375 l/s</td>
</tr>
<tr>
<td></td>
<td>Raw water pipeline: FD DN 800 steel pipeline covering 22 km</td>
</tr>
<tr>
<td></td>
<td>Treated water pipeline: BP DN pipeline of between 900 and 400 over 105 km</td>
</tr>
<tr>
<td><strong>Tangiers</strong></td>
<td>Raw water supply pipeline: DN 110 mm water discharge pipeline over 500 linear metres and a DN 1 200 mm gravity pipeline over 12 km</td>
</tr>
<tr>
<td></td>
<td>Pumping station (GC and Equipment): Raw water plant: Q = 1 000 l/s, HMT = 28.5 m</td>
</tr>
<tr>
<td><strong>Beni Mellal</strong></td>
<td>Treatment plant: Installation of an additional pumping unit at the existing raw water pumping plant</td>
</tr>
<tr>
<td></td>
<td>Extension of the Afourer treatment plant by an additional flow of 190 l/s</td>
</tr>
<tr>
<td></td>
<td>ST Outlet pipeline – upstream of Souk Sebt: Laying of a BP/FD supply pipeline with a diameter of 600 mm over approximately 20.5 km</td>
</tr>
<tr>
<td></td>
<td>Oulad Ayad Branch pipeline: Laying of a PVC supply pipeline of a diameter of DN 500/315 mm, over approximately 24.3 km *Connection to the Oulad Zidouh intake reservoir.</td>
</tr>
<tr>
<td></td>
<td>Pipeline upstream of Souk Sebt – Ould Zidouh Reservoir: Laying of a PVC 500/400/110 supply pipeline over approximately 15 km; Construction of a pumping plant (Q=6l/s; HMT=100 m)</td>
</tr>
</tbody>
</table>

It should be noted that the Beni Mellal and Tangiers plants will continue to be supplied by the existing Bin el Ouediane and Ibn Battouta dams. The sub-projects of the El Houceima, Gercif and Zagora regions will be supplied by water from the new Targe Oumadi, Agdez and Rhiss dams, which are controlled by the Directorate of Research and Water Planning (DRPE), on behalf of the Ministry Delegate to the Ministry of Energy, Mines, Water and the Environment - Responsible for Water. Construction works started on the Targa Oumadi, Agdez and Rhiss dams in 2015, 2016 and 2017, respectively, and the progress rates stand at 12%, 20% and 6%. However, the ESIAs of the dams considered as associated infrastructure were provided and consulted as part of the programme.

3. Analysis of the "Without Project" Variants and Option

The current drinking water supply situation shows that present and future drinking water needs are likely to be compromised because of the vulnerability of water resources to the rainfall deficit which affects most of the regions concerned by the project.

The "without project" scenario would mean leaving areas and regions characterised by continuous demographic and tourism development in a state of water deficit. The situation is exacerbated by the depletion of groundwater resources, the decline in groundwater levels, the diminished flows, which may drop by as much as 70% in some areas, and the deterioration of water quality (significant sulphate contents in the case of Guercif).

This option will condemn thousands of people and families living in these areas to a situation where, as a result of being unable to meet their needs, they would be compelled either to over consume groundwater resources (which would be detrimental to the water quality) or resort to the "desalinisation" and transport of seawater over long distances (which would generate costs too high for consumers to bear).
No alternative was explored for the programme as a whole. However, and at the sub-project level, technical alternatives were studied to identify: (i) the routes of raw and treated water supply pipelines; and (ii) the sites for treatment plants.

Besides the technical and economic criteria, the analysis of alternatives considered the social criterion by opting for the alternative with the least impact on private plots and preferring the installation of plants on public or collective land.

4. Strategic, Administrative and Legal Framework

4.1. Regulatory Framework

Morocco has a substantial legal framework in terms of environmental management and particularly the management of environmental impacts. This relates mostly to environmental protection, the fight against pollution, and improvement of the living environment, including the preventive instruments (Environmental Impact Assessment - EIA) and incentives (financial aid and tax incentives), as well as coercive measures against natural and legal persons guilty of environmental pollution or degradation offenses. Some instruments are of a general or horizontal nature, and others are specific to sector activities.

With respect to environmental impact assessment, the most important piece of legislation is Law 12-03 of 12 May 2003, which establishes the list of projects subject to regulation, the procedure regarding the conduct and consistency, as well as and the requirements, of public investigation and the ESIA approval procedure. Under this legislation, DWS projects are not subject to the environmental assessment requirement. National laws relating to other sectors but relevant to the current programme are:

- Law 11-03 on the protection and enhancement of the environment
- Law 36-15 on water management
- Law 28-00 on solid waste management and disposal, and its implementing decree
- Organic Law 113-14 on municipalities
- Dahir 1-81-254 promulgating Law 7-81 on expropriation in the public interest and temporary occupation (GO of 15 June 1983). The acquisition of land for development and infrastructure pertaining to a project and the payment of compensation for the damage caused to crops will be made amicably or, failing that, in accordance with the compensation and expropriation procedures laid down by this law. In Morocco, the social management system is governed by a relatively sophisticated legal framework.

In addition, the new 2011 Constitution pays great attention to: (i) the consultation and participation of the population in programme development and monitoring (Art. 13é, 139); (ii) the presentation of petitions (Art.15); (iii) access to information (Art. 27)\(^2\); and (iv) petition management (Art.15é). With

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1 It is worth noting that neither the programmer nor the sub-projects are subject to the issuance of an environmental acceptance notification prior to their implementation.

2 Article 27: Citizens have the right to access information in the possession of the public administration, elected institutions and organisations with a public service mission. However, in practice, the system does not comprise specific mechanisms for information, public consultation and management of possible conflicts, which would help ensure that impacts are mitigated to acceptable levels.
regard to equity and non-discrimination, the Constitution enshrines gender equality (Art.19), equitable access to social, economic and cultural services (Section 5), and the inclusion of persons with special needs (Art. 34).

Amazigh is recognised as an official language in the same way as Arabic (Article 5). The 2004 Family Code also contains substantial provisions on gender issues and women's rights.

4.2 **Institutional Framework**

The Secretariat of State attached to the Ministry of Energy, Mines and Sustainable Development in charge of Sustainable Development is responsible for coordinating environmental management activities. In addition, some technical ministries and offices now have specialised environmental services or units. The key ministries that may be involved in the programme implementation are:

- Ministry of Equipment, Transport, Logistics and Water,
- Ministry of National Planning, Urban Planning, Housing and City Policy,
- Ministry of Agriculture, Maritime Fisheries, Rural Development and Water and Forests,
- Ministry of the Interior,
- Ministry of Health, etc.

4.3 **Water Strategy for Coping with Climate Change**

Morocco plans to continue its efforts to combat climate change as part of an overall sustainable development vision. The goal is to ensure the transition to low-carbon and climate-change resilient development. In line with the National Sustainable Development Strategy, Morocco's National Vision for Combating Climate Change was developed based on six crosscutting strategic focus areas:

1. Strengthening of the legal and institutional framework;
2. Improvement of knowledge and observation;
3. Regional implementation;
4. Climate risks prevention and mitigation;
5. Awareness-raising, empowerment of actors and capacity building; and
6. Promotion of research, innovation and technology transfer.

The water sector is currently facing challenges related to increased demand, dwindling water resources and over-exploitation of groundwater. This situation is likely to increasingly worsen due to climate change and especially the growing intensity of extreme events such as drought and flooding. To respond to the needs of the population and cope with the effect of climate change that may become more severe in the coming decades, Morocco adopted a strategy for the development of water

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3 Projections by the National Meteorology Directorate point to an increase in average summer temperatures of around 2°C to 6°C and a 20% decrease in rainfall on average (a 47% drop in spring rainfall by the end of the century). Moreover, the water resource, estimated at 730 m³/inhabitant/year, is likely to drop to 530 m³/inhabitant/year by 2030 (that is, below the water scarcity threshold of 1 000 m³/inhabitant/year).

3 Source: Ministry of Environment (2014)
resources by 2030\(^4\), as part of the National Plan for Combating Global Warming (PNRC). The strategy centres around six major areas aimed mainly at ensuring:

- Demand management and water valuation (water saving programme based on encouraging the use of saving practices);
- Development of supply (construction of 60 major dams, transfer of nearly 800 million m\(^3\)/year of raw water from the North to the South, and mobilisation of unconventional resources through the re-use of treated wastewater; rainwater, seawater desalination and brackish water demineralisation).
- Preservation and protection of water resources, the natural environment and fragile areas;
- Reduction of flood- and drought-related vulnerability; and
- Continuation of regulatory and institutional reforms.

These measures help to preserve the quality of resources and ensure satisfactory water supply, in terms of quantity and quality, not only for the DWS sector, but also for irrigation purposes.

5. Description of the Biophysical and Human Environment

Beyond the Zagora, Guercif, Al Hoceima, Tangiers and Beni Mellal zones and their urban sectors, the programme will cover the adjacent rural areas that will be supplied drinking water by installing tapping points along the treated water supply lines. The programme will benefit more than 1 500 000 inhabitants of these areas by 2040 (44% of them urban and 56% rural inhabitants). The main baseline data on the environmental and social context are summarised in the following tables:

<table>
<thead>
<tr>
<th>Zone</th>
<th>Climate</th>
<th>Fauna and Flora</th>
<th>Annual Rainfall</th>
<th>Mean Temp. (°C)</th>
<th>Topography</th>
<th>Seismic Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zagora</td>
<td>Sub-Saharan with a very low mean annual rainfall</td>
<td>Bare and rocky terrain, no specificity in terms of biodiversity</td>
<td>74 mm in Zagora and 108 mm in Agdez</td>
<td>12 to 35°C</td>
<td>Altitude ranging between 728 and 1 700 m NGM on several topographic compartments: valleys, mountains, desert plains and plateaus</td>
<td>Negligible (Zone I(^*))(^5)</td>
</tr>
<tr>
<td>Al Hoceima</td>
<td>- Mediterranean, with dry and hot summers and rainy and cool winters (on the reliefs) - Semi-arid, hot and dry on the rest of the ridge and the Bokkoyas</td>
<td>The project area does not contain endemic or endangered plant or animal species</td>
<td>308 mm to 2 000 mm at an altitude of 2 km</td>
<td>13.6 to 26.2°C</td>
<td>Uneven with varied and mountainous relief. The minimum and maximum altitudes served range from 39 m NGM to 162.5 m NGM.</td>
<td>Average to high (Zone III(^*))</td>
</tr>
</tbody>
</table>

\(^5\) According to the provisions on seismic zoning laid down by Morocco's regulations on earthquake-resistant construction (R.P.S 2000)
Guercif
Mediterranean with hot and dry summers, mild and relatively humid winters. Therefore, the area ranges from arid to semi-arid

The project area is characterised by the presence of steppe formations and cultivated areas (cereals and olive cultivation)

330 to 400 mm

12 to 31°C

Quite varied, consisting of the Rif chain and Prerif hills to the North, the Middle Atlas chain to the South and the Guercif Plain to centre.

Average* to low* (Zones II and III)

Béni Mellal
Continental semi-arid, hot in summer, cold in winter with a marked effect of altitude on the rainfall variability from the south to the north

The project area does not contain any endemic or endangered plant or animal species

600 to 800 mm

8.2 to 47.2°C

Regular with a gentle slope to the Tadla Plain and an altitude averaging 450 m NGM.

Average* (Zone II)

Tangiers and its region
Both Mediterranean and Atlantic. The area is characterised by a climate that is at once humid and mild.

Most of the area is covered by wild olive trees, mastic bushes and dum trees.

492 to 1 158

7.2 to 31.6°C

Regular with a gentle slope all along the pipeline.

Average (Zone II)

The main zones of ecological interest in areas indirectly impacted by the programme are the Ramsar site of Bas Tahaddart (Tangiers), the biosphere reserve of the southern Moroccan oases, the Ramsar site, known as "Moyenne Draa" (Zagora), the site of biological and ecological interest (SIBE) of Lalla Mimouna (Guercif) and the Al Hoceima National Park (Al Houceima). The programme, including all its sub-projects, does not affect any of these areas of ecological interest, whether directly or indirectly.

With regard to seismic activity, it should be noted that the projected structures and superstructures will be designed to cope with seismic events following recommendations and coefficients of the RPS 2000 and AFPS 90 guidelines.

Table 3
Demographic Sphere

<table>
<thead>
<tr>
<th>Zone</th>
<th>Total Population (2014)</th>
<th>Urban/Rural Population (**)</th>
<th>Population Projection for 2040</th>
<th>Water Needs / Average Deficit (l/s) for 2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zagora</td>
<td>307 306</td>
<td>50 748 / 256 558</td>
<td>389 226</td>
<td>306 / -247.8</td>
</tr>
<tr>
<td>Al Hoceima</td>
<td>399 654</td>
<td>127 543 / 272 111</td>
<td>369 070</td>
<td>483 / -388</td>
</tr>
<tr>
<td>Guercif</td>
<td>250 445</td>
<td>95 840 / 154 605</td>
<td>362 585</td>
<td>320 / -262</td>
</tr>
<tr>
<td>Béni Mellal</td>
<td>296 651*</td>
<td>108 057 / 188 594</td>
<td>366 671*</td>
<td>895/- 125 à –412 ***</td>
</tr>
<tr>
<td>Tangiers /the regions of (Sebt Azzinate and Laouama)</td>
<td>13 166</td>
<td>---</td>
<td>NS</td>
<td>NS</td>
</tr>
</tbody>
</table>

N: (*) period 2015 – 2035 / (**) Gender-based data is not available/ (*** Figure with the new agropole zone
### Table 4
Socio-economic Activities

<table>
<thead>
<tr>
<th></th>
<th>Agriculture</th>
<th>Stockbreeding</th>
<th>Industries</th>
<th>Tourism and Handicraft</th>
<th>Fisheries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Zagora</strong></td>
<td>- Fruit-tree farming, 90% dominated by the date palm, providing 30% of national production &lt;br&gt; - Lowland crops including cereals (50.8% of the UAA), alfalfa (9.72%), market gardening crops (3.90%) and henna (2.65%).</td>
<td>Activity not developed in the area</td>
<td>Activity very poorly developed or embryonic, largely due to the remoteness and isolation of the Province</td>
<td>The significant tourism potential offered by the Drâa Valley and the diversity of its points of interest are reflected in the existence of 14 classified hotel units and 19 guesthouses and 13 inns</td>
<td>Non-existent activity in view of the remoteness of the province from the coast</td>
</tr>
</tbody>
</table>
| **Al Hoceima** | - Almost total absence of tree farming <br> - Market gardening almost generalised in all farms of less than 1 ha <br> - Cereal crops (81 700 ha) and, on a smaller scale, vegetable farming (11 400 ha). | This activity occupies a key position in the economic life of the rural population, with a livestock population dominated by sheep (53%), goats (30%) and cattle (17%). | - Underdeveloped industrial activity with a predominance in the existing industrial fabric of the establishments in the following sectors: agribusiness (66); chemicals and para-chemicals (76), and clothing (27), providing 6 000 jobs. <br> - Trade plays an important role and occupies nearly 11% of the workforce. | First-rate tourism activities <br> - Its coastline is a tourist attraction with 12 sites spread over nearly 15 km <br> - Its mountains are ideal for mountain tourism with 4 sites including a craft centre in Taghzout located at an altitude of 1 000 m. <br> Artisanal activity is highly underdeveloped | - Maritime fishing plays a vital role in the province’s economy with 570 fishing units that generate nearly 4 100 jobs  
- The fish-farming sector provides opportunities for the breeding of marine species of high commercial value. |
| **Guercif** | First-rate agro-pastoral activities. Agriculture is the main economic resource of the rural population. Irrigated agriculture is carried out on an area of nearly 6 000 ha and an area of 115 000 ha is currently devoted to olive plantations. | Besides agriculture, livestock plays a vital role in the area's economy. | - Highly underdeveloped because of the aggressiveness of the natural environment (aridity, low fertility of land, lack of raw materials, etc.), exacerbated by the remoteness of the area from administrative centres. <br> - Textile activity is being developed for export purposes. | The natural sites are the primary factors that account for the tourism appeal of the province, with the mountainous sites of great tourist value and very old historical heritage. | The activity is non-existent in view of the remoteness of the province from the coast. |
**Table 5**

**Access to Basic Services**

<table>
<thead>
<tr>
<th>Access</th>
<th>The intervention sites are accessible by dirt roads and by paved or motorable roads.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electricity</strong></td>
<td>MV/LV power supply lines for the Guercif DebDou treatment plant will be provided by the ONEE Power Supply Branch. Nationally, the electrification rate in urban areas is estimated at 100% vs 99.52% in rural areas.</td>
</tr>
<tr>
<td><strong>Drinking Water</strong></td>
<td>This programme will enhance and ensure the security of local DWS systems in rural areas managed by municipalities or associations. The average connection rate is 96% and the Tangier-Tetouan-Al Hoceima region has the lowest rate with 82% access to drinking water, 14% less than the national average.</td>
</tr>
<tr>
<td><strong>Sanitation</strong></td>
<td>Liquid waste in urban areas is managed by the ONEE Water Supply Branch and the actual treatment is performed by plants using the activated sludge biological treatment process. Douars and neighbourhoods in rural areas do not have sanitation networks; households usually have wells located outside the houses or septic tanks drained by municipality services. According to the General Population and Housing Census 2014 (RGPH 2014), 81.2% of Moroccan households use an appropriate means (network and septic tank): 97.8% in urban areas compared with 52.1% in rural areas (49.2% of which are septic tanks).</td>
</tr>
</tbody>
</table>

**Beni Mellal**

Considered the backbone of the region's economy with farmland representing 90% of the zone's surface area. Cereal farming (69% of the utilised agricultural area - UAA) and tree farming (citrus and olive) are the predominant activities. Industrial agriculture (cotton, beet) accounts for only 3% of the UAA.

Stockbreeding is among the main activities of the area with a livestock population of 1,082,052 that includes cattle, sheep and goats. The region accounts for 17.2% of the national milk production.

The sector is dominated by agribusiness, which comprises 64 establishments and employs 2,368 permanent employees. The mining sector is characterised by a production of 4,812 tonnes, of which 20% are intended for export.

In terms of geographic, forest and historical potential, the region has 3 tourist sites and attracts a good number of tourists. The sites are at the origin of the area's hotel infrastructure comprising 43 hotels, 16 of which are classified in the low occupancy rate (11%) category. The regional handicraft sector includes 11 cooperatives and employs 7,400 artisans.

Non-existent activity due to remoteness of the province from the coast.

Tangiers and its region

Agriculture is a main activity in the non-irrigated area. Cereal crops are predominant, accounting for 1,330 ha. On a smaller scale are market-gardening crops, fodder and various plantations accounting for 103 ha, 43 ha and 68 ha, respectively.

Stockbreeding is considered among the main activities in the area, with an animal population of 1,848 cattle, 5,820 sheep and 1,012 goats.

The Tangiers/Tetouan region is ranked Morocco’s second economic hub after Casablanca, with several industrial free zones. It is also ranked first seaport free zone and second best airport to Casablanca, with several industrial free zones. It is also ranked first seaport free zone and second best airport free zone in the world. Processing industries are considered most significant (textile and clothing industry: 60%), coupled with the emergence of the automobile and aerospace assembling industry.

This sector is essentially based on the seaside activity with the two beachfronts, overlooking the Atlantic and the Mediterranean, and on the existence of historic sites and natural areas consisting of forests on both coasts. Thanks to these characteristics, the area is considered the region’s most attractive tourist hub.

The position of this region as a transitional zone between two maritime areas - the Atlantic Ocean and the Mediterranean - makes fishing a significant extra activity for its population (representing 2% of GDP). The sector employs about 16,100 people in the region, most of them at the Tangiers, M'diq and Larache ports.
Solid Waste

In some cases, solid waste is managed by municipalities and disposed of at controlled landfills far from urban centres (located at an average of 15-20 km). In other cases (e.g. Souk essebt - Bni Mellal), solid waste is not managed by municipalities, but by private providers who dispose of it in existing waste dumps (developed and undeveloped).

Cultural / Historical Sites/ Historical Relics

Some programme sites are located near prehistoric remains or protected areas (Ramsar for Zagora, El Hoceima, etc.). The environmental analyses carried out indicate that the rights-of-way of the programmed works are remote from these remains and in adopting the technically selected variants (choice of sites and routes of the pipelines), efforts were made to ensure that no important or sensitive area is affected.

### Table 6
**Status of Drinking Water Resources**

<table>
<thead>
<tr>
<th>Zone</th>
<th>Current Water Supply</th>
<th>Source of Water after the Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zagora</td>
<td>The drinking water supply (DWS) of the Zagora area comes from groundwater resources. These resources, which consist mainly of aquifers, are derived mostly from the underflow of wadi Draa and its tributaries.</td>
<td>The future Agdez Dam under construction: it should be noted that the allocation reserved for the Zagora City DWS is 10 million m$^3$ per year. The rest of the water will be used for irrigation in the palm plantations, serving as protection against floods and acting as an intermediate storage dam to regulate the water resources of the Mansour Eddahbi Dam.</td>
</tr>
<tr>
<td>Alhoceima</td>
<td>Al Hoceima City, the centres and related douars derive their drinking water supply mainly from the surface waters of the Mohamed Ben Abdelkrim Al Khattabi Dam (SMBAK), which is very silted. The subsidence is ensured by the underground resources of the Rhiss and Nekkor aquifer catchment areas.</td>
<td>Dam being built on the wadi Rhiss specifically to supply Alhoceima City with drinking water and protect the downstream areas against floods.</td>
</tr>
<tr>
<td>Béni Mellal / Souk Sebt</td>
<td>The Béni Mellal/Souk Sebt areas are supplied from surface and underground resources: Ain Asserdoune, several new and old boreholes, well 4420/36 and the Aforer treatment plant. The drinking water service in these areas (production and distribution) is managed by the ONEE - Water Branch and RADEET.</td>
<td>The Aforer treatment plant, which is itself supplied from the existing Bin El Ouediane Dam; the allocation reserved for the DWS is 28 million m$^3$, equivalent to 900 l/s.</td>
</tr>
<tr>
<td>Guercif</td>
<td>The area is currently supplied from underground resources: boreholes, a well and a spring.</td>
<td>Dam being built at Taga or Madi with a capacity of 287 million m$^3$ intended for the irrigation, then drinking water, protection against floods and lastly power generation.</td>
</tr>
<tr>
<td>Tangiers and its Region</td>
<td>The Tangiers system is currently powered from the Ibn Batouta Dam (9 April 1947). The Charf El Akab aquifer located Southwest of Tangiers City is a safe groundwater resource. The raw water intake of the M’Harhar treatment plant comes from water released from the Dam through the agricultural outlet. The water thus released follows the course of wadi M’Harhar over approximately 11 km before arriving at the raw water intake point, exposed to pollution and infiltration risks.</td>
<td>The existing Ibn Battouta Dam with a capacity of 29.1 million m$^3$</td>
</tr>
</tbody>
</table>
6. Assessment of Environmental Impacts and Measures

6.1 Positive Impacts /Enhancement Measures

The positive impacts of the programme will be reflected in the creation of employment and absorption of urban and rural unemployed in the programme impact area during the construction and maintenance phases.

In the operation phase, the positive impacts are:

- Satisfaction of a vital need, thanks to access to drinking water supply,
- Improvement of hygiene conditions and reducing the prevalence of waterborne diseases
- Enhancement of water supply security.

To consolidate these positive impacts, a series of measures are planned. They mainly consist of:

- Ensuring rational demand management,
- Ensuring a regular supply of the right quantity and quality of water through maintenance of water supply systems and compliance with quality standards,
- Supporting the service by encouraging the adoption of appropriate sanitation measures in rural areas,
- Formulating a communication and awareness-raising strategy for users with a view to encouraging them to save water.

6.2 Negative Impacts and Proposed Mitigation Measures

In the preparatory phase, negative impacts relate to the loss of land, property and crops, and disruption of daily activities. In the case of the Béni Mellal sub-project, the expropriation will concern 423 plots and will affect approximately 958 people. For the other sub-projects, the inventory is ongoing. To mitigate the impacts of expropriations, a Resettlement Action Plan (RAP) for each programme sub-component will be prepared as part of technical assistance. It will provide details on the affected persons and the indemnification and compensation methods.

Similarly, the release of the various rights-of-way (for pipelines and plants) will result in the destruction of vegetation cover, the degradation of indigenous plant communities, and felling of trees. The impact of the project on the vegetation cover will be mitigated by planting trees to replace the felled ones.

In the works phase, the impacts are temporary and ad hoc in nature, and relate to construction activities and management of the workers' camp, as indicated below:

- The risk of disturbance of existing flora and fauna,
- The risk of landslides and subsidence in high relief areas resulting from the presence of unstable artificial slopes,
- Exhaust fumes and dust emissions,
- Noise and vibrations,
- Disruption and increase of traffic/risk of accidents,
- Danger linked to the presence of abandoned equipment and work site scraps (health-threatening pollution/compromised safety).

A battery of measures has been proposed to mitigate these negative impacts related to construction site activities. These include:

- Effective and appropriate management of the workers' camp: (i) limit access to the site to site personnel and clearly indicate existence of the site at the most sensitive places; (ii) ensure proper management of waste, wastewater and scraps from the site; (iii) put in place drainable latrines for the collection of wastewater and equip the pits with filter wells; (iv) ensure that pollutants are properly managed and stored in the designated areas; (v) equip all workers with personal protective equipment (including helmets, gloves and safety shoes) and ensure that they are used by all persons travelling in the right-of-way of the site;
- Maintain construction equipment in good technical condition in order to: (i) limit noise emissions and air pollution by fumes; (ii) prevent leakage and spills of hydrocarbons or waste oils;
- Ensure proper management of construction operations: (i) plan the work schedule in a manner that avoids disrupting the lifestyle of local residents; (ii) provide a passage for people and livestock at least every 400 m and limit the time lapse between the opening up of trenches (excavation), laying of pipes and site restoration; (iii) optimise the rounds of the trucks transporting the materials;
- Develop a hazardous material management and an emergency response plan;
- Develop a communication programme to inform the population of about ongoing works;

In the operation phase, the main negative impacts identified are: (i) the risk of pollution due to discharges in the treatment plants: liquid discharge (wash water from treatment tanks) and solid discharge (sludge); (ii) inconveniences for the people in the event of very frequent power cuts; and (iii) pollution caused by a lack of an effective sanitation system in rural areas.

The mitigation measures adopted to counter the negative impacts during the operation phase are: (i) neutralisation of discharged water before evacuation to the natural environment, while complying with the discharge standards in force and ensuring the treatment of sludge prior to its evacuation to the dumping site; (ii) implementation of a regular maintenance and monitoring programme to ensure proper functioning of all existing facilities; (iii) conduct of water quality and sanitation monitoring campaigns to ensure compliance with the standards in force and improve treatment at the onset of anomalies; (iv) control of pipelines by remote management to ensure rapid intervention of specialised repair teams in the event of breakage or leakage; and (v) conduct of awareness campaigns, concerning the key principles of public hygiene and the latter's impact on health, and the risks related to the handling of wastewater.
6.3. **Cumulative and Residual Impacts**

Environmental analysis did not identify any major cumulative impacts as the project areas were not subject to ongoing or known projects at the time of programme preparation. Once the mitigation measures laid out in the ESMP specific to each sub-project are appropriately implemented, there will be no or very low residual impacts related to the construction phase. For the operation phase, the risk of accidental pollution at the supply points of the plant or in the plant itself remains. This risk will be managed by implementing the emergency measures provided for this purpose in the plant operating procedures.

**Environmental and Social Supervision and Monitoring Programme**

ONEE - Water Branch is required to comply with the laws, regulations, codes and other provisions in force intended to prevent, control and protect the physical, natural and human environment through the establishment of a supervision and monitoring system that makes it possible to assess the relevance of environmental measures and to identify appropriate corrective measures, if necessary.

Overall, these programmes should ensure:

- The integration of relevant mitigation measures into the final design of the works and the competitive bidding documents;
- The environmental supervision of construction activities and the implementation of prescribed mitigation measures; and
- Long-term monitoring of environmental conditions during the operation of facilities.

More specifically, environmental supervision helps to ensure that environmental commitments and requirements are fully applied by the enterprise(s) in charge of the works during project implementation, and that corrective measures are identified, if need be.

For its part, environmental monitoring is conducted based on a specific concern, and deals with the evolution of natural and human environments affected by the project, as well as with the effectiveness of the mitigation measures implemented.

In terms of accountability, the successful bidders will be responsible for the implementation of mitigation and enhancement measures. The works execution contracts will contain the description of the penalties that will be applied to the companies in case of non-compliance with the specific technical prescriptions relating to the environmental and social spheres, and as explained in the technical prescriptions for environmental and social management during the construction phase and in the General Coordination Plan for Safety and Health Protection (PGCSPS). During the works, the Site Manager and his/her Health, Safety and Environment (HSE) Expert will be responsible for applying the measures outlined in the specifications and in the ESMP. Where necessary, they may be required to forward a report to the competent authorities containing observations and remarks regarding the degree of implementation of the mitigation measures, and aspects that require special monitoring. The person in charge of the Hygiene, Safety and Environment (HSE) aspects should be knowledgeable in the following areas:

- Environmental protection laws and regulations applicable to the works;
- Environment-specific specifications mentioned in the competitive bidding documents, including the PGCSPS and the technical specification document on environmental and social management during the construction phase;
- Response measures in the event of an accidental spill of hydrocarbons or other chemicals used during the works;

- Noise and air quality control methods; and

- Emergency response in the event of contamination of water resources or a drinking water catchment.

In addition, the HSE Officer will have a copy of the ESMP to enable him/her to ascertain the implementation of environmental measures outlined in the document.

In the preparatory phase, environmental monitoring will cover the following aspects:

- Identification of the project enclosures, which should be done carefully to limit the impact of nuisances (spills, leaks, dust, noise, etc.). In this regard, the sites chosen should be precisely indicated and within certain limits (fence, access roads, etc.);

- Identification the project's right-of-way (water intake at future dams, pumping stations, the location of the raw water treatment plant, loading reservoirs, and pipes). Special attention should be given to the installation of appropriate and visible signage at work sites (along the roads bordering water supply pipelines, at treatment plant development sites, etc.);

- Development of an earth-moving plan specifying the quantities of materials to be carted away or brought in, the borrow and deposit sites, as well as the management of temporary deposits;

- Information of residents and the locals on the nature of the works, their schedules, possible nuisances and risks (cutting up of access roads, temporary interruption of certain services, noise and vibrations, dust emissions, stability of houses, etc.); and

- Establishment of systems for the collection and treatment of solid (recyclable and final) or liquid waste (domestic wastewater and polluting discharges).

Supervision forms will be kept and completed by successful companies, controlled by the environmental monitoring officer and validated by ONEE - Water Branch, which will be responsible for monitoring the implementation of the mitigation measures and the incorporation of the environmental and social performance aspects of each sub-project into the quarterly programme monitoring reports to be forwarded to the Bank.

Under the sub-projects of this programme, the supervision and monitoring programme is as follows:
### Table 8: Monitoring and Supervision in the Preparatory Phase

<table>
<thead>
<tr>
<th>Supervision Programme</th>
<th>Monitoring Parameters</th>
<th>Monitoring Entity</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PREPARATORY PHASE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clarification of property rights</td>
<td>Verification of the indemnification and compensation of the affected persons and owners of land expropriated.</td>
<td>ONEE-Water Branch - Directorate of Legal Affairs (DAJ)</td>
<td>A social development expert will be included in the technical assistance provided for the programme implementation</td>
</tr>
<tr>
<td>Participatory approach and stakeholder involvement (information and awareness-raising among the local population)</td>
<td>- Implementation of a communication plan to ensure the dissemination of information (nature of works, schedule, nuisances and possible risks: roadblocks, temporary interruptions in certain services, noise and vibrations, dust emissions, stability of houses, possibility of recruiting local labour, etc.) from the target public before the start-up of operations on the site; - Posting of signs at a maximum of 50 m from the most sensitive operation sites.</td>
<td>ONEE/Cooperation and Communication (DCC)</td>
<td>A social communication expert will be included in the technical assistance provided for the programme implementation Cost included in the cost of works⁶</td>
</tr>
<tr>
<td>Choice of suitable locations for site installation</td>
<td>Compliance with the objectives pursued and rationalisation of the scope of operations (presence of an enclosure, development of access routes, areas reserved for temporary depots, setting up of collection systems and treatment of solid and liquid waste, preparation of contaminant storage areas, etc.).</td>
<td>Company in charge of works / Municipalities/ONEE-Water Branch</td>
<td>Included in the cost of works</td>
</tr>
<tr>
<td>Preparation of site workers</td>
<td>- Development of the procedures for coaching and training site workers on environmental and safety measures; - Preparation of an emergency response plan; - Acquisition of personal protection equipment (PPE) for site workers adapted to the nature of the planned operations; - Administration of vaccines or conduct of preliminary medical examination in case of operations requiring prior vaccination.</td>
<td>Company in charge of works/HSE Expert ONEE-Water Branch</td>
<td>Included in the cost of works</td>
</tr>
</tbody>
</table>

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⁶ PM: The cost of work site installation and site restoration ranges from 1% to 2% of the overall cost of the works contract.
Table 9
Monitoring and supervision programme in the construction phase

<table>
<thead>
<tr>
<th>Supervision Programme</th>
<th>Monitoring Parameters</th>
<th>Responsible Entity</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PHASE DES CHANTIERS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Public safety                                 | - Safe management of fuels and flammable materials on-site and in working areas  
- Safe storage of equipment on-site  
- Correct demarcation of the project's right-of-way and prohibition of access  
- Verification of the presence of signs at a maximum of 50 m from the most sensitive operation sites | Site Manager - HSE Expert / ONEE-Water Branch           | Included in the cost of works |
| Workers’ safety on-site                       | - Wearing of work and personal protection equipment  
- Presence of absorbent material on-site  
- Existence of first aid kit on-site  
- Permanent presence of vehicle on the site for rescue and emergency purposes  
- Presence of notices posted at the sight of workers showing the names and phone numbers of officials and describing the early warning system | Site Manager - HSE Expert / ONEE-Water Branch           | Included in the cost of works |
| Site hygiene                                  | - Existence of toilets, water closets at workplaces and on-site drainable latrines  
- Presence of garbage cans for ordinary garbage  
- Presence of a place for catering and coffee breaks | Site Manager - HSE Expert / ONEE-Water Branch           | Included in the cost of works |
| Sound and atmospheric pollution               | - Humidification and watering of tracts and rights-of-way whenever necessary for dust elimination  
- Tarpaulin covering for trucks carrying cuttings and materials likely to generate dust  
- Verification of the condition of the machines and equipment used on-site to ascertain their conformity with the specifications | Site Manager - HSE Expert / ONEE-Water Branch           | Included in the cost of works |
| Pollution of water and soil resources         | - Existence on site platform of oil or fuel leaks or of any type of polluting spill  
- Proper management of effluents and solid waste on-site (existence of a temporary storage area and appropriate containers, regular evacuation, safe management of fuels and flammable materials on-site and in the working places)  
- Respect for the surface drainage at all times and ensuring that it is not obstructed by the work site  
- Removal of debris that can interfere with the normal flow of surface water | Site Manager - HSE Expert / ONEE-Water Branch           | Included in the cost of works |
| State of the post-works environment           | - Site restoration:  
- Existence on site platform of oil or fuel leaks or of any type of polluting spill  
- Proper management of effluents and solid waste on-site (existence of a temporary storage area and appropriate containers, regular evacuation, safe management of fuels and flammable materials on-site and in the working places)  
- Respect for the surface drainage at all times, ensuring that it is not obstructed by the work site  
- Removal of debris that can impede the normal flow of surface water  
- Site restoration: *Demolition of buildings | Site Manager - HSE Expert / ONEE-Water Branch           | Included in the cost of works |
*Closure of collection and processing systems
*Management of residual deposits of soil and site scrap: solid waste, demolition waste, scrap metal, spare parts, etc.
*Rehabilitation of access roads for use by villagers;
*Rehabilitation of pavements degraded by the works;
*Remodelling of the relief;
*Revegetation, reforestation and replacement planting in case of felling of trees.

<table>
<thead>
<tr>
<th>Supervision Programme</th>
<th>Monitoring Parameters</th>
<th>Responsible Entity</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervision of the status of the network and leaks</td>
<td>ONEE-Water Branch</td>
<td>Flow measurement with a macrometer</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Supervision of the bacteriological and chemical quality of the water at the point of outlet from the plant</td>
<td>ONEE-Water Branch</td>
<td>Full chemical and bacteriological analysis</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Supervision of liquid discharges</td>
<td>ONEE-Water Branch</td>
<td>Annual temperature sampling, pH, CE, nitrates, heavy metals, etc.,…</td>
<td>Annually</td>
</tr>
<tr>
<td>Accidental pollution</td>
<td>ONEE-Water Branch</td>
<td>Inspection of the reagent storage area</td>
<td>Monthly</td>
</tr>
</tbody>
</table>

**Table 10: Programme Monitoring and Supervision in the Operation Phase**
<table>
<thead>
<tr>
<th>Supervision Programme</th>
<th>Responsible Entity</th>
<th>Monitoring Parameters</th>
<th>Frequency</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvement of living conditions</td>
<td>Ministry of Health, Ministry of Social Affairs/ONEE-Water Branch</td>
<td>Income level per household, poverty index, rate and type of diseases recorded, rural enrolment rate, women's status, etc.</td>
<td>Annual survey</td>
<td></td>
</tr>
</tbody>
</table>
7. Public Consultation and Dissemination of Information

7.1 AfDB Requirements

AfDB’s Integrated Safeguards System (ISS) requires the Borrower to carry out adequate consultation (i.e. free, prior and informed consultation) with communities likely to be affected by the environmental and social impacts, and with local actors. The active participation of the beneficiaries is also required throughout the planning, design, implementation and evaluation stages. The objective is to ensure stakeholder participation throughout the consultation process so that affected communities and stakeholders may have timely access to information concerning the Bank’s operations through appropriate channels, and that they are properly consulted on issues that might affect them. Community participation may also foster transparency and equity in compensation procedures, and encourage closer community involvement in service infrastructure management and maintenance, and in development programmes.

7.2 Provisions of National Regulations

Pursuant to Moroccan Law 12/03, DWS projects are not subject to an environmental and social impact assessment. Therefore, the conduct of environmental impact assessments (EIAs) and the holding of consultations for the sub-projects are more in line with the Bank’s requirements.

However, there are provisions under Law 7-81 that can meet the AfDB ISS requirements regarding consultation, but specifically for affected persons. Pursuant to Article 10 of Dahir 1-20-81-254 (6 May 1982) promulgating Law 7-81 on expropriation in the public interest and temporary occupation, the notice of approval to expropriate land must be preceded by an administrative investigation, which includes a public investigation. On this basis, the notice of approval to expropriate land:

- Is published in the Official Gazette and in one or more newspapers authorised to accept legal notices;
- Is lodged, accompanied by a plan, with the municipality where interested parties may consult it and submit their comments within two months of the date of publication in the Official Gazette (OG).

The Declaration of Public Interest (DPI) file is submitted to the Divisional Officer (Préfet), who issues an order fixing the date for the commencement and duration of the public investigation and appointing an investigation commissioner. The order is published at least eight days before the start of the investigation and posted throughout its duration at the town hall concerned.

Therefore, potentially affected or interested parties may consult it in a free, prior and informed manner, and write their comments in the above-mentioned register within two months of its publication in the Official Gazette (OG).

7.3 Consultation Conducted

ONEE organises stakeholder consultations as required, as part of the preparation of the ESIA/ESMP notes on the sub-components concerned. Thus, the consultation sessions held dealt more with administrative bodies in an effort to consider technical feasibility and minimise
social impacts. During the summary technical studies, these consultations made it possible to choose from the proposed options of alternative routes.

In addition to meetings held in Rabat with various divisions of ONEE-Water Branch, the Bank’s preparation and appraisal missions met with the Beni Mellal Independent Inter-municipal Water and Electricity Distribution Authority (RADEE), in its capacity as the direct project beneficiary in charge of drinking water supply in the region. The Authority said there was a growing need for increased drinking water supply in the region, in view of the dwindling groundwater resources, coupled with water pollution from nitrates used as fertilizer in agricultural areas surrounding the boreholes. This concern is also felt in the other areas of the programme where water shortage protests were recorded.

7.4 Future Consultations and Communication Plan

The various awareness and communication campaigns that were initiated as part of the feasibility and studies are being continued for the production of plot distribution plans. As a result of these campaigns, the people are informed of the characteristics and objectives of the programme, and the various sub-projects as the technical studies are finalised. To reinforce this aspect, ONEE (Water Branch) will also ensure that local residents are informed prior to works start-up through the municipalities and/or local authorities, and according to the provisions of the communication plan. Information will focus on the nature of works, possible damage and related compensation, to enable the locals to organise themselves to make the best of the situation (temporary jobs, etc.).

During the works phase, the hired companies must maintain this consultation with local residents (this requirement will be one of the conditions of the works contract). The communication will mainly concern: (i) the type and duration of works; and (ii) precautions to be taken regarding the movement of machinery.

In addition, information, awareness and education campaigns are necessary to prevent wastage and pollution. These campaigns will focus on: (i) promoting a culture of respect for water and positive behaviour regarding water use; and (ii) fostering attitudes and behaviour conducive to hygiene.

Direct on-site action intended for the various target groups is the ideal method for communicating the following messages: “Drinking water is essential for health, it is a common right, use it but don't waste it.” The target groups are: (i) children and young people (schools, summer camps, visit of facilities, etc.); (ii) women (women’s centres, associations, youth centres, etc.); (iii) subscribers (subscriber’s guide, etc.); (iv) press officers (press day, sending of leaflets, etc.); (v) public and private actors; and (vi) decision makers, elected officials and other partners (information day, etc.). In conducting these awareness campaigns, it will be necessary to take into account the variety of socio-cultural data, habits and customs, and the people's willingness to participate in community action. The details of these activities and their implementation programme are included in the communication plan prepared by ONEE and finalised by the Social Communication Expert of the technical assistance team provided for under this programme.

8. Environmental and Social Management Plan

The programme’s environmental and social management plan is presented in the table below.
<table>
<thead>
<tr>
<th>Phase</th>
<th>Environment Concerned</th>
<th>Negative Impacts Identified</th>
<th>Magnitude of the Impact</th>
<th>Recommended Measures</th>
<th>Residual Impacts</th>
<th>Responsible Entity/Timeframe</th>
<th>Summary Cost of Measures</th>
</tr>
</thead>
</table>
| Pre-construction Phase | Physical Environment  | - Loss of income following the temporary occupation of land during the works (about 410 private plots and 989 persons affected for the Béni Mellal sub-project)  
- Loss of vegetation cover  
- Change in land use following the construction of new plants                                                                         | Averagely permanent and controllable | Expropriation and compensation for property and activities on the land (buildings, crops, crops, wells, cisterns, etc.), according to the law enacted in 1982 and subject to the implementing decree of 1983 and the Bank's safeguards policies through the Resettlement Master Plan prepared for these purposes | Low              | ONEE - WB/Before the start of works  
Triggering recommended as soon as parcelling is finalised                                                                 | To be determined according to the value of the land and/or the price agreed between ONEE-WB and the owners  
Estimated budget: MAD 165 million                                                                                 |
|                   |                       | - Soil compaction  
- Risk of accidental chemical pollution due to the works  
- Presence of unstable artificial slopes, with risk of sliding and subsidence in high relief areas | Low                              | - Restore the original compaction by digging up to a depth of 50 cm  
- Check the condition of vehicles and machinery to prevent leaks and spills of petroleum and hydrocarbon products  
- Provide treatment facilities for on-site buildings and workers' camps  
- Ensure proper management of waste, wastewater and scraps from the site  
- Implement a hazardous materials management plan and a spill action plan  
- Ensure proper management of pollutants and comply with the rules regarding storage areas for these products  
- Avoid leaks and spills of petroleum and hydrocarbon products | Negligible | ONEE - WB/Works Company | Included in the technical requirements for environmental and social management during the construction phase developed for the programme |
<table>
<thead>
<tr>
<th>Phase</th>
<th>Environment Concerned</th>
<th>Negative Impacts Identified</th>
<th>Magnitude of the Impact</th>
<th>Recommended Measures</th>
<th>Residual Impacts</th>
<th>Responsible Entity/ Timeframe</th>
<th>Summary Cost of Measures</th>
</tr>
</thead>
</table>
|       |                       | - Exhaust and dust emissions | Average                | - Construct earth tank dykes with sufficient holding capacity around fuel, lubricant and bitumen storage tanks to contain possible leaks  
- Keep these products tightly sealed and properly identified  
- Provide areas for the storage or handling of hazardous, toxic, flammable, explosive or polluting products  
- Prohibit all direct discharges into the natural environment | Negligible | ONEE - WB/ Works Company | • Budget to be defined by the companies (included in the cost of works)  
• Estimates:  
  Maintenance: MAD 500/vehicle  
  Helmets: MAD 50/helmet / worker/ year |
<table>
<thead>
<tr>
<th>Phase</th>
<th>Environment Concerned</th>
<th>Negative Impacts Identified</th>
<th>Magnitude of the Impact</th>
<th>Recommended Measures</th>
<th>Residual Impacts</th>
<th>Responsible Entity/Timeframe</th>
<th>Summary Cost of Measures</th>
</tr>
</thead>
</table>
|       | Water Resources       | - Risk of accidental pollution of drinking water due to contact between DWS pipes and the sewerage network  
- Pollution related to solid and liquid waste mismanagement  
- Temporary change in the hydrographic flow | Average | - Ensure that the DWS network is well secured from sewerage networks (during works in urban centres, lay DWS pipes at least 0.5m above)  
- Coordinate the works with other users of the territory  
- Control traffic to avoid spills  
- Provide drainable latrines for the collection of wastewater  
- Equip the pits with well-points  
- Preserve the vegetation near wadis  
- Do not refuel vehicles nearby  
- Take all possible precautions when refuelling vehicles on-site to avoid possible spills.  
- Schedule works in areas prone to flooding or heavy runoff for periods outside the flood or rainy seasons  
- Do not obstruct the drainage and provide recovery measures.  
- Avoid obstructing streams, ditches or any other channel.  
- Remove any debris (bulky waste) that obstructs the normal flow of surface water  
- Channel runoff and drainage water to bypass the work site | Negligible | ONEE - BE/Works Company |  
- Included in the technical specifications for environmental and social management in the construction phase and the general coordination plan for safety and health protection, developed for the programme  
- Budget to be defined by the companies (included in the cost of works)  
- Estimates:  
  Maintenance: MAD 500/vehicle  
  Helmets: MAD 50/helmet/worker/year  
- Included in the cost of works  
Estimate for information purposes:  
MAD 8000/latrine  
For wells:
<table>
<thead>
<tr>
<th>Phase</th>
<th>Environment Concerned</th>
<th>Negative Impacts Identified</th>
<th>Magnitude of the Impact</th>
<th>Recommended Measures</th>
<th>Residual Impacts</th>
<th>Responsible Entity/Timeframe</th>
<th>Summary Cost of Measures</th>
</tr>
</thead>
</table>
|                          | Biodiversity            | - Risk of disturbance of existing flora and fauna  
- Destruction of vegetation cover, degradation of native plant communities and felling of trees | Low                     | - Protect possible fragile ecosystems by bypassing them; reforest and revegetate after completion of works at the most sensitive locations to protect areas at risk of erosion  
- Avoid as much as possible removing existing vegetation at the wadi beds  
- Restore the vegetation cover with species adapted to the area by liaising with Water and Forestry services if the cleared trees belong to their domains and not to the Equipment Service | Negligible       | ONEE - WB/Works Company                                           | MAD 600/m³       |
|                          | Human Environment       | - Disruption of residents and risk of undermining the stability of their houses              | Average                 | - Plan a work schedule that will avoid disrupting the lifestyle of local residents  
- Limit access to the site to site personnel and clearly indicate existence of the site in the most sensitive areas  
- Ensure the safety of persons using the RN9 (pedestrians and bicycle riders) by fencing off and putting up appropriate signage at the work site  
- Implement a communication programme to inform the local residents about the works in progress  
- Implement appropriate measures to reduce works-related nuisance | Negligible       | ONEE - WB/Works Company                                           | • Included in the cost of works  
• Indicative estimate: MAD 1218/planting of mimosa-type trees (maintenance costs for a 10-year period: MAD 1145 for the first 10 years) (7) |                      |

---

<table>
<thead>
<tr>
<th>Phase</th>
<th>Environment Concerned</th>
<th>Negative Impacts Identified</th>
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<th>Summary Cost of Measures</th>
</tr>
</thead>
</table>
|       | Traffic and road safety | - Disruption and increase in traffic/risk of accidents | Average | - Ensure the safety of residents and bystanders during the works by applying appropriate measures (fence, supervisor, etc.)  
- Ensure the stability of fragile houses built with adobe bricks before embarking on the works  
- Reinforce concrete or stone structures  
- In extreme cases, evacuate the inhabitants. Provisional relocation should be provided for (included as extreme cases) | Negligible | ONEE - WB/Works Company | • Included in the technical requirements for environmental and social management during the works phase and the general coordination plan for safety and health protection, developed for the programme  
Minimal cost since the measures relate to best practice |
<table>
<thead>
<tr>
<th>Phase</th>
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<th>Magnitude of the Impact</th>
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<th>Summary Cost of Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Risks of worksite accidents and damage to health</td>
<td>Average</td>
<td>- Clean up access roads used by transport vehicles and machinery by removing any accumulation of loose materials and other debris &lt;br&gt; - Rehabilitate pavements degraded by the works</td>
<td>Negligible</td>
<td>ONEE - WB/Works Company</td>
<td>Included in the cost of works&lt;sup&gt;8&lt;/sup&gt; &lt;br&gt; • Included in the coordination of the general plan for safety and health protection developed for the programme. &lt;br&gt; Budget to be determined by the companies &lt;br&gt; Estimated cost PPE: MAD 800/ PPE/worker &lt;br&gt; Notices: MAD 300/notice in A2 format</td>
</tr>
</tbody>
</table>

<sup>8</sup> N.B: Worksite installation and project site restoration costs are generally estimated by the companies at between 1 and 2% of the cost of the contract.
<table>
<thead>
<tr>
<th>Phase</th>
<th>Environment Concerned</th>
<th>Negative Impacts Identified</th>
<th>Magnitude of the Impact</th>
<th>Recommended Measures</th>
<th>Residual Impacts</th>
<th>Responsible Entity/ Timeframe</th>
<th>Summary Cost of Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post Works</td>
<td>Archaeology and heritage</td>
<td>Risk of damage to historical and cultural heritage</td>
<td>Low</td>
<td>- Works interruption in accordance with Law 22-80 on the protection of the cultural heritage</td>
<td>Low</td>
<td>ONEE –WB</td>
<td>Cost not estimated because it relates to cases of special task forces under the company's contract</td>
</tr>
<tr>
<td></td>
<td>Soil • Water Resources • Safety and public health</td>
<td>- Danger linked to the presence of abandoned equipment and construction site waste (health-threatening pollution/ safety compromised) • Risk of destruction of drainage and irrigation networks (in the case of the Tangiers area)</td>
<td>Average</td>
<td>Site rehabilitation</td>
<td>Low</td>
<td>ONEE –WB / Works Company</td>
<td>Lump sum to be determined by the companies</td>
</tr>
<tr>
<td>Operation</td>
<td>Soil</td>
<td>- Risk of erosion of the soil and the gravity-driven pipelines, especially on steeply sloped land</td>
<td>Average</td>
<td>- Conduct of soil conservation operations: revegetation; tree planting to replace felled trees, storm water drainage</td>
<td>Negligible</td>
<td>ONEE – WB</td>
<td>Ten-year routine maintenance of plants: MAD 1145 the first 10 years per plant</td>
</tr>
<tr>
<td>Physical Environment</td>
<td>Soil</td>
<td>- Poor management of reagents and discharges from the treatment plant, especially sludge</td>
<td>Low</td>
<td>- Sludge treatment prior to removal to the dumping ground • Proper management of waste generated by the presence of workers</td>
<td>Negligible</td>
<td>ONEE – WB</td>
<td></td>
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<tr>
<td></td>
<td>Water Resources</td>
<td>- Pollution due to liquid discharges (wash water from treatment tanks) and solid discharge (sludge from treatment facilities)</td>
<td>Average</td>
<td>- Proper storage of sludge from drying beds and removal to dumping ground • Neutralisation of discharged water prior to removal to the natural environment</td>
<td>Low</td>
<td>ONEE –WB</td>
<td>Annual maintenance cost of treatment plants</td>
</tr>
<tr>
<td>Phase</td>
<td>Environment Concerned</td>
<td>Negative Impacts Identified</td>
<td>Magnitude of the Impact</td>
<td>Recommended Measures</td>
<td>Residual Impacts</td>
<td>Responsible Entity/ Timeframe</td>
<td>Summary Cost of Measures</td>
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</table>
|       |                      | - Pollution due to lack of an efficient rural sanitation system | Average | - Compliance with the discharge standards in force  
 - Adopt rural sanitation systems adapted to the specificity of each area | Average and permanent | ONEE – WB | Cost of routine maintenance of stations |
| Human Environment | Landscape | Landscape degradation due to the presence of equipment and visual nuisance |                         | - Ensure the burial of waterworks wherever possible  
 - Integration of facilities in the general environment: revegetation, choice of materials and external paint colours in harmony with the architectural features of the area served |                      |                      |                          |
|       | Health               | - Risk of water supply contamination  
 - Degradation of the living environment and resurgence of waterborne diseases due to lack of an inefficient sanitation system in rural areas | High | - Ensure the proper functioning of all existing facilities through a regular maintenance and monitoring programme  
 - Conduct water quality control and health monitoring campaigns to ensure compliance with current standards  
 - Conduct awareness campaigns based on to the key principles of public hygiene and the latter's impact on health, and the risks related the wastewater handling | Low | ONEE – WB | Routine maintenance of plants |
|       | Service              | - Inconvenience in the event of very frequent cuts  
 - Interference with activities in the surrounding area | High | - Stabilization of pipelines by laying concrete footings for erosion-prone areas  
 - Control of pipelines by remote management to ensure rapid intervention of specialised repair teams in case of breakage or leakage | Average | ONEE –WB / Public Works Company | No additional cost |
9. **Institutional Arrangements and Capacity Building Requirements**

9.1 **Technical Capacity Related to the Drinking Water Control Sector**

The quality control of the water produced and distributed by ONEE-Water Branch is provided by a central laboratory and a network of 98 decentralised laboratories distributed throughout the Kingdom. At all stages of production, supply and distribution, the quality of water is subject to numerous physical, chemical, bacteriological and biological controls.

The laboratory is provided with modern equipment that enables it to determine more than 250 parameters involving over 40 types of analysis reports, depending on the purpose of the control. These analyses are performed using water samples (treated, raw, waste, brackish, sea, brine), sediments, treatment products, biological tissues, etc.

Since 1978, ONEE-Water Branch has had a Water Technology Training Centre (CFTE) located within the Bouregreg Complex in Rabat. The centre has significant human resources (10 managers and individual contractors and about 100 experienced trainers, all of whom contribute to the running of the training modules), proper infrastructure (about 10 equipped rooms), drinking water workshops and platforms, sanitation platforms for practicals, a mobile training unit, a pilot purification plant, a library, classrooms and IT equipment, a conference centre, an accommodation centre with 94 beds and a capacity for about 200 people.

9.2 **Capacity in the Environmental and Social Components**

*Environment Components*

The Environment Division (DAE/V) of ONEE-WB Directorate of Sanitation (DAE) is responsible for, among others:

(i) Developing the water resource protection strategy of the Authority and promoting its environmental and sustainable development policy;

(ii) Developing and implementing action plans necessary for the protection of water resources and the environment as a whole;

(iii) Ensuring the integration of environmental and sustainable development actions into the various activities of the Authority;

(iv) Capitalising on the environmental assessment process and proposing areas for improvement; and

(v) Preparing and supervising the implementation of environmental and social management plans (ESMPs) for water supply and sanitation projects.
This Division comprises two services:

- The resource protection study service, tasked mainly with: (i) formulating the Authority's water resource protection strategy, and adopting action plans for the protection and preservation of resources, and carrying out water resource protection studies;

- The environmental studies service tasked with ensuring: (i) the adoption of the environmental and sustainable development approach in the performance of the Authority's activities; (ii) conducting/coordinating the environmental assessments of water supply and sanitation projects; and (iii) developing and supervising the implementation of environmental and social management plans (ESMPs) for drinking water supply (DWS) and sanitation projects.

With the support in terms of technical assistance, the Environmental Division of ONEE-Water Supply Branch will ensure:

- Pre-start verification of the site
- Site inspection visits and supervision during works implementation
- Supervision of project site waste management
- Monitoring of drainage, noise and dust management at the project site; and
- Verification of the implementation of safety and personnel protection measures.

In terms of human capacity, the Division has four (4) employees, two of whom are responsible for monitoring the implementation of the ESMP for the ADB-13 project. Under the ADB-14 programme, the same arrangement will be maintained to monitor the implementation of ESMP measures by the successful contractors, in collaboration with technical assistance extended to the technical departments concerned. It is worth noting that the officers charged with monitoring received training on the Bank's environmental and social safeguards, and environmental and social procedures (ESS and ESAP) in 2015. In addition, ad hoc interventions by a Health, Safety and Environment (HSE) Expert will be programmed as part of the technical assistance planned under this programme. This expert will support the Division’s team in supervising and monitoring the ESMP implementation, and the fulfilment of commitments regarding the protection of the natural and social environment.

**Expropriation and Compensation Component**

The implementation of the Resettlement Framework will be monitored by the Directorate of Legal Affairs (DAJ), in collaboration with the Regional Directorates concerned. The DAJ will be responsible for:

- Identifying, in collaboration with ONEE's technical services and the municipalities, the land activities to be carried out in implementation of the expropriation and compensation programme;
• Conducting land research activities with the authorised bodies to clearly identify the legal and land status of all land concerned by the expropriation and compensation programme;

• Planning and implementing the required land regularisation operations;

• Preparing land clearance formalities: preparing the expropriation files of the parcels for submission to Conciliation Commission (CC), participating in the work of the CC, carrying out the registration of, payments for and monitoring of expropriation files;

• Following up of legal expropriation files, in case of legal proceedings;

• Carrying out registration in financial services;

• Completing the registration formalities with the land registry; and

• Managing land assets (monitoring sheet, updating, etc.).

In terms of capacity, the ONEE staff assigned to monitor the administrative and litigation components of the expropriations may be summarised as follows:

• Regional Directorate: Legal and Land Affairs Department: 2 legal executives per regional directorate and 1 Survey Technician;

• Central directorate: 8 officers mobilised during the administrative and litigation phases.

As part of the technical assistance provided for under this programme, it is planned to strengthen these resources with the services of:

• A sociologist who will intervene on an ad hoc basis and will be mainly tasked with the preparation of a Resettlement Action Plan (RAP) for each sub-project and a Stakeholder Commitment Plan (PEPP);

• A surveyor; and

• A technician specialised in land in matters.

**Monitoring and Evaluation:**

A monitoring and evaluation expert will be part of the technical assistance team. He/she will contribute to the monitoring and evaluation component during the implementation of the Environmental and Social Management Plan component of sub-projects. The project coordination body will forward quarterly reports on the monitoring of ESMP implementation to the Bank.
**Communication and Awareness:**

The communication component will be implemented and monitored by the Communication Division of the Cooperation Directorate. To that end, a communication plan has been prepared for the programme. The skills and expertise of the Division will be strengthened through the technical assistance provided under the ADB 14 programme by bringing on board a social communication expert, whose main responsibility will be to finalise the Communication Plan and participate in implementing the said Plan and in developing the PPGTP.

**10. Cost Estimates**

The costs of the main environmental and social measures required to mitigate the project's negative impacts are presented in the table below. It should be noted that most of the costs, such as those concerning the installation and dismantling of the site by the company, signage, workers' protection, etc., will be directly incorporated into the company’s bid and monitored by ONEE.

<table>
<thead>
<tr>
<th>Specification of Measures</th>
<th>Cost in MAD</th>
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<tbody>
<tr>
<td>Land expropriation</td>
<td>164 000 000</td>
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<tr>
<td>Mitigation measures during the construction phase (for the record)*</td>
<td>2 500 000*</td>
</tr>
<tr>
<td>Mitigation measures during the operation phase</td>
<td>Operating Cost</td>
</tr>
<tr>
<td>Improvement of environmental performance</td>
<td>1 700 000</td>
</tr>
<tr>
<td>Communication and awareness-raising</td>
<td>750 000</td>
</tr>
<tr>
<td>Technical assistance</td>
<td>2 100 000</td>
</tr>
<tr>
<td>- Monitoring of ESMP implementation (Hygiene, Security and Environmental (HSE) Expert)</td>
<td>1 100 000</td>
</tr>
<tr>
<td>- Preparation of Resettlement Action Plans (RAPs) and Stakeholder Commitment Plans (PEPP)</td>
<td>1 000 000</td>
</tr>
<tr>
<td>Contingencies</td>
<td>500 000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>171 550 000</strong></td>
</tr>
</tbody>
</table>

*At the company’s expense

**11. Implementation Schedule and Information Release**

The environmental and social measures will be implemented concurrently with the works (scheduled below). Each quarterly progress report submitted by the Project Implementation Unit will include a portion on the progress of the environmental and social component of the project.
<table>
<thead>
<tr>
<th>Project</th>
<th>Description of Lots</th>
</tr>
</thead>
</table>
| Study to Strengthen DWS in Guercif-Debdou Region from the TARGA DU MAD1 Dan | Lot 1: Treatment plant  
Lot 2: Raw water pipeline  
Lot 3: Treated water pipeline  
Lot 4: Remote management  
Lot 5: Power line |
| Study to Supply Raw Water to the Al Hoceima Treatment Station from the Projected Oued Ghiss Dam | Lot 1: PIPELINE  
Lot 2: Raw water pipeline  
Lot 3: Treated water pipeline  
Lot 4: Remote management  
Lot 5: Power line |
| Study to Strengthen DWS in ZAOUINA Province from AGDEZ Dam               | Lot 1: Treatment plant  
Lot 2: Raw water pipeline  
Lot 3: Treated water pipeline  
Lot 4: Remote management  
Lot 5: Power line |
| Technical assistance                                                   | Consultation  
Decision  
Contract signed  
Works  
Commissioning |
12. **Conclusion**

The likely negative impacts of the project during the construction and operation phases are generally of low-to-medium importance. These impacts will be largely mitigated by appropriate measures, making it possible to recommend the implementation of the project from the environmental and social standpoint.

13. **References and Contacts**

**Bibliographical References**

<table>
<thead>
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<th>TITLES</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>EIA Zagora July 2017 version</td>
<td><em>Groupement Team Maroc – Montmasson</em></td>
</tr>
<tr>
<td>EIA of the channelling of raw water from the Ibn Battouta Dam to the Mharhar treatment plant - January 2018 version</td>
<td>Cabinet Setragec</td>
</tr>
<tr>
<td>Environmental impact assessment of the supply of raw water to the Al Hoceima treatment plant from the planned Wadi Ghiss Dam - Provisional version, undated</td>
<td>Cabinet CID</td>
</tr>
<tr>
<td>EIA of drinking water supply to the Souk Sebt area from the Afourer treatment plant - Final version, undated</td>
<td>Cabinet CID</td>
</tr>
<tr>
<td>EIA of the DWS Enhancement Project in the Guercif-Debdou region - Final version, undated</td>
<td><em>Groupement Team Maroc – Montmasson</em></td>
</tr>
<tr>
<td>Resettlement Master Plan</td>
<td>ONEE</td>
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<tr>
<td>Communication Plan</td>
<td>ONEE</td>
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</tbody>
</table>

**Contacts**

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