

**Emergency Food Security and
Resilience Support Project (P178926)**

Environmental and Social Impact Assessment Study (ESIA) for Dandara Silo Complex, Qena, Egypt

Submitted To: EHCSS



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LIST OF ABBREVIATIONS

Abbreviation	Definition
%	Percentage
°C	Celsius degree
µg/g	Microgram Per Gram
µg/m ³	Microgram Per Cubic Meter
µg/Nm ³	Microgram Per Normal Cubic Meter
ASTM	American Society for Testing and Materials
CAA	Competent Administrative Authority
CAPMAS	Central Agency for Public Mobilization and Statistics
dB	Decibel
DGPS	Differential Global Positioning System
ECO	Environmental Control Officer
EEAA	Egyptian Environmental Affairs Agency
EIA	Environmental Impact Assessment
EIR	Environmental Incident Register
EMP	Environmental Management Plans
EMRL	Environmental Modeling Research Laboratory
EMS	Environmental Management System
EMU	Environmental Management Unit
ESA	Environmental Site Assessment
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
GEF	Global Environment Facility
GPS	Global Positioning System
H'	Shannon index of general diversity
HIA	Heritage Impacts Assessment
HSE	Health, Safety and Environment
IEIA	Initial Environmental Impacts Assessment
ILO	International Labour Organization
IUCN	International Union for Conservation of Nature
Km	Kilometer
Km ²	Square Kilometer

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m²	Square meter
m³	Cubic meter
mg/L	Milligrams per liter
mg/L	Milligrams per liter
MPW	The Ministry of Public Works
NGO	Non-governmental Organization
OI&M	Operation, Inspection and Maintenance
PA	Protected Area
PEIA	Procedure on Environment Impact Assessment
PPE	Personal Protective Equipment's
QA/QC	Quality Assurance/Quality Control
SCA	Supreme Council of Antiquities
SENS	Consultant
sp.	Species
sq	Square kilometer
TDA	Tourist Development Authority
UNEP	United Nations Environment Program
UNESCO	United Nations Education, Scientific and Cultural Organization
UTM	Universal Transverse Mercator coordinate system
WMS	Waste Management System



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EXECUTIVE SUMMARY

Background

Egypt is among the countries most vulnerable to the economic impacts of the war in Ukraine globally (WTO, 2022). The suspension of grain exports from the Black Sea region has delivered a major supply and food import bill shock, leading to drastic reductions in wheat reserves. Egypt imports approximately 12 million metric tons of wheat annually, which accounts for nearly 62 percent of total wheat use in the country. Up to 66 percent and 25 percent of these imports are from the Russian Federation and from Ukraine respectively. Wheat prices averaged US\$ 284 per metric ton during the first quarter of 2021 and reached US\$ 486 per metric ton in March 2024. In December 2021, the Government of Egypt indicated that the country had stocks of around 5.7 months of wheat consumption in silos. By mid-April 2022, strategic wheat reserves were down to 2.6 months of domestic consumption, reflecting difficulties in securing imports from global markets since March 2022. Egypt suspended its tendering from international markets in March 2022 following two unsuccessful tenders due to high prices and low response.

The World Bank has funded Egypt with a \$500 million to help the country secure its wheat needs in emergencies. The funding is part of the Emergency Food Security and Resilience Support Project (P178926), which was established to help Egypt mitigate the impact of food price shocks and improve its food security. This project has the following three components: a) Component 1: Emergency Response Measures, b) Component 2: Strengthening Preparedness and Response to Shocks, and c) Component 3: Project Management and Knowledge Management. The current activity focuses on sub-component 2.1 which targets improving the resilience of the wheat supply chain and reducing loss and waste.

The Egyptian Holding Company for Silos and Storage is an Egyptian government holding company, one of the companies of the General Authority for Supply Commodities affiliated with the Ministry of Supply and Internal Trade. It was established in 2002 AD pursuant to Prime Minister's Resolution No. 1682 of 2002 AD, with the company assuming the management, operation, and development of silos activity. To achieve this, the company may carry out the following tasks: a) Establishing and operating the necessary silos for grain storage to meet the needs of the country through the Ministry of Supply and Internal Trade, b) Executing approved policies, plans and programs for the development of silos activity and setting appropriate procedures for this, c) Receiving wheat from citizens and suppliers during the local wheat season and storing it in silos annually for consumption throughout the year, d) Maintaining the quality of grains through monitoring and implementing the necessary maintenance, e) Eliminate the percentage of waste, which amounts to about 10% to 15%, because of storage in

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the open and barren, f) Transitioning with storage activity in the field of grain in Egypt is a distinct civilized shift to preserve stocks and reach the lowest possible loss rate, g) Creating new attractions and agricultural expansion by encouraging farmers to grow wheat and grains next to the areas where silos are established, and e) Reducing the average purchase price of wheat throughout the year because of entering the global market for purchase at appropriate.

Dandara is a village located in the Qena Governorate of Egypt, situated on the western bank of the Nile River. The area is known for its agricultural activities, benefiting from the proximity to the Nile's fertile lands and water resources. The proposed site for the construction of the Dandara Silo is positioned near the Nile River at coordinates (26°07'24.82"N, 32°36'04.45"E). This location allows for easy access to transportation routes and the river, providing a strategic advantage for grain storage and distribution. The Dandara Silo is planned to have a total storage capacity of 90,000 tons, comprising 18 storage cells, each with a capacity of 5,000 tons. The site will be connected to the main road network of Qena Governorate, facilitating efficient transportation of grains to and from the silo. The silo's location near the Nile will support the logistical requirements of the project while being mindful of the environmental considerations due to its proximity to this vital water source. The new silo site will be connected to railway transportation and Nile River transportation.

Policy, Legal and Administrative Framework

Legislative framework:

This section lists legislation directly relevant to environmental and social compliance that must be adhered to by all parties involved in the project throughout the planning, construction, operation, and decommissioning phase. These legislations include the following: (1) legislation issued by the Environmental Affairs Agency (laws, regulations, and instructions), and (2) relevant national legislation issued by other ministries (laws, regulations, instructions, and standards). The relevant key legislation and the relevant organization/entity are reviewed for each environmental and social standard that is studied and evaluated in the ESIA framework.

The Egyptian Environmental and Social Regulatory Framework:

Egyptian Environmental Affairs Agency (EEAA): The EEAA is a government agency that regulates environmental management issues. Egyptian laws define three main roles for EEAA:

1. An organizational and coordinating role in most activities, in addition to an executive role limited to managing nature reserves and pilot projects.
2. Responsibility for formulating the environmental management policy framework and developing the required action plans for protecting the environment and following up on their implementation in coordination with the competent administrative authorities.

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3. The EEAA's responsibility for reviewing and approving environmental and social impact assessment studies for new projects and/or expansions that have been undertaken, as well as monitoring the implementation of the environmental and social management plan.

The Environmental Management Unit, at the governorate and district levels, is responsible for the environmental performance of all projects/facilities within the governorate scope. The governorate has established environmental management units at the governorate and city/district levels. Environmental management units are responsible for protecting the environment within the governorate boundaries. They are charged with undertaking both environmental planning and operation-oriented activities, as environmental management units are charged with the following:

1. Monitoring the environmental performance of projects within the governorate during the construction and operation phases to ensure that the project is compatible with laws and regulations as well as with the mitigation measures included in the approval of the Environmental and Social Impact Assessment.
2. Investigate any environmental complaints against projects within the governorate.
3. The Environmental Management Unit is administratively affiliated to the governorate, but technically it is affiliated to the Egyptian Environmental Affairs Agency. The Environmental Management Unit submits monthly reports to the EEAA of its achievements and inspection results.
4. The governorate has a solid waste management unit at the governorate and district levels. The units are responsible for overseeing solid waste management contracts.

Competent administrative authorities are the entities responsible for issuing licenses for the construction and operation of the project. An environmental and social impact assessment is a requirement for licensing. The competent administrative authority for this project is responsible for receiving environmental and social impact assessment studies, and verifying the information contained in the documents related to the site and the suitability of the area for project activity. It is also responsible for ensuring that the activity does not negatively affect the surrounding activities and that the site follows ministerial decisions related to the activity. The competent administrative authority and the EHCSS shall send the documents to the EEAA for review and issuance of a response within 30 days.

Law 4/1994 for environment:

- Defines fauna and flora which are forbidden to be hunted or disturbed.
- Ensure that no species are being disturbed and implement all mitigation measures needed to reduce the impact on any fauna and flora in the vicinity of the project.
- Limits of maximum air emission and maximum permissible noise.

The laws related to land acquisition have been mentioned in detail in chapter 2.

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According to EEAA EIA guidelines:

- Conduct a public consultation as part of the ESIA study according to the EEAA guidelines methodology. The involvement of the public and concerned entities in the EIA planning and implementation phases is mandatory for Category C projects through the public consultation process with concerned parties.
- Preparation of the Public Consultation Plan before starting the consultation activities in the EIA scoping phase, the project proponent prepares a plan indicating the methodology of the public consultation to be adopted in the two public consultation phases (EIA scoping phase and consultation on the draft EIA). The plan should indicate the concerned parties that will be consulted, method of consultation and other points.
- An individual chapter in the EIA will be prepared for public consultation.
- Disclosure of relevant material is an important process and should be undertaken in a timely manner for all Category C projects. This process permits meaningful consultations between the project proponent and project-affected groups and local NGOs are required to take place. Before the public consultation on the draft EIA, the draft technical summary in Arabic should be disclosed to all concerned parties.

Land Acquisition:

- Law 1/2015 on the amendment of some provisions of Law No. 10 of 1990 on the land acquisition
 - The first section of article 7 of the law states that: After depositing the compensation, the entity in acquisition charge shall prepare lists with the real estate subject to acquisition, areas, locations, names of owners and property holders, their addresses, and the value of compensations stipulated. These lists and respective maps showing the location of all properties shall be sited in the head office of the entity in charge. while article 8 after amendment stated that: “The concerned owners and holders of rights have the right to object to the information contained in such lists within 15 days from the date of posting and publishing the lists and information of the expropriated properties.
- Regarding the increase in compensation value, the amendments addressed the valuation criteria to ensure fair compensation. While the exact percentage increase in compensation is not specified in the provided text, the law emphasizes that compensation should reflect the fair market value of the property at the time of acquisition. This approach aims to provide equitable remuneration to property owners affected by public interest projects. Law 24/2018 Replace the provisions of Articles 2 (fourth paragraph), 3, 5 (second paragraph), 6 (second paragraph), 7 (first paragraph), 13, 15 (first paragraph) of Law No. 10 of 1990 regarding land acquisition for the public benefit. The public benefit report shall be attached to the decision of the President of the Republic or his authorized representative, accompanied by
 - A note stating the project to be executed.
 - A drawing of the overall planning of the project and the real estate necessary for it.

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The compensation is estimated according to the prevailing prices at the time of the expropriation decision, and additional (20%) twenty percent of the value of the estimate included in the compensation. Existing expropriation procedures. The decision for the public benefit shall be published with a copy of the memo referred to in Article (2) of this law in the Official Gazette. In addition, affixed in the place prepared for advertisements at the headquarters of the local administration units, in the mayor or police headquarters, and in the primary court located in the property department, and on the front of the property subject to expropriation in a visible manner.

- Ministerial decree 20/2019: This decree serves as the new executive regulations for Law No. 10 of 1990 on land acquisition, and amends Law 827 of 1975 on the Egyptian Survey Authority (ESA) and cancels ministerial decree 319/1990 on the ER for Law No.10 of 1990.
- Law 187/2020: In addition to the amendments that have been referred in Law 24/2018 of Articles (2, 6, 13) the law stipulates Article 12 of Law No. 10 of 1990 regarding land acquisition for the public benefit shall be replaced by the following article:

Article (12): If the forms or the ministerial decision have not been deposited according to the procedures stipulated in the previous articles within three years from the date of the public benefit decision in the official gazette; the decision shall be considered as if it was not for land acquisition for which the forms or the decision related to.

The proposed amendment aims to address some of the drawbacks that have emerged because of the application of Law No. 10 of 1990 regarding land acquisition for the public benefit, which lead to obstructing the procedures of property dispute for the public benefit.

The law also comes within the framework of creating a new constitution that aims to protect private property, through fair compensation paid in advance in accordance with the law; as this phrase was not found in the previous constitution.

Note: no land acquisition is anticipated. Public consultations with surrounding communities revealed that no formal or informal activities were occurring in the designated silo area, which is an empty desert with few shrubs. Additionally, no grievances were reported to EHCSS or local authorities regarding land acquisition or expropriation, even during consultations with local communities after the land was officially allocated for EHCSS silos. Lastly, EHCSS contacted the Ministry of Antiquities and obtained approval for the construction of the silo on the allocated land

Occupational health and safety and workers conditions:

- Articles 43 – 45 of Law 4/1994, which address air quality, noise, heat stress, and the provision of protective measures to workers.
- The law 12/2003 and related decrees regulate labor health and safety, and administration and workers' rights have been mentioned in detail in chapter 2. Which include for example but not limited to:

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- Regulations for working conditions
- Regulations for child and forced labour
- Owner's Responsibilities:
- Provide protective equipment to workers.
- Establish firefighting/emergency response plans.
- Contractor's Responsibilities:
- Ensure the appropriate number of first aid kits are available on site, based on the size of the site and the number of workers present.
- Establishment's Responsibilities:
- Prepare records, reports, and registers related to chemical safety

Traffic management

Interior Minister's Decision No.2777 General Provision on Road Traffic

- Article 2: All road users shall consider the utmost care and remain vigilant and cautious so as not to harm or endanger others to more than the inevitable extent that may be posed by the circumstances.
- Article 3: It is not allowed to leave or throw garbage including dust, stones, and construction materials... etc., impeding movement on roads or causing harm to users thereof. Actions that cause roads to be filthy shall be prohibited.

Pest Management

- Law no. 53 of 1966, Chapter VI (Planting protection), Article 73 The Minister of Agriculture shall specify, by a decision issued by him, harmful pests and plants, methods of protection against them, means of controlling them, and measures to be taken for this purpose

GBV/SEA/SH laws

- Egyptian Penal law (promulgated by Law No. 58 of 1937 and amended by Law No. 95 of 2003)
 - Article 306 bis (b): It is considered sexual harassment if the crime stipulated in Article 306 bis (a) of this law is committed with the intention of the perpetrator obtaining from the victim a benefit of a sexual nature.
 - Article 269 bis: Anyone who sexually harasses another person without his will, whether male or female, shall be punished by imprisonment for a period not exceeding one year and a fine of not less than five hundred pounds and not exceeding five thousand pounds, or one of these two penalties.

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Article 214 of the Constitution mentions some independent national councils, including the National Council for Human Rights, the National Council for Women, the National Council for Motherhood and Children, and the National Council for Persons with Disabilities. These councils enjoy legal personality and technical, financial and administrative independence, and their opinions are taken into account in draft laws and regulations related to them.

The National Council for Women guarantees that Egyptian women are treated equally with men in political, economic, social and cultural rights, and includes offices to receive complaints related to discrimination against women and provide support to those who need it. Its specialty is:

- Developing and proposing draft national plans for the advancement of women and solving the problems they face.
- Expressing an opinion on draft laws and decisions related to women before referring them to the competent authority.
- Recommending draft laws and decisions necessary for the advancement of women.
- Promoting women's rights in accordance with the provisions of the Constitution and international agreements and conventions ratified by Egypt.

The National Council for Women developed the National Strategy to Combat Violence against Women, 2015-2020, which is a five-year plan of action based on cooperation with all relevant ministries and with other national bodies and universities.

The Council supervises the National Strategy to Eliminate Violence against Women 2015-2020. In 2021, the Council launched two reports on the “National Strategy to Eliminate Violence against Women 2015-2020” with the aim of highlighting its most important results.

International Agreements:

Egypt has signed and approved several international agreements that oblige the state to conserve environmental resources and protect workers' health, rights, and safety at work. These principles are listed in the following main points:

- Biodiversity and natural resources
- Hazardous materials and chemicals
- Atmosphere and air pollution
- weather changes
- Health and safety of workers

Description of the Project

The mobilization phase involves the following activities: a) Site preparation: This includes clearing the site of vegetation and debris, levelling or flattening the ground, and



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installing erosion control measures, b) Establishment of construction facilities: This includes building temporary offices, storage facilities, and workshops, and c) Mobilization of equipment and personnel: This includes bringing all necessary construction equipment and personnel to the site.

The construction of Dandara Silo Complex will include the following: a) Construction of the Silo Complex: This includes the excavation of the foundation, the construction of the silo foundation and walls, and the installation of the silo roof, and b) Installation of silo equipment: This includes the installation of the silo conveyor system, the silo loading and unloading equipment, and the silo dust collection system. The mobilization and construction phases will take about 20 months.

The operational phase of Dandara Silo will consist of three stages; stage (i) receiving the wheat which include the following points: a) the car loaded with wheat enters the site, b) a sample of the loaded wheat will be taken by a neutral committee, and its degree of cleanliness and moisture content will be determined using laboratory equipment, c) accepted vehicles loaded with wheat will be weighed on a truck scale and the gross weight of the vehicle will be recorded, d) the car will be unloaded at the wheat receiving station, e) the empty car will be weighed on a truck scale, the empty weight of the car will be recorded, and the quantity received will be recorded, f) the quantity of wheat received in the silo will be recorded in the designated records and the financial dues will be paid to the supplier, and g) the wheat will be stored in the main storage cells. Stage (ii) operation and maintenance of the Silo which include the following points: a) site operation; this includes the loading, unloading, and storage of grain in the silo, b) Silo maintenance; This includes the regular inspection and repair of the silo and its equipment. Stage (iii) wheat dispensing process which include the following points: a) the stored wheat will be withdrawn from the storage cells and placed in one of the drainage cells, b) the empty car enters the site, c) the empty car will be weighed on a truck scale and the empty weight of the car will be recorded, d) the vehicle loaded with wheat will be weighed on a truck scale, the gross weight of the vehicle will be recorded, and the quantity of wheat disbursed will be recorded, and e) the quantity of wheat dispensed from the silo will be determined and recorded in the designated records.

The closure (decommissioning) phase of the sub-project refers to the administrative and technical actions taken to remove some or all of the regulatory controls from an authorized facility so that a site can be reused. This process involves the following points: a) planning, b) physical and radiological characterisation, c) facility and site contamination, d) dismantling, and e) materials management. EHCSS will develop a site decommissioning plan with enough time prior to scheduled decommissioning to allow adequate detailed planning. There may be various environmental, social and OHS risks associated with the decommissioning process, including collection and proper management of hazardous and non-hazardous wastes on the site (including any structural or equipment wastes associated with plant operations); worker safety; worker

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recruitment; presence of heavy equipment (including trucks) that generate air emissions, noise and vibrations; exacerbation of local traffic. End of life use of the site will determine the level of activity required during this phase. Stakeholder consultation must be implemented with respect to the proposed site closure plan. In addition to inspection and maintenance of the equipment and devices used, and renewal of what is necessary of it to ensure that the silo continues to operate with high efficiency. Regarding to the facilities at the Silos sites, it will be renovated to be used for longer time. In the case of closure, the site closure plan will be developed during operation before closure.

Existing Physical, Biological and Social Environments

The existing environmental conditions addressed the following issues: a) Physical Environment, b) Biological Environment, and c) Socio-economic aspects.

Climatically, Qena's climate, where the Dandara silo is located, is characterized by a long, hot, and arid summer, while winters are short, mild, and dry. The hot season lasts for approximately five months, from early May to late September, with average daily high temperatures exceeding 35°C. July is typically the hottest month with average highs of 40°C. The cooler season spans from October to February, with January being the coldest month, averaging lows of around 9°C and highs of approximately 20°C.

Geologically, Dandara is located in the central portion of the Nile Valley, occupying part of the Assiut Basin, which reaches depths exceeding 3000 meters. This basin consists mainly of carbonate rocks from the Eocene and Upper Cretaceous periods, and the lower sections are composed of Nubian Sandstone from the Paleozoic and Mesozoic periods. The region is underlain by a sedimentary sequence that includes Quaternary fluvial sediments, reflecting different environmental conditions. The surface geology includes Pre-Nile sediments (Qena sands and Kom Ombo gravels), Bank sediments (Nile silt), and modern floodplain silty layers.

Geomorphologically, Dandara is located along the western bank of the Nile River, with the elevation gradually decreasing from the southern limestone plateau to the Nile Valley plain. The study area includes the young alluvial plains, old alluvial plains (terraces), and water collectors' areas. The terraces are underlain by mixed sand and gravel, rising up to 100 meters above the present floodplain.

Water-bearing formations in the Dandara area include the Quaternary and Plio-Pleistocene aquifers. The Quaternary aquifer is primarily recharged by irrigation water, while the Plio-Pleistocene aquifer is occasionally recharged by irrigation return flow, surface runoff, or vertically from deeper aquifers like the Nubian Sandstone Complex. Groundwater flow generally moves from southeast to northwest, with some variations near the river. The water table depth ranges from 4 to 97 meters depending on the local topography, and the depth of groundwater at the silo location is 50-60m deep.

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The distance to the nearest surface water (the Nile River) is approximately 500 m. . Dandara's location is 5 kilometers south of Qena, and water resources in the region are heavily reliant on the Nile River, with major irrigation canals like the Asfoun (2.14km from the silo site), and Kalabaya (3.76km from the silo site) canals facilitating agriculture in the area.

Flood risks in the Dandara area are minimal as rainfall is extremely scarce. However, the region could be subject to flash floods due to short, intense storms, which produce significant runoff from nearby wadis, particularly Wadi Qena. Despite this, the site's location along the western bank of the Nile in a low-risk flood zone minimizes any significant flooding concerns. Additionally, there is a flood drainage control system next to the silo site.

Seismicity risks for the Dandara Silo site are relatively low. The region is situated between two seismic zones (Z2 and Z8), with historical seismic events like the March 22, 2003, Kom Ombo earthquake registering at a magnitude of 4.0. However, overall, the area is characterized by low seismicity, particularly compared to other regions in Egypt.

Biologically, Qena Governorate, where the Dandara Silo subproject is located, is characterized by diverse habitats, including wetlands, urban areas, desert landscapes, and agriculture lands habitat. The subproject site is in a transitional habitat between the Nile Valley and the desert, where the landscape supports various flora and fauna. While the immediate site of the Dandara Silo is largely devoid of vegetation, the wider region hosts a variety of species adapted to its unique bio-ecological zones. Species like *Acacia raddiana* and *Zilla spinosa* are common in the surrounding desert areas, and the Nile Valley supports reed swamps and other riparian vegetation (Zahran, 1992).

Flora: A site visit to the proposed Dandara Silo location (September 18, 2023, for 3 days) revealed minimal natural vegetation at the construction site. A detailed assessment of the vegetation present at the site indicated that none of the identified species hold significant ecological importance, nor are they endemic or classified as threatened either locally or globally. The sparse vegetation observed mainly consisted of common, non-endangered species that are typically adapted to disturbed habitats in the Nile Valley. However, the wider area supports a range of flora, including species like Halfa Grass (*Desmostacia bipinnate*) and *Tamarix aphylla* along the Nile's edges. Agricultural fields in the region feature crops like sugarcane and wheat, along with date palms (Zahran, 1992).

Mammals: The Qena region is home to small mammals such as bats and rodents, though larger mammals have largely been extirpated. No significant mammalian species were observed at the Dandara Silo site during the site visit (SEAM, 2000, 2001). Bats: species such as the Egyptian Fruit Bat and Common Pipistrelle are known to inhabit the broader Qena region. These species are classified as "Least Concern" by the IUCN Red List, b) Rodents:

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common rodent species in the region include the House Mouse and the Nile Grass Rat. Both species are also classified as "Least Concern" by the IUCN Red. They are not considered endangered or threatened, locally or globally.

As these species are not present at the immediate project site and are widespread in the region, the construction and operation of the Dandara Silo are unlikely to pose any direct threat to their populations.

Birds: The Dandara area lies along a migratory bird route, with species such as White Storks and other raptors being key avian species. During the site visit conducted in September no significant bird activity was observed, possibly due to the timing of the migration season or delays in migratory patterns. However, the Nile Valley region supports a rich diversity of resident and non-resident bird species. Notable resident species include the Cattle Egret (*Bubulcus ibis*), Spur-winged Lapwing (*Vanellus spinosus*), and Pied Kingfisher (*Ceryle rudis*). These species are commonly found in riparian and agricultural habitats along the Nile. The area is an important stopover for migratory birds, including Palearctic migrants such as the Eurasian Marsh Harrier (*Circus aeruginosus*) and the European Bee-eater (*Merops apiaster*). These species rely on the region's wetlands and agricultural lands for food and rest during their migration.

The Dandara area lies along a significant migratory bird route, particularly species traveling between Europe, Asia, and Africa. This route is part of the larger East African Flyway, making the Nile Valley a critical transit corridor for millions of migratory birds.

The spring migration season occurs from February to April, with birds traveling northward to breeding grounds. The autumn migration season lasts from September to November, with birds moving southward to wintering grounds. Peak migration activity in the region is typically observed during March and October.

The Nile Valley serves as a critical stopover and feeding area for migratory birds, offering rich resources such as wetlands, agricultural lands, and riparian zones. These habitats provide food and rest essential for long-distance migrants.

The Dandara site, in proximity to the Nile and agricultural fields, is likely used by migratory species for temporary foraging and resting during their passage.

The risk of bird collision is low, as the silo design does not include reflective materials. The site is also home to 66 species of birds common to the Nile Valley, including *Egretta ibis* and *Falco tinnunculus*, and serves as an important migratory route for palearctic species (Goodman and Meininger, 1989; BirdLife International, 2004). The project site is near an Important Bird Area (IBA) called Upper Nile located at 12-13 km from the project site. The silo may attract birds during operational phase due to the presence of grains and impacts on birds is present since their

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Nile River habitat is in proximity. In addition to agriculture lands in close proximity which support agrobiodiversity and provide suitable habitats for both resident and migratory birds.

Birds of prey, including raptors, are confirmed to be present in the Nile Valley region. These species include the Common Kestrel (*Falco tinnunculus*), Black Kite (*Milvus migrans*), and Egyptian Vulture (*Neophron percnopterus*). Most of these raptors are protected under CITES and are included in Appendix II. Additionally, raptors play a critical ecological role in maintaining balance within the ecosystem. Secondary poisoning from rodenticides used during operational phase may also be a risk on birds of prey.

Construction and operational phases of the project may also disrupt nesting sites and seasons for birds in proximity to the project site. The ESIA has identified these risks and proposed mitigation measures, including coordination efforts with the Ministry of Environment to enhance and consolidate mitigation measures, ensuring the protection of environmentally sensitive species from any potential harm. (Goodman and Meininger, 1989, Bird Life International, 2004).

Reptiles and Amphibians: Few reptiles and amphibians were recorded in the region, and no significant species were found at the Dandara Silo site. Species like the African Green Toad (*Bufo boulengeri*) are more common in wetland areas near the Nile.

Aquatic Ecosystems: Since the Dandara Silo is located near the Nile River, potential direct impacts on aquatic ecosystems, particularly during the construction phase, must be carefully managed. Key risks include pollution from emissions, construction wastes, and sedimentation. During operational phase, risks from grain spills during river transportation is also present. These risks need to be minimized and mitigated through application of pollution prevention and controlled measures. The Nile supports diverse fish populations, including Nile Tilapia and *Tilapia zillii*, which underline the importance of protecting the aquatic environment.

Protected Areas and sensitive Areas : The nearest protected area, Saluga and Ghazal Protectorate, is located approximately 230 km south of the project site. Wadi El-Rayan, another significant protected area, is located 390 km northwest of the Dandara site. Additionally, all islands in the Nile River were declared a Protected Area under Prime Ministerial Decree 1969/1998, these islands are classified as wetland protected areas. The nearest such island to the Dandara Silo site is, located approximately 1.5 km east of the site. The Nile Islands Protected Area originally consisted of 144 islands across various governorates. However, in 2017, 17 islands—located far from Upper Egypt—were removed from the list of nature reserves. These islands provide an attractive habitat for wintering fowl and wading birds. Seasonal changes in water levels create mudflats and sandy banks, fostering rich bird habitats and supporting various amphibian and freshwater invertebrate species.

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The nearest Important Bird Area (IBA) to the project site is the Upper Nile IBA, located about 12-13 km from the Dandara Silo site. This IBA is of international significance due to its role as a critical stopover for migratory birds along the East African Flyway. The migratory route is an essential pathway for millions of birds traveling between Europe, Asia, and Africa. Migratory seasons include spring (February to April) and autumn (September to November), with peak migration typically observed in March and October.

The project site and its surrounding areas do not host threatened vegetation. Although no species classified as locally or globally endangered have been recorded at the site, the project's Environmental and Social Impact Assessment (ESIA) emphasizes the importance of biodiversity protection. Several bird species, internationally protected or threatened may pass through or near the site during migration or as a stopover. Mitigation measures include preventing grain spills and collision during operation and ensuring proper waste management to minimize risks to both terrestrial and aquatic ecosystems and biodiversity and wildlife protection during both construction and operation phases.

The project is unlikely to have any direct impacts on these sensitive areas due to its specific location and the nature of its activities. The project is not located near a RAMSAR site.

Regarding Socio-economic aspects,

Dandara is a rural area within Qena Governorate, located near the proposed silo site. The village of Dandara is characterized by its reliance on agriculture as the primary economic activity, contributing to the governorate's agricultural output. The population of Dandara is predominantly rural, with most residents engaged in farming, and associated agricultural labor. According to (CAPMAS, 2017), the area supports agricultural activities such as sugarcane, wheat, and vegetable cultivation.

Surrounding Area Description:

- North: The silo is bordered from the north by an empty land followed by the Nile river
- South: Agricultural lands and desert terrain border the southern boundary of the silo site followed by Aswan western agriculture road and agriculture lands.
- East: Agriculture lands are located approximately 25 meters of the silo site from the east
- West: The silo is bordered to the west by a flood control zone (low area) followed by agriculture lands and buildings

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- The nearest buildings surrounding the silo location are approximately 250 meters to the east, 200 meters to the southwest, and 300 meters to the southeast.
- In addition, there are nearby educational institutions such as Dandara Primary School, located approximately 500 meters west of the silo site.

Type of Farmers Using the Silos:

The silo is primarily used by small-scale farmers from nearby regions within Qena Governorate, including Dandara and neighboring villages. These farmers produce wheat, sugarcane, and vegetables. The farmers typically transport grains to the silo using small trucks. Large-scale farmers and cooperatives from adjacent districts may also use the silo, leveraging its enhanced capacity for grain storage.

Ownership and Farmland Use:

Farmlands in the surrounding area are predominantly owned by local families or rented by small-scale farmers. Women play an essential role in agricultural activities, including planting, harvesting, and processing grains for storage or market. They also participate in grain transportation and contribute to household decision-making regarding farming practices.

Access to basic utilities such as electricity and water is relatively well-established in Qena Governorate. Approximately 60% of water is sourced from the Nile, and the remaining 40% from groundwater. Sewerage services are available, with nine sewage treatment stations serving the region.

Qena's economy is largely driven by agriculture and industry, with sugarcane being the primary crop. Other crops include wheat, tomatoes, bananas, and hibiscus. The governorate is also home to significant industrial facilities, including sugar factories and an Aluminum complex.

The education sector in Qena includes 1805 schools and 475 Al-Azhar institutes. The governorate also provides healthcare through 17 government hospitals and 13 private hospitals, with a total of 2000+ beds. Infrastructure is supported by a well-connected road network and reliable access to electricity and water.

Qena has emerging tourist attractions, including the Dandara Temple Complex, which is located approximately 7 km southeast of the proposed silo site. The region's historical and cultural significance, particularly in archaeology, attracting local and international tourists. The project site itself is not expected to impact this tourist destination due to its location and operational nature. Approval was obtained from ministry of antiquities regarding the construction of the silos at the designated land.

Site-Specific Information:

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- The site is located near agricultural lands supporting crops such as wheat, sugarcane, and hibiscus, which are the primary commodities stored and managed at the silo.
- The silo construction aims to address existing challenges in grain storage, particularly the reduction of long waiting times for farmers and traders during peak harvest seasons.
- Consultation feedback from the local community highlights their optimism about the silo's positive impacts on agricultural productivity, storage efficiency, and reduced transportation costs for farmers in the area.

During consultations, residents expressed optimism about the silo's potential to support agricultural activities by improving storage capacity and reducing transportation time. The project is expected to positively impact the livelihoods of small-scale farmers and agricultural workers in the surrounding neighborhood.

Analysis of Alternatives

The analysis of alternatives is based on the evaluation of numerous project alternatives during the conceptual and pre-feasibility design phases. When assessing alternatives, particular emphasis was placed on the environmental and social implications of the alternatives to ensure that the option selected is environmentally sound and meets the Egyptian Laws and regulations.

For the construction and operation of Dandara Silo Complex, an alternative analysis was carried out based on various biophysical and socioeconomic parameters including:

- Technical feasibility.
- Economic viability,
- Environmental acceptability of the project and
- Social benefits.

Based on the above four factors, an alternative analysis matrix was developed with scores given for each factor. This analysis provided information about the advantages and disadvantages of each alternative considered regarding its technical, economic, and environmental factors. The purpose of this matrix was to obtain a favorable implementation of alternatives proposed by considering alternatives in terms of site selection, design and operational methods, the project scale and timing of project. The total for all factors gave an overall score for a given alternative. The highest total score provided the most desirable and preferred alternatives and vice versa.

The location of the Dandara Silo was approved by the EHCSS following several discussions. Three options for the location of the Dandara Silo Complex in Qena were considered:

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- **Option A (Preferred):** The location described in the sub-project layout.
- **Option B:** Located in the southern part of the land, near the road.
- **Option C:** Located in the northern part of the land, near the Nile.

After reviewing these alternatives, Option A was selected based on various economic, social, environmental, and engineering considerations. Economically, it offers lower development costs and proximity to transportation routes, reducing grain delivery expenses. Socially, it ensures accessibility for farmers and traders while minimizing disruption to local communities. Environmentally, the site avoids sensitive areas like the Nile River and poses minimal risks to biodiversity. From an engineering perspective, it features favorable terrain and easier utility connections, enhancing construction feasibility and operational efficiency. This comprehensive assessment confirmed Option A as the optimal choice, balancing project goals, sustainability, and stakeholder needs. Option A is minimizing environmental impact, technical challenges, and community disruptions. It has the lowest risk of air and noise pollution, avoids road reinforcement needs, and ensures safer distance from water resources. Additionally, it simplifies site preparation, reduces costs, and enhances long-term operational efficiency. The consultant (SENS) recommended Option A as the most suitable location for the Dandara Silo Complex in Qena.

Alternative Silo Designs, in which there were several designs a) Modular silos: Multiple smaller silos can be built instead of one large silo. This provides more flexibility and redundancy but requires more land area, b) Silo bags: Large woven plastic bags can be used to store grain in a silo-like manner. They are very low-cost but provide less protection than a permanent structure, and c) Silo complexes: Multiple silos can be built together to increase storage capacity. This allows for economies of scale but requires more land and infrastructure. The third alternative was selected for Dandara Silo in which multiple silos will be built together to increase storage capacity.

Impacts Assessment and Mitigation Measures

Identification and analysis of risks and impacts was carried out in the study area to identify the potential risks and impacts on the surrounding environment. The main objective was to examine, analyze and assess the project activities' risks and impacts on the baseline conditions. Analysis of impacts included the following a) impacts on air quality, b) impacts on soil and water quality, c) impacts of noise, d) impacts on terrestrial biodiversity, e) waste management, f) impacts on socioeconomic aspects, g) Architecture and Heritage, and h) impacts on occupational health and safety (OHS). All risks and impacts were addressed during both construction and operation phases. A full evaluation of risks during the closure phase will be developed towards the end of the project's life. Mitigation measures were identified to ensure that any potentially harmful impacts are minimized and reduced to minor levels.

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A) Risks and Impacts during Construction Phase:

1. Environmental Risks:

- Risks on Ambient Air due to Airborne Dust: Dust generated from construction activities can pollute the air, posing health hazards to workers and nearby residents.
- Engine Exhaust Gases and Other Air Emissions: Emissions from vehicles and machinery can affect air quality, causing respiratory issues.
- Risks on Soil and Water Resources Contamination: Accidental spills and improper waste disposal can lead to soil and surface water (Nile river) and groundwater contamination.
- Risks on Ambient Noise: Noise from heavy machinery and construction activities can disturb the local environment.
- Biodiversity: Disturbance to wildlife from noise, dust, and light emissions.
- Waste Management: Increased generation of solid, liquid, and hazardous wastes from construction activities.

2. Socioeconomic Risks:

Assessment of Land Use and Livelihood Impacts:

Google Maps imagery and historical satellite data were reviewed to track the land use changes over time, in addition to consultations which were carried out with local communities surrounding the designated silo site. The results revealed that no formal or informal activities were occurring in the designated silo area, which is an empty desert land. Additionally, no grievances were reported to EHCSS or local authorities regarding land acquisition or expropriation, even during consultations with local communities after the land was officially allocated for EHCSS silos. Lastly, EHCSS contacted the Ministry of Antiquities and obtained approval for the construction of the silo on the allocated land. The allocated land is part of a state-designated area under Presidential Decree No. 228 of 2019 for the development of silos and storage facilities, with no evidence of formal or informal land tenure disputes.

- Risks to Labor from Inappropriate Working Conditions: Unfair treatment, unsafe working conditions, and lack of grievance mechanisms.
- Child Labor: Exploitation of children in construction work.
- Risks of SEA/SH: Increased risk of sexual exploitation, abuse, and harassment.

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- Community Health and Safety (Traffic Risks): Traffic accidents and congestion from construction vehicles.
- Community health and safety risks from noise and air emissions and waste generation during construction phase
- Communities' Discontent/Dissatisfaction: Lack of transparency and consultation leading to unresolved complaints.

3. OHS Risks:

- Occupational Health and Safety Risks: Exposure to hazardous materials, falls, electrical hazards, machinery accidents, and other physical injuries.

B) Risks and Impacts during Operation Phase:

1. Environmental Risks:

- Airborne Dust: Dust from loading and unloading grain and silo operations.
- Gaseous Emissions: Emissions from vehicles, machinery, and fumigation processes.
- Impacts on Soil and Water Quality Surface water including Nile River and Groundwater: Contamination risks from spills and improper waste disposal.
- Ambient Noise: Noise from operations and machinery.
- Biodiversity: Impact on wildlife from emissions and pesticide use.
- Waste Management: Ongoing generation of solid, liquid, and hazardous wastes.

2. Socioeconomic Risks:

- Risks to Labor: Unfair treatment and unsafe working conditions for silo workers and seasonal workers.
- Risks on Vulnerable Populations: Unequal access to silo services and food distribution channels.
- Risks on Children: Presence of children in grain handling areas and risk of child labor.
- Risks of SEA/SH: Potential SEA/SH among staff and visitors.
- Community Health and Safety (Traffic Risks): Increased traffic and road accidents during high storage seasons.
- Community health and safety risks from noise and air emissions and waste generation during operation phase.

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3. OHS Risks:

- Occupational Health and Safety Risks: Respiratory issues from grain dust, falls, asphyxia, fire and explosion risks, grain engulfment, and other physical injuries.

C) Mitigation Measures during Construction Phase:

1. Environmental Measures:

- Dust Control: Use water spraying, dust screens, and cover transportation trucks.
- Emission Control: Regular maintenance of vehicles and machinery.
- Soil and Water Protection: Spill prevention kits, proper chemical storage, and sewage management.
- Noise Control: Restrict construction times, provide earplugs, and maintain equipment.
- Biodiversity Protection: Follow pest management plans, prohibit hunting, and install aviation obstruction lighting. This is particularly important in regions with bird migration routes, as highlighted in biodiversity protection plans.
- Waste Management: Segregate waste types, proper disposal, and implement pest control measures.

2. Socioeconomic Measures:

- Improvement of Working Conditions: Share information on labor rights, establish grievance mechanisms, and inclusive hiring practices.
- Child Labor Prevention: Maintain attendance sheets, verify worker IDs, and regular inspections.
- SEA/SH Prevention: Implement SEA/SH plans, train workers, and establish grievance mechanisms.
- Traffic Management: Develop traffic management plans, perform regular vehicle maintenance, and ensure safe driving practices.
- Community Engagement: Develop communication channels and accessible grievance mechanisms.
- Potential risks to community health and safety due to noise, air emissions, and waste generation:
 - Noise Management Measures:

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- Restrict noisy construction activities to designated working hours to minimize disturbances to nearby communities.
- Use well-maintained equipment to limit noise.
- Provide noise barriers, such as temporary walls or soundproof screens, along the site boundaries nearest to residential areas.
- Air Quality Management Measures:
 - Implement dust control measures, including regular water spraying on exposed surfaces and covering trucks transporting materials.
 - Maintain and regularly inspect vehicles and machinery to minimize exhaust emissions.
 - Monitor air quality regularly to ensure compliance with national and international standards.
- Waste Management Measures:
 - Develop and implement a waste management plan that includes: a) segregating and properly disposing of construction waste, b) establishing designated waste collection points on-site, and c) ensuring hazardous waste (e.g., oils, chemicals) is securely stored and disposed of by licensed contractors.
 - Regularly inspect waste disposal practices to prevent unauthorized dumping or spills.
- Community Engagement and Communication:
 - Establish a grievance mechanism to allow community members to report concerns related to construction activities promptly.
- Emergency Preparedness and Response:
 - Develop an emergency response plan to address incidents such as accidental spills, fires, or severe air pollution.

3. OHS Measures:

- Safety Training: Provide PPE, conduct hazard identification training, and follow OHS risk assessment.

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- Preventive Measures: Implement site-specific OHS manual, provide medical insurance, and maintain proper housekeeping.
- Emergency Preparedness: Develop and implement fire and emergency response plans, conduct fire drills, and install fire safety equipment.
- Accessibility: Ensure access facilities for people with disabilities or temporary disabilities.

D) Mitigation Measures during Operation Phase:

1. Environmental Measures:

- Dust Suppression: Use water spraying, maintain housekeeping, and ensure proper covering of grain trucks.
- Emission Control: Regular maintenance of vehicles, pressure tests for fumigation, and install gas sensors.
- Soil and Water Protection: Presence of spill prevention kits, ensuring proper chemical storage, and good housekeeping is followed and presence of automated grain dust extraction systems
- Noise Control: Conduct regular noise measurements, restrict truck movements, and maintain equipment.
- Biodiversity Protection: Follow pest management plans, prohibit hunting, prevent grain spill, and use aviation obstruction lighting.
- Waste Management: Identify waste pathways, segregate waste types, and implement pest control measures.

2. Socioeconomic Measures:

- Improvement of Working Conditions: Share information on labor rights, establish grievance mechanisms, and ensure proper OHS for seasonal workers.
- Vulnerable Populations: Develop accessible grievance mechanisms, conduct regular stakeholder consultations, and provide continuous project information.
- Child Labor Prevention: Maintain attendance sheets, verify worker IDs, and regular inspections.
- SEA/SH Prevention: Implement SEA/SH plans, train workers, and establish grievance mechanisms.

3. OHS Measures:

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- Safety Training: Provide PPE, conduct hazard identification training, and follow OHS risk assessment.
- Preventive Measures: Implement site-specific OHS manual, hazard monitoring, provide medical insurance, and maintain proper housekeeping.
- Emergency Preparedness: Develop and implement fire and emergency response plans, conduct fire drills, and install fire safety equipment.

There are no environmentally significant risks and impacts that should prevent the proposed construction of Dandara Silos at the identified site, provided that the recommended mitigation and management measures are implemented. Most significant risks and impacts will occur during the construction phase. There is no significant threat from the project on the terrestrial ecosystem including flora and fauna in the project area.

Environmental and Social Management Plan

The Environmental and Social Management Plan (ESMP) is a plan or program that seeks to achieve a required end state and describes how activities that have or could have an adverse impact on the environment, will be mitigated, controlled, and monitored. Any project has negative and positive impacts on the surrounding environment. The environment is composed of both biophysical and social components. All due concern must be given to the environment, including the social environment, during the implementation of a project, to minimize negative impacts.

The main objective of this ESIA is to provide a tool that will ensure an environmentally friendly development and operation of the proposed Dandara Silo Complex. This ESIA implements appropriate environmental controls and monitoring procedures during all phases of the project. Site-specific environmental and social management protocol will be established to provide practical mechanisms to manage the impacts of all activities and to ensure environmental responsibilities are implemented and documented. These are based upon international best practices, which will effectively address local risks, EEAA requirements and environmental and social conditions, as well as the requirements of the funding organization (ESSs of the World Bank).

Currently EHCSS has a technical consultant on board who supports the preparation of bidding documents. The plan is that the technical consultant will constitute the supervision work related to the construction phase. The technical consultant will contract with a consulting firm to bring Environmental, social, and OHS specialists during the construction phase, and the technical consultant will supervise their work. The technical consultant and the consulting firm work will be finished at the end of the construction work.

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Regarding the operation phase, EHCSS will contract with a consulting firm to bring in environmental, social, and OHS experts who will take the responsibility of the ESMP implementation and supervision during the operation phase, until they (EHCSS) build their own team which will consist of (environmental, social, and OHS specialists) as permanent staff in the Dandara silo.

The construction contractor should report monthly on environment and social and OHS aspects to supervision consultancy firm and the supervision consultancy firm should verify the information and consolidate the report and send it to EHCSS. EHCSS should report quarterly to WB

Public Consultation

Stakeholder Consultations Overview

Stakeholder consultations were conducted to engage relevant parties in the planning process, address their concerns, and incorporate their feedback into the project design. These consultations helped identify opportunities, risks, and mitigation measures to enhance the sub-project's design and sustainability.

Key Stakeholders:

- Egyptian Holding Company for Silos and Storage (EHCSS)
- Local population and farms near the construction sites
- Residents near silos and transportation routes
- Farmer Based Organizations and Cooperatives
- Agriculture Trading Companies
- Private Large-Scale Agriculture Companies
- Small Farmers
- Female Farmers and Small-scale Agriculture Workers
- Informal Construction Workers
- Previous and Current Land Users around the site
- Nearby Landowners
- Other relevant stakeholders

Consultation Methods and dates:

- Site-specific consultations (focus group discussions and individual discussions) on September 18, 2023 for three days were conducted with 18 individuals (including 9 females). The target groups were farmers, traders, women, and vulnerable groups.

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- A virtual meeting on August 22, 2024, in coordination with EHCSS. included two main groups: Local representatives and farmers (6 participants), including major grain suppliers; and Women (3 participants) to ensure their concerns and perspectives were addressed.

Consultation discussions included the following topics

1. Environmental Concerns:

- Vegetation Impact: No concerns about vegetation impact were reported, as the silo is located in an area devoid of natural vegetation.
- Transportation: The location of the Dandara Silo near the main roads and farming areas will facilitate efficient transportation of wheat to and from the silo, reducing delivery times and transportation costs for farmers and traders and will road reduce transport emissions.

2. Economic and Social Impacts:

- Economic Benefits: The local community, including farmers and grain traders, expressed optimism that the construction of the Dandara Silo would lead to increased cultivation of wheat and ease the process of selling and delivering grains. The silo's proximity to agricultural areas is expected to benefit both small and large-scale farmers. The local community is optimistic about the development of the area, creation of job opportunities, and the silo's role in facilitating the wheat supply chain. Farmers and traders particularly highlighted the convenience of the silo's location, which will reduce transportation costs and improve the efficiency of wheat trade
- Job Opportunities: The community anticipates the creation of job opportunities for local residents, including positions related to construction, operation, and maintenance of the silo, as well as roles for engineers, drivers, and support staff.
- Hazard Risks: No significant concerns regarding hazard risks such as fire or explosions were raised, as the design includes appropriate safety and ventilation measures.
- Health and Safety: The community did not express concerns about health or safety risks during the construction or operation of the Silo. The ESIA consultant addressed potential risks and outlined mitigation measures to ensure worker safety.

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- Noise: Minor concerns about noise during the construction phase were discussed, particularly from machinery and truck movements, but these were considered manageable with appropriate noise control measures.
- Air Quality: Dust during construction and harvest periods is expected to be minor and controlled through standard mitigation measures.
- Violence and Child Labor: There were no concerns related to child labor or violence.
- The community did not express any significant concerns regarding the silo's impact on daily life, family safety, or accessibility.

Results from the consultations by groups in Dandara:

Farmers (small- and large-scale farmers) Feedback:

- As part of the site-specific consultations, efforts were made to include farmers and workers whose farmlands border the Dandara Silo site. These stakeholders were identified as a key group potentially affected by the project. The consultation included farmers, landowners, and workers directly bordering the silo site. This group was engaged during one-on-one discussions and focus group discussions to ensure their specific concerns and suggestions were recorded.
Farmers and landowners were specifically asked about the historical land uses of the silo site. Based on their feedback and historical knowledge, it was confirmed that the site did not have any past or current formal or informal users. Additionally, no concerns were raised during the consultation regarding this issue.. Concerns were raised about the potential impact of noise, dust, and traffic from construction activities on their agricultural practices. The consultant discussed the mitigation measures for noise, dust and traffic with the farmers and landowners including dust suppression methods, noise suppression measures and the development of a traffic management plan by the ESIA.
- Farmers mentioned that they produce between 30 to 70 tons of wheat every year and sell their grains to the silos. They believe that the construction of the Dandara Silo will increase the areas cultivated with wheat, as well as facilitate the delivery of wheat due to ease of transportation and the proximity of the silo to wheat farming areas.

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- The construction of the silo is expected to significantly ease the process of selling and delivering wheat, given its convenient location near farming areas. Farmers do not have concerns regarding the impact of the silo construction on wheat prices or the Environment.
- In terms of expectations, farmers anticipate that the silo's construction will result in an expansion of cultivated land due to the ease of transportation and wheat delivery, resulting from the silo's proximity to their farming areas.

Grain Traders Feedback:

- Grain traders mentioned that the amount of grain they buy and sell each year ranges between 2,000 and 7,000 tons or more. They purchase grains from farmers and sell to the silos. The construction of the Dandara Silo will make the process of buying and selling grains easier, including the transportation and delivery of wheat.
- Traders have no concerns about the potential impact of the silo on grain prices, nor do they have concerns about its environmental impact. They believe the silo will positively affect their role in grain trade and transportation, making the entire process more efficient due to the silo's proximity.
- As a result of the silo's construction, traders expect to deliver larger quantities of grains, which will lead to increased cultivation and consequently increased production and delivery to the silos.

Women Feedback:

- Women from the local community, including women farmers, small-scale agricultural workers, and family members of farmers, were consulted during the stakeholder engagement process. A total of 9 women were consulted through focus group discussions and one-on-one interactions , along with 3 women during the virtual consultation. While women were included in broader community consultations, specific efforts were made to hold women-only discussions. These sessions provided a safe and inclusive environment to openly share their views and concerns regarding the silo project.
- Women expressed optimism about the silo project, anticipating benefits such as easier access to grain storage and transportation. The project was seen as a potential opportunity to enhance their participation in wheat farming and trade activities. They raised concerns about potential safety and privacy issues related to the presence of construction workers near their community. They emphasized the importance of ensuring proper conduct by the workers and maintaining secure boundaries around the

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construction site. The ESIA includes measures such as having a proper code of conduct (COC) known and signed by all workers with topics related to SEA/SH and gender based violence and training provided on COC to workers and a grievance mechanism and channels for reporting SEA/SH and gender based violence cases from workers.

- Women Participants highlighted the importance of reducing waiting times for grain delivery at the silo to facilitate their contributions to household and community needs, and ensuring accessibility and safety for women during the construction and operational phases. The ESMP took those concerns into consideration and included mitigation measures as follows: a) establish on-site teams specifically trained to assist women during grain delivery, b) implement a scheduling system during peak periods hours to reduce congestion and ensure that women receive timely assistance and a separate lane for women, c) a grievance mechanism, in which a gender-sensitive grievance mechanism, including channels for reporting harassment or discrimination, will be established to address any potential issues during construction and operation phases, d) the project aims to create equal job opportunities, including roles tailored for women and individuals from vulnerable groups and, e) engage regularly with women and inform them with the above mentioned services tailored to their needs).
- Women stated that the construction of the Dandara Silo will have a positive impact on their work and their families. They expressed no concerns regarding the impact of the silo on their safety and security.
- They have no concerns about the silo's impact on their children and families, nor are there concerns regarding safety, accessibility, or job opportunities related to the silo's construction.
- Women anticipate that the silo's establishment will bring positive social changes, including making it easier for them to participate in wheat farming and trade activities.

Other Vulnerable Groups Feedback:

- Vulnerable groups, including elderly farmers, and individuals with disabilities, were specifically targeted during the consultations to ensure their inclusion. These groups were engaged through focused discussions to understand their concerns and expectations from the project. They were identified based on local knowledge and community leaders' recommendations. One-on-one consultations and small-group discussions were organized to ensure their active participation. Efforts were made to explain the project in simple terms, and to address any questions or concerns.

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- Vulnerable groups expressed the following:
 - Elderly participants emphasized the importance of ensuring that grain delivery and transportation processes remain easy to navigate during both construction and operational phases.
 - Some participants highlighted concerns about potential safety risks during construction, such as increased traffic and construction activities near residential areas.
 - Others expressed interest in potential employment opportunities during the construction and operational phases.
 - Participants with disabilities emphasized the importance of accessibility in the silo's operations, including infrastructure designed to accommodate their needs.

The ESIA has incorporated mitigation measures to ensure the needs of vulnerable groups are addressed, including (a) having a traffic management plan during construction and operation phases and community health and safety measures, b) having a dedicated access paths designed to ensure safety and ease of movement for all, including those with limited mobility by including a fast-tracking lane for elderly and small farmers and separate lane for women, c) establishing on-site teams specifically trained to assist vulnerable groups during grain delivery, d) incorporating ramps to facilitate easy access for individuals with mobility challenges, e) implementing a scheduling system during peak periods hours to reduce congestion and ensure that vulnerable groups receive timely assistance and f) including parking space for special needs and elderly g) engaging regularly with small farmers and elderly and inform them with the above mentioned services tailored to their needs.

Consultations with Residents/Locals Affected by Transmission Line Burial

- Residents and community members relying on electricity supplied by the transmission lines planned to be buried during the project were consulted as part of the stakeholder engagement process. These consultations included households in nearby residential areas potentially affected by temporary disruptions in electricity supply during construction activities. The consultations aimed to identify the concerns of electricity-dependent residents regarding the potential impacts of burying the transmission lines, and collect feedback and suggestions to ensure that mitigation measures effectively address community concerns.

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- Residents expressed concerns about potential power outages during the process of burying the transmission lines. Some community members emphasized the importance of prior notification and alternative power arrangements to minimize inconvenience. Nearby residents raised safety concerns regarding excavation activities near residential areas and the risks of accidents or damage to existing infrastructure.
- The consultations highlighted the community's reliance on the transmission lines and their concerns about potential disruptions. Mitigation measures have been developed to ensure minimal impact on residents, prioritizing safety, and reliable power supply. Continuous engagement with affected communities will be maintained throughout the construction phase. Additionally, the contractor's will be required to cover third parties and their properties and this requirement will be included within the contractor's insurance policy

Feedback from residents and landowners neighbouring the silos:

- While the initial consultation revealed no significant concerns from the community, further discussions indicated that agricultural landowners and residents near the silo site were interested in understanding potential impacts on their land and access. Specifically, they raised inquiries about dust generation during construction and possible restrictions on movement near the site.
- These concerns have been addressed in the ESIA by proposing; dust suppression measures during construction, such as regular watering of access roads and limiting vehicle speeds to reduce airborne dust. Additionally, the measures included defining a separate access routes to the silo to prevent disruptions to nearby agricultural activities and residents' movements.
- Regarding the potential restriction from river transportation and silo construction, the proposed silo construction and associated river transportation activities will not create any restriction of access for individuals.. The construction footprint and river transportation plans have been designed to ensure that no existing paths or informal usage patterns are blocked. This has been explained by the consultant to the neighbouring groups.

Conclusion: Overall, the significant economic and social benefits expected from the Dandara Silo project, coupled with the proposed mitigation measures for environmental and social risks, make the project highly viable. The EHCSS anticipates that the construction of the Dandara Silo will enhance wheat storage capacity in Upper Egypt, improve the resilience of the wheat supply chain, and contribute to reducing grain loss and

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waste. The community's feedback reinforces the positive impact of the silo, with no major concerns regarding its implementation or operation. It is worth mentioning that EHCSS will make sure ramps are present in the public restroom area and any needed area/buildings and toilets will accommodate people with disabilities for both genders.

Overall, the significant economic and social benefits expected from the Dandara Silo project, coupled with the proposed mitigation measures for environmental and social risks, make the project highly viable. The EHCSS anticipates that the construction of the Dandara Silo will enhance wheat storage capacity in Upper Egypt, improve the resilience of the wheat supply chain, and contribute to reducing grain loss and waste. The community's feedback reinforces the positive impact of the silo, with no major concerns regarding its implementation or operation. It is worth mentioning that EHCSS will make sure ramps are present in the public restroom area and any needed area/buildings and toilets will accommodate people with disabilities for both genders.

Grievance Mechanism Summary: **Existing grievance mechanism (GM):**

Unified GM channels:

Any citizen may submit a feedback and complaint through the following multiple channels under the unified electronic complaints portal:

- Egypt's Portal website, <https://www.shakwa.eg/GCP/Default.aspx>,
- Hotline 16528
- At "Your Service" app on Google Play.
- WhatsApp numbers: 01555516528 and 01555525444 to receive messages, complaints and suggestions.
- Citizen service departments and offices in all government agencies and authorities.

Localized communication channels (EHCSS):

At EHCSS level, the complaints during operational phase are usually received from farmers depositing grains or grain buyers in the silos. The main complaints are about the quality of the seeds that are being deposited and tested immediately on site.

In case there are any complaints from farmers and contractor, the complainant can raise their complaints to the Dandara silo manager office or through his phone. If it is not resolved it escalates to the customer services office at EHCSS. The silo manager documents and sends the complaints to EHCSS or the farmer/ contractor can reach the customer service through the EHCSS customer service number visible at silo level. The

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documentation of complaints raised at silo level exists and it will be continuously improved during the project implementation.

- Channels /current contacts are: -
 1. Dandara Silo Manager:
 2. Customer service managed by the EHCSS company:
01279671142/01279671143.
 3. The company's official [website: www.ehcass.com](http://www.ehcass.com)
 4. The unified government complaints system in the Council of Ministers.
 5. Grievances Committee at the company's management. (For company employees only).
- Suggested future communication channels are: -
 1. Create a group on WhatsApp to receive complaints.

Workplace grievance summary:

A well-communicated and easily accessible grievance mechanism will be provided for all direct and contracted project workers, as well as community workers to raise workplace concerns related to recruitment process and/or workplace conditions. Such workers will be informed of the grievance mechanism at the time of recruitment and the measures put in place to protect them against reprisal for its use. The PMU is responsible for managing direct workers' grievances, while the contractor for contracted workers.

The mechanism will include multiple communication channels dedicated for workplace complaints only, including but not limited to an email address/website link; phone number; and a physical address for handing the complaints and grievances in person. Workers will have the freedom to pick the one they are comfortable using.

Current and proposed SEA/SH complaints mechanism channels:

It is suggested to include and disseminate the contacts of National Council for Women (NCW) (below) to ensure safe referral to survivors along with offering the needed services. Implementing partners should be trained on the topics including the survivor centered principles and should establish coordination with NCW.

- Women's Complaints Office at the National Council for Women
- Hotline: 15115
- Email: complain.office.2001@gmail.com
- Fax: 68-23490066 (02) WhatsApp: 01007525600
- Facebook: <https://www.facebook.com/ncwegyptpage>



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The ESMP will be publicly disclosed on EHCSS website and banners on the site on project information and updates will be also available on site in Arabic.

1

INTRODUCTION

The Egyptian Holding Company for Silos and Storage

The Egyptian Holding Company for Silos and Storage is an Egyptian government holding company, one of the companies of the General Authority for Supply Commodities affiliated with the Ministry of Supply and Internal Trade. It was established in 2002 AD pursuant to Prime Minister's Resolution No. 1682 of 2002 AD, with the company assuming the management, operation, and development of silos activity. To achieve this, the company may carry out the following tasks:

- Establishing and operating the necessary silos for grain storage to meet the needs of the country through the Ministry of Supply and Internal Trade.
- Executing approved policies, plans, and programs for the development of silos activity and setting appropriate procedures for this.
- Receiving wheat from citizens and suppliers during the local wheat season and storing it in silos annually for consumption throughout the year.
- Maintaining the quality of grains through monitoring and implementing the necessary maintenance.
- Eliminate the percentage of waste, which amounts to about 10% to 15%, because of storage in the open and barren.
- Transitioning with storage activity in the field of grain in Egypt is a distinct civilized shift to preserve stocks and reach the lowest possible loss rate.
- Creating new attractions and agricultural expansion by encouraging farmers to grow wheat and grains next to the areas where silos are established.
- Reducing the average purchase price of wheat throughout the year because of entering the global market for purchase at appropriate.

Dandara Silo Complex

A Silo Complex will be established in the Dandara area, located in Qena Governorate, with a storage capacity of 90,000 tons, comprising 18 storage cells each capable of holding 5,000 tons. The proposed silo will be connected by highway, railway, and river transportation, which aligns with Egypt's broader strategy to enhance food security and agricultural efficiency. Dandara's strategic location provides optimal access for grain storage, aiding the national objective to reduce grain imports and support economic growth. The silo complex will help minimize post-harvest losses, stabilize food prices, and ensure a steady supply of staple foods across the country.



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Dandara is situated in a region with significant agricultural activities, supported by the fertile lands along the Nile River. The proposed silo will serve to store and maintain grains from surrounding areas, reducing post-harvest losses, enhancing food security, and fostering sustainable agricultural practices in Qena and beyond.

The Egyptian government is actively investing in infrastructure projects in the Dandara region, including enhancements in transportation and water management. The silo's location near the Nile River ensures efficient access to water, with the public network serving as the primary water source for the project. These developments will support the effective functioning of the silo complex while contributing to regional economic growth and agricultural productivity.

Dandara's proximity to major transportation routes, including the highway and rail network, as well as the Nile River, provides excellent logistical advantages for the transport and distribution of grains. The silo will facilitate the movement of grain to other regions, enhancing the supply chain and reducing the reliance on imported grains. The site's connectivity will aid in streamlining operations for local farmers and national food distribution.

World Bank

The World Bank Group is a unique global partnership working for sustainable solutions that reduce poverty and build shared prosperity in developing countries. The World Bank will provide finance to this sub-project via the Emergency Food Security and Resilience Support Project (see Section 1.4 below).

1.3.1 Mission of the World Bank

The main mission of the World Bank is to end extreme poverty and promote shared prosperity on a livable planet.

The World Bank Group is one of the world's largest sources of funding and knowledge for developing countries. Its five institutions share a commitment to reducing poverty, increasing shared prosperity, and promoting sustainable development. The World Bank Group works in every major area of development. They provide a wide array of financial products and technical assistance, and we help countries share and apply innovative knowledge and solutions to the challenges they face.

1.3.2 Environmental and Social Framework

In August 2016, the World Bank adopted a new set of environmental and social policies called the Environmental and Social Framework (ESF). As of October 1, 2018, the ESF applies to all new World Bank investment project financing. With existing projects continuing to apply the Safeguard Policies, the two systems will run in parallel for an



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estimated seven years. The current project follows the WBG ESF and not the old safeguard policies.

Project Components

The World Bank has financed a project to help Egypt secure wheat needs in emergencies. The Emergency Food Security and Resilience Support Project (P178926) was established for this purpose. The Government of Egypt has received financing in the amount of US\$ 500 Million from the World Bank toward the cost of the Emergency Food Security and Resilience Support Project. This project has the following three components:

1.4.1 Component 1: Emergency Response Measures

The objective of this component is to address the shortfall in imports of wheat, to minimize the disruptions in the Bread Subsidy Program. The component will finance the public procurement of up to 700,000 metric tons of imported wheat (the final quantity will depend on the market price at the time of procurement) through a procurement process acceptable to the Bank, to be conducted by the General Authority for Supply Commodities (GASC) of the Ministry of Supply and Internal Trade (MOSIT). This short-term emergency wheat supply, made available through the project, will contribute to replenishing the country's strategic reserves.

1.4.2 Component 2. Strengthening Preparedness and Response to Shocks

This component aims to reduce wheat losses, improve domestic cereal production, and strengthen farm-level resilience and preparedness for shocks. This would be achieved by (a) increasing the storage capacity of wheat in modern silos (Sub-component 2.1); and (b) financing the research, development and dissemination of high yielding adapted wheat varieties, piloting climate smart extension services in lagging regions and upscaling the national Argo-Meteorological early warning system (Sub-component 2.2). The Dandara Silos project falls under subcomponent 2.1.

Sub-Component 2.1. Improving the resilience of the wheat supply chain and reducing loss and waste

This sub-component will finance the upgrading of Egypt's strategic wheat storage capacity to strengthen preparedness for and resilience to future market shocks and climate risks. The sub-component will contribute to food security by reducing loss and waste in the wheat supply chain, and by improving farmers' access to domestic grain markets. The sub-component will provide financing to the Egyptian Holding Company for Silos and Storage (EHCSS) to expand the network of modern, energy efficient silos integrated with rail and river transportation

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system and strategically located in areas with substantial wheat production. The silos will be specially designed to be climate-resilient to maintain the quality of the grain.

The sub-component will be implemented under the auspices of the National Project of Silos, under which the government has set targets for establishing additional modern grain storage capacity of 1.5 million metric tons. The National Project of Silos envisions the establishment and expansion of 23 storage sites, according to priorities set by EHCSS, with average storage capacity of 30,000 to 100,000 metric tons each. Ten of these sites are considered the priority. The component would finance the expansion or construction of up to 10 priority silos serving Qena, Assiut, Aswan, Al Wadi Al Jadid, Minya and Giza governorates. This would include the construction of three new silos with a total capacity of 240,000 metric tons, and the expansion of seven silos with an additional capacity of 360,000 metric tons, thus adding a total of up to 600,000 metric tons of additional strategic storage capacity.

The project will finance the design of silos, civil works, and equipment, including imported equipment and technology components required to assemble field-silos. Government counterpart co-financing is expected to finance local components and local civil works for the construction of silos and the project manager (supervisor) contract.

The sub-component will increase the strategic wheat storage capacity by up to 600,000 metric tons. It will contribute to the reduction of the estimated current level of average storage loss in project silos from approximately 12 percent to 8 percent. The loss in all new facilities is expected to be even lower at around 1-2 percent. Newly built and/or expanded storage facilities will also be available for domestically procured wheat, thereby enabling farmers' access to markets, especially in nearby areas. The strategic location of storage facilities would ensure the integrity of the wheat supply chain, efficient access to transportation routes and it would also likely mitigate climate risks associated with wheat storage in remote locations.

1.4.3 Component 3. Project Management and Knowledge Management

This component will support project management activities and knowledge management activities envisaged under the project. With regards to project management activities, this component will support financial management (including audit), procurement, monitoring, and evaluation and ESF compliance (including a citizen engagement mechanism and a strengthened Grievance Redress Mechanism (GRM) for better risk management). Additionally, this component will facilitate dialogue on food security policies and reforms and cross-border collaboration around regional risk management tools for strategic agricultural commodities.

Qena Governorate

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Qena Governorate, located in Upper Egypt about 600 km south of Cairo, along the eastern bank of the Nile River. Renowned for its fertile lands enriched by the Nile, agriculture is the backbone of Qena's economy. The governorate is a major producer of crops such as sugarcane, wheat, tomatoes, and a variety of fruits, contributing significantly to both local livelihoods and the national economy. Alongside its agricultural prominence, Qena boasts a growing industrial sector, encompassing sugar refining, food processing, ceramics, and textiles. The presence of several sugarcane processing plants underscores the governorate's vital role in Egypt's sugar production industry. Additionally, Qena is expanding its economic portfolio through modern industrial ventures, aiming to diversify and strengthen its economic activities.

Geographically, Qena Governorate is bordered by Sohag to the north, the Red Sea Governorate to the east, and Luxor to the south. This strategic location facilitates key connections to other significant governorates in Upper Egypt, positioning Qena as a central hub for trade and transportation. Covering a total area of approximately 9,565 km², the governorate has a population of around 3.4 million people as of 2021, according to the Central Agency for Public Mobilization and Statistics. The city of Qena serves as the administrative capital, acting as a pivotal center for commerce, education, and transportation in the region.

1.5.1 Dandara

Dandara is a village located in the Qena Governorate of Egypt, situated on the western bank of the Nile River. The area is known for its agricultural activities, benefiting from the proximity to the Nile's fertile lands and water resources. The proposed site for the construction of the Dandara Silo is positioned near the Nile River at coordinates (26°07'24.82"N, 32°36'04.45"E). This location allows for easy access to transportation routes and the river, providing a strategic advantage for grain storage and distribution.

The Dandara Silo (Figure 1.1) is planned to have a total storage capacity of 90,000 tons, comprising 18 storage cells, each with a capacity of 5,000 tons. The site will be connected to the main road network of Qena Governorate, facilitating efficient transportation of grains to and from the silo. The silo's location near the Nile will support the logistical requirements of the project while being mindful of the environmental considerations due to its proximity to this vital water source.

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Figure (1.1): Map showing the proposed location of Dandara Silo in Qena Governorate.

Table (1.1): Coordinates of Dandara Silo Complex.

Point ID	N	E
A	26°07'19.179"	32°36'12.258"
B	26°07'16.034"	32°36'7.664"
C	26°07'22.627"	32°36'3.050"
D	26°07'6.352"	32°36'7.426"
E	26°07'32.393"	32°35'55.356"
F	26°07'35.220"	32°36'0.140"



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2

POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

This chapter first provides an overview of the environmental clearance process for the Project as governed by the environmental legal requirements of the Egyptian Environmental Law 4 of 1994 amended by Law 9/2009 and its executive regulations No. 338 of 1995 modified by Prime Minister Decree no. 1741/ 2005, modified in 2011/2012 and 2015 as well as the EEAA Guidelines for Environmental and Social Impact Assessment (ESIA) issued 2009. Then discusses the regulatory context which is directly related to environmental compliance which must be adhered to by all parties involved in the Project throughout the planning and construction, operation, and decommissioning. The Chapter goes on to summarize the relevant international agreements and conventions to which Egypt is a signatory. Finally, highlights the environmental and social policies and requirements of the World Bank.

2.1. Regulatory and Policy Framework at the National Level

2.1.1. Egyptian Environmental Institutional Framework

Egyptian Environmental Affairs Agency (EEAA)

The EEAA is an authorized state body regulating environmental management issues. The Egyptian laws identify three main roles of EEAA:

- A regulatory and coordinating role in most activities, as well as an executive role restricted to the management of natural protectorates and pilot projects.
- The responsibility of formulating the environmental management (EM) policy framework, setting the required action plans to protect the environment and follow their execution in coordination with Competent Administrative Authorities (CAAs).
- The responsibility of EEAA in reviewing and approving the ESIA studies for new projects/expansions undertaken as well as monitoring the implementation of the ESMP.

Environmental Management Unit (EMU)

The Environmental Management Unit (EMU), at the governorate and district level, is responsible for the environmental performance of all projects/facilities within the Governorates premises. The Governorate has established EMUs at both governorate and city/district levels.

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EMUs are responsible for environmental protection within the governorate boundaries. They are mandated to undertake both environmental planning and operation-oriented activities. EMU is mandated to:

- Follow-up the environmental performance of the projects within the governorate during both construction and operations phases to ensure the project follows the laws and regulations as well as with the mitigation measures included in its ESIA approval.
- Investigate any environmental complaints filed against projects within the Governorate.
- EMUs are administratively affiliated to the governorate, yet technically to EEAA. EMUs submit monthly reports to EEAA with their achievements and inspection results.
- The Governorate has a solid waste management unit at the governorate and district level. The units are responsible for the supervision of solid waste management contracts.

Competent Administrative Authorities (CAAs)

The Competent Administrative Authorities (CAAs) are the entities responsible for issuing licenses for project construction and operation. The ESIA is considered one of the requirements of licensing. The EHCSS is the project owner. The Egyptian Holding Company for Silos & Storage was constructed by a decision of the Prime Minister No. 1682 of 2002 in accordance with the provisions of the public business sector companions' No.203 of 1991. There is a representative of the PMU for Environmental and Social Affairs at EHCSS, they depend on outsourcing, in which they assign consulting offices the required projects and they follow up the implementation of the required tasks. The roles and responsibilities for the ESIA implementation are present in section 8.4 Roles and Responsibilities.

Other related National Government & Permitting Authorities:

Table (2.1): Other related national government & permitting authorities

Entity	Scope
Ministry of Supply and Internal Trade	It is a strategic ministry to achieve food security for Egypt. This is done by considering the limited and non-income, raising their standard of living, and improving the level of services provided to them.
Egyptian Holding Company for Silos and Storage (EHCSS)	The company aims to move the storage activity in the field of grain in Egypt to a distinct cultural shift to preserve the stock and create

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Table (2.1): Other related national government & permitting authorities

	new areas of attraction and agricultural expansion and provide new job opportunities for youth in its establishment areas.
Governorate	The main role of the governorate is supporting the project by providing the various permissions needed, and infrastructure maps in case if needed.
Water and wastewater Company	Provide the project needs of water and wastewater disposal during the construction phase; through the construction contractors (In the case of contracting with them)
Civil Aviation	Issuing a permit for height requirements and warning signs
Public Health	They provide the health services and facilities to the local districts
Manpower Directorate	Data of the labour force and complaints of workers Monitor labour recruitment standards during construction
Roads Directorate	Services and development of external roads in the governorate Issuing permits for any construction work on the external roads
Egyptian National Railways	Freight sector and cargo Ticket Reservation and Issuing
Ministry of Interior	MI is responsible for national and local security, as well as approving emergency response and firefighting plans for establishments/projects
EEAA	Issues the Environmental approval for the project. Monitors the compliance with the conditions of approval
Ministry of Electricity and Renewable Energy	The ministry of electricity is the responsible entity for the generation, transmission, and distribution of electricity in Egypt, under which operates NREA, Egyptian Electricity Holding company and EETC
Ministry of Environment	The ministry of Environment is the entity responsible for the formulation of environmental policies. The preparation of necessary plans for environmental protection and environmental development projects and following up on the implementation of

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Table (2.1): Other related national government & permitting authorities

	all the above. Under the ministry, the EEAA and the Nature protection bureau operate.
Ministry of Antiquities	The ministry of antiquities is the entity responsible for the preservation and protection of the heritage and ancient history of Egypt, under which operates all inspector offices in the governorates
Ministry of Transportation	The ministry of transportation is the entity responsible for developing diverse transport networks, enhancing foreign trade services, and expanding connectivity to integrate Egypt regionally and globally.
General Authority for River Transport (GART)	This authority, under the Ministry of Transportation, is responsible for regulating and overseeing all aspects of river transportation, including the use of Nile River waterways for logistical purposes.

2.1.2 Egyptian Environmental Clearance Process

The ESIA is governed by the Law No. 4 of 1994 and its amendments, the Law on Protection of the Environment and its Executive Regulations 1995 and its amendments (Prime Ministers Decree 338). According to Law 4 of 1994, applications for a license from an individual, company, organization or authority, an assessment of the likely environmental impacts of development projects should be undertaken.

Based on the categorization of development projects included within the Guidelines for ESIA issued by the EEAA in 2009, Emergency Food Security and Resilience Support sub-project P178926 (Dandara Silo Complex) is considered under Category B specific projects which require undertaking a full ESIA including public scoping and consultation activities, in addition to a public disclosure with an Arabic executive summary.

Upon submission of the ESIA report by the ESIA Practitioner to the CAA in charge of issuing licenses, sends the EIA to EEAA for evaluation. The EEAA shall review the ESIA and provide comments or feedback within 30 days. After submission of an ESIA for review, EEAA may request revisions in the ESIA report within 30 days, including additional mitigation measures, before issuing the report approval.

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2.1.3 Egyptian Environmental and Social Regulatory Context

This section lists those legislations that are directly related to environmental and social compliance that must be adhered to by all parties involved in the sub-project throughout the planning and construction, operation, and decommissioning phase. These legislations include: (i) those issued by EEAA (laws, regulations, and instruction), and (ii) the relevant national legislations issued by other line ministries (laws, regulations, instructions, standards).

The table below lists the key relevant legislation and regulator/entity relevant to each of the environmental and social parameters being studied and assessed within this ESIA. Throughout the following Chapters, reference to the requirements set out within those legislations is provided under each relevant parameter.

Table (2.2): National Legislation and guidelines governing the E&S compliance for the sub-project.

Legislation	Relevant Article	Requirements
Land Use		
Law No. 116 of 1983 Amending some provisions of the Agriculture Law promulgated by Law No. 53 of 1966	Article 150	- It is prohibited to hollow out agricultural land or to transport soil for use in purposes other than agriculture. - In this case, the means of transportation, machinery, and equipment used in transporting the dust resulting from dredging shall be seized by the administrative route, and these seizures shall be deposited in the place specified by the competent administrative authority. - In applying the provisions of this law, razing it is considered the removal of any part of the surface layer of agricultural land. It is permissible to razing agricultural land and transferring soil from it for the purposes of improving it agriculturally or preserving its fertility. This shall be determined by the Minister of Agriculture by a decision from him in accordance with agricultural custom.
	Article 152	- It is prohibited to construct any buildings or facilities on agricultural land, or to take any measures in the matter of dividing the lands to erect buildings on them. - It is considered as agricultural land, the arable land within the agricultural area. Excluded from this prohibition are: A. The land located within the scope of the approved cities until 1/12/1981, with no consideration of any modifications to the space as of this date except by a decision of the Council of Ministers.

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Table (2.2): National Legislation and guidelines governing the E&S compliance for the sub-project.

		B. The lands included in the urban area of the villages, which shall be determined by a decision of the Minister of Agriculture in agreement with the Minister of Construction. C. The lands on which the government establishes projects of public benefit, subject to the approval of the Minister of Agriculture. D. Lands on which projects serving agricultural or animal production are established, which are determined by a decision of the Minister of Agriculture. E. The lands located in the control of the villages on which the owner establishes his own residence or a building that serves his land, within the limits to be issued by a decision of the Minister of Agriculture. Except for the case stipulated in Paragraph (C), in the cases, a license is required from the competent governor before starting to construct any buildings, facilities or projects. A decision is issued by the Minister of Agriculture in agreement with the Minister of Construction to specify the conditions and procedures for granting this license.
Unified Building Law No. 119 of year 2008	Article 39	Apply and receive the construction permit before the start of the implementation. Ensure that all designs abide by the building codes of Egypt
Geology, hydrology, hydrogeology		
Law 4/1994	Article 33 of the Executive regulations of Law 4/1994	The owner of the project is responsible to decontaminate the area/soil in case of relocation or decommissioning
Management of solid waste and hazardous waste generated from the facility		
Law 4/1994 amended by Law 9/2009 and ER 1095/2011 amended by Decree 710/2012)	Articles 28, 29, 33, 37, 39	• Identification: Using the HW lists issued by the competent authority. • Minimization: strive to reduce quantitatively and qualitatively the generation of the HW • Segregation: HW is to be separated from other types of non-hazardous waste. In addition, the different types of HW must not be mixed. • On site Storage: HW is to be stored in a designated area, and containers must be made of suitable materials and be properly sealed to avoid any leakages or spills into the surroundings. • Off-site transportation: HW is to be submitted to authorized HW contractors. • Obtaining a license from the competent authority to handle Hazardous waste

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	Article 22 and Article 17 of the Executive Regulations	The establishment should maintain an environmental register in accordance with Annex 3 of the Executive regulations
	Article 39 and Article 41 of the Executive Regulations	- Article 39: The establishment should maintain the cleanliness of garbage bins and vehicles. Garbage collection bins shall be tightly covered, and waste shall be transported at suitable intervals. - Article 41: The establishment shall undertake necessary precautions to secure the safe storage and transportation of waste. These precautions include the following: - Construction waste storage is to be carried out at site such that it does not obstruct movement of vehicles and personnel. - waste subject to emission should be covered to avoid air pollution. - waste is to be submitted to authorized waste contractors
	Articles 26, 28 and 29 of the Executive regulations	The establishment should maintain a register for the hazardous waste should be maintained as well as record for the hazardous substances used
Control of the wastewater discharge		
Ministerial Decree 44/2000, Decree of Law 93/1962	Article 14	- The law prohibits the disposal of domestic, industrial, and commercial wastewater, treated or untreated, in public drainage system without obtaining a prior approval. - Article 14 of the executive regulations set the parameters required regarding the quality of the wastewater discharged to the public sewage network. - The owner of the project should abide by the limits stated in article 14 of the Executive regulations of Law 93/1962
Biodiversity		
Law 4 of 1994	Article 28, as amended by Law 9 of 2009. Annex 4 of the Executive Regulations of law 4/1994, amended by Prime Minister Decree 1095 of 2011	- Defines fauna and flora which are forbidden to be hunted or disturbed. - Ensure that no species are being disturbed and implement all mitigation measures needed to reduce the impact on any fauna and flora in the vicinity of the project. Any of the following acts shall be prohibited: - Firstly: Hunting, killing, catching birds and wild animals or marine living organisms; as well as possessing, transporting, importing and exporting or offering to sell such birds and animals, either dead or alive, as a whole, in part or their derivatives, or practicing activities that tend

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		to destroy their natural habitats or properties or damage their nests, eggs or their offspring. - Secondly: Cutting or damaging plants as well as, possessing, transporting, importing and exporting, or offering them to sell as a whole, in part or their derivatives and products thereof, practicing any activities that tend to destroy their natural habitats or change their natural properties or habitats. - Thirdly: Collecting, possessing, transporting, or offering to sell kinds of fauna and flora fossils or changing their features; as well as destroying their distinguished geological formations or environmental features or harming their aesthetic value in the Natural Protected Areas. - Fourthly: Trading in all endangered living organisms of fauna and flora species; their breeding or planting in sites other than their natural habitats without obtaining a license from Egyptian Environmental Affairs Agency (EEAA).
Archaeology and cultural heritage		
Supreme Council of Antiquities (SCA)	In July 2022, Prime Minister Decision No. 2462 was issued regarding the reorganization of the Supreme Council of Antiquities, as a public body reporting to the Minister responsible for antiquities affairs. The Council - exclusively - is responsible for all affairs of Egyptian antiquities from various eras, and everything related to them, whether they are archaeological sites and areas, warehouses, museums, above or below the surface of the earth, in internal waters or Egyptian territorial waters, or any antiquity found. Through research and excavation of lands, regardless of their owner, or by chance, or any activity related to Egyptian antiquities from various eras or carried out in archaeological sites and areas or in museums affiliated with the Council, which is reflected in the number of human cadres working in the Council, which exceeds 30,000 employees.	
Law 117/1983	Article 20	- States that license of construction in archaeological sites or land is not permitted. It is prohibited to make any installation or landfill or digging channels, construct roads, agricultural land or for public benefits in the archaeological sites or land within its approved border lines. - The Article additionally, states that a buffer zone around the monument or the site is defined as three kilometres in the uninhabited areas, or any distance determined by the Supreme Council of Antiquities (SCA) to achieve environmental protection of the other parts of the monument in the surroundings (article 20-Ch.1). - The provisions of this article (20) apply on land which appears to the SCA - based on conducted studies – that there is a probable existence of monuments in the subsoil. - The provisions of this article are also applied to desert and areas where quarrying work is licensed.

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	Article 22	- States that license of construction in the immediate vicinity of archaeological sites within populated areas could be delivered by the competent authority, after the approval of SCA. - The competent authority must state in the license the conditions which the SCA emphasizes to guarantee that the building does not have a negative visual impact on the monument and its direct buffer zone protecting the archaeological and historical surroundings. - The SCA has to pronounce its verdict on the license demand within 60 days of the date of submission. Otherwise, the elapsing of this period is regarded as a decision of refusal.
	Article 23	- States that the SCA should take the necessary steps to expropriate land that is found in or kept in place and registered according to the rules of this Law. (Article 23- Ch.1). [These rules are defined in the second chapter of the Law 117 – articles 26-30]. - The Ministry of State for Antiquities must be notified in the event that an unrecorded ruin is found by any person (Article 23).
	Article 24	States that everyone finding by chance part or parts of a monument in its place must promptly inform the nearest administrative authority within forty-eight hours.

Air quality and noise

Law 4/1994 amended by Law 9/2009 and ER 710/2012	Article 42 of Law 4/1994 amended by Law 9/2009 Article 44 of ER 710/2012	• All entities and individuals shall be committed, when carrying out production, service, or other activities, particularly operating machinery and equipment or using sirens and loudspeakers, to keeping the volume below the sound level permissible. • Licensing authorities shall ensure that the total amount of noise produced by fixed and mobile sources in one area shall be within the permissible levels and that the establishment selects the appropriate machinery and equipment. • The Executive Regulation of this law shall define the permissible levels of noise and periods of exposure thereto. The maximum permissible noise intensity in different areas <table><tr><th rowspan="2">Area type</th><th colspan="3">The permissible limit for sound intensity decibels (A)</th></tr><tr><th>Daytime from 7 am to 6 pm</th><th>Evening from 6 pm to 10 pm</th><th>Night from 10 pm to 7 am</th></tr></table>	Area type	The permissible limit for sound intensity decibels (A)			Daytime from 7 am to 6 pm	Evening from 6 pm to 10 pm	Night from 10 pm to 7 am
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		Commercial and administrative areas and the city center	55 - 65	55 - 60	45 - 55
		Residential areas with some workshops or businesses or on a public road	50 - 60	45 - 55	40 - 50
		Residential areas in the city	45 - 55	40 - 50	35 - 45
		Residential suburbs with little traffic	40 - 50	35 - 45	30 - 40
		Rural residential areas, hospitals and gardens	35 - 45	30 - 40	25 - 35
		Industrial areas (heavy industries)	60 - 70	65 - 55	50 - 60
	Article 38 of ER	Open burning of garbage and non-hazardous solid waste is strictly prohibited, and garbage and solid waste shall only be dumped or treated in designated areas away from residential, industrial, agricultural and waterways.			
Modified ERs (710/2012) of Law 4/1994	Article 37	It is prohibited to use machines, engines or vehicles which emit exhaust whose contents exceed the following maximum limits: <u>1. Vehicles currently in service:</u> - CARBON MONOXIDE: 7% in volume at the speed of (600-900 R.P.M.) - UNBURNED HYDROCARBONS: 1000 parts in a million, at the speed of (600- 900 R.P.M.) - SMOKES: 65% degree of opacity or the equivalent in other units, at minimum acceleration <u>2. New vehicles licensed as of 1995:</u> - CARBON MONOXIDE: 4.5% in volume at the speed of (600-900 R.P.M.)			

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		- UNBURNED HYDROCARBONS: 900 parts in a million, at the speed of (600- 900 R.P.M.) - SMOKES: 50% degree of opacity or the equivalent in other units, at maximum acceleration. The provisions of this Article shall apply in the governorates to be determined by a decree of the Minister of Interior, provided the decree shall allow a period not exceeding one year for commencement of implementation to enable the owners of these machines, engines, and vehicles to adjust them in accordance with the provisions of this Article.																																							
Law 4/1994	Article 36	It is prohibited to use machines, engines, or vehicles whose exhaust emissions exceed the limits set by the executive regulations of this Law. Appendix No. (8): Maximum limits for air pollutants inside workplaces according to the type of each industry <table><tr><th rowspan="2">Material</th><th colspan="2">Partial average</th><th colspan="2">Short exposure limits</th></tr><tr><th>ppm</th><th>mg/m3</th><th>ppm</th><th>mg/m3</th></tr><tr><td>Gasoline (petrol)</td><td>10</td><td>30</td><td>25</td><td>75</td></tr><tr><td>Chlorobenzene</td><td>75</td><td>350</td><td></td><td></td></tr><tr><td>Coal tar products that are volatile and soluble in gasoline</td><td></td><td>0.2</td><td></td><td></td></tr><tr><td>Ethyl benzene</td><td>100</td><td>435</td><td>125</td><td>545</td></tr><tr><td>Gasoline</td><td>300</td><td>900</td><td>500</td><td>1500</td></tr><tr><td>Liquid petroleum gases</td><td>1000</td><td>1800</td><td>1250</td><td>2250</td></tr></table>	Material	Partial average		Short exposure limits		ppm	mg/m3	ppm	mg/m3	Gasoline (petrol)	10	30	25	75	Chlorobenzene	75	350			Coal tar products that are volatile and soluble in gasoline		0.2			Ethyl benzene	100	435	125	545	Gasoline	300	900	500	1500	Liquid petroleum gases	1000	1800	1250	2250
Material	Partial average			Short exposure limits																																					
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Law 4/1994 and its modified ERs	Article 35 of Law 4/1994 and article 34 of its modified ERs	In carrying out their activities, establishments subject to the provisions of this Law are held to ensure that emissions or leakages of air pollutants do not exceed the maximum levels permitted by laws and decrees in force and determined in the executive regulations of this Law. MAXIMUM LIMITS OF OUTDOOR AIR POLLUTANTS (MICROGRAM PER CUBIC METER) <table><tr><th>POLLUTANT</th><th>MAXIMUM LIMIT</th><th>EXPOSURE PERIOD</th></tr><tr><td rowspan="3">Sulphur Dioxide</td><td>350</td><td>1 hr</td></tr><tr><td>150</td><td>24 hrs</td></tr><tr><td>60</td><td>1 year</td></tr></table>	POLLUTANT	MAXIMUM LIMIT	EXPOSURE PERIOD	Sulphur Dioxide	350	1 hr	150	24 hrs	60	1 year																													
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		Carbon Monoxide	30 Milligrams/cubic meter 10 Milligrams/cubic meter	1 hr 8 hr
		Nitrogen Dioxide	400 150 80	1 hr 24 hrs 1 year
		Ozone	200 120	1 hr 8 hr
		Suspended Particles Measured as Black Smokes	150 60	24 hrs 1 year
		Total Suspended Particles (TSP)	230 90	24 hrs 1 year
		Respirable Particles (Pm 10)	150 70	24 hrs 1 year
		Lead	1	1 year
Occupational health and safety				
Law 4/1994	Articles 43 – 45 of Law 4/1994, which address air quality, noise, heat stress, and the provision of protective measures to workers.	- The owner of the project should abide by the limits stated in Annex 7 of the Executive regulations. - In case the limits are exceeded, special protective equipment should be made available (earmuffs, masks...) (Annex 9) - In case the limits are exceeded, the workers should have rests as specified by the limits (especially for noise and vibration from electric jack hammers or any other ramming equipment) - Conduct regular medical check-ups for workers that are facing noise, vibration or heat stress exceeding the limits		
	Articles 80-87	- Regulates working hours and rest times for workers. - The working hours shall include a period of one or more meals and rest not less than one hour in total and the period shall not exceed five consecutive hours. The competent minister may, by a decision, determine the cases or works which are imperative for technical reasons or operating conditions. - Work hours and rest periods should be organized so that the period between the beginning and the end of working hours does not exceed ten hours per day. - Work shall be organized at the facility so that each worker shall receive a weekly rest of not less than 24 hours after six working days at most. In all cases, weekly rest shall be paid. - The employer shall put on the main doors used by the workers for entry, as well as in a visible place in the establishment a schedule showing the		

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Table (2.2): National Legislation and guidelines governing the E&S compliance for the sub-project.

		weekly rest day, working hours and rest periods for each worker and the amendment to this schedule.
	Book 3 - Single worker contract: Article 32	The employer shall be obliged to issue the contract in writing in Arabic in three copies. The employer shall keep one and deliver a copy to the worker. In particular, the contract shall include the following data: • Name of employer and place of work. • The name of the worker, • his qualification, • his profession or craft, • his insurance number, • His place of residence and what is necessary to prove his identity. The nature and type of work being contracted. • If there is no written contract for the worker, the unit to prove his rights, all methods of proof. The employer shall be given a receipt for the papers and certificates he has deposited with him.
Law 12/2003 on Labour and Workforce Safety and Book V on Occupational Safety and Health (OSH) and assurance of the adequacy of the working environment	Minister of Labour Decree 48/1967. Minister of Labour Decree 55/1983. Minister of Industry Decree 91/1985 Minister of Labour Decree 116/1991.	• The owner of the project is bound with the provision of protective equipment to workers and firefighting/emergency response plans. Moreover, the following laws and decrees should be considered: • The contractors should have appropriate number of first aid kits in relation to the size of the site and the number of workers on site
	Article 211 and article 34 of the Decree of the Minister of Labour and Manpower no. 211/2003	The establishment should prepare records/reports/register for chemical safety
	Wages:	• Article 34: A national council for wages shall be established under the chairmanship of the Minister of Planning, to be concerned with setting the minimum wages at the national level, subject to the cost of living, and by providing the methods and measures guaranteeing the realization of balance between wages and prices. The council shall also be concerned with setting the minimum periodical annual increments such that they shall not be less than (7%) of the basic salary on the ground of which the social insurance contributions are reckoned. In case the establishment is exposed to economic conditions with which it becomes impossible to pay the said periodical increment, the

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	matter shall then be submitted to the national council for wages, to decide whatever it deems suitable with its conditions, within thirty days from the date of submitting the matter to it. The prime minister shall issue - within sixty days from the effective date of the present Law - a decree forming that council and comprising the following categories in its membership: 1-Members on the strength of their positions or experiences. 2- Members representing the employers' organizations, to be elected by these organizations; and 3-Members representing the General Federation of Egyptian Trade Unions, to be elected by the Federation. It shall be observed that the number of the first category's members shall be equal to the number of the second and third categories' members together, and the number of members of each of the second and third categories shall be equal. The decree forming the council shall determine its other power: the system of work in it. - Article 35: Discrimination in wages because of the sex, origin, language, religion or creed shall be prohibited. - Article 36: The wage shall be determined according to the individual contract, the collective labour agreement, or the statute of establishment. If the wage is not determined in any of these methods worker shall be entitled 'to a wage of equivalent position if any; other the wage shall be estimated according to the trade usage in the quarter where the work is performed. If no trade usage exists, the committee prescribed in article (71) of the present Law shall estimate the Wage according to the exigencies of justice. This shall all be subject to provisions of articles (34) and (35) of the present law. - Article 37: If agreement is reached on determining the wage per production or commission, the wage to be obtained by the worker shall not be less the minimum wages. - Article 38: The wages and other amounts due to the worker shall be paid in legally current money, on one of the working days and at the place off" subject to the following provisions: (A) Workers appointed with a monthly pay: their wages shall be paid least once per month. (B) If the wage is per production, and the work requires working for a period exceeding two weeks, the worker shall obtain each week a pay on account commensurate with the work he has performed, and the balance of the wage shall be paid to him during the week following delivery of the work he has been charged with.

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	(C) In other than the cases defined in the two previous items, the workers shall receive their wages once at most every week, unless otherwise agreed upon. (D) If the Labour relation ends, the employer shall pay to the worker his wage and all amounts due to him forthwith, unless the worker has quit work of his own accord, in which case the employer shall pay the worker's wage and all his dues within a period not exceeding seven days from the date the worker claims these dues. - Article 39: Computing the average daily wage of the workers per production or the workers receiving fixed wages plus a commission or a percentage shall be on the basis of the average pay the worker has received for the actual days of work in the last year or for the period he has worked if less than that, divided by the number of the actual days of work for the same period. - Article 40: The employer shall be prohibited to transfer a monthly paid worker to the category of day labourers or the workers appointed with a weekly wage, or paid per hour or per production, except with the written approval of the worker on transferring him. The worker shall in this case have all the rights he acquired during the period he spent with monthly pay. - Article 41: If the worker attends at his place of work, at the time determined for work and is ready to exercise his work but is prevented to start his work for reasons due to the employer, he shall be considered as having actually fulfilled his work and accordingly deserves his wage in full. However, if he attends and is barred from exercising his work by imperative reasons beyond the will of the employer, he shall be entitled to half his wage. - Article 42: The employer shall not oblige the worker to buy foods, goods, or services from specific stores, or buy goods produced or services provided by the employer. - Article 43: The employer shall not deduct more than, (10%) from: the worker's wage for payment of the money he has loaned to him during 'the validity of the contract; nor shall' he charge the worker any interest on these loans. This provision shall apply to the prepaid wages. - Article 45: The employer's obligation for the wage shall not be discharged except after the worker signs for receiving the wage, in the register provided for the purpose, or in the payrolls, providing the data of these documents shall comprise the items of the wage. Subject to the provision of the previous article, the employer shall deliver to his juvenile workers their wages, compensations, or other entitlements

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		legally due to them. Such delivery shall discharge the employer's obligation.
Law No. 12 of the Year 2003 Promulgating Labour Law	Child labor	- Article 98: In applying the provisions of the present Law, an infant/juvenile shall mean any person reaching fourteen years of age, or past the age of elementary education and not reaching eighteen complete years of age. - An employer appointing an infant/juvenile under sixteen years of age shall grant him a card proving that he works for him. A picture of the infant/juvenile shall be stuck on the card and approved by the concerned manpower office. - Article 99: Employing female and male infants/juveniles not reaching the age of complete elementary education or fourteen years of age, whichever is older, shall be prohibited. However, they may be trained once they reach twelve years of age. - Article 100: The concerned minister shall issue a decree determining the system of employing infants/juveniles, the conditions, terms and cases for their employment, and the jobs, occupations, and industries in which it is prohibited to appoint them, according to the different stages of age. - Article 101: An infant/juvenile shall not be made to work for more than six hours a day, during which one or more break periods totalling not less than one hour shall be granted for meals and rest. Such period(s) shall be specified in a way by which the infant/juvenile shall not be made to work for more than four unbroken hours. An infant/juvenile shall not be made to work overtime hours or be required to come to work on the weekly days of rest and the official holidays. In all cases, an infant/juvenile shall not be made to work between 7 p.m. and 7 a.m. - Article 102: An employer appointing one or more infants/juveniles shall: - Hang on a prominent place at the location of work a copy comprising the provisions prescribed in the present chapter. - Draw up a statement indicating the working hours and the break periods duly approved by the concerned administrative authority. - Provide the concerned administrative authority with the names of infants/juveniles working with him, the tasks assigned to them, and the names of the persons charged with controlling their work. - Article 103: The provisions of the present chapter shall not apply to infants/juveniles working in sheer agricultural labor.
Egyptian Penal law (promulgated	GBV/SEA/SH laws	The law stipulates the criminalization of violence in its various forms including physical violence, discrimination or psychological violence,

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by Law No. 58 of 1937 and amended by Law No. 95 of 2003)		including bullying and humiliation, and abuse of personal rights and freedoms - Article 306 bis (b): It is considered sexual harassment if the crime stipulated in Article 306 bis (a) of this law is committed with the intention of the perpetrator obtaining from the victim a benefit of a sexual nature. The perpetrator shall be punished by imprisonment for a period of no less than one year and a fine of no less than ten thousand pounds and no more than twenty thousand. pounds or one of these two penalties. - Article 269 bis: Anyone who sexually harasses another person without his will, whether male or female, shall be punished by imprisonment for a period not exceeding one year and a fine of not less than five hundred pounds and not exceeding five thousand pounds, or one of these two penalties. Harassment may include stalking, stalking or other actions, using sexual or inappropriate language directly or indirectly, or via telephone, the Internet or other new means, or by sending messages containing sexual images, text or inscriptions. - If the perpetrator of the crime is one of those stipulated in the second paragraph of Article 267, he must be imprisoned.
		- Article 214 of the Constitution mentions some independent national councils, including the National Council for Human Rights, the National Council for Women, the National Council for Motherhood and Children, and the National Council for Persons with Disabilities. These councils enjoy legal personality and technical, financial and administrative independence, and their opinions are considered in draft laws and regulations related to them. - The National Council for Women guarantees that Egyptian women are treated equally with men in political, economic, social and cultural rights, and includes offices to receive complaints related to discrimination against women and provide support to those who need it. Its specialty is: ✓ Developing and proposing draft national plans for the advancement of women and solving the problems they face. ✓ Expressing an opinion on draft laws and decisions related to women before referring them to the competent authority.

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Table (2.2): National Legislation and guidelines governing the E&S compliance for the sub-project.

		✓ Recommending draft laws and decisions necessary for the advancement of women. ✓ Promoting women's rights in accordance with the provisions of the Constitution and international agreements and conventions ratified by Egypt. • The National Council for Women developed the National Strategy to Combat Violence against Women, 2015-2020, which is a five-year plan of action based on cooperation with all relevant ministries and with other national bodies and universities. ✓ The Council supervises the National Strategy to Eliminate Violence against Women 2015-2020. In 2021, the Council launched two reports on the “National Strategy to Eliminate Violence against Women 2015-2020” with the aim of highlighting its most important results.
Socio-economic Aspects		
Law 94/2003		• The Law on Establishing the National Council for Human Rights (NCHR) aims to ensure respect, set values, raise awareness, and grant observance of human rights. • At the forefront of these rights and freedoms are the right to life and security of individuals, freedom of belief and expression, the right to private property, the right to resort to courts of law, and the right to fair investigation and trial when charged with an offence.
EEAA EIA guidelines	• Paragraph 6.4.3.1 Scope of Public Consultation • Paragraph 6.4.3.2 Methodology of Public Consultation • Paragraph 6.4.3.3 Documentation of the Consultation Results Paragraph 7 Requirement and	• Conduct a public consultation as part of the ESIA study according to the EEAA guidelines methodology. The involvement of the public and concerned entities in the EIA planning and implementation phases is mandatory for Category C projects through the public consultation process with concerned parties. • Preparation of the Public Consultation Plan before starting the consultation activities in the EIA scoping phase, the project proponent prepares a plan indicating the methodology of the public consultation to be adopted in the two public consultation phases (EIA scoping phase and consultation on the draft EIA). The plan should indicate the concerned parties that will be consulted, method of consultation and other points. • An individual chapter in the EIA will be prepared for public consultation. Disclosure of relevant material is an important process and should be undertaken in a timely manner for all Category C projects. This process permits meaningful consultations between the project proponent and

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Table (2.2): National Legislation and guidelines governing the E&S compliance for the sub-project.

	Scope of the Public Disclosure	project-affected groups and local NGOs are required to take place. Before the public consultation on the draft EIA, the draft technical summary in Arabic should be disclosed to all concerned parties.
Interior Minister's Decision No.2777 General Provision on Road Traffic	Decision No.2777	- Article 2: All road users shall consider the utmost care and remain vigilant and cautious so as not to harm or endanger others to more than the inevitable extent that may be posed by the circumstances. - Article 3: It is not allowed to leave or throw garbage including dust, stones, and construction materials... etc., impeding movement on roads or causing harm to users thereof. Actions that cause roads to be filthy shall be prohibited. - It is not allowed to place or leave anything on the road if it would endanger or obstruct traffic. The responsible for such action shall clear the road immediately. Accordingly, the required caution and warning signs shall be displayed along with red lights, if necessary, until the road is cleared. - It is -by no means- allowed to misuse pavements, roads, or any part thereof, obstructing traffic or pedestrians. Public, private, and other companies, authorities, and institutions, in addition to contractors and others shall get a permit from the competent traffic unit before starting any constructions, drilling, or gravelling operations. Moreover, in the morning, they shall display warning boards and red signs, while at night they shall use red lighted lanterns showing the location of the operation, provided that it is visible from a distance of at least 100 meters away from that location. The Competent traffic unit, before granting the permit, shall ensure that all necessary preventive measures shall be taken. - Article 4: Each vehicle driver, prior to its movement, shall examine the vehicle and all devices thereof, ensuring its good condition, and roadworthiness with no risks posed either to others or to the vehicle itself. The driver shall ensure that the vehicle meets all provisions stipulated by law and regulations. The driver also shall ensure that the vehicle's passengers and cargo meet these provisions. While driving, the driver shall ensure that the driver and the person there beside are using safety belts. Motorcyclists should put on a safety helmet while driving. Using mobile phones in hands shall be prohibited. - Article 5: A vehicle's driver shall ensure the vehicle is free of anything -that may obscure the vision- including the vehicle condition, passengers, cargo, posters, hangings, or anything else. Children under four years are not allowed to sit in the front seats. All vehicle's lights shall always be there and operatable.

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Table (2.2): National Legislation and guidelines governing the E&S compliance for the sub-project.

	Speed - Article 48: A drivers shall not drive beyond the speed at which he can control the vehicle as appropriate to the traffic conditions, the vision, the weather, the driver's condition and his personal capabilities, the vehicle and cargo conditions, and any other surrounding conditions. Consequently, the speed shall not exceed the limit at which the driver can stop the vehicle within the visible part of the road. On narrow roads, where the speed may pose a risk to the opposite traffic, the driver shall slow down so he can stop within the middle of the visible part of the road. In case the vision is not totally clear, the driver has to stop. - Article 49: Vehicles may not slow down impeding the traffic with no justification. - Article 50: Subject to this rule, as appropriate to road conditions, the vehicle maximum speed shall be as follows: In cities: - Trailers and semi-trailers: 40 km/h - The rest of vehicles: 60km/h In residential, tourism and industrial zones - All types of vehicles: 40 km/h Highways or main roads affiliated to the General Authority for Road and Bridges, connecting governorates, and - Trucks and semi-trailers: 60km/h - Cargo vehicles: 70km/h - Passengers' vehicles: 90 km/h - The rest of vehicles: 90km/h - Article 51: The minimum speed of rapid transit vehicles shall be 15 km/h inside cities, and 30 km/h outside cities. Agricultural tractors are allowed to be driven at a minimum speed of 10 km/h on condition that they are driven on the far right of vehicle road. - Article 52: Each vehicle driver shall decelerate the speed of his vehicle while passing by built-up areas, turns, curves, slopes, and crossroads, while approaching pedestrian crossings, while driving in the vicinity of animals or overtaking them. - Article 53: In case any vehicle driver will decelerate or will drive at much lower speed, he shall previously ensure that this would not risk

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Table (2.2): National Legislation and guidelines governing the E&S compliance for the sub-project.

		the following vehicles unless he does the same at a sudden risk. He shall express such desire clearly and early enough by using turn signals, hand signals, and brakes backlights.
Executive regulations of Traffic Law No. 66 of 1973	Article 216 and Article 254	Licenses to operate express transport vehicles - Article 216: An application to obtain a vehicle operating license shall be submitted on the form prepared for that purpose and accompanying this decision to the competent traffic department. The license application shall be accompanied by evidence of the identity of the owner, his place of residence, his capacity, and ownership of the vehicle for which the license is requested, as well as all other documents that may be required by laws or regulations. It is permissible to Licensing units that operate on a computer system must suffice with the form issued by the computer in accordance with the programs prepared for that purpose. Driving licenses in general - Article 254: The application to obtain the driving licenses referred to in Article (34) of the law shall be submitted to the relevant traffic department on the approved form accompanied by the following: 1- Four photographs of the applicant. 2- Evidence of his identity, place of residence and age. 3- For those applying for the licenses referred to in clauses (2, 3, 4, 6, 8) From Article (34) of the law, it is required in addition: (a) Submitting a criminal status report. For employees of the government, one of the local administration units, or the public sector and its branches, an official certificate from the service file stating that they are free of criminal record may suffice. (b) Evidence of his membership in one of the trade unions or one of its branches. (c) If the license applicant is an employee of the government, one of the local administration units, the public sector, or one of its branches, he is required to submit the approval of the entity in which he works to obtain the license, as well as to renew it.
Egyptian Minister of Transport Kamel Al-Wazir issued Resolution No. 440 of	General Authority for Roads and Bridges	- Article (1): Loads allowed to pass on the road network: - The load on the front single axle is calculated at 7.0 tons, and the rear single axle at 13.0 tons, provided that 4 rubber tires are installed on it. - The load on the front single axle of the trailer is calculated at 13.0 tons, provided that 4.0 rubber tires are installed on it.

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Table (2.2): National Legislation and guidelines governing the E&S compliance for the sub-project.

2019 setting movement specifications for vehicles on the road network.	○ The equivalent load on the narrow double axle (bogie) is calculated at 20.0 tons, provided that 0.4 rubber tires are installed on each axle and the distance between the two axles is less than 0.2 meters. ○ The equivalent load on the wide axle (bogie) is calculated at 13.0 tons for one axle, provided that 4.0 rubber tires are installed on each axle. ○ The equivalent load on the third (narrow) axle is calculated at 30.0 tons, provided that 4.0 rubber tires are installed on each axle. ○ It is allowed to exceed within 5% of the transported load that is allowed to pass on the roads for different types of cars to overcome the problem of the difference in the weights of containers and the difference in scales. ○ The width of the vehicle must not exceed 3.60 meters. ○ The length of the vehicle shall not exceed the lengths specified below: - A- For cars with two or more axles, it should not exceed 12 meters. - B- For cars with a semi-trailer or more, it should not exceed 17 meters in accordance with the new traffic law. - C- For a car with a regular trailer, no more than 20 meters. ○ The height of the vehicle, including its load, must not exceed 4 meters from the road surface, and the distance between the bottom of the vehicle and the road surface must not be less than 28 cm. Article (2): Trucks with excess weight (30%) of the truck's rated load are prohibited from using bridges and their movement is in normal roads.
Ministerial decree 20/2019: the new executive regulations for Law No. 10 of 1990 on land acquisition, and amends Law 827 of 1975 on the Egyptian	● Ministerial decree 20/2019: This decree serves as the new executive regulations for Law No. 10 of 1990 on land acquisition, and amends Law 827 of 1975 on the Egyptian Survey Authority (ESA) and cancels ministerial decree 319/1990 on the ER for Law No.10 of 1990. ● Law 187/2020: In addition to the amendments that have been referred in Law 24/2018 of Articles (2, 6, 13) the law stipulates Article 12 of Law No. 10 of 1990 regarding land acquisition for the public benefit shall be replaced by the following article: Article (12): If the forms or the ministerial decision have not been deposited according to the procedures stipulated in the previous article within three years from the date of the public benefit decision in the

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Survey Authority (ESA) and cancels ministerial decree 319/1990 on the ER for Law No.10 of 1990.		official gazette; the decision shall be considered as if it was not for land acquisition for which the forms or the decision related to. The proposed amendment aims to address some of the drawbacks that have emerged because of the application of Law No. 10 of 1990 regarding land acquisition for the public benefit, which lead to obstructing the procedures of property dispute for the public benefit. The law also comes within the framework of creating a new constitution that aims to protect private property, through fair compensation paid in advance in accordance with the law; as the phrase was not found in the previous constitution.
Law 24/2018 on the amendment of some provisions of Law No. 10 of 1990 on the land acquisition		• • Replace the provisions of Articles 2 (fourth paragraph), 3, 5 (second paragraph), 6 (second paragraph), 7 (first paragraph), 13, 15 (first paragraph) of Law No. 10 of 1990 regarding land acquisition for the public benefit. • The public benefit report shall be attached to the decision of the President of the Republic or his authorized representative, accompanied by - A note stating the project to be executed. - A drawing of the overall planning of the project and the real estate necessary for it. • The compensation is estimated according to the prevailing prices at the time of the expropriation decision, and an additional (20%) twenty percent of the value of the estimate included in the compensation. Existing expropriation procedures. • The decision for public benefit shall be published with a copy of the memo referred to in Article (2) of this law in the Official Gazette. In addition, affixed in the place prepared for advertisements at the headquarters of the local administration units, in the mayor or police headquarters, and in the primary court located in the property department, and on the front of the property subject to expropriation in a visible manner.
Law 1/2015 on the amendment of some provisions of Law No. 10		• The first section of article 7 of the law states that: After depositing the compensation, the entity in acquisition charge shall prepare lists with the real estate subject to acquisition, areas, locations, names of owners and property holders, their addresses, and the value of compensations stipulated. These lists and respective maps showing the location of all properties shall be sited in the head office of the entity in charge.

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of 1990 on the land acquisition		Article 8 after amendment stated that: “The concerned owners and holders of rights have the right to object to the information contained in such lists within 15 days from the date of posting and publishing the lists and information of the expropriated properties.
Law No. 164 of 2019 amending some provisions of the Penal Code promulgated by Law No. 58 of 1937.		“Article 115 bis”: Any public employee who trespasses on agricultural land, vacant land, or buildings owned or in the possession of a charitable endowment or one of the entities specified in Article 119 of this law, by cultivating it, erecting constructions thereon, occupying it, or benefiting from it in any way, or facilitating it to others in any way, shall be punished with imprisonment. A period of not less than five years and a fine of not less than one hundred thousand pounds and not more than one million pounds if that property belongs to the entity in which he works or an entity to which he is connected by virtue of his work. The penalty shall be life or aggravated imprisonment and a fine of not less than one million pounds and not more than two million pounds if the crime is inseparably linked to the crime of forgery or the use of a forged document. In all cases, the perpetrator shall be sentenced to dismissal from his job or loss of his position, and the usurped property shall be returned with the buildings or plants on it, or it shall be returned with the removal of what is on it at his expense, in addition to paying the value of the benefit it has gained. “Article 369”: Anyone who enters real estate in the possession of another person with the intention of preventing its possession or with the intention of committing a crime, or who has entered it legally and remains in it after the termination of his legal title with the intention of committing any of the above, shall be punished by imprisonment for a period of not less than two years and not exceeding five years and a fine of not less than fifty thousand. One pound and not more than five hundred thousand pounds. If the crime occurs by fraud or as a result of submitting declarations or giving incorrect data with knowledge of this, the penalty shall be imprisonment for a period of not less than two years and not more than seven years and a fine of not less than one hundred thousand pounds and not more than one million pounds. If the crime was committed using force or by two or more people and at least one of them was carrying a weapon, the penalty shall be imprisonment for a period of not less than three years and not more than

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	seven years and a fine of not less than five hundred thousand pounds and not more than one million pounds. Anyone who enters property despite the issuance of a ruling or court order enabling another person to possess it, with the intention of preventing or diminishing its possession, shall be punished with the same penalty stated in the first paragraph. The penalty indicated in the third paragraph shall be applied if the circumstances set forth therein are present, provided that if the same act is committed within a period not exceeding One year from the date of committing the first act, the penalty shall be imprisonment for a period of not less than three years and not more than ten years and a fine of not less than three hundred thousand pounds and not more than two million pounds. • “Article 370”: Whoever enters an inhabited house or one prepared for habitation, or one of its annexes, or an inhabited ship, or a place prepared for storing money, and these things are in the possession of another, with the intention of preventing his possession or committing a crime in it, or if he entered it in a legal manner and remained in it with the intention of committing any of the above, he shall be punished. Imprisonment for a period of no less than two years and no more than five years and a fine of no less than one hundred thousand pounds and no more than five hundred thousand pounds. If the crime occurs by fraud or as a result of submitting declarations or giving incorrect data, with knowledge of this, the penalty shall be imprisonment for a period of not less than two years and not more than seven years and a fine of not less than one hundred thousand pounds and not more than one million pounds. If this crime occurs at night, or by the use of force, or by breaking or climbing by a person carrying a weapon, or by at least ten people who do not have a weapon, the penalty shall be imprisonment for a period of no less than three years and no more than seven years and a fine of no less than five hundred thousand pounds and no more. About one million pounds. The same penalty stated in the first paragraph shall be imposed on anyone who enters one of the real estate properties specified in the first paragraph of this article and a judgment or judicial order has been issued to him enabling another person to possess it, with the intention of preventing or diminishing his possession. The penalty specified in the third paragraph shall be applied if the circumstances described therein are present. If the same act is committed within a period not exceeding one year from the date of committing the first act, the penalty shall be

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	imprisonment for a period of not less than three years and not more than ten years and a fine of not less than three hundred thousand pounds and not more than two million pounds. • “Article 371”: Whoever is found in one of the places stipulated in Article 370 of this law, hidden from the eyes of those who have the right to take him out, shall be punished with imprisonment for a period not exceeding one year or a fine of not less than ten thousand pounds and not more than one hundred thousand pounds. • “Article 372”: Without prejudice to any more severe penalty stipulated in another law, if the crime stipulated in Article 371 of this law is committed at night, the penalty shall be imprisonment for a period of not less than one year and not more than three years and a fine of not less than one hundred thousand pounds and not more than two hundred thousand pounds. However, if the crime was committed at night by breaking or climbing on the part of a person carrying a weapon, the penalty shall be imprisonment for a period of not less than two years and not more than five years and a fine of not less than five hundred thousand pounds and not more than one million pounds. • “Article 372 bis”: Anyone who trespasses on agricultural land, vacant land, or buildings owned by the state, or by a public legal person, or by a charitable endowment, or by a public sector company, or by any other entity whose funds the law stipulates are considered public funds, or in the possession of any of them, by cultivating or planting it. Or erecting constructions on it, or occupying it, or benefiting from it in any way, shall be punished by imprisonment for a period of not less than two years and not more than five years, and a fine of not less than one hundred thousand pounds and not more than five hundred thousand pounds. The offender shall be ordered to return the usurped property along with the buildings or buildings on it. Plant or restore it with the removal of any of those structures at his expense, in addition to paying the value of the benefit he gained. If the crime occurs by fraud or as a result of submitting declarations or giving incorrect data, with knowledge of this, the penalty shall be imprisonment for a period of not less than two years and not more than seven years, and a fine of not less than one hundred thousand pounds and not more than one million pounds. • The penalty stipulated in the two paragraphs shall be doubled in the event of recidivism.

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Table (2.2): National Legislation and guidelines governing the E&S compliance for the sub-project.

Pest Management		
Law no. 53 of 1966, Chapter VI (Planting protection)	Article 73	The Minister of Agriculture shall specify, by a decision issued by him, harmful pests and plants, methods of protection against them, means of controlling them, and measures to be taken for this purpose, particularly in the following matters: • Determining areas considered to be contaminated with a particular pest, adjusting their borders, and regulating the transfer or passage of plants and other objects capable of transmitting the pest from a contaminated area to another healthy or infected area. • Establishing a system for pest control, including a statement of the chemicals and tools used in the control, and an indication of the treatment and control work carried out by the competent administrative authority at the expense of the plant owner. • Setting the conditions and procedures for plant treatment and pest control by the employees of the competent administrative authority or whomever is entrusted with this from among the individuals, bodies, cooperative societies, companies, or institutions. • A statement of the pests that the owner of agricultural land must report to the competent authorities about, the methods of such notification, and a statement of the measures to be taken to combat and treat them.
	Article 74	• If the infection is a source of danger threatening the plants due to the impossibility of treating the disease or the emergence of a new pest for which no successful treatment is known, the Minister of Agriculture may order the taking of any measure to ensure the prevention of the spread of the disease or pest, including uprooting and destroying infected plants by the workers of the competent administrative authority and at its expense. In this case, the Ministry shall pay compensation to the owner of the plants according to their value. • The Minister of Agriculture shall issue a decision regarding the measures to be taken in estimating this compensation and how to settle the dispute arising from this estimation.
	Article 80	The Minister of Agriculture issues, based on the committee's proposal, the decisions that implement the provisions of this chapter, in particular the decisions related to the following issues: • Types of agricultural pesticides that may be imported and traded, specifying their specifications and import and trading conditions. • Conditions and procedures for licensing the import and trade of pesticides. • Banning the transfer of some types of pesticides from one place to another.

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2.1.4 International Agreements

Egypt has signed and ratified several international conventions committing the country to the conservation of environmental resources and protection of workers' health & safety and labour rights. The following lists the key conventions:

Biodiversity and Natural Resources:

- In 1951: International Plant Protection Convention
- In 1972: Convention Concerning the Protection of the World Cultural and Natural Heritage
- In 1973: Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES)
- In 1979: Convention on the Conservation of Migratory Species of Wild Animals
- In 1992: Convention on Biological Diversity (CBD)
- In 1995: Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean
- In 2003: African Convention on the Conservation of Nature and Natural Resources

Hazardous Materials and Chemicals:

- In 1974: Convention Concerning Prevention and Control of Occupational Hazards Caused by Carcinogenic Substances and Agents
- In 1989: Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal
- In 1995: Amendment to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal

Atmosphere, Air Pollution and Climate Change:

- In 1985: Vienna Convention for the Protection of the Ozone Layer
- In 1987: Montreal Protocol on Substances that Deplete the Ozone Layer
- In 1992: United Nations Framework Convention on Climate Change
- In 1992: (Copenhagen) Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer
- In 1997: Convention Concerning the Protection of Workers Against Occupational Hazards in the Working Environment due to Air Pollution, Noise and Vibration
- In 2015: Occupational Safety and Health Convention.

Health and Worker Safety:

- In 1936: International Labour Organization Core Labour Standards
- In 1977: Convention Concerning the Protection of Workers Against Occupational Hazards in the Working Environment due to Air Pollution, Noise and Vibration
- In 1979: Occupational Safety and Health Convention.

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2.2. Requirements for Sub-project Financing

2.2.1 World Bank (WB)

- The World Bank Environmental and Social Framework sets out the World Bank's commitment to sustainable development, through a Bank Policy and a set of Environmental and Social Standards that are designed to support Borrowers' projects, with the aim of ending extreme poverty and promoting shared prosperity.
- The World Bank Environmental and Social Policy for Investment Project Financing sets out the requirements that the Bank must follow regarding projects it supports through Investment Project Financing
- The Environmental and Social Standards set out the requirements for Borrowers relating to the identification and assessment of environmental and social risks and impacts associated with projects supported by the Bank through Investment Project Financing.
- The ten Environmental and Social Standards establish the standards that the Borrower and the project will meet through the project life cycle, as follows:
 - Environmental and Social Standard 1: Assessment and Management of Environmental and Social Risks and Impacts.
 - Environmental and Social Standard 2: Labour and Working Conditions.
 - Environmental and Social Standard 3: Resource Efficiency and Pollution Prevention and Management.
 - Environmental and Social Standard 4: Community Health and Safety.
 - Environmental and Social Standard 5: Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement.
 - Environmental and Social Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.
 - Environmental and Social Standard 7: Indigenous Peoples/Sub-Saharan African Historically Under-served Traditional Local Communities.
 - Environmental and Social Standard 8: Cultural Heritage; and
 - ESS9: Financial Intermediaries
 - Environmental and Social Standard 10: Stakeholder Engagement and Information Disclosure.

WBG Environmental and Social Standards (ESSs):

The World Bank's Environmental and Social Framework includes the Environmental and Social Standards (ESSs). Projects supported by the Bank through

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Investment Project Financing are required to meet the following Environmental and Social Standards, the following are applicable to the current subproject:

- Environmental and Social Standard 1: Assessment and Management of Environmental and Social Risks and Impacts.
- Environmental and Social Standard 2: Labor and Working Conditions.
- Environmental and Social Standard 3: Resource Efficiency and Pollution Prevention and Management.
- Environmental and Social Standard 4: Community Health and Safety.
- ESS5: Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement –The land for the Dandara Silo is owned by the Egyptian Holding Company for Silos and Storage (EHCSS), land use assessment revealed that no formal or informal activities were previously or currently being conducted in the allocated silo area. Therefore, this ESS is not applicable. .
- Environmental and Social Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.
- Environmental and Social Standard 10: Stakeholder Engagement and Information Disclosure.

Some standards were considered relevant to the project (including the standard mentioned above), and some other standards considered irrelevant to this subproject, for example the Cultural heritage (ESS8) standard may not applicable since there will be no noticeable impact because the proposed site for the construction of the Silo is located away from any archaeological sites. ESS 9 is not relevant because there are no financial intermediaries involved in this project.

World Bank Limits:

Table: World Bank Group EHS guidelines Air Quality Values		
	Reference Period	Recommended maximum ground level concentration values ($\mu\text{g}/\text{m}^3$)
NO ₂	1 hour	200
	Annual average	40
SO ₂	10 minutes	500
	24 hours	20

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Total Suspended Particulate	24 hour average	--
	Annual average	--
PM10	24 hour average	50
	Annual average	20
PM 2.5	24 hour average	25
	Annual average	10

Table: Noise Level Guidelines

Receptor	One Hour LAeq (dBA)	
	Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Residential; institutional; educational	55	45

WBG and International guidelines:

The following WBG environment, social, and health and safety guidelines and relevant international protocols will be used to guide the ESIA including but not limited to the following:

- Good Practice Notes for Addressing Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH) in Investment Project Financing involving Major Civil Works.
- World Bank Group (WBG) Environmental, Health and Safety General Guidelines (“WBG EHS General Guidelines”), December 10, 2007
- World bank Group (WBG) Environmental, Health and Safety Guidelines for Annual Crop Production, March 30, 2016.

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- Good International Industry Practices (GIIP) for management of pesticides (e.g. “International Code of Conduct on Pesticide Management” by FAO and WHO, issued 2014)
- IFC/EBRD (2009). Worker’s accommodation: processes and standards. Public guidance notes by IFC and EBRD. Retrieved from <https://www.ifc.org/content/dam/ifc/doc/mgrt/workers-accomodation.pdf>

Gap Analysis between WB (ESSs) and National laws:

The Gaps between World Bank Environmental and Social Standards (ESSs) and National laws represented in:

1. Discrepancies in air quality, water quality and noise limits between the national laws and WB standards.
2. Not addressing all social risks and impacts in notional laws, including: (i) temporary labor influx, and (ii) risk of gender-based violence.
3. The lack of a specific role for the official in charge of social aspects in national laws.
4. Not addressing all social risks and impacts in national laws, including: (i) Infrastructure and equipment design and safety, and (ii) safety of services.
5. The Egyptian legislation does not address encroachers and informal settlers. The WB identifies a cut-off date to prevent people influx to the project area. The Egyptian laws does not set a cut-off date per say, particularly if the impacts are related to agricultural lands that might experience changes in crops and tenancy. However, there are specific timelines for the census survey, receiving complaints that could cover the same objective of the cut-off date.
 - Monitoring and Evaluation: Monitoring or evaluation measures are not stipulated in Egyptian regulation.
 - Valuation of compensation: Egyptian regulations use prevailing price in the affected areas to calculate and compensate project affected people for their expropriated property. The prevailing price is assessed by a specialized committee created by the government. For crops, they are valued according to the price lists developed by the agriculture directorate. The amendment of the year 2018 entailed increase for the value of the compensation to include additional 20% above the prevailing market price for the interest of the affected persons (landowners), and Law 187/2020 which most importantly include committing the project proponent to deposit the value of the compensation in no more than 3 months from the public interest decree issuance date.
6. Previous Egyptian experiences show that the full replacement value (providing assistance is not covered) principle as stated by ESS5 has not been realized by the affected group.

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- Income restoration (livelihoods): Egyptian law does not discuss compensation for loss of income, only land and assets.
- Although the Environmental Law requires conducting consultations to present the draft EIA results, there are no regulations on committing the project owner to conducting stakeholder engagement activities as an ongoing process nor on disclosing information regarding the environmental and social risks and impacts of the project to project-affected parties as well as to community members, throughout the project life cycle.
 - There are no regulations on committing the project owner in establishing a grievance mechanism.

Gap Analysis for Key Egyptian and WB Environmental Quality Limits

Air Quality, in case of any discrepancy between the requirements of Egyptian legislations and the requirements of the WBG, the requirements of the WBG will be applied if more stringent.

Comparison of ambient air limits

Parameter	Period	WBG EHSG Standards (µg/m3)	National Requirement (Residential; Institutional; Educational) (µg/m3)
Sulphur dioxide (SO ₂)	10 minutes	500	-
	1 hour	-	300
	24 hours	20	125
	1 year	-	50
Carbon Monoxide (CO)	1 hour	-	30 mg/m3
	8 hours	-	10 mg/m3
Nitrogen Dioxide (NO ₂)	1 hour	200	200
	24 hours	-	150
	1 year	40	40
Total Suspended particles (TSP)	24 hours	-	230
	1 year	-	125
Particulate Matter (PM ₁₀)	24 hours	50	70
	1 year	20	50
Particulate Matter (PM _{2.5})	24 hours	25	50
	1 year	10	15
Suspended Particles (measured as black smoke)			
	24 hours	-	100

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Comparison of point source limits such as generators

Parameter	WBG EHS Standards mg/m ³		National Requirement (Residential; Institutional; Educational) mg/m ³	
	Natural Gas	Diesel	Natural Gas	Diesel
Carbon monoxide CO	NA	NA	100	250
Sulphur dioxide SO ₂	NA	2000	100	1000
Nitrogen Oxide NO _x	200 (spark ignition)	460	400	400
	400 dual fuel			
	1600 pressure ignition			
Total Particulates	NA	100	50	50

Water Quality, in case of any discrepancy between the requirements of Egyptian legislations and the requirements of the WB/IFC, the requirements of the WB/IFC will be applied, as it is more conservative.

Ambient Noise, for ambient noise levels, it can be noticed that Egyptian legislations are more precise about the noise levels, as the ambient noise levels are divided according to various area types. Correspondingly, the WB standards only mention the limits for residential and industrial areas. However, for both area types mentioned in the WB standards, the national and WB limits are the same. WBG has more stringent regulations regarding the noise levels, while the Egyptian has more classifications. For conservative approach, the stringent limits will be followed.
Gap analysis between ESSs and national laws.

Comparison of ambient noise limits

Noise area	WBG EHS limit One Hour LAeq (dBA)		National limit One Hour LAeq (dBA)	
	Day (7 am - 10 pm)	Night	Day (7 am - 10 pm)	Night

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		(10 pm - 7 am)		(10 pm - 7 am)
Residential; Institutional; Educational	55	45	– 50	– 40

EHCSS and Contractor's Environmental Policy

An environmental and social policy, as defined by the ESSs of the World Bank and ISO 14001, is a document that sets out an organization's commitment to environmental and social responsibility. It provides a framework for action and for the setting of environmental and social objectives and targets. It will be communicated to all employees and subcontractors through site inductions, toolbox talks, and will be displayed on various notice boards throughout the construction sites. It should also be available to the public.

The Environmental and Social Management Policy was established to demonstrate the EHCSS Company's commitment to improving environmental and social performance. It aims to communicate EHCSS Company's mission, vision, and beliefs towards the environment to its employees and provides a framework for guiding the company's ongoing environmental and social improvement efforts.

To achieve high environmental and social standards (ESSs of World the Bank), satisfying legal requirements and limiting the environmental and social impact of operation activities during the implementation of the Emergency Food Security and Resilience Support Project components, special emphasis will be directed towards sustainability in all phases of the project including design, construction and operations and sub-contracts.

2.2.2 World Bank standards and guidelines for pesticides selection and usage

“World Bank Environmental and Social Standard 3 ESS 3: The selected pesticides and their management (handling, storage, and disposal) shall comply with ESS3, Environmental, Health and Safety General Guidelines (EHSGs) and applicable international conventions and good international practices.

World Bank criteria for Pesticide Selection and Use

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According to paragraph 22 of the ESS3 guidance note¹ “In the procurement of any pesticide the Borrower will assess the nature and degree of associated risks, considering the proposed use and the intended users. The Borrower will not use any pesticides or pesticide products or formulations unless such use is in compliance with the EHSGs. In addition, the Borrower will also not use any pesticide products that contain active ingredients that are restricted under applicable international conventions or their protocols or that are listed in, or meeting, the criteria of their annexes, unless for an acceptable purpose as defined by such conventions, their protocols, or annexes, or if an exemption has been obtained by the Borrower under such conventions, their protocol, or annexes, consistent with Borrower commitments under these and other applicable international agreements. The Borrower will also not use any formulated pesticide products that meet the criteria of carcinogenicity, mutagenicity, or reproductive toxicity as set forth by relevant international agencies. For any other pesticide products that pose other potentially serious risk to human health or the environment and that are identified in internationally recognized classification and labelling systems, the Borrower will not use pesticide formulations of products if: (a) the country lacks restrictions on their distribution, management, and use; or (b) they are likely to be used by, or be accessible to, lay personnel, farmers, or others without training, equipment, and facilities to handle, store, and apply these products properly”

According to paragraph 23 of the guidance note “The following additional criteria apply to the selection and use of such pesticides: (a) they will have negligible adverse human health effects; (b) they will be shown to be effective against the target species; and (c) they will have minimal effect on nontarget species and the natural environment. The methods, timing, and frequency of pesticide application are aimed to minimize damage to natural enemies. Pesticides used in public health programs will be demonstrated to be safe for inhabitants and domestic animals in the treated areas, as well as for personnel applying them; (d) their use will take into account the need to prevent the development of resistance in pests; and (e) where registration is required, all pesticides will be registered or otherwise authorized for use on the crops and livestock, or for the use patterns for which they are intended under the project.”

¹ WBG (2018). Guidance Note on ESS3. Retrieved from <https://documents1.worldbank.org/curated/en/112401530216856982/ESF-Guidance-Note-3-Resource-Efficiency-and-Pollution-Prevention-and-Management-English.pdf>

3

DESCRIPTION OF THE SUB-PROJECT

3.1. Introduction

The World Bank has financed a project to help Egypt secure wheat needs in emergencies. The Emergency Food Security and Resilience Support Project, (P178926), was established for this purpose. The Government of Egypt has received financing in the amount of US\$ 500 Million from the World Bank toward the cost of the Emergency Food Security and Resilience Support Project. Construction of Dandara Silo follows component 2.1.

This sub-component will finance the upgrading of Egypt's strategic wheat storage capacity to strengthen preparedness for and resilience to future market shocks and climate risks. The sub-component will contribute to food security by reducing loss and waste in the wheat supply chain, and by improving farmers' access to domestic grain markets. The sub-component will provide financing to the Egyptian Holding Company for Silos and Storage (EHCSS) to expand the network of modern, energy efficient silos integrated with rail and river transportation system and strategically located in areas with substantial wheat production. The silos will be specially designed to be climate-resilient to maintain the quality of the grain.

This chapter presents description of Dandara Silos sub-project. It details the nature of the proposed sub-project, its location and site layout/plan. It presents the activities that will be involved during all stages of the sub-project; how wastes/by-products that will be generated from all sub-project phases shall be handled as well as details on supportive resources i.e., manpower and utility requirements.

3.2 Sub-project Location

3.2.1 Land Ownership

The Presidential decree No. 228 of 2019 to allocate an area of 92336m² of state -owned land in Qena Governorate for the Ministry of Supply and Internal Trade to establish silos to store wheat. **Land Ownership and Uses**

The land designated for the Dandara Silo project is owned by the **Egyptian Holding Company for Silos and Storage (EHCSS)**. It was allocated specifically for the silo expansion as part of the national plan to enhance grain storage capacity. The ownership of the land has been legally established, and all required administrative and legal approvals for its use in this project have been obtained in compliance with Egyptian laws and regulations. Google Maps imagery and historical satellite data were reviewed to track the land use changes over time, in addition to consultations



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which were carried out with local communities surrounding the designated silo site. The results revealed that no formal or informal activities were occurring in the designated silo area, which is an empty desert land with few shrubs. Additionally, no grievances were reported to EHCSS or local authorities regarding land acquisition or expropriation, even during consultations with local communities after the land was officially allocated for EHCSS silos. Lastly, EHCSS contacted the Ministry of Antiquities and obtained approval for the construction of the silo on the allocated land (Annex V, figure V.5). The allocated land is part of a state-designated area under Presidential Decree No. 228 of 2019 for the development of silos and storage facilities, with no evidence of formal or informal land tenure disputes.

Farmlands in the surrounding area are predominantly owned by local families or rented by small-scale farmers. Women play an essential role in agricultural activities, including planting, harvesting, and processing grains for storage or market. They also participate in grain transportation and contribute to household decision-making regarding farming practices

Planned Jurisdictions and Current Uses

The site lies within a zone designated for storage purposes under the jurisdiction of local authorities in Qena Governorate. There are no known cases of formal private ownership overlapping with the project site nor informal land uses.

Interference with Private Ownership or Uses

A detailed land assessment and stakeholder consultation were conducted as part of the ESIA process. The findings confirmed that there are no formal private ownership claims on the designated land for the silo project nor informal uses

The land transfer followed legal and administrative procedures outlined in Egyptian legislation for state-owned property. After the Presidential Decree, the Egyptian Holding Company for Silos and Storage (EHCSS) coordinated with relevant government authorities to ensure the land's reallocation complied with regulatory requirements. This included mapping the site boundaries, conducting stakeholder consultations, and ensuring no formal private ownership claims existed on the allocated land nor informal land uses.

The proposed site for the construction of the Dandara Silo is positioned near the Nile River at coordinates (26°07'24.82"N, 32°36'04.45"E). This location allows for easy access to transportation routes and the river, providing a strategic advantage for grain storage and distribution. The Dandara Silo is planned to have a total storage capacity of 90,000 tons, comprising 18 storage cells, each with a capacity of 5,000 tons.

The area is primarily characterized by a mix of agricultural lands and desert terrain, typical of the Qena region. Being near the Nile, the site benefits from a central position that supports agricultural activities, which is advantageous for grain storage and distribution as shown in the study location map (Figure 1.1, and Table 1.1).

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Surrounding Area Description:

- North: The silo is bordered from the north by an empty land followed by the Nile River
- South: Agricultural lands and desert terrain border the southern boundary of the silo site followed by Aswan western agriculture road and agriculture lands.
- East: Agriculture lands are located approximately 25 meters of the silo site from the east
- West: The silo is bordered to the west by a flood control zone (low area) followed by agriculture lands and buildings

The nearest buildings surrounding the silo location are approximately 250 meters to the east, 200 meters to the southwest, and 300 meters to the southeast.

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Figure (3.1): Photographs from the proposed location allocated for the construction of Dandara Silo Complex in Qena Governorate. Photograph (1) upper left shows the general landscape of the proposed site for the Dandara Silo Complex. The area consists of flat, open terrain surrounded by reclaimed agricultural lands. The absence of significant vegetation or infrastructure highlights the suitability of the site for construction activities. Photograph (2) upper right; a closer view of the site boundary, showing the clear separation of the land allocated for the silo construction. The photograph also shows adjacent agricultural activities in the vicinity, indicating the relevance of the project to the local community. Photograph (3)

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middle left captures the accessibility of the site via the nearby main Aswan Western Agriculture Road, which is visible in the background and a flood path exists to the west, The road provides a direct connection for transportation and logistical purposes. Also, there is an electricity poles which will be buried. Photograph (4) middle right highlights the current use of the site as empty land, with no significant structures or developments present. This ensures minimal disruption to the surrounding environment during construction activities. The same for Photograph (5) lower left and Photograph (6) lower right. The vegetation observed in Photographs (5) and (6) pose no identified species hold significant ecological importance, nor are they endemic or classified as threatened at either the local or global level. The sparse vegetation primarily consists of common, non-endangered species typically adapted to disturbed habitats within the Nile Valley.

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3.3 Proposed Layout of Dandara Silo

Figure (3.2) shows the layout of Dandara Silo Complex in the proposed location allocated for this purpose in Qena Governorate. The layout shows that Dandara Silo Complex consists of 18 cells for grain storage (Flat bottom metal silos) with a total capacity of 90,000 Tons.

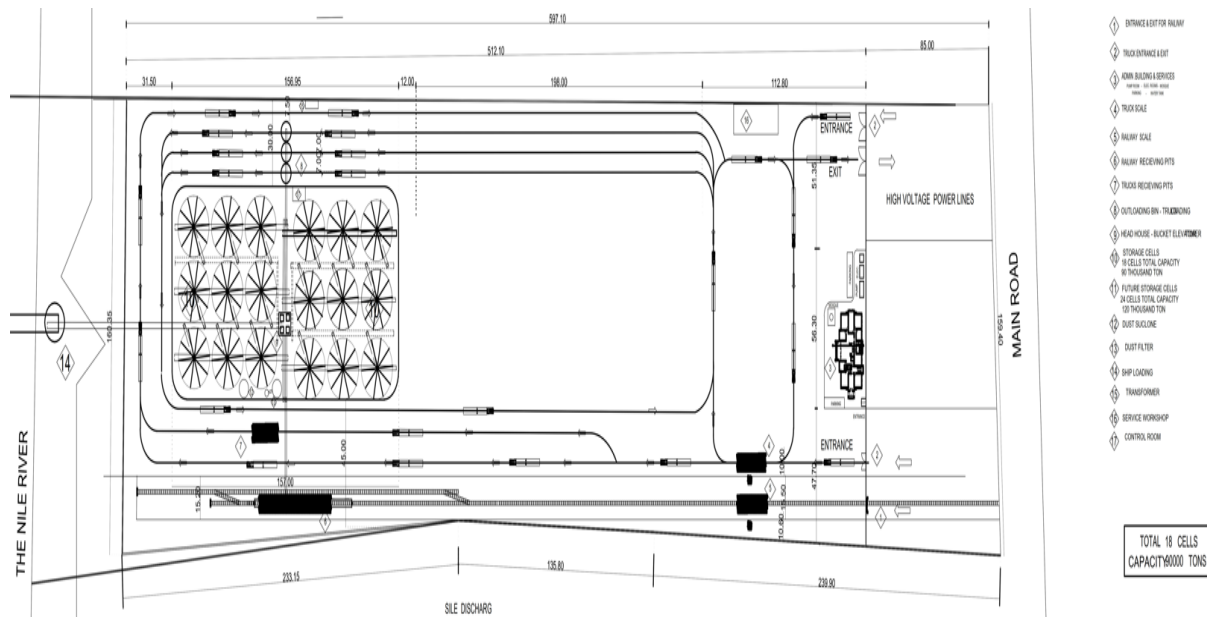


Figure (3.3): Layout of Dandara Silo Complex in Qena.

3.4 Subproject Activities

The Dandara Silo subproject is aimed at establishing a grain storage facility in the Dandara area, Qena Governorate, with a total storage capacity of 90,000 tons. This capacity is distributed across 18 main storage cells, each with a capacity of 5,000 tons. The silo will be equipped with handling systems, including chain belts, hoists, and spiral belts, all with a capacity of 250 tons per hour. In addition to storage and handling, the facility will feature fumigation equipment, a dust extraction system, a ventilation system, an inventory management system, and a temperature control system to ensure optimal grain preservation. The Dandara Silo will facilitate the distribution of wheat through multiple modes of transportation, including trucks, railway, and river transport, while receiving wheat deliveries primarily from trucks.

3.4.1 Mobilization Phase

The mobilization phase involves the following activities:

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- **Establishment of access road:** This will be required for site preparation and construction activities, and it will be paved with asphalt.
- **Site preparation:** This includes clearing the site, levelling or flattening the ground
- **Establishment of construction facilities:** This includes building temporary offices, storage facilities, workshops., in addition to workers and security team accommodations.
- **Mobilization of equipment and personnel:** This includes bringing all necessary construction equipment and personnel to the site.

3.4.2 Construction Phase

The construction phase of the Dandara Silo subproject will be two years, the timeframe/timetable for the construction phase is provided in appendix (V.1). The construction phase of Dandara Silo will include the following:

- **Construction of the silo:** This includes the excavation of the foundation, the construction of the silo foundation and walls, and the installation of the silo roof.
- The Silo diameter will be 21m, and the height of the Silo cells will be 30m.
- **Installation of silo equipment:** This includes the installation of the silo conveyor system, the silo loading and unloading equipment, and the silo dust collection system.
- List of equipment that will be used during the construction work of the Silo complex include the following: (Loaders, Excavators, Cranes, Welding machines. Concrete mixing trucks, Concrete pumping trucks. And manual equipment).
- Information regarding the estimated quantities of key raw materials include the following (Steel 1211, Cement 2494 tons, Gravel 5701m3, and Sand 2850 m3).
- The raw materials will be obtained by primary suppliers, and it will be transported to the site by the contractor using trucks through the supplier, and it will be covered. The contractor will ensure that primary suppliers do not use child labor or forced labor and have OHS procedures in place.
- The main road (Aswan Western Agricultural Road) is located 350 meters away from the silo site. The road is approximately 10 meters wide, accommodating two lanes (one in each direction). Each lane is approximately 4.5 to 5 meters wide, including Road edges and possible road markings. Condition: the road is asphalt-paved and regularly maintained to facilitate the movement of light and heavy vehicles. Usage: It is frequently used for transporting agricultural products and other goods, given its proximity to agricultural hubs in the area. A separate access road branching from this

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main road will be established to reach the construction site and to the silos during operation phase will be implemented to avoid disturbing any neighbouring communities. No land acquisitions or risks on any formal or informal activities will occur from establishing this access road. A traffic assessment (number and type of cars/trucks/ peak times etc) of the road need to be prepared including the TMP prior the start of any work (construction and operation)

- This ensures that no new roads will need to be constructed for access. Additionally, railway transportation is being considered for the transport of grains to and from the silo; however, the full feasibility and details of the railway option are still under study. The site's proximity to the Nile River also provides the potential for utilizing river transport as an additional logistical route.
- All chemicals or hazardous materials that will be used during the construction phase (such as cement, paints, bitumen, asphalt etc.) will be collected by a registered vendors and disposed in the locations assigned by the governorate for disposing chemicals or hazardous materials. The names of the registered vendors include the following (Nahdet Misr for Modern Environmental Services, Egyptian Company for Environmental Services, and Al Arabiya Center for the Safe Disposal of Hazardous and Non-Hazardous Waste).
- All chemicals or hazardous materials that will be used for maintenance which will be performed periodically on construction vehicles, but it should be done off-site. If it has to be done on-site, there will be procedures that must be followed to not pollute the surrounding environment that suit with environmental standards such as maintaining operational records and performing regular lubrication.
- Fuels will be stored at the site but there are some regulations for storage as Fuel is highly hazardous and combustible, so it's important to store and handle it carefully to avoid damage to the surrounding environment. The contractor will follow the relevant legislation to ensure safe storage of fuels. The fuel will be stored in secondary containment on concrete bases at a well-ventilated room, properly labelled and with fire extinguishers and spill prevention kit. The generator location will follow the same requirements.
- Welding work will be used for gathering the Silos cell sheets which imported to the site with metal skeleton in the construction site.
- After reviewing guidance note paragraphs 10 to GN11.3, both railway and river transport may be considered as “associated facilities” for the Dandara Silo. However, neither is currently classified as such, as their feasibility is not being evaluated contemporaneously with the project, and the silo's operation will not depend on them. At this time, trucks are planned to be the primary mode for

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loading and unloading grains. Water and electricity required for the silo during the construction and operational phases will be supplied through short connections to the public network. The impact assessment and proposed mitigation measures for these utility connections are detailed in this ESIA.

3.4.2.1 Construction Demobilization Phase

The demobilization phase involves the following activities:

- **Removal of construction facilities:** this includes the removal of all temporary offices, storage facilities, and workshops.
- **Site clean-up:** this includes the removal of all construction debris and the restoration of the site to its original condition.

Regarding the start-up period, a dry test will be scheduled in which the contractor will test the equipment without load, meaning that it has no grains inside it, but he check if it is working or not, and then there will be equipment flushing, in which they apply a small amount of grains to clean the paths from the remaining components, and then the next stage will be full capacity tests in which they check that all the equipment meets the contractual capacity. The last step will be the commissioning tests, which the contractor will conduct in the presence of the owner to hand over the equipment. The start-up period takes from one month to two months or may be longer if the contractor faced any technical problems in the equipment during the start-up.

3.4.3 Operation Phase

A) Receiving the Wheat

- The car loaded with wheat enters the site.
- A sample of the loaded wheat is taken by a neutral committee, and its degree of cleanliness and moisture content are determined using laboratory equipment.
- Accepted vehicles loaded with wheat are weighed on a truck scale and the gross weight of the vehicle is recorded.
- The car is unloaded at the wheat receiving station.
- The empty car is weighed on a truck scale, the empty weight of the car is recorded, and the quantity received is recorded.
- The quantity of wheat received in the silo is recorded in the designated records and the financial dues are paid to the supplier.
- The wheat is stored in the main storage cells.

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B) Operation and Maintenance

- Operation and maintenance of equipment is carried out in accordance with maintenance programs and operating instructions issued by the relevant sectors on a periodic basis.
- **Silo operation:** This includes the loading, unloading, and storage of grain in the silo.
- The process of handling grains in a silo involves three main stages: loading, storage, and unloading: a) Loading begins with receiving the grains, followed by transporting them to the silo using conveyors, b) During storage, regular aeration and inspections ensure the grains remain in good condition, c) For unloading, grains are discharged using gravity or mechanical systems, controlled to maintain a consistent flow, and then conveyed to transportation vehicles.
- During the operation of the Dandara Silo sub-project, pesticides which will be used for fumigation will be delivered to and stored at the site. Although pesticides can be useful, they also can be dangerous if used carelessly or are not stored properly. They will be stored, used, and, as necessary, disposed in a proper way (in coordination with the governorate) that do not cause any harm to the Environment.
- Pesticides will be brought to the site transported from the main warehouse of EHCSS, and are consumed before their expiration date, and have no waste because they are tablets that evaporate into a gas that leaves no remains. Its containers remain tight so that no gas leakage from them. Phostoxin tablets will be used in the Silo (3 to 4 tablets per ton).
- Phostoxin is a gaseous insecticide consisting of aluminum phosphide and ammonium carbamate in addition to paraffin as a carrier substance. It is used in fumigating wheat, barley, and sorghum grains, warehouses, grain silos, ships, and railway cars to protect them from insect pests such as (grain beetle, grain borers, grain and flour moths, mites, and wax worms). In the case of filling silos with grains, the tablets are received through the openings of the feeding tubes during filling, preferably an automatic distribution device.
- **Fumigation:** Nearly one-third of the total grain harvested worldwide is lost before consumption or sale. Reducing the amount of grain lost after harvest and before use is an important strategy to achieve global food and nutrition security. Chemical pesticides and fumigants are used to protect stored grain. Fumigating in unsealed silos has been cited as a main cause for fumigation failure and the emergence of insect resistance. A sealed structure keeps the

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fumigant within the grain mass long enough and at sufficient concentrations to achieve a complete kill of all insects at all life stages.

- Pesticide storage will be located in room number 3 as shown in the layout of the Silo (figure 3.2). More details regarding the pesticides are provided in Appendix (I) Pest Management Plan (PMP).
- **Silo maintenance:** This includes the regular inspection and repair of the silo and its equipment.

C) Wheat Dispensing Process

- The stored wheat is withdrawn from the storage cells and placed in one of the drainage cells.
- The empty car enters the site.
- The empty car is weighed on a truck scale and the empty weight of the car is recorded.
- The vehicle loaded with wheat is weighed on a truck scale, the gross weight of the vehicle is recorded, and the quantity of wheat disbursed is recorded.
- The quantity of wheat dispensed from the silo is determined and recorded in the designated records.

3.5 Manpower and Utility Requirements

3.5.1 Manpower Requirements

The proposed sub-project is expected to temporarily employ the following:

During construction phase:

18 direct workers.

25 contract workers during implementation.

60 contract workers during electromechanical installations.

- The levels of manpower/workers during the construction phase include the following:
 - ✓ Carpenters / blacksmith for civil works since the beginning of the project implementation (18 direct workers).
 - ✓ workers for public works since the beginning of the project implementation (25 contract workers).
 - ✓ Electromechanical workers during electromechanical installations (60 contract workers).

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The recruitment process of workers will be assigned by the contractor according to the Egyptian law which regulate these issues. The number of working hours/day and holidays will be assigned according to the Egyptian law which regulate these issues and conform to WB ESS2 on Labor and Working Conditions (and any associated international requirements, for example ILO requirements). The food security project labour management plan (LMP) will be used to manage the subproject's labour/workers.

The contractor will provide temporary offices (caravans) in the site, and the accommodation for the workers will be in rented apartments in Qena which meet the standard criteria and in line with the IFC and the EBRD, (2009).

Accommodation standards that must be followed for project workers (IFC/EBRD, 2009):

It is generally not desirable for employers to provide housing for their workers directly and employers should use alternatives where possible. If there are no alternatives, specific attention should be paid to renting arrangements, workers' rights and housing standards. In addition, the possibility of worker-occupants acquiring, for a fair price, ownership of housing provided by the employer should also be examined. Renting arrangements should be fair. Adequate and decent housing should not cost the worker more than a reasonable proportion of their income and should never include a speculative profit. The employer should be entitled to repossess the accommodation within a reasonable time in the event of termination of the worker's contract of employment and the worker should be entitled to a reasonable period of continued occupancy and/or fair compensation when he ceases to exercise his employment. During the time workers spend in the workers' accommodation they should enjoy their fundamental human rights and freedom of association in particular. Workers' accommodation arrangements should not restrict workers' rights and freedoms.

- Housing standards should include special attention to the following:
 - minimum space allocated per person or per family (floor area; cubic volume; or size and number of rooms)
 - supply of safe water in the workers' dwelling in such quantities as to provide for all personal and household uses
 - adequate sewage and garbage disposal systems
 - appropriate protection against heat, cold, damp, noise, fire, and disease-carrying animals, and, in particular, insects
 - adequate sanitary and washing facilities, ventilation, cooking and storage facilities and natural and artificial lighting
 - a minimum degree of privacy both between individual persons within the household and for the members of the household against undue disturbance by external factors

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- the suitable separation of rooms devoted to living purposes from quarters for animals.
- Where accommodations are provided for single workers or workers separated from their families, additional housing standards should be considered:
 - a separate bed for each worker
 - separate gender accommodation
 - adequate sanitary conveniences
 - common dining rooms, canteens, rest and recreation rooms and health facilities, where not otherwise available in the community.
- The following guidelines shall be used for stand-alone dormitories:
 - If the dormitory does not provide a separate space for cupboards/locker rooms, the minimum room space shall be 4 square metres per person (assuming a height of 2.4m).
 - If the dormitory provides a separate space for cupboards/locker rooms, the minimum room space shall be 3 square metres per person (assuming a height of 2.4m).
 - The room shall be adequately ventilated and lit.
 - Adequate number of toilets and sanitary fittings shall be provided (1 toilet, 1 hand wash basin, 1 urinal and 1 bathroom with bench per 15 male workers).

During operation phase:

33 direct workers.

20 contract workers during the local wheat harvest season.

4-6 contract workers outside the local wheat harvest season.

They will be hired to work in the Dandara Silo, the hiring process will be through an announcement for the people of Qena Governorate (where the Silo is located administratively), and the applicants will be interviewed to select the best candidates based on the suitability for the job, experience, and the place of residence closest to the Silo to avoid the risk of labor influx. The recruitment process of employees will be assigned by the EHCSS according to the Egyptian law which regulate these issues.

3.5.2. Security Personnel

In addition to the construction and operation workers, the EHCSS is responsible for contracting to provide security team for the silo during both the construction for protecting the construction materials, construction workers, and construction activities, and during the

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operation phase for protecting the Silo, operation workers, and the grain storage. Mitigation measures for the selection of the security personnel and related risks are mentioned in the mitigation tables (both construction and operation measures).

3.5.3. Electricity

The total connected load for the Dandara Silo will be 33 KV supplied through a three phase 220kVA distribution transformer from national electricity grid. However, due to recurrent power cuts from the national grid the proponent will install a 110 kVA Perkins generator set for emergency.

The emergency generator will start during power cuts from the public electricity network. This Emergency generator will be used during the construction phase (by the contractor), and during operation phase (by EHCSS). Additionally, a new transformer will be used with the capacity of 2500 KVA, and the line will be 150m, the transformer will be located in room 15 as shown in the layout (figure 3.2). Excavations will be around half a meter deep, with the cables properly covered and clearly marked for safety. The transformer will be brought and installed by the contractor in coordination with the Electricity company, the contractor will operate the transformer during the construction phase, and the EHCSS will operate the transformer after the end of the construction phase and during the operation phase of the Silo.

The average (estimated) consumption of electricity in Silo will depend on whether the consumption will be during the season (wheat season), it will be 40,000 KW, and in other conditions 28,000 KW. The electricity lines will be buried (less than 2 meters deep).

Regarding the Risks and mitigation:

OHS Risks: During the construction and operation phases, workers involved in the installation and maintenance of buried transmission lines may face risks associated with contact with high-voltage lines. Mitigation Measures include the following a) conduct detailed OHS risk assessments prior to beginning construction, b) provide training on safe handling of electrical equipment and transmission lines, c) ensure strict adherence to lockout/tagout (LOTO) procedures during maintenance, and d) use insulated tools and provide workers with proper Personal Protective Equipment (PPE) such as insulated gloves, boots, and helmets, e) keep a safe distance between workers and high voltage lines and clearly define the distance f) ensure a proper grounding technique to prevent any accidental contacts with high voltage lines that may result in electrical shocks, g) use voltage detectors to verify the line is completely de energized before staring the work, h) where possible use remote control devices to operate high voltage equipment from a distance, i) follow national standards and best practice guidelines and OHS regulations, avoid working in harsh weather condition and wet/rainy periods .j) Add signs and barriers to

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worn workers and the public of high voltage areas, k) Do not wear any jewellery next to high voltage lines/areas

Social Risks: The temporary burial of transmission lines may result in power outages, potentially disrupting electricity supply to nearby communities or agricultural operations. Mitigation Measures include the following a) notify local communities in advance of any planned power outages, b) coordinate closely with the electricity company to minimize disruption, c) ensure that the power supply is restored promptly after the completion of burial activities, and d) use the emergency generator to provide temporary electricity in the silo area during outages.

Monitoring:

- Regular inspections during the burial and installation of transmission lines to ensure compliance with safety protocols.
- Continuous monitoring of the electrical system post-installation to identify and address potential hazards promptly.
- Documentation and reporting of any incidents or disruptions to evaluate the effectiveness of mitigation measures.

3.5.4. Water Requirement

The estimated quantity of water during the construction phase will be about 1068 m³. During the construction period (20 months). While during the operation phase, water will mainly be used, for drinking and sanitation purposes in the Dandara Silo Complex site (the average monthly consumption of water is from 70 to 140 m³). The main source of water will be the national water grid in Qena. It will be provided to the construction site before starting the construction process.

Excavation will be conducted for water pipelines for the Dandara Silo, with a width of 2 meters and a depth of 2 meters. The total length of the pipeline will be determined in coordination with the water company, which is responsible for connecting the water supply from the public network to the silo. The starting point of the water pipeline will be from the main water line situated near the main Qena-Luxor Road, adjacent to the silo site. The end point will be inside the silo, determined according to the final layout and location of the utilities within the silo facility.

3.5.5. Associated Facilities Criteria

Railway and River Transport: After reviewing guidance note paragraphs 10 to GN11.3, both railway and river transportation could be considered as "associated facilities" for the Dandara Silo. However, neither is categorized as such since their feasibility and construction

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is not carried out contemporaneously with the silo project. The current operations will rely on trucks for the loading and unloading of grains, with no immediate dependence on railway or river transport.

Water Infrastructure: The construction and operation of the Dandara Silo will not solely depend on the connection to the public water network. The project can fully operate using water trucks if necessary, and any connection to the public water network will not occur contemporaneously with the silo's construction and operation activities. Hence, the water network is not considered an associated facility.

Electricity Infrastructure: Similarly, the silo's construction and operation do not rely exclusively on the public electricity network. The facility is equipped to function using generators, ensuring uninterrupted operations. Any connection to the public electricity network is not planned to be carried out simultaneously with the project activities, thus not qualifying as an associated facility.

For the water and electricity short connections, they will be extended from the public networks to the silo site as required. The Environmental and Social Impact Assessment (ESIA) includes a thorough assessment of the environmental, social, and Occupational Health and Safety (OHS) risks and mitigation measures related to these infrastructure activities within the silo site boundaries.

3.6. End of life site closure and site rehabilitation

Decommissioning refers to the administrative and technical actions taken to remove some or all the regulatory controls from an authorized facility so that a site can be reused. This process involves:

- Planning
- Physical and radiological characterisation
- Facility and site contamination
- Dismantling
- Materials management

Planning and implementing decommissioning activities are part of a complex and multi-disciplinary process that requires timely and effective management. EHCSS will develop a site decommissioning plan with enough time prior to scheduled decommissioning to allow adequate detailed planning. There may be various environmental, social and OHS risks associated with the decommissioning process, including collection and proper management of hazardous and non-hazardous wastes on the site (including any structural or equipment wastes associated with plant operations); worker safety; worker recruitment;

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presence of heavy equipment (including trucks) that generate air emissions, noise and vibrations; exacerbation of local traffic.

End of life use of the site will determine the level of activity required during this phase. Stakeholder consultation must be implemented with respect to the proposed site closure plan.

Generally, the service life of a steel grain silo is 25 years while of a concrete silo is 50 years. When the service life of steel grain silo is reached, the original silo body could be replaced with a new one and continue to use it. In addition to inspection and maintenance of the equipment and devices used, and renewal of what is necessary of it to ensure that the silo continues to operate with high efficiency. Regarding to the facilities at the Silos sites, it will be renovated to be used for longer time. In the case of closure, the site closure plan will be developed during operation before closure.

3.7. Emissions and waste Generation during both construction and operation phases

A) Mobilization and Construction Phase emissions and Waste Management:

Air emissions: Dust from excavation, transportation, and materials handling

Vehicle emissions: Exhaust fumes from construction vehicles and equipment.

Solid waste: Construction debris, packaging materials, and leftover building materials.

Excavation will be carried out at the beginning of the construction phase of the Silo. Excavated materials will be removed and deposited offsite. The estimated volumes will be determined by the contractor during the excavation process, according to the following equation.

If the diameter of one cell is 21m and the depth is 5m we can calculate the volume of excavations for each cell.

$V = \text{surface area} \times \text{height}$

Surface area = $\pi r^2 = \pi \times (10.5)^2 = 346.185 \text{ m}^2$

$V = 346.185 \text{ m}^2 (\text{surface area}) \times 5 \text{ m (depth)} = 1730.925 \text{ m}^3$ of excavation per cell.

$18 \text{ cells} \times 3438.93 \text{ m}^3 = 31156.65 \text{ m}^3$ (total excavated material)

The location of the disposal sites will be decided as per the guidance from the governorate of Qena and based on the principle minimizing environmental impacts such as vegetation clearance, proximity to water source and communities, volume of excavation, geology,

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distance from the project site. Egyptian environmental authorities shall advise on candidate disposal sites for excavated materials prior to excavation activities.

Hazardous wastes: Construction chemicals such as cement, lubrication oil fuel, asphalt etc. Chemicals or hazardous materials that will be used during the construction phase will be used for maintenance which will be performed periodically on construction vehicles, but it should be done off-site at service centers. If it has to be done on-site, there will be procedures that must be followed to not pollute the surrounding environment that suit with environmental standards such as maintaining operational records and performing regular lubrication on concrete base in order to not pollute the soil. Fuels will be stored at the site in secondary containment on insulated ground (concrete base) but there are some regulations for storage as Fuel is highly hazardous and combustible, so it is important to store and handle it carefully to avoid damage to the surrounding environment. The contractor will follow the relevant legislation to ensure safe storage of fuels and will handle and store and dispose of the chemical according to its safety data sheet (SDS).

E-Waste and Batteries: Electronic waste (e-waste) and batteries generated during the construction phase, such as damaged electronic components, wiring, and spent batteries from tools or machinery, will be managed carefully. The contractor will: a) segregate e-waste and batteries from other types of waste, b) store e-waste and batteries in secure, designated containers to prevent leakage or contamination, c) dispose of e-waste and batteries through licensed recycling facilities or authorized hazardous waste handlers to ensure compliance with local and international environmental standards, and d) maintain records of e-waste and battery disposal for audit and reporting purposes.

All chemicals or hazardous materials that will be used during the construction (such as cement, paints, fuel, asphalt etc.) will be collected by a registered vendors and disposed in the locations assigned by the governorate for disposing chemicals or hazardous materials. The names of the registered vendors include the following (Nahdet Misr for Modern Environmental Services, Egyptian Company for Environmental Services, and Al Arabiya Center for the Safe Disposal of Hazardous and Non-Hazardous Waste).

Construction phase's sewage (during the construction phase) will be treated the same as the domestic sewage from workers (during the operation phase) which means it will be collected in a specific tank with a capacity of 200 cubic meters, and a sewage trench truck drains the tank, which is then disposed into the public sewage network.

B) Operational Phase Emissions and Waste Management:

Air emissions: Minimal dust emissions are expected during operation. However, grain loading/unloading activities might generate dust. Regarding air emissions, there is a system in the silos that collects dust and emissions produced during the loading and uploading of grains to and from the silos. Dust measurement is the process of determining the

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concentration of dust particles in the air within a silo. This can be done using various techniques, such as optical dust sensors, particle counters, and gravimetric methods. These methods can provide accurate and reliable measurements of dust concentration, which can be used to monitor the health of the silo and identify potential issues before they become serious problems.

Solid waste: during the operation phase: solid waste will be generated including domestic waste such as food and general wastes, and office wastes including paper, cardboard, and printer cartridges/ribbons. All effluent and other waste generated during the operation shall be properly managed and disposed of without adverse effects on people's health and the environment. Solid waste will be collected and disposed in specific sites for solid waste collection as per the guidance from the governorate of Qena and based on the principle minimizing environmental impacts such as vegetation clearance, proximity to water source and communities, volume of excavation, geology, distance from the project site.

Domestic sewage from silos workers. Wastewater will be collected in a specific tank with a capacity of 200 cubic meters, and a sewage trench truck drains the tank (on average 7 times a year), which is then disposed into the public sewage network. Wastewater that will be generated by the sub-project is due to such activities as facilities cleaning as well as domestic activities. No direct discharge shall be made into the environment.

Hazardous wastes such as rodenticides and pesticides will be used for fumigation (Phostoxin tablets:3 to 4 tablets per ton.) during the operation of the Dandara Silo sub-project. Although pesticides can be useful, they also can be dangerous if used carelessly or are not stored properly. Pesticides will be stored, used, and disposed of in a proper way according to their SDSs (in coordination with the governorate) that do not cause any harm to the Environment. Rodenticides and dead rodents from the use of rodenticides should be removed straightaway and treated as hazardous waste to avoid secondary poisoning from non-targeted species. A pest management plan is present in annex I for pesticides and rodenticides management. Related precautions will be considered during the storing of Rodenticides with the Phostoxin. Rodenticides will be selected to be non-acidic and not water based.

All chemicals or hazardous materials that will be used during the construction phase or operation phase will be collected by registered vendors and disposed in the locations assigned by the governorate for disposing chemicals or hazardous materials. The names of the registered vendors include the following (Nahdet Misr for Modern Environmental Services, Egyptian Company for Environmental Services, and Al Arabiya Center for the Safe Disposal of Hazardous and Non-Hazardous Waste).

4

EXISTING PHYSICAL, BIOLOGICAL AND SOCIAL ENVIRONMENT

This chapter aims to provide a description of the environmental sensitivity at and/or surrounding the site to and potential hazards of the study area. The existing environmental baseline will address the following issues in particular:

- Physical Environment
- Biological Environment
- Socio-economic characteristics.

This section of the report is mainly based on a desk study as well as on field visits which were carried out in September 2023 in the study area. The desk study mainly relied on publicly accessible data sources such as the Central Agency for Public Mobilization and Statistics (CAPMAS), as well as previous special studies of the study area carried out by SENS. This is in addition to the Socio-economic Advisory (2018). Technical reports and recent literature covering the same area, as well as satellite images have also been utilized. Findings of field visit were used to refine and supplement information on the sub-project site and nearby sensitivities.

4.1. Physical Environment

This section presents regional information on meteorological conditions, topography and geomorphology, geology, as well as surface and ground waters, with emphasis on the study area of Dandara in Qena Governorate and its surroundings.

4.1.1 Weather and Climate

A) Qena Climate:

Qena's climate is characterized by a long, hot, and arid summer, while winters are short, mild, and dry. The hot season in Qena spans about five months, from early May to late September, with average daily high temperatures exceeding 35°C. July is typically the hottest month of the year, with average highs reaching around 40°C and lows around 25°C. The cooler season lasts from October to February, with average daily high temperatures below 25°C. January is usually the coldest month, with an average low of around 9°C and a high of approximately 20°C. Figure (4.1) shows Qena weather by month. Source: Weather data for Qena retrieved from the Egyptian Meteorological Authority (EMA) and global climate data archives for the region (2023).

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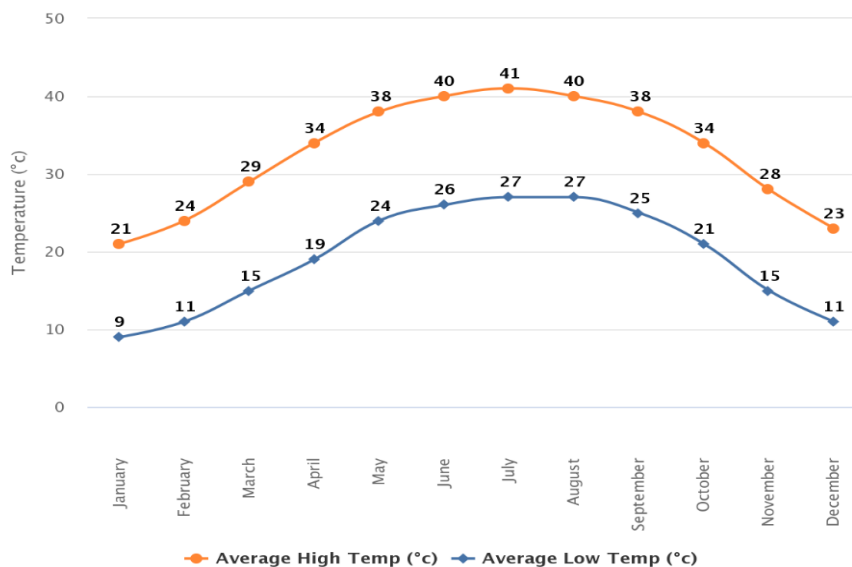


Figure (4.1): The Average Temperature in Qena.

B) Precipitation

Qena does not experience significant seasonal variation in the frequency of wet days (*i.e.*, those with greater than 0.04 inches of liquid or liquid-equivalent precipitation). The frequency ranges from 0% to 1%, with an average value of 0%. Figure (4.2) shows the average daily chance of precipitation in Qena.



Figure (4.2): Daily Chance of Precipitation in Qena.

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C) Clouds

In Qena, the average percentage of the sky covered by clouds experiences significant seasonal variation over the course of the year. The clearer part of the year in Qena begins around May 22 and lasts for 5.2 months, ending around October 27. The clearest month of the year in Qena is September, during which on average the sky is clear, mostly clear, or partly cloudy 96% of the time. Figure (4.3) shows average Monthly cloud coverage in Qena.

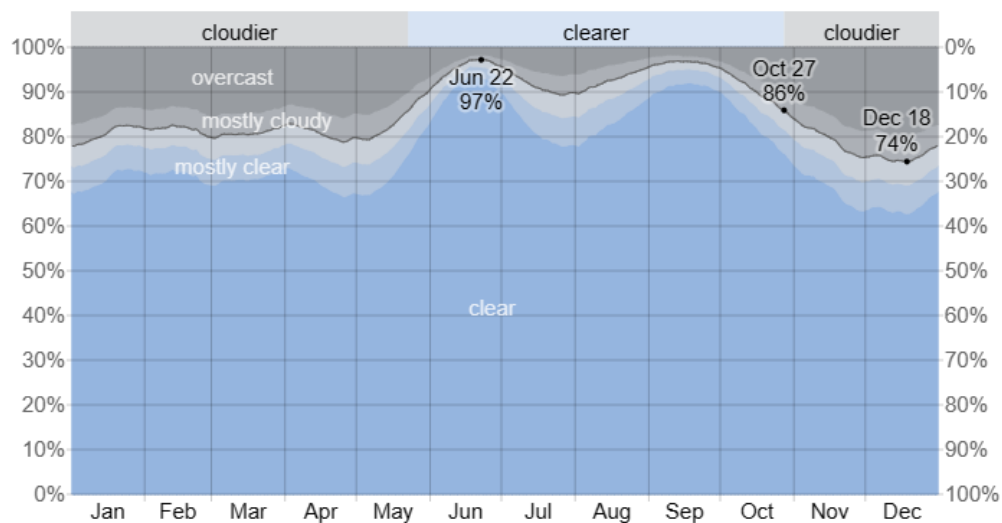


Figure (4.3): The Average Monthly Cloud Coverage in Qena.

D) Humidity

The humidity comfort level is based on the dew point, as it determines whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Unlike temperature, which typically varies significantly between night and day, dew point tends to change more slowly, so while the temperature may drop at night, a muggy day is typically followed by a muggy night. Figure (4.4) shows the perceived humidity level in Qena, as measured by the percentage of time in which the humidity comfort level is muggy, oppressive, or miserable, does not vary significantly over the course of the year, with humidity percent not exceeding 40%.

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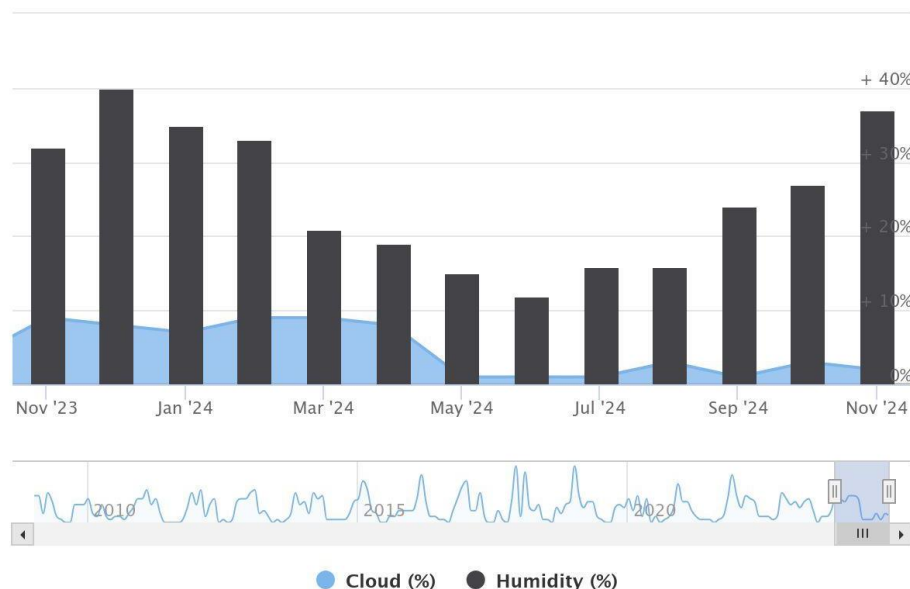


Figure (4.4): shows Average Relative Humidity and clouds in Qena.

E) Wind

The average hourly wind speed in Qena experiences significant seasonal variation over the course of the year. The windier part of the year lasts for 5.4 months, from April 14 to September 26, with average wind speeds of more than 9.0 miles per hour. The windiest month of the year in Qena is June, with an average hourly wind speed of 10.3 miles per hour. The calmer time of year lasts for 6.6 months, from September 26 to April 14. The calmest month of the year in Qena is December, with an average hourly wind speed of 7.5 miles per hour. Figure (4.5) shows the average monthly wind speed in Qena. Figure (4.6) shows the wind rose diagram which represents the direction of wind in Qena.

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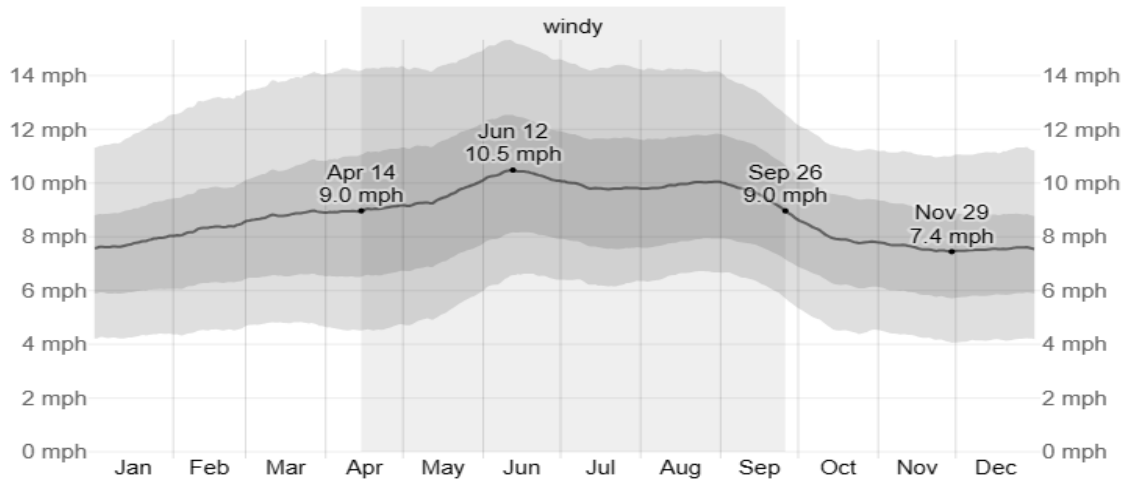


Figure (4.5): Average Wind Speed in Qena.

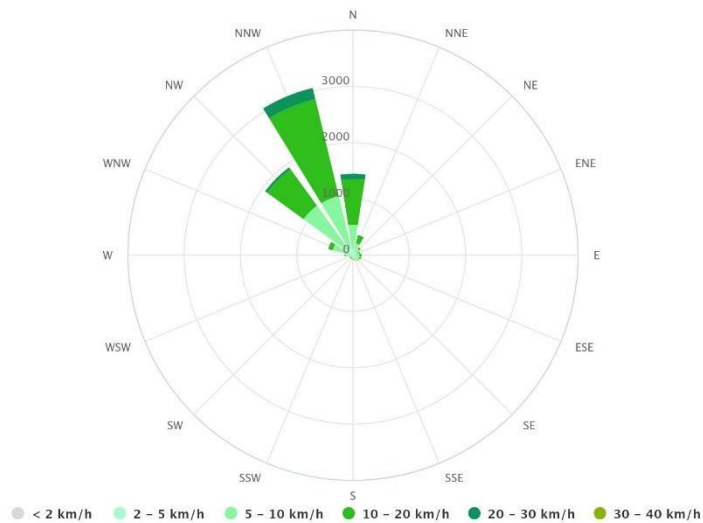


Figure (4.6): Windrose for Qena.

4.1.2 Noise Level

The noise is usually measured by the Noise Pressure Levels (NPL), based on the noise levels that are expected from movement, surrounding areas and activities. Therefore, the noise

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must be monitored near areas with human activities where it is expected to be high. According to the available baseline noise surveys in the subproject site (Table 4.1), the average recorded noise level was 54.05 NPL. These measurements were taken during daytime hours (7:00 AM to 6:00 PM) to compare them with the allowable limits for "Residential, Institutional, Rural and Educational Areas" under national standards, which set an allowable noise range of 50-60 dB during this period. International standards specify a maximum limit of 55 dB but extend the period until 10:00 PM. all the results are within the maximum allowable noise limits set for this area, with no exceedances recorded in the subproject site and the surrounding areas.

The primary sources of noise recorded onsite included occasional trucks passing through the subproject area and high wind speeds, which can significantly affect noise baseline levels.

Table (4.1): Measurements of the average noise levels around the subproject areas.

10 minutes average Leq (dBA)	Points						The permissible limit for sound intensity decibels (A) (Egyptian law) “Residential, Institutional, Educational, Rural Areas”			Noise Level Guidelines (One Hour LAeq (dBA)) (World Bank)	
	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Daytime from 7 am to 6 pm	Evening from 6 pm to 10 pm	Night from 10 pm to 7 am	Daytime 07:00 – 22:00	Nighttime 22:00 - 07:00
	53.7	51.3	55.4	53.6	56.2	54.1	45-60	40-55	35-50	55	45

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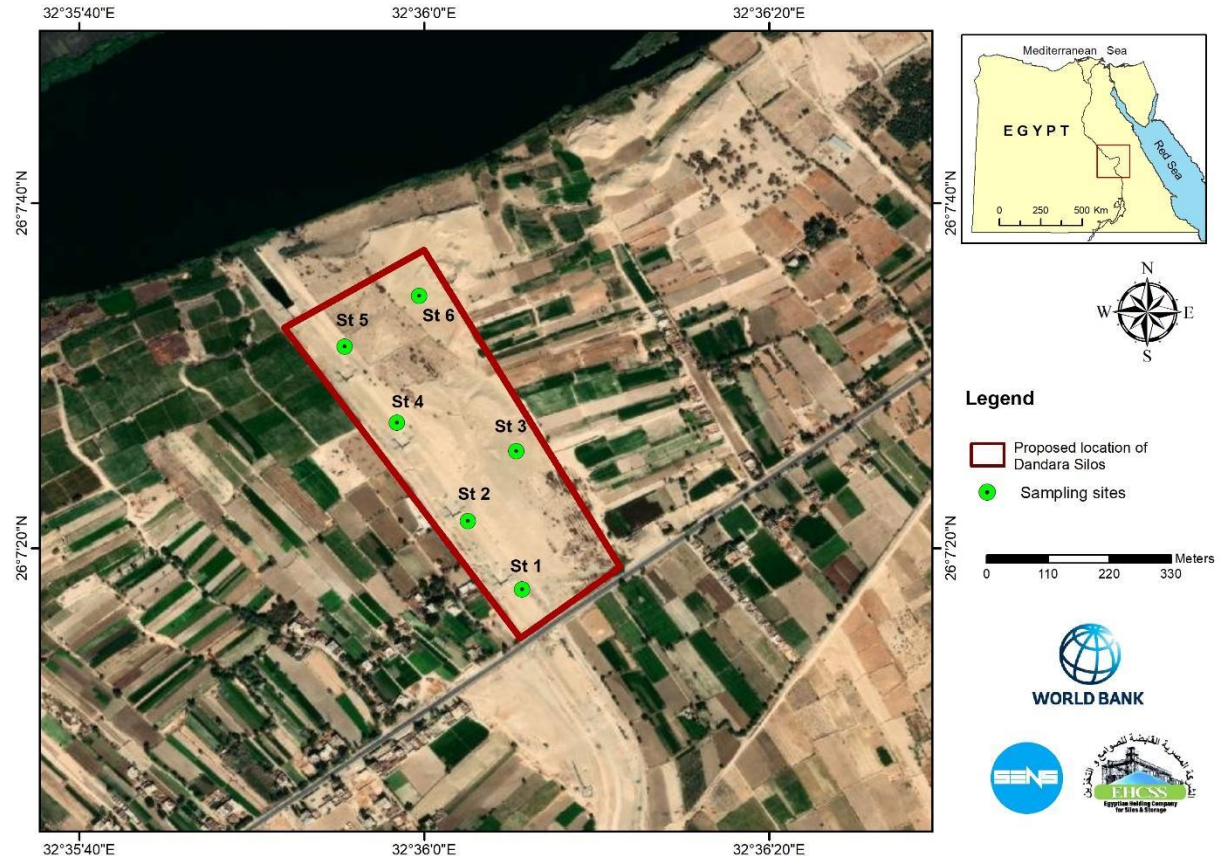


Figure (4.7): Map showing the locations of the six noise measurements.

4.1.3 Geology, Hydrology and Hydrogeology

A) Geology:

Qena is located in the central portion of the Nile Valley, occupies a portion of a sub-regional sedimentary basin (Assiut Basin) having a depth exceeding 3000m. This basin is located in the foreland side of the Arabian Nubian Massif, where the dip is regionally in the westward direction. In this basin the top portion of the sedimentary section is dominated by carbonate rocks belonging to the Eocene and the Upper Cretaceous, and the lower portion is mainly clastics belonging to the Paleozoic and the Mesozoic (Nubian Sandstone Complex). The sedimentary section is locally overlain in the Nile Valley itself by late Tertiary clays and Quaternary fluvial silty clay, sand, and gravel. The basin was affected by tensile stresses which are responsible for the formation of a complex fault system running in NW-SE direction. Basaltic extrusions are generally associated with such faults, but these are not recorded in the Qena area.

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In Qena area, the stratigraphy of the surface and the near surface sedimentary succession as outlined by (Said, 1962) is as follows from top to base:

1. Holocene: silty clay (Neonile and young wadi deposits).
2. Late Pleistocene: graded sand and gravel (Prenile deposits).
3. Plio-Pleistocene: clay sand and conglomerate (Protonile deposits).
4. Pliocene: clay (Paleonile deposits).
5. Eocene: limestone (shallow marine deposits).

Two extensive plateaus are bounding the Nile valley at the study area. These plateaus are composed of Upper Cretaceous-Lower Tertiary rocks. They are drained by a great number of structural controlled Wadis. These Wadis are well developed on the eastern side. The studied Quaternary sediments are bounded by the Upper Cretaceous-Lower Tertiary successions from the east and west in addition to the basement complexes in the east. The studied sections include a variety of sediments which differ in mineral composition and texture reflecting the environmental sedimentary nature of the Quaternary sediments. The distribution of the studied sediments is mapped in some details in a geological map (Figure 4.8).

The measured sections at the present studied area include the following lithostratigraphic units arranged from older to younger: Prenile sediments (Qena sands and Kom Ombo gravels) and Bank sediments (Nile silt). Prenile sediments represent a thick and easily recognizable unit made up mainly of sands which seem to have been deposited by a competent river (Said, 1975) having E-W trend (Askalany, 1988). These sediments are divided into two units namely Qena sands at the base and Kom Ombo gravel at the top (Askalany, 1988). The modern flood plain is represented by the fertile silt layers of agricultural land (Bank sediments, Nile silt) lies on the eastern and western banks of the Nile. Its elevation ranges from about 3 to 5.5 meters above the modern water level of the Nile (Osman, 1996).

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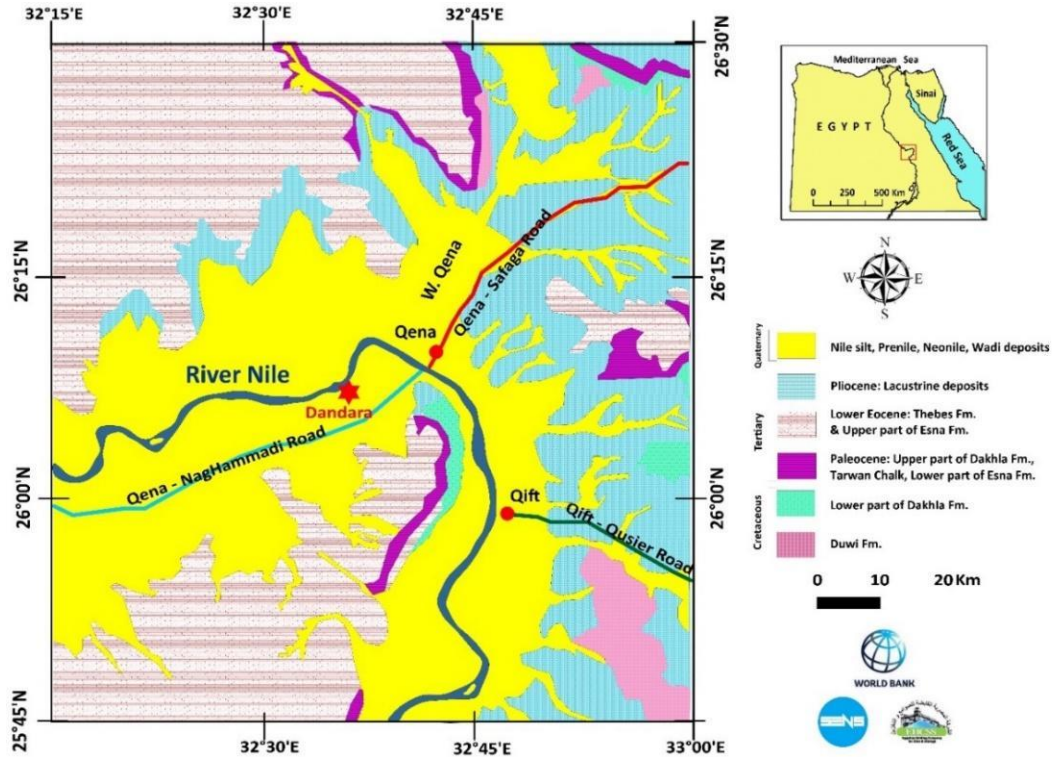


Figure (4.8): Modified geological map of the study area after Egyptian geological survey map (1978).

B) Geomorphology

Geomorphologically, the study area represents a portion along the western bank of the Nile River. The ground surface elevation decreases gradually from the southern limestone plateau to the Nile Valley plain. The giant deviation of the Nile River course, causing the Qena bend, was formed because of the intensive faulting (rift valley) and tectonic activities during different geologic ages. The area is subdivided into four geomorphic units (Said, 1962). These are the young alluvial plains (the cultivated lands), the old alluvial plains (the Nile terraces which are a high level of the cultivated lands), the watershed area (the southern calcareous plateau) and water collectors' areas (alluvial fans and hydrographic basins) (Figure 4.9).

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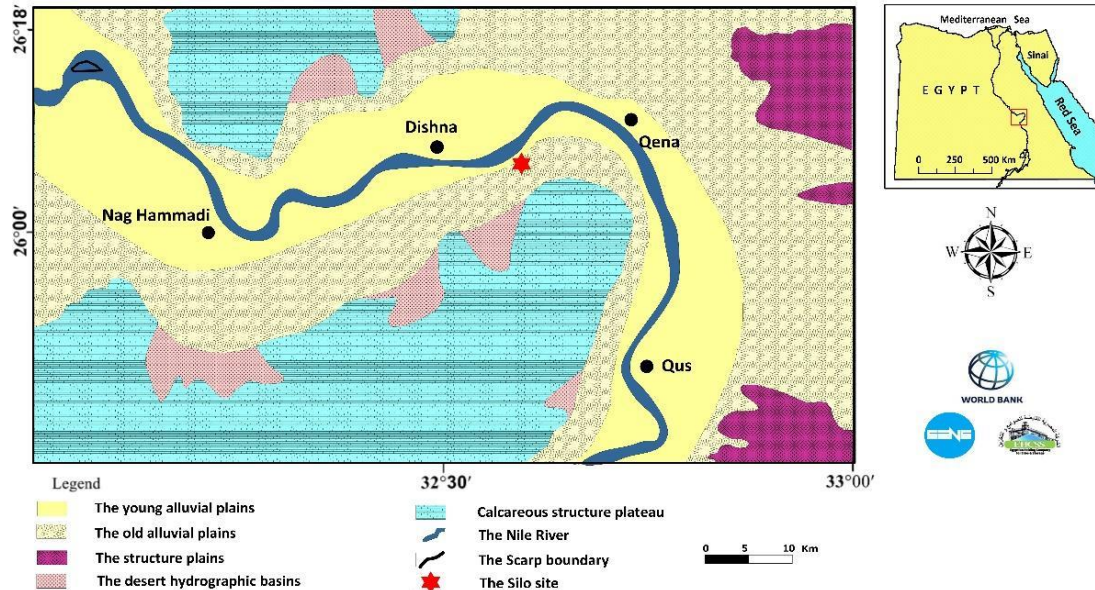


Figure (4.9): Main geomorphologic units of the west Qena (Said, 1962).

The alluvial plains are differentiated into the young plain, which is intensively cultivated, and the old plains, which are developed into terraces. Parts of which are under reclamation. The young alluvial plain occupies the central portion of the Nile Valley and is underlain by a thin silty clay layer that was developed as result of the successive floods of the Nile. The course of the river Nile cuts the plain close to the eastern side and flows in S-N direction. The old alluvial plains occupy the outer portions of the valley. They are underlain by mixed sand and gravel and are developed into successive terraces rising to 100m above the present level of the flood plain. These terraces are dissected by complex drainage lines (Wadis) directed towards the low portions of the valley. The structural plateaux determine the edges of the Nile trough. The surface of these plateaux is rough and is underlain by weathered resistant limestone. The plateaux terminate with fault-controlled escarpments, which rise abruptly from the alluvial plains.

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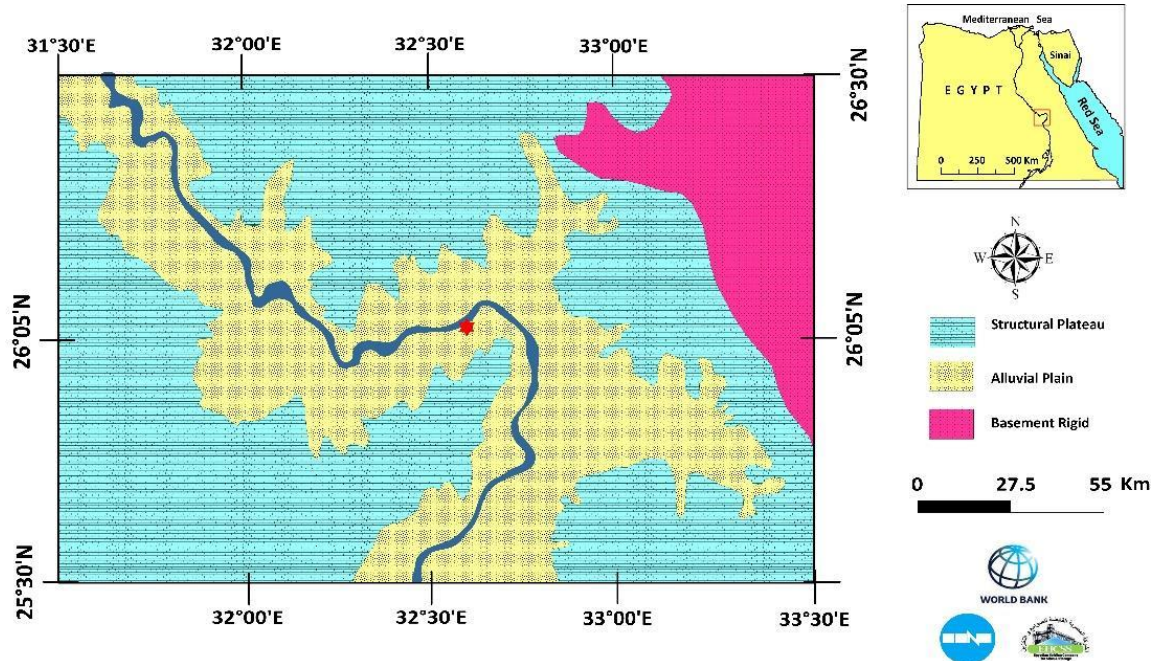


Figure (4.10): Alluvial plains in the study area.

C) Hydrogeology

In the discussion of the hydrogeology of Qena area emphasis is given to the Quaternary fluvial and the Plio-Pleistocene fluvio-marine aquifer systems. The main sources of information are the observation wells drilled by the Research Institute for Groundwater (RIGW) and the private wells. This information includes the lithology, groundwater levels, groundwater extraction and quality. The other aquifer systems, particularly the carbonates and the Nubian Sandstone, are not explored in this area.

The main aquifers are of granular type. Based on their area extent and productivity, these aquifers are classified into four hydrogeological units (Figure 4.11) and (Table 4.2), [RIGW]. The Quaternary aquifer is continuously recharged from vertical percolation of irrigation water (from canals and irrigation return flow). On the other hand, the Plio-Pleistocene aquifer is either recharged from irrigation return flow, runoff, or vertically from deeper aquifers (Nubian Sandstone complex). Groundwater discharge from the Quaternary aquifer is either through transversal flow to the river or to the adjacent aquifers, or vertically through pumping. The Plio-Pleistocene aquifer is discharged mainly through horizontal flow to the Quaternary; or vertically by groundwater pumping. The Eocene carbonate aquifer system is recharged from local rainfall.

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or from other aquifers in direct contact. Groundwater discharge is generally through groundwater flow to the adjacent aquifers depending on groundwater heads.

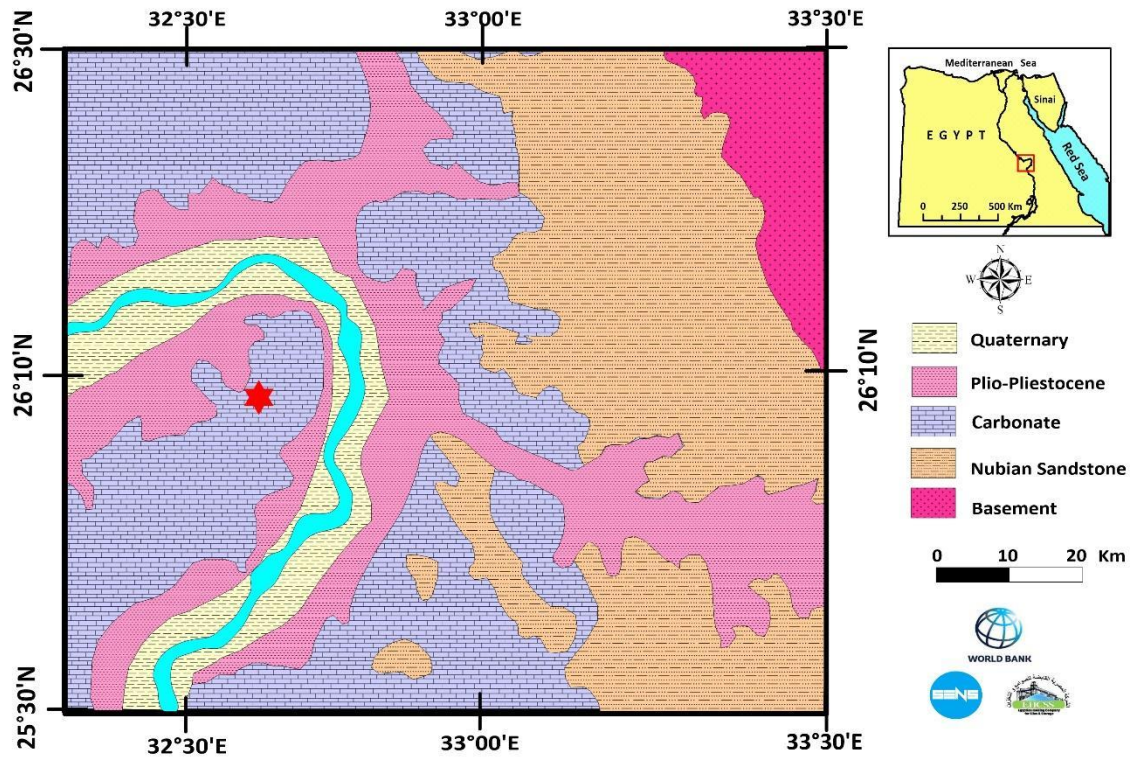


Figure (4.11): Hydrogeological units.

Table (4.2): The characteristics of the hydrogeological units.

Units	Description	Saturated thickness (m)	Depth to groundwater level (m)	Transmissivity (cm ² / day)
Unit (1)	Highly productive unit, consisting of Quaternary graded sand and gravel with clay lenses. Continuous recharge from irrigation.	10-140	<5	5000-20000
Unit (2)	Moderately productive unit consisting of graded sand and gravel with clay lenses,	20-200	5-10	5000-1000

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Table (4.2): The characteristics of the hydrogeological units.

	occasional recharge from irrigation, surface runoff and local rainfall			
Unit (3)	Low productive unit consisting of Plio-Pleistocene sand and gravel and clay, continuous recharge from irrigation and occasionally from surface runoff and local rain	20-80	5-15	3000-1000
Unit (4)	Low to moderately productive unit consisting of: - Eocene Limestone with paleokarst feature; - Upper Cretaceous shale, Paleocene shale; and Pliocene clay (non-aquifer); - Upper Cretaceous Paleozoic Nubian Sandstone complex		Unexplored	

The silo site is located in Unit 4 area, unexplored by RIGW.

Groundwater Flow, Recharge and Discharge

Groundwater heads fluctuate during the year with differences that may change from a few centimeters to more than one meter. The average groundwater heads decrease gradually from 78 m (AMSL), at Isna, to 62 m (AMSL), at Naga Hammady. The general flow direction is north. The main deviations from the general flow direction are found at the borders of the Nile Valley with the flow direction is generally from the aquifer to the river.

The Nile aquifer system at Qena is recharged mainly from irrigation (seepage from canals and percolation from irrigation applications). Recharge from irrigation water varies according to the type of soil and irrigation method. In sandy areas (Valley fringes) with basin irrigation, losses from irrigation vary between 1 and 2.5 mm/day. In areas underlain by semi-confined aquifers, average recharge from irrigation is about 1 mm/day.

Groundwater extraction by wells is another important discharge component. The total annual groundwater extraction for drinking water in Qena Governorate was estimated at 51766 m³/year in 1991 while it reached about 102,042 m³/year in 1999.

The water table depth ranges from 4 to 97 meters depending on the local topography., and the depth of groundwater at the silo location is 50-60m deep. . The constructed water level contour map indicated that the water level decreases regionally from south to north direction and its direction is mainly from southeast to northwest direction, with some local flow groundwater directions from Nile River at the north to old alluvial plain and desert environs at south due to the presence of cone of depression near AL Marashdah and AL Waqf area (Figure 4.12).

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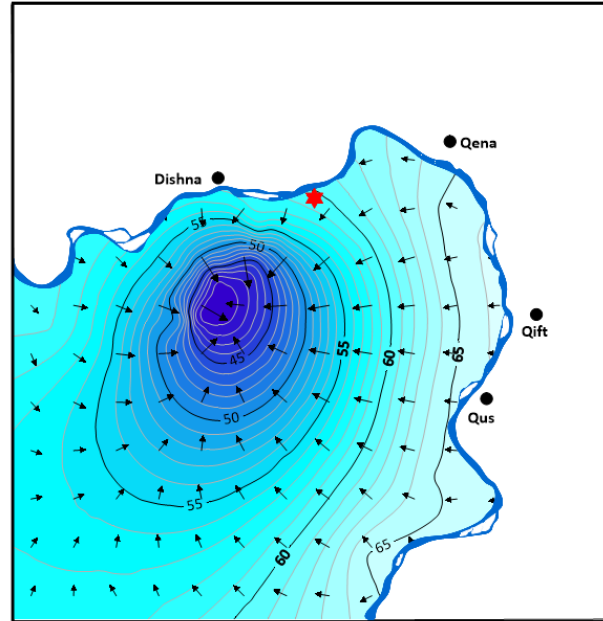


Figure (4.12): Water level contour map and flow direction.

Surface Water

Water resources in Egypt are restricted to the river Nile, rainfall and flash floods, deep groundwater in the Desserts and Sinai and potential desalination of seawater or brackish water. The distance to the nearest surface water (the Nile River) is approximately 500 m. Water resources in the region are heavily reliant on the Nile River, with major irrigation canals like the Asfoun (2.14km from the silo site), and Kalabaya (3.76km from the silo site) canals facilitating agriculture in the area.

Rainfall and Flood Risk

Rainfall in the project area, as in most of the Upper Egypt, is extremely scarce and occurs primarily as scattered winter showers. This precipitation is not a dependable water source and contributes minimally to the local water table. The site's location on the western bank of the Nile, within a low-risk flood zone, minimizes significant flooding concerns. Additionally, a flood drainage control system is situated next to the silo site, further reducing flood risks in the site.

The River Nile in Qena:

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Qena Governorate covers a large area of the Nile Valley and extends more than 350 km along the Nile River from Isna to Naga Hammady. The Ministry of Water Resources and Irrigation divides the area into 3 main irrigation inspectorates, Isna, Qena and N. Hammady, to optimize management of water resources and demands. There are two main canals in Qena that take water directly from the Nile upstream of Isna barrage, these are the Asfoun Canal and the Kalabaya canal. These two canals are used to irrigate the agriculture land between Isna and N. Hammady barrages together with 9 pumping stations directly on the main channel of the Nile.

Asfoun and Kalabaya Canals

Qena Governorate is supplied with Nile water through the two main canals, the Asfoun Canal and the Kalabaya Canal which both abstract water from the main river channel upstream of the Isna Barrages. The Asfoun Canal is located on the western side of the river Nile to irrigate approximately 68,879 Feddan of agriculture land west of the Nile. Its total length is about 126 km. The Kalabaya Canal runs parallel to the eastern bank of the Nile for a length of 163 km and irrigates approximately 174,515 Feddans of agricultural land east of the Nile. The total annual volume of water abstracted from the Nile in Qena Governorate is listed in table below.

Although the project site is not within the primary flood pathways, precautionary measures, will be implemented to mitigate flood risks from nearby wadis such as Wadi Qena. The close proximity to the Nile River and irrigation canals necessitates stringent measures to protect surface and groundwater quality. Construction-phase protocols will include runoff management, spill containment, and compliance with water quality monitoring.

Table (4.2): Total Annual Surface Water Abstraction in Qena Governorate.

Kalabaya Canal	1.306 BCM/year
Asfoun Canal	0.524 BCM/year

Seismicity and Seismic Hazards

According to the spatial distribution of earthquakes that were located around Qena Governorate as shown in Figure (4.13), several areas having different seismicity levels have been represented around. The Silo site lies between two seismic sources (Z2 and Z8). The main characteristics of the individual seismic sources are described as follows.

Zone - 2: This source is located on the West bank of the river Nile in the area between Assuit to the North and Kom Ombo to the South. Several events were recorded in the West Kom Ombo area, where on March 22, 2003, an earthquake (Md 4.0) occurred. This activity in Kom Ombo may be related to the Gebel El-Barqa fault that is one of western desert fault system (Fat-Helbary and Mohamed, 2004).

Zone - 8: This source represents the Red Sea zone, Abo Dabab zone, North Abo Dabab and the south-eastern corner of the Eastern Desert (Allaqi zone). The fault systems in this area

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parallel to the fault systems in the Red Sea where the Arabian plate is continuing to rotate away from the African plate along the Red Sea spreading center (Cochran, 1983). Abo Dabab zone is the most active zone in the Red Sea area.

Seismicity risks for the Dandara Silo site are relatively low. The region is situated between two seismic zones (Z2 and Z8), with historical seismic events like the March 22, 2003, Kom Ombo earthquake registering at a magnitude of 4.0. However, overall, the area is characterized by low seismicity, particularly compared to other regions in Egypt.

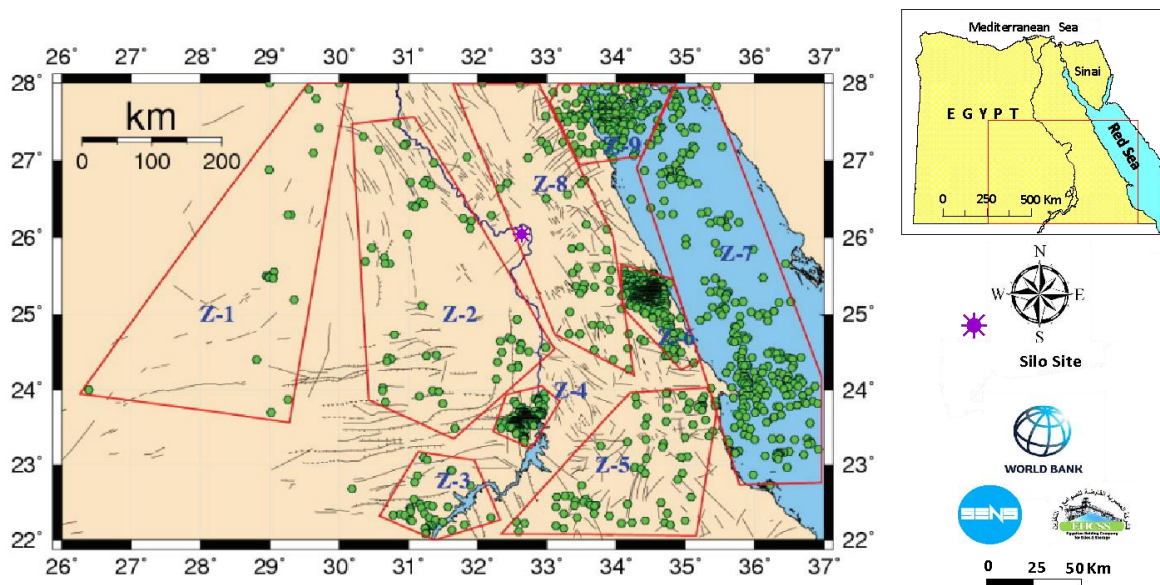


Figure (4.13): Earthquake epicentral distribution in and around the study area during the period 1900 to 2006 (Fat-Helbary and Mohamed, 2004).

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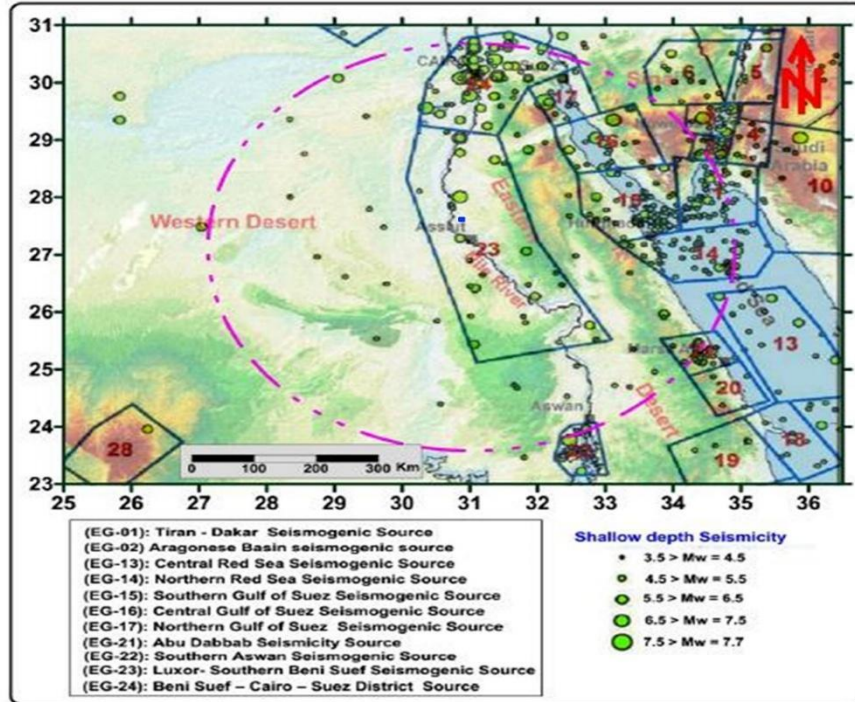


Figure (4.14): Shallow–depth seismicity ($d \leq 35$ km) and delineated seismic sources along the Red Sea, Gulf of Suez, and the Nile River modified after Sawires *et al.* (2015).

4.1.4 Air Quality

Ambient Air Quality

The Ambient air quality at the proposed site for Dandara Silo reflects the localized conditions rather than the general industrial emissions affecting Qena Governorate. While nearby industries, such as the sugar factories and the Naga Hammady aluminum smelter, which is located approximately 38 km from the silo site, contribute to regional air quality concerns, these are not directly relevant to the Dandara subproject site, which is located in an agricultural area and primarily influenced by local dust and vehicular emissions. A site-specific air quality assessment was conducted, measuring key pollutants, including SO_2 , NO_x , and PM_{10} , to evaluate the potential impact on the local environment and human health. Results from the site monitoring indicated that pollutant levels were within allowable national and international standards for rural and agricultural areas. The primary sources of air quality impact at the site are related to agricultural activities, occasional vehicle movement on unpaved roads, and natural dust due to the arid conditions.

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In accordance with **Egyptian Law 4/1994** and the World Bank's Environmental, Health, and Safety Guidelines, air quality at the project site will continue to be monitored during both construction and operational phases to ensure compliance with applicable standards.

Table (4.3): Measurements of the average air quality around the subproject areas.

	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6
SO₂ ppm (max. 1 h)	0.005	0.006	0.004	0.007	0.004	0.008
CO ppm (max. 1 h)	0.7	0.5	0.3	0.5	0.3	0.7
PM₁₀ (µg/m³)	36	31	30	36	38	32
PM_{2.5} (µg/m³)	11	13	16	12	10	17

4.1.5 Soil Quality

Morphological characteristics of the soils

The soils at the project site are characterized by a sandy texture, with colors ranging from light yellowish-brown in dry conditions to pale brown when moist. Soil depth is moderate to deep, with clear to gradual boundaries between layers. The topsoil shows low cohesion and effervesces strongly when treated with diluted HCl, indicating a high calcium carbonate content (Moursy *et al.*, 2020).

Soil physical properties

Sand content at the site dominates, ranging between 78% and 90%, with minimal silt (6–8%) and clay (4–6%). Gravel content is low, typically under 10%. The soil's volumetric water content at the wilting point is measured at approximately 1.2–10%, indicative of limited water retention capacity. This aligns with the regional arid conditions.

Soil classification

The soil is characterized by aridic soil moisture regime. There is ochric surface horizon and calcic sub-surface horizon having more than 15% CaCO₃ and absolutely 5% CaCO₃ than the underlying layer. Thus, these two profiles were keyed out as Typic Haplocalcides subgroup level. The remaining soils were classified as Entisols. The soils were characterized with texture class coarser than loamy sand and showed < 35% (by volume) rock fragments. Hence, they keyed out aspsammments suborder and classified as Typic Torripsammments at subgroup level as they have aridic soil moisture regime (Moursy *et al.*, 2020).

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4.2. Biological Environment

4.2.1. Bio-ecological zones

Qena Governorate is characterized by a diverse range of habitats, shaped by the unique topography and landscapes of the region. The primary habitats include wetlands, arable lands, urban areas, desert landscapes, and agriculture lands habitat, each supporting a variety of flora and fauna. Urban habitats, such as towns and villages, host wildlife species that are well-adapted to living in proximity to human activity, such as the House Sparrow (*Passer domesticus*), Palm Dove (*Streptopelia senegalensis*), and Cattle Egret (*Egretta ibis*), along with various geckos, mice, bats, and numerous invertebrates.

The edges of the Nile Valley represent a transitional habitat between the desert and the riverine environments. This zone, formerly a mix of various habitats, is now increasingly converted into arable land due to ongoing reclamation efforts, which sharply demarcate the boundary between cultivated areas and desert. The natural ridges and plateaus on either side of the Valley act as barriers to further agricultural expansion.

The deserts of Qena, particularly to the east of the Nile, lie at the confluence of several geologic zones, resulting in significant plant diversity. The governorate spans two main sections of the Eastern Desert: The Middle Section and the Idfu-Kom Ombo Section. The Middle Section, a transitional zone, features limestone to the north and non-calcareous terrain to the south, with notable flora such as *Leptadenia pyrotechnica*. The Idfu-Kom Ombo Section, comprised primarily of Nubian Sandstone, is characterized by plant communities dominated by *Acacia raddiana* and *Acacia ehrenbergiana*. In the easternmost parts, the dominant vegetation includes *Acacia raddiana* and *Zilla spinosa*. In Wadi Qena, *Acacia ehrenbergiana* scrubland transitions to *Tamarix* thickets in downstream areas on fluvial substrates. While water sources in this region are few and mostly artificial, they remain largely inaccessible to wildlife.

This diversity of habitats and flora underlines the complex bio-ecological zones present in Qena. The establishment of the Dandara Silo will be within these unique ecological zones, and the environmental and social impact assessments will consider the conservation of these habitats and their associated species.

The subproject site was visited on September 18, 2023, for 3 days.

4.2.2. Terrestrial Ecosystems

Flora and Fauna:

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Flora: Qena Governorate, where the Dandara Silo project is located, has a varied landscape with distinct habitats, from the Nile Valley to desert terrains. The Nile Valley's flora is dominated by Phragmites and Typha reed swamps along riverbanks, canals, and islands. Indigenous wild plants number about 126 species in the Upper Nile Valley, with some unique to the region. Key vegetation includes Halfa Grass (*Desmostacia bipinnate*), *Ceratophyllum demersum*, and clusters of Water Hyacinth (*Eichhornia crassipes*) found in sheltered river inlets. Agricultural areas feature species like *Acacia nilotica* and *Tamarix aphylla*, which serve as windbreakers, with additional species like Date Palm, *Ziziphus spina-christi*, and *Ficus* contributing to the landscape. Along desert edges, various native species such as *Tamarix nilotica*, *Zilla spinosa*, and *Acacia ehrenbergiana* are common (Zahran, 1992).

A site visit to the Dandara Silo's proposed location revealed that it is largely devoid of natural vegetation within the immediate vicinity of the construction area. A detailed assessment of the vegetation present at the site indicated that none of the identified species hold significant ecological importance, nor are they endemic or classified as threatened either locally or globally. The sparse vegetation observed mainly consisted of common, non-endangered species that are typically adapted to disturbed habitats in the Nile Valley. However, in the wider region, the Eastern Desert of Qena supports a complex flora, with some species adapted to the limestone and sandstone terrain.

Mammals: Mammalian fauna in the Qena region is not widely observed, as most species are nocturnal and elusive. Bats and rodents are the most common mammals, with 12 species each recorded in the governorate. Larger mammals, such as the Barbary sheep and Nubian Wild Ass, were historically present but have been extirpated in the past two centuries. During the site visit, no significant large mammal presence was noted in the vicinity of the Dandara Silo, suggesting low mammalian activity around the subproject site (SEAM, 2000, 2001). The small mammals identified in the wider Qena region, including bats and rodents, were not observed at the immediate Dandara Silo project site during the site visit. However, based on available literature and consultations, the following information is provided, a) Bats: species such as the Egyptian Fruit Bat (*Rousettus aegyptiacus*) and Common Pipistrelle (*Pipistrellus pipistrellus*) are known to inhabit the broader Qena region. These species are classified as "Least Concern" by the IUCN Red List due to their wide distribution and adaptability to various habitats, including urban and semi-urban areas. They are not endemic or globally threatened, b) Rodents: common rodent species in the region include the House Mouse (*Mus musculus*) and the Nile Grass Rat (*Arvicanthis niloticus*). Both species are also classified as "Least Concern" by the IUCN Red List and are widespread across Egypt and neighbouring regions. They are not considered endangered or threatened, locally or globally.

Bats play a vital role in pest control and pollination, while rodents contribute to the food web. However, their populations are resilient, and no significant risks to these species are expected from the project. As these species are not present at the immediate project site and are widespread

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in the region, the construction and operation of the Dandara Silo are unlikely to pose any direct threat to their populations.

Birds: The avifauna of Qena is diverse, encompassing both resident and migratory bird species. The region lies on the East African Flyway, a key migratory route for birds traveling between Africa and Eurasia. The Nile River and its surrounding habitats support significant numbers of wintering waterbirds, including migratory soaring birds like White Storks (*Ciconia ciconia*), various raptors, and other protected species listed under CITES Appendix II.

Although the site visit conducted during September did not observe significant bird activity, possibly due to the timing of the migration season or delays in migratory patterns. this does not indicate the absence of migratory birds at or near the project site. The timing of the visit coincided with early autumn migration, a period when the migratory flux may not yet have reached its peak. the Nile Valley region supports a rich diversity of resident and non-resident bird species. Notable resident species include the Cattle Egret (*Bubulcus ibis*), Spur-winged Lapwing (*Vanellus spinosus*), and Pied Kingfisher (*Ceryle rudis*). These species are commonly found in riparian and agricultural habitats along the Nile. The area is an important stopover for migratory birds, including Palearctic migrants such as the Eurasian Marsh Harrier (*Circus aeruginosus*) and the European Bee-eater (*Merops apiaster*). These species rely on the region's wetlands and agricultural lands for food and rest during their migration. The Dandara Silo site is proximate to the Nile River and agricultural lands, which serve as vital stopover and foraging habitats for migratory birds.

The spring migration season occurs from February to April, with birds traveling northward to breeding grounds. The autumn migration season lasts from September to November, with birds moving southward to wintering grounds. Peak migration activity in the region is typically observed during March and October. The Nile Valley serves as a critical stopover and feeding area for migratory birds, offering rich resources such as wetlands, agricultural lands, and riparian zones. These habitats provide food and rest essential for long-distance migrants. The risk of bird collision is low, as the silo design does not include reflective materials. The site is also home to 66 species of birds common to the Nile Valley, including *Egretta ibis* and *Falco tinnunculus*, and serves as an important migratory route for palearctic species (Goodman and Meininger, 1989; BirdLife International, 2004). The project site is near an Important Bird Area (IBA) called Upper Nile located at 12-13 km from the project site. The silo may attract birds during operational phase due to the presence of grains and impacts on birds is present since their Nile River habitat is in proximity. In addition to agriculture lands in close proximity which support agrobiodiversity and provide suitable habitats for both resident and migratory birds.

Birds of prey, including raptors, are confirmed to be present in the Nile Valley region. These species include the Common Kestrel (*Falco tinnunculus*), Black Kite (*Milvus migrans*), and Egyptian Vulture (*Neophron percnopterus*). Most of these raptors are protected under CITES and

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are included in Appendix II. Additionally, raptors play a critical ecological role in maintaining balance within the ecosystem. Secondary poisoning from rodenticides used during operational phase may also be a risk on birds of prey.

Construction and operational phases of the project may also disrupt nesting sites and seasons for birds in proximity to the project site.

Below is a list of key bird species observed or expected in the project area, along with their ecological importance and protection status:

Table (4.4): Key Bird Species in the Dandara Silo Project Area.

Species	Ecological Role	Protection Status	IUCN status
White Stork (<i>Ciconia ciconia</i>)	Migratory soaring bird; feeds in wetlands and agricultural fields.	Listed under Annex II of the Convention on Migratory Species (CMS), under which it is covered by the African-Eurasian Waterbird Agreement (AEWA)	LC
Eurasian Marsh Harrier (<i>Circus aeruginosus</i>)	Migratory raptor; controls rodent populations.	The species is listed on CITES Appendix II, CMS Appendix II and Raptors MoU Category 3.	LC
European Bee-eater (<i>Merops apiaster</i>)	Insectivorous migratory bird; contributes to pest control.	-	LC
Cattle Egret (<i>Bubulcus ibis</i>)	Resident bird; aids in pest control in agricultural areas.	-	LC
Spur-winged Lapwing (<i>Vanellus spinosus</i>)	Resident bird; forages in wetlands and agricultural fields.	Listed under CMS Appendix II. Bern Convention Appendix II	LC
Pied Kingfisher (<i>Ceryle rudis</i>)	Resident bird; feeds on fish in aquatic habitats.	Listed under Bern Convention Appendix II.	LC
Black Kite (<i>Milvus migrans</i>)	Scavenger; helps maintain ecological balance.	CITES Appendix II. CMS Appendix II.	LC

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		Raptors MOU Category 2. Annexe II of the Bern Convention. Annexe II of the Bonn Convention.	
Common Kestrel (<i>Falco tinnunculus</i>)	Small raptor; controls insect and small vertebrate populations.	Listed under CITES Appendix II, CMS Appendix II, Raptors MOU Category 2.	LC
Grey Heron (<i>Ardea cinerea</i>)	Wetland bird; feeds in riparian and wetland areas.	-	LC
Great White Egret (<i>Ardea alba</i>)	Wetland bird; feeds on aquatic organisms.	Listed under Annex II of the Bern Convention and Annex II of the Convention on Migratory Species, under which it is covered by the African-Eurasian Waterbird Agreement (AEWA).	LC
Northern Shoveler (<i>Anas clypeata</i>)	Wintering waterbird; feeds in wetlands.	Listed under CMS Appendix II.	LC
Osprey (<i>Pandion haliaetus</i>)	Migratory bird; predator of fish.	Listed under CITES Appendix II. CMS Appendix II. Raptor MOU Category 3. Bern Convention Annex 3.	LC

EN: endangered, VU: vulnerable, NT: near threatened, LC: Least Concern

The silo area is located at about 12-13km from the Upper Nile IBA with the following species of concern:

Table 4.5 threatened birds in the Upper Nile IBA

Scientific Name	Common Name	CITES and or CMS Status	IUCN Status
<i>Falco cherrug</i>	Saker Falcon	Listed under CITES Appendix II It is listed on CMS Appendix I and II	EN
<i>Aythya ferina</i>	Common Pochard	Listed under CMS Appendix II. Agreement on the Conservation of African-Eurasian Migratory Waterbirds	VU

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<i>Calidris ferruginea</i>	Curlew Sandpiper	Annex II of the Convention on Migratory Species (CMS) and Annex II of the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA).	VU
<i>Calidris falcinellus</i>	Broad-billed Sandpiper	Annex II of the Convention on Migratory Species (CMS) and Annex I of the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA)	VU
<i>Pluvialis squatarola</i>	Grey Plover	Listed under Annex II of the Convention on Migratory Species (CMS) and Annex II of the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA).	VU
<i>Marmaronetta angustirostris</i>	Marbled Duck	Protected under CMS Appendix I and II.	NT
<i>Aythya nyroca</i>	Ferruginous Duck	Appendix III of the Bern Convention and on Appendices I and II of the Bonn Convention/ Convention on the Conservation of Migratory Species of Wild Animals (CMS).	NT
<i>Limosa limosa</i>	Black-tailed Godwit	-	NT
<i>Arenaria interpres</i>	Ruddy Turnstone	It is listed on Annex II (strictly protected) of the pan-European Bern Convention, Annex II of the Convention on Migratory Species (CMS) and Annex I of the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA).	NT
<i>Calidris canutus</i>	Red Knot	Listed under Annex II of the Convention on Migratory Species (CMS) and Annex II of the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA)	NT

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<i>Calidris alpina</i>	Dunlin	It is listed on Annex II (strictly protected) of the pan-European Bern Convention, Annex II of the Convention on Migratory Species (CMS) and Annex II of the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA).	NT
<i>Vanellus vanellus</i>	Northern Lapwing	Listed under CMS Appendix II. Bern Convention Annex III.	NT

EN: endangered, VU: vulnerable, NT: near threatened

The ESIA has identified these risks and proposed mitigation measures, including coordination with the Ministry of Environment will ensure measures to protect birds from any potential disturbance during construction and operation, and the risk of collision is minimized by the silo's non-reflective design and other mitigation measures proposed (Goodman and Meininger, 1989, Bird Life International, 2004).

Reptiles and Amphibians: Qena's amphibian population is primarily confined to wetlands and cultivated areas, with species like the African Green Toad (*Bufotes boulengeri*) are more common in wetland areas near the Nile. Few reptiles have been recorded in the governorate, and there is no established evidence of significant reptile or amphibian presence in the immediate area of the proposed Dandara Silo site.

Aquatic Ecosystems: The Dandara Silo is located near the Nile River, which supports diverse aquatic flora and fauna. Potential direct impacts on aquatic ecosystems, particularly during the construction phase, must be carefully managed. Key risks include pollution from emissions, construction wastes, and sedimentation. During operational phase, risks from grain spills during river transportation is also present. These risks need to be minimized and mitigated through application of pollution prevention and controlled measures. The riverbanks are lined with reed swamps, while the river itself hosts a variety of fish species, some of which have declined due to changes in the river's flow regime. Freshwater fish such as *Oreochromis niloticus* and *Tilapia zillii* have been reported in local studies. However, the silo site is not immediately adjacent to the river, and thus, direct impacts on aquatic ecosystems are expected to be minimal.

Conclusion: The terrestrial and aquatic ecosystems in the vicinity of the Dandara Silo consist of varied habitats, each supporting distinct species. However, the proposed construction area itself

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shows limited natural vegetation and low fauna activity. The ESIA for the Dandara Silo has taken into consideration the potential impacts on these ecosystems, and measures to mitigate environmental risks and protect the surrounding biodiversity have been proposed.

4.2.3. Protected Areas

Protected Areas in Egypt

Law 102 of 1983 empowered the Prime Minister to designate certain areas to be declared as protectorates. A Prime Minister's decree defines the limits of each protected area and sets the basic principles for its management and for the preservation of its resources. Till now, 30 protectorates were declared, which comprise more than 15% of the total area of Egypt. The Protected Area Network (PAN) includes most of the habitats, ecosystems, biodiversity, outstanding landscapes, and geological formations, as well the local population, their culture together with potential utility for Eco-tourism are also important aspects of the protected areas. The importance of nature reserves lies in protecting many types of living organisms, whether plants or animals.

The annual number of visitors to these protected areas is about 800,000, and in 2016 the number of visitors reached 802,000. The South Sinai reserves have the largest number of visitors (372,000), followed by the Fayoum reserves, which were visited by about 341,000 visitors. As for the rest of the governorates, there were a smaller number of visitors, which amounted to 1,000 visitors for each one of them. The idea of establishing reserves began for the first time in 1994, after the issuance of the Fourth Law on Nature Reserves. From 1994 to 2010, decisions were issued to establish 29 nature reserves in Egypt, including Ras Mohammed, Jabal Elba and others.

Table (4.6): Nature Conservation Sector (Protected areas near the study area in Qena)
Source: Nature Conservation Sector in EEAA).

No.	Protectorates Names	Declarati on Date	Area Km ²	Governorate	Prime Ministerial Decree
6	Saluga and Ghazal Protectorate	1986	0.5	Aswan	Decree 928/1986
10	Wadi El Rayan Protectorate	1989	1225	El Fayoum	Decrees 943/1989 and 2954/1997

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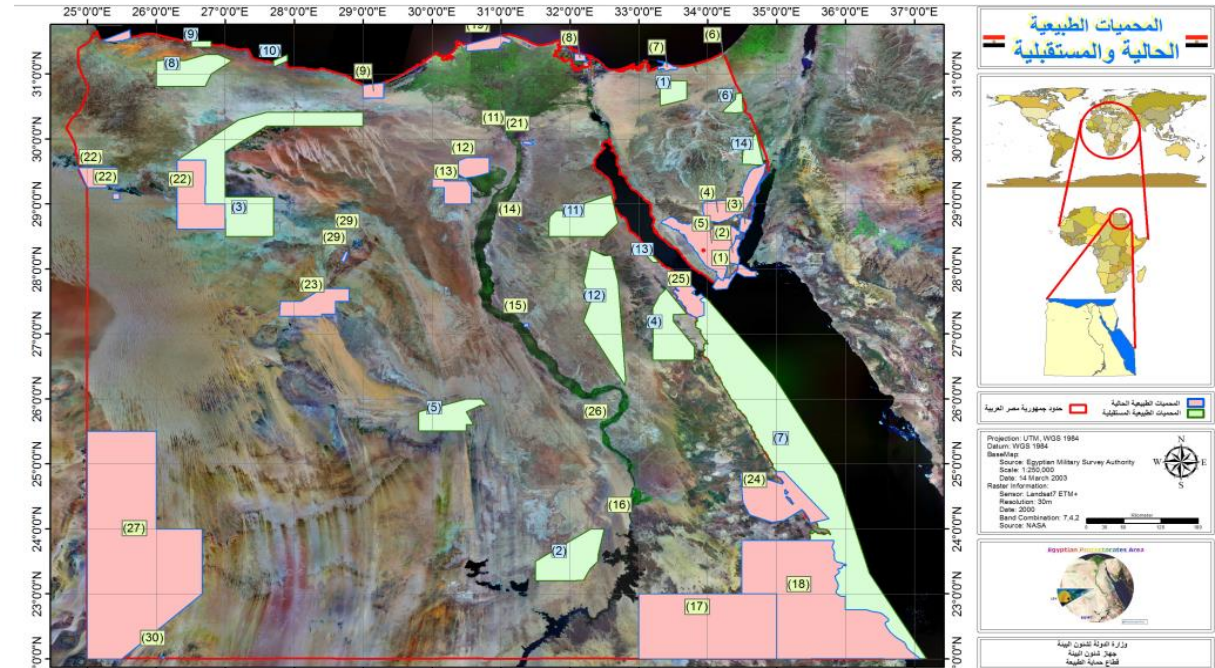


Figure (4.15): Future and Present Natural reserves in Egypt (Source: Nature Conservation Sector in EEAA).

Saluga and Ghazal

Saluga and Ghazal protected area is one of the nature reserves in southern Egypt and is considered the smallest, as its area does not exceed half a kilometer in the form of islands groups in the Nile River. The reserve is located in Aswan Governorate, specifically at the first waterfall, about 3 km north of Aswan Reservoir. In south of it, there is the island of Suhail, and to the north there are the islands of Esposarte, Amun and the Botanical Garden (El Nabatat Island). The name is taken from the two most important islands in the reserve. Saluja Island, which means (waterfall) in Nubian language, while the name Ghazal Island seems to refer to one of the ancient plants that were growing on these islands.

The region declared a nature reserve by decision of the Prime Minister of Egypt in 1986. With the aim of preserving the biological diversity of endangered animals, plants, and mammals. The reserve contains a variety of living creatures from the animal and plant kingdoms despite the small size of the reserve and its presence in the middle of the Nile. Among the most famous animals in the reserve are camels, goats, wild donkeys, hyenas, and the red fox (the Egyptian fox) which, although it does not live mainly in the islands of the reserve but lives in the West Bank of the Nile and crosses the river by swimming to build a hole on the islands of the reserve. Sixty species of resident and migratory birds live in the reserve as well, some of which are threatened with



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extinction. The most famous of these rare birds is the black ibis, which became the symbol of the reserve. The plant life in the reserve is more varied and clearer, as there are more than 90 different types of plants. The reserve is characterized by stunning landscapes that combine the often-quiet vegetation with the water surface of the Nile, which made it an important tourist attraction. It is located about 230 km to the south of the Dandara Silo site.

Wadi El-Rayan

Wadi El-Rayan Protected Area is a significant natural reserve located in the Fayoum Governorate of Egypt. It is characterized by its unique desert landscapes, comprising lakes, waterfalls, and sand dunes, which contribute to its stunning natural beauty and ecological importance. The protected area covers around 1,759 km² and is composed of two main lakes connected by Egypt's only waterfalls, formed due to agricultural drainage water from the Fayoum area. Wadi El-Rayan is renowned for its diverse habitats, supporting a variety of plant and animal species.

The reserve is home to over 13 species of reptiles, 16 species of mammals, and more than 100 species of birds, including both resident and migratory birds, making it a vital stopover for bird migration across Africa and Eurasia. Notably, species such as the slender-horned gazelle, fennec fox, and Egyptian wolf are found in Wadi El-Rayan, which are all key to maintaining the biodiversity of the area. Additionally, the reserve hosts several fish species in its lakes, as well as rich vegetation including medicinal plants and shrubs that thrive in its arid environment.

Wadi El-Rayan's striking geological features include sand dunes, cliffs, and mountainous terrains, offering picturesque views and attracting tourists for activities like birdwatching, camping, and exploring the natural desert environment. The protected area was declared a nature reserve in 1989 by the Egyptian government to preserve its ecological diversity, protect endangered species, and sustain its unique geological and scenic landscapes.

Wadi El-Rayan Protected Area is located approximately 390 km to the northwest of the proposed Dandara Silo site.

Nile river islands protectorate

All islands in the Nile River are designated as protected areas under Prime Ministerial Decree 1969/1998, these islands are classified as wetland protected areas. The nearest such island to the Dandara Silo site is located 1.5 km east of the project site. The Nile Islands Protected Area originally consisted of 144 islands across various governorates. However, in 2017, 17 islands—located far from Upper Egypt—were removed from the list of nature reserves. These islands provide an attractive habitat for wintering fowl and wading birds. Seasonal changes in water levels create mudflats and sandy banks, fostering rich bird habitats and supporting various amphibian and freshwater invertebrate species. According to birdlife, Disturbance to these islands



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caused by a growing number of fishermen and tourist cruises is increasing. There is a substantial water-pollution problem caused by untreated discharge from sugar, phosphate and dairy factories, as well as from urban areas. Erosion of the Nile banks has become a problem since the construction of the High Dam. As a mitigating measure, long stretches of the Nile banks are being encased with rocks. This will alter the natural condition of this part of the Nile and potentially reduce its importance for waterbirds. Reed-control programs are likewise reducing vital waterbird habitat.

While these areas are distant enough to avoid direct impacts, the ecological significance of the Nile River and its islands warrants careful monitoring and mitigation measures. The ESIA will take into account measures to control and mitigate any potential spills or contamination of the Nile River and disturbances to Nile River species

Other Sensitive Areas

Nile River and Adjacent Wetlands:

The Dandara Silo is located approximately 500m west of the Nile River, which is one of the longest rivers in the world, flowing through northeastern Africa. The Nile serves as a critical water source for agriculture, industry, and communities across Egypt. The river is also characterized by its wetland habitats, which host a diverse range of flora and fauna, including waterfowl, fish, and various plant species. Wetlands along the Nile are crucial for maintaining ecological balance and supporting migratory bird species that use the river as a flyway during migration periods. The project area is not located near a RAMSAR site.

Wadi Qena:

Wadi Qena, located approximately 15km e east of the proposed Dandara Silo site, is a significant dry valley (wadi) that extends from the Eastern Desert into the Nile Valley. The wadi serves as a natural habitat for various desert plants, small mammals, reptiles, and bird species. Due to its ecological importance, Wadi Qena plays a role in biodiversity conservation within the Qena Governorate. Though not formally classified as a protected area, Wadi Qena's habitats contribute to the region's overall environmental value.

Aquatic Resources of the Nile:

The Nile's fish populations are diverse and support local fisheries that provide livelihoods for many residents of Qena. Notable fish species include *Oreochromis niloticus* (Nile tilapia), *Tilapia zillii*, and other freshwater species. The river's aquatic ecosystems are sensitive to pollution, habitat changes, and disturbances, making it necessary to monitor any potential impacts from project activities that could affect water quality or fish habitats.

Important Bird Areas (IBAs)

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The nearest Important Bird Area (IBA) is the Upper Nile IBA, located approximately 12-13 km east of the project site. This IBA is a critical stopover for migratory birds traveling between Europe, Asia, and Africa along the East African Flyway. Migratory seasons occur in: a) Spring (February–April), birds traveling northward to breeding grounds, and b) Autumn (September–November), birds migrating southward to wintering grounds. Peak migration typically occurs in March and October, making the surrounding area of the project site an essential ecological corridor. According to birdlife website, The islands are particularly attractive to resting waterbirds. *Aythya nyroca* winters in internationally important numbers. *Netta rufina* winters regularly in small numbers, while *Marmaronetta angustirostris* is an irregular and rare winter visitor, last recorded from the area in 1983. This section of the Nile valley is likely to be of importance for staging waterbirds and other migrants, such as *Ciconia ciconia*, during the migration seasons.

Conclusion:

The construction and operation of the Dandara Silo are unlikely to pose significant risks to the protected areas or other ecologically sensitive zones in the region. The project site is situated at a safe distance from designated protected areas, such as the Saluga and Ghazal and Wadi El-Rayan, and does not fall within any Important Bird Areas (IBAs) or Important Plant Areas (IPAs). However, the presence of the Nile River and Wadi Qena nearby means that certain precautionary measures are necessary to mitigate any potential impacts on these sensitive ecosystems. The project is not located near a RAMSAR site.

The presence of grains may attract birds, including migratory species, during the operational phase. The project will incorporate measures to minimize potential disturbances to avifauna, as well as to consider any potential impacts on local wildlife such as small mammals and reptiles. The ESIA will outline strategies to protect the integrity of surrounding habitats and ensure compliance with environmental standards throughout the construction and operational phases.

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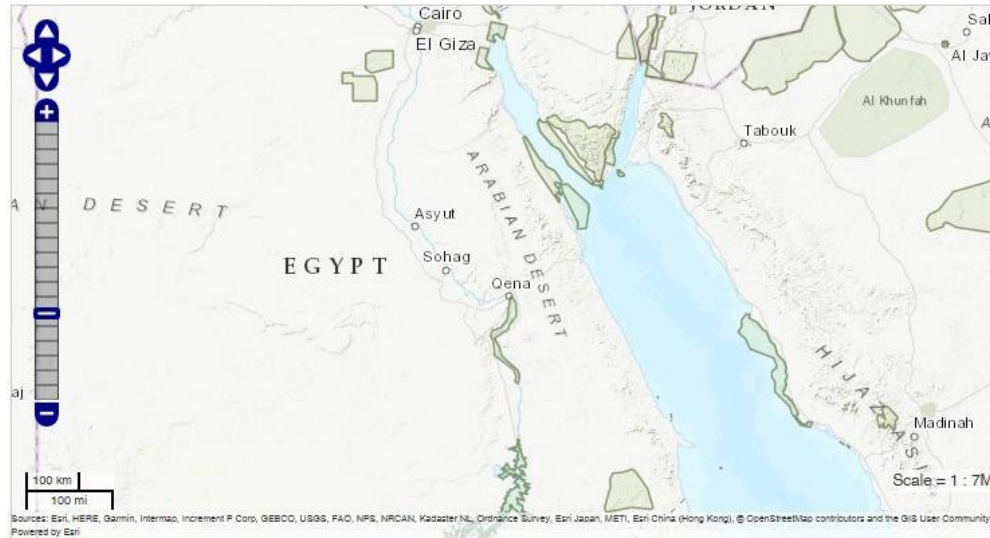


Figure (4.16): Map showing the IBAs in Egypt, including the upper Nile IBA near the Dandara Site (near Qena).

4.3. Socio-Economic Aspects

4.3.1 Assessment Methodology

Socioeconomic conditions were assessed through a combination of a desk-based study, site visits, and consultations with relevant stakeholders. Based on a combination of both primary data collected from the field and secondary resources reviewed, including statistical data, this section highlights some basic information about the demographic characteristics and human development profile, access to basic health services, economic characteristics, roads and transportation, and other services.

Location and Administrative Structure:

Qena is one of the governorates in the southern Upper Egypt region, which includes Sohag, Qena, Aswan, the Red Sea, and Luxor. It is centrally located within the Nile Valley, serving as a connection between the northern and southern parts of Upper Egypt. Qena spans an area of approximately 9,565 km², with only a small fraction of this land area being inhabited, primarily along the Nile River and its fertile valley. The governorate is administratively divided into 11 centers and 44 rural local units, including numerous villages. According to 2021 statistics, Qena has a population of around 3.4 million people, making it one of the most populated governorates in Upper Egypt.

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The capital city, also named Qena, serves as a regional center for commerce, transportation, and education. The governorate is known for its agricultural activities, supported by the fertile lands and proximity to the Nile, and it plays a crucial role in Egypt's agricultural production. The Dandara Silo site, situated in this governorate and specifically in Qena Markaz, is surrounded by these agricultural and rural landscapes, which contribute significantly to both the local economy and livelihoods of the residents.

4.3.2 Basic Demographic Characteristics

Population Profile of Qena:

Qena Governorate represents 3.4% of Egypt's total population. The child dependency ratio in Qena is 58.9% compared to 55.3% at the national level, according to the 2017 census data.

Table (4.7): Population Figures in the Project Area (CAPMAS Statistical Yearbook 2023).

Area		Population		Total Population
		Male	Female	
Qena Governorate	Urban	337529	323299	3605518
	Rural	1511275	1433415	
Markaz Qena	Urban	133670	128275	775913
	Rural	266301	247667	
Markaz Dishna	Urban	34718	32344	443079
	Rural	196289	179728	
Markaz El Waqf	Urban	19011	16954	92142
	Rural	29105	27072	
Markaz Nag' Hammadi	Urban	31266	30471	660690
	Rural	306196	292757	
Markaz Farshout	Urban	37579	35979	214387
	Rural	70951	69878	
Markaz Abu Tisht	Urban	9347	9500	530798
	Rural	260346	251605	
Markaz Qift	Urban	12627	12244	162438
	Rural	71725	65842	
New Qena City	Urban	932	767	1699

Approximately 18.3 % of the population may be described as living in urban areas with 81.6% living in rural areas.

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Through the latest statistics on the population of Qena Governorate, the population reached three and a half million people, and this is considered a large number in one governorate, and therefore the governorate is considered to have a large population density and this number of population occupies an area of 10,265 km², and this may be due to being one of the governorates of Upper Egypt, where there are job opportunities for the presence of antiquities and tourism in it.

Age and Gender Distribution:

The data for age structure in Qena shows that almost half the population (57.6%) are in the 15-59 age group, and just over 33.5% under the age of 14. Approximately 66% of the population are married. The sex structure of Qena Governorate is quite keenly balanced with approximately 48.7% of the population being female. There are small variations between Markazes and between urban and rural areas.

Rate of Natural Increase:

According to Egypt Description by Information for Qena Governorate, the birth rate in Qena Governorate is 28.3 births per 1000 persons, while mortality rate stands at 5.3 per 1000 persons. That gives a natural growth rate of 23.0 per thousand persons in Qena. The Statistical yearbook - Vital Statistics reported tables from 2020 that the newly born mortality rate 17.3 per 1000, while infant mortality is 21.6 per thousand live births. Infant mortality rate below five years old stood at 24.50 per 1000.

Population Profile of Dandara:

Dandara, located within Qena Governorate, is a rural area primarily known for its agricultural activities. According to the 2017 census by CAPMAS, the population of Dandara consists largely of rural inhabitants engaged in farming and agricultural-based livelihoods. The village and surrounding areas are characterized by family-owned farms, small agricultural communities, and scattered settlements. Dandara serves as an important agricultural hub within Qena, contributing to the governorate's production of crops like sugarcane, wheat, and other fruits and vegetables, which are cultivated in the fertile lands near the Nile River.

The area does not have any major urban development, and the population remains dispersed in villages and small residential areas. Due to its agricultural nature, much of the workforce consists of farmers, seasonal laborers, and workers associated with agricultural processing and trade. The majority of human activities are centered around farming, livestock rearing, and small-scale rural commerce, which support the livelihood of the local population.

Activities in the Surrounding Area:

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The surroundings of the Dandara Silo site are largely agricultural lands and rural settlements, with the Nile River providing water for irrigation and influencing the local land use. The area is primarily composed of cultivated fields, with crops such as sugarcane, wheat, and vegetables, and includes palm date and other fruit plantations. The irrigation systems used in the area include traditional Nile-based irrigation, alongside more modern techniques such as drip and center pivot systems, which support efficient water use.

The proposed site for the Dandara Silo is situated in a rural, agricultural landscape, where human activities are generally limited to farming and small-scale local trade. The site is relatively well-connected to Qena city, which serves as a commercial center, and to the main road networks that facilitate transportation to and from the surrounding agricultural areas. The nearest residential areas are small rural settlements and villages closely tied to agricultural production, located within a few kilometers of the proposed silo site.

The Nile River and its canal systems play a vital role in supporting agriculture in Dandara and its surrounding lands. There are several water pumping stations and irrigation channels branching from the Nile that provide water to these farmlands. The proximity to major transportation routes, such as the Qena-Luxor Road, and access to the river provide logistical advantages for grain transport, storage, and distribution in the region, supporting the functioning of the planned Dandara Silo. The rural, agricultural nature of the surrounding environment creates a setting that is conducive to grain storage operations and aligns with the economic activities predominant in the area.

In addition, there are nearby educational institutions such as Dandara Primary School, located approximately 500 meters west of the silo site.

- **Type of Farmers Using the Silos:**

The silo is primarily used by small-scale farmers from nearby regions within Qena Governorate, including Dandara and neighboring villages. These farmers produce wheat, sugarcane, and vegetables. The farmers typically transport grains to the silo using small trucks. Large-scale farmers and cooperatives from adjacent districts may also use the silo, leveraging its enhanced capacity for grain storage.

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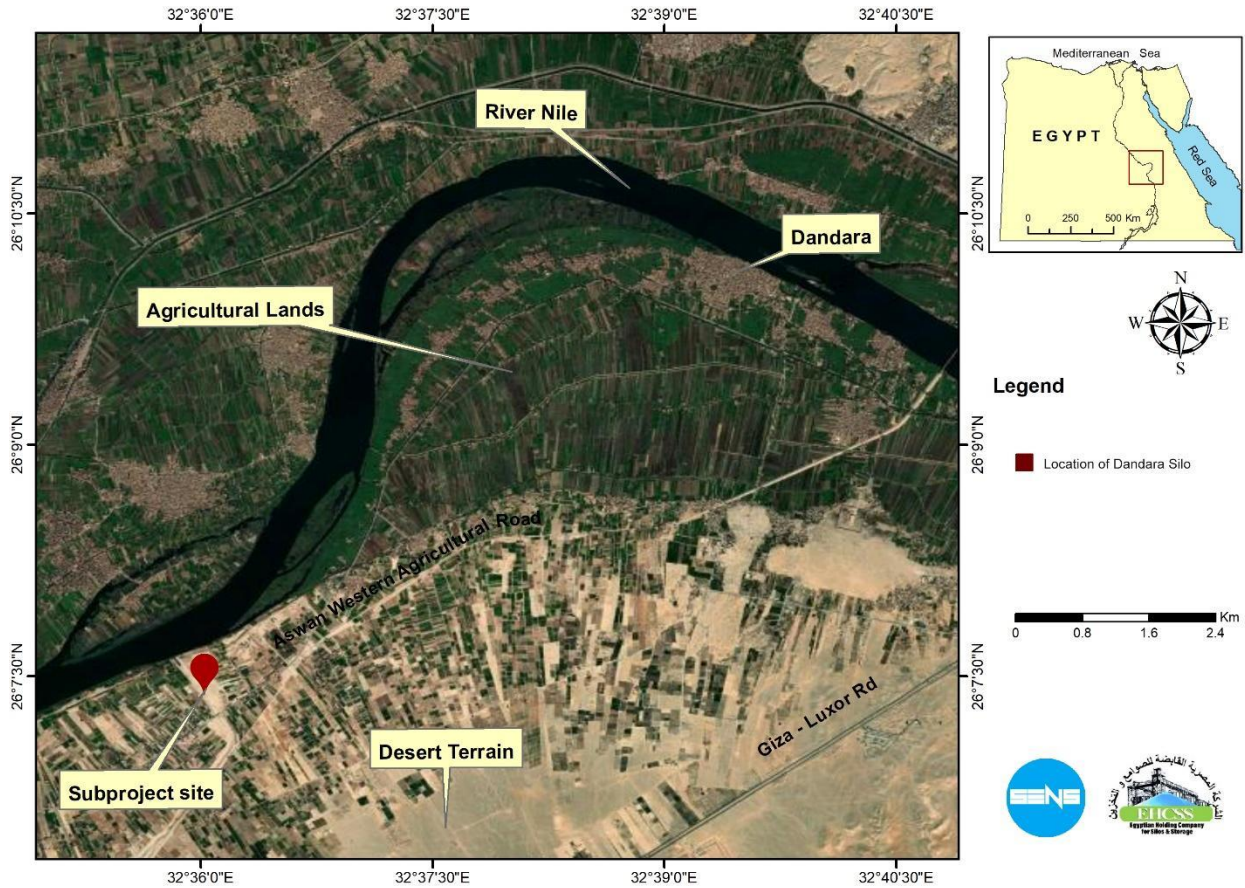


Figure (4.17): Map showing the location of Dandara Silo site and the surrounding area including the Dandara village, River Nile, agricultural lands, and desert terrain.

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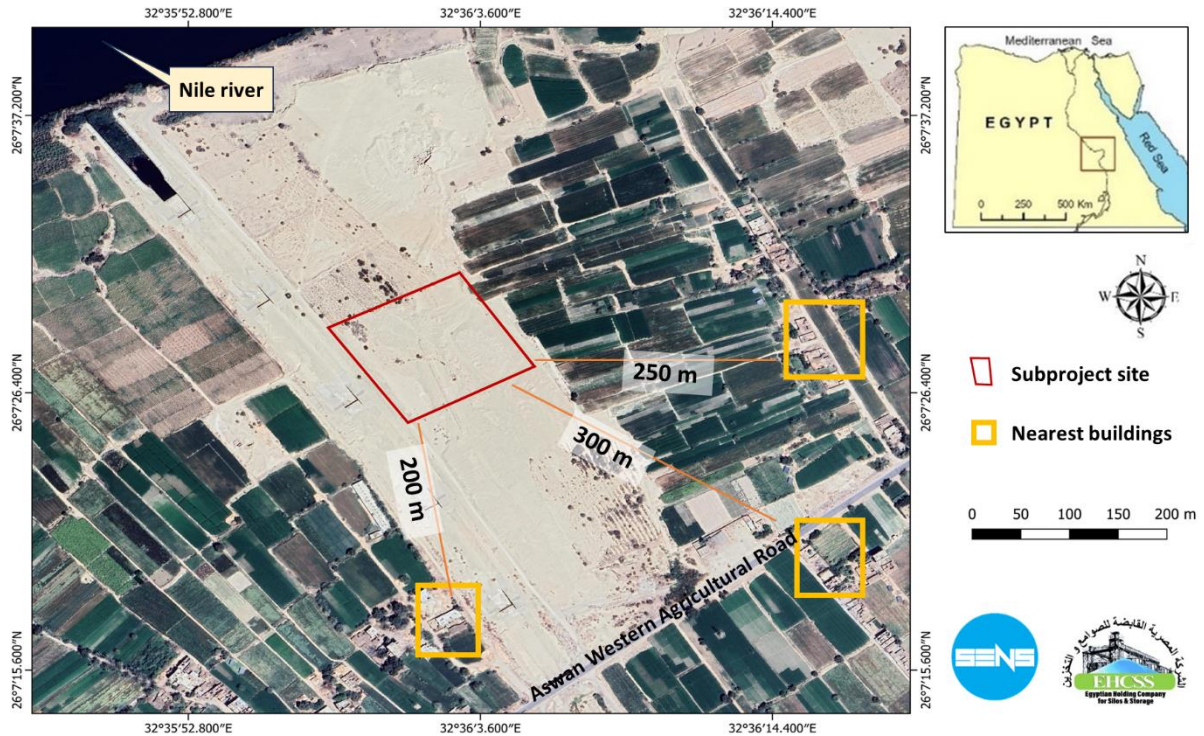


Figure (4.18): Map showing the location of Dandara Silo site and the surrounding buildings.

4.3.3 Living Conditions

Household Size and Density

Housing conditions are key indicators of socio-economic development. Poor and vulnerable communities and households often lack access to utility services. A summary of people's access to the key utility services is given below.

Access to Electricity:

Electricity is a critical utility that significantly impacts the quality of life and socio-economic development in the project area. In Markaz Qena, which includes the Dandara Silo site, nearly 99.4% of households have access to electricity, as per the CAPMAS 2017 Census. This high connectivity rate reflects the success of the government's efforts to expand access to electricity in rural and urban areas of Qena Governorate. Additionally, **65.17%** of the energy consumed in Qena Governorate is allocated for industrial purposes, with the remaining portion used for household lighting and other domestic purposes.

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Access to Water and Sanitation Network:

Access to clean water is a fundamental need and a key indicator of socio-economic development in the project area. According to CAPMAS 2017 Census, in Markaz Qena, approximately 92% of households are connected to a piped water supply system, indicating significant coverage of water grid infrastructure in the area. However, **8%** of the population relies on alternative sources such as hand pumps, private wells, or untreated water sources like irrigation canals and the Nile River. Regarding sanitation infrastructure in Qena, 16% of the population is connected to the public sewage network, while 2% rely on community-based networks. Additionally, 82% use septic tanks or trench systems, indicating limited access to comprehensive sanitation services. On a broader scale at the Qena Governorate level, approximately 90% of households have access to piped water, with the remaining 10% relying on non-grid sources. This disparity highlights the ongoing challenges in ensuring equitable access to treated water, particularly in rural and underserved areas.

4.3.4 Labor Profile

The Statistical Book and the Central Agency for Public Mobilization and Statistics, in the labor force study, revealed a decline in the unemployment rate from 9.6 to 4.8, including 50%, from the year 2016 until the last quarter of 2020, so that Qena Governorate recorded the highest rate of decline in the unemployment rate at the level of the Republic. According to CAPMAS poverty mapping 2013, the unemployment rate in Qena stands at 3.6% among males and 16.6% among females.

Qena Governorate effectively confronted the unemployment crisis by employing a large group of young people through the giant industrial zones in the governorate, such as the industrial zone in Qift and the industrial zone in Nag Hammadi, in addition to reviving some handicrafts and traditional crafts that attracted many workers, and thus the unemployment rate decreased significantly in Qena from 9.6 to 4.8, by approximately 50%.

4.3.5 Economic Activities and Well Being

According to the state information service, Qena is an agricultural as well as an industrial governorate. Qena is also rich in many diverse tourist attractions.

Agriculture Products and Production

Agriculture is a central component of economic activity in Qena Governorate, absorbing a significant portion of the workforce. The fertile land along the Nile Valley supports the cultivation of a variety of crops, making Qena one of Egypt's key agricultural centers. The governorate has a total cultivated land area of around 378,000 feddans, with a cropped area exceeding 400,000 feddans. Due to its fertile soils and abundant water resources from the Nile,

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Qena is known for producing a range of crops including sugarcane, wheat, tomatoes, bananas, sesame, and hibiscus.

Sugarcane is the primary crop grown in Qena, and the governorate plays a significant role in Egypt's sugar industry. It accounts for a large portion of the agricultural land, with about 100,000 feddans dedicated to sugarcane cultivation. Additionally, wheat is a critical staple crop in the region, occupying over 60,000 feddans of cultivated land. Other crops such as hibiscus, bananas, and tomatoes are also cultivated extensively, supporting both local consumption and economic export.

The Dandara area mirrors the overall agricultural practices of the region. The fertile lands near the Nile River allow for the cultivation of a variety of crops, similar to those grown in the broader governorate. Dandara's agricultural activities are primarily managed by local farmers who utilize traditional and modern irrigation techniques, such as Nile-based and drip irrigation systems, to maximize productivity.

The Nile River serves as the principal water source for irrigation in Qena Governorate, including Dandara. The governorate benefits from a network of canals, water pumping stations, and irrigation channels that draw water from the Nile to support its extensive agricultural activities. Efficient irrigation systems are essential for supporting the high cultivation rates, particularly for water-intensive crops like sugarcane.

Qena Governorate has seen numerous agricultural development and land reclamation projects aimed at expanding cultivable areas and boosting productivity. The strategic location of Dandara along the Nile provides an opportunity for further development of agricultural lands, contributing to food security and economic growth in the region.

Agriculture in Qena, including the Dandara area, provides employment for a large segment of the population and contributes to the economic well-being of local communities. The focus on key crops like sugarcane and wheat plays a crucial role in Egypt's overall food production and supports the national goal of reducing reliance on imported staples. The combination of crop diversity, efficient irrigation practices, and ongoing land reclamation projects position Qena as an important agricultural center within Upper Egypt, fostering sustainable development and social advancement for the local population.

Fisheries: Qena's fish stock comes from fresh water, as fish Production in 2020 was around 753 Ton which classified into 315 Ton of Nile Tilapia, 52 Ton of Catfishes, torpedoshaped, 75 Ton of Bargus and 214 Ton of *procambarus clarkii*.

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Livestock: Numbers of livestock and animals (Cows - Buffalo - sheep - goats - Camel) in Qena reached about 143215 head in 2020, as the number of cows reached 52891 thousand head in 2020, while the number of buffaloes reached 22662 thousand head in 2020.

Table (4.8): The Numbers of Cattle and Animals According to Governorates 2020.

Governorate	Cows	Buffaloes	Sheep	Goats	Camels	Other Animals	Total
Qena	52891	22662	37618	12787	2396	14861	143215

Industrial Activities: The governorate hosts three sugar factories and one spinning and weaving factory, in addition to the Aluminum Complex, which is one of the biggest industrial plants in the Middle East. The governorate also hosts two industrial zones; the first is situated in Kalaheen at Qaft (conglomeration of villages). In addition, one of the most important projects is the non-woven fabric factory, anti-biotic factory as well as food projects and plastics industries. The second industrial zone is at Yahaw in Naga Hamadi equipped with the needed infrastructure, where investors are welcomed to start up their projects.

Tourism: Qena Governorate, where Dandara is located, is an emerging tourist destination in Upper Egypt, known for its blend of historical, cultural, and natural attractions. Although not as internationally recognized as neighboring Luxor or Aswan, Qena has a growing reputation for its heritage sites, traditional crafts, and natural landscapes.

One of the most notable historical landmarks in Qena is the Temple of Dandara, located near the village of Dandara. . about 7 kilometres south-east of Dandara, Egypt and It is also about 10 km away from the site of the Dandara silo. The temple attracts both local and international visitors interested in Egyptology, architecture, and ancient history. In addition to the Dandara Temple Complex, which is located approximately 7 km southeast of the proposed silo site. Qena is in close proximity to other significant archaeological sites in Upper Egypt, contributing to its role as a cultural and historical destination.

4.3.6 Social Services Profiles

Education:

According to CAPMAS, September 2018 announced that Egypt's illiteracy rate dropped from 39.4% in 1996 to 29.7% in 2006, and then to 25.8% in 2017. CAPMAS showed that the total number of schools in Qena Governorate is 1805 schools (2020/2021 academic year), of which 52 are experimental schools, in addition to 475 Al-Azhar institutes.

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Table (4.9): CAPMAS Egypt in numbers, 2022.

Education Information	Number
Total number of schools	1805
Experimental schools	52
Al-Azhar institutes	475

CAPMAS General Census of Population Housing and Establishments 2017 shows the number of students according to educational status (10 years or more) in Qena, the total number of illiterate people reached 682,358, and the number of students in the primary stage was 248,501. As for the university, the number of students in it reached 171,776 students.

Health:

The data indicated that non-communicable diseases include diabetes, and hypertension. Other common diseases include digestive system and cardiovascular diseases. Cancer is also increasing, and the most common cancers include breast, liver, bladder, and lymph nodes. In addition, there are other communicable diseases to include diarrheal diseases (especially in children), cold and flu, fever and inflammations or infections of the ear, nose, or throat, as well as skin rashes and infections.

According to CAPMAS "Annual Bulletin of Health Services Statistics and Treatment at State's Expense at Home and Abroad 2019, in Qena governorate, there are 17 government hospitals with approximately 1635 beds, in addition to 13 Private hospitals with 365 beds. The governorate also includes 9 health Bureau. The total number of doctors in Qena governorate is 1172, in addition to 1286 pharmacists and 224 dentists according to the employees' number already working in the directorates of health affairs, (CAPMAS, 2019).

Dandeara hospital is the nearest hospital to Dandara silos. It is located about 10 km away from the silos sites. There is also Qena general hospital, which is about 17 km away from Dandara silos site, Qena university hospital which is 28 km away, and Qena military hospital which is about 17km away from Dandara silos site.

Table (4.10): CAPMAS "Annual Bulletin of Health Services Statistics and Treatment at State's Expense at Home and Abroad, 2019.

Health information	Number
Government Hospitals	17

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Table (4.10): CAPMAS "Annual Bulletin of Health Services Statistics and Treatment at State's Expense at Home and Abroad, 2019.

Government Hospitals Beds	1635
Private Hospitals	13
Private Hospitals Beds	365
Health Bureau	9

Table (4.11): Employees' number already working in the directorates of health affairs of the Qena governorate, (CAPMAS, 2019).

Statement	Males	Females	Total
Human Doctors	864	308	1172
Pharmacists	489	797	1286
Dentists	153	71	224
Nursing Staff	389	2953	3342
Health Assistants	205	-	205

4.3.7 Infrastructure

According to the data from the Statistical Yearbook, Qena, a summary on access to basic infrastructure services available in Qena governorate is presented in the following tables.

Water Network:

Water improves the quality of life, and it is one of the important inputs for productive activities such as agriculture and industry. The National Water Policy also states that every person should have access to potable water at not more than 50 meters by the year 2005 in Qena.

Water Supply: In Qena approximately 60% of water supplies are derived from the river Nile and approximately 40% from groundwater sources. Generally, people's access to water may be through treated, piped water (either in their home, in their building or outside their building), from a hand pump or from "other" sources i.e., from a well, directly from the Nile or from irrigation canals etc.

Sewage Treatment: It has 9 sewage stations; its design capacity is 206.54 thousand cubic meters/day, and its actual capacity is 108.59 thousand cubic meters/day.

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Potable Water & Sanitation: The following table presents the production and consumption rates of drinking water, as well as the sanitation capacity within Qena Governorate:

Table (4.12): Access to Potable Water & Sanitation in Qena governorate (Qena Governorate - Egypt Description by Information, 2020).

Item	Unit	Value
Production of Potable Water	Million m ³	227.50
Consumption of Potable Water	Million m ³	143.40
Potable Water consumption water per capita	M ³ / Person	42.93
Total loss percentage of water	%	37.00
Households connected to public potable water system	Thousand households	723.77
No. of sanitation treatment stations	Station	9
Designed capacity for Sanitation treatment stations	Thousand m ³ / Day	206.54
Actual capacity for Sanitation treatment stations	Thousand m ³ / Day	108.59
Households connected to sanitation system	Thousand households	748.99

Qena ranks 22nd among the governorates in terms of the per capita amount of drinking water consumed, with a value of 42.93 cubic meter,s and the percentage of total water loss in the governorate reached 37%.

The governorate operates nine sewage stations; with a combined design capacity of 206.54 thousand cubic meters/day. it's the actual combined capacity of these stations is 108.59 thousand cubic meters/day.

- The actual capacity of total wastewater treatment plants capacities in Qena governorate was 52.59 % in 2020.
- The amount of potable water consumption to average produced water in Qena governorate was 63 % in 2020.

According to Egypt Description by Information, 748.99 thousand households in Qena are connected to the sanitation and sewage networks.

Electricity:

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According to Egyptian Human Development Report 2010, access to electricity in Upper Egypt Governorates was around 99.0%; even squatter areas have access to electricity, regardless of their illegality.

Table (4.13): Access to Electricity in Qena governorate (Qena Governorate - Egypt Description by Information, 2014).

Item	Unit	Value
Total Electricity Production	Million kwh/year	419.42
Total Electricity Consumption	Million kwh/year	7991.00
Electricity Consumption for Industrial Purposes	Million kwh/year	5208.00
Electricity Consumption for Lighting	Million kwh/year	2783.00
No. of Subscribers in the Electricity Grid	Thousand subscribers	922.90
Per Capita Share of Electricity	kwh yearly/Person	2364.02

Roads:

The total length of the roads network (paved and unpaved) was 5194 km, of which 4368.50km paved roads, 150.00 km dirt roads of the total in 2020.

Table (4.10): Road's length in governorate by type and dependency 30/6/2020. (Source: Communications & Transportation - Statistical Yearbook 2020).

Governorate	Total paved and Un paved. Roads	Lengths of unpaved roads	Paved Roads Lengths				
			Total of Paved Road	The Armed Forces Engineering Authority	New urban Communities Authority	Road Directorates /Localities	General Authority for roads and Bridge
Qena	5194	150.00	4368.50	-	908.5	2576.00	884

Communication:

There are 185 post offices and 69 telephone exchanges with a capacity of 890.70 thousand lines. The number of fixed-line subscribers reached 150.09 thousand subscribers, and the percentage of Internet users reached 40.7%.

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Table (4.14): Communication and Telegraph Offices and Public Telephone Cabines & Internet Centers in Qena Governorate (Qena Governorate - Egypt Description by Information, 2020).

Item	Unit	Value
No. of telephone exchanges	Exchange	69
Capacity of telephone exchanges	Thousand lines	890.70
No. of telephone landlines	Thousand lines	150.09
Percentage of internet users	%	40.70
No. of governmental operating post offices.	Post offices	185
Population per post office	Thousand persons/ post office	18.3

Waste Management:

Solid waste management has been one of the environmental priorities generally in Egypt due to the high urbanization and lack of adequate solid waste handling facilities. In Qena solid waste collection services are usually available only in some parts of major areas. The coverage of these services is much less in rural areas and small settlements where solid waste collection services do not exist. The estimated quantities and composition of solid waste in Qena are given in the table below.

For the time being, solid waste is being collected from inhabited areas (cities only) by cleaners, tractors, and vehicles of the local units of Marakez. Trucks then transfer the solid waste to the public dump site outside the inhabited areas daily. This system, although existing, is inefficient. Containers are mostly unsuitable in terms of both size and type. Most of the time, containers are not available and thus collection is not undertaken regularly. This situation results in health risks due to the accumulation of garbage. As for the rural areas, the official role of these local service unit's decreases, or even disappears in most of the villages.

Table (4.15): Amount of garbage collected in Qena in 2021(Source: CAPMAS 2021).

City	Average collected annually	% Collection efficiency	Average collected per day
Qena	186515	38	511

Agricultural Waste:

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Agriculture waste is generated from agricultural crops, and sugar cane is the most important crop in Qena, based on information collected from the Directorate of Agriculture in Qena Governorate. Table (4.13) shows the total agricultural waste generated in 2017 in each district, and that 940,000 tons of agriculture waste are recycled through animal feed, composting, and RDF.

Table (4.16): Agriculture waste generation (Source: NSWMP2017).

District	Waste generated 2017 (ton/year)	Recycled agricultural waste (ton/year)	% of recycled agricultural waste
Abo Tesht	758,375	40,000	5.3%
Farshot	381,410	100,000	26.2%
Naga Hammadi	811,273	20,000	2.5%
Al-Waqf	217,009	200,000	92.2%
Deshna	614,215	100,000	16.3%
Qena	317,340	240,000	75.6%
Nakada	692,135	40,000	5.8%
Qous	600,495	140,000	23.3%
Qeft	204,526	60,000	29.3%
Total	4,596,778	940,000	20.4%

The above table shows that the highest amount of agricultural waste is produced in Naga Hammadi, while at the same time representing the lowest percentage of recycling (2.5%). El-Waqf has the highest recycling percentage, which represents 92.2% of the total waste generated in the city.

4.3.8 Investment and Development

The Ministry of Planning and Economic Development announced, in a report issued recently, the features of the Citizen's Investment Plan for the Qena Governorate for fiscal year (FY) 2023/22.

The disclosure of the report comes within the framework of continuing to announce the Citizen Investment Plan in all governorates of the Egyptian Republic for the fourth year in a row, to educate citizens about the directions and priorities of the sustainable development plan for FY (2023/22), and its role in achieving "Egypt's Vision 2030".

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Investments in the higher education and scientific research sector amounted to EGP 798.8 million or 17%, the housing sector amounted to EGP 754.4 million or 16%, and the pre-university education sector amounted to EGP 258.5 million or 6%. The report draws attention to the many development projects implemented under the initiative. These projects include the construction of 39 residential buildings for vulnerable families, 38 social units, 19 agricultural services complexes, 33 ambulance points, 77 health units, and 2 central hospitals.

Industrial projects located outside industrial areas:

Table (4.17): Industrial projects located outside industrial areas (Source: Qena Governorate website).

Existing factories	Sector	Location	production volume	Field of activity	Job Opportunities
factory name					
Aluminum factory	Industrial	Nag Hammadi	306.638 thousand tons	Aluminum	7906
Sugar factory		Nag Hammadi	10 thousand tons / Day	Raw sugar	1904
Sugar factory		Qus	11 thousand tons of cane per day	Raw sugar	1688
Sugar factory		Dishna	9 thousand tons / day	Raw sugar	1303
Spinning factory		Qena	4 thousand tons / day	Yarn threads	750
Paper factory		Qus	120 thousand tons	newsprint	1200
Cement Factory		Qift	1.8 million tons/year	Packed cement	500
Fiberboard Factory		Dishna	666 thousand m3 / year	compressed wood	400
Butane factory		Qift	4 million cylinders/year	Cylinders of different sizes	1200
Al Nahda Cement Factory		Qena/ Safaga	1.8 million tons/year	Packed cement	308

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Table (4.17): Industrial projects located outside industrial areas (**Source:** Qena Governorate website).

Power station (Ministry of Electricity)		Dandara	Generating electricity with a capacity of 2/325 MW	Generating electricity	
Establishment of a river port near Dandara		Dandara	-	Transporting goods and production requirements	300

Proposed projects set up in Qena Governorate:

Table (4.18): Proposed projects set up in Qena Governorate. (**Source:** Qena Governorate website).

Project Name	Project goals	The desired results of project implementation	Estimated investment cost required	The expected time frame for implementation
Energy saving electric bulbs factory	Benefiting from the raw materials available in the governorate and participating with the government in reducing electricity consumption.	Eliminate the electricity problem	10000	Two years
Marble and granite factory	Covering the local market and exporting abroad.	-Reducing the prices of marble and granite -Providing job opportunities for young people - Utilizing the raw materials available in the governorate	600000	Two years
Phosphate fertilizer complex and phosphoric acid	Utilization of phosphate ore and production of oxides	-Benefiting from the phosphate ore found in the governorate.	1775000	Two years

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Table (4.18): Proposed projects set up in Qena Governorate. (Source: Qena Governorate website).

		-Reducing fertilizer prices		
5-star tourist hotel, 252 rooms, 3 floors high)	Encouraging tourism in the governorate	Providing job opportunities for young people Placing Qena governorate on the tourist map	60000	Two years
Establishing a small industrial zone in the industrial areas of Kalahin/Qift, Hu/Nag Hammadi	Establishing small industries in industrial areas that serve the major industries located in those areas.	-Creating job opportunities for young people -Reducing product prices		One Year
Establishing a craft industries area in Nqada	Benefiting from the skilled labor force who works in these crafts, in addition to benefiting from the raw materials found in those areas.	-Providing job opportunities for young people. -Put this area on the tourist map -Preserving traditional crafts.		One Year
A project to reclaim an area of 16 thousand acres in West Al-Marashda, Qena	Taking advantage of desert land areas and providing job opportunities for young people. Achieving self-sufficiency in wheat production in the governorate.	Reclaiming and cultivating an area of 16 acres designated for young graduates	51 million pounds/year to reclaim an area of 3,200 acres/year	One Year
Establishment of fish farms (with a small capacity)	Employing youth and providing job opportunities for youth - providing healthy and safe food.	Increasing job opportunities for youth - achieving self-sufficiency in fish.	700 per farm	One Year
Establishing silos to store wheat in the governorate	Benefiting from wheat production	Reducing wheat crop losses and providing a	95000	One Year

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Table (4.18): Proposed projects set up in Qena Governorate. (Source: Qena Governorate website).

		reserve as it is a strategic crop		
The cement factory project on the Qena/Safaga road at kilometer 60, where the governorate possesses huge quantities of limestone and clay in vast areas on the Qeft/Qusayr road.	Taking advantage of the huge quantities of limestone and clay, which are available in vast areas on the Qift/Qusayr road.	-Cement production -Reducing cement prices -Providing quantities for export.	2500000	Two years
Solar energy project	Electricity production from alternative energy is 1.5 megawatts.	-Contributing to the production of alternative energy in Egypt. -Participation of investors in feeding government electricity networks.	30000	6 months - 1 year
A fodder project in partnership with the Qena Water and Sanitation Company on an area of 40 acres	Exploiting the vast areas in the desert hinterland.	-Livestock development. - Re-exploiting treated wastewater and planting clover and fava beans.	700	6 months
Production of methane gas from molasses waste	Using molasses waste in addition to agricultural waste through an anaerobic fermentation process.	Methane gas production.	10-10,000, as the investment cost for the small investor will be 10 thousand pounds, while	Two weeks of anaerobic fermentation process

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Table (4.18): Proposed projects set up in Qena Governorate. (Source: Qena Governorate website).

			the investment cost for the large investor will be 10 million pounds.	
Crushed sand	Benefiting from the huge quantities available in the governorate, which amount to one billion tons.	To be used in coastal reclamation operations.	The investment cost of the project is estimated at billions.	-

Tourism:

Tourism in Qena Governorate is restricted because of issues rating to security and movement of foreigners through the Governorate by road is restricted. Nile cruises do pass through the south of the Governorate on their way between Luxor and Aswan and Isna Temple is often a scheduled stop off point. In addition, day excursions by boat from Luxor are available to Dandara temple in the north. Dandara Temple may also be visited by coach or bus from Luxor. Coaches and buses pass through the Governorate on the way between Luxor and the Red Sea and use the Qena-Safaga Road.

Dandara Temple: Dandara Temple is a major tourist site in Upper Egypt and is visited by tourists both from cruise ships on the Nile and via road in coach convoys directly from Luxor. The temple is about 7 km away from the Dandara Silos site. In 2000, the temple generated LE 1,220,193 in entrance fees and was visited by 124,647 visitors.

Isna Temple: Isna Temple is so a major tourist site in Upper Egypt and is visited by tourists both from cruise ships on the Nile and via road in coach convoys directly from Luxor. The temple is about 134 km away from the Dandara Silos site. In the four-month period from October 2000 to January 2001, the temple generated LE 523,829 in entrance fees and was visited by 67,949 visitors.

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Table (4.19): Tourism: No. of Hotels & Resorts (**Source:** Qena Governorate - Egypt Description by Information, 2020).

No. of Hotels & Resort (Hotel & Resort)	5 Stars	4 Stars	3 Stars	2 Stars and less	Under Classification
2	-	-	1	1	-

Table (4.20): Tourism: Some Important Indicators (**Source:** Qena Governorate - Egypt Description by Information, 2020).

Item	Unit	Value
No. of Rooms	Room	111
No. of beds	Bed	222
Tourism Education:		
No. of hotels & tourism schools	School	4

4.3.9 Fishing and Fisheries

The fisheries sector in Qena Governorate is under the supervision of the General Authority for Fisheries Research and Development (GAFRD). There are four fisheries cooperatives in Qena: Isna (649 fishermen), Qena (390 fishermen), Dishna (323 fishermen), and Naga Hammady (425 fishermen). The total fish catch during the year 2020 was 753 tons of fish, dominated by Tilapia species. Table (4.21) shows the monthly catch and annual distribution of fish catch across Qena.

Table (4.21): Quantity and Value of Fish Production in Qena according to varieties 2020. (**Source:** Fish Statistical Yearbook, 2020).

Common Name	Qena
Tilapia Neil	315
Cat Fishes	52
Grass Carp	-
Bargus	75
procambarus clarkii	214
Nile Perch	-
Chelon	-
Silverside	-
Silver Carp	42

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Table (4.21): Quantity and Value of Fish Production in Qena according to varieties 2020.
(Source: Fish Statistical Yearbook, 2020).

Nile carp	40
Elephant-snout fish	-
Grey Mullet Neil	-
Barbel	-
Schlibid catfish	15
Common Carp	-
Eels Neil river	-
Total	753

Quantity: Ton

4.3.10. Archaeology and Cultural Heritage

The Supreme Council of Luxor Egypt has a rich and diverse cultural heritage dating back to more than 7,000 years before the present. Egypt is internationally renowned for its archaeological and historic sites and a wide variety of sites are present in Upper Egypt.

Originally, Luxor was part of Qena Governorate; however, the significance of the sites presents in the local area, such as Luxor and Karnak temples and the Valley of the Kings, where the treasures of Tutankhamun's tomb were originally discovered has attracted great numbers of visitors. The uniqueness and numbers of sites present in proximity of Luxor and the numbers of visitors and corresponding development pressures from hotels and tourist developments, led to the establishment of a separate administrative status of what was the former Markaz of Luxor. In 1989, Luxor was given the unique administrative status of the "Supreme Council of Luxor".

In addition to the sites located within the Supreme Council of Luxor there are two major tourist sites in Qena Governorate that attract international and local tourists and generate income from official entry tickets, these are Isna Temple in Isna and Dandara Temple in Qena Markaz. Ticketing arrangements were also initiated for El Moalla, a Pharaonic rock-cut cemetery so located in Isna; however, to date this site has received virtually no foreign visitors.

Dandara temple complex is one of the best-preserved temple complexes of ancient Egypt. The entirety of the complex is surrounded by a sizable mudbrick wall. The complex include: Hathor temple (the main temple). The temple that dominates this complex, the structure that commands the attention of those who visit, is the Temple of Hathor. The original temple structure underwent continuous modifications throughout the Middle Kingdom and up until the beginning of the reign of the Roman emperor Trajan (Kipfer and Barbara 2000). The existing temple's structure began construction in 54 B.C.E, the late Ptolemaic period, under the reign of Ptolemy Auletes (Bard and Kathryn 2005). The hypostyle hall was built in the Roman period under Tiberius

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(Wilkinson and Richard 2000). Temple of Dandara, located near the village of Dandara. . about 2.5 kilometres (1.6 miles) south-east of Dandara, Egypt and It is also about 7 km away from the site of the Dandara silo. Dandara Temple is a major tourist site in Upper Egypt and is visited by tourists both from cruise ships on the Nile and via road in coach convoys directly from Luxor.



Figure (4.19): Map showing the distance between Dandara Temple and the Silo site.

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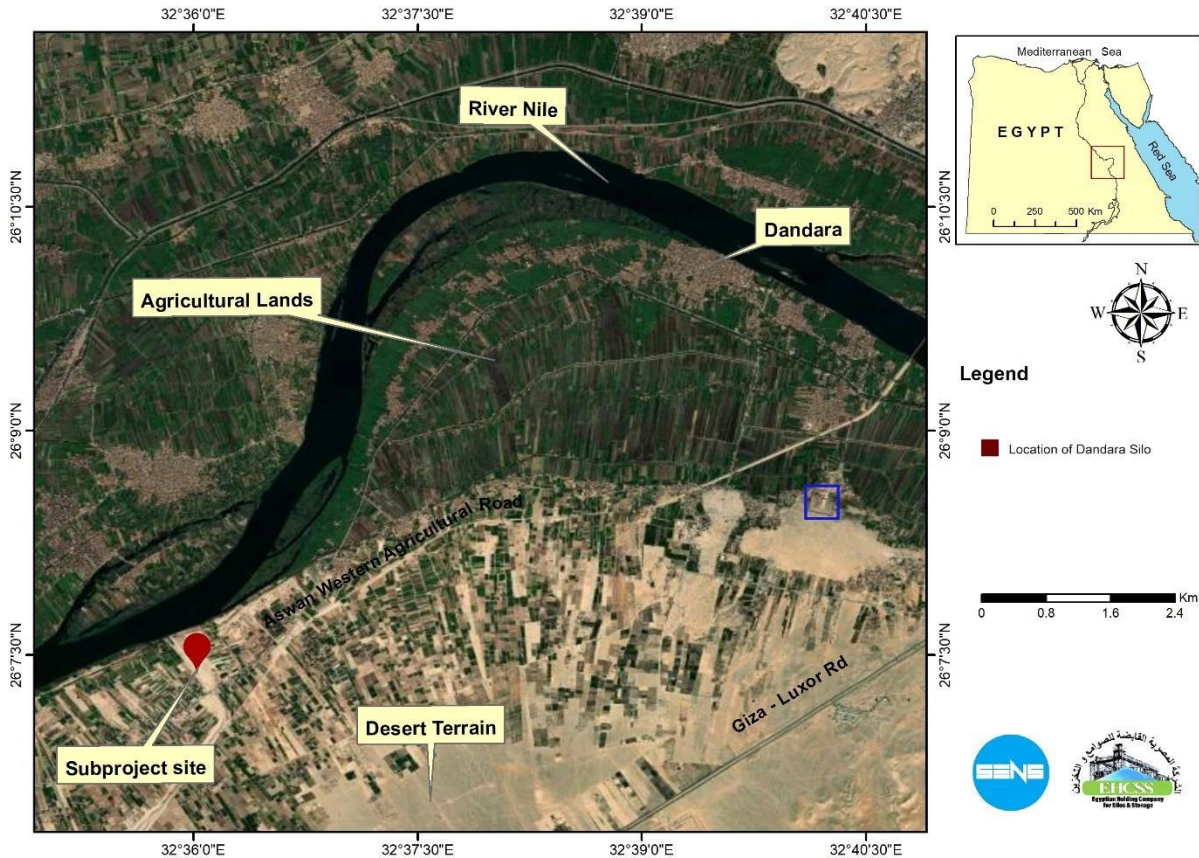


Figure (4.20): Map showing the location of Dandara Temple (blue quadrate in relation to the Dandara Silo site.

4.3.11. Child Labour Indicators

Child labor remains a pressing socio-economic issue, particularly in rural areas of Upper Egypt, including Qena Governorate. According to Central Agency for Public Mobilization and Statistics (CAPMAS) has issued a press release² on November 20th, 2022, 7.4% of children aged 5-17 in Upper Egypt are engaged in economic activities or household chores. This percentage is significantly higher in rural areas, reaching 8.4% in Rural Upper Egypt, compared to 2.7% in urban governorates.

² CAPMAS. (2022). Press Release on Child Labor Statistics. Available at:
https://www.capmas.gov.eg/Admin/News/PressRelease/20221120133353_666e.pdf

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In the context of the Dandara area, informal discussions with local stakeholders and preliminary observations during site visits suggest that child labor is present, primarily in agricultural activities. Children often assist their families with tasks such as planting, harvesting, and transporting crops. Seasonal labor requirements, particularly during peak agricultural seasons, increase the likelihood of child involvement in these activities.

4.3.12. Crimes of Violence and harassment against women and status of women

According to (CAPMAS) Survey of the Economic Cost of Gender-Based Violence 2015, about 18 percent of Egyptian women in the age group (18-64 years) have been subjected to physical or sexual violence since they reached the age of 18 at the hands of family members, close people, or those in the surrounding environment. 17 percent reported that they had been subjected to physical violence, and 2 percent reported that they were exposed to sexual violence.

Strangers' male were the perpetrators of most of the sexual violence to women, with 9 out of 10 women (87 %) reporting sexual violence since they reached 18 years of age, and three-quarters (75 %) of those who had recently been exposed to sexual violence.

Table (4.22): Percentage of women in the age group (18-64 years) who have been exposed to violence since they reached the age of 18 at the hands of family members, close people, or those present in the surrounding environment, according to the type of violence and basic characteristics, Egypt, 2015.*

Basic features	Percentage of women who have been exposed to violence			number of women
	Any physical violence	Any sexual violence	Any physical or sexual violence	
Place of residence				
Urban Governorates	9,0	3,1	10,1	4385
Lower Egypt	27.5	2.7	28.0	8497
Urban	23.0	1.6	23.6	2421
Rural	29.2	3.1	29.8	6076
Upper Egypt	9.4	1.3	10.2	7118
Urban	13.2	2.0	14.5	2380
Rural	7.5	0.9	8.1	4738

The data presented in Table (4.22) was obtained from the Egypt Demographic and Health Survey (EDHS), 2015, published by the Central Agency for Public Mobilization and Statistics (CAPMAS)



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5

ANALYSIS OF ALTERNATIVES

5.1. Introduction

The identification and examination of alternatives is essential to environmental assessment. It provides decision-makers with information that allows them to properly consider ideal solutions to development proposals. Alternatives demonstrate and contrast the environmental implications and significances of different options available to achieve the identical end. In this way, both the proponent and the authorities who must consider granting the authorization, are put in a position where all involved are able to make informed choices or decisions. The consideration of alternatives is one of the more practical sides of environmental management improving the sub-project design through examining options instead of only concentrating on the more self-protective task of mitigating adverse impacts associated with a single design.

The following alternatives are considered for the construction and operation of Dandara Silo Complex as component 2.1 in Emergency Food Security and Resilience Support Project (P178926):

- No development (No action).
- Alternatives of the location of Dandara Silo Complex.
- Design Alternatives.

The analysis of alternatives is based on the evaluation of numerous sub-project alternatives during the conceptual and pre-feasibility design phases. When assessing alternatives, particular emphasis was placed on the environmental and social implications of the alternatives to ensure that the option selected is environmentally sound and meets the Egyptian Laws and regulations.

This section presents details of the alternative construction options investigated by SENS when preparing the planned and potential sub-project outlined before. As per international good silos practice, SENS uses a formal stage gate process through which it progresses its sub-projects. This process begins with feasibility. In the feasibility stage, SENS with EHCSS examined all potential approaches to developing the identified fields. This is undertaken by preparing tables that list for each element of the field development the viable alternatives and then selecting from these to prepare extreme development scenarios.

Based upon the alternatives analysis between some potential scenarios are carried forward into the next stage (Concept), where they are studied in more detail allowing the best option to be determined. The best option is the one that is seen to be best able to meet the established objectives, namely:

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- Minimize potential impact on the environment.
- Minimize potential social risks and impacts.
- Ensure safety risk levels can be brought.
- Minimise sub-project risk – focus on simplification of interfaces during installation phase.

5.1.1 Alternative analysis matrix

For the construction and operation of Dandara Silo Complex, an alternative analysis was carried out based on various biophysical and socioeconomic parameters including:

- Technical feasibility,
- Economic viability,
- Environmental acceptability of the sub-project and
- Social benefits.

Based on the above four factors, an alternative analysis matrix was developed with scores given for each factor. This analysis provides information about the advantages and disadvantages of each alternative considered regarding its technical, economic, and environmental factors. The purpose of this matrix is to obtain a favorable implementation of alternatives proposed by considering alternatives in terms of site selection, design and operational methods, the sub-project scale and timing of sub-project. The total for all factors gives an overall score for a given alternative. The highest total score provides the most desirable and preferred alternatives and vice versa.

In this section the alternative development options addressed by SENS in the feasibility and concept stages are discussed and contrasted with the baseline option of not developing the fields at all - the so-called “No Action” option.

5.2. No Action Alternative

The No Action Alternative in respect to the proposed sub-project implies that the status quo is maintained. This option is the most suitable alternative from an extreme environmental/biodiversity perspective as it ensures non-interference with the existing conditions. The anticipated insignificant environmental impacts resulting from construction, and operation activities would not occur.

The sub-component (2.1 in Project) will finance the upgrading of Egypt’s strategic wheat storage capacity to strengthen preparedness for and resilience to future market shocks and climate risks. The sub-component will contribute to food security by reducing loss and waste in the wheat supply chain, and by improving farmers’ access to domestic grain markets. This will provide financing to the EHCSS to expand the network of modern, energy efficient silos integrated with

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rail and river transportation systems and strategically located in areas with substantial wheat production.

Based on the above the ‘no action or do nothing’ option was not considered as a viable way forward for the assets discussed in the ESIA. SENS has invested substantial capital in demonstrating the further potential of the Upper Egypt Area. Whilst wheat prices are currently high, the best forward plan for the company is to develop these essential resources. This approach is also the most favorable from a socio-economic perspective whilst not introducing unacceptable environmental threats. Consequently, it is the professional opinion of the environmental assessment team that the No-Project option is unfavorable and, therefore, it is submitted that this alternative should be discarded from further consideration in this ESIA report.

5.3. Alternatives of Location

The location of the Dandara Silo was approved by the Egyptian Holding Company for Silos and Storage (EHCSS) after extensive discussions. Three potential location options for the Dandara Silo were considered:

- **Option A (Preferred):** the location described in the sub-project drawing, situated centrally within the allocated land.
- **Option B: A location** in the Southern part of the land, near the main road.
- **Option C: A location** in the northern part of the land, near the Nile River.

After reviewing the different alternatives, Option (A) was selected as the most suitable location based on a comprehensive analysis of economic, social, environmental, and engineering considerations. Table (5.1) presents a comparative analysis of these alternatives. So, the consultant (SENS) recommended option (A) as the suitable location for Dandara Silo Complex in Qena.

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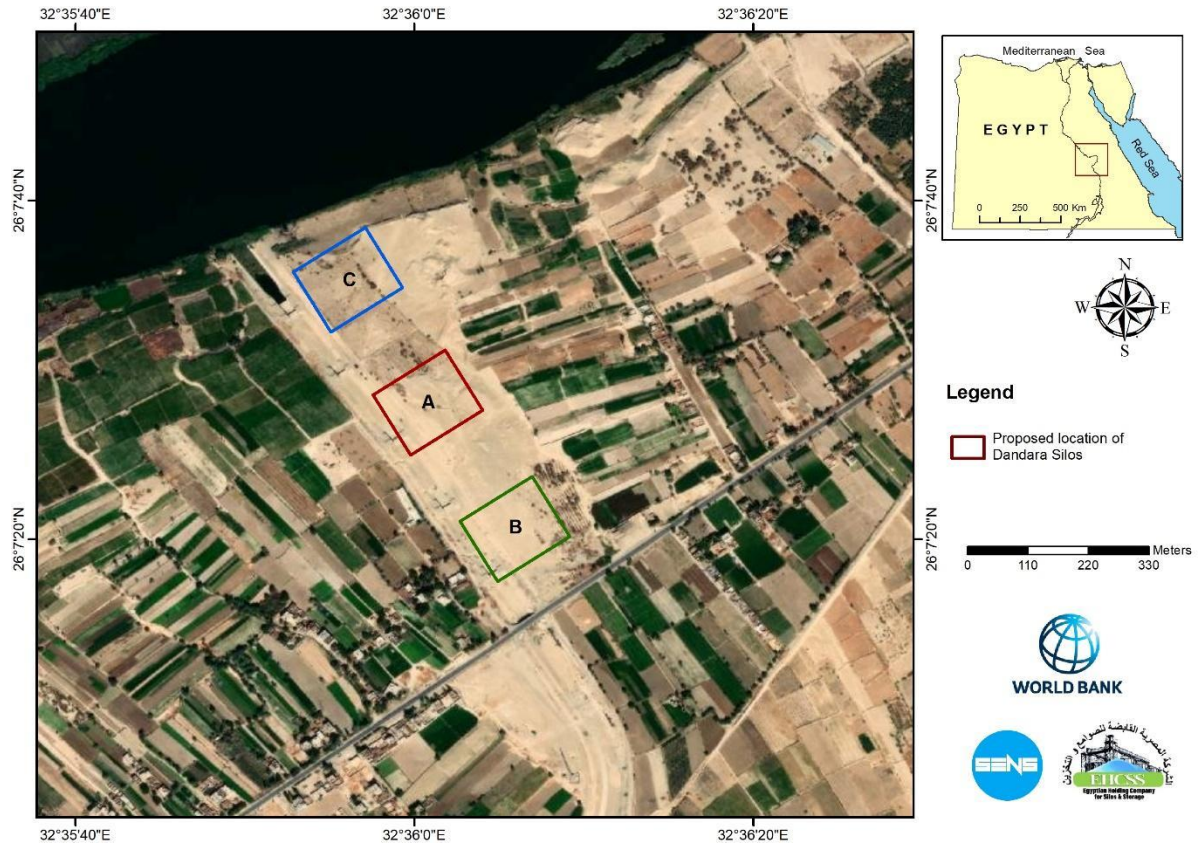


Figure (5.1): Map showing the three alternatives of location of Dandara Silo Complex.

Table (5.1): A comparative analysis of the three potential location options for Dandara Silo.

Criteria	Option A (Preferred)	Option B (Near the Road)	Option C (Near the Nile)
Economic Considerations	Central location minimizes internal transportation costs for grain transfer between silo units.	Proximity to the road may slightly reduce transportation costs during the operation phase.	Proximity to the Nile could increase transportation costs due to potential flooding risks and additional protective infrastructure.
Social Considerations	Minimal disruption to nearby communities	May cause minor disturbances to local	Potential impact on informal uses near the

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	due to central placement away from sensitive areas.	road users during transportation activities.	Nile, including grazing and community access
Environmental Considerations	Central location reduces risk of environmental impacts, including air and noise pollution, on sensitive areas.	Proximity to the road may lead to increased emissions and noise affecting nearby communities.	Proximity to the Nile poses a risk to water resources and biodiversity.
Engineering Considerations	Central placement simplifies site preparation and utility connections, minimizing technical challenges.	Near-road placement may require additional road reinforcement for heavy traffic.	Proximity to the Nile increases construction complexity due to potential erosion and flood risk.

Option A is the best choice for the silo location as it minimizes environmental impact, technical challenges, and community disruptions. It has minimal risk of air and noise pollution affecting sensitive areas, making it the most environmentally friendly choice. Its central placement simplifies site preparation and utility connections, reducing technical challenges. Unlike Option B, which may cause noise and emissions issues near the road and require road reinforcement, Option A avoids these problems. Compared to Option C, which poses risks to water resources, biodiversity, and construction feasibility due to its proximity to the Nile, Option A is safer and more cost-effective. Additionally, it minimizes internal transportation costs, improving long-term operational efficiency and making it the most balanced and efficient option overall.

5.4. Design Alternatives

Environmental considerations have been incorporated into the overall decision-making processes, which have also been informed by SENS studies as required. The final design of Dandara Silo was selected to minimize impacts on local biodiversity, avoiding social impacts. The design of Dandara Silo was selected to comply with stakeholder requirements, to minimize impacts to environments, to avoid the protected areas in the region, as well as avoiding any known ordnance and known biodiversity features.

Alternative Silo Designs

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- Modular silos: Multiple smaller silos can be built instead of one large silo. This provides more flexibility and redundancy but requires more land area.
- Silo bags: Large woven plastic bags can be used to store grain in a silo-like manner. They are very low-cost but provide less protection than a permanent structure.
- Silo complexes of steel structure: Multiple silos can be built together to increase storage capacity. This allows for economies of scale but requires more land and infrastructure.

The third alternative was selected for Dandara Silo in which multiple silos will be built together to increase storage capacity. Additionally, steel silos were selected instead of concrete silos since concrete silos are more costly and take longer time in construction works.

The new technology used in building the new silos, including the Dandara silo complex, differs from the old silos that were built in a previous period. The new technology will include the following: a) inventory control system using laser, b) temperature monitoring system, c) operation of ventilation fans, and d) Evaporation system. This confirms that the new silo design will be the best alternative among other alternatives.

The placement of the Dandara Silo complex near agricultural areas and away from major urban centers necessitates specific arrangements for the design and layout of the silo facilities. The proximity to wheat production zones ensures efficient grain storage and transportation, while the rural location requires careful planning to accommodate both the operational needs of the silo and the workforce.

The engineering layout of the Dandara Silo complex has been thoroughly reviewed in consultation with the project's engineering consultants and management. The arrangement of key units, including the storage cells, administrative offices, workers' accommodations, and access points, was carefully designed to align with the site's natural characteristics and logistical needs. This configuration was determined to be the most optimal option among the alternatives considered, offering efficient operation, ease of access, and a functional work environment for employees.

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6

IMPACT ASSESSMENT

6.1. Overview

The impacts on the environment and terrestrial ecosystems could be generally attributed to natural or anthropogenic factors. However, recognizing natural and anthropogenic stressors might be difficult due to the complexity of ecosystems reactions to the variety of disturbances. This section of the report identifies the potential impacts on the environment and on the community, especially terrestrial habitats, and surrounding environments/communities. An environmental and social impact is defined as any change to an existing condition of the environment/social aspects. The main objective is to examine, analyze and assess the planned project activities' impacts on the baseline conditions.

This chapter concerns both 'planned' activities (those activities concerning normal, or anticipated activities during all sub-project phases), and 'unplanned' activities, that is, those activities that are unexpected. Unplanned activities at grain silos include fire and explosion, often due to poor control of grain dust and conditions that result in ignition of dust.

Various potential positive and negative impacts are described below.

Positive impacts:

- Benefits (that is, positive impacts) are likely to have a positive impact locally through hiring. Worker camps will not be required, accommodation in the form of rented apartments will be provided to a few outsourced workers, and no sub-project-related influx is anticipated (these may have negative impacts on local communities). At the regional level (that is, a second zone of impact), the sub-project may have benefits in terms of additional revenue (Providing new job opportunities for young people in construction areas). Farmers in the region will also benefit from storing wheat at the grain silos, and another from local stakeholders who will be able to withdraw wheat from the silos.
- Providing highly advanced storage capacity within the country.
- Eliminating the percentage of wheat losses resulting from poor storage, which reaches about 10%.
- Aiding the country in maintaining a secure strategic balance of wheat.
- Tightening the process of maintaining and controlling the stock, which leads to an economy in the use of pest control methods with pesticides and maintaining the quality of the grain because of the high quality of storage.

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- Reducing the average purchasing price of wheat throughout the year because of entering the global purchasing market at appropriate times.
- Creating new areas of attraction and agricultural expansion in order to encourage farmers to grow wheat and grains next to the sites where silos are being established.

Negative impacts:

Possible impacts arising from the construction and operation works are categorized into reversible and irreversible impacts. The impacts identified are also described according to their location, extent, and characteristics. Reversible and irreversible impacts are further categorized by intensity of impacts (negligible, minor, moderate, and major) for identifying best possible remedial (mitigation measures) action to be taken. This ESIA identifies and quantifies the significance of adverse impacts on the environment from the proposed Silos Complex sub-project in Dandara. Impacts on the environment were assessed in terms of their significance according to the following categories:

- Insignificant – the impact is too small to be of any significance, (category I).
- Minor – the impact is undesirable but accepted, (category II).
- Moderate – the impact gives rise to some concern but is likely to be tolerable in the short-term (e.g., construction phase) or will require a decision to its acceptability, (category III).
- Major – the impact is large scale giving rise to great concern; it should be considered unacceptable and requires significant change, (category IV).

6.1.1 Impacts Assessment Methodology

A. Identification of area of influence

Physical:

- Surface water resources: The Dandara Silo is located near the Nile River, approximately 500 m. Due to this distance, the subproject is unlikely to have a significant impact on surface water resources. The proximity to the Nile provides logistical benefits, but careful management practices will be implemented to prevent contamination or disruption of the river's natural flow during both the construction and operational phases.
- Sub-surface water resources: Groundwater in the Dandara area is found at a depth between 50-60m deep. The silo's operations and construction are not expected to affect groundwater resources, as water usage will be limited and obtained from the public network rather than from groundwater extraction. During construction, an estimated 3,000 m³ of water will be used over a period of approximately two years, with a

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small amount utilized for drinking and sanitation during operations (between 60 and 120 m³ per month). Construction phase may result in contamination of Nile river from waste and chemicals emissions and mismanagement and accidental leaks from machineries, generators and chemicals etc and operation phase may result in grain spills and accidental generator leaks, fuel leaks into the Nile River.

- **Air, Noise and Vibration receptors:** Dandara silo site is surrounded by agricultural lands, rural communities, and some nearby buildings. The closest residential area is the village of Dandara, situated about 6km from the project site. Given that the prevailing wind direction is primarily from the northwest, air emissions (mainly dust) generated during construction and operation will likely travel southeast, away from populated areas. However, any nearby agricultural lands may be affected by dust, requiring mitigation measures. Noise and vibration impacts are also expected to be minimal due to the distance from residential areas.
- **Land use:** Within a 1 km radius of the silo site, the land is primarily used for agriculture, with fields of sugarcane, wheat, and other crops. The road connecting Qena and Luxor is located nearby and is expected to be the primary transportation route for both construction equipment and operational transport of grains.
- **Traffic receptors:** The Aswan Western Agriculture Road is the primary access route to the Dandara Silo, and it is located approximately 350 meters from the project site. Construction and operational activities will increase traffic on this road, but the impacts on noise and vibration are expected to be limited due to the road's distance from residential areas. Traffic safety measures will be considered to minimize the risk of accidents, and routing plans will be developed to avoid high-density residential zones.
- **Biological:** The subproject site is located at a considerable distance from any designated protected areas, with the nearest significant protected areas being the Saluga and Ghazal (230 km away) and Wadi El-Rayan (390 km away). Additionally, all Nile River islands have been declared a Protected Area under Prime Ministerial Decree 1969/1998. The closest island to the project site is located approximately 1.5 km to the east, which is recognized for its ecological significance. The project is also in proximity to the Upper Nile Important Bird Area (IBA), situated approximately 12-13 km from the Dandara Silo site. This area is part of the East African Flyway and serves as a critical migratory route

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for Palearctic bird species, such as White Storks, raptors, and other protected species listed under CITES Appendix II. Migratory seasons occur from February to April and September to November, with peak activity observed in March and October. Although the project site is located near the Nile, which support diverse habitat including wetlands, baseline studies have shown that the immediate project area is characterized by low biodiversity, with no endemic, globally threatened, or locally endangered species recorded on-site. However, nearby agricultural lands and the Nile River provide habitats for a variety of flora and fauna, including resident and migratory birds, small mammals, and reptiles. Mitigation measures will be included to minimize any potential impacts on biodiversity in the area

- **Social:** The social area of influence encompasses the local communities that will use or benefit from the Dandara Silo. This includes farmers and agricultural stakeholders in Qena Governorate, who will store and transport wheat through the facility, and local communities in Dandara and surrounding villages. Additionally, the area of influence covers road infrastructure, such as the Qena-Luxor road, which will serve as the primary access route for construction and operational traffic.
- **Cultural heritage sites:** There are no immediate cultural heritage sites within the vicinity of the Dandara Silo site. However, Qena Governorate is home to the Dandara Temple Complex and other significant historical sites located several kilometers away. While these sites are not expected to be affected by the silo project, a chance-find procedure will be incorporated into the ESIA to address any potential discoveries of cultural artifacts during construction.

B. Impact significance for planned activities

Impacts significance levels are assessed based on the magnitude (scale, duration and severity of impacts and likelihood of occurrence (for unplanned events)) and the sensitivity of the receptor (presence of receptors/importance of receptor etc.). Accordingly, the negative risks and impacts are assessed based on the following characteristics:

- Duration of the impact (temporal).
- Size of the impact (spatial).
- Severity
- Sensitivity of receptors
- The magnitude of the impact, is the result of the above criteria; and

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- The significance of the impact = (the magnitude of an impact) + (the importance of the receptor).

➤ **Planned risks and impacts**

For planned risks and impacts, the first step is to determine (i) the duration of the impact, (ii) the spatial range of the impact and (iii) the severity of the impact, and (iv) receptor sensitivity. A scoring system was adopted to determine the scale of the three criteria above, with 5 being the highest level and 1 being the lowest for each of the three criteria.

Step1: Temporal scale (duration):

Duration category	Description	Score
Short term	Impacts will last for short duration (<5 years)	1
Medium-term	Impacts will last for medium duration (5-15 years)	2
Prolonged term	Impacts will last for more than a generation lifetime (15-30 years)	3
Long-term	Impacts will last for a long term (30-45 years)	4
Permanent / irreversible	Impacts may last more than 45 years or longer.	5

Step 2: Spatial scale

Spatial category	Description	Score
Localized	Within the project area and immediate surrounding	1
Study zone/ District/Markaz Level	Within Markaz Abanoub	2
Regional	Governorate level	3

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National	Country Level	4
Global	Worldwide	5

Step 3: Severity scale

Severity level	Description	Score
Insignificant/no effect	Receptors are not affected.	1
Slightly severe	Receptors may be slightly affected however mitigation measures are considered in design stage or cheap to implement and/or fast to implement.	2
Moderately severe	Impacts are reversible and could be mitigated.	3
Severe	Impacts could be mitigated with expensive and time-consuming measures.	4
Highly severe	Impacts are permanently irreversible and cannot be mitigated.	5

Step 4: Magnitude scale

The next step is determining the magnitude scale which is the result of the temporal, spatial and severity scales (above). The results of the scores above will provide the magnitude scale as follows:

- A total score above 12 and equals to 15; Very Large scale
- A total score above 9 and equals to 12; Large scale
- A total score above 6 and equals 9; Moderate scale
- A total score above 3 and equals to 6; Small scale
- A total score above 1 and equals to 3; Negligible

Step 5: Receptor importance/sensitivity scale

Receptor sensitivity is based on the degree to which a receptor is resilient to change, and the value attributed to the receptor by stakeholders or applicable regulations/policies. Receptors usually fit into one of the following three categories:

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- Physical (non-living environmental components, including air quality and noise, water resources, sediments and geology).
- Ecological (for example fauna); and Human.

Step 6: Significance scale

The significance of impact is evaluated based on the results of the magnitude scale and the importance of the sensitive receptor/vulnerability of the receptor.

Magnitude	Importance of receptor/sensitivity of receptor		
	Low	Moderate/Medium	High
Negligible	insignificant	insignificant	insignificant
Small	insignificant	Minor	Moderate
Moderate	Minor	Moderate	Major
Large or Very Large	Moderate	Major	Major

➤ Unplanned activities risks and impacts

The grain handling industry is a high hazard industry where workers can be exposed to numerous serious and life-threatening hazards including:

- fires and explosions from grain dust accumulation
- suffocation from engulfment and entrapment in grain bins
- falls from heights
- crushing injuries and amputations from grain handling equipment
- hazardous atmospheres inside storage structures

Only the first category relates to unplanned (or accidental) activities or events during sub-project operations. The others are OHS issues for plant workers that are addressed in Section planned risks during construction and operation phases. This section addresses the potential environmental impacts of accidents. This should not be confused with a discussion of plant safety. Occupational exposure to materials released in accidents, and the potential for personal injury to occur, are only considered environmental issues to the extent that they affect socio-economic stability. Consequently, the potential environmental impacts of a serious accident may seem disproportionately small.

Unplanned activities related to grain silo construction, operations and decommissioning, typically include the following:

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- Fire or explosion related to fuel leaks (from, for example, diesel storage tanks)
- Pesticide leaks
- Fire or explosion related to grain dust

Five steps have been undertaken towards evaluation of the risks of unplanned events:

- Identifying risks: This included analyzing potential risks and opportunities. Although risk identification is continuous throughout the life of the sub-project, risks should be managed as soon as possible.
- Determining probability: This ensured focus on mitigation of the risks most likely to affect this sub-project.
- Determining the impact: This process is similar to the evaluation undertaken with respect to planned sub-project activities.
- Identifying mitigation measures: This part of the process consists of risk response planning. As for evaluation of planned activities, measures will be identified to reduce or eliminate the identified risks. Risks can be addressed via mitigation strategies, preventive plans and contingency plans.
- Monitoring and reviewing the risk: Risk management is a continuous process because conditions change. The ESIA includes procedures for reviewing, monitoring, and tracking of identified risks periodically throughout this sub-project. Uncertainty plays a major factor in risk management.

Technologies for Identifying and Monitoring Risks

To ensure the safety and efficiency of silo operations in Dandara, various technologies will be used for identifying and monitoring risks, including the following:

- **Temperature Sensors:**
 - Monitoring the temperature within grain cells to detect hotspots that could indicate potential spoilage or combustion.
 - Sensors are placed at multiple points within the silo to provide comprehensive temperature data.
 - Early detection of temperature anomalies can prevent spoilage and reduce the risk of grain dust explosions.
- **Hazard Monitoring Equipment:**

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- **Dust Monitoring:**
 - Equipment such as dust sensors and explosion-proof sensors are used to monitor dust levels and prevent hazardous accumulations.
- **Gas Detection:**
 - Phosphine and other fumigant gas detectors ensure that concentrations remain within safe limits.
- **Moisture Sensors:**
 - Moisture content sensors help maintain optimal storage conditions and prevent mold growth and spoilage.
- **Software for Monitoring Silo Systems:**
 - **Integrated Monitoring Systems:**
 - Software systems that integrate data from various sensors (temperature, moisture, dust) to provide real-time monitoring and alerts.
- **Emergency Response and Risk Management:**
 - **Automated Emergency Shutdown Systems:**

Systems that automatically shut down operations if hazardous conditions are detected.

For the purposes of this impact assessment, potential impacts that are dependent on the occurrence of an action that has a finite probability, but might not occur at all, are referred to as “event-related impacts.” An example of event-related impacts that may occur as a result of this Project could be associated, for example, with an accidental, uncontrolled release of hydrocarbons that might occur under non-routine operating conditions. Because event-related impacts may not occur at all, assessment of potential impacts that are event-related may take into consideration the **likelihood** of occurrence.

Likelihood can be derived from historical information, modelling, industry data, stakeholder input, and professional judgment. In addition, likelihood takes into account anticipated or planned mitigation measures, engineering controls, and procedures in place to prevent or reduce the potential consequences of the identified event. To assign likelihood to an event-related impact, six possible levels of likelihood are defined and ranked. The six levels are defined as shown in the table below.

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Table: Likelihood of event-related impact.

Impact	Definition
Rare	The impact is rare or unheard of
Remote	The impact has occurred once or twice in the industry
Unlikely	The impact has occurred in the industry in the past but is not likely to occur on this project during the lifecycle of the facility (e.g. construction, operation, decommissioning).
Seldom	The impact could occur on this project during the lifecycle of the facility but only under exceptional conditions.
Occasional	The impact may occur on this project during the lifecycle of the facility.
Likely	The impact can reasonably be expected to occur on this project during the lifecycle of the facility.

The various levels of risk in relation to the Dandara Silo sub-project have been defined as follows:

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Level of risk	Definition
Catastrophic	Death and/or catastrophic effect on environment that may take longer than a year to restore and cost more than \$1,000,000. Regulator notification mandatory.
Major	Life threatening injury or multiple injuries requiring admission to hospital and/or significant effect on environment that may take up to a year to restore and cost up to \$1,000,000. Regulator notification mandatory.
Moderate	Injury requiring admission to hospital and/or effect on environment that may take 1-2 months to restore and cost up to \$20,000. Regulator notification mandatory.
Minor	Minor illness or injury requiring medical treatment (e.g. first aid) and/or minor effect on environment that can be cleaned up. Any potential damage remediation likely to cost less than \$5,000. Regulator notification unlikely to be required.
Negligible	Illness or injury that doesn't require medical attention. No adverse effect on environment and regulator notification not required.

A single risk usually can result in a range of consequences, generally with less severe consequences being more common. To obtain one rating one must generally consider the scenario that gives the highest number (that is, the worst case).

The significance scale for unplanned events is presented in the following table. It is based on the estimated risk and estimated probability of occurrence.

Level of Risk	Probability of Occurrence					
	Likely	Occasional	Seldom	Unlikely	Remote	Rare
Negligible	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant	Insignificant
Minor	Minor	Minor	Minor	Insignificant	Insignificant	Insignificant
Moderate	Moderate	Moderate	Moderate	Minor	Minor	Minor
Major	Major	Major	Moderate	Moderate	Moderate	Minor
Catastrophic	Major	Major	Major	Major	Moderate	Moderate

Example: Consequences of fire at grain silos

Note: Assume worst case scenario

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There have been many cases of explosions and fires in grain silos and associated ducts and buildings. If the air inside becomes laden with finely granulated particles, such as grain dust, a spark can trigger an explosion powerful enough to blow a silo and adjacent buildings apart, usually setting the adjacent grain and building on fire. Sparks are often caused by (metal) rubbing against metal ducts; or due to static electricity produced by dust moving along the ducts when extra dry. Overheating and mechanical failure of unloading or loading belts and other mechanical equipment and electrical failure can also cause fire outbreaks.

Possible impacts include severe to fatal impacts on workers and impacts of combustion gases (smoke) on surrounding communities. As the area surrounding the Dandara silo site is largely agricultural lands and rural settlements, little impact regarding explosions or fires is expected, as silo fires are normally contained within the site (based on past records of silo explosions/fires). Grain silo explosions can cause broken windows and other impacts on buildings 500m or more if there would be an explosion, but little impact is expected in the agricultural areas to the south of the site.

The incidence of grain silo explosions in the U.S. alone were 8.14E-03 per million tons of wheat. The time of return of explosions was 122.9 per million tons. This will be construed as occasional recurrence. The worst-case impacts are rated as Major. This gives a significance of **Major**. Mitigation measures will therefore be necessary to reduce the possible impact.

6.2. Analysis of Environmental and Social Risks and Impacts for Planned Activities

Table (6.2a): Construction phase risks and Impacts.

Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
Environmental	Risks on Ambient air due to airborne Dust	Airborne dust can be generated from construction activities such as excavation and concrete mixing. This dust can pollute the air and can also pose a health hazard to workers and nearby residents.	Construction phase will result in slight, localized, short term (20 months) dust emissions from construction activities. Therefore, the magnitude of the impact is deemed small the emissions will be limited, mainly affecting the work environment and the surrounding agriculture lands and road and building. The vulnerability of the receptor is High. Therefore, the significance of the impact is Moderate.	1 Short term	1 Localized	2 Slight	4 Small	High	Moderate	Minor
	Engine Exhaust Gases and other sources of air emissions	Exhaust fumes and gaseous emissions such as NOx, Sox and Particulate matter (PM2) and (PM10) from internal combustion	As above, Construction activities will result in slight, localized, short term (20 months), air quality emissions from fuel combustion/burning from construction equipment, machineries and transport vehicles. The vehicle exhausts together with dust generated	1 Short term	1 Localized	2 Slight	4 small	High	Moderate	Minor

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
		engines/ generators/ vehicles and machineries used present another risk to air quality on and close to construction sites.	constitute major pollutants which can affect air quality. The most relevant pollutant considered is particulate matter because of its potentially significant increase during the construction phase. Air pollution will have health implications on the workers, visitors and the neighboring community as it causes respiratory diseases and is a visual irritant (see area of influence). Therefore, the magnitude of the impact is deemed small. The emissions will be limited mainly affecting the work environment. The vulnerability of the receptor (surrounding agriculture lands) is High. Therefore, the significance of the impact is Moderate.							

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
	Risks on Soil and Water resources contamination	- Proximity to the Nile River (500m) increases the risk of water contamination from construction runoff, accidental spills, or improper waste disposal, potentially impacting water quality and aquatic life. - The project may impact soil quality and groundwater quality (on the long run) from; - Accidental oil and fuel spills from	- Construction activities resulting in Nile water, soil and groundwater pollution is of low probability, as these events are accidental. Spills may result from domestic sewage, accidental oil and fuel spills from machineries and vehicles and diesel generator if used and spills from stored chemicals and materials and wastes. - The impacts are Moderately severe, localized and short term with an overall magnitude level of small. The soil and groundwater vulnerability are considered moderate, firstly because spills on the soil can be easily contained and cleaned and groundwater is located at a deep level(50-60 m). But, the Nile River are considered High due to its Proximity to the silo site. Therefore, the	1 Short term	1 Localized	3 Moderate	5 Small	High	Moderate	Minor



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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
		machineries and vehicles used. • Runoff risks from pesticides used near caravans used which could pollute nearby lands/soils • Risks from establishing the water connection may lead to contamination of soil. • Risks from the establishment of electricity connection to the silo may lead to contamination of soils if	overall sensitivity is considered High. The significance of the impacts is therefore assessed to be Moderate.							

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
		batteries are used								
	Risks on Ambient Noise	- The following equipment used excavation and grading of the site may produce high noise emissions: - the use of heavy machinery, such as trucks, bulldozers, and excavators. - the operation of construction equipment, such as generators and compressors.	Construction phase will result in slight, localized, short term noise emission from machineries and vehicles used. Therefore, the magnitude of the impact is deemed small. The emissions will be limited mainly affecting the work environment. The closest residential area is in the village of Dandara, which is located at more than 6km away. However the silo area is a few meters away from agriculture lands and rural building as described in baseline sections. Therefore, the significance of the impact is Minor.	1 Short term	1 Localized	2 Slight	4 Small	Medium	Minor	Insignificant/ Negligible
	Biodiversity/ pesticides consumption	Impacts on biodiversity may result in the disturbance	This impact is slight, localized and short term. The magnitude of the impact is small. The project is located in an area	1 Short term	1 Localized	2 Slight	4 Small	Moderate	Minor	Insignificant/Negligible

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
	ion by non-targeted species The risk of hunting and disturbance of wild animals in case they are present Bird collision risk	of wildlife from noise, dust, air, light emissions and waste generation including chemicals. • Non targeted wildlife may consume rodenticides by accidents or consume the dead rodent if not collected right away and disposed properly and in turn leading to their secondary poisoning.	devoid of vegetation and outside from ecologically sensitive zones with low biological value. Moreover, bird collision risks is low, as the silo design does not include reflective materials. The vulnerability of the receptor is Moderate , and the short-term duration of the risk, the significance of the impacts are assessed to be Minor .							
	Waste generation (solid, liquid, and hazardous)	Solid waste • Increased waste generation from materials,	This impact is slight, localized and short term. The emissions will be limited mainly affecting the work environment. With proper management (handling,	1 Short term	1 Localized	2 Slight	4 Small	Low-Medium	Insignificant minor	Insignificant/Negligible

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
	wastes) emissions	packaging, debris. - Construction waste - Large quantity of excavated soil will be generated among other construction waste. - Solid waste may be generated during the establishment of the water connection into the silo. - Solid waste may be generated during the establishment of the	storage and disposal of wastes), the risks can be easily contained. Therefore, the magnitude of the impact is deemed small. The workers will use the latrines on site with sewage tanks that are emptied regularly at the local sewage network. The vulnerability of the receptor is medium. The soil and groundwater vulnerability are considered low. The significance of the impact is deemed Insignificant- Minor.							

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Tempo ral scale	Spatial scale	Severity	Total			
		electricity connection to the silo. Liquid waste - Potential wastewater from concrete mixing, equipment washing, sanitation. Hazardous waste - Potentially hazardous waste from paints, solvents, oils, pesticides containers and chemicals. - E-waste may be generated during the establishment of the electricity								

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
		connection to the silo.								
Socioeconomic Aspects	Risks to labor from inappropriate working conditions	- Unfair treatment (discrimination, delayed payments, unsafe working conditions). - Unresolved complaints from the lack of grievance mechanism for workers.	Those risks are of short term, localized with a severity level between slight-moderate. The Magnitude is therefore assessed to be small. The sensitivity of the receptors (construction project workers) is High. Therefore, the risk significance is deemed Moderate	1 Short term	1 Localized	2-3 Slight-Moderate	4-5 Small	High	Moderate	Moderate
	Child Labor	- Exploitation of children in construction work. - Hazardous working conditions. - Interference with education. Increased vulnerability to	Those risks are localized and severe in nature. The impact may last for the long term (injuries, loss of educational opportunities etc.) The magnitude is therefore assessed to be moderate. The sensitivity of the receptors (children under the age of 18) is High. Therefore, the risk	4 Long term	1 Localized	4 Severe	9 moderate	High	Major	Major

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
		exploitation or abuse	significance is deemed Major .							
	Risks of SEA/SH	- Risk of sexual exploitation and abuse and harassment may increase due to the presence of workers near local communities and lack of awareness on SEA/SH issues - There is a risk of violence from appointed security personnel.	Those risks are of short term, localized with a severity level slightly severe because they can be easily mitigated with low-cost measures. The magnitude is deemed small. The sensitivity of the receptor is Medium/Moderate. The overall impact significance is Minor.	1 Short term	1 Localized	2 Slight	4-5 Small	Medium/Moderate	Minor	Minor
	Community health and safety: Traffic	Traffic accidents due to the increase in number of trucks during construction	The risk is of short term, at district -regional levels and is moderately severe. The magnitude is therefore Small-Moderate.	1 Short term	2-3 District-regional	3 Moderately Severe	6-7 Small-Moderate	High	Moderate-Major	Moderate

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
	risks and accidents	phase may pose a risk on other road users. - Traffic congestions due to the increase in transportation trucks for materials, machineries and wastes to and from the site. - Potential risks from air and noise emissions and vibration from high traffic volume during transportation of materials and machineries and wastes to								

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
		and from the site.								
	Community health and safety: Electrical Hazards and Power Supply Risks	The burial of transmission lines may result in power outages, potentially disrupting electricity supply to nearby communities or agricultural operations	Those risks are short term, localized and slightly severe, as they can be effectively mitigated with low-cost measures. The magnitude is deemed Small. The sensitivity of the receptor is High. The overall impact significance is Moderate.	1 Short term	1 Localized	2 Slight	4 Small	High	Moderate	Minor
	Communities' discontent /dissatisfaction	This risk can be encountered as a result of: lack of transparency in information sharing including information about the impacts and	Those risks are of long term, localized with a slight severity level. A Stakeholder Engagement Plan was formulated to inform on the project design and community's needs. The Magnitude is therefore assessed to be Moderate. The sensitivity of the receptors (construction project workers) is High.	4 Long term	2-3 District-regional	2 Slight Severity	8-9 Moderate	High	Major	Moderate

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
		mitigation measures - Lack of consultation - Risks of increase in unresolved complaints	Therefore, the risk significance is deemed Major							
	Risks on Cultural Heritage and archeological sites	Impacts on archaeological and historic sites during the construction phase are expected to be negligible since there are no archeological sites nearby the subproject site.	NA	NA	NA	NA	NA	NA	NA	NA
OHS Aspects	Occupational Health and Safety (OHS)	The use of hazardous materials and chemicals and wastes can pose	The risks are long-term (Major injuries which may result in long-term health impacts, loss of limb etc.), localized and are severe. The	4 Long-term	1 Localized	4 Severe	9 Moderate	High	Major	Moderate

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
	risks/ Lack of OHS considerations	a risk to worker health (i.e. cement, paints, oil, asphalt etc.). - Falls from heights are a possible cause of injuries in construction (silo rooftop areas/ use of scaffoldings etc.). - Electrical hazards can cause serious injuries or death. - Machinery can cause crushing injuries or amputations/moving loads. - Dust and fumes can irritate the eyes, nose, and throat, and can also cause	magnitude of the risks is deemed moderate. The sensitivity of the receptor is High prior mitigation measures. Therefore, the risk significance is deemed Major	•						



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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
		respiratory problems. • Noise emissions may disturb workers. • Falling into excavated zones. • Working during bad weather conditions (dust storm, heat wave, rainy seasons etc.). • Injuries and burns from welding activities. • Accidents while transporting materials and machinery to and from the subproject site. • Accidental loads falling on workers while								

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
		being lifted by cranes. - Physical injuries from physical activities and wrong lifting techniques, wrong posture while conducting any work. - Slip trip and fall - Injuries and cuts from machineries and hand arm vibration syndrome from machineries used - Working in confined area (risk of asphyxia while working inside the silos) during construction phase. - Risks of electrocution								

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Tempo ral scale	Spatial scale	Severity	Total			
		while installing the Silos. • Getting hit by moving load/vehicle/machine. • Risks of snake and/or scorpion bites. Risks of establishing the water connection to the Silo • Workers may fall into open excavations. • Workers could be struck by or caught in heavy machinery used for excavation and installation. • Workers may encounter								

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Tempo ral scale	Spatial scale	Severity	Total			
		hazardous materials, such as contaminated soil or water. - High temperatures may cause heat stress or sunstroke among workers. Risks of establishing the electricity connection to the Silo - Risk of workers coming into contact with live wires or faulty equipment causing Electrical Shock and Electrocutation and fire risks.								

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Tempo ral scale	Spatial scale	Severity	Total			
		- workers involved in the installation and maintenance of buried transmission lines may face risks associated with contact with high-voltage lines. - Workers may need to climb poles or structures, increasing the risk of falls from height. - Risk of accidents involving machinery used for digging and cable laying. - Potential exposure to hazardous materials such as								



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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Tempo ral scale	Spatial scale	Severity	Total			
		old or damaged insulation, batteries and e- waste. High temperatures may cause heat stress or sunstroke among workers.								

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Table (6.2b): Risks and impacts for unplanned events during Construction phase

Factors	Impacts/risks	Description	Impact Summary	Probability of occurrence	Level of risk	Impact significance level	Impact significance after mitigation measures implementation (table 6.1)
Catastrophic events/ extreme events (fire and explosion)	Catastrophic event can produce major negative impacts on OHS and public health and safety	Fire and explosion risks from badly stored fuel/ poorly stored/installed generator, transformer and mishandling of chemicals during construction phase can lead to the death of workers	- During construction, fire risks and explosion from chemicals (i.e. fuel or diesel if any) / and generator used during construction activities may occur. However, contractors usually follow Egyptian regulations for fuel and hazardous chemicals handling and proper safety measures. The probability of this risk to occur is Seldom - Impacts from fire and explosion may be irreversible (life threatening/ loss of lives) and therefore the risk level is deemed Moderate.	Seldom	Major	Moderate	Moderate

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Factors	Impacts/risks	Description	Impact Summary	Probability of occurrence	Level of risk	Impact significance level	Impact significance after mitigation measures implementation (table 6.1)
			The impact significance is deemed Major.				
Catastrophic events/ extreme events (fire and explosion)	Risk of property loss	Fire and explosion (i.e generator/fuel/transformer) events from construction work can produce major negative impacts on the society (i.e. loss of livelihood and property) as follows: Damage to agriculture irrigation systems and agriculture lands nearby	- Fire and explosion events resulting from construction activities due to badly stored fuel and mishandling of chemicals and generator mismanagement can lead to potential damage to agriculture irrigation systems and agriculture lands nearby. The impacts are temporary until the agriculture lands are rehabilitated/reconstructed/ - Fire risks are not expected to reach neighboring areas as fire risks are expected to be contained within project site boundaries. - Therefore, based on the above, the risk level is Moderate.	Occasionally	Moderate	Moderate	Minor



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Factors	Impacts/risks	Description	Impact Summary	Probability of occurrence	Level of risk	Impact significance level	Impact significance after mitigation measures implementation (table 6.1)
			- Moreover, Contractors usually follow Egyptian regulations for fuel and hazardous chemicals handling and proper safety measures. - The overall impact significance is therefore deemed Moderate.				

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Table (6.3a): Operation phase risks and impacts for planned activities

Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
Environmental	Airborne Dust	Airborne dust can be generated from activities such as loading and unloading grain, and from the movement of grain through the Silos. This dust can pollute the air and can also contribute to the formation of smog.	- Those impacts are intermittent but long-term (mainly during loading and unloading seasons), localized and slightly severe. The magnitude is moderate. - The emissions will be limited mainly affecting the work environment - The sensitivity of the receptor is medium - The overall assessment is deemed Moderate	4 Long term	1 Localized	2 Slightly Severe	7 Moderate	Medium	Moderate	Insignificant

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
	Gaseous emissions from Engine Exhaust fumigation and other sources	The major activities at this phase are maintenance procedures and transport of many cars during the daytime. Trucks transporting grains will release exhaust emissions, containing carbon monoxide (CO), sulfur dioxide (SO₂), oxides of nitrogen (NOX), and particulate matter (PM).	- Those impacts are long-term localized and slightly severe. The magnitude level is moderate. - The emissions will be limited, mainly affecting the work environment and immediate vicinity. - The sensitivity of the receptor is medium - The overall assessment is deemed Moderate	4 Long term	1 Localized	4 Severe	9 Moderate	Medium	Moderate	Minor



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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		- Exhaust fumes and gaseous emissions such as NOx, Sox and Particulate matter (PM2) and (PM10) from internal combustion engines/ generators/ vehicles and machineries used present another risk to air quality on and close to construction sites. - Fumigation emissions from silos and airborne drift from								



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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		pesticides application may also reduce ambient air quality Odors emanate from fermenting grains. A major contributor to the odor is dimethyl disulfide which has been identified as a key component of the emitted volatiles. This is often accompanied by hydrogen								



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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		sulfide, dimethyl sulfide and dimethyl trisulfide which is particularly odiferous. These odors can become a nuisance, causing temporary symptoms such as headache and nausea but can be lethal when emitted in excess. Grain storage structures can develop potentially hazardous atmospheres due to gases								



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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		produced from fermenting grains. Fermenting or molding grain produces carbon dioxide (CO ₂), nitric oxide (NO), and compounds known to be respiratory irritants such as nitrogen dioxide (NO ₂) and nitrogen tetroxide (N ₂ O ₄). However, individual reactions to silo gas depend on								

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		the concentration of inhaled gas and length of exposure. While low NO2 concentrations can cause coughing, labored breathing, and nausea, high concentrations can cause fluid to fill the lungs.								
	Impacts on Soil and long-term risks on ground Water quality from	Soil contamination and water pollution are accidental and mainly due to:	The operation and maintenance phase may result in long-term, localized and slightly severe risks on soil contamination.	4 Long term	1 Localized	2 Slightly Severe	7 Moderate	Low	Minor	Insignificant

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
	trucks and machinerie s	➤ Mismanage ment of chemicals and wrong storage and handling and disposal use of machine lubricants ➤ Fuel spills of trucks transporting grains to and from the Silo Complex in Dandara. ➤ Inappropriat e waste disposal from the offices and inappropriat e sewage disposal	Leaks from chemicals and trucks and sewage tanks on the soil are of low probability, as these events are accidental. The silo management has a sewage collection tank that is regularly emptied in the public sewage network. The magnitude of the impact is deemed moderate. • The soil and groundwater vulnerability are considered low, firstly because spills on the soil can be easily							

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		which may contaminate the soil. ➤ Spills may also result from result from badly stored chemicals and materials and wastes. ➤ Badly stored and bad disposal off fumigation chemical (Phostoxin) may pose risk of contamination Accidental spills from generator.	contained and cleaned and groundwater is located at a deep level. The significance of the impacts is therefore assessed as Minor/insignificant.							

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
	Risks on the Nile River and Grain Transport	Proximity to the Nile River (500m) to the silo site increases the risk of water contamination from accidental grain spills, or waste discharge from transport vessels may pollute the river, affecting water quality and aquatic life.	the activities during operation phase resulting in Nile water pollution is of low probability, as these events are accidental. The impacts are Moderately severe, localized and long term with an overall magnitude level of Moderate . The significance of the impacts is therefore assessed to be High .	4 Long term	1 Localized	3 Moderately Severe	8 Moderate	High	Major	moderate
	Ambient Noise	The following activities can generate noise pollution: a) the loading and unloading of	Construction phase will result in slight, localized, long-term noise emission from silos operations. Therefore, the	4 Long term	1 Localized	2 Slightly Severe	7 Moderate	Medium	Moderate	Insignificant

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		materials as well as the loading and unloading of grains from the trucks to and from the silos, b) the operation of fans and pumps, conveyer belts, motors and other units, and c) the movement of vehicles and machinery in and around the Silos project site noise from the generator.	magnitude of the impact is deemed moderate. The emissions will be limited, mainly affecting the work environment. The vulnerability of the receptor is medium. The closest residential area is in the village of Dandara which is located at more than 6km away. However the silo area is a few meters away from agriculture lands and rural building as described in baseline sections							

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
			Therefore, the significance of the impact is Moderate .							
	Biodiversity	The following activities can have a negative impact on biodiversity in the study area: a) the use of pesticides can be consumed by non-targeted species and can lead to their poison/death b) the emission of pollutants from vehicles and	This impact is slight, localized and prolonged term. The magnitude of the impact is small. The project is located in an area devoid of vegetation and outside from ecologically sensitive zones with low biological value. Moreover, The risk of bird collision is low, as the silo design does not include reflective	3 Prolonged- term	1 Localized	2 Slightly Severe	6 Small	High	Moderate	Minor

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		machinery can pollute the air and water, which can harm animals if any. Bird collision risks	materials Given the high importance of the receptor (migratory birds), the significance of the impacts are assessed to be Moderate .							
	Waste Management	Solid waste - Ongoing generation from silo operations, maintenance work, offices. Liquid waste - Potential wastewater from grain washing, equipment cleaning,	This impact is slight, localized and long-term. The emissions will be limited mainly affecting the work environment. With proper management (handling, storage and disposal of wastes), the risks can be easily contained. Therefore, the	4 Long term	1 Localized	2 Slightly Severe	7 Moderate	Low-Medium	Minor-Moderate	Insignificant

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		sanitation (water use is minimal). Hazardous waste Potentially hazardous waste from pesticide use, grain fumigation, maintenance.	magnitude of the impact is deemed moderate . The vulnerability of the receptor is medium . The soil and groundwater vulnerability are considered low . The significance of the impact is deemed Minor-Moderate .							
	Risks to labor and lack of appropriate work conditions and risks on Seasonal Workers	Silo workers and seasonal workers may face unfair treatment (discrimination, delayed payments, unsafe working conditions and	Those risks are of long-term-, localized with a severity level equals to Severe. The Magnitude is therefore assessed to be Moderate. The sensitivity of the receptors	4 Longterm	1 Localized	4 Severe	9 Moderate	High	Major	Moderate

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		unresolved complaints from the lack of grievance mechanism. - Workers may face occupational health and safety hazards (e.g., grain dust exposure, machinery accidents) - Seasonal workers including cleaning workers during operational phase are at risk from working from height and confined	(construction project workers) is High. The risks are therefore deemed Major.							



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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		areas, utilizing child labor and improper PPEs, from the following activities: ➤ There is a contractor that brings seasonal workers to empty seed bags and conducting cleaning activities including silos cleaning. ➤ The cleaning specialists remove the grains from the bottom and sides of								

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		the silos. Cleaning is done every beginning of the season								
	Risks on vulnerable populations	Gender, ethnicity and other social stratification of beneficiaries may lead to disproportionate distribution of project benefits especially on vulnerable populations (minorities, women, disabled and very poor populations) as follows:	- This risk is long-term, district level, moderately severe. The magnitude is therefore moderate. - The sensitivity of the receptor is high. The impact level is therefore deemed Major.	4 Long term	2 District	3 Moderately Severe	9 Moderate	High	Major	Minor-Moderate



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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		- Limited access to silo services by small farmers and vulnerable populations due to elite capture. - Risk of unequal access to food distribution channels and purchasing power which can lower food accessibility to vulnerable population.								

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
Socio-economic Aspects	Risks on children/child labor/children present in silos during grain transport	• Presence of children in grain handling or transport and loss of educational opportunities	• The risk is long-term but intermittent (during grain handling/transfer), localized with a severity level equals to severe (health risks on children loss of educational opportunities). The magnitude is therefore assessed to be Moderate. The sensitivity of the receptors (children below the age of 18) is High. Therefore, the	4	1	4	9	High	Major	Major
	Risks of child labor by seasonal workers subcontractors	• Children being Exposed to hazardous substances or working conditions.		Long term	Localized	Severe	Moderate			

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
			risk significance is deemed Major .							
	Risks of SEA/SH	Potential SEA/SH among staff and visitors.	Those risks are long-term, localized with a severity level of slightly severe because the risks can be easily mitigated with low-cost measures. The magnitude is deemed Moderate. The sensitivity of the receptor is Medium/Moderate. The overall impact significance is Moderate.	4 Long-term	1 Localized	2 Slightly severe	7 Moderate	Medium/Moderate	Moderate	Minor

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
	Community health and safety: Traffic risks and accidents	Risks of increase in traffic and road accidents during high storage season.	The risk is of long-term, at district - regional levels and is moderately severe. The magnitude is therefore Large. Local community including silo customers are at risk of road accidents. The	4 Long term	2-3 District-Regional	3 Moderately Severe	9-10 Large	High	Major	Moderate

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
			sensitivity of the receptor is High The overall risk significance level is Major .							
Occupational Health and Safety (OHS)	Risks from silo operations on workers	Risks on workers respiratory system: Grain dust pollution while loading and offloading grains may lead to impacts on human health. Long-term exposure to	The OHS risks are long-term, localized and severe. The magnitude is, therefore, moderate . The sensitivity of the receptor is High . The overall risks are assessed to Major .	4 Long term	1 Localized	4 Severe	9 Moderate	High	Major	Moderate



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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		grain dust can cause respiratory problems. • Gaseous exposures from trucks causing severe respiratory irritation, • Falling from height or accidentally falling in silos while working at height during maintenance • Asphyxia from working in confined areas while conducting maintenance works.								



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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		- Grain dust is a fire hazard, and a fire at the silos could cause serious injuries or death. - Fire risks from transformer. - Grain dust explosions can also cause serious injuries or death. - Risks from grain engulfment - Risks of being entangled in unguarded auger and								

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		potential injuries • Risks of burns from hot surfaces • Noise and vibration emissions from silos operations and units, • Unhygienic practices • Handling of toxic substance, chemicals and wastes, such as pesticides and rodenticide especially during application								



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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		- Risks of skin and eye burns and irritation from handling, storing and disposing chemicals and empty containers and other types of wastes including domestic waste - Risks of snake and/or scorpion bites.								

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Table (6.3b): Risks and impacts of Unplanned events during Operation phase.

Factors	Impacts/risks	Description	Impact Summary	Probability of occurrence	Level of risk	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
Catastrophic events/ extreme events	Catastrophic events can produce major negative impacts on OHS, health and safety of silo users including non-workers and neighboring lands	Fire and explosion during silo operations (unpredicted events) can lead to the death of workers and silo users. • Phostoxin/Aluminum phosphide may ignite spontaneously and may lead to explosion • Risk of leaks of Phostoxin during transportation • Fire risks from transformer	• Fire and explosions from silo operations may occur. • Possible impacts include severe to fatal impacts on workers and impacts of combustion gases (smoke) on surrounding communities. As the area bordering the silo site is largely agricultural, little impact regarding explosions or fires is expected, as silo fires are normally contained within the site (based on past records of silo explosions/fires). Grain silo explosions can cause broken windows and other impacts on buildings 500m or more from the explosion, but little impact is expected in the agricultural areas to the south of the site • The incidence of grain silo explosions in the U.S. alone were 8.14E-03 per million tons of wheat. The time of return of explosions was 122.9 per	Occasionally	Major	Major	Moderate

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Factors	Impacts/risks	Description	Impact Summary	Probability of occurrence	Level of risk	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
			million tons. This will be construed as occasional recurrence. The worst-case impacts are rated as Major since impacts from fire and explosion may be irreversible (life threatening). The impact significance is therefore deemed Major.				
Catastrophic events/ extreme events (fire and explosion)	Risk of property losses	Catastrophic events such as explosions and fire events can produce major negative impacts on the livelihood of silo users and nearby agriculture lands and irrigation systems.	Fire and explosion from silo operations can lead to loss of stored grain in the silos/socio-economic losses. The risk may lead to temporary economic losses to farmers and traders due to silo damage which may temporarily stop the grain buying and selling activities. This risk may also impact farmers who are in the process of unloading their grains and before receiving their payment. The impacts are temporary until compensations are provided to unpaid farmers and storage areas are reconstructed rehabilitated for other farmers	Occasionally	Moderate	Moderate	Minor

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Factors	Impacts/risks	Description	Impact Summary	Probability of occurrence	Level of risk	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
			and traders to use for selling and buying grains. - Therefore, the risk level is Moderate. - Risks of damage to surrounding agriculture lands and irrigation systems from fire and explosion events is also Moderate. - Moreover, the silos have their own heat sensors and firefighting systems and procedures. - The probability of this risk occurring is occasional. - The overall impact significance is therefore deemed Moderate.				
Catastrophic events/ extreme events	Pesticides leaks	Pesticides during fumigation activities may leak into the atmosphere and cause health and safety and environment risks.	The risk of pesticide leaks may occur during fumigation. However, prior to handing over, silos are pressure tested to ensure no gas leaks and to ensure proper sealing. Pressure testing is an ongoing process in silos and is also carried out before fumigation.	Likely	Moderate	Moderate	Minor



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Factors	Impacts/risks	Description	Impact Summary	Probability of occurrence	Level of risk	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
			- The design of the silos takes into consideration pesticides leaks. - This impact may occur if improper management/ maintenance of silos and leak tests are not performed on a regular basis. Since fumigation is carried out almost every month. The probability of the risk is deemed Likely. - Since risks may cause skin and lung injuries to workers and community nearby, the level of the risk is Moderate.				

6.3. Cumulative Impacts

Surface water from the Nile River and groundwater resources in the Dandara area are considered Valued Environmental Components (VECs) that may be impacted by cumulative developments and other external factors. There are ongoing national initiatives to increase agricultural land reclamation in Upper Egypt, including Qena Governorate, which may put additional pressure on water resources in the region.

The reclaimed lands near Dandara primarily rely on surface water obtained from the Nile River for irrigation, as described in the socio-economic baseline. The expansion of agricultural lands is regulated by the Ministry of Water Resources and Irrigation (MWRI), ensuring that new reclamation projects are aligned with the availability of water resources. The Dandara area benefits from water supply through established irrigation channels and public networks.

Although climate change and increased competition for water resources may pose future challenges, current water usage in the Dandara region is closely managed. Climate models predict slight increases in evaporation rates, which may further stress water availability, but national water management strategies are in place to mitigate these risks. According to El-Mahdy et al. (2021), evaporation rates in the region are expected to increase by approximately 2% by 2050 due to climate change. Additionally, studies by El-Shirbeny & Abutaleb (2018) highlight the ongoing pressure on water resources caused by rising temperatures and increased evaporation. In response to these challenges, the Ministry of Water Resources and Irrigation (MWRI) has implemented strategies to monitor and regulate water usage to ensure sustainable water management in the face of climate variability.

The Dandara Silo will rely on surface water from the Nile and will not extract groundwater resources, as groundwater is located at a significant depth. A small connection to the existing water network will be established to supply the silo during both the construction and operational phases. The estimated water usage during construction is approximately 1068 m³ over 20 months, and during operation, the average monthly consumption is expected to range between 70 and 140 m³, with an annual total of around 1,680 m³.

The percentage of water used by the Dandara Silo during construction and operation phases will be negligible in relation to the total water available in the region. The silo's operations will not significantly affect the overall water budget of the Nile River or contribute to cumulative impacts on groundwater and surface water resources. Moreover, the government's plans to expand agricultural lands in Qena will proceed regardless of the silo's establishment, and the silo will serve to support the anticipated increase in crop production. Therefore, the Dandara Silo project is not expected to contribute to significant cumulative impacts on local water resources.

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7

MITIGATION MEASUREMENTS

7.1. The Environmental and Social Management Plan (ESMP)

The Environmental and Social Management Plan (ESMP) is a plan that outlines how a project will manage its environmental and social impacts. It identifies potential impacts, sets out mitigation measures, and establishes monitoring and reporting procedures. Any project has both positive and negative impacts on the environment. When planning and implementing a project, it is important to consider all the potential impacts, both positive and negative, and to take steps to minimize the negative impacts.

The ESMP will address the environmental and social impacts during the construction and operational phases of the silos project. Due regard must be given to environmental protection during the entire project. To achieve this, several environmental specifications/recommendations are made. These are aimed at ensuring that the contractors maintain adequate control over the project to: a) minimize the extent of impact during construction, and b) ensure appropriate restoration of areas affected by operation, and c) prevent long-term environmental degradation.

7.2. EHCSS Environmental and Social Management System (ESMS)

The EHCSS Environmental and Social Management System (ESMS) has been in place since (2002). The ESMS provides for continual improvement through periodic review and, as necessary, updating of environmental and social (E&S) and OHS targets, deadlines, and measurement of results. The ESMS assigns responsibilities to appropriate departments and personnel. Full support for the ESMS is by senior management was obtained via formal approval of the ESMS corporate policy, thus sending a clear message, to all employees at all levels, that this is a long-term commitment by EHCSS to sound E&S and OHS management.

Development of ESMS Action Plans was based on responding to the following key questions:

- **What** – environmental and social risks you want to address
- **How** – related actions and procedures to be implemented to address the risk
- **Why** – reasons (objectives) for the actions and procedures, and the expected

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results (targets)

- **When** – timeframe and deadlines
- **Who** – responsible people

The ESMS contains a summary of the key elements required for a robust risk assessment system, specifically environmental, OHS, labor and community risks associated with EHCSS activities.

The ESMS provides for

- monitoring E&S and OHS performance indicators, as defined in the ESMS, at regular intervals (at least once a year).
- updating the ESMS if there are significant changes to operations.
- updating the ESMS if there are external changes such as new laws or regulations.
- collecting periodic input regarding performance of the system from all levels of workers and managers.
- collecting input from affected communities and other external stakeholders through stakeholder consultation (as detailed in the SEP).
- the use of external consultants and experts for complex projects, as required.
- periodic assessment and prioritization of E&S and OHS risks associated with EHCSS activities according to both their probability and the severity of negative impacts.
- linking monitoring plans to prioritized risks.
- Consideration of risks in the EHCSS supply chain in addition to those in your company, scaled as appropriate to the size and complexity of the business.

Senior EHCSS management recognizes that the team that takes responsibility for the ESMS does not need to be a full-time job for team members, but senior management ensures realignment of reporting duties, allocation of appropriate time and authority to carry out the work involved as necessary. Involved departments includes human resources, production, procurement and maintenance. Human resources manage training needs related to the labor aspects: production focuses on the more efficient use of resources and the reduction of waste; procurement manages the qualifications and performance of suppliers and contractors; and maintenance ensures that the equipment runs efficiently, and that spills, leaks and other emergency situations are minimized.

In carrying out its responsibilities, the ESMS Team consults with people from all levels of the company, including supervisors and workers, as they are key frontline identifiers of problems.

Plans /procedures provided in the ESMP's annexes for Emergency Evacuation Plan (EEP), Occupational Health and Safety Plan (OHS) and Traffic Management Plan (TMP) and Pest

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Management Plan (PMP) will be revised and developed into full-fledged plans (i) by the contractor during construction phase as part of their C-ESMP and approved by EHCSS PMU or delegated consultants and (ii) by the Silo Design Consultant (responsible to bring in needed experts to advise on those plans) during operational phase for operational phase plans and approved by EHCSS.

Traffic Management Plan (Appendix II)

Contractor's Traffic Management Plan (TMP) should include key components to ensure the proper management of traffic and minimize negative impacts on the environment, workers, and the community. The key components of a contractor's TMP can be summarized as follows:

- a. Objective of Traffic Management Plan: The TMP should clearly define its objectives, which are based on the guidelines of the Environmental and Social Framework of the World Bank (WB) and determine the responsibilities for the evaluation, management, and follow-up of the environmental and social impacts associated with the project implementation phases
- b. Legal and Institutional Framework**: The plan should outline the legal and institutional framework within which the traffic management activities will be conducted. This includes compliance with national regulations as well as the requirements of the World Bank's Environmental and Social Framework (ESS 4)
- c. Site and Surroundings Diagnostics and Characteristics**: The TMP should include an assessment of the site and its surroundings, including the traffic conditions, road configurations, access points, and any potential environmental and social impacts related to traffic management
- d. Possible Environmental and Social Impacts: The plan should identify potential environmental and social impacts associated with traffic management during the construction and operational phases of the project.
- e. Evaluation of Environmental and Social Impacts: The TMP should include an evaluation of the identified environmental and social impacts, along with measures to avoid, reduce, and minimize these impacts
- f. Measurements for Traffic Management: Specific measures for traffic management during the construction and operational phases of the project should be detailed in the plan
- g. Implementation Plan: The TMP should outline a comprehensive implementation plan, including the roles and responsibilities of the involved parties, coordination with local authorities, and the use of appropriate traffic management measures

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- h. Budget and Costs: The plan should include a budget for implementing the traffic management measures, including the costs associated with infrastructure, equipment, and personnel
- i. Stakeholders Consultation Plan: A plan for engaging and consulting with relevant stakeholders, including local communities, authorities, and other affected parties, should be part of the TMP
- j. Grievance Redressal Mechanism: The plan should incorporate a mechanism for addressing grievances related to traffic management, allowing affected parties to raise concerns and seek resolution
- k. Follow-up and Evaluation: The TMP should include provisions for ongoing follow-up and evaluation of the effectiveness of the traffic management measures, with opportunities for adjustments and improvements as needed
- l. Adaptive Management Arrangements: The plan should incorporate adaptive management arrangements to respond to changing conditions and new information, ensuring that the traffic management measures remain effective throughout the project lifecycle

Regarding **emergency situations** (unplanned activities), the following steps help to anticipate the possible scenarios and prepare accordingly:

- Identification of the areas where accidents and emergency situations may occur, and communities and individuals that may be impacted. This has been accomplished through process analysis, physical mapping and consultations with workers, experts and the community.
- Development of response procedures for each identified emergency situation that clearly explain what actions need to be taken. These need to be detailed clearly for everyone in your company to understand what he or she needs to do.
- Provision of necessary equipment and resources to effectively implement the response plans. A stockpile of fire extinguishers is not effective unless people can effectively find and use them when needed.
- Assignment of responsibilities so that each activity has people responsible for carrying it out, and designation of persons responsible for routine analysis of how well the system is working and update the risk assessment and plans.
- Assurance that everyone in your company (and the affected community) understands the importance of the emergency preparedness and response system and is encouraged to help monitor and improve its effectiveness.
- Provision of periodic training so that everyone in your company has an overview of the system, and knows the response plans, and ensure that concerned people can exercise individual judgment and adapt to quickly changing situations.

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- Collaboration with government agencies and community groups to identify areas of common concern to allow effective response to internal and external situations.
- Periodic checks and drills to test how well the system is working.

The Emergency Evacuation Plan (EEP) specific to the Dandara sub-project is attached in Appendix VI. As required by the EHCSS ESMS, it includes:

- identification of potential emergencies based on hazard assessment.
- procedures to respond to the identified emergency situations.
- procedures to shut down equipment.
- procedures for rescue and evacuation.
- list and location of alarms and schedule of maintenance.
- list and location of emergency response equipment (fire-fighting, spill response, first aid kits, personal protection equipment for emergency response teams).
- protocols for the use of emergency equipment and facilities.
- schedule for periodic inspection, testing and maintenance of emergency equipment.
- clear identification of evacuation routes and meeting points.
- schedule of trainings and drills, including with local
- emergency response services (fire fighters).
- procedures for emergency drills.
- emergency contacts and communication protocols, including with communities when necessary, and procedures for interaction with the local government authorities.
- procedures for periodic review and update of emergency response plans.

Occupational health and safety (OHS) hazards in the workplace can be divided into four categories: physical, chemical, biological, and ergonomic and psychosocial. EHCSS has identified the specific hazards that are relevant to EHCSS operations (including construction activities). The ESMS places priority on avoidance of negative impacts from each hazard, by eliminating or substituting the equipment, material, or work activity that is causing the hazard. If it is not possible to eliminate the hazard, EHCSS seeks to minimize the impacts of hazards by instituting engineering controls (for example by installing machine guards or active ventilation) and administrative controls (including warning signs).

EHCSS provides technically appropriate personal protective equipment (PPE) according to requirements of the respective activities, and trains personnel on the appropriate use and maintenance of the same. Usually, a combination of all controls is applied. OHS emergency situations often occur because of gaps in a company's management system. Thus, even

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though accidents may seem to be very different, (for example slips and falls due to spilled liquids) they are often the result of the same root cause – ineffective implementation of the ESMS, such as: an incomplete risk assessment, the lack of safety procedures, and insufficient worker training. EHCSS periodically reviews OHS provisions and addresses any gaps to determine potential root-causes of problems during your risk assessment.

In addition to emergencies that may result from workplace hazards, workplaces may also be vulnerable to emergencies caused by external events. The following list includes possible artificial and natural disasters pertinent to EHCSS that can result in significant worker injury or death, as well as disruption of operations, destruction of property, and severe financial losses.

- Storms (that can result in flooding).
- Flooding and earthquakes.
- Local and regional fires.
- Explosions, including accidental, military or terrorism; and
- Civil unrest.

EHCSS engages in **internal and external communications** via the ESMS. External communications are partly addressed through the sub-project **grievance procedure**.

The ESMS has various quantitative or qualitative indicators that allow periodic assessment of ESMS **performance** against set goals.

Some examples of key performance indicators (KPIs) are as follows:

- energy consumption.
- water consumption.
- volume of solid waste disposal.
- liquid effluents discharge.
- emissions to air.
- accidents (injuries, ill-health, property damage) and near misses.
- lost time injury frequency, incidence, and severity rates.
- emergency response incidents (including any traffic incidents on or offsite).
- recruitment of local workers
- average working hours and wages paid.
- wage levels.
- incidences of child labor.
- incidences of disciplinary and discrimination complaints; and
- employee demographics matching access to training, jobs, and wages.

7.3 Mitigation Measures

Mitigation measures during both construction and operation phases are provided in Tables (7.1 and 7.2). The contractors are required to develop their own construction ESMP (C-ESMP) based on table (7.1) below and management plans present in this ESIA.

Table (7.1): Mitigation measures during the construction phase. Note the budget for the mitigation measures during the construction phase was calculated for two years.

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
Environmental	Risks on Ambient air quality due to airborne Dust	Airborne dust can be generated from construction activities such as excavation. This dust can pollute the air and can also pose a health hazard to workers and nearby residents.	- Demolition debris and dust shall be kept in controlled areas, well protected from the wind by installing enclosures and covers to the stored piles/friable materials and sprayed with water mist to reduce debris dust. The storing of the excavated soil and any other materials will take into consideration the direction of the wind. - Use dust sweeping methods to reduce water usage in dust suppression - Ensure water conservation measures and practices are in place for concrete mixing by ensuring the use of best practice concrete/water ratios - During pneumatic drilling/wall destruction dust shall be suppressed by ongoing water spraying and/or installing dust screen enclosures at site. - The surrounding environment (sidewalks, roads) shall be kept free of debris to minimize dust. - There will be no open burning of construction / waste material at the site. - Transportation trucks shall be properly covered to minimize dust and air emissions. - Use ready mix concrete whenever possible. - Spray water on roads to minimize dust emissions because of vehicles moving.	- Contractor and subcontractor - Supervised by Environmental specialist, Social Specialist for reporting on grievance.	16,800

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			- Ensure vehicles and trucks use paved roads wherever possible. - Speed limits shall be enforced on unpaved roads, to be <30km/hr. - Implement preventive maintenance program for vehicles and equipment working on site and promptly repair vehicles with visible exhaust fumes. - Using newer equipment for more fuel-efficient alternatives - Using low sulfur content diesel - Ensure turning off vehicles when not in use. - Ensure the Grievance mechanism is functional to address workers, and community complains regarding air emissions. - Schedule construction activities to avoid rainfall and high wind periods to the extent practical.		
	Gaseous emissions from Engine Exhaust Gases	Exhaust fumes and gaseous emissions such as NOx, Sox and Particulate matter (PM2) and (PM10) from internal combustion engines/ generators/ vehicles and machineries used present another risk	- Implement preventive maintenance program for vehicles and equipment working on site and promptly repair vehicles with visible exhaust fumes. - Procurement of energy efficient equipment and machineries from certified contractors. - Using newer equipment for more fuel-efficient alternatives - Inspect machineries regularly - Using low sulfur content diesel	- Contractor and subcontractor - Supervised by Environmental specialist, Social Specialist for reporting on grievance	14,000

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		to air quality on and close to construction sites.	• Ensure workers turnoff vehicles when not in use. • Ensure Grievance mechanism is functional to address workers and community complains. • In case a generator will be used, conduct air emission tests stipulated under the current legislation for generators • Ensure regular machine and vehicle maintenance. • Ensure energy conservation measures and practices are in place by raising awareness to workers on good practices and measures above.		
	Risks on Soil and Water resources contamination	The project may impact soil quality and groundwater quality (on the long run) from; • Accidental oil and fuel spills from machineries and vehicles used and generator. • Runoff risks from pesticides used near temporary offices/caravans which could pollute nearby lands/soils • Improper sewage disposal • Risk of the establishment of water connection to get	• Include spill prevention kits on site to control and contain and clean up any potential spills. • Use offsite equipment fueling and oil stations as much as possible or dedicated fueling areas onsite. • Perform periodical maintenance on equipment and machinery. • Cover on-site stockpiles of soil and fill. • Establish appropriate erosion and sediment control measures. • Schedule construction activities to avoid rainfall and high wind periods to the extent practical • Ensure all chemicals are labelled, stored, handled, and disposed according to their safety data sheets (SDSs) by trained workers. • All chemicals are stored on insulated areas from the ground and in secondary containment.	• Contractor and subcontractor • Supervised by Environmental specialist, Social Specialist for reporting on grievance.	44,000

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		water into the silo may lead to soil contamination. • Risk of establishment of electricity connection to the silo may lead to soil contamination. Proximity to the Nile River (500m) increases the risk of water contamination from construction runoff, accidental spills, or improper waste disposal,	• Develop and implement a pest management plan for rodenticides (refer to Annex I). • In case generators will be used, locate them on concrete base to avoid leaks to the soil and ensure they are located in properly ventilated areas. • Generator and fuel and transformers and batteries are stored on concrete base and well-ventilated zones. Batteries to be stored on acid resistant flooring. • Store fuel in secondary containment on concrete bases • Monitor fuel used to detect leakage • Ensure the Grievance mechanism is functional to address workers and community complaints. • Sewage will be collected in a specific tank with a capacity of 200 cubic meters, and a sewage trench truck drains the tank, which is then disposed into the public sewage network. • Ensure that pipes and connectors are made from high-quality, durable materials to prevent leaks and breakages. • Conduct regular inspections of the water connection infrastructure to detect and address any leaks or weaknesses early.		



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			- Train workers on emergency response procedures for spills, including immediate containment and reporting protocols. - Ensure that cables, conduits, and connectors are made from high-quality, durable materials to prevent leaks and breakages. - Conduct regular inspections of the electrical connection infrastructure to detect and address any leaks or weaknesses early and inspect soil color to detect leaks. - Waste Management by Ensure proper disposal of construction waste to avoid contamination of the Nile. <u>Water Quality Monitoring</u>: Regularly test water quality to detect any potential contamination from construction activities - Store fuels and chemicals in secure, designated areas with secondary containment to prevent spills and store away from Nile water resources and runoffs - Do not store any chemicals or waste near the Nile and store in safe area away from wind		
	Risks on Ambient Noise	The following equipment used in excavation and	Construction noise will be limited to restricted times agreed to in the permit.	Contractor and subcontractor	12,600

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		grading of the site may produce high noise emissions: - the use of heavy machinery, such as trucks, bulldozers, and excavators. - the operation of construction equipment, such as generators and compressors.	- Avoid construction work in the evening. - Reduce workers' exposure to noise. - Ensure noise does not exceed the safety limits stipulated in the Egyptian environmental law in addition to occupational safety and health standards. - Provide workers in areas of activities with high noise levels with earplugs. - The contractor must train all workers before starting construction work on the danger of noise and how to avoid them. - Restricting the movement of lorry cars/trucks to prevent noise in the early morning and late evening periods. - Ensure all machines and vehicles are turned off when not in use. - Keep machineries and vehicles in good working conditions and perform maintenance regularly - Monitor noise and vibration levels to confirm the effectiveness of measures implemented. - Select equipment with low noise emissions and that is technically and financially feasible. - Ensure Grievance mechanism is functional to address workers and community complaints.	Supervised by Environmental specialist, Social Specialist for reporting on grievance.	
	Biodiversity/ pesticides consumption by non-targeted	Impacts on biodiversity may result in the disturbance of wildlife	Follow measures present in the pest management plan to avoid consumption of pesticides by non-targeted species or secondary poisoning.	Contractor and subcontractor	14,000

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
	species/ risks of hunting and disturbing of wildlife in case they occur in the area. Bird collision risks	from noise, dust, air, light emissions and waste generation including chemicals. In addition to the risk of hunting. - Non targeted wildlife may consume rodenticides by accidents or consume the dead rodent if not collected right away and disposed properly and in turn leading to their secondary poisoning. - Bird migratory route is located near the project site	- dead rodents from rodenticides will be disposed as hazardous waste. - Follow measures for air, noise, waste emissions reduction. - Raise awareness to workers on the importance of preserving wildlife and the importance of gazelles and hyenas - Enforce penalties in case hunting or wildlife collection was observed - Prohibit any hunting or trade activities - In case of sighting contact the EEAA to inform them on the species type and location and to confirm if any measures should be taken - Aviation obstruction lighting which is used to enhance visibility of airplanes and birds in order to avoid any collision or obstacles will be used. - Avoid heavy construction activities during migratory seasons and sensitive seasons	Supervised by Environmental Specialist.	
	Waste generation (solid, liquid, and hazardous wastes) emissions.	Solid waste Increased waste generation from materials, packaging, debris.	Develop a waste management procedure with the following requirements: Waste management: Proper handling of raw material to minimize waste.	Contractor and subcontractor	25,200

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		- Construction waste - Large quantity of excavated soil will be generated among other construction waste. - Establishment of water connection to get water into the silo generate solid waste. - Establishment of electricity connection to the silo generate solid waste. Liquid waste - Potential wastewater from concrete mixing, equipment washing, sanitation. Hazardous waste - Potentially hazardous waste from paints, solvents, oils, pesticides containers and chemicals.	- Waste collection and disposal pathways and sites will be identified for all major waste types expected from demolition and construction activities. - Wastes will be segregated by type (solid, hazardous, liquid, construction wastes). - Construction waste will be collected and disposed properly by licensed collectors and disposed in site approved by the responsible municipality/government authority. - The records of waste disposal will be maintained as proof for proper management as designed. - Whenever feasible the contractor will reuse and recycle appropriate and viable materials. - Avoid accumulation of organic wastes and food remains. - Implement pest and rodent control measures by following the PMP in annex 1. - Ensure the reuse or recycling of materials. - Adopt measures to reduce or eliminate the use of toxic or hazardous raw materials. - Ensure raw materials are not sought from ecologically sensitive zones. - Record grievances. - Ensure that all waste materials, including excavated soil and debris, are disposed of properly in accordance with local regulations.	Supervised by Environmental specialist, Social Specialist for reporting on grievance.	

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		Establishment of electricity connection to the silo generate e-waste if the batteries and cables are used.	- Optimize the use of materials to reduce waste generation. - Ensure that all non-recyclable waste is disposed of at authorized disposal sites. Wastewater: - Workers will use latrines/toilets. They will be established in the new site for Dandara Silo - Construction vehicles and machinery will be washed only in designated areas. - Open urination and defecation shall be prohibited. - Record grievances. - Sewage will be collected in a specific tank with a capacity of 200 cubic meters, and a sewage trench truck drains the tank, which is then disposed into the public sewage network. Hazardous chemicals, materials, and waste: - Temporarily storage on site of all hazardous or toxic substances will be in safe containers labelled with details of composition, properties, and handling information. - The containers of hazardous substances shall be placed in a leak-proof container to prevent spillage and leaching and should be stored on concrete surfaces. - Spill prevention kits shall be present on site and any spills should be removed instantly		



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			- The wastes shall be transported by specially licensed carriers and disposed in a licensed facility. - Paints with toxic ingredients or solvents or lead-based paints will not be used. - All chemicals and hazardous materials should be stored, handled, and disposed according to their materials safety data sheets (SDSs) and by trained workers and will be disposed by certified contractors as discussed in baseline. - Record grievances. - Workshop area/ machine maintenance and oiling will be carried out on concrete bases to avoid soil contamination. - Store E-waste separately according to manufacturer's guidelines and dispose of hazardous waste (including e-waste) through certified waste disposal services to ensure safe and environmentally friendly handling. Pest Management Plan (for onsite worker camps and facilities): - Ensure a suitable pest and rodent management plan (annex 1) is in place and carefully followed. - Ensure guidelines of hazardous materials and wastes are followed.		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
Socioeconomic Aspects	Risks to labor from inappropriate working conditions	- Unfair treatment (discrimination, delayed payments, unsafe working conditions). - Unresolved complaints from the lack of grievance mechanism for workers.	- The project owner and contractor will share information related to labor rights and working conditions, labor grievance mechanisms, and will ensure that appropriate insurance schemes are in place and operational to cover different types of workers. - Workers will be made aware of their rights regarding working hours, days off, salaries. - All workers will sign contracts - A grievance mechanism (present in chapter 8) will include channels for workers. Workplace grievances will be handled in a positive manner with no retaliation, and this will be communicated to workers. - Provision of anonymous grievances - Follow project level Labor Management Plan (LMP). - Implement inclusive hiring practices for vulnerable populations by selecting lower income individuals - Providing jobs to members of vulnerable groups, if possible, based on needs. There will be jobs available for vulnerable groups including (low-income people), but not for elderlies, because the conditions for employment require only young people. - Regular inspections by the food security Project Management Unit (PMU) will be performed	- Contractor and subcontractor - Supervised by Environmental specialist, Social Specialist for reporting on grievance. - PMU	16,800



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
	Child Labor	- Exploitation of children in construction work. - Hazardous working conditions. - Interference with education.	- Maintain daily attendance sheets to verify that workers do not include staff under 18 years. - Maintain a copy of IDs of workers to prevent hiring workers under 18 years. - Fines and penalties will be set in case child labor is detected - Awareness to contractor on danger of child labor and penalties will be communicated before project implementation and will be part of the contractor's contract. - EHCSS will check labor policies of the contractor. - Regular inspection will be conducted by the environmental and Social Specialists and the Food Security PMU (Project Management Unit) - Ensure implementing the Labor Management Plan (LMP) EHCSS and the contractor will ensure primary suppliers do not use child labor or forced labor and have OHS procedures in place. Measures to ensure primary supplier is not using child labor will include checking the primary supplier labor logs, policies and labor requirements and conditions and communicating the contractor's policies on child labor.	- Contractor and subcontractor - Supervised by Environmental specialist, Social Specialist for reporting on grievance. PMU	8,400

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
	Risks of SEA/SH	- Risk of sexual exploitation and abuse and harassment may increase due to the presence of workers near local communities and lack of awareness on SEA/SH issues - Risks from security personnel (i.e. use of violence etc.).	- Appropriate signposting to be added at the sites which will inform workers of key rules and regulations to follow. - Contractor to implement the SEA/SH plan (annex IV) and will ensure workers are trained and adhering to compliance to the prevention of Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) risks. - Workers must read and sign the code of conduct. - Establish an accessible Grievance Mechanism with channels to receive different types of grievances including SEA/SH grievances (see SEA/SH related grievance in chapter 8). - Provision of anonymous grievances - The Contractor formally agrees that all work will be carried out in a safe and disciplined manner designed to minimize impacts on neighboring residents and environment - Ensure developing and implementing the Labor Management Plan (LMP) and train workers on the code of conduct. - Implement the stakeholder engagement plan (SEP) Security management measures” In addition to careful examination of security personnel files including their transaction history and	- Contractor and subcontractor - Supervised by Social Specialist for reporting on grievance. - PMU	11,200



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			evaluating their actions in terms of abuses and acts that violate the safety and security of persons (such as deprivation of life/liberty/security, use of violence or other forms of gender-based violence, including sexual exploitation or abuse). Also completely ensure their full knowledge of the use of force policy and how to practice it in proportion to the types of risks. Since the silos project falls under national security projects (food security), the public security authority's contribution in any joint training or exercises to deal with attacks when occurs. They also have designated channels of communication with silo security in the event of an attack and escalating situation that are beyond the capabilities of the silo security team. The ESS4 requirements on security personnel are met through inclusion of the following measures in ESIA. - EHCSS to carry out risk assessment associated with mobilizing security team for the proposed operation - EHCSS to provide regular training in the use of force and firearms, and appropriate conduct toward workers and affected communities - The security team is to act as per the applicable national regulations and ESS4 requirements - use of force by security team will not be allowed except when used for preventive and defensive purpose in proportion to the nature and extent of the threat - Use of firearms should be strictly managed by a responsible person in the security team following the		



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			management procedure including recording of firearms for purchase, storage, transportation, use and disposal. - EHCSS will review all allegations of unlawful/abusive acts of security personnel, take action to prevent recurrence and, where necessary, report unlawful and abusive acts to the relevant authorities. - having a proper code of conduct (COC) known and signed by all workers with topics related to SEA/SH and gender based violence and training provided on COC to workers and a grievance mechanism and channels for reporting SEA/SH and gender based violence cases from workers.		

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	Community health and safety: Traffic risks and accidents	• Traffic accidents due to the increase in number of trucks during construction phase which may pose a risk on other road users. • Traffic congestions due to the increase in transportation trucks for materials, machineries and wastes to and from the site. • Potential risks from air and noise emissions and vibration from high traffic volume during transportation of materials and machineries and wastes to and from the site. • Increased heavy vehicle traffic near school • Risk of accidents involving children Children accessing construction areas	➤ The contractor will develop and implement a traffic management plan (including routes and alternative routes, truck movements and transport of workers, assess the number of vehicles for the routes leading to the silos and routes widths and capacities) appendix II. ➤ Avoid peak hours when transferring machinery and construction trucks to the site. There will be coordination with the traffic authorities in the governorate regarding the time of the construction of the Silo, as well as it will be considered in the plan for construction and operational phase to avoid peak hours. Traffic regulations and local regulations for trucks will be applied. ➤ The safety record of vehicles in purchase or leasing should be present. ➤ Perform regular maintenance of vehicles and trucks ➤ Minimize pedestrian interactions with construction vehicles by selecting appropriate time for truck movement in coordination with local authority. ➤ Ensure transport vehicles maintain speed limit and good driving practices. ➤ Conduct drug check-ups on workers. ➤ Ensure workers have driving license for trucks.	• Contractor and subcontractor • Contractor and subcontractor • Supervised by Environmental specialist, Social Specialist for reporting on grievance.	16,800



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			➤ Use locally sourced materials whenever possible to minimize transport distances. ➤ The contractors should make sure that the employed drivers of construction machinery (such as trucks and loaders) have received sensitization/training on safety utilization of their machines to minimize accidents risks. ➤ Unusual traffic delays or accidents caused during construction, or any complaints received should be reported in the monthly report prepared by the construction supervisor. ➤ Report any major injuries and accidents to the WB within 48 hours. ➤ The contractor formally agrees that all work will be carried out in a safe and disciplined manner designed to minimize impacts on neighboring residents and environment. ➤ Traffic Warning Signs during construction and use reflective road signs for night visibility. ➤ Install temporary speed bumps near construction access points and residential areas. ➤ A separate access asphalt road from the main road will be established to reach the construction site to avoid		

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			disturbing any neighboring communities. ➤ Having a traffic management plan during construction and operation phases and community health and safety measures ➤ Defining a separate access routes to the silo to prevent disruptions to nearby agricultural activities and residents' movements. ➤ Traffic Warning Signs: ➤ Install "Construction Ahead," "Slow Down," and "Heavy Trucks Crossing" signs well in advance. ➤ Use reflective road signs for night visibility. ➤ Speed Reduction & Control: ➤ Set a strict speed limit (≤ 40 km/h near the site, ≤ 60 km/h elsewhere on the road). ➤ Install temporary speed bumps near construction access points and residential areas. ➤ Add safety signs ➤ The traffic management plan will include measures for the two way		



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			roads which do not have a safety island/pavement separating the roads. This could be done by adding cones or structures to separate the two way lanes. ➤ Schedule construction-related transportation during non-school hours (e.g., early morning or after 3 PM) ➤ place security personnel near entry points ➤ Install physical barriers (e.g., fences, warning signs) around the construction areas to ensure separation from nearby surroundings.		



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	Community health and safety: Electrical Hazards and Power Supply Risks	burial of transmission lines may result in power outages, potentially disrupting electricity supply to nearby communities or agricultural operations	- Notify local communities in advance of any planned power outages. - Coordinate closely with the electricity company to minimize disruption. - Ensure that the power supply is restored promptly after the completion of burial activities. - Use the emergency generator to provide temporary electricity when needed. - Importance of prior notification and alternative power arrangements to minimize inconvenience - The contractor's will be required to cover third parties and their properties and this requirement will be included within the contractor's insurance policy	- Contractor and subcontractor - Supervised by Environmental specialist, Social Specialist for reporting on grievance. PMU	14,000

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
	Lack of stakeholder engagement and proper grievance mechanism	- Risks of untransparent sharing of information - Risks of increase in unresolved complains	- The local construction and environment inspectorates and communities have been notified of upcoming activities related to the construction of the Silo. - The public has been notified of the works through appropriate notification in the media and/or at publicly accessible sites (including the site of the works). - All legally required permits have been acquired for construction. - Develop a well communicated and accessible grievance mechanism for community members to address any complaints. - Develop communication channels with surrounding communities - Presence of complaint boxes on site and banners including numbers for grievance submission - Provide information to farmers and different stakeholders on the progress of the project including civil works and on mitigation measures and grievance redress mechanisms during general meetings and information posted on local levels and conduct focus group discussions (FGD) with women and vulnerable groups as per the SEP document. - Some of the consulted women preferred to receive information through their husbands. As with all vulnerable groups who are either illiterate or have	- Contractor and subcontractor - Supervised by Social Specialist and EHCSS	16,800

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			no access to the internet, face-to-face communication is the preferred method of communication - For vulnerable groups including women and small-scale farmers, use preferred means of communication using Arabic language and illustrations including location sketches, physical models, and film presentations - For other vulnerable groups such as persons with disabilities use preferred means of communications using Arabic language and tailored means of communications for different types of disabilities.		
	Risks on Cultural Heritage and archeological sites	Impacts on archaeological and historic sites during the construction phase are expected to be negligible since there are no archeological sites nearby the subproject location.	- In case of any finds/discoveries apply chance find procedure as follows: - Stop excavation and construction activities immediately in the area, - Delineate the site. - Ensure the site is secured to prevent any damage or losses of archaeological objects. Add signs and barriers around the site. - Notify the Silo Managers and Environmental Specialist who should immediately notify the responsible local authorities (Supreme Court of Antiquities) (within 24 hours or less);	- Contractor and subcontractor - Supervised by Environmental specialist, social Specialist for grievance reports - EHCSS	Not Applicable



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			- Responsible local authorities and SCA will decide on the way forward and appropriate procedures - Construction work could resume only after permission is obtained from the SCA and any relevant authority. These procedures must be taken into consideration in the construction contracts. - It shall be ensured that provisions are put in place so that artifacts or other possible “chance finds” encountered in excavation or construction are noted and registered, responsible officials contacted, and works activities delayed or modified to account for such finds. - Workers shall be made aware of the chance find procedure. Workers shall be trained on how to recognize potential archaeological artifacts or possible archaeological sites.		
Occupational Health and Safety (OHS)	Risks on workers' health and safety	The use of hazardous materials and chemicals and wastes can pose a risk to worker health (i.e. cement, paints, oil, asphalt, bitumen etc.).	- OHS risk assessment shall be conducted prior the start of any work including Job Hazard Analysis (JHA), developing Permit to Work (PTW), Stop Work Authority (STA)...etc. - Develop a site specific OHS Manual to include the results of the OHS risk assessment, responsibilities	- Contractor and subcontractor - Supervised by OHS specialist, Environmental specialist, Social	37,800

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		- Falls from heights are a possible cause of injuries in construction (silo rooftop areas/ use of scaffoldings etc.). - Electrical hazards can cause serious injuries or death. - Machinery can cause crushing injuries or amputations/moving loads. - Dust and fumes can irritate the eyes, nose, and throat, and can also cause respiratory problems. - Noise emissions may disturb workers. - Falling into excavated zones. - Working during bad weather conditions (dust storm, heat wave, rainy seasons etc.). - Injuries and burns from welding activities. - Accidents while transporting materials and	and staffing, preventative measures, mitigation measures, emergency plans, training program, etc. - Ensure the adequate implementation of occupational health and safety provisions on-site such as providing the personal protective equipment (PPE) to the workers including ear mufflers, masks, eye goggles, head helmets and safety boots are adhered by workers. - Workers' PPE will comply with international good practice (always hardhats, as needed masks and safety glasses, harnesses, and safety boots) - Communication and training programs to prepare workers to recognize and respond to workplace hazards. Programs should include aspects of hazard identification, safe operating and materials handling procedures, work permit, safe work practices, basic emergency procedures, first-aid, and special hazards unique to their jobs. - Follow the labor management procedures (LMP) and the workers grievance mechanism (GM). The GM should be established, and well-functioning and workers should be made aware of their rights regarding working hours, days off, salaries, etc. - Prohibit all forms of child and forced labor. - Monitoring and record-keeping activities, including audit procedures designed to verify and record the effectiveness of prevention and control of exposure	Specialist for reporting on grievance.	

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		machinery to and from the subproject site. • Accidental loads falling on workers while being lifted by cranes. • Physical injuries from physical activities and wrong lifting techniques, wrong posture while conducting any work. • Slip trip and fall • Injuries and cuts from machineries and hand arm vibration syndrome from machineries used • Physical injuries from physical activities and wrong lifting techniques, wrong posture while conducting any work • Getting hit by moving load/vehicle/machine • Working in confined area (risk of asphyxia while working inside the silos) during construction phase. • Risks of electrocution while installing the Silos.	to occupational hazards, and maintaining accident and incident investigation reports. • Provide medical and life insurance for all workers • Provide potable water supply and regular breaks to workers. • Encourage workers to ask for help • Raise awareness to workers on proper posture and hand lifting techniques to avoid back and muscle injuries • Train drivers on traffic safety rules and measures (e.g., leave safe distance and avoid distractions with mobile phones) • Conduct drug check-ups on workers. • Ensure workers have driving license for trucks. • Use locally sourced materials whenever possible to minimize transport distances. • The contractors should make sure that the employed drivers of construction machinery (such as trucks and loaders) have received sensitization/training on safety utilization of their machines to minimize accidents risks • Arrange work site vehicles and set speed limits and use a flagman for guiding vehicles and workers. • Provide site boundaries by installing suitable physical boundaries (barriers, tape, or fence) • The contractor should prepare and implement an Occupational Health and safety Management Plan (appendix III).		



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		Risks of snake and/or scorpion bites	- The contractor is provided with safety performance procedures and safety and hazard information. - Contractors observe safety practices. - Ensure proper housekeeping is maintained. - Use dust suppression techniques and provide dust masks and ear mufflers during excavation and noisy activities. - Inspect equipment and machines before usage. - Provide soap and water and disinfectants at the site. - Workers' accommodation if needed should be according to international standards (i.e. EBRD/IFC guidance note for workers accommodation). - Any accidents should be communicated to the WB within 48 hours. - Although unlikely due to the nature of the site, provide precautionary measures to protect workers and site personnel and visitors against insect bites, snake bites or other animal/reptiles which could pose threats to humans. - Provide awareness training to workers on physical handling to avoid back and muscle injuries. - Check weather forecasts prior to conducting any work. - Provide a rest area with chairs for workers - Safety signs and banners are added around work areas		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			● Provide daily OHS toolbox talks ● Workers to strictly maintain safe distance (marked) from equipment ● Falling in excavated zones (5meters deep)Mark excavated holes with physical boundaries (barriers, tape, or fence) and provide signs alerting workers and machines of excavated zones. ● Maintain a buffer zone between workers and excavations ● Providing safe means of access and egress from excavations, such as graded slopes, graded access route, or stairs and ladders ● Ensure presence of a well-fixed ladder for entering the excavations and ensure workers are wearing proper PPEs including dust masks, head helmets and fall prevention devices while entering the excavated zone. ● Keep excavated piles away from the excavated areas by 2 meters. ● Ensure a flagman is present for movements at work site. ● Always check if workers are present within dredged zones prior to establishing any foundations. Handling hazardous chemicals and wastes		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• All workers should be trained in handling, storing, and disposing of all types of chemicals and wastes according to their material safety data sheets (SDSs) and manufacturer's guidelines. • Ensure chemicals and materials and hazardous wastes are properly labeled • Train workers on handling hot asphalt safely and dealing with spills. • Provide appropriate Personal Protective Equipment (PPE), including heat-resistant gloves, long-sleeved clothing, safety goggles, and respirators to minimize exposure to fumes. • Implement a rotating shift schedule to limit prolonged exposure to fumes and heat stress. • Empty oil containers or chemical containers to be stored and disposed of according to manufacturer's guidelines and SDSs and can be returned back to manufacturer • Bitumen safety measures³ : • Store handle and dispose of bitumen according to SDS and manufacturer's guidelines. For fire risks of bitumen ensure Water spray, foam, dry powder or carbon dioxide are used and stored next to bitumen. Do not use water jet as an extinguisher.		

³ https://www.neste.com/files/pdf/5jSubFKwtrYoTqetXkhDIH-10507_bitumen.pdf



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• Store away from oxidizing agents. Store in accordance with local regulations. Use containers made of carbon steel and stainless steel. • All handling should only take place in well-ventilated areas. • PPEs include: Wear tight-fitting, chemical splash goggles or face shield. Thermally insulated protective gloves. Change protective gloves regularly. Protective gloves should be according to standards EN 374 and EN 407. • PPEs are temperature resistant. • At high concentrations a breathing apparatus must be used (self-contained or fresh air hose) • At high concentrations a breathing apparatus must be used (self-contained or fresh air hose breathing apparatus). Filter must be changed often enough. Respirator according to standard EN 140. First aid: If it is suspected that volatile contaminants are still present around the affected person, first aid personnel should wear an appropriate respirator or self-contained breathing apparatus. If spray/mist has been inhaled, proceed as follows. Remove person to fresh air and keep comfortable for breathing. If breathing stops, provide artificial respiration. Get medical attention if symptoms are severe or persist. Do not induce vomiting. Get medical attention. In case of skin contact remove contaminated clothing and rinse skin thoroughly with water. Continue to		



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			rinse for at least 10 minutes. Do not use the following: Solvent. No attempt must be made to remove the bitumen adherent to the skin at the worksite. In the case of a circumferential burn with adhesion of the bitumen, the adhering material should be split to prevent a tourniquet effect as it cools. If adhesive bonding occurs, do not force skin apart. Get medical attention. In case of eye contact Rinse immediately with plenty of water. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention. Risks of falling loads on workers • Close the lifting /crane area with fence to prevent access to the lifting area during lifting work. • Install warning signs for lifting activities. • Prevent accessibility to non-workers at lifting zones or any construction zone. • Ensure all workers are standing at a safe distance from the lifting zone. • Carry out lifting work by well trained, qualified, and certified lifting team. • Ensure a flagman is present on site to manage workers and machineries movements. • Provide workers with all necessary Personal Protective Equipment PPEs and safety materials. • Use well-maintained cranes for lifting that are appropriate for the weight; well checked and tested.		



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			- Secure loads when lifting and use strong and reliable fixation materials to make sure that the load is well tighten. - Lifting device capacity shall be higher than the maximum calculated static load at that point. An ultimate load shall be ≥ 4 times the maximum static load. Risks from falling from height/working at height: - In case working from height risks is present, the contractor shall ensure the presence of fall arrest systems/harness and PPEs including head helmets and fall prevention devices and lifelines. - Ensure proper use of ladders and scaffolds by trained workers and inspected, tested regularly by competent inspectors, train workers on the use of fall prevention devices, including safety belt and lanyard to prevent risks of falls, or fall protection devices such as full body harnesses and head helmet used in conjunction with shock absorbing lanyards. - Do not move ladders when workers are standing on them. - Inspect scaffolds and ladders prior usage. - Installation of guardrails with mid-rails and toe boards at the edge of any fall hazard area where practical.		



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			● Inclusion of rescue and/or recovery plans, and equipment to respond to workers after an arrested fall and a fall protection plan should be in place which includes the following aspects: ○ Training and use of temporary fall prevention devices, such as rails or other barriers able to support a weight of 200 pounds, when working at heights equal or greater than two meters or at any height if the risk includes falling through an opening in a work surface. ○ Training and use of personal fall arrest systems, such as full body harnesses and energy absorbing lanyards able to support 5000 pounds. ● Risks from working in confined spaces/entering the silos: ● For entering confined workspaces, gas emissions including nitrogen dioxide should be quantified and monitored, with costs covered by the Contractor. Machinery, equipment, and processes under their control are safe and without risk to health, ● Carry gas tests prior to entering the silo to confirm its safety. ● Measure oxygen content prior entering the silo and ventilate silo prior entering ● Ensure the breathing apparatus was inspected prior to entering.		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			- Adhere to oxygen breathing devices/breathing apparatus while working in silos. - Always ensure workers in confined areas are supervised and checked up on regularly. - Ensure worker receive a confined aid training prior to working in silos. - Develop a rescue plan for confined space. - Ensure adhering to safety ropes and lanyards. - All machineries are stopped before entering silos - Ensure an emergency stop button to stop augers. - Keep shirts, and hair properly tightened to avoid being tangled in augers. Risks from welding activities and burns: - Train workers on welding safety measures prior to conducting any welding work. - Ensure workers are wearing heat and fire-resistant clothing, gloves, overalls, head and eye protection and respiratory protection equipment, boots, welding helmets and side shields and ear protection/mufflers. - Use only well-maintained equipment and regularly maintain equipment. - Inspect equipment prior usage. - Avoid welding activities at areas with high risks of fire hazards. - Welding activities should be avoided during rainy periods and avoiding damp areas. - Carry welding activities at well-ventilated areas		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			Risks from electrocution while performing electrical work. • Ensure only trained workers/electricians perform such work. • Ensure workers adhere to insulated PPEs. • Never work during rainy periods • If construction work to be carried out on elevated areas, ensure working from height measures are followed. Emergency and fire risks: • Presence of an emergency preparedness and response plan with site specific procedures so workers know what is expected and what to do in the event of emergency and fire risks. • Ensure presence of fire prevention and mitigation measures. • Train workers on emergency and fire prevention plans. • Avoid working in bad weather conditions (dust storm, rainy periods, heat waves) and check weather forecast before conducting any work. • Presence of PPEs and fire extinguishers. • Presence of first aid kits on site. • Material and banners indicating the nearest police station and hospital (with accident and emergency facilities) should be posted at the site.		



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• Provide first aid kits in different places of the work site and trained workers on first aid. • The presence of emergency procedures to transfer sick or injured workers on site to the nearest hospital. • Provide fire extinguishers on work sites. • Ensure corrective actions are implemented instantly • Report any major injuries to WB within 48 hours. Risks of snake and scorpion bites: • Ensure workers are wearing long pants and long safety boots near sandy areas. • Raise awareness to workers on possible risks of snake and/or scorpion bites and proper PPEs adherence • Ensure the presence of antivenom kits on site and first aid workers • Raise awareness to workers on not killing those creatures and how to handle workers in case of bites Risks of establishing water connection to the Silo • Falls into Excavation: ○ Use barriers and warning signs around excavation sites. ○ Provide adequate lighting for night work. • Heavy Machinery Accidents:		



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			○ Train workers on the safe operation of machinery. ○ Establish clear communication protocols and use spotters. ● Exposure to Hazardous Materials: ○ Provide personal protective equipment (PPE) such as gloves, masks, and protective clothing. ○ Train workers on the handling and disposal of hazardous materials. ● Heat Stress: ○ Schedule work during cooler parts of the day. ○ Provide shaded rest areas and ensure access to drinking water. ○ Training for workers on the signs of heat stress and proper hydration. Risks of establishing electricity connection to the Silo ● Electrical Shock and Electrocutation: ○ De-energize and lockout/tagout electrical circuits before work begins. ○ Use insulated tools and wear appropriate personal protective equipment (PPE) such as rubber gloves and boots.		



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			○ Ensure all electrical installations comply with relevant safety standards. ○ Ensure the area is dry and away from any wet areas while performing the work ○ keep a safe distance between workers and high voltage lines and clearly define the distance ○ ensure a proper grounding technique to prevent any accidental contacts with high voltage lines that may result in electrical shocks, ○ use voltage detectors to verify the line is completely de energized before staring the work, ○ where possible use remote control devices to operate high voltage equipment from a distance, ○ follow national standards and best practice guidelines and		



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			OHS regulations, avoid working in harsh weather condition and wet/rainy periods . ○ Add signs and barriers to warn workers and the public of high voltage areas, ○ Do not wear any jewellery next to high voltage lines/areas ● Falls from Height: ○ Use fall protection equipment such as harnesses and guardrails. ○ Provide proper training on working at heights and climbing techniques. ○ Apply same measures for falling from height mentioned above ● Heavy Machinery Accidents: ○ Train workers on the safe operation of machinery. ○ Establish clear communication protocols and use spotters. ● Exposure to Hazardous Materials: ○ Provide PPE such as gloves, masks, and protective clothing. ○ Train workers on the handling and disposal of hazardous materials.		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			○ Apply same measures mentioned in sections above ● Heat Stress: ○ Schedule work during cooler parts of the day. ○ Provide shaded rest areas and ensure access to drinking water. ○ Educate workers on the signs of heat stress and proper hydration. Accessibility Train construction workers on assisting colleagues and visitors with disabilities and injuries. Ensure all construction safety protocols accommodate the needs of disabled individuals.		
Unplanned events	Catastrophic event can produce major negative impacts on OHS and public health and safety	● Fire and explosion risks from badly stored fuel/ poorly stored/installed generator, transformers. and mishandling of chemicals during construction phase (unpredicted events) can lead to the death of workers in silos construction area.	● Follow similar measures present in the section above under “emergency and fire risks” ● Ensure proper grievance procedure is followed. ● Develop and implement a fire and emergency response plan and evacuation ● Procure and increase the number of firefighting equipment such as fire extinguishers, fire hose reels, smoke detectors, fire alarms and fire hydrants as needed, and place them at appropriate locations within the construction site including next to the generator and transformer.	● Contractor and subcontractor ● Supervised by Environmental specialist, social specialist and OHS specialist for reporting on grievance. ● Silo management ● PMU	21,000

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• Ensure firefighting equipment are serviced quarterly by fire service providers • Install fire and emergency exits at appropriate locations within the construction site • Ensure good ventilation is maintained for fuel and generator area and follow Safety Data Sheet for storage and handling and disposal of different chemicals used. • Regularly perform maintenance on generators transformers and other units • Train staff on fire safety and have fire marshals on standby • Conduct fire drills and fire safety audits for construction workers if during the construction phase and with operational workers during the operational phase. Throughout the sub-project local authorities and community members shall be informed and involved.		
Unplanned events	Risk of property losses	Fire and explosion (i.e. generator/fuel/transformer) events from construction work can produce major negative impacts on the society (i.e loss of livelihood and property)	• Ensure proper grievance procedure under chapter 7 is followed. • Immediately report to the WBG any major events / incidents within 48 hours	• Contractor and subcontractor • Supervised by Environmental Specialist, Social specialist, and OHS	



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		agriculture lands and irrigation systems nearby		specialist for reporting on grievance (in case of explosion risks from the silos) • Silo management • PMU	

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Table (7.2): Mitigation measures during the operation phase. Note the budget for the mitigation measures during the operation phase was calculated for one year.

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
Environmental	Airborne Dust	Airborne dust can be generated from activities such as loading and unloading grain, and from the movement of grain through the Silos. This dust can pollute the air and can also contribute to the formation of smog.	- Grain trucks should be properly covered to minimize dust and air emissions. - Spray water for dust suppression. - Minimize using water during dust suppression by applying dust sweeping methods. - Maintain proper housekeeping - Check weather forecasts prior to loading and unloading activities. - Ensure vehicles and grain trucks use paved roads wherever possible. - Speed limits shall be enforced on unpaved roads, to be <30km/hr. - Ensure turning off vehicles / grain trucks when not in use. - The design of the silo includes automated grain dust extraction systems.	- Silo Management - Environmental specialist, Social Specialist for reporting on grievance.	8,400

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			Ensure Grievance mechanism is functional to address operation workers and community complains.		
	Gaseous emissions from Engine Exhaust Gases and from fumigation process	- The major activities at this phase are maintenance procedures and transport of many cars during the daytime. Trucks transporting grains will release exhaust emissions, containing carbon monoxide (CO), sulfur dioxide (SO₂), oxides of nitrogen (NO_x), and particulate matter (PM). - Emissions from generator when used - Fumigation emissions from silos and airborne drift from pesticides application may also reduce ambient air quality	- Ensure turning off vehicles / grain trucks when not in use. - Maintain trucks and vehicles belonging to EHCSS in good working conditions and perform regular maintenance and maintain a maintenance log - Ensure Grievance mechanism is functional to address operation workers and community complains - Provide awareness raising on energy reduction measures to workers. - Gas tight Pressure tests must be carried out when grains are added and prior to each fumigation activity - Pressure tests need to be part of the annual maintenance of silos	Silo Management Environmental specialist, Social Specialist for reporting on grievance.	6,300

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			- Monitor and maintain and repair seals regularly when silos are empty - Add gas sensors around silos - Follow the PMP in annex I - Carry regular maintenance and checkup on generator.		
	Impacts on Soil and long-term risks on ground Water Quality from trucks and machineries and any potential chemical	- Sources of soil contamination are accidental and lubricant/fuel spills of trucks transporting grains to and from the Silo Complex in Dandara. Other sources also include inappropriate waste disposal from the offices and inappropriate sewage disposal which may contaminate the soil. Spills may also result from result from badly stored chemicals and materials and wastes. - Badly stored and bad disposal off fumigation	- Include spill prevention kits on site to control and contain and clean up any potential spills from grain trucks immediately during the operation. - Perform periodical maintenance on equipment used during the operation phase, for example during loading and uploading of grains. - Schedule operation activities to avoid rainfall and high wind periods to the extent practical. - Ensure all chemicals are labelled, stored, handled, and disposed according	Silo Management Environmental specialist, Social Specialist for reporting on grievance.	47,000 ”



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		chemical (Phostoxin) may pose risk of contamination. Accidental spills from generator and transformer and soil contamination from battery.	to their safety data sheets (SDSs) and manufacturer's guidelines by trained workers. - Inspect soil around generator and fuel storage area and transformers and batteries and detect if any soil color changes occur. Ensure proper concrete base is maintained, and ventilation is functional. Batteries are stored on acid resistant flooring and in well-ventilated room. - All chemicals are stored on insulated areas from the ground and in secondary containment. - Ensure the grievance mechanism is functional to address operation workers and community complaints.		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• Ensure good housekeeping • Wastewater will be collected in a wastewater tank and regularly disposed of in the sewage network. • The presence of fire extinguishers and CO2 extinguishers next to stored chemicals. • Ensure phostoxin is stored in tight containers, ensure the storage area is equipped with good ventilation system. Do not store phostoxin next to water and sewage areas and strictly store in dry areas • Inform relevant authorities in case of seepage in water resources or sewage system • Remove any spills based on directions by manufacturers and label		

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			instructions and safety data sheet (SDS). • Dispose in accordance with local regulations. • Coordinate with a local certified contractor to dispose hazardous chemicals and wastes • Generator and fuel and transformer are stored on concrete base and well-ventilated zones • Store fuel in secondary containment on concrete bases • Monitor fuel used to detect any leakage		
	Risks on the Nile River and Grain Transport	• Proximity to the Nile River (500m) to the silo site increases the risk of water contamination from accidental grain spills , or waste discharge from transport vessels may pollute the river, affecting	• Wastewater Management: Properly treat and dispose of wastewater generated from silo operations to prevent contamination of the Nile. Wastewater will be collected in a wastewater tank and	• Silo Management • Environmental specialist, Social Specialist for reporting on grievance.	



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		water quality and aquatic life.	regularly disposed of in the sewage network • Ensure all grain is transported in covered or sealed trucks and barges to prevent accidental spills. • Develop and implement a rapid response plan to contain and clean up any grain spills near or into the Nile • Inspect and maintain transport vehicles and loading equipment to prevent leaks or mechanical failures that could lead to spills • Train transport workers and drivers on best practices for safe handling and emergency response to spills. • Do not store any grains or waste near the Nile and store in safe area away from wind		

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
	Noise	- The following activities can generate noise pollution: a) the loading and unloading of materials as well as the loading and unloading of grains from the trucks to and from the silos, b) the operation of conveyer belts, motors and other units and c) the movement of vehicles and machinery in and around the Silos project site - Noise from the generator	- Ensure noise does not exceed the safety limits stipulated in the Egyptian environmental law in addition to occupational safety and health standards by conducting regular noise measurements. - Restricting the movement of grain trucks to prevent noise in the early morning and late evening periods in coordination with local authority. - Ensure all vehicles are turned off when not in use. - Monitor noise levels during operation activities to confirm the effectiveness of measures implemented. - Select equipment with low noise emissions and that is technically and financially feasible. - Conduct regular maintenance to equipment and units to reduce noise emissions	Silo Management Environmental specialist, Social Specialist for reporting on grievance.	6,300

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			- Ensure the Grievance mechanism is functional to address workers and community complaints. - Regular health checkups to ensure protection from noise.		
	Biodiversity	- The following activities can have a negative impact on biodiversity in the study area: a) the use of pesticides can be consumed by non-targeted species and can lead to their poison/death b) the emission of pollutants from vehicles and machinery can pollute the air and water, which can harm animals if any. - The risk of hunting and disturbance of wild animals in case they are present.	- Follow measures present in the pest management plan to avoid consumption of pesticides by non-targeted species or secondary poisoning. - Dead rodents from rodenticides will be disposed as hazardous waste. - Follow same measures for air, noise and wastes emissions. - Enforce penalties in case hunting or wildlife collection was observed - Prohibit any hunting or trade activities	Silo Management Environmental specialist	7,000

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		Bird migratory route is located near the silo (risk of collision)	- In case of sighting contact the EEAA to inform them on the species type and location and to confirm if any measures should be taken - The silo design already includes aviation obstruction lighting which are used to enhance visibility of airplanes and birds in order to avoid any collision or obstacles, and the risk of collision is higher when the buildings are made of glass which is not the case in the silos.		
	Waste Management	Solid waste - Ongoing generation from operations, maintenance, offices. Liquid waste - Potential wastewater from grain washing, equipment	Waste management: Waste collection and disposal pathways and sites will be identified for all major waste types expected from the operation activities.	- Silo Management Environmental specialist, Social Specialist for reporting on grievance - Waste contractors	12,600

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		cleaning, sanitation (water use is minimal). Hazardous waste - Potentially hazardous waste from pesticide use, grain fumigation, maintenance. - E waste from maintenance of electrical unit (cable changes, battery disposal etc)	- Wastes will be segregated by type (solid, hazardous, and liquid wastes). - Waste generated during operation activities will be regularly collected and disposed properly by licensed collectors and disposed in site approved by the responsible government authority. - The records of waste disposal will be maintained as proof for proper management as designed. - Avoid accumulation of organic wastes and food remains. - Implementing pest and rodent control measures (Annex 1). - Record grievances. Wastewater: - The approach to handling sanitary wastes and wastewater must be approved by the local authorities.		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			- Wastewater/sewage from toilets/latrines will be collected in the tank and disposed at the closest sanitation network. - Record grievances. Hazardous chemicals, materials, and waste: - Temporarily storage on site of all hazardous or toxic substances will be in safe containers labelled with details of composition, properties, and handling information. - The containers of hazardous substances shall be placed in a leak-proof container to prevent spillage and leaching. - The wastes shall be transported by specially licensed carriers and disposed in a licensed facility. - All chemicals and hazardous materials should be stored, handled, and disposed according to their safety data		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			sheets (SDSs) and by trained workers. - Remove any spills regularly based on directions by manufacturers. - Coordinate with a local certified contractor (see baseline for names of certified contractors) to dispose hazardous chemicals and wastes - Record grievances. - For E-waste ensure they are stored separately according to their manufacturer's guidelines, and they are disposed by E-waste contractors Pest Management Plan (fumigation in silos, rodenticides around site and offices): - Follow and develop the pest management plan (PMP) annex1 and ensure fumigation and pesticides		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			applications and handling are carried according to the PMP Ensure guidelines of hazardous materials and wastes are followed.		
Socio-economic Aspects	Risks to labor and lack of appropriate work conditions and Workers	- Silo workers and seasonal workers may face unfair treatment (discrimination, delayed payments, unsafe working conditions and unresolved complaints from the lack of grievance mechanism. - Workers may face occupational health and safety hazards (e.g., grain dust exposure, machinery accidents). - Seasonal workers including cleaning workers during operational phase are at risk from working from height and confined areas, utilizing child labor and	- The project owner and contractor will share information related to labor rights and working conditions, labor grievance mechanisms, and will ensure that appropriate insurance schemes are in place and operational to cover different types of workers. - Workers should be made aware of their rights regarding working hours, days off, salaries - All workers will have valid signed contracts - A grievance mechanism (present in chapter 8) will include channels for workers. Workplace grievances will be handled in a positive manner	- Subcontractors for seasonal workers supervised by Social Specialist and environment health and safety specialist - Silo Management Social Specialist and environment health and safety specialist for silo operations - EHCSS	8,400



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		improper PPEs, from the following activities: ➤ There is a contractor that brings seasonal workers to empty seed bags and conducting cleaning activities including silos cleaning. • The cleaning specialists remove the grains from the bottom and sides of the silos. Cleaning is done every beginning of the season	with no retaliation, and this will be communicated to workers • Provision of anonymous grievances • Implement the project level labor management plan (LMP) which also addresses to subcontracted workers. • Subcontractor will provide all the needed PPEs and safety tools with supervision of the silo management. • Subcontractor and silo management will ensure proper OHS mentioned in this document are followed by seasonal workers and subcontractors. • The silo management will provide the following based on consultation: ○ Providing industrial security equipment for site employees in accordance with		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			occupational safety and health requirements. ○ - Paying transportation allowances to site employees and providing cars to reduce the burden of transportation to and from the sites due to the distance of the silo sites from residential areas and considering establishing silos in places close to residential areas and with available means of transportation. ○ Organizing shifts so that daily working hours comply with the controls of the labor law, and paying for additional working hours in the event that additional working hours are achieved ● PMU will conduct regular inspections on silos		

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	Risks on vulnerable populations	- Gender, ethnicity and other social stratification of beneficiaries may lead to disproportionate distribution of project benefits especially on vulnerable populations (minorities, women, disabled and very poor populations) as follows: - Limited access to silo services by small farmers and vulnerable populations due to elite capture. - Risk of unequal access to food distribution channels and purchasing power which can lower food accessibility to vulnerable population.	- Develop a well communicated and accessible grievance mechanism for community members to address any complaints including anonymous grievances (see GM in chapter 8) - Provide various grievance channels to obtain grievances. - Ongoing stakeholder consultation will include female farmers, disabled and vulnerable populations through regular focus group discussions. - Provide continuous information to farmers and different stakeholders on the progress of the project and on mitigation measures and grievance redress mechanisms during general meetings and information posted	Silo Management Social Specialist	7,000



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			on local levels and conduct focus group discussions (FGD) with women and vulnerable groups as per the SEP document. • Some of the consulted women preferred to receive information through their husbands. As with all vulnerable groups who are either illiterate or have no access to the internet, face-to-face communication is the preferred method of communication • For vulnerable groups including women and small scale farmers, use preferred means of communication using Arabic language and Illustration, Location sketches, physical models, and film Presentations		



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			- For other vulnerable groups such as persons with disabilities use preferred means of communications using Arabic language and tailored means of communications for different types of disabilities. - Liaison with the communities will be maintained - The silos operations will include two pathway lines for small farmers and big farmers and traders. The small farmers pathway lines will be a fast-tracking line. Provide the following on site based on consultation results: - Organizing the operations of supplying and dispensing wheat from silos to reduce the		



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			accumulation of cars around and inside the site - Reducing the waiting time for wheat suppliers to reach the silos. - Expediting the procedures for disbursing wheat suppliers' dues. - Using laboratory equipment to settle disputes that may arise between suppliers and the sorting committee regarding the degree of wheat cleanliness. - Providing yards and waiting areas equipped with bathrooms segregated by sex for wheat suppliers. - establish on-site teams specifically trained to assist vulnerable groups and women during grain delivery		



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			• implement a scheduling system during peak periods hours to reduce congestion and ensure that elderly and women receive timely assistance and a separate lane for women • Accessibility measures: • Install ramps, elevators, and wide pathways to ensure accessibility for people with disabilities. • Designate accessible parking spots and clearly marked accessible entrances. • Ensure that public areas and facilities within the silo are accessible for the people with disabilities, including restrooms and workstations. • a grievance mechanism, in which a gender-sensitive grievance		



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			mechanism, including channels for reporting harassment or discrimination, will be established to address any potential issues during construction and operation phases • the project aims to create equal job opportunities, including roles tailored for women and individuals from vulnerable groups • Engage regularly with small farmers ,elderly, and women and inform them with the mentioned services tailored to their needs in this section. • Having a dedicated access paths designed to ensure safety and ease of movement for all, including those with limited mobility by including a fast-tracking		



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			lane for elderly and small farmers and separate lane for women • Incorporating ramps to facilitate easy access for individuals with mobility challenges • Including parking space for special needs and elderly • A traffic management plan will be established and implemented.		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
	Risks on child labor/children present in silos during grain transport Risks of child labor by seasonal workers subcontractors	• Presence of children in grain handling or transport and loss of educational opportunities. • Children being Exposed to hazardous substances or working conditions.	• The security persons in the Silo will check IDs and will include a supervisor to prevent the children from accessing high risk areas and from reaching any active operations in the silos during the loading and unloading of grains and in vehicle pathways for safety. • Ensure implementing the Labor Management Plan (LMP) • For silo workers, maintain a copy of IDs of workers to prevent hiring workers under 18 years. • The silo management will add signs and banners on the dangerous of child labor and will raise the awareness of silo users. • For subcontractors of the seasonal workers, awareness on danger of child labor and penalties will be communicated and will be	• Subcontractor for seasonal workers supervised by Social Specialist and Environmental Health and Safety Specialist • Silo Management Social Specialist and Environmental Health and Safety Specialist • EHCSS	4,200



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			part of the sub contractor's contract. fines and penalties will be set in case child labor is detected. - EHCSS will check labor policies of the contractor. - Regular inspection will be conducted by the Food Security PMU (Project Management Unit).		
	Risks of SEA/SH	- Potential SEA/SH among staff and visitors. - Risks from security personnel (i.e violence).	Follow same measures for this risk present in construction phase.	Silo Management Social Specialist.	5,600
	Community health and safety: Traffic risks and accidents	Risks of road accidents may increase during high storage seasons.	Update and implement the traffic management plan (including routes and alternative routes, truck movements and transport of workers, assess the number of vehicles for the routes leading to the silos and	Silo Management Social Specialist with support from Environmental Specialist.	7,000



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			routes widths and capacities) appendix II. • Access roads for grain trucks shall be determined in coordination with the traffic authority. • EHCSS truck drivers: • Ensure truck drivers have valid license • Ensure truck drivers received training on good practice driving such as maintaining speed limits and wearing seat belts • Ensure drug check-ups are regularly conducted on truck drivers • Monitor unusual traffic delays or accidents • Ensure regular maintenance is conducted for the trucks • Avoid peak hours		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			- Follow, develop and implement the traffic management plan (appendix II) and GM (chapter 8) - Report any major injuries and accidents to the WB within 48 hours. - Using river transport to receive grains, which reduces traffic problems on the main road. - A separate access road from the main road will be established to reach the silos during operation phase will be implemented to avoid disturbing any neighboring communities. - having a traffic management plan during		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			construction and operation phases and community health and safety measures - defining a separate access routes to the silo to prevent disruptions to nearby agricultural activities and residents' movements. - Install speed bumps near residential areas, farm entrances, and silo access points to control truck speed. - Schedule truck movements outside peak hours (morning rush & evening return from farms). - Implement a weight restriction policy to prevent road degradation. - Ensure proper lane markings, pedestrian		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			crossings, and truck waiting zones. - Clearly mark no-overtaking zones and truck entry/exit points. - Add safety signs - The traffic management plan will include measures for the two way roads which do not have a safety island/pavement separating the roads. This could be done by adding cones or structures to separate the two way lanes. - Installation of pedestrian crossings, speed humps, and warning signs near		

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			farms and residential zones. - Maintain continuous fencing and restricted access around the facility - use traffic signs and speed bumps near school areas.		
Occupational Health and Safety (OHS)	Risks on workers health and safety	- Risks on workers respiratory system: Grain dust pollution while loading and offloading grains may lead to impacts on human health. Long-term exposure to grain dust can cause respiratory problems. - Gaseous exposures from trucks causing severe respiratory irritation, - Falling from height or accidentally falling in silos while working at height during maintenance - Asphyxia from working in confined areas while	- Develop a site specific OHS Manual to include the results of the OHS risk assessment, responsibilities and staffing, preventative measures, mitigation measures, emergency plans, training program, etc. - Ensure the adequate implementation of occupational health and safety provisions on-site such as providing personal protective equipment (PPE) to the workers during operation activities and dust masks while loading and unloading grains.	- Silo Management OHS Specialist with support of Environmental specialist, Social Specialist for reporting on grievance - Subcontractor for seasonal workers supervised by Silo management Environment Health and Safety Specialist with support of Environmental	17,500

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		conducting maintenance works. - Grain dust is a fire hazard, and a fire at the silos and transformer and generator and battery could cause serious injuries or death. - Grain dust explosions can also cause serious injuries or death. - Risks from grain engulfment - Risks of being entangled in unguarded auger and potential injuries - Risks of burns from hot surfaces - Noise and vibration emissions from silos operations and units, - Unhygienic practices - Handling of toxic substance, chemicals and wastes, such as pesticides	- Check weather forecasts prior to loading and unloading to prevent grain dust emissions - Ensure regular site cleaning is kept. - Ensure toilets are well kept and cleaned regularly - Provide ear muffers to workers working near noisy units. - Communication and training programs to prepare workers to recognize and respond to workplace hazards. Programs should include aspects of hazard identification, safe operating and materials handling procedures, work permit, safe work practices, basic emergency procedures, first-aid, and special hazards unique to their jobs. - Monitoring and record-keeping activities, including audit procedures designed to verify and record the effectiveness of prevention	specialist, Social Specialist for reporting on grievance EHCSS	

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		and rodenticide especially during application • Risks of skin and eye burns and irritation from handling, storing and disposing chemicals and empty containers and other types of wastes including domestic waste • Risks of snake and scorpion bites	and control of exposure to occupational hazards, and maintaining accident and incident investigation reports. • Follow the labor management procedures (LMP) and the workers grievance mechanism (GM). The GM should be established, and well-functioning and workers should be made aware of their rights regarding working hours, days off, salaries, etc. • Prohibit all forms of child and forced labor. • Provide medical and life insurance for all workers • Material/banner indicating the nearest police station and hospital (with accident and emergency facilities) should be posted at the site. • Provide first aid kits in different places on the work site and trained workers in first aid.		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• The presence of emergency procedures to transfer sick or injured operation workers on site to the nearest hospital. • All workers should be trained in handling, storing, and disposing of all types of chemicals and wastes according to their safety data sheets (SDSs). • Ensure workers handling chemicals and pesticides are properly trained. • Ensure all EHCSS transport/truck drivers have valid driving licenses and raise awareness on good road practices such as maintaining speed limit and wearing seat belts. • Train workers on proper management of toxic substances used at the plant, with regular refresher training • Ensure careful control of substances entering or leaving the site		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• Ensure vehicles are regularly maintained. • Conduct drug check-ups on workers. • Report any major incident to WB within 48 hours. • Body harness and safety line and breathing PPE must be worn when working on top of the silos in case of accidental falls within the silo, worker can be pulled back to safety. • All workers entering the silo must adhere to safety-line. Body harness and breathing apparatus and must be supervised and in case of grain engulfment, they can be pulled away. • Apply same measures present under construction phase for silo workers as well as any seasonal workers including specific measures for working in confined areas, handling chemicals and hazardous wastes, falling from height, electrocution		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			and follow EHCSS emergency procedures. • Ensure grain augers (if present) and grain elevators are turned off prior to conducting any operational and maintenance works inside the silos. • Follow safety procedures in the pest management plan annex I. • Food security PMU will conduct regular inspections Handling Phostoxin (fumigation): Keep ignition sources away Do not smoke. Protect against electrostatic charges. Keep protective respiratory device available Store away from water, acids, bases, strong oxidizing agents and strong reducing agents Do not store with acids		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			Store products in a locked, dry, cool, well-ventilated area away from heat. Post as a pesticide storage area. Do not store in buildings inhabited by humans or domestic animals. Do not breathe dust/fume/gas/mist/vapors/spray. Do not allow contact with water Respiratory protection will most likely be required during cleanup of spilled aluminum phosphide fumigants. If the concentration of phosphine (hydrogen phosphide, PH₃) is unknown, NIOSH/MSHA approved SCBA or its equivalent must be worn. Full-face gas mask canister combinations may only be worn at concentrations no higher than 15 ppm. Wear dry gloves of cotton or other material if contact with tablets, pellets, or dust is likely. Gloves should remain dry after use. Aerate gloves and other		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			clothing that may be contaminated in a well-ventilated area prior to laundering. Wear tightly sealed goggles Wear face protection Wear respiratory protection Wash thoroughly after handling. All ventilation should be designed in accordance with OSHA standard (29 CFR 1910.94). Use local exhaust at filling zones and where leakage and dust formation is probable. Use mechanical (general) ventilation for storage areas. Keep away from foodstuffs, beverages and feed. Immediately remove all soiled and contaminated clothing and wash before reuse. Wash hands before breaks and at the end of work. Avoid contact with the eyes and skin.		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			If on skin: Wash with plenty of water. If skin irritation occurs: Get medical advice/attention If inhaled: Remove person to fresh air and keep comfortable for breathing If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Specific treatment is urgent (see supplementary first aid instructions on this Safety Data Sheet). If swallowed: Immediately call a poison center/doctor. - Keep containers tightly closed and proper ventilation. - Containers to be disposed based on SDSs and manufacturers recommendations.		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			- Properly label and store the material according to its MSDS. Seasonal Workers - The silo's manager and OHS Specialists make sure that the cleaning workers for silos have the capacity to work in silos and aware of the OHS measures and how to use PPEs properly and knowledge about risks in working in silos. - The manager and OHS Specialists reviews safety measures with cleaning workers before entering the silos. - Silos are emptied before the worker enters - All machineries are shut down before the worker enters the silo - The LMP has procedures to deal with contractors and subcontractors obtained by EHCSS, on the labor rights		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			and OHS for seasonal workers. - Follow child labor mitigation measures Risks of snake and scorpion bites: - Ensure workers are wearing long pants and long safety boots near sandy areas and vegetated areas in case they are present. - Raise awareness to workers on possible risks of snake and/or scorpion bites and proper PPEs adherence - Ensure the presence of antivenom kits on site and first aid workers - Raise awareness to workers on not killing those creatures and how to handle workers in case of bites. Accessibility measures		

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			☐ Conduct regular training sessions for all staff on disability awareness and assistance. ☐ Maintain an inclusive workplace by continually updating accessibility measures and ensuring they meet current standards.		
Unplanned risks	Catastrophic events can produce major negative impacts on OHS, health and safety of silo users including non-workers and individuals in neighboring lands	• Fire and explosion during silo operations (unpredicted events) can lead to the death of workers and silo users. • Phostoxin/Aluminum phosphide may ignite spontaneously and may lead to explosion. • Risk of leaks of Phostoxin during transportation • Fire risks from transformers and generators and battery.	• Develop and implement a fire and emergency response plan • Procure and increase the number of firefighting equipment such as fire extinguishers, fire hose reels, smoke detectors, fire alarms and fire hydrants as needed, and place them at appropriate locations within the silos • Ensure firefighting equipment are serviced	• Silo Management Environmental specialist, social specialist and OHS specialist for reporting on grievance. • EHCSS/PMU	17,500



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			quarterly by fire service providers • Install fire and emergency exits at appropriate locations within the silos • Ensure good ventilation is maintained within the silos, generator room and transformer and appropriate extinguishers are placed for each unit. • Train staff on fire safety and have fire marshals on standby • Conduct fire drills regularly and fire safety audits annually. These must include site personnel and local stakeholders and must be coordinated with local authorities and any local services (for example the		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			local or regional fire brigade) that may be required to supplement site capacity for fighting fire and explosions. - The system includes sensors and blowers that blow air from the bottom of the silos to ventilate the silo when heat is high - Regularly perform maintenance on generators transformers and other units. Phostoxin/Aluminum phosphide management according to its SDS⁴: - Never allow the buildup of phosphine gas (hydrogen phosphide,		

⁴ For more information and guidance on Phostoxin follow https://label.westernpest.com/files_techservices/live/deggesch.phostoxin052418.sds.pdf



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			PH3) to exceed explosive concentrations. Open containers of metal phosphides in open air only and never in a flammable atmosphere Do not confine spent or partially spent dust from metal phosphide fumigants as the slow release of phosphine gas (hydrogen phosphide, PH3) from these materials may result in the formation of an explosive atmosphere. Spontaneous ignition may occur if large quantities of aluminum phosphide are piled in contact with liquid water.		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			- Do not store next to water and wet areas and do not dispose in sewage - Do not allow to enter sewers/surface or ground water. - If possible, dispose of spilled material by use according to label instructions. Freshly spilled material which has not been contaminated by water or foreign matter may be placed back into its original or other air-tight container. Punctured flasks, pouches or containers may be temporarily repaired using aluminum tape. - If the age of the spill is unknown or if the product has been contaminated with soil,		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			debris, water, etc., gather up the spillage in small open buckets having a capacity no larger than about 1 gallon. Do not add more than about 1 to 1.5 kg (2 to 3 lbs.) to a bucket. If on-site wet deactivation using deactivation solution is not feasible, transport the uncovered buckets in open vehicles to a suitable area according to local authority and manufacturer's guidelines. Small amounts of spillage, from about 4 to 8 kg (9 to 18 lbs.) may be spread out over the ground in an open area to be deactivated by atmospheric moisture. Alternatively, spilled aluminum phosphide fumigants may be deactivated by using the		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			deactivating solution as noted on the SDS and guidelines of manufacturer. • Inform relevant authorities in case of seepage in water resources or sewage system • In case of fire, use CO2, sand, extinguishing powder. Do not use water. Use firefighting measures that suit the environment. • Respiratory protection will most likely be required during cleanup of spilled aluminum phosphide fumigants. If the concentration of Phosphine (hydrogen phosphide, PH3) is unknown, NIOSH/MSHA approved SCBA or its equivalent must be worn. Full-face gas mask		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			canister combinations may only be worn at concentrations no higher than 15 ppm. As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear to prevent contact with skin and eyes. Wear a NIOSH/MSHA approved full-face gas mask – phosphine gas canister combination may be used at levels up to 15 ppm or following manufacturers' use conditions instructions for escape. Above 15 ppm or in situations where the phosphine gas concentration is unknown, a NIOSH/MSHA approved SCBA must be worn.		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			Follow EHCSS evacuation procedures, OHS plan and firefighting procedures. Immediately report to the WBG any major events / incidents within 48 hours Ensure proper grievance procedure is followed. Storage precautions mentioned in the document for Phostoxins will be considered also during the transportation of these pesticides.		
Unplanned risks	Risk of property losses	Catastrophic events such as explosions and fire events can produce major negative impacts on the livelihood of silo users.	For socio-economic risks: - Silo management unit provides instant grain deposit receipt to farmers who deposited their grains - Ensure proper grievance procedure under chapter 7 is followed. - and raise awareness to farmers and grain buyers on the grievance mechanism.	- Silo Management Social Specialist - EHCSS.	



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			The silo will have a damage insurance in case of damage Ensure proper grievance procedure is followed. Immediately report to the WBG any major events / incidents within 48 hours.		
Unplanned risks	Pesticides leaks	Pesticides during fumigation activities may leak into the atmosphere and cause health and safety and environment risks.	- Pressure tests must be carried out prior to handing over - Gas tight Pressure tests must be carried out when grains are added and prior to each fumigation activity - Pressure tests need to be part of the annual maintenance of silos. - Monitor and maintain and repair seals regularly when silos are empty. - Add gas sensors around silos.	Silo Management Environmental Specialist /EHCSS.	

7.4. Training and Awareness

The policy and objectives of this ESIA will only be met successfully when all those responsible for its implementation and review are thoroughly conversant with its content, interpretation, and performance measurement.

It is the responsibility of the EHCSS and contractors, with the assistance of the Occupational Health and Safety specialist (OHS), in implementing environmental education measures to ensure that all workers and all sub-contractors on the site are aware of and appreciate the need to implement the measures contained within this ESIA. Records of all environmental and social education / training / induction activities are to be kept and stored within the environmental management file on the site.

All employees and sub-contractors in Dandara Silo are to be inducted and given appropriate environmental and social awareness training. The training is to be relevant to their different roles to ensure that they are aware of:

- The importance of conformance with the environmental and social policy and procedures and with the requirements of this ESIA of Dandara Silo.
- The actual and potential environmental and social impacts of their work activities and the environmental and social benefits of improved personal performance.
- Their roles and responsibilities in achieving conformance with the environmental and social policy and this ESIA; and
- The potential consequences of departure from specified operating procedures.

Records of induction and training will be kept in the environmental and social file on the Dandara Silo site, including the topic of training, dates, names, and trainer details. Trainees will be required to sign off that they have been informed of the environmental and social issues and that they have understood their responsibilities. Specific individuals with environmental and social responsibilities may require the following training (see details below):

- Training in E&S and OHS legal and regulatory requirements pertinent to this facility
- Emergency response training.
- Emergency kit training.
- Environmental and social auditing; and
- Sampling and Monitoring.

All environmental and social training records are to be held at the EHCSS and Dandara Silo office. The environmental and social manager will have responsibility for maintaining and updating these records. As a requirement of each training session a record should be completed with the date of the training exercise, a description of the training content, the name of the trainer and trainees, and the signature of the trainer and relevant manager. The principal contractors and sub-contractors may use its own format if available.

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7.4.1. Training Requirements

Experienced, well-trained personnel are essential for the successful implementation of this plan. EHCSS and its contractors will undergo prevention and response, as well as safety training. The program will be designed to improve awareness of safety requirements, all pollution control laws and procedures, and proper operation and maintenance of equipment. The EHCSS and contractors and all his sub-contractors will ensure that persons engaged in sub-project operation are informed of the operation issues and concerns and that they attend and receive training regarding these requirements as well as all laws, rules, and regulations applicable to the work. Prior to operation, all sub-project personnel will be trained on environmental permit requirements and environmental and social specifications, including fuel handling and storage, cultural resource protection methods, stream and wetland crossing requirements, and sensitive species protection measures. Different levels of training will be required for different groups of worker and contractor personnel. EHCSS supervisors, managers, field foremen, and other contractor's personnel designated by EHCSS will attend a comprehensive environmental and social training session.

7.4.2. Site Induction

Prior to working on site all personnel and sub-contractors will attend a site induction session incorporating Environmental and Occupational Health and Safety requirements. The induction will address a range of environmental and social awareness issues, as a general environmental module, including but not limited to:

- The ESMP (purpose, objectives, method statements, procedures, key issues)
- Legal requirements including due diligence, duty of care and potential consequences of infringement.
- Environmental and social responsibilities
- Conditions of licenses, permits and approvals.
- Environmental and social policy of EHCSS
- Significant environmental and social issues and areas of the site including site boundaries; waste types, their segregation and location of waste disposal containers; washing, re-fuelling and maintenance of vehicles/trucks and equipment.
- Environmental and social management techniques for key environmental elements (soil, water, waste and recycling, flora and fauna, heritage etc.)
- Incident management and emergency response plans
- Reporting process for environmental and social incidents

7.4.3. Task-Specific Training

The environmental and social manager determines activities and personnel required to have specific instruction, when this training will take place, how it will be delivered and if there is a



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need to retrain personnel. This includes advanced training on noise minimization for staff working at night and any other subjects listed in Sub-Plans and/or work method statements. The environmental and social manager maintains a register of environmental and social training carried out including dates, names or people trained, and trainer details.

7.5. Roles and Responsibilities

The EHCSS and their contractors, as project initiator and applicant for the environmental authorization, has overall accountability and responsibility for environmental and social management, and for ensuring that any conditions attached to the record of decision are communicated to, implemented, and complied with by the EHCSS and main contractor and its sub-contractors during construction and operation. The EHCSS and contractors will organize the project implementation team. Although it will be the responsibility of these parties to prepare and implement detailed method statements and management plans, the EHCSS and contractors will remain accountable for their implementation.

Currently EHCSS has a technical consultant on board who supports the preparation of bidding documents. The plan is that the technical consultant will constitute the supervision work related to construction phase. The technical consultant will contract with a consulting firm to bring Environmental, social, and OHS specialists during the construction phase, and the technical consultant will supervise their work. The technical consultant and the consulting firm work will be finished at the end of the construction work.

Regarding the operation phase, EHCSS will contract with a consulting firm to bring in environmental, social, and OHS experts (roles mentioned below) who will take the responsibility of the ESMP implementation and supervision during the operation phase, until they (EHCSS) build their own team which will consist of (environmental, social, and OHS specialists) as permanent staff in the Dandara Silo.

Table (7.3): Roles and responsibilities at Dandara Silo for the Emergency Food Security and Resilience Support Project.

Staff and Individuals	Responsibility
All Staff including workers and sub-contractors	All staff have a responsibility for their own environmental and social performance and the impact they have on the environmental and social performance of the project. In particular, all staff should: • Undertake all activities in accordance with the agreed plans of management, procedures, and work methods. • Ensure that they are aware of the contact person(s) regarding environmental and social matters.

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Table (7.3): Roles and responsibilities at Dandara Silo for the Emergency Food Security and Resilience Support Project.

	● Report any activity that has resulted, or has the potential to result, in an environmental and social incident. ● Ensure they attend the environmental and social training provided.
Contractors	● Prepare Contractors' ESMP (C-ESMP) based on the WB approved ESMP, get clearance from EHCSS and implement ● Take actions to mitigate all potential negative impacts ● Hire/appoint qualified, OHS specialist, and Social Specialist to be endorsed by EHCSS. ● Actively communicate with local residents and take actions to prevent disturbance during construction and operation. ● Ensure all the construction and operation activities having sufficient documents from the related organization. ● Ensure that all staff and workers understand the procedure and their tasks in the environmental and social management program.
Silo Manager	● The primary responsibility of the Silo Manager is to ensure that the workers and contractors comply with the environmental specifications in this document. Over-all workers and contractor's representative to direct, manage, coordinate, and supervise all workers and contractor's personnel assigned at the silo site; and, Responsible for the over-all management of all operation activities including all related OHS and quality control activities at the silo site (Dandara Silo). In addition, the Silo Manager will: ● Assume overall responsibility for the effective implementation and administration of the ESMP. ● Ensure that the ESMP is included in the workers and contractor contracts. ● Ensure that the ESMP is given to the applicable construction and operation supervisor and the contractors. ● In conjunction with the construction and operation supervisor; undertake regular inspections of the workers and contractor's site as well as installation works to check for compliance with the ESMP in terms of the specifications outlined in this document. ● Inspections shall take place at least once a week and copies of the monitoring checklist contained in the file. ● Keep a register of all incidents (accidents, injuries, complaints, legal transgressions, etc) and other documentation related to the ESMP. ● Responsible for the overall management of all operation activities including all related OHS and quality control activities at the silo site.

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Table (7.3): Roles and responsibilities at Dandara Silo for the Emergency Food Security and Resilience Support Project.

	● Provide environmental and social advice on matters specified in the conditions of approval, project contracts, licenses and permits. ● Facilitate induction and training programs for all persons involved in the construction works. ● Liaise with all relevant government authorities such as the EEAA. ● Implement and review compliance with the OHS specialist and associated environmental and social documents. ● In addition, the Silo Manager is responsible for: ● Apprise the Site Foreman of requirements of the EHS management system, and their responsibilities within them. ● Allocate resources to meet the requirements of the EHS management system. ● Investigate complaints to determine effective resolution. ● Maintain all necessary monitoring records and reports. ● Take action in the event of an emergency and allocating the required resources to minimize the environmental and social impact. ● Share the monthly environmental, health, safety and social report with EHCSS/PMU ● Report to EHCSS/ PMU any activity that has resulted, or has the potential to result, in an environmental and social and OHS incident.
Technical consultant	● Responsible for bidding documents preparation ● Responsible to assign the environmental and social and OHS experts during construction phase and to supervise ESMP implementation during construction phase by the contractor.
Environmental Specialist	During the construction phase: ● Conduct and oversee the EIA to identify potential environmental impacts of the construction activities. ● Ensure that construction activities comply with environmental regulations and standards. ● Develop and implement waste management plans to minimize the environmental footprint. ● Monitor air, water, and soil quality to prevent contamination and mitigate any adverse effects. ● Ensure that construction activities do not harm local wildlife and habitats.

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Table (7.3): Roles and responsibilities at Dandara Silo for the Emergency Food Security and Resilience Support Project.

	During the operation phase: - Continuously monitor environmental parameters to ensure compliance with regulations. - Promote and implement sustainable practices in the operation of the silo. - Oversee the management of operational waste to minimize environmental impact. - Prepare and submit regular environmental reports to regulatory authorities. - Conduct training sessions for staff on environmental best practices and compliance requirements.
Occupational Health and Safety Specialist (OHS)	During the construction phase: - Develop and implement a comprehensive safety plan for the construction site. - Conduct regular risk assessments to identify potential hazards and implement measures to mitigate them. - Provide training for all workers on health and safety protocols and emergency procedures. - Investigate any accidents or incidents to determine causes and prevent recurrence. - Ensure compliance with all occupational health and safety regulations and standards. During the operation phase: - Develop and oversee the implementation of workplace safety programs and policies. - Provide continuous training for employees on health and safety practices and emergency response. - Conduct regular health check-ups and monitor the health of workers to prevent occupational illnesses. - Ensure that emergency response plans are up to date and conduct regular check.

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Table (7.3): Roles and responsibilities at Dandara Silo for the Emergency Food Security and Resilience Support Project.

	● Investigate any workplace incidents to improve safety measures and prevent future occurrences. ● Maintain records of safety incidents and prepare reports for regulatory authorities and internal review.
Social Specialist	During the construction phase: ● Facilitate communication and engagement with local communities to address their concerns and incorporate their feedback into the project. ● Conduct and manage social impact assessment to understand the social implications of the construction activities. ● Establish and manage a grievance mechanism to address community complaints and concerns. ● Organize and participate in stakeholder meetings to ensure transparent communication. During the operation phase: ● Maintain positive relationships with the local community and address any ongoing concerns. ● Continuously monitor the social impact of silo operations and make necessary adjustments to mitigate negative impacts. ● Maintain an effective grievance mechanism to handle any complaints from the community. ● Document and report on social performance and community engagement activities.
Sub-Contract Personnel	All sub-contract personnel must carry out the work in accordance with contract instructions and shall conduct their activities in an environmentally and socially sound manner. All sub-contract personnel will undergo environmental and social and OHS induction before they commence any work on the site.

7.6. Environmental and Social Monitoring

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Monitoring is an essential part of the ESIA. The purpose of the environmental and social monitoring program is to serve as an early warning system of undesirable impacts arising from the project activities. From this information, the ESIA is amended as necessary to provide an effective remedy. This ensures that environmental protection is optimized and demonstrates compliance with regulatory requirements.

The Environmental Monitoring Program has important objectives as follows:

- To assess compliance and to enable corrective actions to be taken in the case of non-compliance.
- To provide evidence in connection with contractor's claims (e.g., unexpected weather or sea conditions).
- To provide data to be used as evidence in claims from third parties about impacts affecting them during and after operation and
- To provide data to support assessment of impacts in future ESMPs in the region.
- To assess the effectiveness of control measures and identify if further controls/corrective action is required.
- To identify any negative impacts from construction and operation activities.

Environmental and Social Monitoring Plan contains the following information:

1. Frequency of sampling / sampling points. Sampling should be done at the same locations and at effluent release points to check whether permit requirements are met.
2. Sampling parameters: soil quality air quality, noise, etc.
3. Sampling methodology for the following: (Air quality, Soil and, biological conditions, Temperature and ventilation, Noise, and social conditions).

The monitoring results are then evaluated to determine compliance with the imposed requirements. Adaptive environmental monitoring is consistent with the principle of "continual improvement" as per the 'Plan -Do-Check' approach expressed in ISO 14001 and ESSs of the WB. The frequency of monitoring and reporting will largely be dictated by requirements of the planning obligation and the objectives and targets set in the ESIA. An environmental monitoring program for the operation period must be implemented to monitor the environmental impacts and recovery of affected areas and to monitor and document that environmental requirements are complied with.

Table 7.4. Monitoring measures during construction phase. Note the budget for the monitoring measures during the construction phase was calculated for two years (the construction period).

Factors	Impacts/risks	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing ⁵
Environmental	Risks on Ambient air due to airborne Dust	Airborne dust can be generated from construction activities such as excavation. This dust can pollute the air and can also pose a health hazard to workers and nearby residents.	- Visual inspections - Spot check measurements of ambient air quality - Review of maintenance records of machinery- according to Egyptian national requirements - Recording and documentation of complaints/ Grievance records	Daily inspections onsite of weather conditions and operating machinery and excavation and construction activities	- Weather conditions: visual ambient dust levels; windy conditions. - Operating vehicles and machinery: dust generation and black exhaust emissions observed. - Dust generated during construction activities (earthworks)/visible dust cloud.	- Construction site and surroundings - Point source: machinery, equipment, and vehicles exhaust and generators if used.	- Contractor and subcontractor - Environmental specialist, social specialist for reporting of grievance.
	Gaseous emissions from Engine Exhaust Gases	Exhaust fumes and gaseous emissions such as NOx, Sox and Particulate matter (PM2) and (PM10) from internal combustion engines/ generators/ vehicles and machineries used present another risk to air quality on and close to construction sites.	Monthly report.	- Prior to procurement of machinery for maintenance log and monthly onsite: verification of maintenance records. - Weekly for grievance	- Compliance for machinery inspection records and number of maintenances performed. - Number of grievance records related to air emissions.		
	Risks on Soil and Water	The project may impact soil quality	Visual inspection of site: backfilling and restoration	Daily visual inspection	Change in soil colour.	Construction site including	Contractor and Subcontractor

⁵ The PMU will ensure provision of Environment, Social and OHS monitoring supervision during construction work

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	resources contamination	and groundwater quality (on the long run) and Nile water from; - Accidental oil and fuel spills from machineries and vehicles used and generators. - Runoff risks from pesticides used near temporary offices/caravans which could pollute nearby lands/soils - Solid waste and construction waste may impact Nile River quality	- Visual inspection on soil - Inspection of equipment and machinery used and associated maintenance records. - Grievance records. - Fuel consumption records	especially during excavation and backfilling - Daily visual inspection on soil. - Daily visual inspection on chemicals storage and proper labeling. - Prior the start of the construction activities and monthly for: inspection of machinery records. - Weekly for grievance. - Monthly for fuel consumption.	- Maintenance records for equipment and machineries and number of maintenances performed. - Number of grievance records and complaints related to soil, contamination. - Significant decrease in stored fuel.	generator area and surrounding.	Environmental Specialist, social Specialist for reporting on grievance.
	Risks on Ambient Noise	The following equipment used excavation and grading of the site	- Inspection and tests of operating machineries and vehicles onsite for proper functioning. - Grievance records.	- Weekly noise tests - Daily inspection of operating machinery onsite	Noise level below permissible levels applicable by zone (industrial,	Construction site and surroundings.	Contractor and Subcontractor

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		may produce high noise emissions: - the use of heavy machinery, such as trucks, bulldozers, and excavators. - the operation of construction equipment, such as generators and compressors.		Prior the start of the construction activities and monthly for: inspection of machinery maintenance records.	nearby community) - Maintenance records for equipment and number of maintenances performed and inspection of proper noise enclosure fitting - Time logs for work/construction activities. - Number of grievance records related to noise emissions.		Environmental Specialist, social Specialist for reporting on grievance.
	Biodiversity/ pesticides consumption by non-targeted species Bird collision risks	- Impacts on biodiversity may result in the disturbance of wildlife from noise, dust, air, light emissions and waste generation including chemicals. - Non targeted wildlife may consume	Surveys at project site and surroundings	Daily on site and surrounding.	- Presence of dead animals and birds - Number of non-compliances for capturing and trading - Number of penalties enforced	Project site and surroundings	Contractor and Subcontractor Environmental Specialist.

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		rodenticides by accidents or consume the dead rodent if not collected right away and disposed properly and in turn leading to their secondary poisoning. • Disturbance and hunting of wild animals in case they occur • Bird collision into the silo construction site during migratory seasons.					
	Waste generation (solid, liquid, and hazardous wastes) emissions.	Solid waste • Increased waste generation from materials, packaging, debris. • Construction waste • Large quantity of excavated soil will be generated among other construction waste.	• Visual inspection on site and surrounding. • Inspect waste storage sites. • Inspect soil colour. • Review of maintenance records of machines and generators. • Grievance records related to waste and pollution.	• Daily inspection on site and surrounding and waste areas. • Weekly inspection on waste receipt • Monthly inspection on machine maintenance records	• Presence of waste in undesignated areas. • Change in soil colour. • Presence of waste receipt. • Number of maintenances performed on	Project site, waste storage area and surrounding	• Contractor and subcontractor • Environmental specialist, social specialist for reporting of grievance.

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		Liquid waste - Potential wastewater from concrete mixing, equipment washing, sanitation. Hazardous waste - Potentially hazardous waste from paints, solvents, oils, pesticides containers and chemicals.		Weekly on grievance	equipment and machines. Number of grievances recorded.		
Socioeconomic Aspects	Risks to labor from inappropriate working conditions	- Unfair treatment (discrimination, delayed payments, unsafe working conditions). - Unresolved complaints from the lack of grievance mechanism for workers.	- Inspection of documents, labor contracts and LMP - Grievance records	- Prior the start of any work for labor contracts and LMP and awareness sessions records to workers on their rights - Weekly for grievance - Monthly inspections by the PMU	- Presence of grievance mechanism in place and adequate LMP - Number of awareness sessions performed to workers on their rights - Number of contracted workers /presence of contracts versus	Site location	- Contractor and subcontractor - Environmental specialist, social specialist for reporting on grievance.

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					number of actual workers - Number of grievances reported from workers and number of solved grievances - Number of visits conducted by the PMU.		
	Child Labor	- Exploitation of children in construction work. - Hazardous working conditions. - Interference with education.	- On site inspection and ID inspection - Workers logs inspections - Inspection on contractor's labor policies - Grievance mechanism	- Daily for ID inspections - Prior to starting any work for child labor policies inspection and for awareness sessions to contractors - Weekly for grievances - Upon occurrence for penalties	- Number of workers below the age of 18. - Presence of contractor's policy on child labor - Number of awareness sessions provided to contractor on child labor - Number of visits conducted by the PMU - Number of recorded	On site	Contractor and Subcontractor Social Specialist and OHS Specialist

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					grievances related to child labor		
					Number of penalties/ fines		
	Risks of SEA/SH	- Risk of sexual exploitation and abuse and harassment may increase due to the presence of workers near local communities and lack of awareness on SEA/SH issues - Risks from security personnel (i.e. violence)	- Complaint records - Inspection on LMP and CoC - Inspection on signposts - Inspection on contractor's SEA/SH policies and security personnel contractor's policies	- Weekly for complaints - Prior to the start of any work for LMP and COC and awareness sessions on SEA/SH and contractor's policies - Daily for signposts	- Number of complaints regarding SEA/SH and number of solved complaints - Presence of LMP and code of conduct - Presence of SEA/SH in contractor's policies - Number of awareness sessions provided to workers on SEA/SH - Number of workers who signed the COC versus actual number of workers - Presence of signposts	On site and surrounding	Contractor and Subcontractor Social Specialist

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	Community health and safety: Traffic risks and accidents	- Traffic accidents due to the increase in number of trucks during construction phase may pose a risk on other road users. - Traffic congestions due to the increase in transportation trucks for materials, machineries and wastes to and from the site. - Potential risks from air and noise emissions and vibration from high traffic volume during transportation of materials and machineries and wastes to and from the site.	- Traffic management plan in place - Grievance records - Accidents log inspection - Maintenance log inspection	- Prior the start of work for the traffic management plan - Weekly for grievances - Weekly for accidents log - Monthly for maintenance log.	- Number of traffic complaints - Number of incidents, injuries to local communities and workers with details - Number of maintenance performed.	On site and District-regional level	- Contractor and Subcontractor - Social Specialist with support from Environment Specialist
	Community health and safety: Electrical Hazards and	Risks of power outages, potentially disrupting electricity supply to nearby communities or agricultural operations	Continuous monitoring of the electrical system post-installation to identify and address potential hazards promptly.	- weekly site inspection and surrounding. - Weekly for grievance log	- Number of power outage complaints - Number of maintenance	- construction area - District area/communities around silos.	Contractor Electrical Subcontractor

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	Power Supply Risks		Documentation and reporting of any incidents or disruptions to evaluate the effectiveness of mitigation measures.		- interventions on buried lines - Voltage stability readings before and after burial		
	Lack of stakeholder engagement and proper grievance mechanism	- Risks of untransparent sharing of information - Risks of increase in unresolved complains	- Community consultations/consultation records - Inspection on required permits and documents. - Complaint records inspection - Signage and posting are present on site.	- Prior the start of any work for permits, documents signage and posting and previous consultation records - Weekly for complaints received - Monthly for consultations	- Presence of required permits - Number of complaints received versus number of solved complaints - Presence of signage on site - Presence of consultation records and stakeholder types (including small farmers, women, disabled farmers and other vulnerable groups)	Site location and surrounding.	- Social Specialist - Silo Manager

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					- Number of consultations performed - Presence of complaint boxes and banners including number for grievance - Presence of LMP		
	Risks on Cultural Heritage and archeological sites	Impacts on archaeological and historic sites during the construction phase are expected to be negligible since there are no archeological sites nearby the subproject site.	- Document with chance find procedure - Awareness logs on chance find procedures	Before and during construction works.	- Presence of cultural artifacts and number of encounters. - Number of workers aware of the chance find procedure.	Project work site.	- Contractor and Subcontractor - Environment Specialist - Silo Manager
Occupational Health and Safety (OHS)	Risks of injuries and accidents	The use of hazardous materials and chemicals and wastes can pose a risk to worker health (i.e. cement, paints, oil etc.).	Visual inspection for proper use of PPE, emergency preparedness, fire extinguishers adequate signage for health and safety measures etc. and fencing.	Daily site inspection and surrounding. for PPEs and proper safety measures (i.e barriers and fences are in	- Number of recorded incidents and injuries and type. - Number of non-compliances including not wearing PPEs	Site location and surrounding and rented apartments for workers,	Contractor and Subcontractor

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		- Falls from heights are a possible cause of injuries in construction (silo rooftop areas/ use of scaffoldings etc.). - Electrical hazards can cause serious injuries or death. - Machinery can cause crushing injuries or amputations/moving loads. - Dust and fumes can irritate the eyes, nose, and throat, and can also cause respiratory problems. - Noise emissions may disturb workers. - Falling into excavated zones. - Working during bad weather conditions (dust storm, heat wave, rainy seasons etc.). - Injuries and burns from welding activities.	- Visual inspection for good housekeeping and storage of hazardous materials and equipment. - Verification of training records including daily induction for general construction related risks and hazards, proper use of PPE. - Inspection of complaints and grievance reports and register. - Inspection of employment contracts. - Records about occupational injuries and infectious diseases among workers. - Records of GM and complaints. - Perform gas tests for silos/confined areas - Inspection of insurance policies and attendance sheets. - Report major accidents to WB - Checking meteorological conditions/forecasts prior the start of work daily.	- place, fire extinguishers, presence of flagman banners with emergency measures and daily induction for OHS risks etc) - Prior entering silos for gas emissions - Monthly on workers accommodation. - Weekly inspection of GM - Monthly inspection on training records and maintenance of equipment. - Major accidents reported within 48 hours - Prior start of construction work for OHS plan.	- Presence of potable water supply and disinfectants - Presence of fire extinguishers on site. - Number of grievances and solved grievances. - Presence/proof of valid insurance coverage for all workers on site - Presence of trainings materials and records of trained personnel and type of trainings. - Number of maintenances performed on equipment. - Number of major accidents reported within 48 hours.	Occupational Health and Safety Specialist with support of Environment Specialist, social Specialist for reporting on grievance.



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		• Accidents while transporting materials and machinery to and from the subproject site. • Accidental loads falling on workers while being lifted by cranes. • Physical injuries from physical activities and wrong lifting techniques, wrong posture while conducting any work. • Slip trip and fall • Injuries and cuts from machineries and hand arm vibration syndrome from machineries used • Physical injuries from physical activities and wrong lifting techniques, wrong posture while conducting any work • Getting hit by moving load/vehicle/machine • Working in confined area (risk of asphyxia)					

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		while working inside the silos) during construction phase. Risks of electrocution while installing the Silos.					
Unplanned events	Catastrophic event can produce major negative impacts on OHS and public health and safety	Fire and explosion risks from badly stored fuel/ poorly stored/installed generator and mishandling of chemicals during construction phase (unpredicted events) can lead to the death of workers.	- Presence of fire safety measures (i.e. fire extinguishers) Incidence report/log - Report major accidents to WB. - Grievance log.	- Daily for safety measures, presence of fire extinguishers and PPEs in place - Daily for corrective actions - Monthly for incident log - Report of major accidents within 48 hours to WB - Monthly for grievances.	- Number of incidences and near misses - Number of injuries - Number of fire events - Presence of fire extinguishers - Number of grievances and number of solved grievances - Number of major accidents reported to WBG within 48 hours.	Site location and surrounding	Contractor and Subcontractor Occupational Health and Safety Specialist, Environment Specialist, and Social Specialist for reporting on grievance.
Unplanned events	Risk of property losses	Fire and explosion (i.e. generator/fuel) events from construction work	Complaint records inspection	Weekly for complaints	Number of complaints and	District and regional level Site location	Occupational, Health and Safety



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		can produce major negative impacts on the society (i.e. loss of livelihood and property) as follows: • Loss of grains and loss of storage area	• Insurance records inspection for silos • Payment receipt inspections	• Monthly on insurance papers and policies • Report of major accidents within 48 hours to WB	number of solved complaints • Presence of payment receipts • Presence of insurance papers • Number of major accidents reported to WBG within 48 hours		Specialist, Environmental Specialist, and Social Specialist for reporting on grievance

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Table (7.5): monitoring measures during operational phase. Note the budget for the monitoring measures during the operation phase was calculated for one year.

Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
Environmental	Airborne Dust Gaseous emissions from Engine Exhaust Gases and from fumigation process	- Airborne dust can be generated from activities such as loading and unloading grain, and from the movement of grain through the Silos. This dust can pollute the air and can also contribute to the formation of smog. - The major activities at this phase are maintenance procedures and transport of many cars during the daytime. Trucks transporting grains will release exhaust emissions, containing carbon monoxide (CO), sulfur dioxide (SO₂), oxides of nitrogen (NO_x), and particulate matter	- Visual inspections - Spot check measurements of ambient air quality - Review of maintenance records according to Egyptian national requirements - Recording and documentation of complaints/ Grievance records - Monthly report. - Pressure tests for fumigation	- Daily inspections onsite of weather conditions - Monthly Verification of maintenance records. - Monthly for fumigation pressure tests - Weekly for grievances related to air emissions	- Weather conditions: visual ambient dust levels; windy conditions. - Operating vehicles and grain trucks: dust generation and black exhaust emissions observed. - Dust generated during operation work (loading and uploading of grains). - Onsite ambient air quality compliance with WB limits and national limits for PM - Compliance for inspection records. - Number of grievance records	- Silo Complex site and surroundings. - Point source: equipment, grain trucks and vehicles exhaust.	Silo management Environmental specialist, social specialist for reporting on grievance	8,000



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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
		(PM). Regular maintenance to silos trucks (belonging to EHCSS) and machinery will reduce equipment failure and loss of integrity. - Exhaust fumes and gaseous emissions such as NOx, Sox and Particulate matter (PM2) and (PM10) from internal combustion engines/ generators/ vehicles and machineries used present another risk to air quality on and close to construction sites. - Fumigation emissions from silos and airborne drift from pesticides application may also reduce ambient air quality.			related to air emissions. - Number of maintenance performed - Number of pressure tests performed versus number of fumigation activities			

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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
	Impacts on Soil and long-term risks on ground Water Quality and Nile river from trucks and machineries and any potential chemical and wastes	- Sources of soil contamination are accidental and lubricant/fuel spills of trucks transporting grains to and from the Silo Complex in Dandara. Other sources also include inappropriate waste disposal from the offices and inappropriate sewage disposal which may contaminate the soil. Spills may also result from result from badly stored chemicals and materials and wastes, generator and transformer. - Nile river contamination from grain transfer	- Visual inspection of site: backfilling and restoration - Visual inspection on soil - Inspection of equipment used during the operation phase and associated maintenance records. - Grievance records. - Generator fuel consumption records	- Daily visual inspection especially during loading and uploading of grains. - Daily visual inspection on soil. - Daily visual inspection on stored chemicals and proper labeling and presence of fire extinguishers - Weekly for grievances - Monthly for fuel consumption.	- Change in soil colour. - Maintenance records. - Number of grievance records and complaints related to soil, geology, and topography. - Number of spills - Significant decrease in fuel consumption	Silo Complex and surrounding.	- Silo Management - Environmental specialist, social specialist for reporting on grievance.	6,400
	Noise	The following activities can generate noise pollution: a) the	Inspection of operation activities for proper functioning.	Daily inspection of operating	Noise level below permissible levels applicable by zone (industrial,	Silo Complex site and surroundings.	- Silo Management - Environmental specialist, social	7,200

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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
		loading and unloading of materials as well as the loading and unloading of grains from the trucks to and from the silos, b) the operation of conveyer belts, motors and other units and c) the movement of vehicles and machinery in and around the Silos project site The use of generator.	- Noise Tests - Maintenance records - Grievance records.	- activities onsite - Weekly for noise tests and grievances - Monthly for maintenance records	- nearby community). - Maintenance records for equipment and inspection of proper noise enclosure fitting. - Number of grievance records related to noise emissions.		specialist for reporting on grievance.	
	Biodiversity	The following activities can have a negative impact on biodiversity in the study area: a) the use of pesticides can be consumed by non-targeted species and can lead to their poison/death b) the emission of pollutants from vehicles and machinery can pollute the air and water,	Surveys at project site and surroundings.	Daily on site and surrounding.	- Presence of dead animals and birds. - Number of noncompliance regarding capturing and trading. - Number of penalties enforced.	Silo Complex location and surroundings.	- Silo Management - Environmental specialist.	8,000

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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
		which can harm animals if any. - Disturbance of wild animals and hunting and or trading of animals in case they occur. - Bird collision risk						
	Waste Management	Solid waste - Ongoing generation from operations, maintenance, offices. Liquid waste - Potential wastewater from grain washing, equipment cleaning, sanitation (water use is minimal). Hazardous waste - Potentially hazardous waste from pesticide use, grain fumigation, maintenance.	- Visual inspection on site and surrounding. - Inspect waste storage sites. - Inspect soil colour. - Review of maintenance records. - Presence of labels on wastes and materials - Grievance records related to waste and pollution.	- Daily inspection on site and surrounding and waste areas. - Weekly inspection on waste receipt - Weekly for grievances related to waste	- Presence of waste in undesignated areas. - Change in soil colour. - Presence of waste receipt. - Number of maintenances performed in the sites. - Number of grievances recorded.	Silo complex site, waste storage area and surrounding.	Silo Management Environmental specialist, social specialist for reporting on grievance.	9,600

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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
Socio-economic Aspects	Risks to labor and lack of appropriate work conditions and risks on Seasonal Workers	- Silo workers and seasonal workers may face unfair treatment (discrimination, delayed payments, unsafe working conditions and unresolved complaints from the lack of grievance mechanism. - Workers may face occupational health and safety hazards (e.g., grain dust exposure, machinery accidents). - Seasonal workers including cleaning workers during operational phase are at risk from working from height and confined areas, utilizing child labor and improper PPEs, from the following activities: ➤ There is a contractor that brings seasonal	- Inspection of documents, labor contracts including seasonal labor and LMP - Grievance records - Inspection on signage and boxes for grievance	- Prior the start of any work for labor contracts and LMP and awareness sessions provided to workers including seasonal workers on their rights - Weekly for grievances - Monthly inspections by the PMU	- Presence of grievance mechanism in place and adequate LMP and awareness sessions records to workers on their rights - Presence of grievance boxes and signage on site - Number of contracted workers /presence of contracts versus number of actual workers observed - Presence of contracts for seasonal workers. - Number of grievances reported from	Site location	- Silo Management Social specialist and environment health and safety specialist. - EHCSS.	9,600



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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
		workers to empty seed bags and conducting cleaning activities including silos cleaning. The cleaning specialists remove the grains from the bottom and sides of the silos. Cleaning is done every beginning of the season.			workers and number of solved grievances Number of visits conducted by the PMU.			
	Vulnerable populations	Gender, ethnicity and other social stratification of beneficiaries may lead to disproportionate distribution of project benefits especially on vulnerable populations (minorities, women,	- Inspection of community grievance log - Reviewing community consultation reports and outreach minutes of meetings.	- Weekly inspection of records reports, grievance logs. - Number of grievances and number of	- Number of reported complaints from community and surrounding industries if any and number of solved complaints - Number of female complainers	Site and surrounding communities/district level.	Silo Management Social Specialist	9,600



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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
		disabled and very poor populations) as follows: ➤ Limited access to silo services by small farmers and vulnerable populations due to elite capture. • Risk of unequal access to food distribution channels and purchasing power which can lower food accessibility to vulnerable population.	• Site inspection for separate lines (small farmers vs big farmers) and presence of grievance boxes and signs.	solved grievances • Every 2 months for community consultation reports and outreach • Monthly site inspection by PMU	• Number of consultations and FGDs performed and targeted group types • Number of incidents, injuries to local communities from operations • Presence of fast-tracking line for small farmers • Presence of grievance boxes and signage on site • Presence of ramp and latrines for disability inclusion			
	Risks on child labor/children present in silos during grain transport	• Presence of children in grain handling or transport. • Children being exposed to hazardous	• Site inspection • Visitors ID inspection	• Daily for visitors' ID inspection and seasonal workers ID inspections	• Number of children present in silos • Number of children present near loading and	• Site area	• Social specialist and OHS Specialist • EHCSS	4,800



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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
	Risks of child labor by seasonal workers subcontractors	substances or working conditions.	- Seasonal workers ID inspection - Awareness records - Grievance Log	- Prior the start of any work for awareness sessions to subcontractors on child labor - Weekly for grievances - Upon occurrence for penalties	- unloading activities - Number of children identified during maintenance works - Number of awareness sessions provided to subcontractor on child labor - Number of visits conducted by the PMU - Number of recorded grievances related to child labor - Number of penalties/ fines.			
	Risks of SEA/SH	Continued potential for SEA/SH among staff and visitors.	Same measures as in construction phase	Same measures as in construction phase	Same measures as in construction phase	Same measures as in construction phase	Silo management Social Specialist	6,400



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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
		Risks from security personnel (i.e violence).						
	Community health and safety: Traffic risks and accidents	Risks of road accidents may increase during high storage seasons.	- Inspection of community grievance log - Accidents log - Maintenance log.	- Weekly for grievance log - Weekly for accidents log - Monthly for maintenance log.	- Number of accidents - Number of maintenance performed - Number of grievances submitted.	- Silo area - District area/communities around silos. - District /regional area for accidents.	Silo Management Social specialist	9,600
Occupational Health and Safety (OHS)	Injuries and accidents to workers	- Risks on workers respiratory system: Grain dust pollution while loading and offloading grains may lead to impacts on human health. Long-term exposure to grain dust can cause respiratory problems. - Gaseous exposures from trucks causing severe respiratory irritation, - Falling from height or accidentally falling in silos while working at	- Visual inspection for proper use of PPE, emergency preparedness, fire extinguishers adequate signage for health and safety measures etc. - Visual inspection for good housekeeping and storage of hazardous materials. - Inspection of complaints and grievance reports.	- Daily site inspection and surrounding. - Monthly inspection on training records and maintenance of equipment - Prior entering silos for gas test - Major accidents reported within 48 hours.	- Number of recorded incidents and injuries and near misses during operation work and type. - Presence of fire extinguishers on site. - Presence of first aid equipment on site - Number of grievances and solved grievances.	Silo complex site and surrounding.	Silo Management OHS Specialist with support of Environmental specialist, social specialist for reporting on grievance including on subcontractor of seasonal workers EHCSS	17,600



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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
		height during maintenance - Asphyxia from working in confined areas while conducting maintenance works. - Grain dust is a fire hazard, and a fire at the silos could cause serious injuries or death. - Grain dust explosions can also cause serious injuries or death. - Risks from grain engulfment - Risks of being entangled in unguarded auger and potential injuries - Risks of burns from hot surfaces - Noise and vibration emissions from silos operations and units, - Unhygienic practices	- Records about occupational injuries and infectious diseases among operation workers. - Records of GM and complaints. - Perform gas tests for silos/confined areas - Inspection of insurance policies and attendance sheets. - OHS training records - Report major accidents to WB		- Presence/proof of valid insurance coverage for all workers on site - Presence of trainings materials and records of trained personnel and type of trainings. - Number of maintenances performed on equipment. - Number of gas tests performed and results - Number of major accidents reported within 48 hours.			



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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
		- Handling of toxic substance, chemicals and wastes, such as pesticides and rodenticide especially during application - Risks of skin and eye burns and irritation from handling, storing and disposing chemicals and empty containers and other types of wastes including domestic waste.						
Unplanned risks	Catastrophic events can produce major negative impacts on OHS, health and safety of silo users including non-workers and individuals in neighboring lands Phostoxin/Aluminum phosphide may ignite spontaneously and may lead to explosion	Fire and explosion during silo operations (unpredicted events) can lead to the death of workers and silo users.	- Incidence log - Site inspection on safety measures - Grievance log - Report major accidents to WB - Fire drills records - Pressure tests	- Monthly for incidence log and for grievance - Daily for site inspection - Daily for corrective actions - Daily for safety measures and PPEs in place	- Number of incidents - Number of injuries - Number of corrective actions taken - Number of grievances and number of solved grievances	Silo site area and surrounding and district-regional level (silo users)	- Silo Management OHS specialist, Environmental specialist, and social specialist for reporting on grievance. - EHCSS	12,000



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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
	Risk of leaks of Phostoxin during transportation			- Daily for presence of fire extinguishers - Report of major accidents within 48 hours to WB - Monthly fire drills - Monthly Pressure tests and maintenance performed	- Number of fire extinguishers - Presence of evacuation and emergency plans - Number of fire drills performed - Number of pressure tests and silos gate maintenance performed - Number of major accidents reported within 48 hours.			
Unplanned risks	Risk of property losses	Catastrophic events such as explosions and fire events can produce major negative impacts on the livelihood of silo users.	- Complaint records inspection - Insurance records inspection for silos - Payment receipt inspections	- Weekly for complaints - Monthly on insurance papers and policies - Report of major	- Number of complaints and number of solved complaints - Presence of payment receipts - Presence of insurance papers	District and regional level Site local (silo users)	- Silo Management Social specialist - EHCSS	



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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
				accidents within 48 hours to WB.	Number of major accidents reported to WBG within 48 hours.			
Unplanned risks	Pesticides leaks	Pesticides during fumigation activities may leak into the atmosphere and cause health and safety and environment risks.	- Leak test - Maintenance repair log - Report major accidents to WB	- Leak tests/pressure tests prior handing over - Leak tests prior fumigation event - Seasonal for repair and maintenance of seals - Report of major accidents within 48 hours to WB.	- Number of incidences/leaks - Number of injuries as result of leak - Number of grievances and solved grievances - Number of major accidents reported to WBG within 48 hours	Silo site area and surrounding	Silo Management Environmental Specialist /EHCSS	

7.7. Monitoring Strategy

The monitoring strategy proposed for the sub-project can best be termed "Adaptive Environmental Monitoring". It is adaptive in the sense that the responsible entity must adapt its methods and activities to the prevailing environmental conditions in a continuous process. Adaptive Environmental Monitoring is in fact a cyclic process. This ESMP of the Dandara ESIA sets out the basic parameters to be monitored to determine that mitigation measures identified above are being implemented effectively. The parameters in the monitoring plan are expected to focus on potential air and water pollution, especially in areas of higher sensitivity.

7.7.1. Monitoring Duration and Sampling Plan

A monitoring grid will be established on the site, consisting of 6 sampling sites for air, soil, and water quality. The monitoring program will be implemented for five years during the operation and maintenance phase of Dandara Silos. The monitoring plan will be in accordance with the main principles of the EHCSS ESMP.

7.7.2. Environmental Monitoring Program

Monitoring is an essential part of ecosystem science and management. It provides baseline data to help track natural changes, identify new threats, and assess the effectiveness of management programs. The consultant SENS supports Silos in managing programs to monitor air, noise, and water quality, as well as key habitats and species in and around the study areas. Several physical, chemical, and biological characteristics will be monitored regularly throughout the year to track the impacts of the EHCSS's operations.

7.7.3. Social Monitoring Program

Social monitoring must be undertaken to ensure compliance of involved entities with the mitigation and monitoring requirements as detailed in the ESMP requirements. This should be completed by the Silo Operator and contractors as applicable. Inspection and monitoring should include the following as applicable and as highlighted in the table that follows.

- Daily inspection and monitoring at the site and preparation of a daily observation report stating therein the corrective measures on observed safety deficiencies, unsafe acts, and conditions.
- Weekly site inspections to be carried out using the weekly site inspection checklists template based on requirements of the ESMP.
- Social Audits to be undertaken by Silo Manager and contractors to ensure compliance with ESMP requirement.

Social audits should be undertaken quarterly during the operation phase. Monitoring of social aspects will be by:

- Communicated with stakeholder.
- Review the feedback from stakeholder.
- Review of complaints.

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7.7.4. Data Management

The monitoring program will generate a large amount of data on several environmental and social parameters. To ensure correct interpretation and to secure easy access to the data by all relevant Authorities, it is a requirement that the EHCSS, in cooperation with the contractor, establishes an environmental information system, which includes a database containing all the monitoring data, as well as information on ongoing and past operation activities and other relevant data on meteorology, hydrography etc. The system will be based on a geographical information system (GIS) to allow the users to view the geographical distribution of data and will include collecting data, reports, and other relevant information.

7.7.5. Monitoring Reporting

The consultant SENS, in cooperation with EHCSS, prepared a plan for reporting the monitoring results for approval by the World Bank and EEAA as following:

Table (7.3): Timetable for reporting of the monitoring results for Dandara Silo complex.

Every Year	Items	Description
A	The air, noise and water quality Report	- Four reports in each season - One final report annually
B	The biological Report	- Two reports in each season - One final report annually
C	The Social condition Report	- Two reports in each season - One final report annually

The contractor should report monthly on environment and social and OHS aspects to supervision consultancy firm and the supervision consultancy firm should verify the information and consolidate the report and send it to EHCSS. EHCSS should report quarterly to WB.

7.8. Budget for Implementation of ESMP

The total Budget for implementation of the ESMP for Dandara Silo is provided in Table (7.4).

Table (7.4): Budget for implementation of the ESMP for Dandara Silo.

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No.	Categories	Description of Items	Budget (USD / yearly)	Total (USD)
A	Mitigation Measures during Construction phase*			
1	Environmental Mitigation Measures	Dust control measures	8,400	16,800
		Control of engine emissions	7,000	14,000
		Soil and water contamination measures	22,000	44,000
		Noise reduction measures	6,300	12,600
		Biodiversity protection measures	7,000	14,000
		Waste management systems	12,600	25,200
2	Socioeconomic Mitigation Measures	Improvement of working conditions	8,400	16,800
		Child labor prevention measures	4,200	8,400
		SEA/SH prevention measures	5,600	11,200
		Community health and safety: Traffic management measures	8,400	16,800
		Community health and safety measures: Electrical Hazards and Power Supply Risks measures	7,000	14,000
3	OHS Mitigation Measures	Safety training	10,500	21,000
		Provision of PPE	8,400	16,800
4	Catastrophic Events Mitigation Measures	Fire and explosion prevention measures	10,500	21,000
	Total budget for mitigation measures during construction phase		126,300	252,600
B	Mitigation Measures during Operation phase**			
5	Environmental Mitigation Measures	Dust control measures	8,400	8,400
		Emission control systems	6,300	6,300
		Soil and water contamination measures	47,000	47,000
		Noise reduction measures	6,300	6,300
		Biodiversity protection measures	7,000	7,000
		Waste management systems	12,600	12,600
6	Socioeconomic Mitigation Measures	Improvement of working conditions	8,400	8,400
		Child labor prevention measures	4,200	4,200
		SEA/SH prevention measures	5,600	5,600
		Traffic management measures	7,000	7,000
		Community health and safety measures	7,000	7,000
7	OHS Mitigation Measures	Safety training	10,500	10,500
		Provision of PPE	7,000	7,000

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8	Catastrophic Events Mitigation Measures	Fire, explosion, and leakage prevention measures	17,500	17,500
	Total budget for mitigation measures during operation phase		154,800	154,800
C	Monitoring during Construction Phase*			
9	Environmental Monitoring	Air quality monitoring	7,000	14,000
		Soil /water contamination monitoring	7,200	14,400
		Noise level monitoring	6,400	12,800
		Biodiversity monitoring	8,000	16,000
		Waste management compliance monitoring	14,400	28,800
10	Socioeconomic Monitoring	Work conditions inspections	9,600	19,200
		Child labor monitoring	6,400	12,800
		SEA/SH prevention monitoring	8,000	16,000
		Community health and safety: Traffic management monitoring	9,600	19,200
		Community health and safety monitoring: Electrical Hazard and Power Supply Risks measures	5,000	10,000
11	OHS Monitoring	safety audits	9,600	19,200
		Health check-ups and monitoring	9,600	19,200
12	Catastrophic Events Monitoring	Fire and explosion safety monitoring	12,000	24,000
	Total budget for monitoring during construction phase		112,800	225,600
D	Monitoring during Operation Phase**			
13	Environmental Monitoring	Air quality monitoring	8,000	8,000
		Soil contamination monitoring	6,400	6,400
		Noise level monitoring	7,200	7,200
		Biodiversity monitoring	8,000	8,000
		Waste management compliance monitoring	9,600	9,600
14	Socioeconomic Monitoring	Work conditions inspections	9,600	9,600
		Child labor monitoring	4,800	4,800
		SEA/SH prevention monitoring	6,400	6,400
		Traffic management monitoring	9,600	9,600
		Community health and safety monitoring	9,600	9,600
15	OHS Monitoring	Safety audits	8,000	8,000
		Health check-ups and monitoring	9,600	9,600
16	Catastrophic Events Monitoring	Fire, explosion, and leakage safety monitoring	12,000	12,000

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8 STAKEHOLDER CONSULTATION AND PUBLIC PARTICIPATION			
	Total budget monitoring during operation phase	108,800	108,800
	Total Budget		741,800

Note: *The total budget for the mitigation measures and monitoring activities during the construction phase was calculated for two years, and **The total budget for the mitigation measures and monitoring activities during the operation phase was calculated for one year.

Stakeholders' consultations were carried out to ensure that the stakeholders are provided with the opportunity to engage in the planning process, to raise questions and receive input and responses to their concerns. Stakeholders' consultation helps to identify opportunities and risks, it improves sub-project design / implementation and increases sub-project sustainability. Consultations were conducted before and during the preparation of the ESIA to identify the environmental and social risks and mitigation measures of the sub-project.

8.1. Key Stakeholders

The key stakeholders relevant to the scope of the Dandara Silo sub-project include specific individuals, organizations (such as the Agricultural Association and the Association for Environment and Community Development in Dandara), and communities directly or indirectly affected by or involved in the project. The identified stakeholders and their roles are outlined below:

- The Egyptian Holding Company for Silos and Storage (EHCSS):*
The company maintains several silo complexes across Egypt that are either located near production areas *i.e.*, near farms, or consumption areas near wheat millers and bakeries. EHCSS is responsible for upkeep of silo complexes including admitting quality wheat locally or internationally; maintaining the quality of wheat during storage; and transporting stored wheat to millers to be ready for consumption.
- Population and farms close to the construction sites of the silos:*
Some sub-project locations might be in the proximity to residents and/or farms. These locations will be impacted by the construction related impacts.
- Residence near silos or/and on the route of transportation to silos:*
Population living near silos may be impacted by road safety especially during the construction phase.

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- d) *Farmer Based Organizations and Cooperatives:*
Medium-scale organizations that purchase locally produced wheat supplies from small farmers and organize the logistics to be transported to silos managed by EHCCS.
- e) *Agriculture Trading Companies:*
Large-scale organizations that purchase locally produced wheat supplies from small farmers and organize the logistics to be transported to silos managed by EHCCS.
- f) *Private Large Scale Agriculture Companies:*
Large-scale locally producer of wheat supply.
- g) *Small Farmers:*
They are at risk of exclusion from the benefits of the sub-project. Offering equal opportunities to small farmers might be a challenge. This applies to opportunities to access silos to deliver local wheat and to benefit from technical support that the sub-project will be providing in terms of knowledge, skills, and tangible resources such as agriculture seeds, equipment, and others.
- h) *Female Farmers and/or Small-scale Agriculture Workers*
They are at the same risk of exclusion from the benefits of the sub-project. Risk of sexual abuse and/or exploitation may apply in the case of small-scale female farmers. Sexual Exploitation, Abuse and Sexual Harassment (SEA/SH) plans will be developed. The SEA/SH plan should include measures to target cooperatives, female workers, and other relevant actors. The plan will disseminate information on the code of conduct (Annex V) to use and the appropriate referral mechanism to report cases of abuse and/or exploitation at local level.
- i) *Informal Construction Workers:*
Daily and informal workers under contractors and subcontractors who are at risk of accepting working conditions that are not appropriate.
- j) *Previous and current land users:*
This includes any individual, or a group who have previously or/and currently using the land for livelihood activities or/and for residential purpose.
- k) *Near-by- landowners:*
This include any landowner near the newly constructed or/and silos that will be expanded under the sub-project to assess the impact of the sub-project's activities on their livelihoods and/or other social activities.
- l) *Other Relevant stakeholders:*
Other stakeholders include the Ministry of Environment, the Qena Governorate local council, and nearby educational institutions such as *Dandara Primary School*, located approximately 500 meters west of the silo site.

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The consultations were conducted in a manner that was meaningful, informed, and inclusive. The consultations were open to all participants to ensure that the views of interested and affected parties were incorporated into the sub-project design.

8.2. Site Specific Consultations

The consultations were conducted with the local community through site-specific consultations (focus group discussions and individual consultations) which was carried out during the site visit on September 18, 2023, for 3 days and an additional round of consultation was conducted through a virtual meeting on August 22, 2024, in coordination with EHCSS Group discussion is an effective method of consulting because it encourages the sharing and discussion of opinions and ideas related to the proposed project.

Several focus group discussions were conducted with the relevant groups as part of the preparation of the ESIA, including consultations with farmers and grain traders. The number of consulted people was 18 persons (including 9 females), and their type was farmers, traders, women, and vulnerable groups as presented in the next section. The virtual consultation, coordinated with EHCSS, included two main groups: Local representatives and farmers (6 participants), including major grain suppliers; and Women (3 participants) to ensure their concerns and perspectives were addressed.

During the consultations, the ESIA consultant team explained to stakeholders the findings and results of the ESIA study including project design, findings, risks, impacts, including possible impacts on bordering communities and agricultural lands, including noise, dust, and traffic-related risks during construction and operation phases, risks to current silo users due to construction activities, such as temporary disruptions or delays during peak supply periods, potential risks to laborers working on the silo construction, including occupational health and safety hazards, and mitigation measures and were open to receive feedback and concerns and suggestions. The funding sources were also discussed with the interested parties.

Consultation discussions included the following topics

3. Environmental Concerns:

- Vegetation Impact: No concerns about vegetation impact were reported, as the silo is located in an area devoid of natural vegetation.
- Transportation: The location of the Dandara Silo near the main roads and farming areas will facilitate efficient transportation of wheat to and from the silo, reducing delivery times and transportation costs for farmers and traders and will road reduce transport emissions.

4. Economic and Social Impacts:

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- **Economic Benefits:** The local community, including farmers and grain traders, expressed optimism that the construction of the Dandara Silo would lead to increased cultivation of wheat and ease the process of selling and delivering grains. The silo's proximity to agricultural areas is expected to benefit both small and large-scale farmers. The local community is optimistic about the development of the area, creation of job opportunities, and the silo's role in facilitating the wheat supply chain. Farmers and traders particularly highlighted the convenience of the silo's location, which will reduce transportation costs and improve the efficiency of wheat trade
- **Job Opportunities:** The community anticipates the creation of job opportunities for local residents, including positions related to construction, operation, and maintenance of the silo, as well as roles for engineers, drivers, and support staff.
- **Hazard Risks:** No significant concerns regarding hazard risks such as fire or explosions were raised, as the design includes appropriate safety and ventilation measures.
- **Health and Safety:** The community did not express concerns about health or safety risks during the construction or operation of the Silo. The ESIA consultant addressed potential risks and outlined mitigation measures to ensure worker safety.
- **Noise:** Minor concerns about noise during the construction phase were discussed, particularly from machinery and truck movements, but these were considered manageable with appropriate noise control measures.
- **Air Quality:** Dust during construction and harvest periods is expected to be minor and controlled through standard mitigation measures.
- **Violence and Child Labor:** There were no concerns related to child labor or violence.
- The community did not express any significant concerns regarding the silo's impact on daily life, family safety, or accessibility.

Results from the consultations by groups in Dandara:

Farmers (small- and large-scale farmers) Feedback:

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- As part of the site-specific consultations, efforts were made to include farmers and workers whose farmlands border the Dandara Silo site. These stakeholders were identified as a key group potentially affected by the project. The consultation included farmers, landowners, and workers directly bordering the silo site. This group was engaged during one-on-one discussions and focus group discussions to ensure their specific concerns and suggestions were recorded.
Farmers and landowners were specifically asked about the historical land uses of the silo site. Based on their feedback and historical knowledge, it was confirmed that the site did not have any past or current formal or informal users. Additionally, no concerns were raised during the consultation regarding this issue. . Concerns were raised about the potential impact of noise, dust, and traffic from construction activities on their agricultural practices. The consultant discussed the mitigation measures for noise, dust and traffic with the farmers and landowners including dust suppression methods, noise suppression measures and the development of a traffic management plan by the ESIA.
- Farmers mentioned that they produce between 30 to 70 tons of wheat every year and sell their grains to the silos. They believe that the construction of the Dandara Silo will increase the areas cultivated with wheat, as well as facilitate the delivery of wheat due to ease of transportation and the proximity of the silo to wheat farming areas.
- The construction of the silo is expected to significantly ease the process of selling and delivering wheat, given its convenient location near farming areas. Farmers do not have concerns regarding the impact of the silo construction on wheat prices or the Environment.
- In terms of expectations, farmers anticipate that the silo's construction will result in an expansion of cultivated land due to the ease of transportation and wheat delivery, resulting from the silo's proximity to their farming areas.

Grain Traders Feedback:

- Grain traders mentioned that the amount of grain they buy and sell each year ranges between 2,000 and 7,000 tons or more. They purchase grains from farmers and sell to the silos. The construction of the Dandara Silo will make the process of buying and selling grains easier, including the transportation and delivery of wheat.
- Traders have no concerns about the potential impact of the silo on grain prices, nor do they have concerns about its environmental impact. They believe the silo will positively affect their role in grain trade and transportation, making the entire process more efficient due to the silo's proximity.

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- As a result of the silo's construction, traders expect to deliver larger quantities of grains, which will lead to increased cultivation and consequently increased production and delivery to the silos.

Women Feedback:

- Women from the local community, including women farmers, small-scale agricultural workers, and family members of farmers, were consulted during the stakeholder engagement process. A total of 9 women were consulted through focus group discussions and one-on-one interactions , along with 3 women during the virtual consultation. While women were included in broader community consultations, specific efforts were made to hold women-only discussions. These sessions provided a safe and inclusive environment to openly share their views and concerns regarding the silo project.
- Women expressed optimism about the silo project, anticipating benefits such as easier access to grain storage and transportation. The project was seen as a potential opportunity to enhance their participation in wheat farming and trade activities. They raised concerns about potential safety and privacy issues related to the presence of construction workers near their community. They emphasized the importance of ensuring proper conduct by the workers and maintaining secure boundaries around the construction site. The ESIA includes measures such as having a proper code of conduct (COC) known and signed by all workers with topics related to SEA/SH and gender based violence and training provided on COC to workers and a grievance mechanism and channels for reporting SEA/SH and gender based violence cases from workers.
- Women Participants highlighted the importance of reducing waiting times for grain delivery at the silo to facilitate their contributions to household and community needs, and ensuring accessibility and safety for women during the construction and operational phases. The ESMP took those concerns into consideration and included mitigation measures as follows: a) establish on-site teams specifically trained to assist women during grain delivery, b) implement a scheduling system during peak periods hours to reduce congestion and ensure that women receive timely assistance and a separate lane for women, c) a grievance mechanism, in which a gender-sensitive grievance mechanism, including channels for reporting harassment or discrimination, will be established to address any potential issues during construction and operation phases, d) the project aims to create equal job opportunities, including roles tailored for women and individuals from

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vulnerable groups and, e) engage regularly with women and inform them with the above mentioned services tailored to their needs).

- Women stated that the construction of the Dandara Silo will have a positive impact on their work and their families. They expressed no concerns regarding the impact of the silo on their safety and security.
- They have no concerns about the silo's impact on their children and families, nor are there concerns regarding safety, accessibility, or job opportunities related to the silo's construction.
- Women anticipate that the silo's establishment will bring positive social changes, including making it easier for them to participate in wheat farming and trade activities.

Other Vulnerable Groups Feedback:

- Vulnerable groups, including elderly farmers, and individuals with disabilities, were specifically targeted during the consultations to ensure their inclusion. These groups were engaged through focused discussions to understand their concerns and expectations from the project. They were identified based on local knowledge and community leaders' recommendations. One-on-one consultations and small-group discussions were organized to ensure their active participation. Efforts were made to explain the project in simple terms, and to address any questions or concerns.
- Vulnerable groups expressed the following:
 - Elderly participants emphasized the importance of ensuring that grain delivery and transportation processes remain easy to navigate during both construction and operational phases.
 - Some participants highlighted concerns about potential safety risks during construction, such as increased traffic and construction activities near residential areas.
 - Others expressed interest in potential employment opportunities during the construction and operational phases.
 - Participants with disabilities emphasized the importance of accessibility in the silo's operations, including infrastructure designed to accommodate their needs.

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The ESIA has incorporated mitigation measures to ensure the needs of vulnerable groups are addressed, including (a) having a traffic management plan during construction and operation phases and community health and safety measures, b) having a dedicated access paths designed to ensure safety and ease of movement for all, including those with limited mobility by including a fast-tracking lane for elderly and small farmers and separate lane for women, c) establishing on-site teams specifically trained to assist vulnerable groups during grain delivery, d) incorporating ramps to facilitate easy access for individuals with mobility challenges, e) implementing a scheduling system during peak periods hours to reduce congestion and ensure that vulnerable groups receive timely assistance and f) including parking space for special needs and elderly g) engaging regularly with small farmers and elderly and inform them with the above mentioned services tailored to their needs.

Consultations with Residents/Locals Affected by Transmission Line Burial

- Residents and community members relying on electricity supplied by the transmission lines planned to be buried during the project were consulted as part of the stakeholder engagement process. These consultations included households in nearby residential areas potentially affected by temporary disruptions in electricity supply during construction activities. The consultations aimed to identify the concerns of electricity-dependent residents regarding the potential impacts of burying the transmission lines, and collect feedback and suggestions to ensure that mitigation measures effectively address community concerns.
- Residents expressed concerns about potential power outages during the process of burying the transmission lines. Some community members emphasized the importance of prior notification and alternative power arrangements to minimize inconvenience. Nearby residents raised safety concerns regarding excavation activities near residential areas and the risks of accidents or damage to existing infrastructure.
- The consultations highlighted the community's reliance on the transmission lines and their concerns about potential disruptions. Mitigation measures have been developed to ensure minimal impact on residents, prioritizing safety, and reliable power supply. Continuous engagement with affected communities will be maintained throughout the construction phase. Additionally, the contractor's will be required to cover third parties and their properties and this requirement will be included within the contractor's insurance policy

Feedback from residents and landowners neighbouring the silos:

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- While the initial consultation revealed no significant concerns from the community, further discussions indicated that agricultural landowners and residents near the silo site were interested in understanding potential impacts on their land and access. Specifically, they raised inquiries about dust generation during construction and possible restrictions on movement near the site.
- These concerns have been addressed in the ESIA by proposing; dust suppression measures during construction, such as regular watering of access roads and limiting vehicle speeds to reduce airborne dust. Additionally, the measures included defining a separate access routes to the silo to prevent disruptions to nearby agricultural activities and residents' movements.
- Regarding the potential restriction from river transportation and silo construction, the proposed silo construction and associated river transportation activities will not create any restriction of access for individuals.. The construction footprint and river transportation plans have been designed to ensure that no existing paths or informal usage patterns are blocked. This has been explained by the consultant to the neighbouring groups.

Conclusion: Overall, the significant economic and social benefits expected from the Dandara Silo project, coupled with the proposed mitigation measures for environmental and social risks, make the project highly viable. The EHCSS anticipates that the construction of the Dandara Silo will enhance wheat storage capacity in Upper Egypt, improve the resilience of the wheat supply chain, and contribute to reducing grain loss and waste. The community's feedback reinforces the positive impact of the silo, with no major concerns regarding its implementation or operation. It is worth mentioning that EHCSS will make sure ramps are present in the public restroom area and any needed area/buildings and toilets will accommodate people with disabilities for both genders.

Overall, the significant economic and social benefits expected from the Dandara Silo project, coupled with the proposed mitigation measures for environmental and social risks, make the project highly viable. The EHCSS anticipates that the construction of the Dandara Silo will enhance wheat storage capacity in Upper Egypt, improve the resilience of the wheat supply chain, and contribute to reducing grain loss and waste. The community's feedback reinforces the positive impact of the silo, with no major concerns regarding its implementation or operation. It is worth mentioning that EHCSS will make sure ramps are present in the public restroom area and any needed area/buildings and toilets will accommodate people with disabilities for both genders.

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8.3. Grievance Mechanism

Existing Unified GM

During the design, construction and implementation of any sub-project, a person or group of persons may perceive or may experience potential harm, directly or indirectly, due to the activities of the project. The grievances that are likely to arise could be related to social issues such as eligibility and entitlement criteria, disruption of services, temporary or permanent loss of livelihood and other socio-cultural issues. Grievances may also relate to environmental issues such as excessive dust generation, damage to infrastructure due to vibrations associated with construction or transportation of raw materials, noise, traffic congestion, reduced quality or quantity of private/public surface/ground water resources, damage to home gardens and farmland, etc. should such a situation occur, there should be a mechanism through which the affected parties can resolve these issues amicably with the project staff in an efficient, impartial, transparent, timely and cost- effective manner. To achieve this objective, a grievance mechanism has been included in the ESIA.

All implementing partners under the Food Security project including EHCSS are encompassed under the national unified electronic complaints portal hosted by Prime Minister Office, Egypt's Portal. The unified government GM was established by a Presidential Decree No. 314 of 2017 to receive, examine, direct, and respond to all complaints electronically. Its scope of work extends to all ministries, departments, government agencies, local administration units, public bodies and other government agencies. The unified electronic complaints portal has a clear referral system to the concerned entities who receive their relevant complaints, address it and either respond directly to the complainant or through the unified system.

Any citizen may submit a feedback and complaint through the following multiple channels under the unified electronic complaints portal:

- f. Egypt's Portal website, <https://www.shakwa.eg/GCP/Default.aspx>,
- g. Hotline 16528
- h. At "Your Service" app on Google Play.
- i. WhatsApp numbers: 01555516528 and 01555525444 to receive messages, complaints and suggestions.
- j. Citizen service departments and offices in all government agencies and authorities.

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All complaints are kept confidential and ID information of complainants are protected to ensure nonretaliation and transparency. Multi-level entry to the system is defined that allow those who are authorized from the relevant Government departments to enter the electronic system and access information about complaint submitted. All complaints are registered electronically, classified and refereed to relevant authorities to address.

Procedures and standards for sorting, processing and following up on complaints

Complaints are received as soon as they are submitted. Complaints are received through the government complaints system and directed to the relevant ministry to examine them, prepare a response, send the response to the government portal, and follow up on that.

- Determine who is responsible for receiving complaints and the channels connection
- The complaint is received on the government portal, sorted, and forwarded to each concerned ministry.
- Each ministry has a work team specialized in following up on complaints on the designated website.
- The response will be sent after examining the complaint.
- The complainant will be contacted by the government complaints system in the Council of Ministers to inquire about the response.

Localized GM at EHCSS level

During the preparations for food security project, EHCSS confirmed that they receive complaints and feedback at a timely manner from Egypt's portal and it is by mandate they must give feedback within a specific timeframe from receiving the complaint.

Nevertheless, each implementing partner under the project including EHCSS has their own localized GM procedures that support stakeholders in submitting a complaint and/or feedback.

At EHCSS level, the complaints are usually received from farmers depositing grains or grain buyers in the silos. The main complaints are about the quality of the seeds that are being deposited and tested immediately on site. In case there are any complaints from farmers and contractors, the complainant can raise their complaints to the EHCSS company until the construction of Dandara Silo finished and then after the operation of Dandara silo, the complainant can raise their complaints to the Dandara Silo manager. If it is not resolved

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it escalates to the customer services office at EHCSS. After the construction of Dandara Silo, and starting the operation, the silo manager documents and sends the complaints to EHCSS or the farmer/ contractor can reach the customer service through the EHCSS customer service number visible at silo level.

EHCSS customer service number for complaints: 01279671142/ 01279671143

The documentation of complaints raised at silo level exists and it will be continuously improved during the project implementation. For grievance log sheet/form, see annex X.

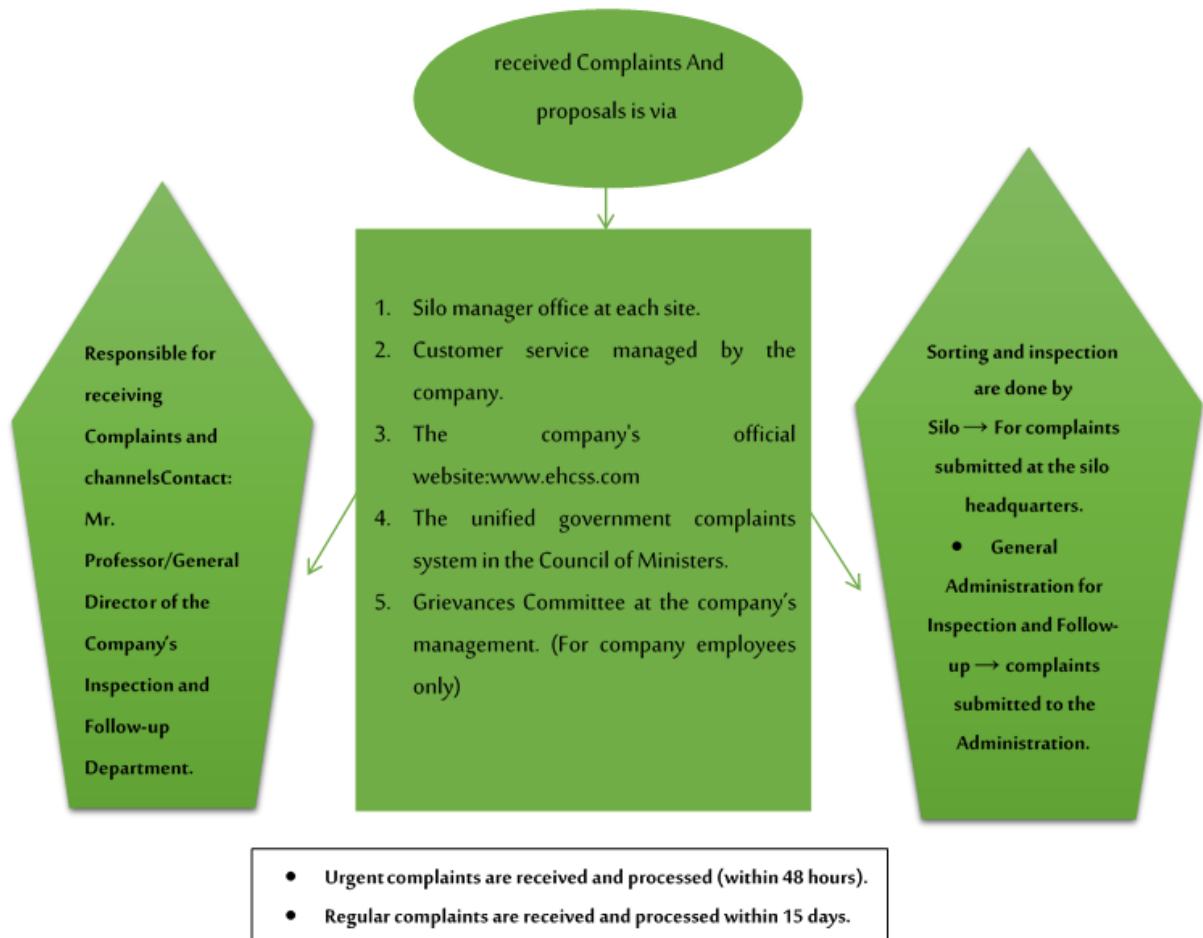


Figure (8.2): Scheme of proposed grievance procedures.

Procedures and standards for sorting, processing and tracking complaints

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- Verify and transfer complaints to the relevant sectors to study the complaint.
- Monitoring is done and evaluation through the recipient of the complaint (silo/General Administration for Inspection and Follow-up).
- Feedback is done by responding to the complaint through the same means and channel of communication.

Below is the detailed procedure:

- The complaint is received and the date, number of the complaint, its subject, and the name of the complainant are recorded.
- Acknowledgment and review are made by giving the complainant the number and date of the receipt to complain.
- Complaints are referred to the Inspection and Follow-up Department to be sorted and transferred to the relevant sectors.
- Responses to complaints are received from the relevant sectors.
- Responses are sent to the same entities receiving the complaint to notify the complainant through the same means and channel of communication.

Summary of communication channels (EHCSS):

- Channels /current contacts are: -
 - (1) Dandara Silo Manager
 - (2) Customer service managed by the EHCSS company:
01279671142/01279671143.
 - (3) The company's official website: www.ehcass.com
 - (4) The unified government complaints system in the Council of Ministers.
 - (5) Grievances Committee at the company's management.
(For company employees only).
- Suggested future communication channels are: -
 - (1) Create a group on WhatsApp to receive complaints.

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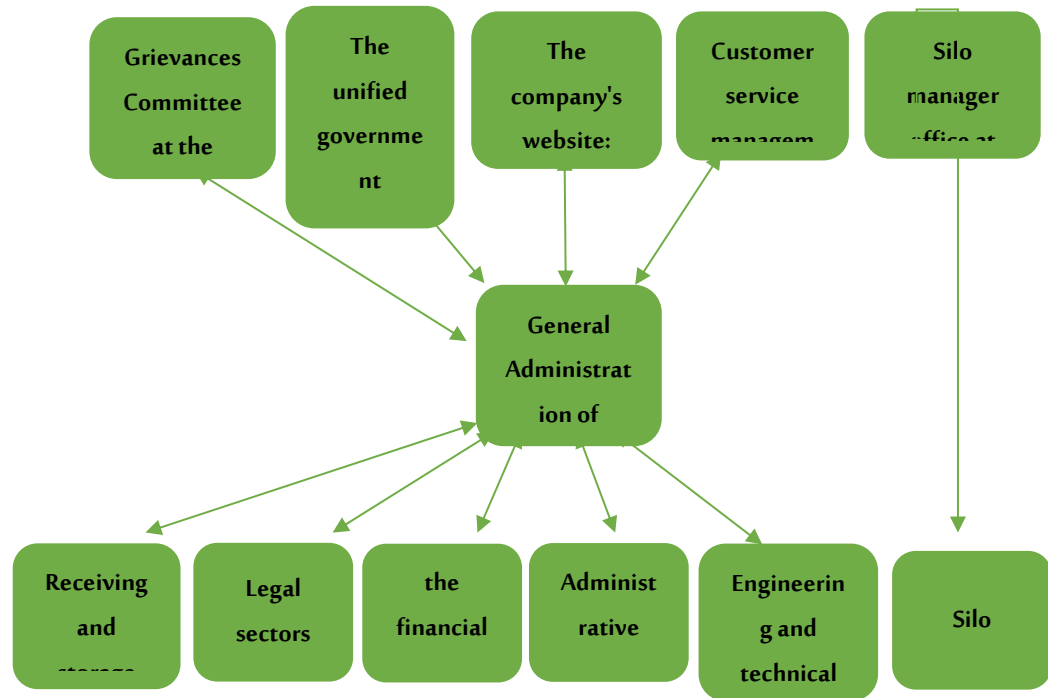


Figure (8.3): Organizational structure to receive complaints.

Workplace Grievance:

A well-communicated and easily accessible grievance mechanism will be provided for all direct and contracted project workers, as well as community workers to raise workplace concerns related to recruitment process and/or workplace conditions. Such workers will be informed of the grievance mechanism at the time of recruitment and the measures put in place to protect them against reprisal for their use. The PMU is responsible for managing direct workers' grievances, while the contractor for contracted workers.

The workplace grievance mechanism will be designed to be easily understandable, clear, and transparent and to provide timely feedback. The policy of confidentiality and non-retribution will be reinforced, along with the ability to raise anonymous grievances.

The mechanism will include multiple communication channels dedicated for workplace complaints only, including but not limited to an email address/website link; phone number;

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and a physical address for handing the complaints and grievances in person. Workers will have the freedom to pick the one they are comfortable using.

The workplace grievance mechanism will not impede access to other judicial or administrative remedies that are available under the law or through existing arbitration procedures, or substitute for grievance mechanisms provided through collective agreements.

GM Procedures

Workers will be encouraged to discuss their grievance and complaint informally with their direct managers. In cases where the direct manager is related to the subject of the complaint, the employee would most probably choose to directly submit a formal grievance. For all cases where the employees decide to submit a formal grievance, the following provides details about the step-step procedure they will be using:

1- Receipt, acknowledgment and registration

- The worker will submit the grievance through one of the dedicated channels indicated above.
- The worker will be requested to use to the extent possible a grievance template which will be shared with all workers in hard/soft copies /available to download from the website.
- If the worker wishes to submit the grievance orally via phone or in person, the project staff will lodge the complaint on their behalf, and it will be processed through the same channels.
- Under the request of the plaintiff, grievances can be lodged anonymously. This option shall be made clear to the complainant in the Grievance template and/or in cases of oral submissions.
- In case of anonymity opt-out, the worker will provide contact details or any other suitable means for him/her to be updated on the status of their complaints/grievances.
- All received grievances shall be logged into the workplace grievance log.
- In all cases, the staff in charge should provide timely communication back to the complainant(s) that their grievance has been received, will be logged and reviewed for eligibility and provide them with the registration number. Clear and announced standards for the time frame of the response should be established, announced and adhered to.

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2- Grievance verification and assessment

- In order to verify the grievance, it should be discussed with the worker, investigated and evidence gathered to the extent possible. This should include field inspections if needed in order to conduct interviews and gather information about the incident or the case.
- The GM staff will need to make a decision with regards to the eligibility of the grievance or whether it should be directed to other mechanisms such as the project GRM. The following represents the proposed eligibility criteria:
 - Is the complainant one of the project’s workers: direct; contracted or primary supply workers?
 - Is the complaint related to one of the following OHS and/or worker and labor conditions: 1- OHS; 2- Forced labor; 3- Child Labor; 4- Social insurance; 5- wages and working hours; 6- discrimination and unequal opportunities; 7- Freedom of association and collective bargaining?
 - Is the complaint not related to any of the above categories but still related to labor and working conditions?

3- Response and Feedback

- **As an initial response**, the complainant will be informed of the eligibility results as well as all the steps being taken to address his concerns. This initial response shall be provided via a formal letter; an email; or a phone call within 5 working days from the date of receipt of the grievance.
- **For eligible and straightforward grievances**, GM staff will provide a response without further investigation within 10 days from the initial date of receipt of the grievance, where actions are proposed to resolve the complaint and agreement on the response is sought with the complainant.
- **For eligible grievances that require further assessment**, GM staff will further engage with the complainant via a phone call or a formal meeting in order to collect further information. Based on this, they will provide within 14 days from the initial date of receipt of the grievance, where actions are proposed to resolve the complaint and agreement on the response is sought with the complainant.
- **Imminent and serious safety risks reported** by the worker will be addressed immediately and will not follow the normal timeline.

In all the above-mentioned scenarios, the response should include a clear explanation of the proposed response including any alternative options, while clarifying to the extent

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possible the rights of the complainant, and the choices he has including: 1- to agree to proceed; 2- request for a second round of assessment; 3- to consider any other organizational, judicial or non-judicial possibilities.

In case the grievance feedback is satisfactory to the complainant, the response should be implemented and recorded in the grievance log with the date of grievance resolution.

In case the grievance feedback is not satisfactory to the complainant, he/she has the right to appeal within 5 working days. In such a case, a second tier should be initiated where the GRM staff will attempt to propose alternative options and carry out additional investigation in order to meet the concerns of the complainant, and other stakeholders. The complainant will be invited to attend an appeal meeting or to discuss the appeal over a pre-scheduled phone call, during the first three days following the appeal. It would be preferred that a more senior staff attended/discuss the appeal with the employee. Where needed, a grievance committee might be established representing different sectors as relevant to the complaint, in addition to worker representative(s) (upon the complainant's consent) in order to help achieve a transparent process. The GRM staff should send their response within 7 days of the date of the appeal. The second-tier response should also include a clear explanation of the proposed response including all alternative options and the choices the complainant has as described above.

4- Agreement and implementation of the response

- If the grievance has been resolved, the GM staff will document the actions taken, time it took to resolve the grievance and satisfactory resolution.
- If the grievance has not been resolved, GM staff should document additional information including actions taken, communication with the complainant, and the final decisions made by the complainant and the organization with regards to any other alternatives.
- In general, confidentiality should be maintained in GRM documentation, if the complainant has requested so.
- In all cases, the total number of grievances should be recorded including the time it took to resolve them, as well as the number of unresolved cases.

SEA/SH Grievance Mechanism at national level:

In order to avoid the risk of stigmatization, aggravation of psychological/emotional harm and possible retaliation for the survivors, the grievance mechanism must take a different and sensitive approach to cases related to gender-based violence. The grievance response mechanism also applies to workers who experience SEA/SH. When such a case is reported to the Grievance

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Mechanism, it should be immediately referred to appropriate service providers, such as medical and psychological support, emergency accommodation, and any other necessary services. In the case of the project, it is suggested to include and disseminate the contacts of NCW (below) to ensure safe referral to survivors along with offering the needed services. Implementing partners should be trained on the topics including the survivor centered principles and should establish coordination with NCW.

Current and proposed SEA/SH complaints mechanism:

- Women's Complaints Office at the National Council for Women
- Hotline: 15115
- Email: complain.office.2001@gmail.com
- Fax: 68-23490066 (02) WhatsApp: 01007525600
- Face book: <https://www.facebook.com/nwegyptpage>

Recommendation for strengthening the overall EHCSS GM process:

- The grievance mechanism should be gender and socially inclusive to address potential access barriers for women, older persons, persons with disabilities, youth and other potentially marginalized groups as appropriate for the project and will not retaliate against any person who will be submitting complaints.
- The grievance mechanism impedes access to judicial or administrative remedies that may be relevant or applicable and would be readily available to all stakeholders at no cost and without penalty.
- Information regarding the grievance mechanism and how to submit a complaint and/or grievance should be communicated during the stakeholder engagement process and placed in prominent locations to inform key stakeholders.
- All complaints and/or grievances related to social and environmental issues can be received through available channels either orally (to field staff), by telephone or in writing where it has to the project management team and the construction contractor must maintain a record of grievances received at the respective project site offices, this includes worker

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grievances. In the above-mentioned register, the following information will be recorded:

- The time, date and nature of the investigation, concerns, complaints and/or grievances.
- The type of communication that took place (e.g. telephone, letter, personal contact).
- Names, contact addresses and contact numbers.
- Anonymous complaints are also recorded, investigated and resolved.
- Response and review resulting from your inquiry, concern, complaint and/or complaint.
- Actions taken and the name of the person who took the action.

The project is managed by EHCSS which has a grievance mechanism. The PMU will work with EHCSS parties to evaluate the effectiveness of the current grievance mechanism and work to address gaps in terms of capacity, access, transparency, etc.

The ESMP will be publicly disclosed on EHCSS website and banners on the site on project information and updates will be also available on site in Arabic

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Appendix I: Pest Management Plan (PMP)

1. Background

Once a cereal crop is harvested, it may be stored for a certain period before it is marketed or used as food, feed, or as raw commodity. The length of time during which the cereals can be safely stored will depend on the harvest condition, the post-harvest treatment (such as drying and cleaning) and the type of storage facility being used. Grains stored at low temperatures and low moisture content can be kept in storage for longer periods of time before quality deterioration. The presence and build-up of insects, mites, molds, and fungi – all of them influenced by grain temperature and moisture content of the crop– will affect grain quality and duration of grain storage.

Storage silos are structures designed to store grain and other material in bulk or powder. They are also used for storing other elements such as cement, calcium oxide, calcium hydroxide, activated carbon or plastic resins, among others. The most common storage silos are cylindrical with a metal support although there are also rectangular and square ones. They are like a tower and the material with which they are built can be metal, stainless steel, reinforced concrete, wood, reinforced plastic, fiberglass, etc. They are made to measure, considering the product to be stored, the environmental conditions or their location. They can be closed or open, and the interior surface is smooth and lined with special coatings.

2. Advantages and Disadvantages of Storage Silos

a) Advantages

The use of storage silos presents several advantages including a) they need less area to store the same amount of material than if it were stored in a horizontal warehouse, b) products are stored in optimal conditions, and c) its cost is lower than that of other storage systems.

b) Disadvantages

The most common disadvantages are a) the risk of fire and explosion, which unfortunately are very common in grain elevators, b) accidents due to suffocation and risks of poisoning. This circumstance occurs when inhaling the flammable vapors that are generated with the decomposition of grains, c) risk of intoxication due to the use of fumigants and pesticides, and d) risk of suffocation when opening the silos by accumulation of carbon dioxide.

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3. Pest Management Targeted Silos

The Dandara Silo Complex will be established in Qena Governorate, with a storage capacity of up to 90 thousand tons. The silo will be connected by highway transportation and railway transportation. It will be equipped with the latest storage technology, including a) inventory management and control system, b) steaming system and stock temperature control, and c) firefighting system and wireless system.

4. Regulatory framework for implementing the PMP

a) World Bank Environmental and Social Standard 3 ESS 3 The selected pesticides and their management (handling, storage, and disposal) shall comply with ESS3, Environmental, Health and Safety General Guidelines (EHSs) and applicable international conventions and good international practices.

World Bank criteria for Pesticide Selection and Use

According to paragraph 22 of the ESS3 guidance note⁶ “In the procurement of any pesticide the Borrower will assess the nature and degree of associated risks, considering the proposed use and the intended users.²⁰ The Borrower will not use any pesticides or pesticide products or formulations unless such use is in compliance with the EHSs. In addition, the Borrower will also not use any pesticide products that contain active ingredients that are restricted under applicable international conventions or their protocols or that are listed in, or meeting, the criteria of their annexes, unless for an acceptable purpose as defined by such conventions, their protocols, or annexes, or if an exemption has been obtained by the Borrower under such conventions, their protocol, or annexes, consistent with Borrower commitments under these and other applicable international agreements. The Borrower will also not use any formulated pesticide products that meet the criteria of carcinogenicity, mutagenicity, or reproductive toxicity as set forth by relevant international agencies. For any other pesticide products that pose other potentially serious risk to human health or the environment and that are identified in internationally recognized classification and labelling systems, the Borrower will not use pesticide formulations of products if: (a) the country lacks restrictions on their distribution, management, and use; or (b) they are likely to be used by, or be accessible to, lay personnel, farmers, or others without training, equipment, and facilities to handle, store, and apply these products properly”

According to paragraph 23 of the guidance note “The following additional criteria apply to the selection and use of such pesticides: (a) they will have negligible adverse human health effects; (b) they will be shown to be effective against the target species; and (c) they will have minimal

⁶ WBG (2018). Guidance Note on ESS3. Retrieved from <https://documents1.worldbank.org/curated/en/112401530216856982/ESF-Guidance-Note-3-Resource-Efficiency-and-Pollution-Prevention-and-Management-English.pdf>

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effect on nontarget species and the natural environment. The methods, timing, and frequency of pesticide application are aimed to minimize damage to natural enemies. Pesticides used in public health programs will be demonstrated to be safe for inhabitants and domestic animals in the treated areas, as well as for personnel applying them; (d) their use will take into account the need to prevent the development of resistance in pests; and (e) where registration is required, all pesticides will be registered or otherwise authorized for use on the crops and livestock, or for the use patterns for which they are intended under the project.”

The Bank requires that any pesticides it finances be manufactured, packaged, labelled, handled, stored, disposed of, and applied according to relevant international standards and codes of conduct (Annex V), as well as the EHSs.

b) Pest Management in Egypt

According to law no. 53 of 1966, Chapter VI (Planting protection).

Table I.1: Applicable Articles.

Chapter One: Agricultural pest control		
Article No.	Subject	
Article 72	The word “pest” means every organism that may cause economic damage to plants, and the word “plants” in this chapter means all types of crops, seedlings, weeds, wild plants, their fruits, seeds, and all other parts and products thereof.	
Article 73	The Minister of Agriculture shall specify, by a decision issued by him, harmful pests and plants, methods of protection against them, means of controlling them, and measures to be taken for this purpose, particularly in the following matters:	Determining areas considered to be contaminated with a particular pest, adjusting their borders, and regulating the transfer or passage of plants and other objects capable of transmitting the pest from a contaminated area to another healthy or infected area.
		Establishing a system for pest control, including a statement of the chemicals and tools used in the control, and an indication of the treatment and control work carried out by the competent administrative authority at the expense of the plant owner.
		Setting the conditions and procedures for plant treatment and pest control by the employees of the competent administrative authority or whomever is entrusted with this from among the individuals, bodies, cooperative societies, companies, or institutions.

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		A statement of the pests that the owner of agricultural land must report to the competent authorities about, the methods of such notification, and a statement of the measures to be taken to combat and treat them.
Article 74	If the infection is a source of danger threatening the plants due to the impossibility of treating the disease or the emergence of a new pest for which no successful treatment is known, the Minister of Agriculture may order the taking of any measure to ensure the prevention of the spread of the disease or pest, including uprooting and destroying infected plants by the workers of the competent administrative authority and at its expense. In this case, the Ministry shall pay compensation to the owner of the plants according to their value. The Minister of Agriculture shall issue a decision regarding the measures to be taken in estimating this compensation and how to settle the dispute arising from this estimation.	
Article 38 law 4/1994	It is prohibited to spray or use pesticides or any other chemical compounds for agricultural, public health, or other purposes except after observing the conditions, controls, and guarantees specified by the executive regulations of this law, in a way that does not guarantee that humans, animals, plants, waterways, or other components of the environment are not exposed. Directly or indirectly, it affects the current or future harmful effects of these pesticides or chemical compounds	
Article 39 law 4/1994	When carrying out excavation, drilling, construction, or demolition work, or transporting the resulting waste or dust, all parties and individuals are obligated to take the necessary precautions for safe storage or transportation to prevent their dispersal, as stated in the executive regulations.	
Chapter Two: Agricultural pesticides		
Article No.	Subject	
Article 78	Agricultural pesticides mean substances and preparations used in the control of plant	

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	diseases, insects, rodents, weeds and other organisms harmful to plants, as well as in the control of insects and external parasites harmful to animals.	
Article 79	A committee for agricultural pesticides shall be formed in the Ministry of Agriculture. Its formation and work system shall be determined by a decision of the Minister of Agriculture. This committee shall be concerned with proposing agricultural pesticides that may be traded and specifying their specifications, registration procedures and trading conditions.	
Article 80	The Minister of Agriculture issues, based on the committee's proposal, the decisions that implement the provisions of this chapter, in particular the decisions related to the following issues:	Types of agricultural pesticides that may be imported and traded, specifying their specifications and import and trading conditions.
		Conditions and procedures for licensing the import and trade of pesticides.
		Banning the transfer of some types of pesticides from one place to another.
Article 81	Pesticides may not be manufactured, prepared, sold, offered for sale, imported, traded in, or released from customs without a license from the Ministry of Agriculture.	
Article 82	The advertisement of pesticides or the publication of data about them must be in conformity with their specifications, conditions of handling and registration, and the recommendations of the Ministry of Agriculture regarding their use.	

5. Pesticides management in EHCSS silos

Once a cereal crop is harvested, it may be stored for a certain period before it is marketed or used as food, feed, or as raw commodity. The length of time during which the cereals can be safely stored will depend on the harvest condition, the post-harvest treatment (such as drying and cleaning) and the type of storage facility being used. Grains stored at low temperatures and low moisture content can be kept in storage for longer periods of time before quality deterioration. The presence and build-up of insects, mites, molds and fungi – all of them influenced by grain temperature and moisture content of the crop– will affect grain quality and duration of grain storage.

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Rapid deterioration of the crop quality might occur with combined attacks by insects, acaroid and larvae. For cereals, a rise in temperature is expected due to respiration; it might also occur due to insect or fungal activity. Heating leads to moisture condensation within the grain mass in cool areas, which can increase insect infestation (Appert, 1987; Imura & Sinha, 1989).

Things to consider when assessing storage monitoring systems (Burrill *et al.*, 2021):

- Measuring both grain temperature and equilibrium relative humidity (ERH) is valuable as it provides information on storage conditions, grain moisture content and providing insight as to how active insect pests are, if present.
- Tests following phosphine fumigation have shown that sensors inside a silo designed to measure humidity in grain can be permanently damaged by phosphine gas during standard fumigation. To tackle this damage first the humidity in grains must be measured to know if it's possible to add phosphine gas or not.
- Sensor location inside a silo is critical. If sensors are too close to silo walls, readings may be influenced by excessive grain trash or external temperatures i.e., sun or shade on walls.
- Some sensors may be difficult to install in silos and to access later if they require maintenance.
- Grain storage sensors and cables are in a hostile environment with dust, heat, moisture, and significant physical stresses when the silo is filled, emptied and as grain settles during storage.
- Sensor's build quality, lifespan and long-term accuracy will be important for each parameter i.e., grain temperature, humidity and in some cases gas concentration measurements.
- Reliable communication of data between the internal storage sensors and external reading / recording devices will be required.

a) Plan for insect control before storage:

- Management plans should include:
 - Good hygiene as an essential part of insect control,
 - Methods to try to prevent insect problems developing,
 - Inspection for insects and other quality problems, and
 - Methods to control insects if they do develop.
- Methods that aim to prevent infestations, include:
 - Cooling grain with aeration,
 - Treating grain by spraying with residual chemicals, or

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- Treating grain by mixing amorphous silica powder.

b) Inspection

In an aerated silo, the smell of the air coming out of the grain is a guide to the state of the grain. A musty smell later in storage is an indicator of insect and/or moisture problems. High temperature is an indicator of insect or moisture problems. A rod of not less than a meter or two is driven into the grain and left to equilibrate with the grain for an hour if it is metal, or half a day if it is wood. After pulling the rod out, pike samples are taken and checked for insects and molds.

c) Cleaning

Before harvest all machinery and equipment used to handle grain are cleaned out, including headers, augers, field bins, truck bins, silos, and other storages. Any equipment used to treat or handle pickled seed must be thoroughly cleaned to prevent contamination of new grain.

Special care should also be taken to clean out bags of seed, feed troughs, shed floors, heaps of old bags or any other places where grain and insects may be present. Grain and residues from cleaning should be fumigated with phosphine, buried, burned, or spread thinly over the ground away from insect control in stored grain buildings and storages. Grain held over from the previous season should be inspected and treated if insects are found.

d) Treatment of storages and equipment

Treating the surfaces of storages and equipment before they are used may kill insects walking on those surfaces but will not control insects in grain placed in the storage or equipment.

e) Sampling of pests in grain silos

Sampling or pest monitoring is an important component of the Integrated Pest Management (IPM) approach with which one can know the nature of pests in full detail so that suitable management tactics should be made accordingly. With the help of sampling, one can show the status of a pest, whether the population is below or exceeds the economic threshold level, and accordingly, physical, biological, or chemical approaches can be recommended.

- **Sequential sampling method**

Sampling should be performed frequently after fixed intervals for best observations, and to gather information about population changes from time to time. For example, those stored grain pests stored above 20°C should be visited after a gap of 25–30 days. Grains held below 20°C permits sampling intervals to be longer than 25–30 days. These are the test frequencies to determine if there are any pests in the silos and then use fumigation to control pests in silos.

- **Population density estimation method in silos**

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Absolute estimation: In this method number of insects per kilogram of grain or the number of moths per square meter are estimated.

Fumigation method/ treatment

The Dandara Silo will use the fumigation method in pest control, which is carried out by using Phostoxin tablets. Where the stored grains are examined in the laboratories and by monitoring the temperatures, and then the extent of the infection is determined. The number of tablets is calculated based on 4 tablets per ton.

The number of used tablets will be calculated based on the severity of the infection, as the infection depends on the duration and time of storage, infection in other Silos usually does not occur (the monitoring frequency to detect the pests and use the fumigation method is 25-30 days).

f) Sampling for pests around silos

- **Population density estimation method**

- Indirect estimation: Here pests are marked with a specific dye and then recaptured after releasing into the stored grains, hence commonly referred to as mark-release-recapture methods. It can be easily performed with the help of suitably designed traps with baits.
- Relative estimation: This method can be done by counting all the insects caught in a sticky trap, food baited trap or perforated probe trap. The Frequency of sampling pests around the silos should be every 2-3 days.

- **Trapping method**

Trapping is a convenient approach in small as well as in the larger volumes. There are fixed trapping and mobile trapping.

Table I.2: Insect and rodent control methods.

No.	Pest type	Control method	Pesticide used	Places of use
1	Rodents	Traps	Glueforte Live traps	1. Around the silo wall from the inside. 2. Around warehouses from the outside. 3. Around the administrative building.
2	Flying insects	Sticky traps	Flyribbon attractive	Inside the administrative building and at the doors.

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Table I.3: A form for the record of conducting the disinfection and pest control process.

Control type (check mark)			Control area	Active substance used with concentration	Usage rate	Amount of pesticide used	Method used for control
Disinfection	Rodent control	Reptile control*					
√	√	√	Tunnel	—	100 cm ³ per 100 liters of water	2 packs of malathion, 1 pack of Master Fog*	Metal trap
—	√	√	Scales	—			Metal trap
—	√	√	Control	—			Metal trap
√	√	√	Next to the fence	—			Metal trap
√	√	√	Below the cells	—			Metal trap
—	—	—	—	—			—

According to the follow-up report on rodent control, there are 14 metal traps distributed in the silo, offices and fences, and there are 20 fixed traps distributed in the silo. They are managed by a specific person in the staff of the Silo who is an expert with dealing with traps.

* The pesticides are allowed under international conventions guidelines and national regulation

g) Physical methods

Once the stored grains are infested, some physical methods used for the management of the stored grain pests are:

- **Physical exclusion:** Fine perforated floors are made for the collection of dusty fines at the bottom that are susceptible to insect infestation.
- **Grain distribution:** Grains inside granaries as well as inside bins and containers should be properly levelled. Improper levelling can create room for insect infestation and mold development due to the accumulation of moisture into the peaked grained mass. To prevent the stored grains, removing grains from the old bins and redistributing them to other containers are very helpful.
- **Temperature:** Based on the nature of pests, the temperature can be set either at low or high degrees. As some pests like moist and cool places and some like hot and humid regions.

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Most pests require temperatures above 60–70°F to reach damaging populations. Hence maintaining a cool temperature can reduce the excess loss. In certain situations, maintenance of –4°C to 0°C can kill many stored grain pests. Maintenance of very high temperatures can also be recommended but it has certain drawbacks such as it can crack, harden, and make brittle grains inside bins.

- Hermetic sealing: To maintain a very low oxygen level inside stored grain containers this method is used. Low oxygen level causes suffocation to the pests and hence has insecticidal property.
- Aeration: Air flown at the rate of 0.1–0.5 cubic feet per minute per bushel are used to cool stored grains. This low-volume airflow is an important component of the management of the stored grain pests. Grains remain uniform and to some extent in dry conditions as some grains are susceptible to pest attack in moist climates.
- Oxygen saturation: Insects perform aerobic respiration for their survival. Maintenance of low O₂ atmosphere is blown at the base of the containers, bins, and other stored chambers, forcing out the existing O₂ rich atmosphere is a convenient method for infestation control.
- To avoid low Oxygen pockets, it is recommended to have a continuous ventilation to ensure continuous airflow to prevent the accumulation of low oxygen pockets. Additionally, using of air movers or fans to distribute fresh air evenly.
- Sanitation: All bins, containers, granaries, and other stored places should be cleaned using shovels, brooms, vacuum cleaners to clear old grains, dust, spider web, and fines from all cracks and crevices, windows, doors, vents, fans, elevators, and floor. Even a small old grain or fines left in any place where new grains are to be stored can harbour insects that can infest the whole grain. A suitable dryer should be used to remove the moisture from bins. To improve storability, especially in the case of wet, damaged, or immature grains, grain cleaners can be used frequently (Ahmad *et al.*, 2021).

h) Aeration Cooling

Temperature effects on grain insects

- The common grain pests increase by 20-25 times a month at high temperatures (30–35°C) and moistures (14-16% grain moisture for wheat, equivalent to 70-80% relative humidity (RH)).
- Reducing grain temperature slows insect development. For example, flour beetles can complete their development in three weeks at 35°C and 70%RH but take ten weeks at 22.5°C and 70%RH.
- Although adult grain insects live a long time at cool temperatures, their young stages stop developing at temperatures below 15°C for weevils or 20°C for most other species.

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- Reducing moisture also slows development. Weevils cannot reproduce in wheat below 10-10.5% grain moisture, but the lesser grain borer will build up in numbers at moistures as low as 8%.

Controlled aeration cooling can greatly reduce insect and mold activity in stored grain, as well as preserving grain quality. Aeration cooling lowers the temperature of grain by blowing cool air through it. An automatic controller is more effective than thermostats, timers, or manual switches in selecting the coldest air available.

Aeration may fail to control insects because of heating of the surface layer, particularly in summer, or because of insects flying into the surface layer. Both these problems can be overcome by mixing amorphous silica into the top 30 cm of grain at the rate of 1 kg/ton of grain. The amorphous silica is diluted when out-loading to levels that are acceptable to buyers. Painting the roof and northwestern side of the storage white can reduce the effects of surface heating.

6. Risks and Impacts of Pest Management

Chemical insecticides are still considered as entomological weapons for the foreseeable future because of their wide host range, quick knockdown effects, and easily availability to consumers. Their use in stored grain insect pests is still restricted as they pose a threat to health hazards and other environmental issues. Most of the chemical insecticides are carcinogenic and may cause other health disorders. The repeated application of insecticides leads to insecticide residues, secondary pest outbreaks (Burrill *et al.*, 2021). Additionally, wrong handling of phostoxin (Aluminum Phosphide) used in fumigation may be lead to spontaneous ignition or explosion. Phostoxin may also cause skin and eye irritation.

Reduction of risks arising from agricultural pesticides: (OECD Programme on Pesticides and Sustainable Pest Management)

- High standards will be used for registration and placing on the market of active substances and products.
- National action plans will be developed with mandatory and voluntary provisions and requirements for proper manufacturing, marketing, and use of agricultural pesticides.
- Progress in risk reduction will be monitored.
- The effective and efficient compliance with regulatory requirements will be ensured through enforcement policies and measures.
- Integrated pest management will be promoted, leading to a broader suite of control methods and lower risks to health and the environment.

PPE Required for Working with Phostoxin:

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Phostoxin requires specific personal protective equipment (PPE) for safe handling. The following PPE is recommended for working with phostoxin, beyond just in cases of fire:

- **Respiratory Protection:**
 - Use a full-face respirator with an appropriate filter to protect against inhalation of toxic phosphine gas released by phostoxin.
- **Skin Protection:**
 - Wear chemical-resistant gloves to prevent skin contact with phostoxin tablets or dust.
 - Use long-sleeved shirts and full-length pants to cover as much skin as possible.
 - Consider additional protective clothing such as a chemical-resistant suit for added protection.
- **Eye Protection:**
 - Use safety goggles or a full-face shield to protect eyes from dust or accidental splashes.
- **Foot Protection:**
 - Wear chemical-resistant boots to prevent contact with phostoxin residues on the ground.
- **General Safety Measures:**
 - Always work in well-ventilated areas to avoid the accumulation of phosphine gas.
 - Have an emergency eye wash station and safety shower readily accessible in case of accidental exposure.

7. Mitigation and Monitoring Measures

a) Mitigation Measures: (The World Bank environmental and social framework, 2017).

- Identifies mitigation measures and significant residual negative impacts that cannot be mitigated and, to the extent possible, assesses the acceptability of those residual negative impacts.
- Identifies differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable.
- Assesses the feasibility of mitigating the environmental and social impacts; the capital and recurrent costs of proposed mitigation measures, and their suitability under local conditions; and the institutional, training, and monitoring requirements for the proposed mitigation measures.

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- Specifies issues that do not require further attention, providing the basis for this determination.

Measures to handle, store and dispose pesticides include the following:

- ***Management of Pesticides***

Pesticides will be properly handled, stored, and disposed through the following measures (Adapted from FAO (2001)⁷ and IFC guidelines for annual crop production (2016)⁸):

- Whenever possible obtain pesticides from a low GHG manufacturer.
- Follow the manufacturer guidelines for pesticides used.
- Pesticides must be classified and labelled in an appropriate manner with their names, date of purchase and expiry date and material safety data sheet (MSDS).
- The storage area of pesticides is far from any equipment and chemicals including flammable materials. The storage area must be secure and inaccessible to wildlife.
- Training including OHS training on handling pesticides must be provided to workers.
- Pesticides application should be carried out by trained personnel.
- Following regular inspection as indicated in the “sampling method” section, pesticides dosage and frequencies will be decided to ensure minimal usage whenever possible.
- The selected pesticides should be applied based on the manufacturer’s label including its recommended dose rate and number of treatments and method of application.
- Workers will follow treatment intervals prior to re-entry to the treated area, to avoid health and safety issues and exposure to pesticides residues.
- Pesticides empty containers will be disposed as hazardous waste material and should not be re-used for any other purposes. Empty containers can be delivered back to suppliers whenever possible.
- If containers cannot be returned to suppliers, they shall be collected and disposed by licensed hazardous waste contractors.
- Regular cleaning of trucks, equipment and containers transporting pesticides shall be performed.

⁷ FAO (2001). Guidelines on Good Practice for Ground Application of Pesticides

⁸ IFC (2016). Environmental and social health and safety guidelines for annual crop production. Retrieved from <https://www.ifc.org/content/dam/ifc/doc/mgrt/annual-crop-production-ehs-guidelines-2016-final.pdf>

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Safety requirements for Handling Phostoxin (fumigation)⁹:

- Keep ignition sources away
- Do not smoke.
- Protect against electrostatic charges.
- Keep protective respiratory device available
- Store away from water, acids, bases, strong oxidizing agents and strong reducing agents
- Do not store with acids
- Store products in a locked, dry, cool, well-ventilated area away from heat. Post as a pesticide storage area.
- Do not store in buildings inhabited by humans or domestic animals.
- Do not breathe dust/fume/gas/mist/vapors/spray.
- Do not allow contact with water
- Respiratory protection will most likely be required during cleanup of spilled aluminum phosphide fumigants. If the concentration of phosphine (hydrogen phosphide, PH₃) is unknown, NIOSH/MSHA approved SCBA or its equivalent must be worn. Full-face gas mask canister combinations may only be worn at concentrations no higher than 15 ppm.
- Wear dry gloves of cotton or other material if contact with tablets, pellets, or dust is likely. Gloves should remain dry after use. Aerate gloves and other clothing that may be contaminated in a well-ventilated area prior to laundering.
- Wear tightly sealed goggles.
- Wear face protection
- Wear respiratory protection
- Wash thoroughly after handling.
- All ventilation should be designed in accordance with OSHA standard (29 CFR 1910.94). Use local exhaust at filling zones and where leakage and dust formation is probable. Use mechanical (general) ventilation for storage areas.
- Keep away from foodstuffs, beverages and feed. Immediately remove all soiled and contaminated clothing and wash before reuse. Wash hands before breaks and at the end of work. Avoid contact with the eyes and skin.
- If on skin: Wash with plenty of water.
- If skin irritation occurs: Get medical advice/attention

⁹ For more information and guidance on Phostoxin follow
https://label.westernpest.com/files_techservices/live/deggesch.phostoxin052418.sds.pdf

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- If inhaled: Remove person to fresh air and keep comfortable for breathing
- If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- Specific treatment is urgent (see supplementary first aid instructions on this Safety Data Sheet).
- If swallowed: Immediately call a poison center/doctor.
- Keep containers tightly closed and proper ventilation.
- Containers to be disposed based on SDSs and manufacturers recommendations.
- Properly label and store the material according to its MSDS.

Fire and spill risks procedures for phostoxin:

- Phostoxin/Aluminum phosphide management according to its SDS¹⁰:
- Never allow the buildup of phosphine gas (hydrogen phosphide, PH₃) to exceed explosive concentrations. Open containers of metal phosphides in open air only and never in a flammable atmosphere
- Do not confine spent or partially spent dust from metal phosphide fumigants as the slow release of phosphine gas (hydrogen phosphide, PH₃) from these materials may result in the formation of an explosive atmosphere. Spontaneous ignition may occur if large quantities of aluminum phosphide are piled in contact with liquid water.
- Do not store next to water and wet areas and do not dispose in sewage
- Do not allow to enter sewers/surface or ground water.
- If possible, dispose of spilled material by use according to label instructions. Freshly spilled material which has not been contaminated by water or foreign matter may be placed back into its original or other air-tight container. Punctured flasks, pouches or containers may be temporarily repaired using aluminum tape.
- If the age of the spill is unknown or if the product has been contaminated with soil, debris, water, etc., gather up the spillage in small open buckets having a capacity no larger than about 1 gallon. Do not add more than about 1 to 1.5 kg (2 to 3 lbs.) to a bucket. If on-site wet-deactivation using deactivation solution is not feasible, transport the uncovered buckets in open vehicles to a suitable area according to local authority and manufacturer guidelines. Small amounts of spillage, from about 4 to 8 kg (9 to 18 lbs.) may be spread out over the ground in an open area to be deactivated by atmospheric moisture. Alternatively, spilled aluminum phosphide

¹⁰ For more information and guidance on Phostoxin follow
https://label.westernpest.com/files_techservices/live/deggesch.phostoxin052418.sds.pdf

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fumigants may be deactivated by using the deactivating solution as noted on the SDS and guidelines of manufacturer.

- Inform relevant authorities in case of seepage in water resources or sewage system
- In case of fire, use CO₂, sand, extinguishing powder. Do not use water. Use firefighting measures that suit the environment.
- Respiratory protection will most likely be required during cleanup of spilled aluminum phosphide fumigants. If the concentration of phosphine (hydrogen phosphide, PH₃) is unknown, NIOSH/MSHA approved SCBA or its equivalent must be worn. Full-face gas mask canister combinations may only be worn at concentrations no higher than 15 ppm.
- As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear to prevent contact with skin and eyes. Wear a NOISH/MSHA approved full-face gas mask – phosphine gas canister combination may be used at levels up to 15 ppm or following manufacturers' use conditions instructions for escape. Above 15 ppm or in situations where the phosphine gas concentration is unknown, a NIOSH/MSHA approved SCBA must be worn.

Recommended actions to be followed by Silo Management before fumigation application:

- Gas tight pressure tests must be carried out when grains are added and prior to each fumigation activity
- Pressure tests need to be part of the annual maintenance of silos
- Monitor and maintain and repair seals regularly when silos are empty
- Add gas sensors around silos. Maintenance is the key to ensuring a silo purchased as sealable can be sealed and gas-tight.

Specific management measures for rodenticides shall be followed (Adapted from EBPF, (n.d)¹¹ and Tobin, (2005)¹²).

- Pesticides and baits shall be located at areas away from non-targeted species. Specific bait zones shall be selected carefully to ensure efficiency and consumption by the targeted rodent/pest.
- Use insulated trays to add bait should not contaminate the soil and to ensure its proper removal at the end of the treatment period.
- Use enclosed trays/traps that are only accessible to the targeted pest.

¹¹ EBPF (n.d). Guideline on Best Practice in the Use of Rodenticide Baits as Biocides in the European Union

¹² Tobin, M. E., & Fall, M. W. (2004). Pest control: rodents.

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- The pesticide/bait can be located in the burrow of the targeted rodent.
- Inspection in and around treated areas shall be done on a regular basis (daily) and dead animals shall be removed instantly to avoid any secondary poisoning by non-targeted species.
- Dead pests that have consumed the bait may be disposed as hazardous waste by a certified hazardous waste contractor.
- Rodent repellent devices including ultrasonic devices can be used to minimize the use of pesticides.
- Store food properly to prevent its accessibility by rodents.
- Doors and windows and any openings shall be tightly closed.

b) Monitoring:

- Weekly and Monthly checking of grain in storage for insect pests (sieving / trapping) as well as checking grain quality and temperature. Record these details, including any grain treatments applied.
- After an application:
- Record application date, product used, rate, and location of application.
- Follow up to confirm that treatment was effective.
 - For pests inside silos, regular sampling and monitoring will be conducted frequency around 25-30 days)
 - For rodent monitoring: estimate the abundance of rodents using live traps or tracking plates to detect tracks of animals or electronic devices, the regular frequency of rodents will be every 2-3 days.
 - Check which rodents are the most abundant and track if they are significantly increasing.
- **Indicators:** number of pest manifestation incidents in silos and number and type of rodents trapped number and amount of pesticides/fumigation used, number of fumigation leak incidents

8. Capacity Building and Training on Pesticide Use and Handling

It is necessary to maintain careful and continuous control over the use and handling of pesticides during the transport, storage, mixing, loading, application, and disposal.

The need to accurately identify and diagnose pests and pest problems and understand ecosystem interactions could enable farmers with biological and ecological control opportunities and in making pragmatic pest control decisions. Therefore, it is required to have a strong linkage between researchers, governmental authorities, and the implementers of IPM techniques.

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Agricultural workers and pesticide handlers need Worker Protection Standard (WPS) training annually if they will be working in treated areas on an agricultural establishment, and their activities are directly related to agricultural production. Currently certified pesticide applicators and certified crop advisors are exempt from WPS worker and handler training. Any worker who has been trained as a handler does not need to receive worker training.

Training on IPM shall include: (Pest Management Plan, Draft Report, July 2014)

- Learning-by-doing/discovery training programs – experiences indicate that farmers are most apt to adopt new techniques when they acquire knowledge and skills through personal experience, observation, analysis, experimentation, decision-making and practice. This allows to identify farmers’ own knowledge and for farmers to understand how IPM applies to their own farms.
- Recovering collective memory - Pest problems often emerge because traditional agricultural methods were changed in one way or another or lost. These changes can sometimes be reversed. This approach uses group discussions to try to identify what changes might have prompted the current pest problem.
- Smallholder support and discussion groups -Weekly meetings of smallholders, held during the cropping season, to discuss pests and related problems can be useful for sharing the success of various control methods. However, maintaining attendance is difficult except when there is a clear financial incentive (e.g., credit).
- Demonstration projects - Subsidized experiments and field trials at selected farms (farmer-field school) can be very effective at promoting IPM within the local community. These pilots demonstrate IPM in action and allow farmers to compare IPM with ongoing cultivation supported by synthetic pesticides.
- Educational material - Basic written and photographic/figures guides or even videos to pest identification and crop-specific management techniques are essential for training and could be an important factor in motivating farmers to adopt IPM.
- Youth education - Promoting and improving the quality of programs on IPM and the risks of synthetic pesticides has been effective at technical schools for rural youth. In addition to becoming better farmers in the future, these students can bring informed views back to their communities now.

Training for workers by EHCSS

The company has trained groups of technical and administrative engineers in various scientific and technical specializations due to warehousing, quality of subscriptions, accounting, management, and other specializations. Some of them have obtained master’s degrees in these fields and are currently practicing their work in project management, operation, and maintenance. The company also follows up the stages of training its

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representatives through internal programs, whether in the treaty and government universities, or through on-the-job training to qualify and develop the capabilities and skills of employees, with the following internal training specializations: -

- **Programs in the financial and financial field:** to focus on specialized programs in the financial and financial field to develop their competence in the work assigned to them.
- **Programs in specific specializations:** to focus on developing the capabilities and skills of employees in the field of maintenance of precision equipment in silos.
- **Programs in the field of computers:** The aim of these programs is to master the computer and maintain it.
- **Professional industrial and computer programs:** To focus on the field of the industrial workforce, the need to provide employees with basic skills in combat security work, security guards, emergency preparedness, and understanding the principles of achieving security in industrial innovation.

Training on use of pesticides shall include the following:

- Pesticide Selection – Indicating the list of authorized pesticides per target pests, indicating its level of toxicity and hazardous, possible harmful effects and experience using those pesticides for the pest and the crop.
- Understanding the Pesticide Label – Explain all the information included in the label.
- Pesticide Transport – Give indications on how to transport pesticides to avoid any leakages and avoiding the contact with persons or animals.
- Mixing and Loading Pesticide – Explain the importance of ensure the proper dilution of the concentrated pesticide and the need to use protective clothing.
- Pesticide Storage – Give indications on how to storage pesticides – site location (not allowed in flood areas), security (against illegal entries, as well as children and livestock), isolated from other houses, be well ventilated, waterproof roof, have a current inventory list of pesticide stock.
- Container Disposal – Give indications on how to destroy used pesticide containers.
- Obsolete pesticides – Explain the risks associated with obsolete pesticides and procedures to be followed.
- Calibration, Product Quantity and Pesticide Application – Explain the importance of application equipment calibration and how to do it.
- Determining the Amount of Chemical to Use – Give explanations on methods to find out the amount of chemical to apply per hectare and its level of dilution.
- Important Cautions related to the Application of Pesticides – Give indications on important cautions for safe use of pesticide.

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- Toxicity, Human Protection and First Aid – Explain the possible effects of pesticide on human health, ways of pesticides entering in the body, importance of protective clothing & other protective equipment, basic first aid for pesticide exposure (with skin, mouth, eye, or respiratory system).
- Training on using the material safety data sheet (MSDS).

9. Implementation of PMP

This Implementation Plan outlines the role of individuals involved in the implementation of this PMP. The PMP will be on-site to set up and take down the lane closure and associated devices, assist with any incidents that may occur, and assist with access and egress into the work area as needed. During active work, trucks and vehicles will use the closed lane to access the work area.

9.1. Supervisor of PMP

The Supervisor of PMP is responsible for conducting daily toolbox meetings, addressing issues, and being the point of contact with the EHCSS Representative.

The pest control department in the Dandar Silo will consist of 6 people, with the following positions: 2 agricultural engineers, 3 agricultural diplomas personnels, and a laboratory technician.

- 1- Agricultural engineers solve problems concerning power supplies, machine efficiency, the use of structures and facilities, pollution and environmental issues, and the storage and processing of agricultural products.
- 2- Agricultural diplomas personnels maintain crops and tend livestock, plant, inspect, and harvest crops, irrigate farm soil and maintain ditches or pipes and pumps, operate and service farm machinery and tools, apply fertilizer or pesticide solutions to control insects, fungi, and weeds.
- 3- Laboratory technicians work alongside scientists and engineers in a laboratory and assist with a range of experiments and investigations. They carry out both routine procedures and one-off projects, which will be dependent on the function of the laboratory – a laboratory technician could help develop new products, diagnose diseases, or carry out mechanical or diagnostic texts, subject to the nature of the work that the company employing them specializes in.

9.2. The PMP Budget

The costs of implementing the PMP will be related to the preparation of Specific Pest Management Plans, capacity building, training, and awareness-raising campaigns.

Appendix II: Traffic Management Plan (TMP)

1. Background

Traffic management plan aims to protect workers, pedestrians, and motorists by minimizing the risks associated with traffic movement. Establishing effective methods for managing traffic in the site of Dandara Silo and workplace serves an important role. The Dandara silo is located on Aswan Western Agriculture Road.

They are designed for the following purposes:

- **Safety:** a traffic management plan eliminates or reduces the chances of accidents that may occur while working in the Dandara Silo.
- **Accessibility:** a traffic management plan aids in the smooth traffic flow and makes it easier for people to get around. It makes sure that pedestrians, trucks, and vehicles can share the same space without coming into conflict.
- **Compliance with relevant legislation:** a traffic management plan helps organizations to comply with relevant legislation.

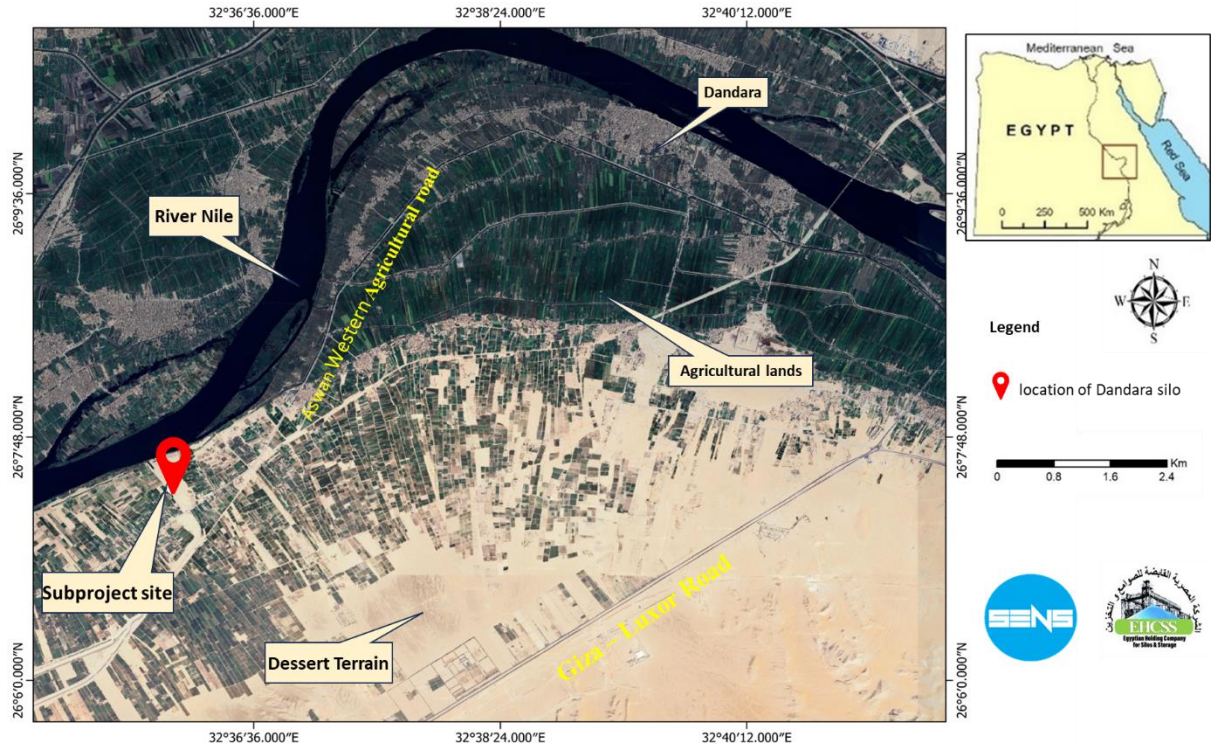
A traffic management plan may include details of:

- The desired flow of pedestrian and vehicle movements
- The expected frequency of interaction of vehicles and pedestrians
- Illustrations of the layout of barriers, walkways, signs, and general arrangements to warn and guide traffic around, past, or through a work site or temporary hazard, and,
- How short term, mobile work and complex traffic situations will be managed.

2. Dandara Silo

The road that will be used for transporting construction equipment's is not yet determined, as the contractor is not yet assigned. Upon assigning the contractor, the EHCSS and the ESIA consultant will determine the safest roads with lowest risks on the local communities and will avoid high density roads.

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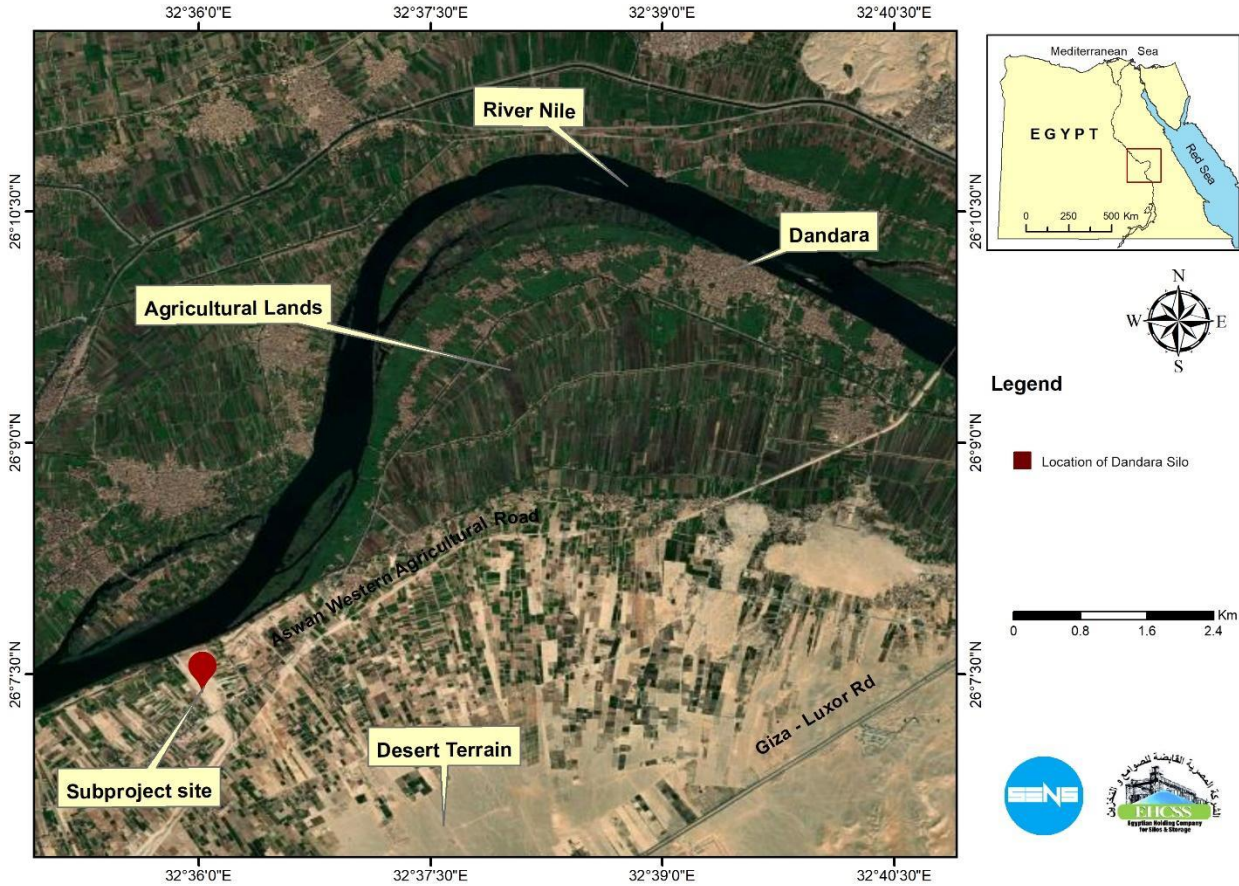


Figure (II.1): Map showing the location of Dandara Silo site and the surrounding area including the main roads; Aswan Western Agricultural road, and Giza – Luxor Road.

- **Current traffic to Dandara Silos**

The Dandara Silo Complex will be established in the Qena Governorate, with a storage capacity of up to 90 thousand tons. The silo will be connected by highway transportation and in the future by railway transportation and river transportation. It will be equipped with the latest storage technology, including a) inventory management and control system, b) steaming system and stock temperature control, and c) firefighting system and wireless system.

- **Traffic during construction phase**

The access road of the construction trucks will be the same road that will be used by the grain trucks during the operation phase.

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● Traffic after silos construction phase/operational phase

After the construction phase the traffic will be normal for the grain trucks, and there will be no trucks for the construction. Upon completion of construction, river transport will be another method for delivering grain to the facility in the future, while road transport via the Aswan Western Agricultural Road will be used primarily for distribution, helping to minimize traffic congestion in the area. A separate access road from the main road will be established to reach the construction site and to the silos during operation phase will be implemented to avoid disturbing any neighboring communities.

Heavy Vehicles Accessing the Site

- **Number of Heavy Vehicles:**
 - during construction phase: up to 30 trucks loaded with sands, concrete and other materials enter the site.
 - during operation phase: up to 35 trucks are loaded with up to 60 tons of grains enter the site.
 - the shift is 8 hours, the intake rate is 250 tons/ hour, it can accomodate up to 35 trucks loaded with 60 tons of grains each.
- **Size and Weights of Heavy Vehicles:**
 - **Heavy Trucks:**
 - 20 tons trucks with length 8.5 meters, width 2.3 meters and height 3.2 meters

Expected Routes to and from the Site

- **Primary Route:**
 - The main Road (Aswan Western Agriculture Road) which is 350 m away from the silo site. The road is approximately 10-meter width accommodating two lanes (one in each direction). Each lane is approximately 4.5–5 meters wide, considering the total width includes road edges and possible road markings.

Route for Big Equipment

- **Port of Entry:**
 - Safaga port on the Red Sea.
- **Transportation Route from Port:**
 - From the Port of Safaga:

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- transportation through the main roads to the Dandara Silo site.

3. Traffic Management Requirements

3.1. Records

Participants using the Transport Code are required to keep and maintain records for these actions to demonstrate adherence to this Transport Code. (GTA Grain Transport Code of Practice, July 2014). The following includes some records that must be kept:

- All loads carried by vehicles (e.g., collection/delivery tickets, load sheets etc.)
- All cleaning operations
- Inventory of all vehicles and trailers
- List of approved Subcontractors
- Audit records of sub-contractors
- Staff training/instruction/Qualifications
- Insurance documents
- Operator's license – if applicable
- Container weight declaration – if applicable
- Complaints
- Internally produced records must be signed.

3.2. Managing Traffic Risks

Traffic management is about keeping people safe by managing traffic conditions. It is important to be aware of the potential hazards posed by silos traffic and to put measures in place to minimize the risks. Silos safety duties are identifying hazards, assessing them, and controlling traffic risks. We can take several steps to control the risks associated with silos traffic.

3.3. Identifying Traffic Hazards

Many potential hazards can cause problems for employees in the workplace of the Dandara Silo. Traffic Hazards are one type of hazard that can pose a serious threat to workers. Traffic hazards can include cars and trucks driving through the work area to pedestrians walking through the work area. Traffic hazards can result in injuries or even death if not adequately controlled.

When identifying hazards with traffic management, it is essential to consider the layout of the silos and how people and vehicles interact, this includes:

- Looking at the floor plan layout and determining where there are overhead structures
Consider whether work is close to public areas.
- Consider high traffic volumes, which can impact traffic flow and create hazards.
- Checking for blind spots, as these can be areas where accidents are more likely to occur.
- Checking if there are areas of poor visibility, as this can also impact safety.

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While managing traffic flow, we would consider the vehicles using the space and height for other objects. Loading and unloading areas should be marked, and vehicles should be directed to park in designated areas that provide the appropriate road surface and allow for easy entry and exit and that's all provided in Dandara Silo as the road surface is appropriate and there is appropriate parking space for trucks inside and outside the workplace. (GTA Grain Transport Code of Practice, July 2014).

3.4. Assessing Traffic Risks

Risk assessments are an essential part of ensuring silos safety. By identifying potential hazards and assessing their likelihood, employers can take steps to minimize the risk of harm to employees. Traffic hazards are common workplace hazards, and a thorough risk assessment can help identify potential risks and control measures. Some factors to consider when assessing traffic hazards include:

- The volume and speed of traffic
- The layout of the workplace
- The type of work being undertaken

By considering these factors, employers can develop effective control measures to reduce the risk of accidents and injuries. Also, some basic elements in this traffic management plan need to be considered as follows.

- The type of operation work that will take place: This is important information for drivers, as it will help them know what to expect when traveling through the work zone.
- The operation site's location (Dandara Silo): This will help drivers plan their route and avoid the operation area if possible.
- The expected traffic volume: will help to determine the necessary traffic control measures. An average of 470 to 550 vehicles passes through the Aswan Western Agricultural Road in front of the Dandara Silo site each month. The average vehicle speed was 65 km/h, with the highest recorded speed at 85 km/h and the lowest at 35 km/h. No vehicles exceeded 100 km/h, indicating stable traffic conditions.
- The heavy trucks and trailers do not use this route. The majority of vehicles consist of pickup trucks and light transport vehicles (50-60%), which are primarily used for agricultural and goods transport, while private cars (40-50%) are used for local commuting. The road experiences moderate to low traffic volume, serving nearby farms and rural communities. Most vehicles are used for agricultural transport or daily travel, and the absence of speeding violations suggests well-regulated and safe traffic movement. In general, it will be considered in the plan for construction and operational phase to avoid peak hours,

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- The traffic control measures that will be in place: This includes things like road closures, detours, and lane closures.
- A diagram of the construction site and proposed traffic flow: This will help drivers understand the traffic control measures that are in place.
- The contact information for the project manager: This is important in case there are any questions or concerns about the traffic management plan.

3.5. Risk Control Measures for Traffic Management

This framework prioritizes the most effective control measures over the least effective ones. Therefore, the traffic management plan will incorporate technically and financially feasible road safety measures into the project design to prevent and mitigate potential road safety risks to road users and other communities.

There is no information about the offsite traffic. But in general, there will be coordination with the traffic authorities in the governorate regarding the time of the construction of the Dandara Silo, as well as it will be considered in the plan for construction and operational phase to avoid peak hours.

Elimination: the person conducting a business or undertaking is responsible for ensuring the safety of employees, contractors, and visitors in the workplace. One of the ways to do this is by implementing controls to eliminate traffic hazards. For example, consider if powered mobile plants or other vehicles present in the workplace can be removed.

Substitution, Isolation, and Engineering Controls: it may be possible to substitute the hazard for something safer. For example, trucks and forklifts could be swapped for load-shifting equipment such as a walker stacker. Alternatively, the risk could be isolated from workers by isolating pedestrians from vehicles using overhead walkways. Engineering controls could also be used, such as fitting vehicles with devices such as reversing sensors and cameras.

Administrative controls: if risk remains, even after implementing engineering controls and safe work practices, administrative control measures should be implemented. These measures are designed to reduce the chances of an accident or injury. Administrative controls can take many forms, but some common examples include training, instruction, and supervision.

Personal Protective Equipment (PPE): PPE helps to protect workers from being hit by trucks or other hazards. High visibility clothing is one type of PPE often used in traffic control measures. PPE is designed to protect workers from injuries but cannot eliminate all risks. PPE should only be used as a last resort when all other control measures have been implemented. Examples of PPE for traffic risks include:

- High-visibility vests.
- Lace steel cap boots.
- Hard hats with brim.

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- Earplugs or earmuffs.
- Safety glasses or goggles.

Road Safety Enhancements for an Agriculture/Residential Area

Construction Phase Measures:

Traffic Warning Signs:

- Install "Construction Ahead," "Slow Down," and "Heavy Trucks Crossing" signs well in advance.
- Use reflective road signs for night visibility.

Speed Reduction & Control:

- Set a strict speed limit (≤ 40 km/h near the site, ≤ 60 km/h elsewhere on the road).
- Install temporary speed bumps near construction access points and residential areas.
- Add safety signs
- The traffic management plan will include measures for the two way roads which do not have a safety island/pavement separating the roads. This could be done by adding cones or structures to separate the two way lanes.

Operational Phase Measures (Post-Construction):

Permanent Road Speed Bumps:

- Install speed bumps near residential areas, farm entrances, and silo access points to control truck speed.

Traffic Management for Heavy Vehicles:

- Schedule truck movements outside peak hours (morning rush & evening return from farms).
- Implement a weight restriction policy to prevent road degradation.

Safety Markings and Road Infrastructure:

- Ensure proper lane markings, pedestrian crossings, and truck waiting zones.
- Clearly mark no-overtaking zones and truck entry/exit points.
- Add safety signs
- The traffic management plan will include measures for the two way roads which do not have a safety island/pavement separating the roads. This could be done by adding cones or structures to separate the two way lanes.
-

Safety Measures for Pedestrians and Farmers:

Installation of pedestrian crossings, speed humps, and warning signs near farms and residential zones.

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3.5.1. Information, training, instruction, and supervision

- Workers including contractors who are required to perform duties associated with traffic management at the workplace should be trained to perform those duties. Training should be provided to workers by a competent person.
- Responsibilities for health and safety management must be clearly allocated. It is important each worker, contractor, subcontractor, visiting driver and other relevant people clearly understand their role in following safe work practices and taking reasonable care of themselves and others.
- EHCSS would provide supervision to ensure safety procedures are being followed, particularly if you are relying on administrative control measures to minimize risks.
- EHCSS must ensure so far as is reasonably practicable, everyone who has access to the workplace including visitors are provided with information necessary to protect them from risks to their health and safety, for example instructions on designated safe routes, parking areas, pedestrian exclusion zones and speed limits. This could be addressed through an induction process at your workplace.
- Visitors should report to the reception area or site office and be given information on the safety procedures for the workplace before they are allowed into areas where vehicles and powered mobile plant are used.
- EHCSS must ensure that any information, training, and instruction provided, is presented so it is easily understood by workers. This may require providing information and training material in different languages.

3.5.2. Keeping people and Trucks apart

The best way to protect pedestrians is to make sure people and trucks cannot interact. Where a powered mobile unit is used at a workplace, you must ensure it does not collide with pedestrians or another powered mobile unit.

This can be achieved by not allowing vehicles or trucks in pedestrian spaces or not allowing pedestrians in vehicle or trucks operating areas, for example using overhead walkways. However, this may not be reasonably practicable in all workplaces. If people and vehicles or trucks cannot be separated, you should consider using:

- Barriers or guardrails at building entrances and exits to stop pedestrians walking in front of vehicles or trucks.
- High impact traffic control barriers.
- Temporary physical barriers.
- Separate, clearly marked footpaths or walkways e.g., using lines painted on the ground or different coloured surfacing.

3.5.3. Trucks Routes

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- Vehicle routes at the workplace should have a firm and even surface, be wide and high enough for the largest vehicle using them and be well maintained and free from obstructions. They should be clearly sign-posted to indicate speed limits, traffic calming measures like speed humps and parking areas.
- The current state of roads supporting the Dandara Silo project traffic has seen significant improvements as part of major development initiatives in the South Valley region of Egypt. These initiatives, which include the construction and expansion of over 3,000 kilometers of road networks, aim to enhance infrastructure and facilitate better transportation.
- The maintenance of these roads' falls under the responsibility of the Egyptian Ministry of Transport. It has been pivotal in developing and maintaining the necessary infrastructure to support ongoing agricultural and developmental projects in the region
- Reducing speed is very important where administrative control measures are the only reasonably practicable approach. Speed limits should be implemented and enforced and traffic-calming devices like speed humps considered. Variations to speed limits should be clearly signposted.

3.5.4. Pedestrian Crossings

If pedestrians have to cross vehicle / trucks routes in the workplace you can manage the risk in a number of ways, for example interlocked gates or gates with warning devices, physical barriers or rails, traffic light systems or having a competent worker direct traffic.

Pedestrian crossings should be clearly marked with ground markings, lights or signs. If the vehicle / trucks route to be crossed is a road or railway, consider control measures that will work with those already established by the relevant authority, for example a local council or rail authority. Both pedestrians and vehicles or trucks should have good visibility, for example pallet goods should not be stored in a way that would obscure vision. Procedures indicating who has right of way at crossings should also be established (Safe Work Australia, 2014).

3.5.5. Parking Areas

Parking may be needed for workers, visitors, trucks, and other vehicles used in the workplace. Consider setting out the workplace so parking areas:

- Are located away from busy work areas and traffic routes.
- Have walkways leading to and from parking areas which are separated from vehicles or vehicle routes e.g., use physical controls like barriers or bollards to prevent vehicles from crossing into walking areas,
- Are clearly marked and sign-posted, well-lit, and unobstructed.

3.5.6. Reversing Trucks

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If reasonably practicable, eliminate the need for reversing by using drive-through loading and unloading systems, multi-directional mobile plant, or rotating cabins. Where this is not possible, consider:

- Using devices like reversing sensors, reversing cameras, mirrors, rotating lights, or audible reversing alarms
- Using a person to direct the reversing vehicle if they cannot see clearly behind—this person should be always in visible contact with the driver and wear high-visibility clothing.
- Providing designated clearly marked, signposted and well-lit reversing areas, and excluding non-essential workers from the area.

3.5.7. Loading and Unloading Trucks

It is important to make sure visitors, including visiting drivers, are aware of the workplace layout, the route they should take and safe working procedures for the workplace. Provide drivers with safe access to amenities away from loading areas or other vehicular traffic. To reduce driver, fatigue a seat should be provided for long loading times.

If you have created zones to separate vehicles from people - called ‘exclusion zones’ - the person operating the powered mobile plant such as forklifts should control the exclusion zone. Clear operating procedures should be understood and always implemented. Provide effective ways to warn of loading in progress to other plant operators, drivers, and pedestrians. Warning devices can include signage, cones, lights, alarms, and horns.

Ways to stop vehicles or trucks from moving during loading and unloading activities include using: a) Trucks or trailer restraints, b) Dock locks, c) Air brake isolation interlock devices, d) Traffic lights, e) Barriers or other ‘stop’ signals, f) Systems for controlling access to vehicle keys or the cabin, and, g) Safe systems of work which make sure the driver is aware of when it is safe to leave.

3.5.8. Signs and road markings

Clear road markings like reflective paint and signs should be used to alert pedestrians and vehicle / trucks operators to traffic hazards in the workplace. Signs should be provided to indicate exclusion and safety zones, parking areas, speed limits, vehicle crossings and hazards like blind corners, steep gradients and where forklifts are in use. Signs and road markings should be regularly checked and maintained so they can be easily seen (Safe Work Australia, 2014).

3.5.9. Lighting

Traffic routes, maneuvering areas and yards should be well lit with particular attention given to junctions, buildings, walkways, and vehicles / trucks routes. Where possible they should

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be designed to avoid extreme light variation, for example drivers moving from bright into dull light or vice versa (Safe Work Australia, 2014).

3.6. Safe Work Method Statements for Traffic Management

Before undertaking any operation work on or next to a public road, it is important to assess the risks involved first. This type of work is classified as high risk due to the potential for injuries from moving traffic. As such, it is essential to have a safe work method statement in place. The safe work method statement is an important part of traffic management plans. It outlines the work to be done, the hazards associated with the work, and the traffic control measures in place to minimize the risks. The safe work method statement should be developed prior to undertaking any work that could pose a risk to workers and should be reviewed and updated as required (Safe Work Australia, 2014).

The developed plan also shall adopt best transport safety practices across all aspects of project phases to prevent traffic accidents and minimizing injuries suffered by project personnel and the public by including:

- A) Safe Grain Loading and Unloading:** Loading and unloading grain from trucks or other transport vehicles can be hazardous. EHCSS will address best practices for securing loads, operating machinery safely, and preventing falls during loading and unloading processes including the securing and appropriate weather protection of the load, all parties will be responsible so far as is practical for checking that pre-loaded vehicles were loaded in a safe and satisfactory manner.
- B) Grain Auger Safety:** Operation of grain auger poses risk of hand, arm, feet, and leg injury caused by being entangled in an unguarded auger flight. This injury is common. Crush injury may also occur in unguarded pulleys, belts, and drive-shafts. Ensure that all auger flights, engine pulleys, drive belts and shafts are properly guarded and that the guards are in good condition before using all augers. Make sure that all guards are in place before augers are operated, especially after maintenance. Full augers are unstable and pose risk of toppling when moved. Injury may occur if the operator or bystander in the vicinity. Ensure that all auger flights, engine pulleys, drive belts and shafts are properly guarded and that the guards are in good condition before using all augers. Make sure that all guards are in place before augers are operated, especially after maintenance. Ensure all bystanders are kept away. To prevent toppling, empty, and lower augers before moving them (Temperley and Fragar, 2017).

Carriers must hold the licenses and comply with any codes or licenses required for the performance of services, including but not limited to:

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- Operating the vehicle or trucks or other machinery or equipment supplied or operated by the carrier.
- Carrying particular kinds of goods, including dangerous goods.
- Entry to facilities/premises for the purposes of loading and/or unloading grain.
- Operating the vehicle / trucks supplied to carry the specified capacity of the vehicle on the routes that will be used.

3.6.1. Induction Processes

- The carrier will satisfactorily complete any site induction process required as a condition of entry to the facilities/premises.
- Work facilities will provide such training where appropriate and ensure documentation is available to assist carriers with achieving compliance.
- Training of drivers including Overview of the role of drivers in the operation of grain silos and understanding the importance of drivers in the safe and efficient transport of grain, and Overview of daily tasks and responsibilities.

3.6.2. Safety Equipment

- All parties will supply and wear appropriate standard safety equipment.
- Drivers must be always in control of their vehicles during loading and unloading.
- All parties must conduct themselves and always operate their vehicles / trucks in a safe and reasonable manner.
- All parties shall only smoke in designated areas.
- Drivers must obtain approval from facilities/premises they visit before they carry out any form of maintenance or repair work on vehicles whilst on those facilities/premises.
- All parties must ensure that full safety precautions applying at the point of loading or unloading appropriate to the vehicle and its load, are taken during loading and un-loading for the protection of the driver, employees, third parties and plant and equipment, (GTA Grain Transport Code of Practice, 2014).
- Vehicles, equipment, and load carrying areas must be inspected before loading and if necessary, cleaned, and dried to remove any applicable residue accumulations or foreign material that may lead to contamination of the grain to be loaded.
- As part of the commitment to this Transport Code, it is the carrier's responsibility to ensure that if the load carrying area requires painting, then food grade paint is used. Note: the paint must not discolour or taint the grain to be transported in any way.
- Prior to leaving a facility/premise where the grain was loaded, the exterior of a vehicle must be suitably cleaned of spilt grain and all relevant biosecurity requirements of that facility/premise complied with. On arrival at the destination, drivers must: -

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- Report to the weighbridge or other site-designated point, hand over the delivery note for the load and any evidence of the vehicle's three previous loads/cleaning records if required by the receiver.
 - Under no circumstances discharge their load before the documentation has been checked, sampling completed, and the vehicle weighed (where appropriate).
 - Obtain instructions identifying where to unload. Drivers should only discharge bulk product into the intake pit or other area, as instructed by intake staff, and should ensure that they leave the intake area in an acceptable state.
 - On arrival of a truck on site, receival facilities must ensure drivers are aware of the expected loading or unloading time. On site means when a truck joins a queue either inside or outside the facility.
 - If drivers are unsure about what grain to load/where to unload and cannot obtain advice at the loading point/destination, they must contact the supplier/consignor and not commence loading/unloading until they have had instructions that identify the correct facility to load from/into which to unload, respectively.
- Drivers must attend their vehicles / trucks whilst loading and unloading.
 - All grain should be removed from the vehicle / truck after unloading, to the appropriate level of cleanliness.
 - Receiving facility is responsible for providing a means for cleanout and disposal of residues at the drop off point. Sweepings, washings, and similar residues from vehicle bodies should be disposed of in a point designated and provided by the receival facility.
 - If any grain is spilled during unloading the approximate quantity of the spillage must be noted by the Driver. This estimated quantity should be noted both on the receipt note to be returned to the consignor and on the delivery, document left with the recipient. (Records Required)
 - If any grain cannot be unloaded and is redirected, the Driver must record the destination of the grain.

Monitoring:

- Regular monitoring will be carried out, the frequency of monitoring will be based on the schedule of the work in the construction of the Silo, considering and avoiding the peak hours, and in coordination with the traffic authorities in the governorate.

4. Implementation of the Plan

This Implementation Plan outlines the role of individuals involved in the implementation of this Traffic Management Plan. Traffic control people (TCPs) will be on-site to set up and take down the lane closure and associated devices, assist with any incidents that may occur, and assist with access and egress into the work area as needed. During active work, trucks and vehicles will use the closed lane to access the work area.

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4.1. Site Supervisor

The Site Supervisor or Silo Manager of Dandara Silo will be responsible for conducting daily toolbox meetings, addressing issues as they occur, leading the crew, and being the point of contact with the EHCSS Representative. As part of his role, he will ensure that:

- Each silo member is familiar with the Traffic Control Plan
- Each silo member wears the required safety apparel.
- Each silo member has adequate training on the equipment they will be using.
- The work area is protected by implementing this TMP.

He will also be responsible for liaising with the Traffic Control Supervisor to inform them of the work schedule, daily activities, and to address any incidents, improvements or changes which need to be made.

4.2. Traffic Control Plan (TCP)

A traffic control plan (TCP) is a document that outlines the steps necessary to manage and control traffic in a workplace. The plan includes a section on emergency procedures, as well as how to deal with incidents or accidents that occur. A traffic control plan can also be a diagram or layout plan illustrating the arrangement of signage and devices used to manage traffic at your worksite. It is an important tool that helps traffic controllers safely and efficiently direct traffic around construction zones, temporary road closures, and other potential hazards. TCP also allows for allocating traffic control and information measures in response to a pre-defined scenario.

There are a variety of traffic control plans that are used to help regulate the flow of traffic and keep motorists safe. The typical traffic controls include:

- Give way signs: to indicate who has the right of way.
- Signages: used to warn motorists of potential hazards ahead.
- Speed limits sets the maximum speed that vehicles are allowed to travel to ensure that vehicles are travelling at a safe speed.
- Traffic cones: used to direct traffic around a construction site or other hazard.
- Barricades: used to block off an area entirely
- Traffic controllers: used with other traffic controls, such as signs and cones, to help direct motorists safely through an area.
- Roundabouts: to regulate the flow of traffic
- Traffic lights: to control the sequence of traffic flow.
- One-way streets: to restrict the direction of traffic flow.
- Pedestrian crossings: to provide safe crossing points for road users.

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4.3. Traffic Control Supervisor

Typically, there will only be 1 TCP on site as the work area is not on the travelled roadway. In these cases, the TCP will assume the role of, and be considered, the Traffic Control Supervisor. However, if more than 1 TCP is on site, such as during busy periods or if an incident occurs, a Traffic Control Supervisor will be named to provide support. Their name will be recorded on the Daily Traffic Control Log. The Traffic Control Supervisor (TCS) will be responsible for, but not limited to, the following tasks:

- Overseeing traffic control operations, ensuring traffic control is executed according to the Traffic Control Plan, and taking note of any improvements or changes that should be made.
- Ensuring compliance with the requirements BSS10 Occupational Health and Safety Regulations regarding supervision of TCPs
- Supervision and authority over all the TCPs on site
- Providing direction to TCPs
- Ensuring traffic control devices are in place, checked, maintained, and moved as required.
- Ensuring daily traffic control setups are documents and changes are identified in the daily traffic control log.
- Ensuring traffic concerns are reported to the Traffic Control Manager and/or Site Supervisor, as required.

On site, the TCS will also be responsible for ensuring all TCPs are:

- Carrying evidence of their current TCP certification.
- Wearing the required safety apparel and have the appropriate equipment.
- Performing traffic control duties competently and safely.
- Positioned in safe locations.
- Provided with rest breaks.

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Appendix III: Occupational Health and Safety Management Plan (OHSMP)

1. Background

Occupational Health and Safety Management Plan (OHSMP) means a detailed plan proposed by the Borrower describing the organizational structure, planning activities, responsibilities, practices, procedures, processes, and resources for developing, implementing, achieving, reviewing, and maintaining an occupational health and safety policy complying with the Agreed Environmental Requirements.

2. OHSMP for Silos project include the following:

- **Identifying the Hazards:** Identifying the specific hazards associated with construction of the Dandara Silo complex as well as the operation of silos. Considering factors such as the design of the silo, maintenance programs, and the training and experience of workers entering confined spaces.
- **Controlling Risks:** Implementing measures to control the risks associated with working with silos. This may include following manufacturer's instructions for concrete slab preparation, locating silos away from houses, powerlines, and water holes, providing safety features such as roof platforms, ladder cages, and wire mesh guards, and installing ladders inside the silo for emergency exits.
- **Involving Management and Employees:** Ensuring that management and employees are actively involved in the development and implementation of the OHSM Plan. This includes providing leadership, participation, and resources necessary for the plan's success.
- **Planning the Safety Management System:** Developing a comprehensive plan that outlines the goals, objectives, and strategies for managing safety and health risks specific to silos construction and operation. This plan should align with the requirements of ISO 45001, which provides guidance on occupational safety and health management systems.
- **Implementing and Operating the Safety Management System:** Putting the plan into action by assigning roles and responsibilities, providing training, conducting inspections, and collecting hazard control data. This step ensures that the OHSMP is effectively implemented on the silo's construction project.
- **Monitoring, Evaluating, and Correcting the safety Management System:** Regularly review the plan to assess its effectiveness and make necessary adjustments. This includes

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monitoring the performance of the safety management system, evaluating it against expectations, and making corrections as needed.

- **Management Review of the Safety Management System:** Conduct a formal review of the plan to ensure that it is meeting the organization's goals and objectives. This step involves management's assessment of the OHSMP's performance and making improvements as necessary.

3. Legal Framework

World Bank Environmental and Social Standards

a) Environmental and Social Standard (ESS) 2: Labor and Working Conditions

The main objective of this standard is to promote safety and health at work, to promote the fair treatment, non-discrimination and equal opportunity of project workers and to protect project workers, including vulnerable workers such as women, persons with disabilities, children (of working age, following this ESS) and migrant workers, contracted workers and primary supply workers, as appropriate and to prevent the use of all forms of forced labor and child labor (Standard (ESS) of the World Bank).

b) Environmental and Social Standard (ESS) 4: Community Health and Safety

The main objectives of this standard is to anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle from both routine and non-routine circumstance, to promote quality and safety, and considerations relating to climate change, in the design and construction of infrastructure, including dams, to avoid or minimize community exposure to project-related traffic and road safety risks, diseases and hazardous materials, to have in place effective measures to address emergency events, to ensure that the safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities (Standard (ESS) of the World Bank).

More details about the legislation, including the applicable international and local legislation, are provided in chapter three of this report.

4. OHSMP Requirement

The cornerstone of an effective occupational health and safety management strategy is the promotion of increased employee wellbeing, health, and safety. The OHSMP attempts to reduce the risks to employees from work-related activities and ensures their work safety while they are on the job.

The following major categories of occupational hazards may be considered while conducting risk assessment, evaluation, and control:

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- **Chemical hazards:** silo fumes, gases, and vapours.
- **Physical risks:** Noise, heat, cold, vibration, ionizing radiation, ultraviolet light, and workplace lighting.
- **Biological risks:** Mosquito-borne viruses, contaminants in potable water, and other water-borne risks like legionella.
- **Mechanical risks:** Risks of falling from heights, sudden disintegration or breakage of gears or large parts of silo filling machines.
- **Life threatening risks:** Some of the previously mentioned risks, whether chemical, physical, biological, and mechanical, each of them contains risks that threatening life such as inhaling toxic gases, sudden explosion of huge parts of machinery because of their disintegration, sudden fall from heights, exposure to electric shock, exposure to fire and collision with large vehicles or trucks located inside the silo. These risks are avoided as much as possible, and when they occur, they will be dealt with quickly with first aid by trained workers, with immediate transportation to the nearest health care unit.

A) Occupational Hygiene

The H&S expert must guarantee dedication to occupational health risk monitoring and reporting, as well as the implementation of controls to lower risk in line with all applicable laws and, whenever practical, with adherence to recognized best practices. Specific assessments of occupational hygiene will be performed using recognized procedures and relevant standards. For the following workplace health risks, ongoing evaluations must be done, and controls must be put in place as necessary.

✓ Sanitation and Good Hygiene

H&S Expert is required to provide workers with suitable facilities including:

- A reasonable distance between restrooms and each workspace.
- Clean, well-maintained sanitation and hygiene facilities.
- Dining establishments with enough seating, tables, and facilities for hand washing and waste disposal.
- Potable water supplies accessible to all employees.

Additionally, employees are not permitted to misuse or harm any given sanitation or hygiene facilities or purposefully pollute work areas.

B) Safety

✓ Personal Protective Equipment (PPE)

To safeguard employees and visitors from danger, the H&S expert must make sure that everyone wears or uses the personal protective equipment that is offered. According to the

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Environmental, Health, and Safety (EHS) Guidelines, General (EHS) Guidelines of the World Bank 2007 as shown in table (III.1), personal protective equipment will be fitted appropriately, and users will be trained on how to use it. All provided personal protective equipment must meet appropriate standards, be kept in good condition, and be replaced if it ever breaks down.

According to Environmental, Health, and Safety (EHS) guidelines, the available PPE to be provided include:

- Hearing protective devices, such as earmuffs and ear plugs
- Respiratory protective equipment
- Eye and face protection, such as safety glasses
- Safety helmets
- Fall arrest harnesses for working at heights
- Skin protection, such as gloves and gauntlets
- Clothing, such as high visibility vests and coveralls
- Footwear, such as safety boots and rubber boots.

Table (III.1) Recommended personal protective equipment for silo workers by hazard type according to the World Bank 2007 Environment, Health, and Safety (EHS) and Common Guidelines.

Objective	Workplace Hazards	Suggested PPE
Eye and face protection	Flying particles, molten metal, liquid chemicals, gases or vapors, light radiation.	Safety Glasses with side-shields, protective shades, etc.
Head protection	Falling objects, inadequate height clearance, and overhead power cords.	Plastic Helmets with top and side impact protection.
Hearing protection	Noise, ultra-sound.	Hearing protectors (ear plugs or earmuffs).
Foot protection	Falling or rolling objects, pointed objects. Corrosive or hot liquids.	Safety shoes and boots for protection against moving & falling objects, liquids, and chemicals.
Hand protection	Hazardous materials, cuts or lacerations, vibrations, extreme temperatures.	Gloves made of rubber or synthetic materials (Neoprene), leather, steel, insulating materials, etc.
Respiratory protection	Dust, fogs, fumes, mists, gases, smokes, vapors.	Facemasks with appropriate filters for dust removal and air purification (chemicals, mist, vapors, and gases). Single or multi-gas personal monitors, if available.

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	Oxygen deficiency	Portable or supplied air (fixed lines). On-site rescue equipment.
Body/leg protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration.	Insulating clothing, body suits, aprons etc. of appropriate materials.

✓ *Silo Gas*

The potential threat of silo gases represents as a type of hazard associated with silo filling. Gas formation can begin immediately after filling and can peak within two to four days after filling if not vented or exhausted. If workers must enter the silo during this time, they should be protected by wearing a respirator while maintaining both visual contact and using a wireless communication device with another person outside the silo.

✓ *Noise Prevention*

The Occupational Safety and Health Administration (OSHA) recommends hearing protection when workers and bystanders are exposed to 85 decibels or more for an 8-hour workday. During silo filling, workers are exposed to high noise levels through unloading and blowring processes simultaneously. Sound levels of 100 dB or more for even short periods of time, can result in permanent hearing loss. Therefore, it requires the protection of workers in high-noise work areas can be protected by using Personal protective equipment (PPE) such as ear plugs or earmuffs can significantly reduce the noise level. Other interventions would include limiting the worker's exposure by maintaining the tractors and machinery in good condition and requiring that the workers rotate out of the high noise area after shorter work sessions of no more than 10-15 minutes for 100 dB levels.

✓ *Fall Prevention*

To lessen the risk of a person falling from one level to another, a health and safety expert must ensure that all employees who participate in works where there is a risk of falling carry out those works in a controlled manner. H&S experts therefore carry out comprehensive risk assessments, checking the condition of ladders, handrails and cages and the integrity of the silo roof. In addition to ensuring that they are well trained in dealing with fall accidents. So, if a worker falls or is injured while working at heights, or suffers a heart attack, heat stroke, or sprains his ankle while on top of the silo, a rapid rescue will be carried out to safely lower the stricken individuals by trained silo workers on site as immediate assistance without relying on requesting external assistance, because any delay may be crucial to their health.

✓ *Machinery inspection*

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One of the main risks involved in filling the silo stems from the operator being exposed to numerous moving machine parts in a relatively crowded work area. These mechanical hazards include pinch, wrap, shear, and crush points as well as freewheeling parts hazards. Hazards on self-unloading wagons include a combination of moving aprons, beaters, conveyors or augers, and an assortment of chains and sprockets. To prevent injury incidents, all protective machinery shields must be in place, in addition to regular maintenance and permanent inspection of these machines. Workers also should wear comfortable and close-fitting clothing and under no circumstances. No one should be around while unloading process.

✓ *Warning Signs*

The H&S expert must make sure that there is enough safety signs put on buildings and roadways to deter accidents, identify dangers, point out where fire and safety equipment is located, and provide instructions on what to do in an emergency.

✓ *Driving Safety*

The H&S expert is required to make sure that anyone who is allowed to operate a vehicle in a silo area or a silo vehicle on a public road has a valid driver's license and is adhering to the applicable traffic laws for that type of vehicle.

All employees operating vehicles on silo property are required to follow all traffic regulations, adhere to road conditions, and follow any applicable traffic (transportation) management plans.

✓ *Fire Safety Requirements*

- The quantity and size of staircases and emergency exits for fast evacuate.
- Regular drills in accordance with the fire safety plan, testing and monitoring of fire safety equipment on a regular basis, and training for fire wardens.
- Data processing rooms, telecommunication switches, and process control rooms—areas containing priceless or essential equipment—are protected by fixed extinguishing systems and fixed fire extinguishing/suppression systems.
- Employee Alarm Systems: By ensuring that alarm systems function correctly and that protocols are in place to notify employees of workplace emergencies, employee alarm systems can lessen the severity of workplace accidents and injuries.
- Portable fire extinguishers, which help reduce the damage caused by these fires. Fire extinguishers, when used correctly, can put out a minor fire or contain a fire until further assistance arrives, saving lives and protecting property.
- There is already a plan for escape routes, and evacuation in case of emergency (Emergency evacuation plan Appendix VI).

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✓ *Fire Prevention Requirements*

- Regular upkeep of safety measures put on heat-producing equipment to avoid the unintentional igniting of combustible materials.
- Controlling the accumulation of flammable and combustible waste products.
- In the event of a major accident, as a huge fire in the Silo. The fire will be dealt with quickly and immediately, in addition to quickly requesting the nearest assistance from the Civil Defence Department in Qena.

C) *Security*

- Workplace theft and assault prevention measures are implemented as part of a security plan.
- A security strategy with explicit guidelines on the use of force has been carefully created and put into action.
- The security crew has undergone background checks to make sure they have not been connected to any wrongdoing or abuse in the past. Security personnel are hired from both genders when suitable.
- Security personnel have received sufficient training in dealing with domestic violence and the use of force, and they are aware of the value of upholding both individual rights and the rights of entire communities.
- Body searches are only permitted under certain conditions, and professionally trained security personnel carry them out in the least invasive manner possible.
- Security personnel act appropriately toward employees.

✓ *Access and site security*

The H&S expert shall restrict access to the silo area and install all essential safeguards, including fencing the area and erecting the requisite signage, among other things. The H&S expert oversees ensuring that all site security standards for this activity that were listed in the risk assessment are adequately executed.

✓ *Site Induction and Site Safety Rules*

The H&S expert will conduct site orientations. The following are the arrangements for site inductions:

- Any new employee reporting to the work site will receive a briefing on the site safety rules, including the site logistics plan, hazards, evacuation procedures, emergency and first aid procedures, and the duties and responsibilities of all

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individuals on site. A Site Induction briefing, and Site Safety Rules will be developed in Arabic and in English.

- Visitors will receive a brief site induction (based on an oral or written form) and will be always accompanied during their visit to the site.
- All attendees of the Site Induction briefing will have their names recorded.

✓ *Inspections of Workplace*

Weekly inspections must be performed. H&S Expert will conduct weekly inspections of the whole work site, paying particular attention to the following: equipment, scaffolds, small tools, lifting equipment, electrical lines, fire extinguishers, and first aid supplies. H&S Expert will maintain records of the inspections.

H&S Expert

- H&S expert is the main person who is responsible for health and safety of workers with the help of two other engineers.
- As needed, offers office H&S support and assistance.
- Make Weekly and monthly assessments and monitoring of the safety performance.
- Creates all required OHSAS 18001 Systems Document
- Creates fundamental H&S strategies, practices, and guidelines, etc.
- Establishes an inspection scheme and schedule that involves all levels of site supervision, office staff, and other parties exposed to the specified stage of the project. Effectively manages the safety personnel under his control and gives them the necessary direction and training as needed to maximize their effectiveness on site.
- Introduces a program for H&S training.
- Coordinates any incident's inquiry.
- Recognizes any patterns that emerge in incident investigations and makes sure that corrective measures have been agreed upon, taken, and recorded.
- Examine, assemble, analyze, and evaluate Key Performance Indicator data to identify significant severity potential incidents, causes, trends, and relationships of injury/illness, and all other unexpected occurrences.
- Examines the workplace using equipment for mechanical testing and visual observation to look for probable breaches of the H&S standards and to report them.
- Gathers information and creates reports on safety violation complaints and work-related accidents and fatalities.
- Examines accident, injury, and illness reports to identify problem areas relating to employee safety.

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- Participate in all incident investigation committees, when necessary, as a team member.

D) Housing

✓ Construction workers housing

While construction workers will be provided with their own accommodation facilities, which will conform to specifications and standards for workers' accommodation according to the IFC and the EBRD which was mentioned before.

✓ Visitors housing

Visitors' facility, it serves as a rest stop for a day or two days for guests and VIP visitors, whether observers, followers, or officials from government ministries to follow up on the silo's work. As for the workers in the silo, there is no need to provide them with permanent or even temporary housing, given that most of them are residents of the governorate and reside in their own homes near the silo.

- *Visitors' facility specifications*
 - It is positioned to be at a reasonable distance of the workplace.
 - It is constructed with sufficient materials, maintained in good condition, kept clean, and devoid of trash and other waste.
 - Safe and simple transportation to the silo as the location of visitors' facility is inside the silo.

✓ Lightning Heating and Cooling

- There is both natural and artificial illumination available, as well as emergency lighting.
- In accordance with the climate, sufficient ventilation and/or air conditioning systems are offered, as well as heating systems.

✓ Water

- Workers always have access to a sufficient and convenient supply of free potable water.
- Drinking water fulfils national/local or WHO drinking water criteria. It is frequently checked. All tanks used to hold drinking water are built and oversized to keep the water inside from getting contaminated or polluted.

✓ Hand wash basins and showers

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- There are enough hand washing stations available for employees. Hand washing stations should have a sink and a tap, soap, and a sanitary way to dry hands.
- Workers have access to enough shower/bathroom facilities with enough cold and hot running water. The flooring in bathrooms and showers is composed of durable, washable anti-slip materials.

✓ *Toilet and Drainage*

- All restrooms are well-lit, have decent ventilation or exterior windows, and have an acceptable quantity of hand wash basins. Additionally, there are convenient locations and easy access to all restrooms.
- The location of the resting-building is properly drained to prevent the buildup of stagnant water, keeping possible disease vectors like mosquitoes, flies, and others at bay.

✓ *Liquid and solid waste*

- All waste products are properly disposed of, in accordance with regional or World Bank requirements, whichever is more demanding, and without having a major negative impact on the biophysical environment or the populations in the vicinity.
- Specific garbage collection bins are offered and regularly emptied. Standards might include having enough trash cans or having leak-proof, non-absorbent, rust- and corrosion-resistant containers that are protected from rodents and insects.
- Pest extermination, vector control, and disinfection are performed on a regular basis throughout the resting building in accordance with local requirements and/or good practice.
- Such containers are emptied at regular intervals (to be determined based on temperatures and volumes generated) to avoid unpleasant odors associated with decaying organic materials.

E) Medical Care

- It's critical to provide access to sufficient medical facilities for employees to preserve their health, to respond appropriately to medical crises, and to ensure that there is transportation to such facilities.
- The number of first aid kits in the first aid room should be sufficient for the number of workers wherever possible, in addition to the fact that there is a first aid service center near the silo that is open 24 hours a day, seven days a week and is easily accessible.
- First aid kits are stocked properly and include items like a pamphlet with general first aid instructions, like the HSE leaflet. simple guidelines for workplace first aid. Assorted size individually wrapped sterile triangle bandages, sterile eye pads,

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safety pins, disposable gloves, and medications including painkillers, fever reducers, and burns ointments. Individually wrapped sterile adhesive and non-medicated wound dressings. In addition, vaccines for scorpions and rodents are available due to the desert nature of the place.

- An appropriate number of employees are educated to administer first aid, helping to save lives and stop minor injuries from worsening.
- In case of a major accident, the case will be transferred to the nearest health care unit via an equipped ambulance.
- The remedial actions shall also consider the status of the project worker in terms of wage level and age, the degree of injury or adverse impact and the number and age of dependents concerned.

5. Monitoring Plan of Occupational Health and Safety Risks

The usage of machinery, inhalation of grain, falls from heights, entanglement in grain-moving equipment, poisonous atmospheres from fumigation and fermenting grains, electrocution, fire breakouts, and grain dust explosions are all possible safety and health dangers during silo operation. This might have a negative impact on human health or result in fatalities. To create a successful plan of action and to guarantee compliance with the Occupational Safety and Health Act of 2007, the monitoring plan's goal is to evaluate current controls in addition to possible health and safety hazards.

✓ *Monitoring Strategy*

The main components of the monitoring schedule for workplace safety and health are:

- Producing reviews and reports on occupational safety and health.
- The identification of hazards through the examination of actions that pose a threat now or in the future.
- Ensuring that all mishaps and events that occur on the property are immediately reported and investigated.
- Maintaining records of events, accidents, and hazardous happenings; ensuring that situations that require reporting are sent to the health, safety, and environment specialist.
- Regular examinations of the building and its apparatus.
- Visual assessment and key employee interviews to find areas that need improvement.
- Completing and analyzing reports for risk, energy, and fire assessments
- Review of standards for fire safety training, fire drills, and safety awareness.
- A review of the workforce's health and safety education's efficacy.
- Action plans based on the risk assessment's key findings.
- Having emergency plans, escape routes, and safety signs, among other things.

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- there are 3 trained workers on OHS affiliated to the receiving and storage department.

✓ *Monitoring Frequency*

Medical monitoring is required, also providing new PPE to the workers every six months, conduct yearly fire and health and safety audits, hold quarterly fire drills, and make sure that all serviceable equipment is maintained on schedule.

✓ *World Bank accidents and diseases monitoring*

- The employer should establish procedures and systems for reporting and recording:
 - Occupational accidents and diseases
 - Dangerous occurrences and incidents

These systems should enable workers to report immediately to their immediate supervisor any situation they believe presents serious danger to their life or health.
- The systems and the employer should further enable and encourage workers to report to management all:
 - Occupational injuries and near misses
 - Suspected cases of occupational disease
 - Dangerous occurrences and incidents
- All reported occupational accidents, occupational diseases, dangerous occurrences, and incidents together with near misses should be investigated with the assistance of a person knowledgeable/competent in occupational safety. The investigation should:
 - Establish what happened.
 - Determine the cause of what happened.
 - Identify measures necessary to prevent a recurrence.
- Occupational accidents and diseases should, at a minimum, be classified according to Table (III.2). Distinction is made between fatal and non-fatal injuries. The two main categories are divided into three sub-categories according to time of death or duration of the incapacity to work. The total work hours during the specified reporting period should be reported to the appropriate regulatory agency.

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Table (III.2): Occupational accident reporting about fatal and non-fatal injuries.

a. Fatalities (number)	b. non-fatal injuries (number)	c. Total time lost non-fatal injuries (days)
a.1 Immediate	b.1 Less than one day	
a.2 Within a month	b.2 Up to 3 days	c.1 Up to 3 days
a.3 Within a year	b.3 More than 3 days	c.2 More than 3 days



Figure (III.1): Fire equipment, Fire exit, warning, and prohibition safety and First aid signs.

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Figure (III.2): Personal Protective Equipment (PPE).

7. Implementation of OHSMP

Implementation of OHSMP in Silos project involves several steps and considerations including the following:

- Establishing a Safety Culture:** Make safety and health a core value in the workplace. This involves creating a culture where safety is prioritized, and everyone understands its importance.
- Employee / Workers Participation:** Management should lead by example and actively involve employees /workers in the development and implementation of the OHSMP. This can be done through regular communication, training, and encouraging employee feedback and participation.
- Defining OHSM Competence:** Assessing the competence needed for employees and contractors to effectively implement the OHSMP. Providing training, or other methods

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to ensure that employees and contractors are aware of the OHSMP requirements and understand their importance.

- d) **Developing a Reporting System:** Implementing a reporting system that allows employees to report any safety and health issues or concerns. This system should be easily accessible and encourage timely reporting. There is already a Grievance Mechanism system and GM channels for workers in the Silo.
- e) **Providing Training:** Ensure that all employees / workers receive appropriate training on safety procedures, hazard identification, and emergency response protocols. Training should be ongoing and tailored to specific job roles and tasks. Training take place in the training center in EHCSS in Cairo.
- f) **Conducting Inspections:** Regularly inspect the workplace to identify hazards and assess the effectiveness of safety measures. Inspections should be documented, and any identified hazards should be addressed promptly. Inspections are carried out according to planned schedules by EHCSS.
- g) **Implementing Hazard Controls:** Take steps to control and mitigate identified hazards. This may involve implementing engineering controls, administrative controls, or personal protective equipment (PPE).
- h) **Monitoring and Reviewing:** Continuously monitor and review the effectiveness of the OHSMP. This can be done through regular audits, incident investigations, and feedback from employees. Make necessary adjustments and improvements to the plan as needed. The monitoring and reviewing are carried out internally in the Silo according to planned schedules by EHCSS.
- i) **Compliance:** Ensure compliance with relevant occupational health and safety regulations and standards. Stay updated on any changes in regulations and make necessary adjustments to the OHSMP to remain compliant.
- j) **Documentation:** Maintain proper documentation of the OHSMP, including policies, procedures, training records, incident reports, and any other relevant documentation. This documentation should be easily accessible and regularly reviewed.



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Appendix IV: Sexual Exploitation Abuse and Sexual Harassment Plan

Table (IV): SEA/SH Prevention and Response Action Plan:

Action to Address SEA/SH Risks	Who is Responsible for Action	Project Update/ Comments	Notes	Ongoing Risk Management & Timeline	Estimated Budget
Agree with PMU/EHCSS and MALR on Code of Conduct (CoC) that is focused on SEA/SH Clearly define the SEA/SH requirements and expectations in the bid documents. Bidding documents should: - emphasize that the construction company must comply with all relevant laws and regulations concerning sexual harassment and abuse prevention in the workplace. - Specify that the construction company must establish clear and accessible reporting mechanisms for incidents or suspicions of sexual abuse and harassment	PMU, contractor and silos management		Code of conduct should draw on national legislation and assessment conducted as part of ESMP and should include clear language to prohibit sexual harassment at workplace. COC should be disclosed in a clear place visible for workers and silos users.	All staff must be regularly informed about CoC in meetings and other venues. Relevant staff and workers including of the contractors should sign the CoC.	As part of the contract budget
Sensitize PMU/ EHCSS Team including Supervising Engineer and Silo managers/staff on the SEA/SH risks at project level.	PMU, contractor and silos management		Topics should encompass exclusions, and the misuse of power based on gender particularly toward female clients, as well as ensuring fair payment practices to minimize gender disparities.	- Prior to the construction - Prior to Wheat Season (March-April) and throughout operation of the silo	As needed brining in experts in GBV and SEA/SH to conduct the sensitization sessions



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Establish GRM mechanism for SEA/SH cases. as per Stakeholder Engagement Plan (SEP) - Setup safe uptake channels for SEA/SH that is separate and confidential. - Ensure coordination and collaboration with National Council for Women is done to refer cases as needed. - Disclose the information related to NCW hotline to allow access to safe referral to different services in case of SEA/SH incidents - Ensure the information is disseminated at silo level and all staff and users are aware of how to report SEA/SH cases.	PMU, contractor and silos management		Focal Point for social aspect with good knowledge about SEA/SH needs to be assigned by the contractor and the Supervision engineer	● Disseminate information to staff at silo level. ● Regularly assess confidentiality of reporting and introduce any enhancement to reinforce the survivor centered principles. ● Ongoing monitoring and reporting on GRM to verify it is working as intended. ● Follow a survivor centered approach to ensure, as appropriate, that reported cases/survivors are receiving the appropriate services.	Travel cost to silo. Posters and others to disseminate SEA/SH uptake channel in silo.
Map out SEA/SH prevention and response services and introduce the project SEA/SH risks to services providers namely:	PMU, contractor and silos management		Coordinate with National Council for Women to identify contact person and	● Update mapping as appropriate	Travel cost to silo.



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Action to Address SEA/SH Risks	Who is Responsible for Action	Project Update/ Comments	Notes	Ongoing Risk Management & Timeline	Estimated Budget
- Contact person at National Council for Women to support in case management Procedures. - Contacts related to other services (health, legal, psychosocial) in coordination with NCW.			inform them of SEA/SH risks at project level.		Training cost of contact persons.
As part of SEP, conduct consultations with affected population and relevant stakeholders, specifically women farmers, and women staff to inform them about SEA/SH risks, measures in place to address (e.g. CoC, GRM and referral pathway). Given the cultural sensitivity, it is preferable to have separate meetings for women and girls.	PMU, contractor and silos management		Coordination with MALR to engage with women farmers.	● Monitoring of implementation of Stakeholder Engagement Plan. ● Ongoing consultations	Cost of implementing the SEP.
				Report as part of the ESF reports	Cost included in the contractor's agreement.

Appendix V: Dandara Silo Subproject Documents and Figures

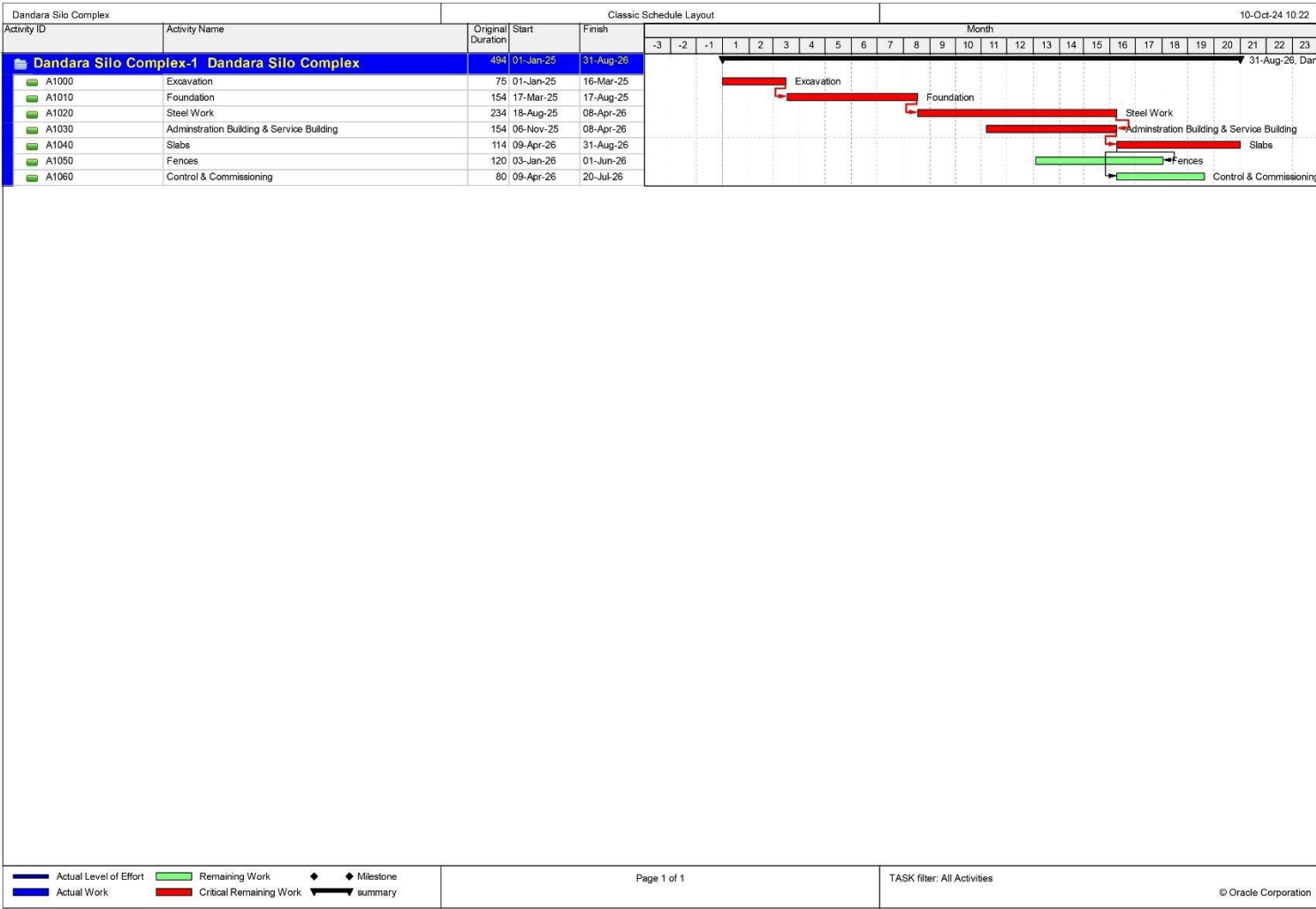


Figure (V.1): Time Schedule for the Dandara Silo project.

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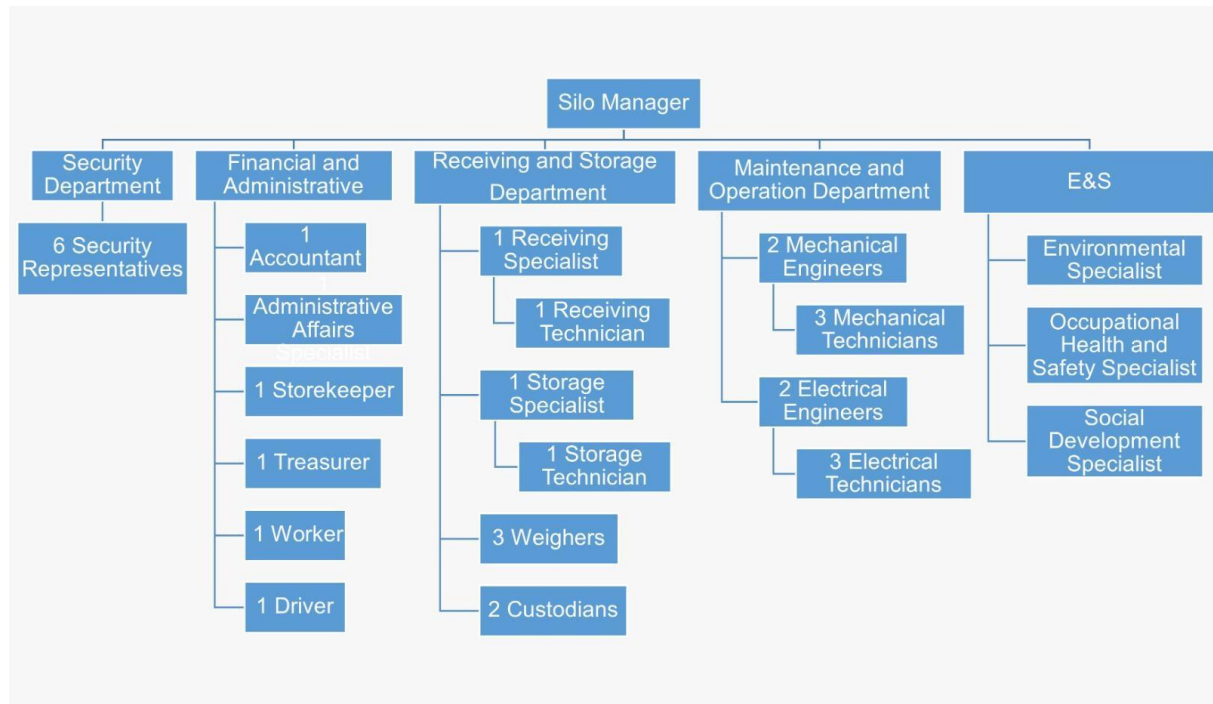


Figure (V.2): Planned administrative structure of Dandara Silo Complex.

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Figure (V.3): Some photos from the surrounding area of the proposed location for the construction of Dandara Silo Complex.



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Figure (V.4): Some photos of consultation at Dandara Silo Complex.

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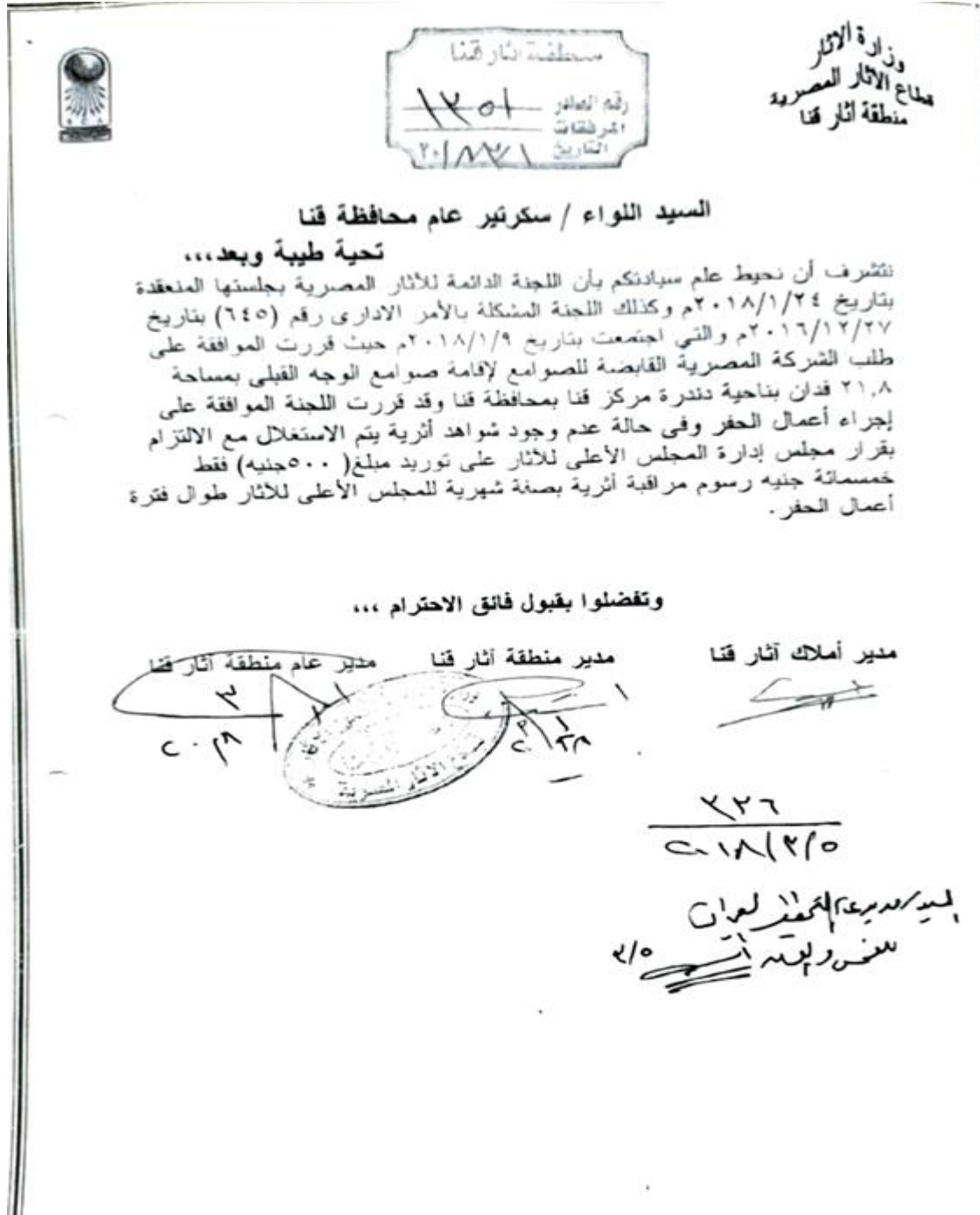


Figure (V.5): the approval from the Ministry of antiquities for Dandara Silo Complex.

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الجمهورية العربية السورية
قرار رئيس جمهورية مصر العربية
رقم ١١٨ لسنة ٢٠١٩

رئيس الجمهورية

بعد الإطلاع على الدستور :

وعلى قانون الهيئات العامة الصادر بالقانون رقم ٦١ لسنة ١٩٦٣؛

وعلى قانون نظام الإدارة المحلية الصادر بالقانون رقم ٤٣ لسنة ١٩٧٩؛

وعلى القانون رقم ١٤٣ لسنة ١٩٨١ في شأن الأراضي الصحراوية؛

وعلى القانون رقم ٧ لسنة ١٩٩١ في شأن بعض الأحكام المتعلقة بالأقاليم الجديدة الخاصة؛

وعلى قانون البيئة الصادر بالقانون رقم ٤ لسنة ١٩٩٤؛

وعلى قرار رئيس الجمهورية رقم ١٥٢ لسنة ٢٠٠١ بشأن تحديد المناطق الإستراتيجية ذات الأهمية العسكرية من الأراضي الصحراوية والفوائد الخاصة بها؛

وعلى قرار رئيس الجمهورية رقم ١٥٣ لسنة ٢٠٠١ بإنشاء المركز الوطني للحفاظ على استخدامات أراضي الدولة؛

وعلى قرار رئيس الجمهورية رقم ٢٠١٨ لسنة ٢٠١٨ بشأن خريطة تنمية أراضي جمهورية مصر العربية؛

وبناء على ما عرضه المركز الوطني للحفاظ على استخدامات أراضي الدولة؛

وبعد موافقة مجلس الوزراء.

قرر

(المادة الأولى)

ووفق على تخصيص المساحات المبينة فيما بعد من الأراضي المملوكة للدولة ملكية خاصة تابعة محافظة قنا، لصالح وزارة التوطين والتجارة الداخلية لاستخدامها في إقامة المنشآت الموضحة قرين كل منها:-

١- مساحة ٢١,٩٨ فدان تعادل ٩٢٣٣٦ م^٢، ولها للخريطة والإحداثيات المرفقة وبرمز لها بالحرف (أ) لاستخدامها في إقامة صوامع قذح

٢- مساحة ٢,٣٥ فدان تعادل ٩٨٩٤ م^٢، ولها للخريطة والإحداثيات المرفقة وبرمز لها بالحرف (ب) لاستخدامها في إقامة مستودع دقيق.

٣- مساحة ٠,٥٧ فدان تعادل ٢٤٠٥٦ م^٢، ولها للخريطة والإحداثيات المرفقة وبرمز لها بالحرف (ج) لاستخدامها في إقامة مخازن للسلع الاستراتيجية.

وذلك كله وفقاً للقواعد والفوائين المعمول بها في هذا الشأن.

(المادة الثانية)

ينشر هذا القرار في الجريدة الرسمية.

(عبد الفتاح السيسي)

صدر برئاسة الجمهورية في ١٠ رمضان سنة ١٤٤٠ هـ

الموافق ١٥ مايو سنة ٢٠١٩ م

وزير التوطين والتجارة الداخلية

رئيس

لجنة مستشاري مجلس الوزراء

المستشار: شريف الشاذلي

٢٠١٩

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Figure (V.6): Presidential Decree No. 228 of 2019 for the development of silos and storage facilities

Contractor Code of Conduct:

- All employees, associates, and representatives commit to treating women, children (under the age of 18), and men with respect, regardless of race; color; language; religion; political or other opinion; national, ethnic or social origin; sexual orientation or gender identity; disability; birth or other status.
- GBV constitutes acts of gross misconduct and is therefore grounds for sanction, which may include penalties and/or termination of employment. All forms of GBV are unacceptable, regardless of whether they take place on the worksite, the worksite surroundings, or off-site. In addition to the potential sanctions listed above, legal prosecution will be pursued, if appropriate, for any employees, associates, and representatives alleged to have committed GBV.
- Demeaning, threatening, harassing, abusive, or sexually provocative language and behavior are prohibited among all company employees, associates, and representatives.
- Sexual favors, making promises or favorable treatment dependent on sexual acts are prohibited.
- Unless there is full consent by all parties involved, sexual interactions between the company's employees (at any level) and members of the surrounding communities are prohibited. This includes relationships involving the withholding or promise of any kind of reward.
- All employees, including sub-Contractors are expected to report suspected or actual GBV by a fellow worker, whether in the same company or not. Reports must be made in accordance with GBV allegation procedures.
- All employees are required to attend an induction training course prior to commencing work on site to ensure they are familiar with the GBV Code of Conduct.
- All employees must attend a mandatory training course once a month for the duration of the contract starting from the first induction training prior to commencement of work to reinforce their understanding of the institutional GBV Code of Conduct.
- All employees will be required to sign an individual code of conduct confirming their agreement to support GBV activities.



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I do hereby acknowledge that I have read the foregoing GBV Code of Conduct, and on behalf of the company agree to comply with the standards contained therein. I understand my role and responsibilities to prevent and respond to GBV. I understand that any action inconsistent with this Code of Conduct or failure to act mandated by this Code of Conduct may result in disciplinary action.

Company Name:

Signed by:

Title:

Date:

Document (V.7): Contractor Code of Conduct.

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Appendix VI: Grievance Redress Mechanism (GRM) for Labour

As part of the Labour Management Procedure (LMP), grievances that relate to project workers will be handled by a separate grievance redress mechanism from that of other project-related grievances. The grievance redress mechanism (GRM) will provide all direct workers and contracted workers (and, where relevant, their organizations) with channels to raise workplace concerns. Such workers, including community workers, will be informed of the grievance redress mechanism at the time of recruitment and the measures put in place to protect them against reprisal for its use. Measures will be put in place to make the grievance redress mechanism easily accessible to all such project workers. Community workers can access the GM via local NGOs, project officers, or the Environmental and Social Safeguards Team.

The Grievance Redress Mechanism (GRM) in the LMP also makes clear procedures for the handling of Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) grievances. Complaints can be made in person, in writing, verbally over the phone, by fax, email or any other media. Concerns can be raised anonymously and/or to a person other than an immediate supervisor. The Project Coordinator (PC) and the Social Safeguards Focal Point and Social Safeguards Specialist assigned to the project will be designated as the key officers in charge of labour grievances resolution. Grievances must be treated with the utmost confidentiality and if they are registered on the project site should be forwarded immediately to the Project Coordinator, who receives all grievances.

Grievance Redress Mechanism

A grievance refers to an issue, concern, problem, or claim, whether actual or perceived, that affects the physical, social and economic conditions of all workers in their workplace. They can occur at different stages of the project cycle.

- **Inception** – complaints about the perceived work conditions.
- **Implementation** – complaints about wages, work-related injuries, discrimination, Violence.
- **Close** – non-fulfilment of contractual agreement.

The GRM aims to quickly address all relevant grievances to minimize or eliminate the negative impacts of the Project on affected persons. In satisfying its aim, the GRM will ensure that grievances are identified early and that the redress mechanisms are appropriate and expeditious, ultimately preventing escalation or unmanageable circumstances. The



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GRM can also help to minimize or eliminate conflicts with the potential to compromise the project development objective.

Processing of Grievance

1. Receive Grievance

The Project Coordinator should receive all grievances. Through the consultation process, the complainants will be informed of various avenues through which the mechanism can be accessed. (Complaints can be made in person, anonymously, in writing, verbally over the phone, by fax, email or any other media).

(Notice of information through which workers can file grievances will be displayed on the sign at the project site, on project posters, communication documents or wherever project activities are being carried out).

2. Acknowledge the Grievance

All grievances will be acknowledged by telephone or in writing by the Project Coordinator within 48 hours of receipt. The complainant will be informed of the approximate timeline for addressing the complaint if it cannot be immediately addressed. The Project Coordinator will work with the safeguards team to ensure the speedy resolution of the grievance. If the complaint cannot be resolved at this level, it is taken to the next level.

3. Register/Log

After receiving and recording the grievance on the Grievance Registration Form, it will be registered in the Grievance Redressal Registration through the attached grievances registration form.

4. Screen

The Project Coordinator reviews the complaint, classifies it, and assigns a grievance officer. The complaint will be forwarded to the Safeguard Team responsible for investigating the claim and liaising with both the aggrieved party and the project technical team to reach a mutually acceptable resolution. The complainant will be given a specific timeline for resolving the claim. Meetings with the grievant/complainant will be held, if necessary, in an attempt to resolve the matter. All meetings must be recorded.

5. Investigate

The grievance officer will investigate the complaint. This investigation will include but is not limited to meetings with the complainant, site visits, meetings and/or interviews with project staff and collection of relevant documentation and other forms of evidence.

6. Levels of Grievance

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Level 1	When an answer can be provided immediately and/or the safeguards team is already working on a resolution.
Level 2	One-off event, a member of the Safeguards Team & Project Coordinator, can provide a resolution.
Level 3	If the complaint is repeated or if it's a high-profile grievance that, if not resolved promptly, may represent significant risks to the environment or community, the Grievance Redress Committee will address it. Additionally, the Grievance Redress Committee would address any complaint that indicates a breach of law or applicable policy/regulation.
Level 4	The Court of Law - Violations of rights, Gender-Based Violence (GBV), all grievances that the Grievance Redress Committee cannot resolve.

Addressing Gender-Based Violence (GBV)

The Client will specify the individual responsible for dealing with any GBV issues should they arise. The manifestation of GBV includes, but is not limited to:

- Physical violence (such as slapping, kicking, hitting, or the use of weapons).
- Emotional abuse (such as systematic humiliation, controlling behavior, degrading treatment, insults, and threats).
- Sexual violence, which includes any form of non-consensual sexual contact, including rape.
- Sending inappropriate videos or pictures with co-workers.
- Making sexual or lewd comments.
- Inappropriate and unwanted sexual advances or gestures.
- Making comments about body parts, clothing, or appearance in a sexual manner.
- Inappropriately making physical contact with another person.
- Asking a co-worker about their sexual orientation/history, etc.
- Making comments about someone's gender identity or sexual orientation.
- Being offered an employment benefit in exchange for a sexual favour.
- Economic abuse and the denial of resources, services, and opportunities (such as restricting access to financial, health, educational, or other resources to control or subjugate a person).

If any GBV-related incident occurs, it will be reported through the GRM, as appropriate and keeping the survivor information confidential. The Project Manager and the Social Specialist should assist GBV survivors by referring them to GBV Services Provider(s) for

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support immediately after receiving a complaint directly from a survivor. Specifically, the GRM will only record the following information related to the GBV complaint:

- The nature of the complaint (what the complainant says in their own words without direct questioning).
- If, to the best of their knowledge, the perpetrator was associated with the Project; and,
- If possible, the age and sex of the survivor.
- Any cases of GBV brought through the GRM will be documented but remain closed/sealed to maintain the survivor's confidentiality.

Here, the GRM will primarily serve to:

- Refer complainants to the GBV Services Provider; and
- Record the resolution of the complaint.
- Immediately notify the Implementing Agency and the World Bank of any GBV complaints **WITH THE SURVIVOR'S CONSENT**.

Timeline for Grievance Processing

The resolution at the first tier should generally be completed within fifteen (15) working days of receiving the grievance and notified to the concerned party through the Disclosure Form. If the grievance is not being resolved within this period, it can be referred to the Grievance Redressal System's next level. However, once it is determined that progress is being made towards a resolution, the grievance will be retained at this first level. The complainant will be informed of this decision, and an estimated time for the resolution of the matter will be given either verbally or in writing. If the issue cannot be resolved within twenty-five (25) working days, it will be transferred to the next level. Once a resolution has been agreed upon and accepted, the complainant's acceptance will be obtained on the Disclosure Form. If the proposed resolution is not accepted, the grievance will be escalated to level 2.

The complainant will be informed in writing of the measures taken to address the grievance by the Project Manager or the Social Specialist if the complaint is against the Project Manager.

Community Grievances

Stakeholder engagement is critical at all stages of World Bank-funded projects, it is an inclusive process conducted throughout the project life cycle. In the World Bank's Environmental and Social Framework (ESF, "Stakeholder Engagement and Information Disclosure", is the tenth standard (ESS10) which recognizes "the importance of open and transparent engagement between the Borrower and project stakeholders as an essential

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element of good international practice”. In the event of any grievances, they will be dealt with as follows: -

- First, provide a box at the project site to receive grievances. This can be used by any member of the affected community and the general public to provide written feedback on the contents of the presented materials.
- Grievances received should be forwarded to the Project Coordinator immediately and provide a register to note all grievances and suggestions – transferred to an excel file.
- Where necessary, a project representative or an appointed consultant should be made available to receive and record any verbal feedback in case some stakeholders experience difficulty with providing comments in written form.
- Grievances can also be received via telephone or email (see the section on Grievance Redress)
- If the complainant does not receive a response or is not satisfied with the outcome within the agreed time, they can lodge their grievance directly to the Grievance Redress Committee (GRC). The GRC should issue a response within thirty (30) business days following communication from the aggrieved.
- Grievances that the Grievance Redress Committee cannot resolve shall be submitted to the Attorney General and the executing agencies. Should grievances remain unresolved at this level, they can be referred to the Court of Law.



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Grievance Registration Form

Grievance No.: _____

REGISTRATION OF GRIEVANCE

Name:

Contact No:

Address:

E-mail Address:

Gender:

National ID No:

Age Group:

(5-19) (20-39) (40-59) (60 +)

Please note that personal information is optional. Refusal to provide or unavailability of such information cannot hinder the registration of a grievance or in any way prejudice an individual or their grievance.

Name of Project Site:

As per the ESMF of the Project, Grievance Redressal, I register my grievance as detailed:

Details of Grievance

Undertaking:

I hereby certify that the statements made in my grievance and the documentation enclosed are accurate and complete to the best of my knowledge. If at any time, any part of the grievance or the documentation is found to be false, I will be responsible for any legal action taken against me.

Date: Signature of Aggrieved Person: _____

Name of Recording Officer: Signature: _____

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Appendix VII: Emergency Evacuation Plan

The evacuation plan is considered one of the important means of civil protection requirements that aims to reduce human losses to the minimum possible extent by removing all people present, without exception, from inside buildings or dangerous and vulnerable areas to an area where security and safety are available.

1. Objectives of the Evacuation Plan

Reducing or preventing human losses to the least possible extent, whether injuries or deaths, by evacuating the building of its occupants, preventing any overcrowding in escape routes, preserving property to limit the area of the event, and working to prevent it from spreading to another area.

- Confront the event in an optimal way to reduce losses to a minimum.
- Study the causes of the event (positives - negatives) and work to avoid the negatives.
- Working to restart the facility safely.

2. Reasons for Evacuation

The building is evacuated in the event of an emergency, such as (a fire, a building collapse, or the spread of smoke).

3. Evacuation Direction

Evacuation is always carried out downward towards the surface of the ground through escape routes (which are the transportation paths taken by the occupants of the building from any point in it to outside the building in the open air on the public road or in a safe place), and it is prohibited to evacuate upward to the top of the facilities and buildings except in special cases.

4. Plan Elements

Forming a special committee consisting of a chairman and a group of members responsible for managing and implementing the evacuation plan. It consists of building employees, for example (mechanical engineer, electrical engineer, occupational health and safety expert, security specialist, receiving specialist, mechanical technician, electrical technician). This committee is devoted to the following: supervising the building's civil protection plan, organizing civil defense services to confront emergency situations, calling external assistance, and assessing the situation, organizing building evacuation operations and ensuring that each individual is aware of his role at the time of the accident, ensuring the adequacy of civil protection devices to perform their mission by continuing experiments and evaluating them and avoiding what is revealed.

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The individuals participating in the evacuation plan are divided into groups and each group is assigned to a specific task:

- Guidance and counselling group (works to direct people to nearby escape routes).
- Organization group (organizing the evacuation process on floors).
- Anti-rebound group (located at the building exits to prevent entry into the building).
- Confrontation group (which is the fire and rescue group).
- Aid group (working to provide aid in the safe area).
- A group of technicians (represented in gas, plumbing, elevators, air conditioners, and switches).
- Inspection group (working to ensure that there are no people in the building after the evacuation process).

5. Implementing the Evacuation Plan

- Ensure that everyone who contributes to the evacuation plan is trained on an ongoing basis so that they can perform their role and act automatically in times of danger.
- It is necessary to have explanatory signs or guide signs drawn with arrows that guide everyone to what they must do when implementing the evacuation plan. They should be in four colours (red - green - yellow - blue), and each colour leads to a path that leads to an exit door or corridor to ensure the flow of workers. On the exits evenly.
- There are specific instructions to be followed when implementing the evacuation plan in terms of arranging the landing of each floor separately in an organized manner to ensure that individuals are not exposed to injury.
- Providing a place for gathering, which could be outside the building as a safe place at the expense of what circumstances may require at the time of danger (to leave a safe distance between it and the building, equipped with an ambulance unit for the injured with means of communication, and the presence of a number of security personnel at the gathering place to prevent entry or exit any people except after making an inventory of those present and identifying the people who are likely not to leave the building).

5.1. In the Event of a fire

The following must be followed:

- Tight control of fire sites and preventing the presence of non-specialists at the fire site.
- Disconnect the electrical current.
- Close the gas and fuel valves if any.
- Directing and guiding fire and rescue vehicles and officials from outside the building to the fire site.
- Evacuating infected individuals from the site.
- Evacuate all people present in the place.
- Providing first aid to the injured.
- Fighting fires using firefighting methods and equipment.
- Prevent the spread of fire by removing any flammable materials.
- Follow up on the situation and inform the operating rooms about its developments.

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- Maintaining the morale of individuals and announcing the nature of the situation and the danger to which they are exposed.

5.2. Actions Taken upon the Arrival of Firefighters

1) The site official gives an initial statement of the position explaining:

- The location of the fire or its starting area.
- The exact sources of the fire.
- Ensure that the electrical current is disconnected.
- Ensure that the fuel supply is disconnected if there are gas cylinders in the buffet.
- Individuals trapped behind doors or trapped by fire.
- Injured individuals to try to provide first aid or transfer them to hospital for treatment in the event of serious injuries.

2) Assisting the firefighting forces with personnel and equipment if requested

3) The presence of the person in charge of the site always next to the head of the fire brigade to provide him with information if requested.

5.3. Actions Taken after Completing the Firefighting Process

- Loss inventory (individuals - equipment - materials - fire pumps).
- Restoring the situation to what it was before the fire (removing the accumulated water from the extinguishing process - pulling the equipment and materials that were extinguished outside the place to ensure that they do not ignite again).
- Fire report (writing a detailed report on the incident and submitting it to the security official to indicate the negatives and positives of the incident, along with an evaluation report on the measures taken regarding the incident or after its end).

5.4. In the Event of an Earthquake

- The situation must first be calmed, and panic removed from the souls of the people present in the building, and they must be directed to remain in their places while taking shelter under the desk or tables to protect them from injury because of falling hanging objects, or to take shelter under the concrete beams in the building's construction.
- After the earthquake ends, the security team manager directs the team members to the exit points that were not affected by the earthquake, then implements the evacuation plan as mentioned previously.

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Appendix VIII: Emergency Response Plan

Creating an emergency response plan for Dandara silo involves identifying potential hazards, establishing preventive measures, and defining clear procedures for responding to emergencies.

1. Risk Assessment

- Identify potential hazards (e.g., explosions, fires, etc.).
- Evaluate risk levels and prioritize.

2. Preventive Measures

- Safety training and regular practicing.
- Maintenance of silos and safety equipment.
- Dust control and ventilation.
- Access control and clear signage.

3. Emergency Procedures

- Incident detection and alarm systems.
- Evacuation plans and practicing.
- Fire response with firefighting equipment.
- Explosion response protocols.
- Entrapment and chemical spill response plans.

4. Communication Plan

- Internal: Clear chain of command and communication tools.
- External: Contacts for local emergency services and media spokesperson.

5. Emergency Contacts and Resources

- List of key personnel and emergency services contacts.
- Inventory of emergency equipment and supplies.

6. Post-Incident Procedures

- Incident investigation and documentation.
- Review and update the emergency response plan.

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7. Training Sessions

- Regular training sessions and practicing.
- Continuous improvement based on feedback.

Having a well-documented and practiced emergency response plan is crucial for the safety of personnel and the protection of grain silos. Regular training, maintenance, and review of the plan ensure preparedness for any emergency situation.

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Appendix IX: Procedure for Fire and Evacuation Plan

To reduce risks and fire explosions:

- Dust filter system to suppress dusts and reduce risks of fire and explosion
- Heat thermometer to calculate heat in silos.
- Ventilation system to adjust the weather condition within the silo.
- Systems to reduce impact of explosion (design phase) including windows and gates
- Alarm system
- Guidelines attached to walls on fire fighting
- Water firefighting system
- Presence of FM 200 and FMD fire extinguishers in control room and self-activated fire extinguisher/system
- Presence of CO2 fire extinguisher and self-activated fire extinguisher/system
- Presence of water hose in machine towers

Firefighting and Evacuation procedure:

- Responsible personnel: OHS specialist:
- Fire in electricity room or control room:
 - In case of fire, the heat sensors and smoke detector technologies will be activated.
 - An alarm system/awareness system will be activated (in the form of noise)
 - The self-activated firefighting system will be activated in electricity rooms and in control rooms.
- Fire in machine tower:
 - In case of fire in machine tower: there are water hose /extinguishers in each floor of the tower.
- In case of heat change within silo:
 - The sensor for heat change within the silo is activated
 - An alarm system is activated and reaches the control system
 - The OHS specialist and trained workers (15 worker) go up the machine tower and open-air gates to reduce pressure in silos. There are gates around the silos to reduce pressure in addition to other gates that can be opened manually.

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- Water hoses are present on machine tower and are used to suppress the fire.
- When fire events occur the OHS Specialist and trained workers split into groups to activate water hose/extinguishers and distribute fume masks to workers and a group to notify the nearest firefighting unit (15km drive), police inspection unit (3km drive) and ambulance unit (3km drive).
- There are also firefighting measures signs added on the walls
- The Security guard working for the police unit also notifies the firefighting unit through walkie talkie
- Silo gate and area are quickly emptied to allow the firefighting unit to enter.
- Training with local authorities.
- Cooperating with local authorities during evacuation.

Procedure evacuation in case of fire for workers and clients:

- The trained workers provide direction for exist and evacuation areas
- There are arrows indicating exist areas on walls.

In case of injuries:

- The OHS Specialist and 2 trained workers perform First Aid/CPR.
- The ambulance located at 3km drive from the silo site transfers injured to the main Hospital located at about 10km drive away.

Facility OHS procedures

Procedure for silo workers inside silo:

1. Grains are emptied before the worker enters the silo.
2. The silo system/machineries are turned off/shut down before the worker enters the silo.
3. OHS Specialists reviews safety measures with cleaning workers before entering the silos.
4. Worker adheres to safety belt and filter mask.
5. Worker accesses the silo from a gate/door. He enters using safety belt and filter mask and he has a ladder.

Silo workers working at height:



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- Workers on machine towers are not at risk of falling from height as the towers have barriers and safe floor to walk. The silos gates will be linked to a rope. This rope can be pulled by the worker to open those gates.



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Appendix X: Grievance Log Form

Ref No.	How Was grievan ce submitt ed	Classificati on of complaints	Date of Submissi on of Grievanc e	Name and Contact Informati on	Descripti on of Grievance	Actions Taken to Resolve the Grievan ce	Mean of Communicati on for the solution reached	Has grievan ce been resolve d (Y/N) if not explain why