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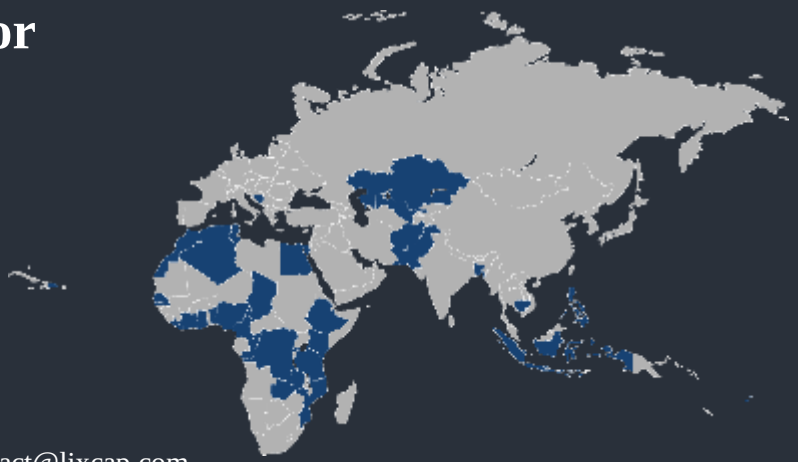
Environmental and Social Impact Assessment for Ifria

Souss Massa

March 2023

Past Performance Geography



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1 Introduction

1.1 Project display

1.1.1 Overview

Ifria is an integrated cold chain development company (DevCo) focused on the development and operation, under franchise, license or directly, of cold chain logistics assets ranging from storage/logistics centers added value to the first mile cold chain.

Ifria has received funding from USDFC and IFC for the implementation of cold chain cold storage infrastructure in Morocco. This project is perfectly in line with a sustainable development approach to the agricultural, pharmaceutical and other perishable product value chain, and materializes the objectives and orientations of the Green Generation Plan Strategy (2020-2030) and the economic development of the Souss Massa region.

Ifria wants to install a modern Cold Warehouse in the Ouled Teima industrial zone in the Souss Massa region of Morocco. Its infrastructure will integrate measures to mitigate the impact of the project on the environmental component by installing solar panels, best quality insulation and equipment to reduce water use, among other things. Ifria is a temperature-controlled logistics service provider that will manage the supply chain for agri-food and pharmaceutical products. Ifria will offer its cold rooms and services to agricultural, agri-food and pharmaceutical players in the region.

The installation of a cold chain warehouse in the Souss Massa region is going to have a significant positive impact on various aspects of the supply chain, especially for companies and farmers who deal in perishable goods or produce. pharmaceuticals requiring temperature-controlled storage and transport. Among these main impacts:

1. Improved product quality, especially for export: A cold chain warehouse ensures that perishable products are stored at the optimum temperature, helping to maintain product quality and integrity.
2. Reduced post-harvest losses: With the Ifria warehouse to be set up, produce is less likely to spoil or be damaged due to temperature fluctuations, reducing post-harvest losses and improves overall supply chain efficiency.
3. Improved safety and compliance: For some industries such as pharmaceuticals, installing a cold chain warehouse is essential to comply with regulatory requirements and ensure consumer safety.

In this report we will deal in detail with the main impacts generated by the activities of the unit (cold storage) planned in the region of Souss Massa and the measures taken by the operator to mitigate these impacts as well as the monitoring program. and environmental monitoring.

The sketches of the project under consideration are attached. (Appendix Unit sketches)

1.1.2 Scope of the environmental and social impact study

The delimitation of the zone of influence is drawn up taking into account the foreseeable impacts on the components of the physical, biological and human environment.

The area of influence of the project delimited within the framework of this study takes into account the city of Ouled Teima.

The environmental and social impact study will describe the environmental and social conditions of the project area of influence, identify the environmental, social and economic impacts and benefits of the project, and recommend mitigation measures. The study is organized into six chapters. The environmental and social impact study will address the following factors:

- Review relevant documentation and literature related to the program (including feasibility studies and master plans) so that appropriate plans and social and environmental management instruments can be developed and developed, ensuring that particular attention is given to achieving the objectives of the project concepts;
- Develop a procedure to identify potential environmental and social impacts of specific activities, and measures to address and manage those impacts; or whether there are potentially significant effects on natural habitats, physical or cultural resources at particular project work sites that would require further and separate analysis due to these complexities; Create appropriate mitigation measures to be incorporated into project contract documents;
- The ESIA should also include legal and institutional arrangements and information on the agency or agencies responsible for overseeing project impacts;

1.1.3 Project location and access

The project site is located in the industrial zone of Ouled Teïma, Province of Taroudant. Direct access to the site is via the national road N10 passing through the center of the urban area of this city. Ifria is considering building its project on an area of 22,000 m², with a constructed area of 4,200 m² during the first phase of the project.

Batch number	Area in m²
74	1102
75	1102
76	1102
77	1102
78	2409
79	2409
80	2449
81	2450
82	3126
83	2351
84	2466
Total	22,068

The following figure shows the location plan of the project (Zone Industrielle Ouled Teima)

The site is located in an industrial zone already fitted out with a road network, sewage network and electricity. Here are the plans of the site and the lots that will be occupied by Ifria.

Here are pictures of the site





1.1.4 Report structure

The study report is prepared according to the table shown below:

Table 1: Structure of the environmental and social impact study report

Chapter	Content

Chapter 1 – Introduction	Provides a brief history of the project, as well as the purpose, methodology and structure of the report.
Chapter 2 – Legal framework	Describes relevant policies and environmental and social guidelines and policies
Chapter 3 – Environmental Reference State	Provides a detailed baseline condition of the existing physical, biological and socio-economic environment in the project area.
Chapter 4 – Potential environmental impacts	Presents the foreseeable impacts on the physical, biological and socio-economic and cultural environment due to the proposed project.
Chapter 5 – Social Reference State	Provides a detailed baseline condition of the existing physical, biological and socio-economic environment in the project area.
Chapter 6 – Potential social impacts	Presents the foreseeable impacts on the physical, biological and socio-economic and cultural environment due to the proposed project.
Chapter 7 – Mitigation Measures	Provides mitigation measures to reduce, mitigate, offset and prevent various impacts resulting from the proposed project during construction and operation.

1.2 Summary of impacts and mitigation measures

Table 2: Summary of Environmental and Social Impacts and Mitigation Measures (Construction Phase)

Possible effects related to the project	Effect characteristics				Reduction measures
	Intensity	Extent	Duration	Significance	
Climate	Weak	Punctual	Short	Minor	• Use machinery and vehicles in good working order • Ensure regular maintenance and technical inspections of construction machinery and vehicles
Floor	Mean	Punctual	Short	Minor	• Landscape excavated areas to allow native vegetation to grow back naturally. • Suspend activities during extreme precipitation events • Be sure to provide drainage channels and silt traps for all parts of the topsoil storage areas. • Be sure to reclaim areas with topsoil and revegetate them after activities are completed. • Use non-toxic and readily biodegradable chemicals on site when possible. • Install natural or synthetic liners under chemical storage tanks. • Level unpaved roads
Surface water	Mean	Local	Short	Mean	• Ensure that sediment and erosion control measures are installed. • Follow guidelines and procedures for immediate cleanup of spills (oil, fuel, chemicals). • Cover open stockpiles of building materials on site with tarps during storms to prevent building materials from being washed away.
Underground waters	Mean	Local	Short	Mean	

					• Install natural or synthetic liners under chemical storage tanks. • Compact earthworks as soon as the final surfaces are formed to prevent erosion, especially during the rainy season. • Be sure to grade gravel roads to maintain existing drainage patterns. • Ensure the protection of riparian areas • Take care to avoid the dumping of construction waste into waterways. • Ensure that chemicals and materials used on the job site are properly stored.
Vibration	Mean	Punctual	Mean	Mean	• Choose intrinsically silent equipment • Keep equipment speed as low as possible • Minimize idling time for pickup trucks and other equipment. • Limit working hours on site when possible • Ensure that all workers exposed to environmental noise are equipped with appropriate hearing protection and PPE. • Schedule noisy activities during the morning hours • Set up noise monitoring • Inform the local population when loud activities are planned. • Properly use and maintain mufflers that reduce vibration from construction machinery. • Use only well-maintained mechanical equipment on the job site.
Air quality	Mean	Local	Short	Mean	• Ensure proper maintenance and repair of equipment and machinery. • Adopt a traffic management plan avoiding congested roads.

					• Ensure vehicles and machinery are turned off when not in use. • Hose down surfaces to control dust emissions • Avoid burning materials resulting from site clearance. • Make sure people working in dusty areas have PPE. • Ensure the use of high quality diesel for generators and vehicles. • Maintain a minimum traffic speed on the site and on access roads. • Make sure building materials and hazardous substances are handled properly. • Cover all vehicles transporting materials likely to generate excessive dust emissions. • Water surfaces regularly to control dust emissions.
Noise	Mean	Local	Short	Mean	• Use equipment with low noise emissions, as indicated by the manufacturers. • Properly adjust and maintain all vehicles and machinery. • Where possible, conduct construction activities during daylight hours to minimize disturbance to humans and wildlife. • Limit working hours to 7 a.m. - 7 p.m. when activities are very noisy.
Wildlife	Weak	Punctual	Short	Minor	• Avoid killing any wild animal during the work; • Avoid killing any wild animal caught during the work and keep it away from the site; • Do not expose food or attract prey to avoid attracting predators (snakes among others) to the site; • Physically protect construction sites against snakes; • Avoid the elimination of wild animals during the work; • Prevent any hunting activity • Be sure to report wildlife species of high conservation value.

					• Avoid any direct or indirect impact on areas of high ecological value. • Ensure sustainable management of solid and liquid waste from construction and operating activities. • Ensure that exterior lighting on construction sites is discreet and switched off when not needed. • If these measures described above are taken into account, they will partially reduce the impacts during the operation phase.
Flora	Weak	Punctual	Short	Minor	• Reduce the direct destruction of vegetation as much as possible by delimiting the surfaces of construction sites, barracks, access tracks and sites for the storage and extraction of construction materials to the strict minimum and by concentrating all activities within these sites. • Identify and clearly delineate the sites (marking them with ribbons, informing the workers) and the areas not to be damaged, considering their ecological value (denser vegetation, etc.). • Take all preventive measures to avoid damaging the surrounding environment, in particular agricultural land; • Protect the species present; • Carry out the adjustment and restoration of the premises after the work.
Odors	Weak	Punctual	Short	Minor	
Waste management	Mean	Local	Short	Mean	Identify all waste streams for effective management • Manage waste based on the three Rs (reduce, reuse, recycle) • Train all staff. • Minimize the production of waste that must be treated or disposed of. • Control placement of all construction waste (including spoil) in approved disposal sites (>300m from rivers,

					streams, lakes or wetlands). Deposit in authorized areas all waste, metals, used oils and surplus materials produced during construction, integrating systems for recycling and separation of materials. Identify and delineate equipment maintenance areas (>15m from rivers, streams, lakes or wetlands). • Sign a contract for the recovery and treatment of hydrocarbon waste, filters, irons, batteries and other non-biodegradable waste with a company that has an environmental permit • Set up a concrete washing area for vehicles and machinery with an oil separator
Cultural properties	Weak	Punctual	Short	Minor	• Reinforce the presence of visual plant screens vis-à-vis the landscape of the area and the axes of communication of rural localities. • Reinforce the plantations at the level of the fence taking into account the orientations of the prevailing winds and constitute a diversified and coherent screen fitting into the landscape.
Cultural landscapes	Weak	Punctual	Short	Minor	
Health and safety of site workers and users	Mean	Local	Short	Mean	• Provide staff with adequate Personal Protective Equipment (PPE) (helmets, safety shoes, boots, etc.) • Provide the site with an infirmary and first aid equipment; − register employees with the National Social Security Fund (CNSS); • Raise awareness among employees and local populations on hygiene, health and safety at work; • Develop and apply a Health, Safety and Environment Plan (PHSE); • Train employees in safety and risks and ensure compliance with the wearing of personal protective equipment (PPE) on construction sites; • Put up signs near the work areas (approximately 100m).
Road traffic	Mean	Local	Short	Mean	• Sensitize the local populations as well as the project drivers on road safety

					• Put up signs to indicate the presence of the works.
Quality of life of the population	Mean	Local	Short	Mean	• Ensure sorting, collection and transport to the waste management center • Inform and raise awareness among the personnel and users of the industrial zone • Ensure the cleaning and removal of the site after the work.

2 Legal framework

The Moroccan legislative and legal frameworks are characterized by a large number of texts, the first of which date back to 1914.

Legislative texts have as a basic principle:

- The protection of the private property of the heritage of the state with a view to the protection of public health;
- Maintaining the quality of the borrowed product which should be returned in its original state.

The national environmental authority has developed a national environmental strategy. The legal texts are based on the following:

- Protection and sustainable management of water resources;
- Protection and sustainable management of soil resources;
- Air protection and the promotion of renewable energies;
- The protection and sustainable management of natural environments, particularly forests, oases and the coast;
- Prevention of natural disasters and major technological risks;
- Improvement of the urban and pre-urban environment; And
- Environmental management and communication.

Indeed, this strategy aims to:

- To guarantee the development of a legislative and regulatory arsenal for the protection and amendment of the environment harmonizing the requirements of environmental protection and those of socio-economic development;
- To carry out the legal unity of all the existing environmental texts as well as their unbreakable integration;
- Ensure synchronization of national environmental legislation with international environmental regulations.

Strengthening the legal and regulatory framework relating to the environment was the major concern of the country's senior officials. Indeed, on the subject of environmental protection, on May 12, 2003, three new laws were promulgated:

- Dahir n°1-03-59 promulgating framework law n°11-03 relating to the protection and development of the environment;
- Dahir No. 1-03-60 promulgating Law 12-03 relating to environmental impact studies (EIE);
- Dahir n°1-03-61 promulgating law 13-03 relating to the fight against air pollution.

This adoption made it possible to better define the general framework for environmental protection in Morocco and to significantly strengthen the legal and regulatory arsenal in terms of ecosystem protection. The different laws are:

- Framework law 99-12 on the National Charter for the Environment and Sustainable Development.
- Law 11-03 on the protection and enhancement of the environment;
- Law 12-03 on Environmental Impact Studies and its implementing decrees (Decree No. 2-04-584 setting the terms of organization and conduct of the public inquiry relating to projects submitted for study impact on the environment, and decree no. 2-04-563 relating to the powers and operation of the National Committee and the regional committees for environmental impact studies);
- Law 13-03 relating to the fight against air pollution and its implementing decree;
- Law 28-00 on solid waste management and disposal and its implementing decrees;
- Law 10-95 on water and its implementing texts;

Other legal texts complement those cited above and are adapted to the context of each project.

- Law 65-99 relating to the labor code;
- Municipal charter 78-00 as amended in 2002 and 2009;
- Law 54-05 relating to the concession of public services;
- Decree No. 2-05-1326 relating to water for food use;
- Dahir of 1914 relating to the public domain;
- Law 81-12 on the coast;
- Etc.

It is important to point out that the legal framework in terms of environmental protection continues to be strengthened and fed by several new texts and decrees recently promulgated, such as the decrees for the application of Law 12-03 on environmental studies. impact, the implementing decree for law 13-03 on air pollution and others, without however omitting to cite the national charter for the environment and sustainable development which presents a springboard towards a better consideration of the environmental concern in the realization of projects and in development in general.

2.1 Framework Law No. 99-12 on the National Charter for the Environment and Sustainable Development

The main concern of the charter is to include the realization of development projects in the promotion of sustainable development combining social progress and economic prosperity with the protection of the environment, and this in respect of the rights, duties, principles and values provided for in the charter.

Environmental rights refer to the right of every person to live in a healthy environment, which provides security, economic development, social progress, and where the natural and cultural heritage and quality of life are presented. These rights will be guaranteed by the charter. At the same time, and as environmental duties, every person, natural or legal, has the duty to protect and preserve the integrity of the environment, to ensure the sustainability of the cultural and natural heritage, and to improve the health and quality of life.

The values and principles of the charter are:

- Sustainable development ;
- Social progress;
- The preservation and enhancement of the natural and cultural heritage;
- Education and training;
- The preservation and protection of the environment;
- The pooling of resources;
- Access to information;
- The participation ;
- research and development;
- Responsible production and consumption;
- Precaution and prevention;
- The responsibility.

2.2 Law 11-03 for the protection and enhancement of the environment

This law (n°11-03) published in June 2003 sets the general framework for environmental protection in Morocco. This general law responds to the need to adopt a global and integrated approach ensuring the best possible balance between the need to preserve the environment and the country's economic and social development needs, by specifying:

- The principles of environmental protection related to human settlements and the protection of nature and natural resources;
- The principles of discharge standards and the definition of sources of nuisance;
- Environmental management and protection instruments, which are environmental impact studies, emergency plans, environmental quality norms and standards, and financial and fiscal incentives. The law also establishes a national fund for the protection and enhancement of the environment, the framework and operation of which will be determined by regulatory texts;

- Rules of procedure defining responsibilities and obligations in the event of damage.

The general provisions of this law aim to protect the environment against any form of nuisance causing its degradation, thus ensuring a clean environment and adequate living conditions. They also define the basic orientations of the legislative, financial and technical frameworks relating to the protection and management of the environment, and the establishment of a specific liability regime (Reparation and compensation) in the event of damage caused to the environment

The application of the provisions of this law requires the establishment of a balance between the requirements of national development and the protection of the environment. That said, it would be necessary to integrate the concept of environmental protection and ecological balance when drawing up sectoral development plans as well as territorial development plans and their execution, and to respect international pacts in all actions and in the development of environmental legislation. It is also based on the application of the "user pays" and "polluter pays" principles in the management of development projects and the provision of services.

Law 11-03 also aims to protect the soil, subsoil and its wealth against any form of degradation or pollution, and specific protection measures are enacted in this regard.

The allocation and development of the land for all purposes, whether agricultural, industrial, tourist, urban, or other likely to harm the environment, are subject to prior authorization depending on the case and in accordance with the conditions set by the legislative and regulatory texts

This law also encompasses the protection of marine spaces and resources, including the coastline, against the deterioration of the quality of water and marine resources and harm to human health. It also lays down the legislative and regulatory provisions governing the protection of the marine environment.

2.3 Law 12-03 relating to environmental impact studies and its implementing decrees

The law on impact studies aims to harmonize the procedures for drawing up and examining impact studies at the national level. This law delimits the field of application of the law enforceable against public and private projects which, due to their size or nature, are likely to have an impact on the environment.

It defines the objectives and content of an impact study and conditions the granting of any authorization for the realization of said projects to obtaining an Environmental Acceptability decision. This law also provides for a compliance check and sanctions in the event of violation of the law or of the texts adopted for its application.

The main provisions of this law are summarized as follows:

- **Article 1** presents a certain number of definitions concerning the environment, the impact study, the petitioner and the environmental acceptability of a project submitted to the environmental impact study;
- **Articles 2 to 4** specify that all projects for activities, works, facilities and works undertaken by any natural or legal person, private or public which, by reason of their nature and/or size, may harm the environment, must be the subject of an environmental impact study in their entirety.
- **Article 5** presents the purpose of the impact study. This must make it possible to evaluate, in a methodical and preliminary manner, the possible positive and negative repercussions of the activities of the project on the components of the environment, to eliminate, attenuate or compensate for their negative repercussions, to highlight and to improve the positive impacts on the environment, and especially to inform the population concerned about the negative impacts of the project on the environment;
- **Article 6** defines the headings that the impact study must include and which relate to a detailed description of the project of activities, works, facilities and works, an analysis of the initial state of the site and of its environment, an assessment of the foreseeable, direct and indirect consequences of the activities, works, facilities and works on the environment and the measures envisaged by the petitioner to eliminate, mitigate or compensate for the harmful consequences for the environment ; A monitoring and follow-up program for the project as well as the

measures envisaged in terms of training, communication and management with the aim of ensuring the execution, operation and development in accordance with the technical prescriptions and the environmental requirements adopted by the study;

- **Article 7** specifies that any authorization of projects subject to an EIA is subject to a decision of environmental acceptability, which constitutes one of the documents in the application file presented with a view to obtaining authorization for the project;
- **Article 8** deals with the national impact studies committee responsible for examining the studies and the environmental acceptability of the projects submitted for these studies.

And the decrees recently adopted: Decree n°2-04-584 fixing the modalities of organization and conduct of the public inquiry relating to projects subject to environmental impact studies, and decree n°2-04 - 563 relating to the powers and operation of the National Committee and regional committees for environmental impact studies.

2.4 Law 10-95 on water and its implementing texts

Law 10-95 on water provides for water management at the level of large watersheds. Hydraulic basin agencies have been created and have been operational since July 2001.

Published in the official bulletin on 09/20/1995, this law provides for the legal and regulatory provisions for the rationalization of water use, the generalization of access to water, inter-regional solidarity and the reduction differences between town and country. The contributions of this law are numerous and concern, in addition to the creation of hydraulic basin agencies, the establishment of a legislative arsenal relating to the fight against pollution and the protection of water resources and the hydraulic public domain, as well as imposition of penalties for violations. (Chapters 3 and 4).

The Water Act organizes the procedure for authorizing discharges (Chap. 1), lays down the basic rules for setting discharge standards (Chap. 2), and organizes the discharge fee, referring for its fixing in joint decrees of the ministries concerned (Chap. 3).

Law 10-95 on water, promulgated in 1995, provided for the provisions aimed at regulating deposits in general, and will encourage the rationalization and organization of discharges, which will ensure the preservation of water resources. against pollution by solid waste, and contribute to the protection of the environment in general

This law introduces several provisions to protect water resources from pollution due to solid waste of domestic or industrial origin. It prohibits depositing or burying solid waste in the constituent portions of the hydraulic public domain. It also submits any direct or indirect deposit likely to modify the characteristics of the water to the authorization of the Basin Agency.

These provisions make it possible to introduce the commitment of the waste manager, by means of the authorization, to respect the standards and specifications which will be fixed by regulation.

The implementing decrees for this law were published in the official bulletin of February 1998. They concern the procedures for authorizations for sampling and dumping in the environment, the demarcation of protection zones and perimeters for safeguarding and prohibition. They specify that the discharge, use and reuse of wastewater are subject to the authorization of the director of the basin agency concerned and pave the way for the effective application of the procedures for declaring existing discharges and subsequent payment. of the fee.

The Dahir of May 26, 1916 aims to specifically protect water intended for drinking water by prohibiting:

- To wash the linen and other objects, in particular meat or animal products in the waters of the seguias, pipes, aqueducts, pipes, reservoirs, wells which supply the agglomerations less than 10 m from it;
- To deposit unsanitary substances there or to install cesspools or cesspools within 20 m;
- To wash or bathe in it, to water animals, to wash or bathe in it.
- We quote certain decrees of application of the law 10-95:
- Decree No. 2-97-414 of Chaoual 6, 1418 (February 4, 1998) relating to the procedures for fixing and collecting the fee for the use of water in the public hydraulic domain;

- Decree No. 2-97-489 of February 5, 1998 relating to the delimitation of the DPH, the correction of watercourses and the extraction of materials;
- Decree No. 2-97-657 of Chaoual 6, 1418 (February 4, 1998) relating to the delimitation of protection zones and safeguard and prohibition perimeters;
- Decree No. 2-97-875 of Chaoual 6, 1418 (February 4, 1998) relating to the use of wastewater;
- Decree No. 2-05-1533 relating to autonomous sanitation;
- Decree No. 2-05-1326 relating to water for food use;
- Decree No. 2-04-553 of 13 Hijja 1425, January 2005 relating to spills, flows, discharges, direct or indirect deposits in surface or underground waters
- Decree No. 2-97-657 of Chaoual 6, 1418 (February 4, 1998) relating to the delimitation of protection zones and safeguard and prohibition perimeters.
- Decree No. 2-97-787 of 6 Chaoual 1418 (February 4, 1998) relating to water quality standards and the inventory of the degree of water pollution.

2.5 Decree No. 2-05-1326 relating to water for food use

This decree is a supplement to Law 10-95 on water (particularly Articles 58 to 66), and Decree No. 2-97-787, relating to water quality standards and the inventory of the degree of water pollution.

It is based on drinking water quality standards that must be met to ensure the distribution and supply of drinking water under conditions that do not harm public health.

The request for authorization for the supply of drinking water is addressed to the government authority responsible for health, accompanied by a study justifying the absence of other alternatives, the impossibility of making the water subject of the request drinkable under reasonable economic conditions, and demonstrating the absence of health risks.

The authorization request must indicate the origin of the water and the products to be used. It must be accompanied by:

- A copy of the water abstraction concession authorization;
- A technical study relating in particular to the quality of the water to be treated, the products to be used, the possible impact of this treatment on the health of populations, the treatment processes to be used and the different treatment phases.

If the population is supplied with drinking water by barrels or portable cisterns, it is subject to authorization issued by the government authority responsible for health.

The barrels and/or cisterns covered by the authorization must be clean, disinfected and must in no case have been used for the storage or transport of products that could have a negative impact on the quality of the water or create a health risk.

The decree also requires permanent monitoring and according to the standards in force of the quality of the water produced or distributed for food use, by the managers, operators or owners of the production or distribution facilities.

2.6 Decree relating to spills, flows, discharges, direct or indirect deposits in surface or underground waters

The first article of this decree n ° 2-04-553 of January 24, 2005, defines the spill as being any spill, flow, rejection, direct or indirect deposit in a surface water or an underground layer likely to modify the characteristics. physical, including thermal and radioactive, chemical, biological or bacteriological.

This decree is essentially based on the following principles:

- The water management unit is the hydraulic basin: the application for the discharge authorization is sent to the director of the relevant hydraulic basin agency. The authorization decision sets in particular:
    - The identity of the recipient of the discharge authorization;
    - The spill location;

    - The duration of the authorization which must not exceed 20 years, renewable by tacit agreement;
    - The sampling methods and the number of spill analyzes that the successful tenderer must carry out by an approved laboratory;
    - The quantities of quantities characteristic of the activity to be declared annually to the basin agency by the entities generating industrial wastewater;
    - Discharge limit values;
    - The terms and conditions for collecting the fee;
    - The time frames within which discharges must comply with the limit values.
- The physical, chemical, biological and bacteriological characteristics of any spill must comply with the discharge limit values, set by joint decrees of the government authorities responsible for the interior, water, the environment, industry and any other relevant government authorities;
- Water is a natural resource whose economic value must be recognized by applying the polluter-pays principle.

This decree mentions the authorization of Hydraulic Basin Agencies to collect royalties. The latter are due in return for the discharge authorization issued by the basin agency, and this when the discharge is likely to modify the physical, chemical or bacteriological characteristics, and that of the use of the water in the hydraulic public domain.

The proceeds from discharge fees are intended by the basin agency to grant financial aid for depollution and for technical assistance to any natural or legal person who undertakes specific water depollution actions.

2.7 Moroccan standard NM 03.7.001 on the quality of human drinking water

This standard sets the requirements that the quality of human drinking water must meet.

"Human drinking water" means

- Any water intended for drinking regardless of the method of production and distribution;
- Water used for the preparation, packaging or preservation of foodstuffs intended for the public

This standard is applicable to:

- To all water which, either in its "natural" state or after treatment, is intended for drinking, cooking, food preparation or other domestic uses, whether supplied by a distribution network, from a tank truck or tanker, in bottles or containers, including spring water.
- To all water used in food businesses for the manufacture, processing, preservation or marketing of products or substances, intended for human consumption, which may affect the safety of the final foodstuff, including edible ice waterborne.

2.8 Soil protection legislation

The legislator has established a specific legal regime for the defense and restoration of soils by means of their reforestation. The legal statutes thus established confer on the administration extensive powers for the preservation of the plant cover and its improvement.

The law and the decree of July 27, 1969 relating to the defense and restoration of soils allow for their part, by means that combine the constraint and the interest of landowners, to ensure reforestation and land use to specific cultural practices, with a view to combating erosion and ensuring the protection of works or property declared to be of national interest.

Through a fragmented system, comprising more than a hundred texts, the law in force seeks to safeguard natural resources, to organize their exploitation and at the same time to ensure the protection of public health and safety in their use.

One of the means by which the State has sought to limit the exploitation of natural resources has been the proclamation of their state ownership.

Activities likely to generate risks for hygiene, safety or sanitation are subject to prevention and control rules. This is the case for all inconvenient, unhealthy or dangerous establishments which are subject both with regard to their location and their installation, and the conditions of their operation, to close administrative control which may in particular impose special rules for the elimination of waste and reduction of nuisances.

2.9 Law No. 28-00 on solid waste management and its implementing decrees

Law 28-00 lays down the rules and fundamental principles which must henceforth constitute the basic reference system for everything relating to waste management and disposal. It makes it possible to establish a rational, modern and efficient management of the sector, respectful of the requirements of sustainable development and the protection of the environment. Its most important contributions can be summarized in the following points:

- It defines the different types of waste, specifies their management method and specifies the level of their management;
- It clearly regulates the management of hazardous waste by subjecting it to a system of prior authorization at all stages of its management, collection, transport, storage and disposal. It also prohibits any mixing of hazardous waste with other categories of waste, any burial, treatment or storage of this waste outside the facilities specially reserved for them;
- It lays down the rules for the organization of existing landfills, and calls for their replacement by controlled landfills, taking care to classify them into three distinct categories according to the type of waste they are authorized to receive;
- It makes planning a fundamental tool of the waste management system by providing for the establishment of three kinds of master plans, at three different territorial levels, corresponding to three distinct categories of waste: a national master plan for the management of hazardous waste, a regional master plan for the management of non-hazardous industrial, medical and pharmaceutical waste, agricultural and inert waste and a prefectural or provincial master plan for the management of household and similar waste;
- It sets up a system of accountability at source for waste generators, drawing inspiration from globally recognized basic principles such as the principle of prevention, the polluter-pays principle and the principle of correction by priority at source, the application of which in terms of waste management will help preserve human health and protect the environment with a view to sustainable development;
- It establishes a system of control and observation of infringements accompanied by sanctions that are both gradual and dissuasive of an administrative nature but also by fines and imprisonment according to the seriousness of the infringements committed;
- It takes into account the financial, technical and human constraints related to its application and provides, for this purpose, sufficiently important transitional measures and deadlines to enable all the operators concerned to bring themselves up to speed by implementing the appropriate facilities and infrastructure and the preparation of the human resources necessary for effective waste management.

Furthermore, it is important to emphasize that this law does not provide for the creation of new administrative structures. On the other hand, it refers to many regulatory texts that must specify the methods and procedures for its implementation and offers real prospects in terms of investment, employment and improvement of the living environment of citizens.

The implementing decree of this law decrees:

> **Article 1:** Pursuant to Articles 29 and 83 of Law No. 28-00 referred to above, waste is inventoried and classified, according to its nature and origin, in a catalog called "Moroccan Catalog of Waste", subject of Annex I of this decree.
>
> **Article 2:** Are considered hazardous waste, the waste designated in the said Catalog by Asterix (*). This waste is determined on the basis of the hazard characteristics listed in appendix II of this decree.

Article 3: The Moroccan Waste Catalog is revised as many times as necessary by order of the Minister responsible for the environment.

2.10 Law 13-03 on air pollution and its implementing decree

Law 13-03 relating to the fight against air pollution was published in the BO in June 2003. The implementing decrees for this law have not yet been published.

Chapter II of this law, in article 2 specifies that the law applies to any person, natural or legal, of public or private law, who owns or holds or uses or operates buildings or mining, industrial, commercial, agricultural or artisanal. It also applies to vehicles or machines with motors or apparatus for the combustion or incineration of waste or for heating or refrigeration.

Chapter III of this law, in article 4 specifies "that it is prohibited to release, emit or reject, to allow the release, emission or rejection into the air of pollutants such as toxic or corrosive, fumes, vapours, heat, dust, odors beyond the quality or concentration authorized by the standards set by regulation".

This article also specifies "that in the absence of standards set by regulation, the operators of the installations provided for in article 2 are required to apply the available and more advanced techniques in order to prevent or reduce emissions".

Decree No. 2-09-286 of 20 hija 1430 (December 8, 2009) setting air quality standards and air monitoring procedures, aims to set air quality standards and define the procedures for setting up air quality monitoring networks.

The decree set up the definition of terms related to the air quality alert threshold, concentration level, air quality index, station, monitoring network, emergency measures. It also sets the quality standards which must not be exceeded and which are set by the government authority responsible for the environment, in consultation with the ministerial departments and public establishments concerned. They are revised according to the same forms every ten (10) years and whenever necessities so require.

This decree also specifies the air quality standards concerning the following air polluting substances:

- Sulfur dioxide (SO2);
- Nitrogen dioxide (NO2);
- Carbon monoxide (CO);
- Suspended particles (MPS);
- Lead in dust (Pb);
- Cadmium in dust (Cd);
- Ozone (O3), and;
- Benzene (C6H6).

It also specifies the method of sampling and analysis which must comply with the regulations in force. The information thresholds, alert thresholds and emergency measures are set by joint order of the Minister for Energy, Mines, Water and the Environment, the Minister for Health, the Minister for interior after the opinion of the minister in charge of equipment and transport and the minister in charge of industry.

The table below presents the air quality standards dictated by the decree implementing Law 13-03:

Table 3: Air quality standards

Polluants	Nature du seuil	Valeurs limites
Dioxyde de soufre (SO2) µg/m3	Valeur limite pour la protection de la santé	125 centile 99,2 des moyennes journalières.
	Valeur limite pour la protection des écosystèmes	20 moyenne annuelle.
Dioxyde d'azote (NO2) µg/m3	Valeurs limites pour la protection de la santé	200 centile 98 des moyennes horaires 50 moyenne annuelle
	Valeur limite pour la protection de la végétation	30 moyenne annuelle.
Monoxyde carbone (CO) mg/m3	Valeur limite pour la protection de la santé	10 le maximum journalier de la moyenne glissante sur 8 h.
Matières en Suspension µg/m3	Valeurs limites pour la protection de la santé	50 centile 90,4 des moyennes journalière ; MP10.
Plomb (Pb) µg/m3	Valeur limite pour la protection de la santé	1 moyenne annuelle.
Cadmium (Cd) ng/m3	Valeur limite pour la protection de la santé	5 moyenne annuelle.
Ozone (O3) µg/m3	Valeur limites pour la protection de la santé	110 moyenne sur une plage de 8h
	Valeur limite pour la protection de la végétation	65 moyenne journalière ne devant pas être dépassée plus de 3 jours consécutifs)
Benzène (C6H6) µg/m3	Valeur limite pour la protection de la santé	10 moyenne annuelle

2.11 International standards governing noise pollution

In the absence of Moroccan regulations governing noise pollution, we rely on international regulations setting noise pollution standards.

The regulations set, for classified installations, sound levels limits acceptable to the neighborhood and a maximum level of emergence of noise from installations in relation to ambient noise.

For the admissible emergence values, the sound emissions of a classified installation must not generate, in areas with regulated emergence, an emergence greater than the admissible values set out in the following table:

Ambient noise level in ZERs (including THE noise of establishment)	Emergence eligible E dB(A)

	Period 7 a.m. - 10 p.m. except sundays And days holidays	Period 10 p.m. – 7 a.m. +sundays and days holidays
>35 dB(A) and ≤ 45dB(A)	6dB(A)	4dB(A)
> 45 dB(A)	5dB(A)	3dB(A)

Admissible levels at property boundaries may not exceed **70 dB(A) for the daytime period and 60 dB(A) for there period of night** except whether THE noise residual for the period considered East better than this limit.

In THE Case of the facilities located In A building housing, whether installation East located In A building inhabited or occupied by third parties, the permissible noise levels to be retained inside the premises neighbors inhabited Or busy by third parties must not exceed THE values below:

Kind of premises	Day	Period intermediate	Night
Premises housing, of care, ofrest, teaching	35dB(A)	30dB(A)	30dB(A)
Premises to activity of tertiary type	45dB(A)	45dB(A)	45dB(A)
Premises industrial No loud	55dB(A)	55dB(A)	55dB(A)

In the case of an installation located outside a building inhabited or occupied by third parties, the levels boundaries of noise are determined in function of there nature of urbanization, To leave of one value of base equalat 45 dB(A), to which corrections will be added to take account of the type of zone (hospital, residential, urban, etc.) And of the period hourly

2.12 Law 22-07 on protected areas in Morocco

Morocco has a natural heritage rich in rare species, natural ecosystems and landscapes of priceless. Aware of the importance of preservation, the State has been interested since the 1930s in the creation of national parks with the establishment of a Dahir on September 11, 1934 relating to the creation of parks and then a Viziriel Order on March 20, 1946 relating to the creation of an advisory committee for parks national and their application texts.

The design of this national network of protected areas as an enhancement of Morocco is based on the identification of a certain number of Sites of Biological and Ecological Interest (SIBE). This network is a tool functional in use of all to give A true sense At heritage natural Moroccan, assigning it objectives and recognizing a role worthy of its exceptional qualities in him conferring some kind a true value.

This policy, which aims in particular to establish a national network of areas protected covering all of the natural ecosystems throughout the Kingdom, is, however, governed by legislation old and whose provisions no longer meet the international criteria that should be applied to protected areas.

To better meet these international criteria and adapt to the evolution of the protection of the heritage natural, Also GOOD At level regional that international, THE sector To summer endowed of one frame legal framework which takes these developments into consideration and which can adapt to future developments, in harmony with the agreements And THE regional treaties and international to which the Morocco To subscribed.

AT this effect, this law specific to areas protected encompasses No only THE parks national, but also the other categories of protected areas, recognized worldwide, by adapting the criteria which are applicable to context policy And economic specific of OUR country.

There law in question stipulates To the article 2 This following :

Section 2 : A area protected East classified by administration, in terms of his features, of her vocation And of her socio-economic scope, in moon of the following categories :

- Park national ;
- Park natural ;
- Reserve biological ;
- Reserve natural ;
- Site natural.

2.13 Dahir of 1914 relating to the public domain

The Dahir of 1914 considering that there is a category of goods which cannot be possessed privately because they are for the use of all, and whose administration belongs to the State guardian of the community and that it is important to specify the nature and the legal situation of the goods remaining in the public domain as well as the rules which govern their management decreed:

Are part of the public domain in Morocco:

- The sea shore up to the limit of the highest tides, as well as a zone of 6 meters measured from this limit;
- Roadsteads, ports, harbors and their dependencies;
- Lighthouses, lanterns, beacons and generally all works intended for the lighting and beaconing of the coasts and their dependencies;
- Watercourses of all kinds and the springs that give rise to them;
- Gushing artesian wells; public wells and drinking troughs;
- Lakes, ponds, lagoons and salt marshes;
- Navigation, irrigation or draining canals executed as public works;
- Dykes, dams, aqueducts, pipelines and other works carried out as public works for the defense of the land against water, the supply of urban centers or the use of hydraulic forces;
- Roads, streets, paths and tracks, railways or tramways, bridges and generally communication routes of any kind for public use;
- Telegraph and telephone lines, pylons for wireless telegraphy;
- All works of defense and fortification of places of war or military posts and their dependencies;

And, in general, all the parts of the territory and all the works which cannot be owned privately as being for the use of all.

This dahir also specified that the public domain is inalienable and imprescriptible. However, areas recognized as having no public utility can be downgraded by decree.

2.14 Law 29-05 on the protection of wild fauna and flora

The purpose of this law is to protect and conserve species of wild flora and fauna, in particular by controlling the trade in specimens of these species.

To this end, it determines in particular:

- The categories in which are classified the species of wild flora and fauna threatened with extinction;
- The conditions of import, transit, export, re-export and introduction from the sea of specimens of these species as well as the documents that must accompany them;
- The conditions for raising, holding and transporting specimens of species of wild flora and fauna threatened with extinction;
- The measures applicable to the taking of specimens of these species from the natural environment and their multiplication or reproduction;
- The conditions for introducing or reintroducing specimens of wild flora and fauna species into the natural environment.

2.15 Law 12-90 on urban planning and its implementing decree

This law contains provisions for the protection of agricultural land. Its decree of application came out in 1993. Important provisions of this text provide for the preservation of agricultural land and forests, on the occasion of the development of various Master Plans and Urban Development Plans. Indeed, when new urban areas open, the limits of agricultural and forest land are fixed by regulation. Maps of agricultural and forest areas must be drawn up during the preparation of Urban Development Master Plans (SDAU).

2.16 Law 13-09 relating to renewable energies

It concerns the production of electricity from renewable sources. It establishes a legal framework offering prospects for the construction and operation of installations for the production of electrical energy from renewable energy sources, by natural or legal persons, public or private. It specifies in particular the general principles that they must follow, the applicable legal regime including for marketing and export.

2.17 Law 47-09 on energy efficiency

In particular, it encourages the systematic integration of energy efficiency measures in all sectoral development programs, encouraging industrial companies to rationalize their energy consumption, generalizing compulsory energy audits, implementing codes of energy efficiency specific to the different sectors, to promote the development of solar water heaters, to generalize the use of low-consumption lamps and equipment adapted to public lighting.

2.18 Law 65-99 relating to the labor code

The provisions of this law apply to persons bound by an employment contract regardless of its terms of execution, the nature of the remuneration, the method of payment it provides for and the nature of the company in which it is. executes, in particular industrial, commercial, artisanal enterprises and agricultural and forestry exploitations and their dependencies. They also apply to companies and establishments of an industrial, commercial or agricultural nature under the responsibility of the State and local authorities, or cooperatives, civil societies, unions, associations and groups of any kind.

The provisions of this law also apply to employees exercising a liberal profession, to the service sector and, in general, to persons bound by an employment contract whose activity does not fall within any of those mentioned above.

This labor legislation is characterized by its compliance with the basic principles set by the Constitution and with international standards as provided for in the conventions of the United Nations and its specialized organizations in relation to the field of labor.

Work is one of the essential means for the development of the country, the preservation of the dignity of man and the improvement of his standard of living as well as for the realization of the appropriate conditions for his family stability and his social development.

Labor is not a commodity and the worker is not a tool of production. It is therefore not permitted, under any circumstances, to carry out work in conditions that undermine the dignity of the worker.

Collective bargaining is one of the essential labor rights. Its exercise does not prevent the State from playing its role of protecting and improving working conditions and preserving the rights of the worker through legislative and regulatory texts. Negotiation takes place in a regular and compulsory manner at all levels and in all sectors and companies subject to this law.

Freedom of association is one of the main labor rights. Its exercise falls within the framework of the recognized means for workers and employers to defend their material and moral rights as well as their economic, social and professional interests.

This results in particular in the need to ensure the protection of trade union representatives and the conditions allowing them to accomplish their mission of representation within the company and to

participate in the process of economic and social development and to build relations healthy working conditions, in the interests of both workers and employers.

In accordance with the right to work provided for by the Constitution, any person who has reached the age for admission to work and wishes to obtain a job which he is able to exercise and which he actively seeks to obtain, has the right to benefit free of charge public services when looking for a decent job, retraining or training for possible promotion.

Everyone has the right to employment suited to their state of health, qualifications and abilities. Eue also has the right to choose his work in complete freedom and to exercise it throughout the national territory.

Companies subject to this law and which actively participate in the creation of stable employment positions may benefit from facilities and advantages fixed by legislative or regulatory means according to their nature.

The company is an economic and social cell enjoying the right of private property. It is bound to respect the dignity of the people working there and to guarantee their individual and collective rights. It works to achieve the social development of its employees, particularly with regard to their material security and the preservation of their health.

The rights protected and whose exercise, both inside and outside the company, is guaranteed by this law include the rights contained in the international labor conventions ratified on the one hand, and the rights provided for by the main conventions of the international labor organization, which include freedom of association and the effective adoption of the right to organize and collective bargaining:

- The prohibition of all forms of forced labour;
- The effective elimination of child labour;
- Prohibition of discrimination in employment and occupations;
- Equal pay.

This results in particular in the need to work for the standardization of the legal minimum wage between the different sectors in a progressive manner in consultation with the professional organizations most representative of employees and employers.

Everyone is free to engage in any activity not prohibited by law.

- No one can forbid others to work or force them to work against their will. The work may be prohibited by decision of the competent authority in accordance with the law, in the event of infringement of the rights of others or of public security and order.
- Any measure aimed at undermining the stability of employees at work for one of the following reasons is prohibited:
- Participation in a collective dispute;
- The exercise of the right to collective bargaining;
- pregnancy or maternity
- The permanent replacement of a worker who has suffered an accident at work or an occupational disease before the expiry of his convalescence period.

Employees must be informed by union representatives or, in their absence, by employee representatives of the information and data relating to:

- To the structural and technological changes of the company before their execution;
- The management of the company's human resources;
- The company's social balance sheet;
- The company's production strategy.

The provisions of this law are applicable throughout the national territory without discrimination between employees based on race, color, sex, disability, marital status, religion, political opinion, union, national or social origin.

The rights contained in this text are considered as a minimum of rights which cannot be waived.

In the event of contradiction between the legal texts, priority is given to the application of those which are the most advantageous for the employees.

During the procedure for the settlement of individual or collective labor disputes, the following are taken into consideration in order:

- The provisions of this law, the international conventions and charters ratified in this area;
- Collective agreements;
- The work contract ;
- Arbitration decisions and case law;
- Custom and usage when not inconsistent with the provisions of this Act and the principles mentioned above.
- General rules of law;
- The principles and rules of equity.

2.19 Legislation relating to the protection of historical and cultural heritage

Law 11-03 invokes in article 8, the national interest of the protection, conservation and enhancement of the historical and cultural heritage and establishes legislative and regulatory provisions which set the various measures to be taken to achieve these objectives. .

2.20 Montreal Protocol on Substances that Deplete the Ozone Layer

This protocol comes in addition to the previous Vienna Convention, it cites the substances causing the destruction of the ozone layer and calculation of the limit value. The use of the air conditioning system, refrigeration and cleaning in the different compartments makes the site eligible. Measures will be taken and implemented in the choice of equipment for the reduction of emissions related to equipment .

2.21 International agreement at the UNFCCC of 1997 (Kyoto Protocol)

Presence within the framework of the project of activities likely to generate greenhouse gases (CO2) implicated in the context of climate change. Also, pursuant to Article 2 of this agreement, all provisions to reduce these CO2 emissions must be implemented.

2.22 Stockholm Convention on Persistent Organic Pollutants (POPs)

Morocco has ratified the Stockholm Convention on Persistent Organic Pollutants (POPs) since 2004. The use of phytosanitary products and equipment should comply with the provisions for the use of approved phytosanitary products.

2.23 Convention concerning Discrimination (Employment and Occupation) 22 May 1961

The Convention on Discrimination in Employment is a convention developed by the International Labor Organization relating to the elimination of all discrimination in hiring and social exclusion. During the operation of the project, there must be no discrimination on the basis of religion, ethnicity, politics for the employees working on the site.

2.24 Minimum Age Convention (minimum age specified: 15 years) 06 January 2000

In view of the provisions of this agreement, no worker below this minimum age is admitted to employment or work on the project site.

3 Current environmental baseline

3.1 Introduction

3.2 Climate

The climate of Souss is complex because it results from the interference of three very different factors: a high and closed mountainous framework except in the west; the proximity of the ocean on which the valley opens wide, a "Saharan" latitude.

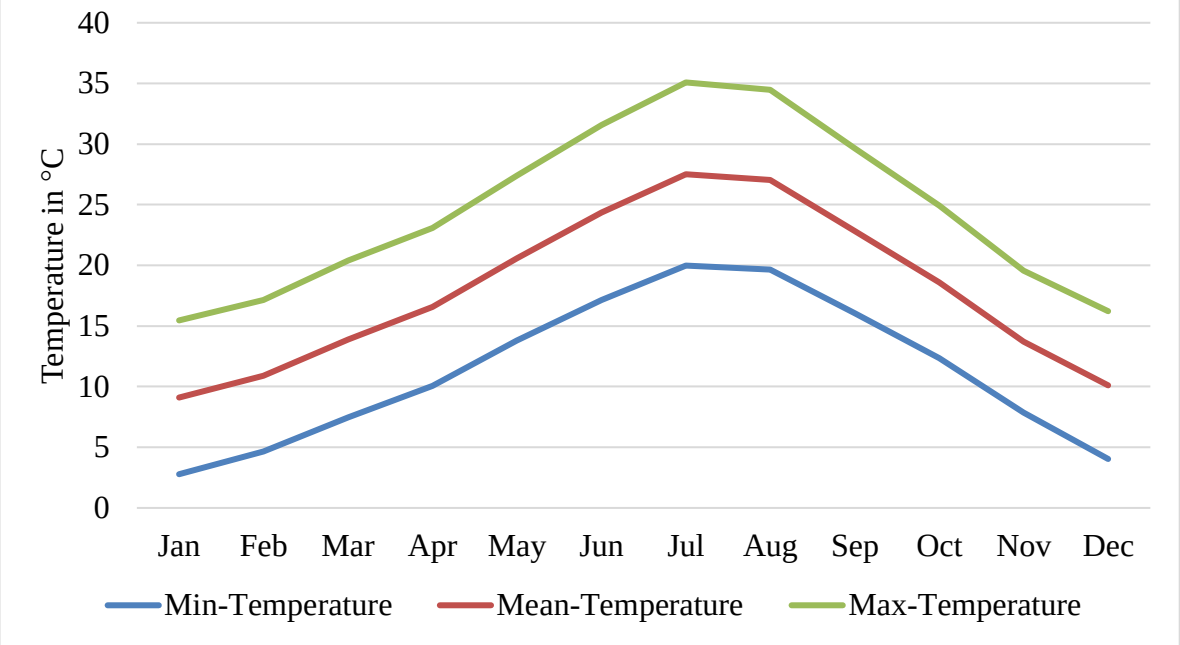
The High Atlas forms a barrier for the cold fronts which develop over Atlantic Morocco, to the N. From the W, a sea breeze blows towards the valley; its influence is especially felt in the coastal zone which thus enjoys a relatively mild and regular climate. At a depth of 20 to 30 km, inland, frosts are unknown, which allows the cultivation of early vegetables in winter.

The climate of the valley is on the whole of the arid type, with attenuations due to the oceanic influence. The diurnal temperature amplitudes are around 17° C in winter and 20° C in summer: 33° C and 43° C for extreme temperatures; winter frosts can appear one year out of three or five.

The differences between the temperatures of the plain and those in the mountains are much greater with regard to the maxima than the minima (ratio of 3 to 1). In general, the temperature differences decrease in the vicinity of the ocean and at altitude, this being more marked towards the High Atlas.

The proximity of the ocean contributes to maintaining a low thermal amplitude during the year in the Agadir region. The coldest month is January and the hottest months are between May and October.

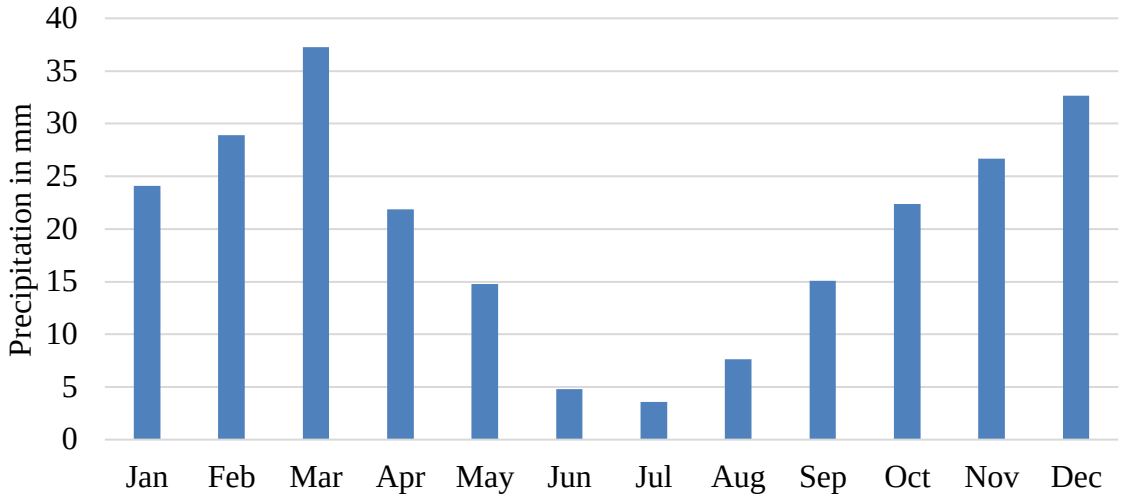
Figure 1: Average temperature in Souss Massa between 1991 and 2020



Source: World Bank

With regard to rainfall, the amount of rainfall is extremely variable in space and time (violence of the rains, seasonal and interannual variations). In Agadir, the average annual rainfall is around 240 mm, divided between an average of 22 rainy days, most often from October to March. However, atmospheric humidity remains quite high all year round on the ocean fringe, which allows the maintenance of a fairly dense natural plant cover.

Figure 2: Average precipitation in mm in the Souss Massa region between 1991 and 2020



Source: World Bank

The Saharan influence manifests itself in the valley especially towards the S and the E, and rises in the tributary mountain valleys which are sometimes drier than the Souss valley itself. From the end of spring to the middle of autumn and sometimes in winter, a regime of warm winds: "chergui", can be established for periods varying from a few days to several weeks, when a cyclonic depression is centered in the N of the Atlas. The winds are from the E or S SE direction. The average annual wind speed is around 3 km/h in the mountains and 5 km/h in the plain. It can reach the foothills of the mountains nearly 8 km / h.

The average annual evaporation varies between 1,400 mm in the mountains and near the Atlantic coast and 2,000 mm in the plains of Souss. The minimum is recorded in January with an average of 35 mm in the mountains and 100 mm in the plains, while the maximum is recorded in July with an average of 240 mm in the mountains and 270 mm in the plains.

In general the region is relatively windy. The "Chergui" hot east wind can blow in summer and autumn. The average annual wind speed is around 3 km/h in the mountains and 5 km/h in the plain.

3.3 Soils

Soil resources in the Souss Massa region are subject to several anthropogenic pressures manifested by the abusive exploitation of natural resources, population growth, rapid urbanization of agricultural areas and the development of intensive agriculture.

Indeed, the consequences of these attacks on the quality of the soil are diverse and visible in many places, including mainly: water erosion of the land, silting and salinization.

The soil of the foothills and mountains of the region, generally bare or covered by widely scattered argan trees, following clearing or deforestation, are directly exposed to erosion. The latter is further amplified with the brutal nature of the showers, and with a lithology and a terrain conducive to its development.

In the foothills of Ouled Teima-Taroudant and in the Chtouka plain, this morphogenesis is also amplified under climatic conditions, and intensified by anthropogenic actions.

In the Taroudant area, the gullies are spectacular. The most affected space concerns the immediate surroundings of the Oued el Ouaar, between Taroudant and the Talaa douar, they extend to the Alaricha hill. This space corresponds to the distal and eastern part of the Irguitène wadi cone, essentially made up of fine sands, silts and clays (Ait Hssaine et al., 2006).

This fine lithology constitutes an essential element for the development of the badlands, since it presents heterogeneous physical properties and an incoherent texture. He deduces a low resistance to erosion agents and cracking in the form of "shrinkage slots". This behavior exposes these lands to deflation and water erosion, which easily occur in this fragile and bare environment.

The long-term impact of erosion is difficult to assess in practice. For example in agriculture, the increase in crop productivity following technological developments and the addition of fertilizers and organic amendments, has probably masked until now the impact of soil degradation on yields.

The region is also threatened by the phenomenon of silting, given the sandy nature of the soils which are, throughout the dry season, subjected to the action of a strong, hot and dry wind which accelerates the desiccation of the soils. and particle transport. This situation is further aggravated by changes in land use and occupation patterns, uncontrolled urban sprawl, land clearing and overgrazing which expose land to intense sunshine and wind deflation.

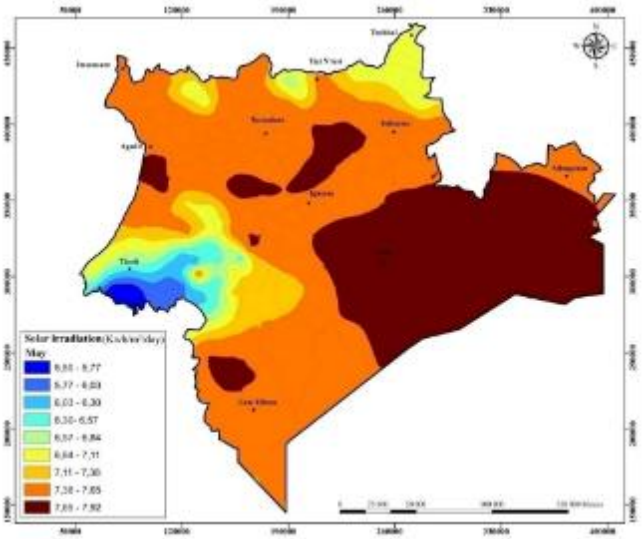
In the region, arable land invaded by sand is generally neglected, because the majority of farmers are unable to fight against this problem.

3.4 Sources of energy

In the region of Souss Massa, there is only a small gas turbine plant of 2X16 MW.

This kind of plant is very important to back up the network. Its usefulness is linked to the advantages of its rapid start-up and its relatively low operating costs. Turbines are one of the main means of producing electrical energy in peak and emergency periods. This plant is also used, mainly during peaks in demand and also to compensate for voltage drops on long high voltage lines, especially the 225KV line supplying the south of the country by acting as a reactive energy source. The Agadir power plant thus operates alternately as a generator during peak hours and as a compensation unit with a reactive power output of approximately 48 MVAR and absorption power if necessary of 22 MVAR.
If the Souss-Massa region does not have thermal power stations running on fossil resources, the region's potential in renewable energies is very significant. The following figure shows the solar field of the region:

Figure 3: Sunshine map of the Souss Massa region during the month of May



It can be noted that the sunshine reaches up to about 8 kWh/m2/day in certain localities such as Tata. The region thus has several sites that can accommodate decentralized photovoltaic power plants or those connected to the network. In this context, the Noor-Atlas, NOOR-Argana and NOOR-Tafilalt projects aim to increase the country's photovoltaic capacity to 500 MW by 2018. This program also aims to secure the country's electricity supply , the improvement of the quality of service for the regions located

at the end of the line (Regions supplied by 60 kV lines in antenna and located at distant distances from the transformer stations.

3.5 Hydrology

The Oueds of the Souss Massa basins are characterized by hydrological regimes known for their irregularities. These regimes are dependent on irregular and often violent rainfall occurring after long periods of drought.

The Souss basin extends over an area of 16,200 km2, is framed by voluminous reliefs; the High Atlas to the North, the Antis Atlas to the South, to the East by the junction of the two aforementioned chains and to the West by the Atlantic Ocean.

The average annual contributions of the Souss wadi at the level of Aoulouz are 128.1 Mm³. It is fed by the tributaries of the High Atlas and the Anti-Atlas whose contribution is 290.9 Mm³ (225.1 Mm³ as contribution from the right bank and 65.8 Mm³ from the left bank).

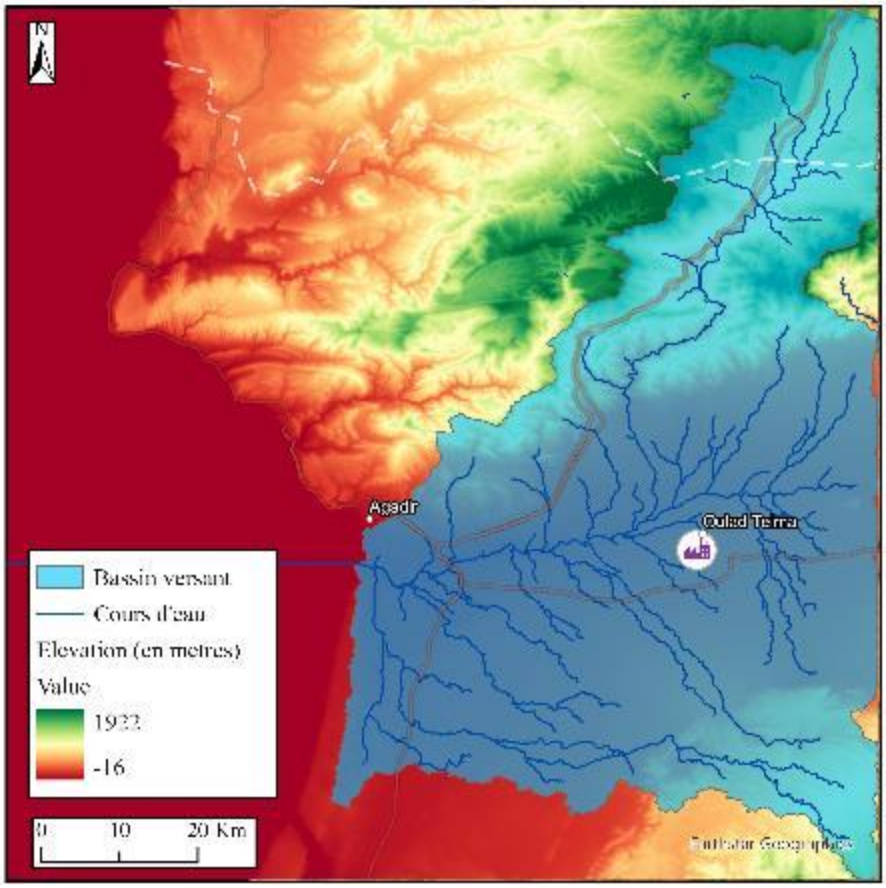
The Massa basin is drained by the Amaghous and Assaka wadis and the Sfa and Tekat wadis which arise, respectively, in the Atlantic part of the anti-Atlas and in the northern part of the basin.

The Massa wadi flows into the Atlantic Ocean, while the Sfa and Tekat wadis are lost in the plain. The average annual contribution of the Massa wadi is estimated at 128 Mm3/year, of which the sheet of runoff water is of the order of 21 mm/year.

Adding also, the existence of the dam of Youssef Ben Tachfine (height of 85 m, length of 707 m and capacity of 303 Mm3), which blocks one of the arms of the Massa wadi by forming an artificial lake with a useful capacity of 304 Mm3 for a basin area of 3800 ha.

This work regularizes 88 Mm3/year, of which 85 Mm3 are reserved for irrigating the areas of Massa and Tassila and 3 Mm3 for the drinking water supply of Tiznit.

Figure 4: Hydrological context of the project area



3.5.1 Mobilization of surface water

The succession of years with a deficit caused a reduction in the inflows from the wadis in all the dams. Regulated volumes have been reduced due to hydrological changes. This impact is greater in large structures (reduction in regulated volume of 7 Mm3/year for the Aoulouz-Mokhtar Soussi complex and 5.4 Mm3/year for the Youssef Ben Tachfine dam).

The revised regularized volumes thus go from 379 Mm3/year initially assessed to 364 Mm3/year in the "complete series" hydrological scenario (-4%) and to 345 Mm3/year in the "short series" scenario (-9%).

Table 4: Potential regulated by existing large and medium-sized dams

Dams:	Initial (Mm3/year)	Full Series Scenario		Short Series Scenario	
		Revised (Mm3/year)	Gap(%)	Revised (Mm3/year)	Gap (%)
Aoulouz - Mokhtar Soussi	184	177.1	-4%	173.8	-6%
Youssef Ben Tachfine	90	84.6	-6%	81.8	-9%
Abdelmoumen	69.5	67.4	-3%	54.9	-21%
Moulay Abdellah	27.5	27.1	-2%	27	-2%
Imi El Kheng	5.5	5.2	-5%	5	-9%
Ahl Souss	2.6	2.6	0%	2.6	0%
Total	379	364	-4%	345	-9%

The PDAIRE area has nine hill lakes and small dams which were commissioned between 1985 and 1992. These works are used for domestic water supply, irrigation and livestock watering while contributing to the fight against flooding and flood control. The following table summarizes its main characteristics.

Table 5: Small dams and hill lakes

Province / prefecture	Name	Date put into service	Watershed (km²)	Annual contribution (Mm3/year)	Normal storage capacity (Mm3/year)	siltation		Use
						T. dead	Ap. Ann.	
Agadir Ida Ou Tanane	Taguenza	1987	24.5	1.0	0.3	33.864	17	AED. AC. I
Agadir Ida Ou Tanane	tildi	1991	15.5	0.6	0.0	20.955	6.2	AED . AC
Agadir Ida Ou Tanane	Tiguemi N'Ait Bihi	1992	7.5	0.4	0.1	15.967	3	AED . AC
Chtouka Ait Baha	sfa	1985	14.8	0.3	0.5	62.368	3.25	pc. AC
Chtouka Ait Baha	Azgherkis	1991	8.3	0.3	0.1	6.833	4.37	AED . AC
Chtouka Ait Baha	Timisha	1989	5.6	0.1	0.1	1.333	2.97	AED . AC
Taroudant	Assderm	1989	13.4	0.2	0.1		6	AED . AC

Taroudant	Sellaoun	1992	25.5	0.2	0.2		13.5	AED . AC
Tiznit	Anou Issafaren	1989	1.8	0.05	0.01	0.547	0.95	I. AED

3.5.2 Groundwater

The Souss Massa basin is the seat of underground water tables of varying importance. The water tables of Souss, Chtouka (1500km², about a third of the Souss plain) and Tiznit are the most important. They overlie other captive aquifers but of lesser importance The underground aquifers of the Souss Massa area are represented on the map below.

Groundwater reserves are estimated between 30 and 40 billion m³, constitute an important part of the hydraulic potential of the region, i.e. 4105 Mm3 and it represents more than 30% of mobilizable water resources and plays an important role in socio-economic development. economy of the region:

The updated renewable potential in groundwater amounts to 425 Mm3/year on average and is distributed as follows:

Nevertheless, higher quantities of water are currently withdrawn under overexploitation: 696 Mm3/year across the entire basin, including 68 Mm3/year for the AEPI and 628 Mm3/year for irrigation.

The Souss aquifer is generally of good quality. The electrical conductivity of water in the aquifer increases from east to west with excessive values in the downstream part of the aquifer and in the region of Ouled Teïma.

Table 6: Updated Renewable Potential in Groundwater

Souss tablecloth		200
Chtouka tablecloth		26
Tablecloth of Tiznit		8.3
High Atlas, right bank of the Souss		42
Western High Atlas		20
The Adoudounian limestones of the Anti-Atlas	85	
Buttonholes of the Anti-Atlas		44
Total		425

The waters of the Chtouka aquifer show significant variations in conductivity, it increases globally from upstream to downstream and from North to South. Salinity anomalies are observed in the southern part (irrigated sector of Aït Belfaa) and downstream of the Chtouka and north of the Aït Amira-Biougra line. The Chtouka aquifer is much more polluted. This is due to the use of nitrogen fertilizers which lead to groundwater pollution by nitrates. In the plain of Tiznit, the salinity of groundwater increases from south to north towards the ocean.

3.6 Air quality and noise

The project area consists, in its northern part, of Argan forests. The other part is a rural area where agriculture is practiced. Industrial activities are minimal and are mainly linked to the valorization of agricultural products. There are mainly oil mills and stations for conditioning and packaging agricultural products.

Thus, it can be said that the industry in the project area does not present a source of pollution or a source of noise.

The Souss Massa Drâa Region generally enjoys good air quality. However, given the intensity of its demographic growth, the forecasts for the development of its industrialization, the prospects for the development of its car fleet, the challenge would be to maintain the current air quality of this region at its current level. , and to anticipate the factors of polluting atmospheric emissions.

3.7 Geological features

High Atlas

The High Atlas includes part of the ancient massif representing the highest zone occupied by pre-Mesozoic crystalline terrains. This massif forms the base of a secondary age cover which outcrops to the south and west:

- To the south are the lands of the Erguita valley, located roughly between Taroudant and Tafingoult;
- To the west, the Mesozoic cover is represented by the red layers of the Triassic ages of the Argana corridor, relayed by the mainly limestone reliefs of the Jurassic and Cretaceous age of the Ida Or Tanane to the west.

Lithostratigraphically:

- The Precambrian is made up of metamorphic rocks and granitoids.
- The Paleozoic is essentially represented by the Cambrian deposits (High Atlas Plaeozoic). Hercynian deformation was manifested by folding, the emplacement of the Tichka Granite and by significant metamorphism.
- The Permo-Triassic: designates the red silto-sandstone series recognized in the Argana corridor and its basic conglomerates about ten meters thick. It is formed by an alternation of sandstone and clay more than 100 m thick. This series is crowned by basalt flows.
- The Jurassic:
  - ✓ The lower Lias: a sedimentary continuity seems to exist between the upper Triassic and the lower Lias. The base of the Lias is represented by red siltstones rich in evaporites at the top of which limestone bars are inserted. Basaltic flows with tholeiitic affinity are intercalated in this series at the Triassic-Liassic boundary.
  - ✓ The Upper Lias is made up of dolomites.
  - ✓ The Middle Jurassic is made up of red AmsKroud sandstone, dolomites and limestone.
- The Cretaceous outcrops on the edge of the High Atlas, in the northern flank of the Cretaceous-Eocene syncline of the Souss. To the west, there is a complete marine Cretaceous series. To the east, lagoon facies mark the series more and more, surmounted by Eocene deposits of lacustrine or continental facies. The power of the Lower Cretaceous represented by clays and marl-limestone decreases from West (300 m) to East (60 to 100 m). The Cenomanian is represented by gray marl with anhydrite, limestone and sandstone in small proportions. The Turonian is made up of dolomitic limestone at the base surmounted by limestone with flint (limestone from the Kasbah of Agadir). Its power varies from 50 m in the west to 10 m in the east. The Upper Cretaceous is essentially marly and marl-limestone, gypsum towards the east. Its power is 400 m to the west, 1000 m at the level of a subsidence pit at the height of the 9° meridian where it develops 300 m of Maestrichtian phosphate sandstone, 300 m further to the east and goes to 50 m at Aoulouz in the form of sandstone and red marls.
- Paleogene-Neogene: in the region of Agadir, the Oligocene directly covers the Maestrichtian. The Eocene is well individualized to the east of the Souss valley where it overcomes the Maastrichtian in continuity of sedimentation.

The Souss plain

The filling formations of the Souss plain include the sediments which are accumulated in the subsidient furrow, formed in the south of the High Atlas during the Neogene and the Quaternary.

The continental Neogene is represented by powerful conglomeratic deposits at the foot of the High Atlas. Further south, it is an essentially marly-limestone, clayey or sandstone fluvio-lacustrine formation, with

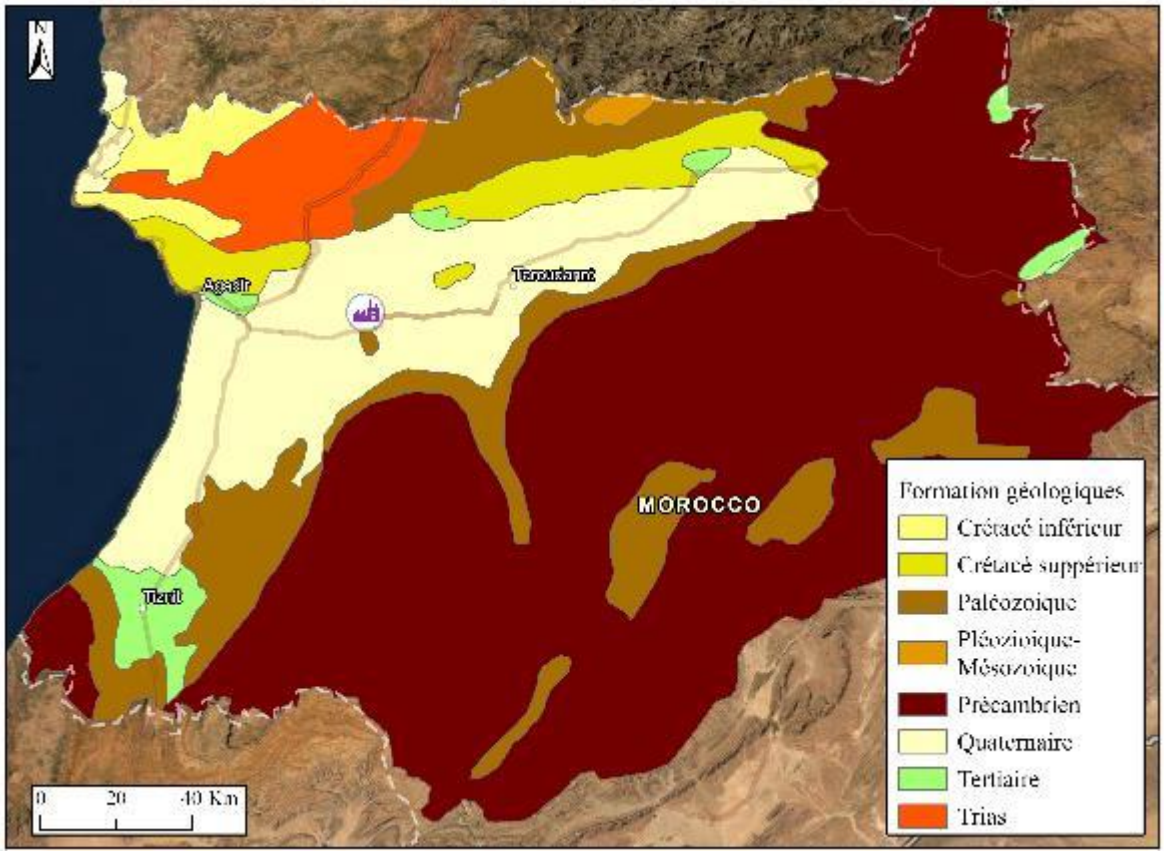
conglomeratic intercalations. It is the “Souss formation” to which a Plio-Villafrachian age has been assigned.

In the subsidient basin of Souss, the early Pliocene is represented by limestones, sandstones, consolidated sands, lumachelles and marls. It is crowned by Moghrebian shell sandstones. The series reaches a thickness of 600 m.

The Neogene Quaternary limit is difficult to determine, overall the continental Quaternary is quite often clayey. It forms the dejection cones (early Quaternary), the fossil beds of the Souss wadi (gravelly) and the more recent alluvial deposits (silt and clayey alluvium).

Structurally, the Souss plain is a narrow zone of collapse between the High Atlas and the Anti-Atlas, the detrital and marl-limestone formations of Plio-Quaternary filling cover a Cretaceous-Eocene syncline Oriented east-west . The northern flank of this syncline largely outcrops discontinuously on the edge of the High Atlas. Its southern flank is manifested by an alignment of hills dominated by Turonian limestone in the axis of the Souss valley.

Figure 5: Geological characteristics of the region



Source: LixCap analysis

On the left bank of the Souss wadi, the Precambrian lands, forming part of the north-western Anti Atlas, outcrop in inlets of variable dimensions and orientation. The largest are that of Ighrem, Timjich and Tanguerfa surrounded by buttonholes of smaller dimensions which are Wawfengha, Alma, Ait Abdallah and Tataout.

In the region of Taroudant Ighrem, the substratum consists of Paleoproterozoic terrains and quartzites associated with the Lower Neoproterozoic. They are covered in major unconformity by a volcanic and volcano-detrital cover of the Upper Neoproterozoic, then sedimentary. The latter is essentially carbonated attributed to the Adoudounian and the lower Cambrian.

- The Paleoproterozoic (P1): is made up of schito-growackeuse series cut by more or less deformed granites during the Eburnian orogonesis.
- The Neoproterozoic is represented by the lower Precambrian II and the Precambrian III.
- The Lower Precambrian II: is made up of massive quartzites and limestone nearly 1000 m thick. It is cut by numerous doleritic and gabbroic dykes attributed to Precambrian II.
- The Upper Neoproterozoic (PII-PIII): is composed of conglomeratic deposits associated with acid volcanic tuffs.
- The Precambrian III: includes flows of andesites or basalts surmounted by pelites and conglomerates.

The sedimentary cover is less developed than in the western part (Tiznit basin). It is formed by:

- The basic series: represented by conglomerates, limestones and shales;
- The lower limestones: made up of limestones and dolomites representing the main part of the carbonate plateau which characterizes this area;
- The Lie-de-Vin series: characterized by purplish shales deposited in bands around the main synclinal structures;
- The Cambrian: is formed by upper limestones (black limestones and dolomites of Tiout), which enrich themselves upwards in clayey levels (schist-limestone series). The latter is surmounted by the terminal sandstones, then by the Paradoxides shales.

3.8 The fauna and the flora

In the region, we find natural vegetation mainly on the edge of the Souss wadi and its tributaries and also in the area reserved for the argan tree, the olive tree and the almond tree. The poorly developed oleander (defla: Nerium oleander) is found along the seguias and the agave americana near dwellings and cropland used as fences; and everywhere else the vegetation is modified by man.

The plant species endemic to the region is the argan tree (Argania spinosa), but not present in the immediate vicinity of the project area. It is a gasoline that requires very little water and can use the water present in the vapor state in the air. It covers the mountain slopes up to an altitude of 2000 m and is also found throughout the Souss plain, especially in its downstream part.

The vegetation introduced or planted by man includes reforestation of eucalyptus, poplar and plantations of fruit trees (almond, olive, fig, citrus, etc.).

Near the rivers, there is a diversified natural vegetation; with in particular, oleanders, reeds, colchiques, and exotic species, such as Berber cacti, etc.

The highly intensified farming system of agricultural land has created an open landscape where natural plantations (argan tree, oleaster, edge shrubs, etc.) mix with crops and planted trees.

The faunal distribution varies according to the distribution of the habitats that have defined it. Thus it is possible to highlight some faunal oppositions between the different habitats that constitute the plant formations. The woody or herbaceous plant formations and also the entire hydrographic network of the watershed are of great interest for wildlife. The enclaves close to the rivers are home to certain species of fish and amphibians, as well as various reptiles, birds, and mammals that have adapted very well to this habitat. Moreover, the existing surrounding humidity in these places promotes the development of vegetation throughout the year, which benefits many species of animals.

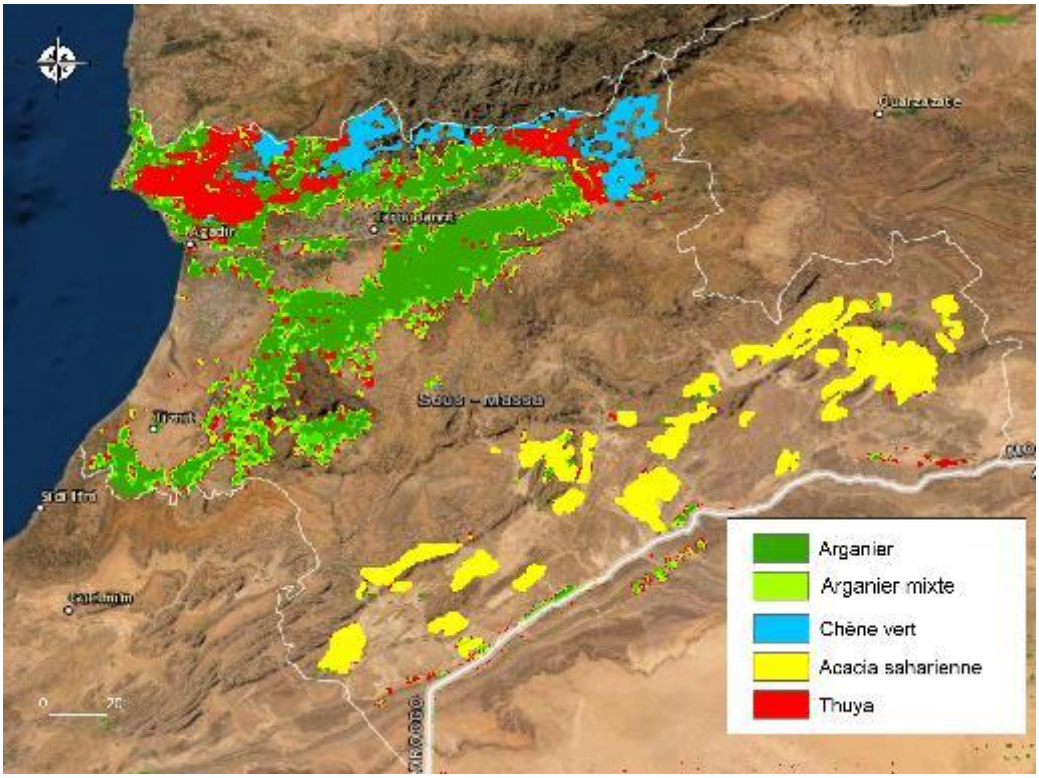
The region presents very attractive habitats for avian settlement because the local vegetation offers a suitable microclimate and favors the presence of numerous aquatic and terrestrial macro invertebrates and small vertebrates which constitute favorite prey of several species of nesting and migratory birds.

National and international legislation on environmental protection ensures the management and protection of Sites of Biological and Ecological Interest, in accordance with the agreements of the Convention for the Protection of World and Natural Heritage (UNESCO, 1972). The nearest SIBEs are:

- Ademine SIBE terrestrial priority 1, at a distance of 26 km from the site

- Assads SIBE land priority 3 at a distance of 24 km from the site;
- Tafingoult land SIBE priority 1, at a distance of 71 km from the site;
- Source Tizi-n-Test wet SIBE priority 3, at a distance of 72 km from the site

Figure 6: Map of protected areas



4 Potential environmental impacts

The project to build a storage infrastructure for perishable products generally generates environmental consequences such as the loss of agricultural land, soil erosion, degradation of plant cover, socio-cultural effects, disruption of local activities, etc. . During the works, the negative impacts are generally limited in time. Those of the exploitation phase can appear continuously during the life of the project.

The project area does not include natural habitats or areas with legal protection and classified physical cultural resources.

Looking at the topic of public interest and controversy the risk for public controversy is deemed low risk due to the following reasons:

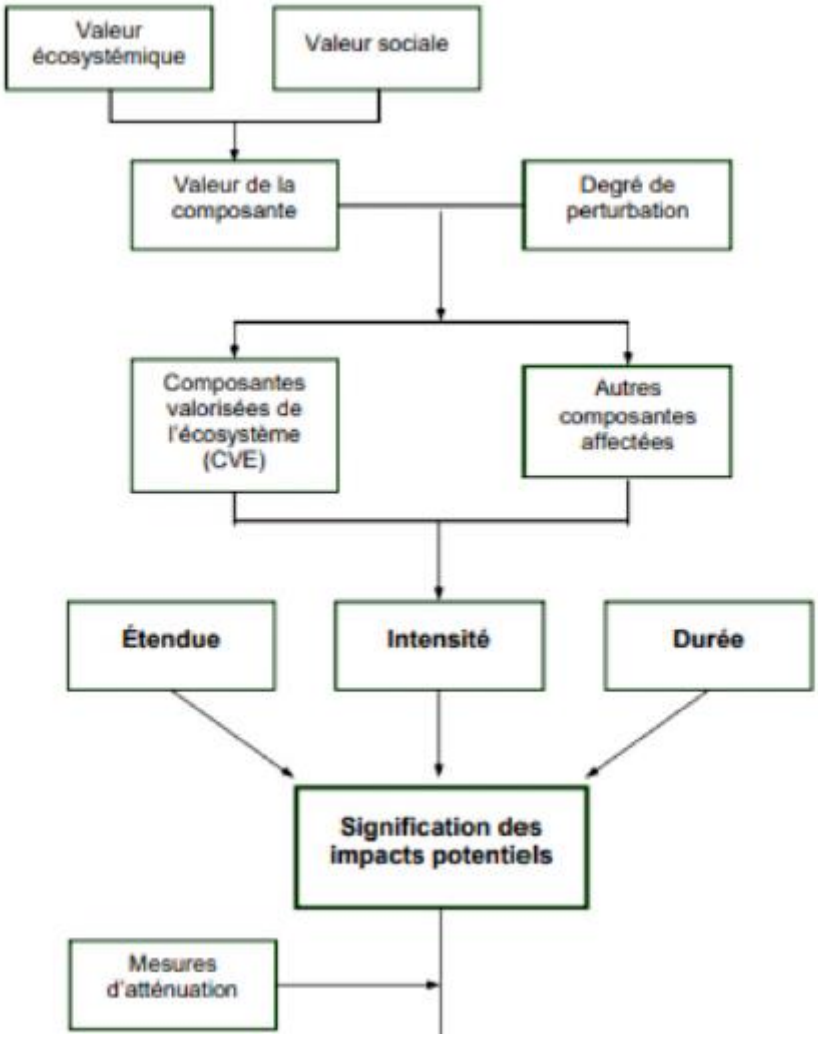
- Since the project is designed in an Industrial Zone which has already submitted Environmental Impact Studies and has already passed the period of public consultations and litigation and has already received the necessary authorizations for a company like Ifria.
- In will not have any additional waivers needed.
- The Industrial Zone is already occupied by other operators and the addition of Ifria will not measurably change the overall impact in the industrial zone.

4.1 Impact evaluation methodology

This assessment of the impacts is based first on the assessment of three indicators, i.e. the intensity (determined according to the value of the component and the degree of disturbance), the extent and the duration of the the apprehended impact. These four indicators are aggregated into a summary indicator, ie the significance of the anticipated potential impact. In a second stage of analysis, the importance of the residual impact is estimated so as to make an overall judgment on the impact associated with the interaction of an activity on an environmental component, by considering the mitigation measures. put forward to reduce the anticipated adverse effects. The figure below shows the process leading to the evaluation of the significance of the potential environmental impacts, then to that of the significance of the residual environmental impacts, including those that could affect the valued ecosystem components (VECs). Details relating to each step of the evaluation process are presented below.

For the purposes of this project, the terms “environmental impact” and “environmental effect” are equivalent.

Figure 7: Stages of the environmental impact process



The first step in evaluating the significance of the impact consists in evaluating the potential impact of the project by taking into account its intensity, according to the value of the component affected and the degree of disturbance apprehended, its extent and its duration.

4.1.1 Description of indicators

Each of the indicators for determining the significance of the potential impact includes a scale of three distinct levels. The description of each of these indicators and the levels used to characterize them are presented below.

4.1.1.1 Impact intensity

The intensity of the impact expresses the relative importance of the consequences attributable to the alteration of a component of the environment. It concerns the extent of the modifications that affect the productivity of a habitat, a species or a community or the use of a component affected by the source of impact. It integrates the value of the component both in terms of its ecosystem value and its social value.

The intensity of the impact can be low, medium or high. This evaluation is expressed by the degree of disturbance.

a. Determination of component value

The ecosystem value expresses the relative importance of a component according to its interest for the ecosystem where it is located. It calls on the judgment of specialists following a systematic analysis of the components of the environment. There are three ecosystem values:

- Strong: the component is of major interest in terms of its ecosystem role or biodiversity and exceptional qualities whose conservation or protection are the subject of consensus in the scientific community;
- Average: the component presents a strong interest and recognized qualities whose conservation or protection represents a subject of concern without however being the subject of a consensus;
- Low: the component has an interest and qualities whose conservation and protection are the subject of little concern.

b. Determination of the degree of disturbance

The degree of disturbance assesses the extent of the changes made to the structural and functional characteristics of the component likely to be affected by the project. These modifications may result in the total or partial destruction of the component or the loss of one or more characteristics specific to it. This degree of disturbance takes into account the reversibility or irreversibility of the environmental effect on a component. There are three degrees of disturbance:

- Strong: the project calls into question the integrity of the affected component, strongly and irreversibly modifies this component or the use made of it;
- Average: the project leads to a reduction in the quality or use of the affected component without compromising its integrity;
- Low: the project only slightly changes the quality, use or integrity of the environmental component affected.

c. Impact intensity determination

The grid for determining the intensity of the impact based on the value of the environmental component and the degree of disturbance is presented in the following table:

Degree of disturbance	**Component value**		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

It is thus possible to identify three classes of intensity:

- High: the project completely or largely destroys or alters a component of the environment and calls into question its integrity. For the components of the biological environment, the intensity is high if an entire population or a high proportion of the population or habitat of a species is threatened. For the components of the human environment, the intensity is high if it significantly or irreversibly affects or limits the use of the component by a local community or population.
- Medium: the project modifies the affected component without jeopardizing its integrity and its use or leads to a limited modification of its general distribution in the environment. For the components of the biological environment, the intensity is medium if the effect affects an average proportion of the population, of the size of the population or of the habitat of the species, without calling into question the integrity of this species, but may lead to a decrease in average abundance or a change in distribution. For the human environment, the intensity is medium if the effect affects part of a community or a population or if it significantly reduces the use, quality and integrity of the use of the component without irreversibly and completely reducing its use.
- Low: the project slightly alters the component, but does not really modify its quality, its general distribution or its use. For the components of the natural environment, the intensity is low if only a small proportion of the population or the habitat of a population is affected by the project. In this case, the effect does not jeopardize the integrity of the species and does not lead to a reduction or a change in the distribution that exceeds the fluctuations in natural conditions. For the human environment, the intensity is low if a small part of a community or population is

affected and if the reduction in the use or the quality of the component does not call into question its vocation or its use.

4.1.1.2 Extent

The extent expresses the spatial scope of the effects generated by an intervention in the environment and refers to the distance or the surface on which the disturbance will be felt. Thus, the extent can represent the relative distance over which the repercussions of an intervention on an element of the environment will have an effect. It can also represent the relative area that will be affected, either directly or indirectly (nature), by the effects of the project. In the context of this project, three levels of scope can be distinguished:

- Regional: the intervention on an element of the environment is felt over a vast territory or at a significant distance from the project site, or is felt by the entire population of the study area or by a significant proportion of the population .
- Local: the intervention affects a relatively small space or a number of elements of the same nature located near the project or at a certain distance from the project, or it is felt by a limited proportion of the population of the study area .
- Punctual: the intervention affects only a very limited space, few components inside or near the project site, or it is felt by only a small number of individuals in the study area .

4.1.1.3 Duration

Impact duration refers to the time dimension of the impact. It assesses the period during which the effects will be felt in the environment. This period may be the recovery or adaptation time of the affected element. The duration of an impact can be:

- Long: the impact is felt continuously or discontinuously throughout the life of the project.
- Medium: the effects of the impact are felt continuously or discontinuously over a relatively prolonged period of time but generally less than the life of the project.
- Short: the effects are felt continuously or discontinuously over a limited period of time, generally corresponding to the construction period or when the recovery or adaptation time of the affected component is less than one year.

The indicator that constitutes the duration also takes into account the schedule, that is, all the stages of the life of the project, for example at the time of construction or operation, as well as the frequency of the environmental impacts on the components of the environment. Frequency is the measure of repetitions of an environmental effect over a period of time.

4.1.2 Assessment of the significance of the potential impact

The assessment of the significance of the potential impact is based on the integration of the three indicators described above, i.e. intensity, extent and duration of the impact, and is obtained using the grid presented in the table below. It is thus possible to identify three levels of significance:

- Major: the impact causes strong repercussions on the component affected by the project, corresponding to a profound alteration of its nature and its use, and which may even jeopardize its sustainability;
- Moderate: the impact causes appreciable repercussions on the affected component, resulting in a partial alteration of its nature and its use, without however calling into question its durability in the study area;
- Minor: the impact causes reduced repercussions on the affected component, resulting in a minor alteration of its quality and use.

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Strong	Regional	Long	Major
		Mean	Major
		Short	Mean
	Local	Long	Major

		Mean	Major
		Short	Mean
	Punctual	Long	Mean
		Mean	Mean
		Short	Minor
Mean	Regional	Long	Major
		Mean	Major
		Short	Mean
	Local	Long	Major
		Mean	Mean
		Short	Mean
	Punctual	Long	Mean
		Mean	Mean
		Short	Minor
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

4.2 Climate and meteorology

4.2.1 During the construction phase

The construction site has no impact on the climate, namely: Temperature and rainfall.

The impact of the construction phase on climate and temperature is of minor or even negligible importance following the assessments made in the following tables:

Degree of disturbance	**Component value**		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	**Weak**	Weak

The impact of the construction works on the climate will be of low intensity

Impact intensity	**Extent of impact**	**Duration of impact**	**Meaning of potential impact**
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

The effect of the construction works on the climate will be of minor significance.

4.2.2 During the operation phase

Estimating the exact impact of cold chains on the environment is a difficult exercise because the type of cold chain logistics varies from region to region and data on energy consumption or emissions from different sections of the cold chain are inconsistent. The limited data available suggests that food cold chains account for 1% of global CO2 emissions [1]. Sources likely to cause climate change are: Emissions of greenhouse gases during cooling, which come from refrigerated vehicles.

Food cold chain process	Overview of emission sources	Quantity of emissions
Post-harvest cooling (including cleaning, packaging, etc.)	Refrigeration is an energy-intensive technology. Depending on the type of food and the efficiency of operations, refrigeration can account for 60-70% of the electricity used in the establishment. The energy load also depends on the product and the cooling system cooling system (eg freezing, refrigeration for fresh meat and milk products).	There are no precise estimates of GHG emissions from electricity consumption for post-harvest cooling on a global scale due to the discrepancy in energy consumption between different countries. - The pre-chill range, especially for fruits and vegetables, is also defined by the regional sales cycle of these types of food.
Transportation	Depending on the type of refrigerated truck and the temperature maintained, it can consume around 20 liters of diesel per hour of travel. The refrigeration unit uses approximately 8% of the truck's total fuel consumption when in use.	The CO2 emissions of medium, large and 32-38 ton refrigerated vehicles vary between 51g CO2/pallet/kilometre (km) and 115g CO2/pallet/km depending on temperature conditions. Refrigerants could increase CO2 emissions from food vehicle transport systems by up to 40%. It is estimated that a high class vehicle with a refrigerant charge of 6 kilograms (kg) and an annual leakage rate of 20% produces 5.3 g CO2/pallet/km.

The impact of the operating phase on the climate and temperature and of average importance to the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	**Weak**	Weak

The impact of the operation phase on the climate will be of low intensity

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor

[1]James, SJ & James, C. The food cold-chain and climate change. Food Res. Int. 43, 1944–1956 (2010).

	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	**Long**	Minor
		Mean	Minor
		Short	Minor

The effect of the operation phase on climate will be of low significance.

4.3 Soil and physical change

Soil can be affected and degrades over time. Soil degradation refers to undesirable changes in the physical, chemical and biological properties of soils.

4.3.1 During the construction phase

The cold chain infrastructure construction works will generate various wastes that will pollute the ground. It's about :

- Ordinary Industrial Waste (DIB) which is non-inert and non-hazardous waste generated by activities. We can cite for example: timber (frames, framework, floor, etc.), metals, plastics, unsoiled packaging waste, paper, cardboard, etc.
- Inert Waste (DI) is waste which does not undergo, in the event of storage, any significant physical, chemical or biological modification and does not present a danger to humans or the environment. Examples: remains of concrete and mortar, broken concrete blocks, sand and gravel, shavings, sawdust, pieces of formwork wood, mixed construction and demolition waste, not containing any hazardous substance, etc.

The impact of the construction phase on the ground is low following the assessments made in the following tables:

Degree of disturbance	**Component value**		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The impact of the construction works on the ground will be of low intensity

Impact intensity	**Scope of impact**	**Duration of impact**	**Meaning of potential impact**
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

The significance of the potential impact is minor. It requires special mitigation measures. This impact is reversible.

4.3.2 During the operation phase

The most important sources of soil pollution are linked to cleaning water from the premises. With the promoter's requirement for the installation of separate pits (collection of washing water) this impact will be reduced. The ground of the buildings will be sticked what will prevent having infiltrations. In

addition, domestic solid waste generated by project staff may degrade the quality of surrounding agricultural land. Collecting its waste and transporting it to the nearest public landfill site.

The impact of the operation phase on the ground is low following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The impact of the operation phase of the project on the ground will be of low intensity

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	**Long**	Minor
		Mean	Minor
		Short	Minor

The significance of the potential impact is low. It requires special mitigation measures. This impact is reversible.

4.4 Capacity Building

The project will increase capacity building and training during the construction and operation phases, ensuring that local people, project-affected people and their communities are prioritized. During the construction and implementation of the project, local people and project affected people will receive training, their skills will be enhanced and they will be used even after the life cycle of the project.

4.5 Sources of energy

4.5.1 During the operation phase

The average electricity consumption of current cold stores is around 30 to 50 kWh/m³/year, depending on the characteristics of the building, the activity, the temperature of the products, the outside temperature, the speed of rotation, the the size of the rooms. The following measures reduce consumption:

- Control the insulation system
- Provide maintenance
- Integration of solar panels for self-consumption
- Sustained management.

4.6 Hydrology

4.6.1 Surface water

4.6.1.1 During the construction phase

Surface water quality could be affected by a number of factors during the construction of the cold chain infrastructure. Construction activities can lead to increased soil erosion and sediment loading of nearby waterways, while leaks or accidental spills of hydrocarbons (oil, fuel or other substances) can also pollute waters. surface and have an impact on groundwater.

The impact of the construction phase on surface water is low following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The impact of the construction works on surface water will be of low intensity

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

The significance of the potential impact is minor. It requires special mitigation measures. This impact is reversible.

4.6.1.2 During the operation phase

The project activities are not likely to generate substances or objects that can pollute surface waters. It is noted that at the level of the project site, the absence of any watercourse, the rainwater runoff could be loaded by the washing waters of the infrastructure which could have an impact on the flora and fauna of the surrounding area of the site.

The impact of the operation phase on surface water is low following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The impact of the operation phase on surface water will be of low intensity

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact

Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

The significance of the potential impact is minor. It requires special mitigation measures. This impact is reversible.

4.6.2 Underground waters

4.6.2.1 During the construction phase

Construction work in cold chain infrastructure can have significant impacts on hydrology and groundwater quality. Potential chemicals and improper handling of lubricating sludge, fertilizers and other toxic substances during construction can lead to groundwater pollution through gradual seepage.

The impact of the construction phase on groundwater is low following the assessments made in the following tables:

Degree of disturbance	**Component value**		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The impact of construction works on groundwater will be of low intensity

Impact intensity	**Scope of impact**	**Duration of impact**	**Meaning of potential impact**
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

The significance of the potential impact is low. It requires special mitigation measures. This impact is reversible.

4.6.2.2 During the operation phase

Project activities are not likely to generate substances or objects that could pollute groundwater. So there will be no direct or indirect impact of the project during the operation phase.

4.7 Vibration

4.7.1 During the construction phase

The workers on the various infrastructural modernization work sites of the port, in particular the workers, will be exposed to the vibrations generated by the vehicles and machines operating on the site, during the dredging, excavation and vibro-compacting works.

The oscillations are exerted on the workers by means of means of transport, machines and vibrating tools. The importance of mechanical oscillations, characterized by their frequency, amplitude and duration, determines whether or not their action is detrimental to health, well-being and safety.

The effects of oscillations and vibrations on human beings can be detrimental to their well-being or even damaging to their organism. The oscillations can act both locally and on the whole body. The effects of vibrations are still poorly understood, above all in the neurovegetative field. Local vibrations can cause health problems, such as vasomotor disorders (Raynaud's syndrome or dead fingers), damage to the nervous system, damage to the bones and joints of the upper limbs and degeneration of the spine.

Regular exposure to vibrations, daily or several times a week, represents a health risk if the following acceleration values, weighted over a working day, are exceeded:

Guide values for vibrations

$$- \textit{Ensemble main} - \textit{bras}: \overline{a_{hw}} \leq 5m/s^2$$

$$- \textit{Corps entier}: \overline{a_2} = 0{,}8m/s^2$$

The impact of the construction phase on vibrations is moderate following the evaluations carried out in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The intensity of this impact is classified as medium, the value of the component is social since it concerns human beings.

Impact intensity	Extent of impact	Duration of impact	Meaning of potential impact
Mean	Regional	Long	Major
		Mean	Major
		Short	Mean
	Local	Long	Major
		Mean	Mean
		Short	Mean
	Punctual	Long	Mean
		Mean	Mean
		Short	Minor

The significance of the potential impact of the project during the construction phase is medium. It requires special mitigation measures. This impact is reversible.

4.7.2 During the operation phase

During the operational phase, the frequency of truck movements will increase, which may induce an increase in vibrations. The impact of the operation phase of the project on vibrations in the area is of low significance following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The impact of the operation phase of the project on vibrations around the area will be of low intensity.

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

The effect of the operation phase on noise will be of minor significance, this impact is reversible.

4.8 air quality

4.8.1 During the construction phase

The Air component testifies to an accumulation of fine particles due to the movement of earth, digging and traffic in the site. Air quality may deteriorate within the work area. Maximum daily emissions can be estimated as a function of time with the maximum expected operations of construction equipment, fugitive dust, heavy truck operations, and commuting of the workforce, divided by the number of working days. operation during this period (6 working days per week).

The maximum annual construction emissions can be estimated by adding the daily emissions over the 302 day period.

The limit values for air pollutant emissions in Morocco are presented in the following table

	Daily	Hourly	Annual
SO_2 $(\mu g/m^3)$	125	-	-
NO_2 $(\mu g/m^3)$	-	200	50
CO $(\mu g/m^3)$	10	-	-
$PM10$ $(\mu g/m^3)$	50	-	-

The impact of the construction phase on air quality is low following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The impact of construction work on air quality will be of low intensity

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor

	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

The significance of the potential impact of the project during the construction phase is low. It requires special mitigation measures. This impact is reversible.

4.8.2 During the operation phase

It is important to note that the project is taking place in rural areas where the air quality is generally good. The current and existing source of air pollution along the project area is vehicular traffic (particulates and combustion emissions). Potential air emissions from the Project in the form of fugitive dust and emissions releases will occur as a result of transportation activities of various products to and from Project sites, particularly when trucks travel over unpaved portions of tracks and roads. The local ambient air quality around the project area will be affected during the operation phase due to air emissions generated by transportation activities. The impact of the operation phase of the project on noise in the area is of medium importance following the assessments made in the following tables:

Degree of disturbance	**Component value**		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The impact of the operation phase of the project on the noise around the area will be of low intensity.

Impact intensity	**Scope of impact**	**Duration of impact**	**Meaning of potential impact**
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

The effect of the operation phase on noise will be of low significance.

4.9 Noise

4.9.1 During the construction phase

During the construction phase, the noise level due to the mobilization of heavy machinery (side-boom, trax, mechanical shovels, bulldozer, trucks, etc.) is below the admissible limit threshold (60 dB) for short-term exposure. The non-repetitive nature of the construction work on the same perimeter and the scarcity of nearby environments potentially impacted, makes it possible to assess that the effects of noise and vibrations are minor, except for the site personnel, to whom by default, measures mitigation are required.

Sound levels from these sources can be estimated at 70 dB(A). The work will respect the usual working hours (7:00 a.m. to 6:00 p.m.).

In addition, Law 65-99 sets out the noise limits and individual protection standards.

During the work, these unusual noises in the environment and the rise in the noise level in the environment will cause noise pollution that can cause hearing problems on the site and disturb the tranquility of the surrounding populations.

The impact of the construction phase on noise is of medium importance following the assessments carried out in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The impact of construction works on noise will be of medium intensity.

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Mean	Regional	Long	Major
		Mean	Major
		Short	Mean
	Local	Long	Major
		Mean	Mean
		Short	Mean
	Punctual	Long	Mean
		Mean	Mean
		Short	Minor

The significance of the potential impact of the project during the construction phase is medium. It requires special mitigation measures. This impact is reversible.

4.9.2 During the operation phase

The noise emitted by the unit will be produced by trucks as well as transport vehicles, the movement of the vehicles themselves and the operation of mechanical equipment. During the operation phase, noise from trucks is not likely to be heard above the background noise of the surrounding road system.

The promoter will pay attention to the noise produced by the installations of his unit in order to minimize the impact on the areas bordering the site, it will however be very low and will remain within the standards taking into account:

- Both the machines and the installations carried out will comply with the safety standards in force;
- The sound levels which are very low compared to the standards in force (70db);
- Compliance with transport schedules (avoid night schedules).

The impact of the operation phase of the project on noise in the area is of medium importance following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The impact of the operation phase of the project on the noise around the area will be of low intensity

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact

Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

The effect of the operation phase on noise will be of low significance.

4.10 Wildlife

4.10.1 During the construction phase

The construction phase does not represent any significant impact that could affect terrestrial fauna. As the species existing on the two facades are mainly birds, a temporary migration from the site perimeter is expected. However, no rare or vulnerable species is likely to be directly impacted, except in relation to their deterioration or the destruction of their natural habitat (forests, Marjas, etc.).

The impact of the construction phase on wildlife is of minor or even negligible importance following the assessments made in the following tables:

Degree of disturbance	**Component value**		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	**Weak**

The impact of construction works on wildlife will be of low intensity

Impact intensity	**Scope of impact**	**Duration of impact**	**Meaning of potential impact**
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

The effect of construction works on wildlife will be of minor significance.

4.10.2 During the operation phase

During the operation of the project and to meet the sanitary requirements of the storage and distribution of the cold chain, it is important to install and have the necessary devices to hunt insects and other species outside the infrastructure, which will impact wildlife around the project but not to a significant extent.

The impact of the operation phase on wildlife is of minor or even negligible importance following the assessments made in the following tables:

Degree of disturbance	**Component value**		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak

Weak	Mean	Weak	**Weak**

The impact of the operation phase on wildlife will be of low intensity.

Impact intensity	Extent of impact	Duration of impact	Meaning of potential impact
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	**Long**	Minor
		Mean	Minor
		Short	Minor

The effect of the operation phase on wildlife will be of minor significance.

4.11 The flora

4.11.1 During the construction phase

Vegetation at the project site consists of grass and seasonal crops. Land preparation and earthworks operations will only require some deforestation.

Hence, the impact of the development, construction and transport work phase on the vegetation of the environment studied will be of low intensity.

The project is located in an area with no space recognized as a protected area. However ; it is located in the middle of agricultural land and land with dayas and crops will not be impacted during the project's operating phase.

The impact of the construction phase on the flora is of minor or even negligible importance following the assessments carried out in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	**Weak**

The impact of the construction works on the flora will be of low intensity

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

The effect of the construction works on the flora will be of minor significance.

4.11.2 During the operation phase

The installation of the project will have an indirect impact through the clearing of vegetation on microfauna and the protection of the soil against the various forms of soil erosion. This impact remains

slight taking into account the nature of the project. Also, the petitioner will reinforce the installation of a plant screen at the level of the fence.

The impact of the operation phase on the flora is of minor or even negligible importance following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	**Weak**

The impact of the operation of the infrastructure on the flora will be of low intensity

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	**Long**	Minor
		Mean	Minor
		Short	Minor

The effect of the construction works on the flora will be of minor significance.

4.12 Odors

4.12.1 During the construction phase

Due to its nature, the cold chain infrastructure construction project has minor negative impacts, indeed the waste emitted during the construction phase will be the only source of unpleasant odors.

The impact of the construction phase on odor is of minor or even negligible importance following the assessments carried out in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The impact of the construction works on the odor will be of low intensity

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean

		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

The effect of construction works on odor will be of minor significance. This impact is reversible.

4.12.2 During the operation phase

During the operation of the infrastructure, there will be no release of odors, even the waste that will be rejected will not have an impact on the odor of the area surrounding the site.

4.13 Waste management

4.13.1 During the construction phase

Several activities and factors related to the sub-project will produce waste likely to pollute the ground or clutter it. Since the project will be built on an industrial zone, this will ensure compliance of waste management during the construction phase with national and international laws.

The impact of the construction phase on waste management is of minor importance following the assessments made in the following tables:

Degree of disturbance	**Component value**		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The impact of construction works on waste management is low

Impact intensity	**Scope of impact**	**Duration of impact**	**Meaning of potential impact**
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	**Minor**
		Short	Minor

The effect of construction works on waste management will be of minor significance, this impact may be reversible.

4.13.2 During the operation phase

The operational phase of the project will generate moderate amounts of solid waste. The types of waste likely to be generated include packaging, green waste, cans, bottles, hazardous waste (waste fuel, etc.).

The industrial zone is subject to the texts of national and international laws with regard to waste management.

The impact of the operations phase of the project on waste management is of minor importance following the assessments made in the following tables:

Degree of disturbance	**Component value**		
	Strong	Mean	Weak

Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The impact of cold chain infrastructure operations on waste management is low

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	**Minor**
		Short	Minor

The effect of infrastructure operations on waste management will be of minor significance, this impact may be reversible.

4.14 Cultural properties

4.14.1 During the construction phase

The municipality of Ouled Teïma does not have any cultural properties. No paleontological evidence has been recorded in the area. However, an archaeologist may be hired during the construction phase to monitor excavated areas and any unearthed items or artifacts. If elements are discovered, it will be necessary to modify the route of the pipeline to avoid damaging them.

The impact of the construction phase on the cultural properties is of minor or even negligible importance following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	**Weak**

The impact of construction works on cultural properties will be of low intensity

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

The effect of construction works on cultural properties will be of minor significance.

4.14.2 During the operation phase

Based on public consultation, site assessment and available documentation, there is no area of interest in terms of archaeological, historical and cultural sites near the cold chain infrastructure.

The impact of the operation phase of the project on the cultural properties is of minor or even negligible importance following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	**Weak**

The impact of the operationalization of the project on cultural properties will be of low intensity.

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

The effect of construction works on cultural properties will be of minor significance.

4.15 natural landscapes

4.15.1 During the construction phase

The landscape references near the project site are characterized by agricultural land. The impacts that can be generated by the installation of the project relate essentially to the modifications of the characteristics of the local landscape by the construction of the premises at the level of the site.

The impact of the construction phase on the cultural landscapes is of minor or even negligible importance following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	**Weak**	Weak

The impact of the construction works on the cultural landscapes will be of low intensity.

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

The effect of construction works on cultural landscapes will be of minor significance.

4.15.2 During the operation phase

The construction of the cold chain infrastructure in the Ouled Teima area will no longer change the landscape of the environment.

The impact of the operation phase on the cultural landscapes is of minor or even negligible importance following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	**Weak**	Weak

The impact of the operation phase of the project on the cultural landscapes will be of low intensity.

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

The effect of the operation of cold chain infrastructure on cultural landscapes will be of minor significance.

4.16 Geological features

The project will have no direct or indirect influence on the geological characteristics of the area in the two phases: construction phase and operation phase.

The impact of the construction and operation phase on the geological characteristics is of minor or even negligible importance following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	**Weak**	Weak

The impact of the operation phase of the project on the geological characteristics will be of low intensity.

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

4.17 Hydrological characteristics

The project will have no direct or indirect influence on the hydrological characteristics of the area in the two phases: construction phase and operation phase.

The impact of the construction and operation phase on the hydrological characteristics is of minor or even negligible importance following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	**Weak**	Weak

The impact of the operation phase of the project on the hydrological characteristics will be of low intensity.

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

4.18 Cultural landscape

The project will have no direct or indirect influence on the cultural landscape of the area in the two phases: construction phase and operation phase.

The impact of the construction and operation phase on the cultural landscape is of minor or even negligible importance following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	**Weak**	Weak

The impact of the operation phase of the project on the cultural landscape will be of low intensity.

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

4.19 Entertainment

The project will have no direct or indirect influence on the entertainment areas of Ouled Teïma in the two phases: construction phase and operation phase.

The impact of the construction and operation phase on entertainment is of minor or even negligible importance following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	**Weak**	Weak

The impact of the project's operation phase on entertainment will be of low intensity.

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

4.20 Ground subsidence

Activities that may cause ground subsidence are not anticipated during the construction or operation phase. There will be no direct or indirect influence of the project on ground subsidence.

The impact of the construction and operation phase on ground subsidence is of minor or even negligible importance following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	**Weak**	Weak

The impact of the operation phase of the project on ground subsidence will be of low intensity.

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

5 Current social reference state

5.1 Population

The population of the urban commune Ouled Teima according to the General Population and Housing Census (RGPH) in 2004 and 2014 is reported in the following table. The total population of the commune is 89,303 inhabitants according to the RGPH 2014, thus The population within the commune recorded an average annual growth rate of 3.05% between 2004 and 2014.

Table 7: Population of Ouled Teima commune in 2004 and 2014

Urban community	People (2004)	People (2014)	CAGR (%)
Ouled Teima	66 159	89,303	3.05%

By age group, according to the RGPH 2014, more than 60% of the population in the Ouled Teima commune is young, between 15 and 59 years old.

Table 8: Distribution according to age groups

Breakdown by major age groups	Feminine	Male	Total
Under 6 years old	13.1	12.2	12.7
From 6 to 14 years old	17.3	16.7	17.0
From 15 to 59 years old	62.0	64.1	63.0
60 and over	7.7	7.0	7.3

5.2 Habitat

With regard to the number of households, it has evolved from 13,144 in 2004 to 19,652 according to data from RGPH 2004 and 2014. The average size of households has increased from 5 people per household in 2004 to 4.5 people in 2014.

In terms of housing, the town is marked by the predominance of modern Moroccan houses, then apartments in buildings totaling nearly 97% of the types of existing housing in the town. R+2 dwellings are more predominant.

Table 9: Population, number of households and types of housing

Indicator	Value
Population and households	
Number of households	19,652
Average household size	4.5
Housing type	
Villa or villa floor	1.9
Apartment in a building	6.4
Modern Moroccan House	90.3
Basic habitat	0.4

Rural type housing	0.4
Other	0.6
Source: GDPR 2014	

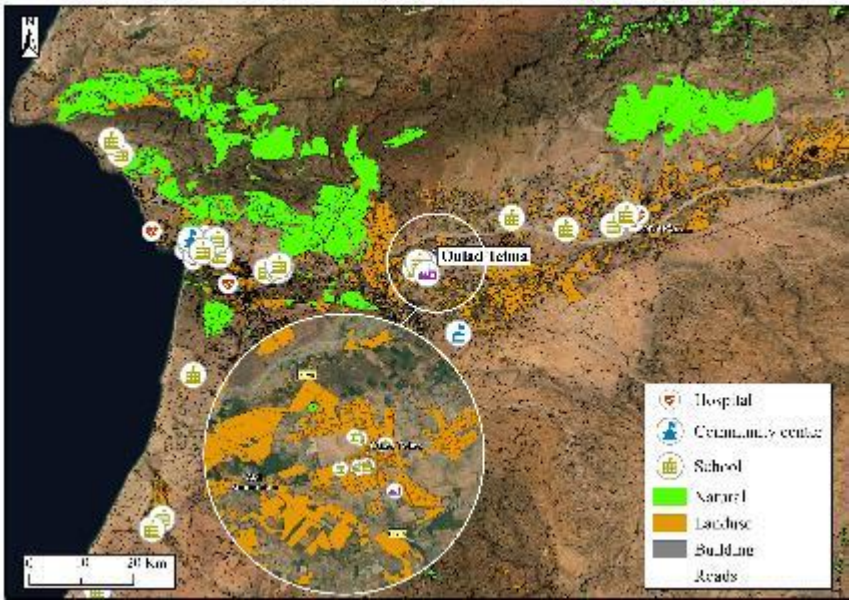
5.3 Public facilities

The socio-cultural facilities identified in the study area are all establishments that regularly attract a considerable number of people for various reasons, which may range from the workplace to seeking the benefit of a particular service. These include in particular:

- Groups of educational institutions
  - Houara High School
  - Houara secondary school
  - Anwal High School College
  - Hassan II High School
  - Abdellah Chefchaouni High School
  - Institute of technicians specialized in Agriculture
- Worship and religious buildings
- Public services (districts, post offices, sports establishments, zoo, leisure and grounds, etc.)
- Electric post.

These facilities are characterized by their dispersion at the commune level, and they are almost far from the project area.

Figure 8: Location map of public facilities and the project area



Source: LixCap using Openstreetmap data

5.4 Traffic and road network

Inside the study area, the nature of the existing accesses serving the douars is distributed as follows:

- Asphalt road.
- Motorable track.
- Track not passable.
- Trail: footpath or on horseback.

Ouled Teïma is crossed mainly by the N10 road, this penetrating East West links the town mainly with Taroudant and the city of Agadir

The town is mainly linked with the A3 motorway thanks to the provincial road P1705, it is located 23 km from this motorway, i.e. nearly 30 minutes.

Figure 9: Map locating the project area and the highway, RN10 and P1705

Source: LixCap

5.5 Jobs

The number of active people in the Souss Massa region reached about 904 thousand people during the year 2021, an increase of about 11 thousand people compared to the year 2020. The urban environment is home to almost 571 thousand (i.e. 63%). The number of working people residing in rural areas is about 333 thousand (ie 37% of the working population). Women make up 20% of the total labor force, down 0.9 from 2020.

The employment rate recorded at the regional level in 2021 is identical to that recorded a year earlier (36.6%). This shows the beginning of a return to the level before the pandemic and a delay in this situation compared to the national level; the national employment rate increased by 0.3 points during this period, going from 39.4% to 39.7%. However, the employment rate remains below the level recorded before the pandemic (38.5% in 2019).

The employment rates in the two places of residence did not show any remarkable change after the pandemic. The employment rate in 2021 is 35.6% (35.5% in 2020) in urban areas and 38.4% in rural areas (38.5% in 2020).

Table 10: Distribution of jobs

Indicator	Male	Feminine	Together

Population by activity			
Active population	23,603	4,924	28,527
Inactive population	21,127	39,649	60,776
Net activity rate	**75.6**	**15.5**	**45.3**
Unemployment rate	**11.0**	**22.7**	**13.0**
Situation in the profession of employed persons and unemployed persons who have already worked			
Employer	4.1	1.6	3.7
Independent	33.7	12.1	30.3
Employee in the public sector	8.7	12.4	9.3
Employee in the private sector	48.3	71.3	52.0
Family support	1.5	0.9	1.4
Apprentice	0.9	0.6	0.9
Associate or partner	2.5	0.5	2.2
Other	0.2	0.5	0.3
Source: HCP			

5.6 Quality of products available in local markets

Currently, one of the main challenges for the future is to enhance and diversify local products and, at the same time, improve the quality of production to attract more customers, both nationally and internationally. Acting at the level of the value chain seems an effective way to increase employment both in the agricultural sector and in all the other economic sectors that interact with it: industry, energy, crafts, design and marketing. However, at present, not all value chains are well organized; in these cases, the lack of organization should be tackled so that large companies, cooperatives and institutions can support the aggregation of small players and transfer know-how, promoting the adoption of technologies, new business models, access to finance, and quality control and certification. A related problem is that the informal market has a negative impact on the most innovative companies, pushing down prices and quality.

The issue of improving the quality of products and the introduction of structural quality control actions were indicated during the interviews as a key element for the future of the sector. While the Green Morocco Plan focused on productivity, that of the Green Generation that followed focuses on improving production, and therefore product quality. ONSSA certification is necessary for products to be on the market, while other types of certifications are still difficult for some companies to access due to the high associated costs.

A related action to improve the positioning of Moroccan products towards the upper price segment of the value chain is that of the promotion of organic farming, the preservation of food identity, and the development of products or niche apps. Organic (i.e. certified) farming and its counterpart agro-ecological farming (based on an agreement between small producers) are growing but need recognizable labels and more support to reduce costs and reach customers. A relevant factor highlighted during a focus group was that of preserving food identity, which requires traceability technologies but also skills and competences on how to protect and enhance local products. Finally, higher sales value and better

employment can be achieved through niche products, such as argan oil, avocados, or low-calorie sugar, or niche applications, such as use of the oil as an ingredient for the cosmetics industry.

Growing demand for healthier foods is growing worldwide, creating opportunities for exported products; in any case, industries are forced to adapt and introduce innovations to achieve greener and more sustainable production. On the national market, there is also a growing interest in ethical, environmental and nutritional aspects, especially among the educated middle classes and the younger generations. Yet several companies have complained about a lack of awareness among the general Moroccan population on issues such as quality (also due to higher prices for quality local products).

5.7 Accessibility of farmers to cold chain infrastructure

Rapid access to the cold chain is an essential requirement for agribusinesses and farmers to take advantage of the growing demand for fresh produce in national and international markets that demand consistent quality, large volumes and high levels of Food Safety. Access to first-mile cold chain and certification-ready facilities offers agribusinesses the ability to reduce post-harvest losses and store, consolidate and process produce from multiple farmers.

Despite this, the cold chain system is still weak or even non-existent in some countries. A small percentage of all perishable food volumes in Morocco are refrigerated. As in most emerging markets, cold chain growth is fragmented, usually concentrated in urban centers, and cold storage capacity for fresh produce consists mainly of large packing warehouses with cold rooms.

In rural areas, most farmers located in the first mile of distribution do not have the infrastructure necessary for the development of the cold chain. Additionally, most farmers do not have access to the cold chain due to their inability to invest capital in infrastructure or due to the lack of nearby cooling facilities, which means they are relatively disadvantaged in the supply chain.

6 Potential social impacts

6.1 Health and safety of site workers and users

6.1.1 During the construction phase

The risks of work accidents and damage to the health and safety of employees and populations will be linked to the construction of foundations, the construction of buildings, related infrastructure and fencing (elevation of walls, framework, coating) , related facilities, movement of vehicles and machinery, presence of site personnel, onlookers and job seekers as well as during maintenance of vehicles and machinery.

Accidents at work can be related to a shock, a fall, a slip, an injury, etc. or be the result of poor control of the operation of equipment and poor posture during manual and mechanical handling. For the risk of disease, factors such as dust, gas and odors can be identified, with risks of contamination by respiratory and eye diseases.

The impact of the construction phase on the health and safety of workers and users of the site is of medium importance following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The impact of construction work on the health and safety of site workers and users is of medium intensity

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Mean	Regional	Long	Major
		Mean	Major
		Short	Mean
	Local	Long	Major
		Mean	Mean
		Short	Mean
	Punctual	Long	Mean
		Mean	Mean
		Short	Minor

The effect of the construction works on the health and safety of the workers and users of the site will be of medium significance, this impact may be reversible.

6.1.2 During the operation phase

During the operation phase of the project, the risk for the population will be linked to the movement of staff vehicles and refrigerated trucks.

The impact of the operation phase on the health and safety of workers and users of the site is of minor importance following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The impact of the operation phase on the health and safety of site workers and users is of low intensity.

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact

Weak	Regional	Long	Mean
		Mean	Mean
		Short	Minor
	Local	Long	Mean
		Mean	Mean
		Short	Minor
	Punctual	Long	Minor
		Mean	Minor
		Short	Minor

The effect of the operation phase on the health and safety of workers and users of the site will be of minor significance, this impact may be reversible.

6.2 Habitat

6.2.1 During the construction phase

According to the site observations, the area development plan and the GIS analysis, there will be no potential impact of the project on the habitat since the area is already designed as an industrial zone.

6.2.2 During the operation phase

According to the site observations, the area development plan and the GIS analysis, there will be no potential impact of the project on the habitat since the area is already designed as an industrial zone.

6.3 Public facilities

6.3.1 During the construction phase

According to the observations of the site, the development plan of the area and the GIS analysis, there will be no potential impact of the project on public facilities (Schools, hospitals and others) since the area is already designed as an industrial area. At the level of the industrial zone there are other public infrastructures, namely the electricity stations, which will not be impacted by the project.

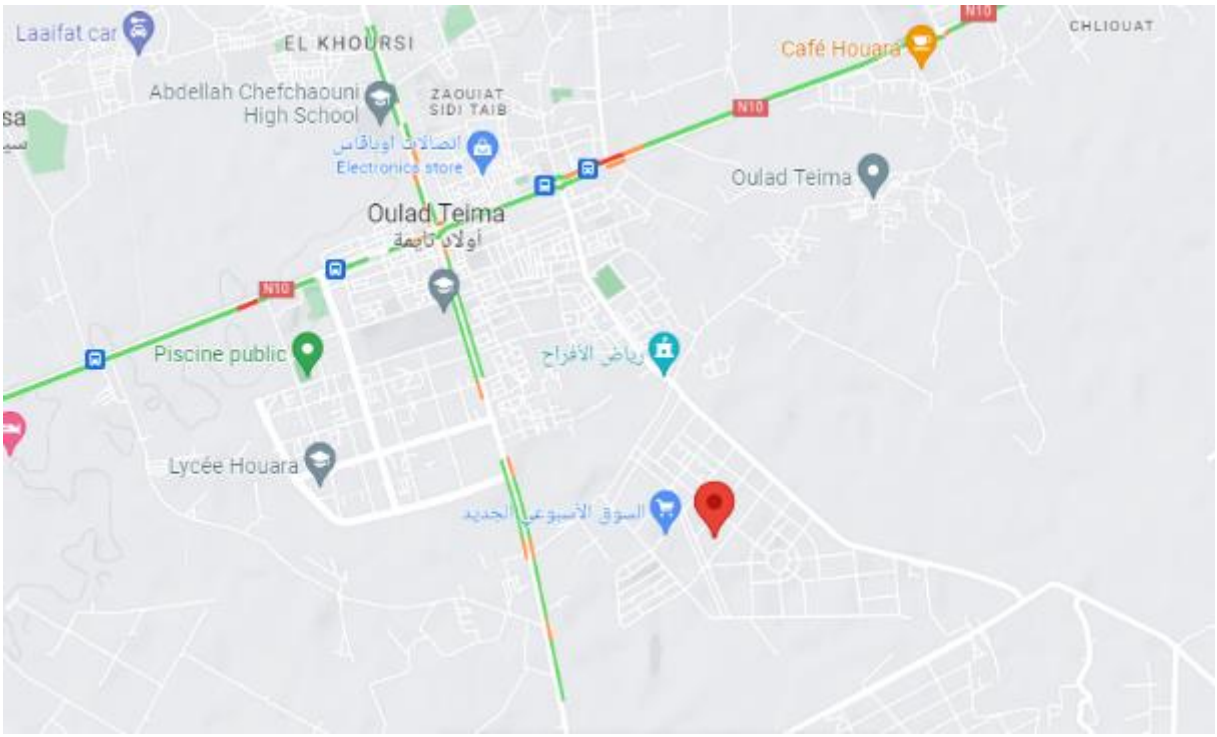
6.3.2 During the operation phase

According to the observations of the site, the development plan of the area and the GIS analysis, there will be no potential impact of the project on public facilities (Schools, hospitals and others) since the area is already designed as an industrial area. At the level of the industrial zone there are other public infrastructures, namely the electricity stations, which will not be impacted by the project.

6.4 Road traffic

6.4.1 During the construction phase

The circulation of construction trucks and transport of materials for the construction of the cold chain infrastructure will disturb the movement of the inhabitants a little. This disruption will be important on Thursday which is particularly the busy day of the Ouled Teima market. These disturbances will be linked to the traffic and congestion of construction machinery and vehicles on the national road N10 and the provincial road P1705 which are very busy on market days by the vehicles of the merchants.



The impact of the construction phase on road traffic is of medium importance following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The impact of construction works on road traffic is medium

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Mean	Regional	Long	Major
		Mean	Major
		Short	Mean
	Local	Long	Major
		Mean	Mean
		Short	Mean
	Punctual	Long	Mean
		Mean	Mean
		Short	Minor

The effect of construction works on road traffic will be of medium significance, this impact may be reversible.

6.4.2 During the operation phase

Daily traffic related to the operation of the cold room will concern staff vehicles and refrigerated distribution and transport trucks. However, this impact will be moderate to minor as additional parking will also be provided for parking.

In addition to the fact that transport activities generate environmental impacts linked to greenhouse gas (GHG) emissions, transport can generate other impacts, known as societal, such as noise, deterioration of pavements, accidents in urban areas. Often presented in the background, these side effects represent

a real financial but also human cost. Better control of travel is therefore an environmental and societal issue.

The impact of the operation phase on road traffic is of medium importance following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The impact of mining works on road traffic is moderate

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Mean	Regional	Long	Major
		Mean	Major
		Short	Mean
	Local	Long	Major
		Mean	Mean
		Short	Mean
	Punctual	Long	Mean
		Mean	Mean
		Short	Minor

The effect of the project operation phase on road traffic will be of medium significance, this impact may be reversible.

The road traffic relating to the Ifria project has been given as follows:

6.5 Jobs

6.5.1 During the construction phase

The construction of the cold chain infrastructure, sanitation works and roads will require the recruitment of skilled and unskilled labour. It is a job opportunity for young people looking for labourers. Thus, the works will generate direct and indirect jobs. It is a chance for local labor (from different localities due to the Commune of Parakou or surrounding Communes) because for these types of work, it is more prioritized. This labor will be more in demand for the actual construction work, painting, cleaning, glazing, security, etc. In total, from the preparation phase to construction, 100 jobs will be created.

The impact of the construction phase on employment is of medium importance following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The impact of the construction works on employment will be of high intensity

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Strong	Regional	Long	Major
		Mean	Major
		Short	Mean
	Local	Long	Major
		Mean	Major

		Short	Mean
	Punctual	Long	Mean
		Mean	Mean
		Short	Minor

The significance of the potential impact of the project during the construction phase is medium. It requires special mitigation measures. This impact is reversible.

6.5.2 During the operation phase

The project will generate multiple direct and indirect jobs. For direct jobs, there will be the recruitment of personnel who will have a direct link with the infrastructure, namely the shelving workers, the inventory manager and the manager. Indirect jobs will be created in the field of miscellaneous trade, miscellaneous consumer goods, provision of small services, catering, etc. which will be able to develop around the infrastructure in order to satisfy the needs of the workers. With this project, the promotion of this sector will encourage the creation of around 300 jobs, especially for young people trained in the logistics and cold chain sector. The activities, surveillance and guarding of the site will generate specific jobs on the site. Job creation is a direct and indirect positive impact. It is high intensity, given the high potential number of people to be employed. This staff will come from localities neighboring the site as well as from other localities in the country or even from outside, depending on the technical skills and expertise required. Therefore, the extent of the impact is considered regional. The jobs will last for the duration of the project.

The impact of the operation phase on employment is of major importance following the assessments made in the following tables:

Degree of disturbance	**Component value**		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The impact of mining works on employment will be very intense

Intensity of positive impact	**Scope of impact**	**Duration of impact**	**Meaning of potential impact**
Strong	Regional	Long	Major
		Mean	Major
		Short	Mean
	Local	Long	Major
		Mean	Major
		Short	Mean
	Punctual	Long	Mean
		Mean	Mean
		Short	Minor

The significance of the potential impact of the project during the operation phase is major.

6.6 Accessibility of farmers to cold chain infrastructure

6.6.1 During the construction phase

During the construction phase, the project will have no direct or indirect impact on the accessibility of farmers.

6.6.2 During the operation phase

The commissioning of the cold chain infrastructure will increase the vision of the actors of the different sectors (Agricultural, Dairy products, meat and others) due to the modernity of the storage equipment for these products. So they will find pleasure and satisfaction.

The work planned as part of the modernization of the cold chain infrastructure will allow rational and optimal management of space. This would give a better organization and occupation of the space inside this infrastructure. Indeed, the markets may be equipped with an operational back-up plan in the event of an emergency. From a security point of view, farmers can access the storage premises by respecting the security codes which will be drawn up by the Ifria team. Thus, the lighting will have a deterrent effect in the fight against insecurity, banditry in the environment of the infrastructure. The technology to be deployed will considerably reduce the constraints formerly linked to the activity.

The operation of the infrastructure will generate gains which will be reinvested in the infrastructure with a view to improving its technological performance and renewing obsolete equipment.

The impact of the exploitation phase on the accessibility of farmers is of major importance following the evaluations carried out in the following tables:

Degree of disturbance	**Component value**		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The impact of the operation of the infrastructure on the accessibility of farmers will be of high intensity

Intensity of positive impact	**Scope of impact**	**Duration of impact**	**Meaning of potential impact**
Strong	Regional	Long	Major
		Mean	Major
		Short	Mean
	Local	Long	Major
		Mean	Major
		Short	Mean
	Punctual	Long	Mean
		Mean	Mean
		Short	Minor

The significance of the potential impact of the project during the operation phase is major.

6.7 Quality of products available in local markets

6.7.1 During the construction phase

During the construction phase, the project will have no direct or indirect impact on the quality of products available on local markets.

6.7.2 During the operation phase

The agricultural products cold chain is a special supply chain system. The agricultural products cold chain is composed of agricultural producers (farmers/production base), agricultural product supply and processing companies, distributors, retailers and logistics companies, a service network farm-to-table logistics.

Specifically, the cold chain of agricultural products includes agricultural production, acquisition, sale of the pre-cooling process, transportation, storage, handling, transport, packaging, distribution, processing of circulation, information activities and other sectors, and aims to achieve organizational objectives and produce added value in the process.

The project will provide most of the added value of the cold chain process, namely: pre-cooling, storage, packaging and distribution using modern equipment and ensuring product quality (by reducing the percentage of post-harvest loss) passing through Ifria's cold chain infrastructure intended for the local market or the external market.

The impact of the exploitation phase on the quality of the products available on the local market is of major importance following the evaluations carried out in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The positive impact of the operation of the infrastructure on the quality of the products available on the local market will be of high intensity.

Intensity of positive impact	Scope of impact	Duration of impact	Meaning of potential impact
Strong	Regional	Long	Major
		Mean	Major
		Short	Mean
	Local	Long	Major
		Mean	Major
		Short	Mean
	Punctual	Long	Mean
		Mean	Mean
		Short	Minor

The significance of the potential impact of the project during the operation phase is major.

6.8 Quality of life of the population

6.8.1 During the construction phase

The project site is far from the homes of Ouled Teima, it is located in the industrial zone. However, for users of the industrial zone, the work could cause some inconvenience (noise, dust, construction waste, etc.). In terms of environmental hygiene, the anarchic discharge of waste from the works (especially residues from the demolition of existing buildings) and from the site base could degrade the site or its environment.

The construction of the project requires labor and will attract a large number of professionals from different trades including skilled workers, unskilled workers, technical experts, construction workers and operating technicians. This additional population will impact the demand for the city's basic services.

The impact of the construction phase on the quality of life of the population is of medium importance following the assessments made in the following tables:

Degree of disturbance	Component value		
	Strong	Mean	Weak
Strong	Strong	Strong	Mean
AVERAGE	Strong	Mean	Weak
Weak	Mean	Weak	Weak

The impact of the construction works on the quality of life of the population will be of medium intensity.

Impact intensity	Scope of impact	Duration of impact	Meaning of potential impact
Mean	Regional	Long	Major
		Mean	Major
		Short	Mean
	Local	Long	Major
		Mean	Mean
		Short	Mean

	Punctual	Long	Mean
		Mean	Mean
		Short	Minor

The significance of the potential impact of the project during the construction phase is medium. It requires special mitigation measures. This impact is reversible.

7 Mitigation measures and environmental and social surveillance and monitoring programs

7.1 Summary of impacts

Phase, project activities	Possible effects related to the project	Effect characteristics			
		Intensity	Extent	Duration	Significance
Construction phase	Climate	Weak	Punctual	Short	Minor
	Floor	Weak	Punctual	Short	Minor
	Surface water	Weak	Local	Short	Minor
	Underground waters	Weak	Local	Short	Minor
	Vibration	Mean	Punctual	Mean	Mean
	air quality	Weak	Local	Short	Minor
	Noise	Mean	Local	Short	Mean
	Wildlife	Weak	Punctual	Short	Minor
	Flora	Weak	Punctual	Short	Minor
	Odors	Weak	Punctual	Short	Minor
	Waste management	Weak	Punctual	Short	Mean
	Cultural properties	Weak	Punctual	Short	Minor
	Cultural landscapes	Weak	Punctual	Short	Minor
	Health and safety of site workers and users	Mean	Local	Short	Mean
	Road traffic	Mean	Local	Short	Mean
	Quality of life of the population	Mean	Local	Short	Mean
	Jobs	Strong	Local	Short	Mean
Operation phase	Climate	Weak	Punctual	Long	Minor
	Floor	Weak	Punctual	Long	Minor
	Surface water	Weak	Punctual	Long	Minor
	Vibration	Weak	Punctual	Mean	Minor
	air quality	Weak	Local	Short	Minor
	Noise	Weak	Punctual	Long	Minor
	Wildlife	Weak	Punctual	Long	Minor
	Flora	Weak	Punctual	Long	Minor
	Waste management	Mean	Punctual	Mean	Mean
	Cultural properties	Weak	Punctual	Long	Minor
	Cultural landscapes	Weak	Punctual	Long	Minor
	Health and safety of site workers and users	Weak	Punctual	Short	Minor
	Road traffic	Mean	Local	Short	Mean

	Jobs	Strong	Regional	Long	Major
	Accessibility of farmers to cold chain infrastructure	Strong	Regional	Long	Major
	Quality of products available on the market	Strong	Regional	Long	Major
	Quality of life of the population	Strong	Regional	Long	Major

7.2 Reduction measures

7.2.1 Air pollution

- Ensure proper maintenance and repair of equipment and machinery.
- Adopt a traffic management plan avoiding congested roads.
- Ensure vehicles and machinery are turned off when not in use.
- Hose down surfaces to control dust emissions
- Avoid burning materials resulting from site clearance.
- Make sure people working in dusty areas have PPE.
- Ensure the use of high quality diesel for generators and vehicles.
- Maintain a minimum traffic speed on the site and on access roads.
- Make sure building materials and hazardous substances are handled properly.
- Cover all vehicles transporting materials likely to generate excessive dust emissions.
- Water surfaces regularly to control dust emissions.

7.2.2 The water pollution

- Ensure that sediment and erosion control measures are installed.
- Follow guidelines and procedures for immediate cleanup of spills (oil, fuel, chemicals).
- Cover open stockpiles of building materials on site with tarps during storms to prevent building materials from being washed away.
- Install natural or synthetic liners under chemical storage tanks.
- Compact earthworks as soon as the final surfaces are formed to prevent erosion, especially during the rainy season.
- Be sure to grade gravel roads to maintain existing drainage patterns.
- Ensure the protection of riparian areas
- Take care to avoid the dumping of construction waste into waterways.
- Ensure that chemicals and materials used on the job site are properly stored.

7.2.3 Soil pollution

- Landscape excavated areas to allow native vegetation to grow back naturally.
- Suspend activities during extreme precipitation events
- Be sure to provide drainage channels and silt traps for all parts of the topsoil storage areas.
- Be sure to reclaim areas with topsoil and revegetate them after activities are completed.
- Use non-toxic and readily biodegradable chemicals on site when possible.
- Install natural or synthetic liners under chemical storage tanks.
- Level unpaved roads

7.2.4 Vibes

- Choose intrinsically silent equipment
- Keep equipment speed as low as possible
- Minimize idling time for pickup trucks and other equipment.
- Limit working hours on site when possible

- Ensure that all workers exposed to environmental noise are equipped with appropriate hearing protection and PPE.
- Schedule noisy activities during the morning hours
- Set up noise monitoring
- Inform the local population when loud activities are planned.
- Properly use and maintain mufflers that reduce vibration from construction machinery.
- Use only well-maintained mechanical equipment on the job site.

7.2.5 Climate change

- Use machinery and vehicles in good working order
- Ensure regular maintenance and technical inspections of construction machinery and vehicles

7.2.6 Hydrological characteristics

- Use vehicles in good working order to carry out the work
- Provide the site with garbage bins for the pre-collection of household waste
- Have on each site a sealed space for handling used oils
- Take preventive measures to avoid accidental spills of effluents when emptying septic tanks
- Provide oil absorption devices in case of accidental spillage
- To avoid disruption of the surface water flow system, the substation's concrete areas will be limited to runways and handling areas.

7.2.7 Wildlife

- Avoid killing any wild animal during the work;
- Avoid killing any wild animal caught during the work and keep it away from the site;
- Do not expose food or attract prey to avoid attracting predators (snakes among others) to the site;
- Physically protect construction sites against snakes;
- Avoid the elimination of wild animals during the work;
- Prevent any hunting activity
- Be sure to report wildlife species of high conservation value.
- Avoid any direct or indirect impact on areas of high ecological value.
- Ensure sustainable management of solid and liquid waste from construction and operating activities.
- Ensure that exterior lighting on construction sites is discreet and switched off when not needed.
- If these measures described above are taken into account, they will partially reduce the impacts during the operation phase.

7.2.8 Flora

- Reduce the direct destruction of vegetation as much as possible by delimiting the surfaces of construction sites, barracks, access tracks and sites for the storage and extraction of construction materials to the strict minimum and by concentrating all activities within these sites.
- Identify and clearly delineate the sites (marking them with ribbons, informing the workers) and the areas not to be damaged, considering their ecological value (denser vegetation, etc.).
- Take all preventive measures to avoid damaging the surrounding environment, in particular agricultural land;
- Protect the species present;
- Carry out the adjustment and restoration of the premises after the work.

7.2.9 natural landscape

- Reinforce the presence of visual plant screens vis-à-vis the landscape of the area and the axes of communication of rural localities.
- Reinforce the plantations at the level of the fence taking into account the orientations of the prevailing winds and constitute a diversified and coherent screen fitting into the landscape.

7.2.10 Noise

- Use equipment with low noise emissions, as indicated by the manufacturers.
- Properly adjust and maintain all vehicles and machinery.
- Where possible, conduct construction activities during daylight hours to minimize disturbance to humans and wildlife.
- Limit working hours to 7 a.m. - 7 p.m. when activities are very noisy.

All costs included in the contract value as general maintenance of the site.

7.2.11 Population

- Provide staff with adequate Personal Protective Equipment (PPE) (helmets, safety shoes, boots, etc.)
- Provide the site with an infirmary and first aid equipment; − register employees with the National Social Security Fund (CNSS);
- Raise awareness among employees and local populations on hygiene, health and safety at work;
- Develop and apply a Health, Safety and Environment Plan (PHSE);
- Train employees in safety and risks and ensure compliance with the wearing of personal protective equipment (PPE) on construction sites;
- Put up signs near the work areas (approximately 100m).

7.2.12 Road traffic

- Sensitize the local populations as well as the project drivers on road safety
- Put up signs to indicate the presence of the works.

7.2.13 Waste management

Identify all waste streams for effective management

- Manage waste based on the three Rs (reduce, reuse, recycle)
- Train all staff.
- Minimize the production of waste that must be treated or disposed of.
- Control placement of all construction waste (including spoil) in approved disposal sites (>300m from rivers, streams, lakes or wetlands). Deposit in authorized areas all waste, metals, used oils and surplus materials produced during construction, integrating systems for recycling and separation of materials. Identify and delineate equipment maintenance areas (>15m from rivers, streams, lakes or wetlands).
- Sign a contract for the recovery and treatment of hydrocarbon waste, filters, irons, batteries and other non-biodegradable waste with a company that has an environmental permit
- Set up a concrete washing area for vehicles and machinery with an oil separator

7.2.14 Quality of life of the population

- Ensure sorting, collection and transport to the waste management center
- Inform and raise awareness among the personnel and users of the industrial zone
- Ensure the cleaning and removal of the site after the work.

7.3 Environmental and social programs, monitoring and follow-up

7.3.1 Construction phase

7.3.1.1 Environmental and social monitoring

Environmental and social monitoring

The purpose of environmental monitoring is to ensure compliance with:

- The measures proposed in the impact study, in particular the mitigation measures;
- Conditions set by regulations and the various standards;
- Commitments of the promoter in relation to the institutional actors concerned;

- Requirements relating to other laws and regulations in terms of hygiene and public health, management of the living environment of populations, protection of the environment and natural resources. Environmental monitoring will concern both the construction phase of the infrastructure and the operation phase.

During the construction phase, environmental and social monitoring must be carried out by a Control Office or Control Mission (MdC) whose main missions will be to:

- Ensure compliance with all current and specific mitigation measures for the project;
- Remind contractors of their environmental obligations and ensure that these are respected during the construction period;
- Write environmental monitoring reports throughout the work;
- Inspect the work and request the appropriate corrective measures if necessary;
- Write the final report of the environmental monitoring program during the period.

7.3.1.2 Environmental and social monitoring

Environmental monitoring will make it possible to verify, in the field, the accuracy of the assessment of certain impacts and the effectiveness of certain mitigation or compensation measures provided for in the ESIA, and for which uncertainty remains. The knowledge acquired with the environmental monitoring will make it possible to correct the mitigation measures and possibly to revise certain measures taken by the proponent in terms of environmental management. It will be ensured by the Environment Expert that Ifria will recruit to lead the Environment Unit.

7.3.2 Areas of environmental and social inspection

During the works, monitoring will include the effectiveness of the implementation of the mitigation measures retained in the environmental and social surveillance and monitoring programme. Aspects that should be monitored include:

In the construction phase:

- Gear movement
- Origin of building materials
- Protection of personnel against the raising of dust
- Soil erosion during excavations
- Waste management
- Hygiene and safety on the construction site

In operation phase

- Air quality
- Quality of stored products
- Operating personnel and accidents
- Fire fighting device
- Energy consumption
- Control of the cold chain

7.3.3 Environmental and social monitoring indicators

Indicators are parameters whose use provides quantitative or qualitative information on the environmental and social impacts and benefits of project activities. Monitoring of all biophysical and socioeconomic parameters is essential. It is suggested to follow the main elements indicated in the following tables:

7.3.3.1 During the construction phase

Table 11: Monitoring indicators during the construction phase

Item to check	Indicators	Monitoring manager	Implementation deadline
Gear movement	• Speed Limit • Machine parking	Ifria environmental expert	During the works
Origin of building materials	• Number of sites authorized to operate • Number of suppliers	Ifria environmental expert	Before the works
Protection of personnel against the raising of dust	• Number of masks • Number of agents sensitized	Ifria environmental expert	During the works
Soil erosion during excavations	• Foundation design	Ifria environmental expert	Before the works
Waste management	• Quantity of waste evacuated to the CET	Ifria environmental expert	During the works
Hygiene and safety on the construction site	• Number of PPE provided • Safety instructions • Number of accidents	Ifria environmental expert	During the works

7.3.3.2 During the operation phase

Table 12: Monitoring indicators during the operation phase

Item to check	Indicators	Tracking frequency
Air quality	• Compliance of the refrigerants used	Annually
Operating personnel and accidents	• Number of officers with appropriate PPE • Safety instructions • Number of accidents	Daily
Energy consumption	• Insulation system performance	Monthly
Control of the cold chain	• Compliance of the links in the cold chain monitored	Daily
Quality of stored products	• Storage temperature compliance • Room sanitation	Daily

7.4 Institutional capacity building and communication plan

The effectiveness of the consideration of environmental and social issues in the implementation of project activities requires training and capacity building of the actors involved. These are the actors in charge of the execution of the project, the follow-up and the monitoring of the mitigation measures identified. It is also about the users of the platform and the local populations of the site.

For the proper execution of the measures contained in the program and environmental and social monitoring and the monitoring of their application, it appears necessary to take into account the fact that the technical capacities for implementing the various measures to mitigate negative impacts and monitoring are not the same for all categories of actors. To this end, it is important to develop a program to strengthen the institutional capacities of the external structures (CRI, ONSSA, DMP, etc.) involved in monitoring the implementation of the program. This capacity building program should be based on information and awareness campaigns on environmental management; good environmental practices; health and safety measures, etc.

During the works phase, the Promoter will be supported in environmental monitoring by a control office with an HSE expert specializing in the implementation of environmental and social management plans. In addition, the staff that will be hired as part of the works must be trained and made aware of good practices and health, safety and environmental measures.

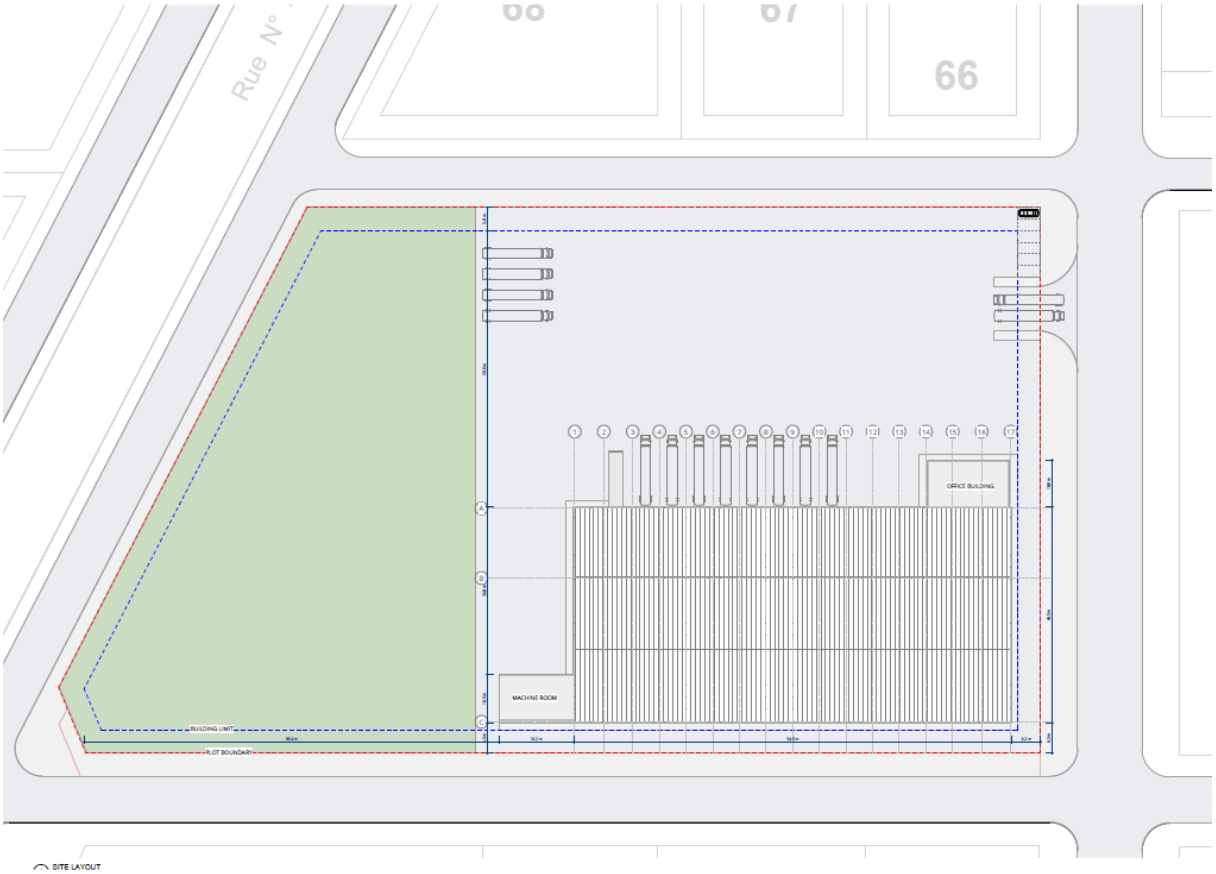
In the operational phase, Ifria will have to recruit an HSE specialist to monitor the implementation of the program and environmental and social monitoring.

Ifria will also have to train staff in health/safety/environment and energy management. He must see to the establishment of a hygiene, health and safety committee for working conditions.

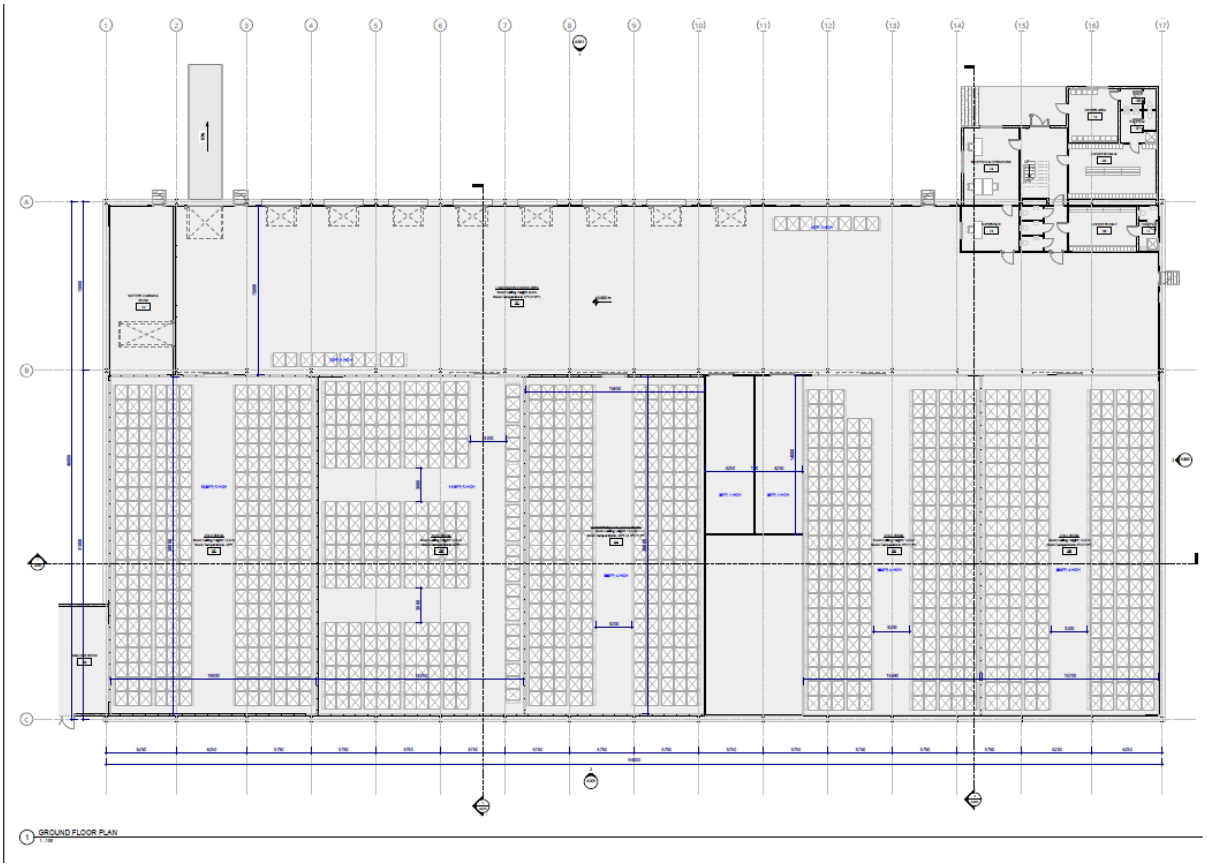
Ifria will have to coordinate the implementation of communication, information and awareness campaigns for local populations, particularly on the nature of the work and the environmental and social issues during the implementation of project activities.

8 Appendix Unit sketches

8.1 Site map



8.2 Unit Ground Plan



8.3 Section plan and facade