Emergency Food Security and Resilience Support Project (P178926)

Environmental and Social Impact Assessment Study (ESIA) for Toshka Silo Complex, Aswan, Egypt

Prepared by: EHCSS

July 2024

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Date 18th July 2024

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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

m^2	Square meter
m^3	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

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

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.

Toshka is located southeastern of the Western Desert, 1 km far from southeast of Aswan/Abou Simbel Road and about 55 km far from the western coast of the High Dam. It lies 90 km northwest of Abou Simbel city. It occupies a surface area of about 11000 km^2 lying between latitudes 22º 15- and 23º 15- N and longitudes 31º 00- and 32º 00- E (Aly *et al*., 2023). The Silo Complex will be established in Toshka area in Aswan Governorate, with a storage capacity of up to 300 thousand tons, it will be connected by highway transportation and railway 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.
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.

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.

    Note: no land acquisition is anticipated.

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 details in chapter 2. Which include for example but not limited to:
  - 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.

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 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 Toshka 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 operational phase of Toshka 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 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, Aswan climate is characterized by the long, sweltering, and arid summer; while winters are short, cool, and dry. The hot season lasts for 5 months, starting from the beginning of May to the end of September, with an average daily high temperature above 38°C.

Geologically, the bare rock units in the Toshka area expanded from the Precambrian Era to Quaternary Era. However, the resistant Paleocene Esna Shale mostly covers the depression. The study area is occupied by a sedimentary succession ranging in age from Upper Jurassic to Quaternary (Issawi and Osman, 1993). The rock units in the area are represented by low-lying exposures the basement rocks that are overlain by the sedimentary succession. The basement rocks are represented by granites, granodiorite, and gneiss. The sedimentary rocks exposed in the area include a wide area covered by Paleozoic to Cenozoic rocks.

Geomorphologically, the topographic elevations in Toshka area are subdivided into three groups; the lowlands topography group (less than 150 masl), which constitutes only 1,020 km2 (about 2.1% of Toshka total area (48,903 km2)). These lowlands occupy the central part of the study area. The moderate relief topography group (150– 300 masl), which comprises about 77.63% of the Toshka total area. These topographic elevations are related to the hillslopes, isolated hills and pediplains. The less dissected mountainous topography group (more than 300masl) occupies about 20.27% of Toshka total area and embraces mainly the northern and northeastern parts (Sinn El-Kaddab Plateau). However, this group comprises also small areas at the most southern parts of the study area.

The water bearing formations in the area are represented by the two main aquifers: the Quaternary and the Nubia aquifer. To investigate hydrogeological conditions in the study area, the available hydrogeological data were collected and investigated. The data include lithology of the existing wells, water table data, extraction data, and seasonal depth to water table, etc. The result of the collected data is subjected to detailed review, organized and analyzed to revel the hydrogeological conditions on the area and to monitor the geo-environmental impact of the project on the groundwater and the HDL (high Dam Lake) in the area. (Abdel Moneim *et al* 2014).

The depth to groundwater at the silo site is approximately 80 m depending on the contour map for the depth to groundwater and the hydrogeological cross-sections were made located around and near the silo site in the Toshka area. Regarding the surface water, the distance between the proposed site for the Silo and the nearest point of Lake Nasser is about 17 Km, and the nearest canal is Sheikh Zayed Canal which is located about 6km from the proposed site for the Toshka subproject.

Regarding the risk of flooding, the silo site is located on the western side of the Nile River (in the western Desert of Egypt), and depending on the topographic gradient, flooding take place when the water moves from areas with high elevations to areas with low elevations (such as the Red Sea Mountains to lowlands until they flow into the Nile River), but in the case of the western Desert (where the location of the silo exist) there is no risk of flooding.

Regarding the risk of seismicity, based on the seismic hazard map, and seismic hazard curve, the proposed silo site and the surrounding area is characterized by low amplification of seismic waves (site effect) during earthquakes, which means it has a low seismicity in comparison to other areas in Southern Egypt; therefore, the risk of seismicity is very low.

Biologically, Toshka Project in Aswan is a large-scale land reclamation and irrigation project designed to transform a portion of the Western Desert into arable land. The project involves diverting water from Lake Nasser and the Nile River to create new agricultural areas in the desert. In the context of bio-ecological zones, the Toshka area experiences significant changes due to human intervention.

Flora: A desktop review covered the wider Toshka area. The vegetation survey by Sheded et al., (2012) focused on the southwestern desert of Egypt and the wider Toshka region. Vegetation survey of 124 stands in the Southwestern Desert of Egypt (Toshka area) identified 79 species of angiosperms belonging to 25 families. 54 species (68.3%) are annuals (including one hydrophyte), and 25 species (31.7%) are perennials. Grasses (Poaceae or Gramineae) contributed 21.5% of the total flora, considered the most dominant family in the Southwestern Desert. Two herbaceous species were recorded for the first time in this region: *Eragrostis lepida* and *Enarthrocarpus pterocarpus*. Eleven vegetation clusters were obtained and categorized into five distinct groups according to soil composition and chemical characteristics. Many weeds appear in the extreme arid desert due to the recent extensive and intensive anthropogenic effects. Seventy-nine species were recorded in the present study belonging to 71 genera and 25 families. The Graminae is the largest family, represented by 17 species, followed by Leguminosae (7 species), Compositae and Chenopodiaceae (each with 6 species), Cyperaceae (5 species), Cruciferae (4 species), Amaranthaceae and Palmae (each with 3 species) (Sheded *et al*., 2012).

The consultant (SENS) team conducted a site visit to the proposed location for the construction of the Toshka Silo. It was carried out on October 3, for three days. The proposed location for the construction of Toshka Silo was characterized by a desert area without any natural vegetation growing in the area. Photographs of the subproject site show that it is devoid of vegetation (figure 3.1). The vegetation of the wider area as described in the desktop review was not observed at the subproject area and there are no threatened or endemic flora species present at the subproject site.

Mammals: Mammalian species which represent these habitats are Dorcas Gazelle (*Gazella dorcas*), Redfox (*Vulpes vulpes*) and Rüppell's Sand Fox (*Vulpes rueppleii*) which were recorded before in such western desert habitats.

Dorcas Gazelles are classified as Vulnerable (VU) in Egypt by Basuony et al. (2010) and globally as Endangered (EN) by the IUCN Red List, their vulnerability stems primarily from habitat degradation and loss, due to human activities and the huge agricultural projects in the area, compounded by hunting pressures. The lack of vegetation in the area, and the dryness of the area renders the area unattractive to Gazelles.

Striped Hyaena (*Hyaena hyaena*) has most recently been assessed under The IUCN Red List of Threatened Species in 2014. *Hyaena hyaena* is listed as Near Threatened. Land modification in the area, and habitat loss may be considered as the main factors which reduce the probability of the presence of the *Hyaena* in the project area. Regarding reptiles, the venomous Desert Horned Viper (*Cerastes cerastes*), classified as least concern by the IUCN, often present near vegetated areas may can be present in desert areas with no vegetation (Baha El Din, 2006) and according to the IUCN and Baha El Din (2006) It can endure extreme hyperarid habitats. Concerning other reptiles' species and amphibians, there is no evidence/indicators (or established literature) regarding their presence in the area of study, confirmed by consulting EEAA.

Birds: Many species nest at the riverbank. Key avian species which represent these habitats include wheatears, larks, shrikes, and warblers, also raptors and some species of Corvidae.

During the site visit of the consultation team to the area of study (the proposed location for the construction of the Silo) they did not observe any migratory birds in the area. It was noted based on the consultations with local residents that they previously observed migratory birds particularly raptors in the area. Most of the birds of prey including raptors are protected by CITES and included in CITES appendix II. Coordination efforts will be initiated with the Ministry of Environment to enhance and consolidate mitigation measures, ensuring the protection of environmentally sensitive species from any potential harm. Lake Nasser includes an Important Bird Area (IBA) and Important Plant Area (IPA) located at about 17km away from the project site.

It is worth noting that, the site visit was conducted in October 2023 during one of the bird's migration seasons. There are two seasons for migratory birds crossing Egypt; spring season (from February to April), and Autumn season (from September to November), The site visit in October was carried out in Autumn season, and no migratory birds were observed. However, related measures were considered in case they appear in the future.

Moreover, the risk of bird collision during migratory season is low, since the silo design already include aviation obstruction lighting, which is 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 design of the silos.

Regarding nesting sites, the nearest water body is the Sheikh Zayed canal which is about 6 km away from the proposed silo site, and it is a paved water way without any side vegetation, therefore, this location is not considered as a suitable location for nesting of birds. On the other hand, Lake Nasser, which is 17 km away from the silo site is an IBA and IPA which is suitable and more attractive for resting and nesting of birds.

There exists no evidence or established literature concerning the presence of raptor species within the designated subproject site. although consultations with locals confirmed their presence Furthermore, the information available is predominantly derived from prior research and firsthand observations conducted during onsite visits, supplemented by inquiries made to local residents regarding their observations.

Aquatic Ecosystems: The nearest point of the Lake Nasser (which was formed after the construction of the High Dam) to the subproject site, is an extension of Lake Nasser and is about 17km away from the project site.

Fishes: Data on fish production and Fishing Societies of Lake Nasser were kindly provided by General Authority for Fish Resources Development and General Authority of Agricultural Projects, High Dam Lake Development Branch (HDLD). The shoreline of Lake Nasser is divided into five “Fishing Regions”. Each region represents a territory of a fishermen society.

Protected and Sensitive Areas: Lake Nasser holds dual classifications as an Important Bird Area and an Important Plant Area, while the Wadi Al-Allaqi, Saluga and Ghazal, and Kurkur-Dungul Protectorates are designated as Important Plant Areas. These classifications have been conferred by BirdLife International and PlantLife organizations, signifying the ecological significance and conservation value of these regions for avian and plant biodiversity, respectively.

The project is unlikely to entail any potential impacts on the protected areas as the result of the project, including Important Bird Areas and Important Plant Areas, throughout any phase of the sub-project. The sub-project site is situated at a considerable distance from these protected areas and ecologically sensitive zones and will not pose the potential risk to harm their ecological integrity. However, the project site may attract birds including migratory birds during operational phase due to the presence of grains and the nature of the project. The potential presence of Gazelles and Hyaenas will also be considered in the mitigation plan in order to prevent disturbing them.

Regarding **Socio-economic aspects**,

Based on information from Aswan CAPMAS 2017, there was no population in Toshka, but it is expected that population of the new city of Toshka will reach 80,000 inhabitants in the next few years. However, their current population is very limited and mainly encompasses workers working on new agriculture projects in the reclaimed desert lands in the area. The

reclaimed lands mainly use center pivot systems to irrigate the lands in addition to drip irrigation. There reclaimed lands include several irrigated crops such as wheat, palm date trees, mangoes, corn etc. The nearest town to the subproject site is New Toshka, which is located about 5 km to the east of the proposed subproject site. There is another residential complex located 4.5km west of the subproject site. There is a power transformer station 5.3km west of the subproject site and Sheikh Zayed Canal located 6km west of the subproject site. There are several water pumping stations that transfer water from the Sheikh Zayed Canal and several branched canals to the reclaimed lands which obtain the water from Lake Nasser.

In New Toshka city a specialized school has already been established for all educational levels at a cost of 6 million pounds, in addition to the presence of a school for the basic education stage and a nursery for children.

New Toshka city includes a fully equipped health unit, which was built and prepared at a cost of 5.5 million pounds. Both the school and the health unit are functioning.

New Toshka city receives its water mainly from Lake Nasser through Sheikh Zayed Canal.

New Toshka city's sewage is collected at two lifting stations and from there via flushing lines to the treatment station which uses the natural oxidation lake method.

The city is supplied with electricity from Toshka transformers (2)

New Toshka City has the following services

- A mosque
- A health unit.
- A commercial center.
- A school.
- A water station.
- Basic education and nursery school.

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 Toshka 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 alternative for the location was chosen in consultation with the company EHCSS and the engineering consultant for the Toshka silo complex construction sub-project, the advantages of this location that are summarized in the following: a) it is located close to the main road leading to the silo complex, b) the level of the ground in that area, c) close to the wheat production areas in Toshka, and d) the geotechnical studies that confirm the validity of the construction process. Also, from an environmental standpoint (SENS), this location is very suitable for establishing the silo complex in Toshka.

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 Toshka 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.

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 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:

- 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.
- Community Health and Safety (Traffic Risks): Traffic accidents and congestion from construction vehicles.
- 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: 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.

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.
- 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.

3. OHS Measures:

- Safety Training: Provide PPE, conduct hazard identification training, and follow OHS risk assessment.
- Preventive Measures: Implement site-specific OHS manual, provide medical insurance, and maintain proper housekeeping.
- Emergency Preparedness: Develop fire and emergency response plans, conduct fire drills, and install fire safety equipment.
- Accessibility: Ensure temporary access facilities for people with 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: Spill prevention kits, proper chemical storage, and good housekeeping.
- Noise Control: Conduct regular noise measurements, restrict truck movements, and maintain equipment.
- Biodiversity Protection: Follow pest management plans, prohibit hunting, 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:

- Safety Training: Provide PPE, conduct hazard identification training, and follow OHS risk assessment.
- Preventive Measures: Implement site-specific OHS manual, provide medical insurance, and maintain proper housekeeping.
- Emergency Preparedness: Develop 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 Toshka 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 Toshka 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).

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
- Nearby Landowners
- Other relevant stakeholders

Consultation Methods:

- Site-specific consultations (October 3, 2023)
- Virtual meetings with companies (July 14, 2024)

Consultation Findings include the following

1. **Environmental Concerns:**
    - High Temperatures: Emission of high temperatures from metal silos; suggested to create a plant fence around the site to mitigate this.
    - Vegetation Impact: No impact on natural vegetation as the silo is located on bare soil.
    - Transportation: Main road Aswan/Abu Simbel will be used for grain transport.

2. **Economic and Social Impacts:**
    - Economic Benefits: Positive impact by reducing grain loss from traditional storage and transportation methods.
    - Job Opportunities: Creation of jobs for local people, including workers, engineers, drivers, and support roles.
    - Hazard Risks: Limited risk of fires and explosions due to safety measures and ventilation systems.
    - Health and Safety: Limited impact on worker health, with concerns about sunstroke and scorpion stings being addressed through safety measures.
    - Noise: Construction noise from machinery; operational noise from loading/unloading and truck movements.
    - Air Quality: Minor dust impact during harvest, controlled by mitigation measures.

- Violence and Child Labor: Minimal risk due to stringent measures in place to prevent child labor and SEA/SH.

3. Community Feedback:

- Positive Impacts: Development of the area, job creation, reduced transportation costs, and facilitation of wheat supply.
- No Concerns: No significant concerns regarding the subproject's impact on daily life, family safety, or accessibility.

The significant potential benefits that this sub-project will bring to Egypt, and proposed mitigation of identified environmental, social and OHS risks, make this sub-project viable. EHCSS expects that the construction of Toshka Silos will increase the capacity of the existing Silos in upper Egypt for storing of grains, as well as improving the resilience of the wheat supply chain and reducing loss and waste. Regarding the other views, the feedback from the community mentioned that there will be positive impacts including the following development of the area around the Toshka silo, creation of job opportunities, reduced transportation costs, facilitation of wheat supply, as well as no significant concerns regarding the proposed subproject’s impact on daily life, family or accessibility.

1 INTRODUCTION

1.1. 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.

1.2. Toshka Silo Complex

A silo Complex will be established in Toshka area in Aswan Governorate, with a storage capacity of up to 300 thousand tons, indicating that the silo will be connected by highway transportation and railway transportation. The Silo complex in Toshka is part of Egypt's broader efforts to enhance agricultural sustainability and effectiveness. The region has seen increased investor interest, aligning with the national goal of improving productivity in the agriculture sector, which is predominantly characterized by smallholders. Toshka's strategic location is essential for optimizing agricultural production. The silo complex will contribute to supporting the Egyptian

economy by reducing the need to import grains in foreign currency, aligning with national projects to enhance food security and reduce reliance on external sources.

Additionally, a) Toshka is a promising agricultural region with plans to cultivate up to one million feddans of land. The silo will be strategically positioned to store and preserve grains produced in this area, reducing post-harvest losses, and enhancing food security, c) The Egyptian government is investing in infrastructure projects in Toshka, including water delivery systems from Lake Nasser. The source of water for the proposed Toshka Silo subproject will be the public network. The logistics area which is located near the proposed location for the Silo, belongs administratively to the ministry of Transportation. It will include civil works and steal constructions. It is not clear at the moment when the construction work of the logistics area will start. The silo will become operational without the logistics area through direct loading from the silos to the trucks. Therefore, the logistics area is not considered as an associated facility because the timing of its construction is not known. The silo complex will complement these efforts and contribute to the region's economic growth, d) Toshka is located in a central location with access to major transportation routes, facilitating the distribution of grains to different parts of the country. This can help stabilize food prices and ensure a reliable supply of staple foods, and e) The silo complex is expected to create employment opportunities in Toshka, fostering economic development and community growth. It can also contribute to enhancing food security and reducing poverty in the region.

Toshka silo is located on the Aswan / Abu Simbel Road, a few meters away from it, about 317 meters. It is also located near the New City of Toshka, about 7 km away, and the New Toshka City Authority, about 5 km away. The General Administration for Projects Implementation in Toshka is about 61 km away from the silo. Add to that Sheikh Zayed Canal passes near the silo, at a distance of about 6 km. Abu Simbel Port and Abu Simbel Airport both are about (66 km, 60 km) away from Toshka silo, respectively.

Regarding health care, the two closest hospitals to the silo are (Aswan Specialized Hospital and Mubarak Hospital, each of which is about (226 km, 225 km) away from the silo, respectively. As for railway, the closest railway station to the silo site is Aswan Railway Station, which is about 223 km away from the silo. Concerning civil protection, the closest fire station to the silo is the Abu Simbel fire brigades, which is about 64 km away from the silo. Add to that Civil Protection Administration in Aswan, which is about 221 km away from Toshka silo.

With regard to Power Plants, the closest Power station to Toshka silo is Abu Simbel power station which is about 62 km away from the silo. Furthermore Toshka 2 transformer station, which is considered the closest transformer station to the silo, is about 6 km away, Likewise Toshka 3 transformer station, which is about 28 km away from the silo, as well as Toshka 1 transformer station, about 55 km away from the silo.

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

1.4. 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 Toshka 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 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.

1.5. Aswan Governorate

Aswan is located on the eastern bank of the river Nile, 899 km south Cairo, it is a link between Egypt and Sudan, which is the gateway to the heart of the Africa, making it an important commercial center. During comprehensive development, New Aswan City, on the west bank of the Nile, was planned and is located 10 km north of Aswan city, which accommodates 70.000 people. Agriculture is the main activity in the governorate, which is famous for growing sugar cane, hibiscus, wheat, dates, and henna. The governorate contributes as well to industry, most important industries include sugar, chemicals fertilizers, phosphate, and fish preparing and packing.

Aswan Governorate lies in the south of Egypt, and is bordered in the North by Qena governorate, in the East by the Red Sea governorate, in the West by the New Valley governorate, and in the South by Sudan. The total area of the governorate is 62726 Km^2.The population of Aswan is estimated at1,632,171 million people, according to 2021 statistics issued by the Central Agency for Mobilization and Statistics.

1.5.1 Toshka

Toshka is located in the southeastern part of the Western Desert, 1 km southeast of the Aswan / Abou Simbel Road and about 55 km from the western coast of the Aswan High Dam. It lies 90 km northwest of Abou Simbel city. It occupies a surface area of about 11000 km^2 lying

between latitudes 22º 15- and 23º 15- N and longitudes 31º 00- and 32º 00- E (Aly *et al*., 2023). The Toshka project aims to reclaim 540, 000 feddans depending on surface water (3x109 m^3 /year from the Lake Nasser), transported to the area by El Sheikh Zayed Canal and its tributaries.

The Toshka Silo Complex will be established in the Toshka area in Aswan Governorate, with a storage capacity of up to 300 thousand tons, it will be connected by highway transportation and railway transportation. Figure (1.1) shows the location of the proposed Silo Complex in Toshka, and table (1.1) shows the coordinates of the location of the location of the Toshka Silo.

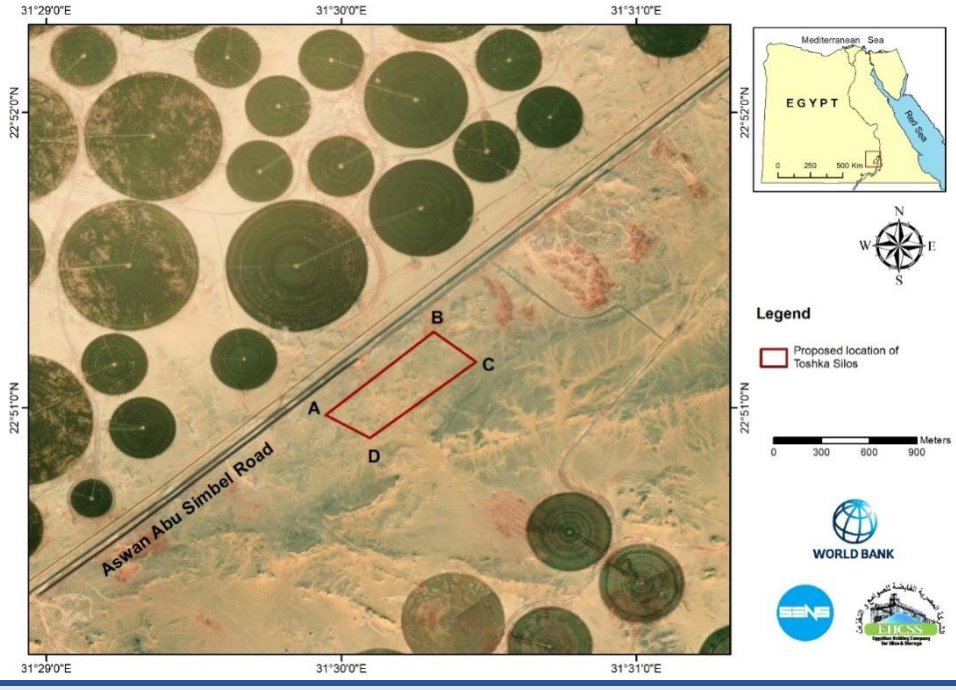

Figure (1.1): Map showing the proposed location of Toshka Silo Complex in Aswan.

Table (1.1): Coordinates of Toshka Silo Complex.

Point ID	N	E
A	22°50'58.56"	31°29'56.76"
B	22°51'15.48"	31°30'18.72"
C	22°51'9.360"	31°30'27.36"
D	22°50'53.880"	31°30'5.760"

2 POLICY, LEGAL AND ADMINSTRATIVE 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.

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

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 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

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 (Toshka 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.

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	Article 150	• It is prohibited to hollow out agricultural land or to transport soil for use in purposes other than agriculture.

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

Amending some provisions of the Agriculture Law promulgated by Law No. 53 of 1966		• 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. 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

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

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
	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		

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

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 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

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

	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.
	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.

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

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**

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
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

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

<table>
<tr><td></td><td>Article 38 of ER</td><td>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.</td></tr>
<tr><td>Modified ERs (710/2012) of Law 4/1994</td><td>Article 37</td><td>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.)
– 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.</td></tr>
<tr><td>Law 4/1994</td><td>Article 36</td><td>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><td rowspan="2">Material</td><td colspan="2">Partial average</td><td colspan="2">Short exposure limits</td></tr>
<tr><td>ppm</td><td>mg/m3</td><td>ppm</td><td>mg/m3</td></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>
</table></td></tr>
</table>

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

<table>
<tr><td></td><td></td><td>
<table>
<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>
</td></tr>
<tr><td>Law 4/1994 and its modified ERs</td><td>Article 35 of Law 4/1994 and article 34 of its modified ERs</td><td>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>Sulphur Dioxide</td><td>350
150
60</td><td>1 hr
24 hrs
1 year</td></tr>
<tr><td>Carbon Monoxide</td><td>30 Milligrams/cubic meter
10 Milligrams/cubic meter</td><td>1 hr
8 hr</td></tr>
<tr><td>Nitrogen Dioxide</td><td>400
150
80</td><td>1 hr
24 hrs
1 year</td></tr>
<tr><td>Ozone</td><td>200
120</td><td>1 hr
8 hr</td></tr>
<tr><td>Suspended Particles Measured as Black Smokes</td><td>150
60</td><td>24 hrs
1 year</td></tr>
<tr><td>Total Suspended Particles (TSP)</td><td>230
90</td><td>24 hrs
1 year</td></tr>
<tr><td>Respirable Particles (Pm 10)</td><td>150
70</td><td>24 hrs
1 year</td></tr>
<tr><td>Lead</td><td>1</td><td>1 year</td></tr>
</table>
</td></tr>
<tr><td colspan="3">Occupational health and safety</td></tr>
<tr><td>Law 4/1994</td><td>Articles 43 – 45 of Law 4/1994, which address air quality, noise, heat stress, and the provision</td><td>• 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)</td></tr>
</table>

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

	of protective measures to workers.	• 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 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	Minister of Labour Decree 48/1967. Minister of Labour Decree 55/1983. Minister of Industry Decree 91/1985	• 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

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

Safety and Health (OSH) and assurance of the adequacy of the working environment	Minister of Labour Decree 116/1991.	
	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 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

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

		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 oft" 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. (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

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

		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 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

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

		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 by Law No. 58 of 1937 and amended by Law No. 95 of 2003)	**GBV/SEA/SH laws**	• The law stipulates the criminalization of violence in its various forms including physical violence, discrimination or psychological violence, 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.

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

		• 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. ✓ 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 b 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

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

		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 Scope of the Public Disclosure	• 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.
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,

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

		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.
		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 resedential, tourism and industrial zones – All types of vehicles: 40 km/h

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

		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 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

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

		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 2019 setting movement specifications for vehicles on the road network.	General Authority for Roads and Bridges	• Article (1): Loads allowed to pass on the road network: o 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. o 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. o 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. o 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. o 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. o 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. o The width of the vehicle must not exceed 3.60 meters. o **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. o 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.

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

		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.
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 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. • 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		• "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

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

Code promulgated by Law No. 58 of 1937.		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 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.

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

		• "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 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

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

		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
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

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

		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.

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.

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 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.
- 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 land acquisition (ESS5), there is no land acquisition in the case of Toshka Silo, because the land of the proposed location for the construction of the Silo is owned by the Egyptian Government and does not have any past land uses or current land uses. Another point is the antiquities and heritage (ESS8), 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 (µg/m^3)
NO_2	1 hour	200
	Annual average	40
SO_2	10 minutes	500
	24 hours	20
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
Industrial; commercial	70	70

WBG and International guidelines:

The following WBG environment, social, and health and safety guidelines and relevant international protocols will be used to guide the ESMP 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.
- 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 valuated 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.
    - Income restoration (livelihoods): Egyptian law does not discuss compensation for loss of income, only land and assets.
7. 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.
8. 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	IFC Standards (µg/m3)	National Requirement (Industrial Zones) (µg/m3)
Sulphur dioxide (SO2)	10 minutes	500	-
	1 hour	-	350
	24 hours	20	150
	1 year	-	60
Carbon Monoxide (CO)	1 hour	-	30 mg/m3
	8 hours	-	10 mg/m3
Nitrogen Dioxide (NO2)	1 hour	200	300
	24 hours	-	150
	1 year	40	80
Total Suspended particles (TSP)	24 hours	-	230
	1 year	-	125
Particulate Matter (PM10)	24 hours	50	150
	1 year	20	70
Particulate Matter (PM2.5)	24 hours	25	80
	1 year	10	50
Suspended Particles (measured as black smoke)			
	24 hours	-	150

Comparison of point source limits such as generators

Parameter	IFC Standards mg/m3		National Requirement mg/m3	
	Natural Gas	Diesel	Natural Gas	Diesel
Carbon monoxide CO	NA	NA	100	250
Sulphur dioxide SO2	NA	2000	150	1300

Nitrogen Oxide NOx	200 (spark ignition)	460	500	500
	400 dual fuel			
	1600 pressure ignition			
Total Particulates	NA	100	50	100

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	IFC limit One Hour LAeq (dBA)		National limit One Hour LAeq (dBA)	
	Day (7 am - 10 pm)	Night (10 pm - 7 am)	Day (7 am - 10 pm)	Night (10 pm - 7 am)
Industrial/ commercial	70	70	55 - 70	50 - 60

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

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,

[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

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."

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 Toshka 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 Toshka 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 decision of Aswan Governor No. 570 of 2013 to allocate an area of 60000m^{2}of state -owned land in Aswan Governorate for the Ministry of Supply and Internal Trade to establish silos to store wheat.

The proposed location for Toshka Silo Complex is located close to Aswan /Abu Simbel Road, and close to Toshka new city in Aswan Governorate. Figure (3.1) shows photographs from the proposed location allocated for the construction of Toshka Silo Complex in Aswan (more photos are provided in the appendix of this report). The area is described as empty desert land suitable for the construction of the Silo complex. It is located very close to reclamation projects,

mainly using pivot irrigation system as shown in the study location map (Figure 1.1, and Table 1.1). There are no constructions nearby, only powerlines transferring electricity to the reclamation projects as well as to the planned new settlements to be built in the area including Toshka new city.

Historical images from google Earth were used to check if there are any previous land uses to the targeted area (for the construction of Toshka Silo) in the previous years. We did not observe any changes in the satellite images throughout the previous years. Even during the site visit to the targeted area there were no signs of any activities in the area, the photographs from the proposed location for the construction of the Toshka Silo were provided in Figure (3.1).

Figure (3.1): Photographs from the proposed location allocated for the construction of Toshka Silo Complex in Aswan Governorate.

More details regarding the proposed location of the Toshka Silo complex include the following:

- The site is located on Aswan / Abu Simbel Road.
- The distance between the high-speed train axis and the Aswan/Abu Simbel road is approximately 500 meters.
- The distance between the logistics area that will be established and the site is approximately 650 meters, which means the availability of water and electricity sources for the site and will be close to it.
- Regarding the dimensions of the site:-
  - The maximum width of the site is 500 meters, taking into account leaving a right-of-way distance, and the site will be parallel to the sidewalk of the high-speed train track.
  - As for the length, it depends on the total area of the site, as there are no obstacles.

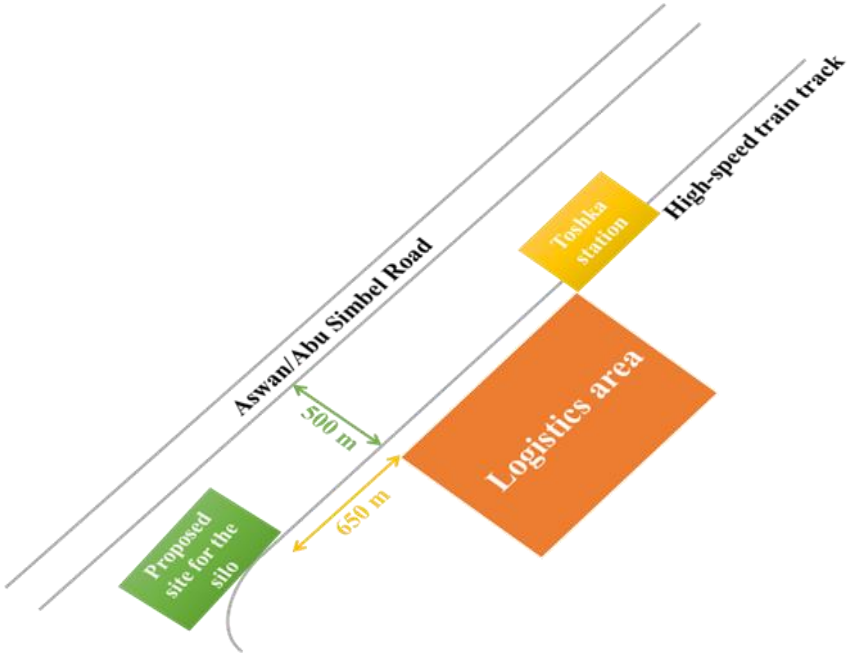

Figure (3.2): The proposed location for the Toshka Silo Complex.

3.3 Proposed Layout of Toshka Silo

Figure (3.3) shows the layout of Toshka Silo Complex in the proposed location allocated for this purpose in Aswan Governorate. The layout shows that Toshka Silo Complex consists of 30 cells for grain storage with a total capacity of 300,000 Tons.

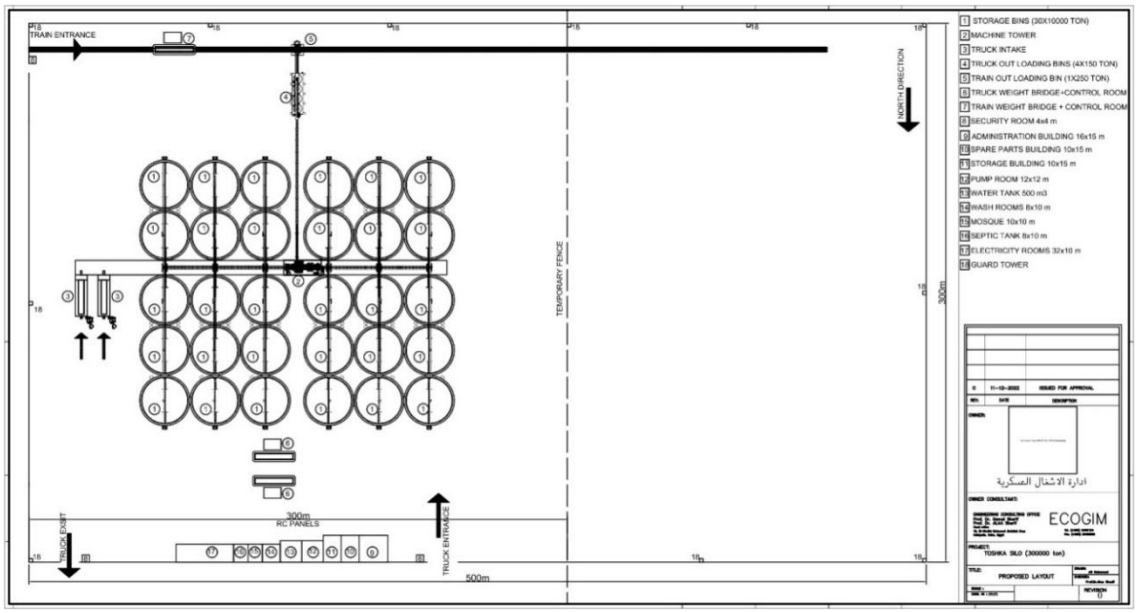

Figure (3.3): Layout of Toshka Silo Complex in Aswan.

3.4 Subproject Activities

The subproject of Toshka Silo focuses on establishing a grain storage silo in the Toshka area - Aswan Governorate with a total storage capacity of (300) thousand tons divided into (30) main storage cells with a capacity of (10) thousand tons per cell and containing handling equipment (chain belts - hoists - hoists - spiral belts) with a capacity of 250 tons/hour, and includes fumigation devices, a dust extraction system, a ventilation system, an inventory control system, a temperature measurement system and several other auxiliary systems, with the possibility of distributing wheat through trucks and railways and receiving wheat from trucks only.

3.4.1 Mobilization Phase

The mobilization phase involves the following activities:

- ***Establishment of access road:*** This will be required for site preparation and construction activities.
- ***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 Toshka Silo subproject will be two years, the timeframe/timetable for the construction phase is provided in appendix (V.1). The construction phase of Toshka 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 29.6m, 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 3858 tons, Cement 7943 tons, Gravel 18,157 m3, and Sand 9078 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 Access Road for the Silo will be Aswan – Abu Simbel Road which is located in front of the proposed Silo complex in Toshka, there will be no need for installing new roads. Additionally, the railway option is under consideration for

transportation of grains but the details of viability of railway transportation is not fully studied yet.

- All chemicals or hazardous materials that will be used during the construction phase (such as cement, paints 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, railway may be considered as "associated facilities". However, it is not considered as one of the associated facilities as the feasibility of railway is not considered contemporaneously with this project, and the operation of the silo will not depend on it, but trucks is planned for loading and unloading of grains at the moment.Water and electricity will be connected via short connections to supply the silo with the water and electricity required during the construction and operation phase, and those connections, whether (water or electricity), will be from the public network. The impact assessment and mitigation measures are proposed in this ESIA.

3.4.2.1Construction 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.

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 Toshka 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 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 11 as shown in the layout of the Silo (figure 3.3). 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).

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 the new Toshka 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
  - 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:
32 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 Toshka Silo, the hiring process will be through an announcement for the people of Aswan 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. 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 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

Total connected load will be 33 KV supplied through 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).

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 17 as shown in the layout (figure 3.3).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 50,000 KW, and in other conditions 35,000 KW. The electricity lines will be buried (less than 2 meters deep).

3.5.4. Water Requirement

The estimated quantity of water during the construction phase will be about 3404 m3. During the construction period (24 months). While during the operation phase, water will mainly be used, for drinking and sanitation purposes in the Toshka Silo Complex site (the average monthly consumption of water is from 70 to 140 m^3). The main source of water will be the national water grid in Aswan. It will be provided to the construction site before starting the construction process.

Eexcavation will be conducted for water pipelines, it will be 2-meter width and 2-meter depth, the length will be decided in coordination with the water company which is responsible for connecting the water from the public network to inside the silo. The starting point of the water pipeline will be from the main water pipeline in front of the location of the Silo site beside the main Aswan-Abu Simbel Road, the end point will be inside the Silo and will be decided based on the location of the utilities within the Silo.

3.5.5. Associated Facilities Criteria

Railway: After reviewing guidance note paragraphs 10 to GN11.3, railway may be considered as “associated facilities”. However, it is not considered as one of the associated facilities as the feasibility of the railway is not considered contemporaneously with this project, and the

operation of the silo will not depend on it, but at the moment trucks is planned for loading and unloading of grains.

Water infrastructure: The silos construction and operation works will not solely rely on the connection to the the water public network. The silo construction and operation can function with water trucks only. The connection to the water public network will not occur contemporaneously with the project activities. Therefore, it is not considered as an associated facility.

Electricity infrastructure: The silos construction and operation will not rely on the electricity public network to function and can be fully functional using the generators. The connection to the electricity public network will not occur contemporaneously with the project activities. Therefore, it is not considered as an associated facility.

For the water and electricity short connections, it will be extended from the public networks to the silo site, and the ESIA will take into consideration the environmental, social, and OHS risks and measures of those activities within the silo site boundaries.

The logistics area which will be located near the proposed location for the construction of the Silo, belongs administratively to the ministry of Transportation. It will include civil works and steal constructions. It is not clear at the moment when the construction work of the logistics area will start. The silo will become operational without the logistics area through direct loading from the silos to the trucks. Therefore, the logistics area is not considered as an associated facility because the timing of its construction is not known. The logistics area will not be used in any way during project construction and operation and is not related to the silos.

3.6. End of life site closure and site rehabilitation

Decommissioning 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:

- 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; 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 29.6m and the depth is 5m we can calculate the volume of excavations for each cell.
V= surface area x height

Surface area= $\pi r^2 = \pi x (14.8)^2 = 687.79 m^2$
V= 687.79 m^2(surface area) x 5 m (depth)=3438.93 m^3 of excavation per cell.

30 cells x 3438.93m^3= 103,167.9 m^3 (total excavated material)

The location of the disposal sites will be decided as per the guidance from the governorate of Aswan 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. 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 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).

All chemicals or hazardous materials that will be used during the construction (such as cement, paints, fuel 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 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 Aswan 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 Toshka 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).

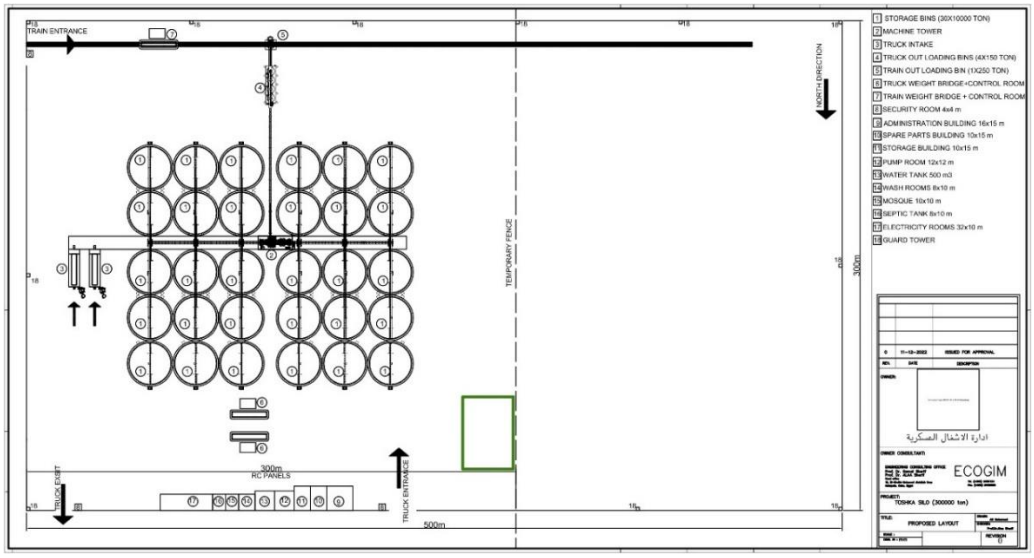

Figure (3.4): Layout of Toshka Silo Complex, showing the proposed location (the green box) for onsite storage of waste.

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 October 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 land use, meteorological conditions, topography and geomorphology, geology, as well as surface and ground waters, with emphasis on the study area of Toshka in Aswan Governorate and its surroundings.

4.1.1 Weather and Climate

A) Aswan Climate:

Aswan climate is characterized by the long, sweltering, and arid summer; while winters are short, cool, and dry. The hot season lasts for 5 months, starting from the beginning of May to the end of September, with an average daily high temperature above 38°C. The hottest month of the year in Aswan is July, with an average high of 42°C and low of 28°C. The cool season lasts for 2-7 months, from October to February, with an average daily high temperature below 26°C. The coldest month of the year in Aswan is January, with an average low of 11°C and high of 23°C.

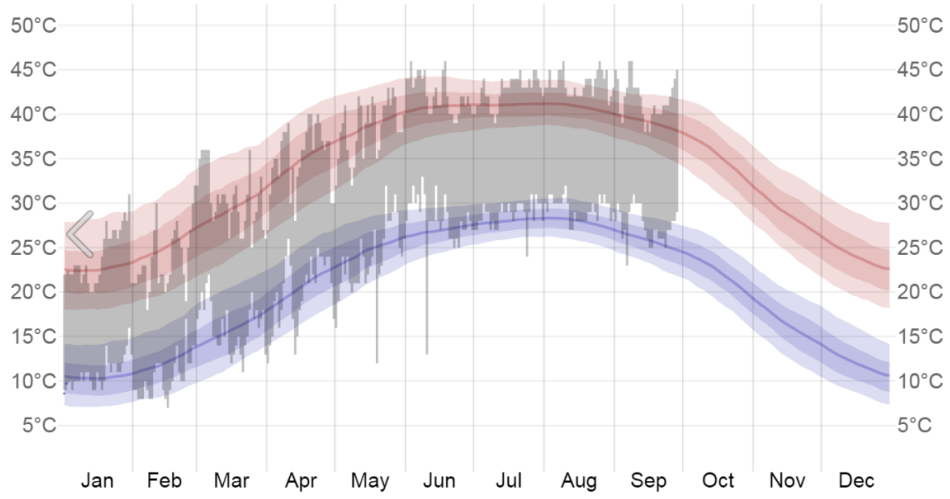

Figure (4.1): The Average Temperature in Aswan during 2023.

B) Precipitation

Aswan 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 0%, with an average value of 0%s. The figure below shows daily chance of precipitation in Aswan from 2015 to 2023.

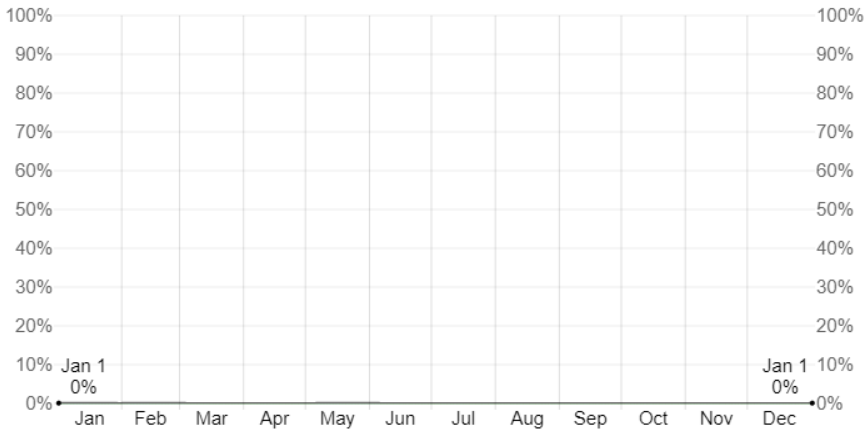

Figure (4.2): The percentage of days in which various types of precipitation are observed, excluding trace quantities: rain alone, snow alone, and mixed (both rain and snow).

C) Clouds

In Aswan, the average percentage of the sky covered by clouds experiences mild seasonal variation over the course of the year.The cloudier part of the year begins around July and lasts for 10 months, ending around in May.The cloudiest month of the year in Aswan is December, during which on average the sky is overcast or mostly cloudy 24% of the time.The figure below shows Cloud Cover Categories in Aswan from 2015 to 2023.

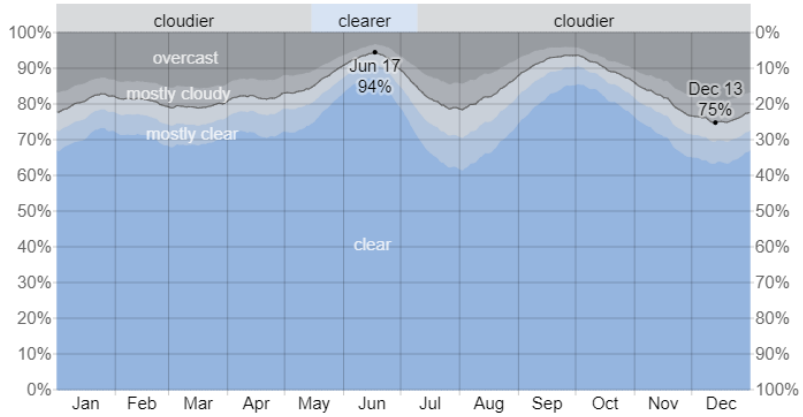

Figure (4.3): The percentage of time spent in each cloud cover band, categorized by the percentage of the sky covered by clouds.

D) Humidity

The perceived humidity level in Aswan, 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, remaining a virtually constant 0% throughout. The figure below shows Humidity Comfort Levels in Aswan from 2015 to 2023.

Figure (4.4): The percentage of time spent at various humidity comfort levels, categorized by dew point.

E) Wind

The average hourly wind speed in Aswan experiences mild seasonal variation over the course of the year. The activity of the wind of the year lasts for 4-7 months, from May to September, with average wind speeds of more than 9.6 miles per hour. The maximum windy month of the year in Aswan is June, with an average hourly wind speed of 10.7 miles per hour. The calmer time of year lasts for 7-3 months, from September to May. The calmest month of the year in Aswan is December, with an average hourly wind speed of 8.5 miles per hour. The figure below shows Average Wind Speed in Aswan from 2015 to 2023. Windrose also was provided for Aswan (figure 4.5-1), showing that wind mainly comes from the North North West and North West.

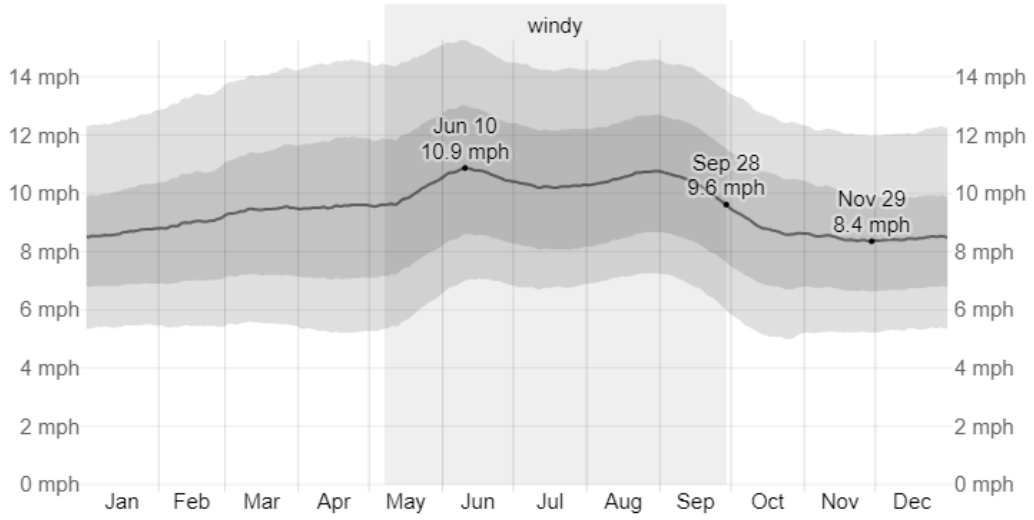

Figure (4.5): Average Wind Speed in Aswan.

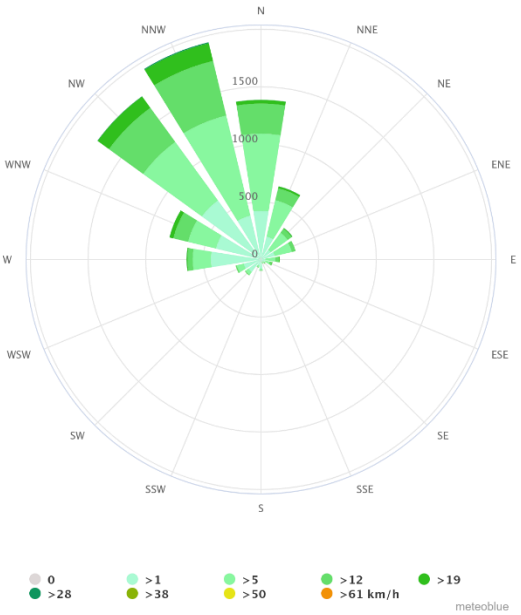

Figure (4.5-1): Windrose for Aswan.

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 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 55.4 NPL, 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 only source of noise that can be recorded onsite was the occasional trucks within the subproject area as well as the high wind speeds which can significantly affect noise baseline levels.

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

	Points						The permissible limit for sound intensity decibels (A) (Egyptian law)			Noise Level Guidelines (One Hour LAeq (dBA)) (World Bank)	
10 minutes average Leq (dBA)	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
	63.5	55.7	67.2	58.4	57.6	54.2	60 - 70	65-55	50-60	70	70

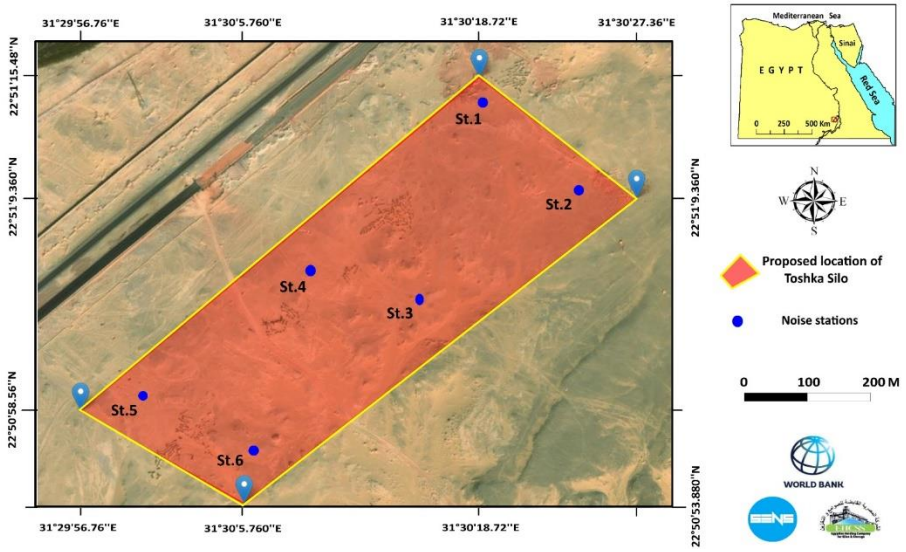

Figure (4.5-2): Map showing the locations of the six noise measurements.

4.1.3 Geology, Hydrology and Hydrogeology

A) Geology:

From the geological point of view, the bare rock units in the Toshka area expanded from Precambrian Era to Quaternary Era However, the resistant Paleocene Esna Shale mostly covers the depression. The study area is occupied by a sedimentary succession ranging in age from Upper Jurassic to Quaternary (Issawi and Osman, 1993), the main geological units are arranged from older to younger as follow: (Figure 4.6).

The rock units in the area are represented by low-lying exposures the basement rocks that are overlain by the sedimentary succession (Figure). The basement rocks are represented by granites, granodiorite, and gneiss. The sedimentary rocks exposed in the area include a wide area covered by Paleozoic to Cenozoic rocks. The Paleozoic rocks include Devonian Wadi Malik and Carboniferous Gilf formations, Jurassic Cretaceous rocks comprising Upper Jurassic-Lower Cretaceous Abu Ballus Formation and Abu Simbel Formation, Cenomanian El Burg, Bahariya Formations, Upper Cretaceous Nubia Formation, and the lower beds of the Dakhla Formation. The Cenozoic units are classified into the upper beds of the Dakhla, Kurkur Formation, Garra Formation and Dungul Formation, and the Oligocene volcanic. On the top of the succession there is the Quaternary deposit that covers large areas and includes piedmont gravels, Tufa, freshwater limestone, calcite deposits, playa deposits sand dune and sand sheets (Issawi, 1968) and (Issawi and Osman, 1993).

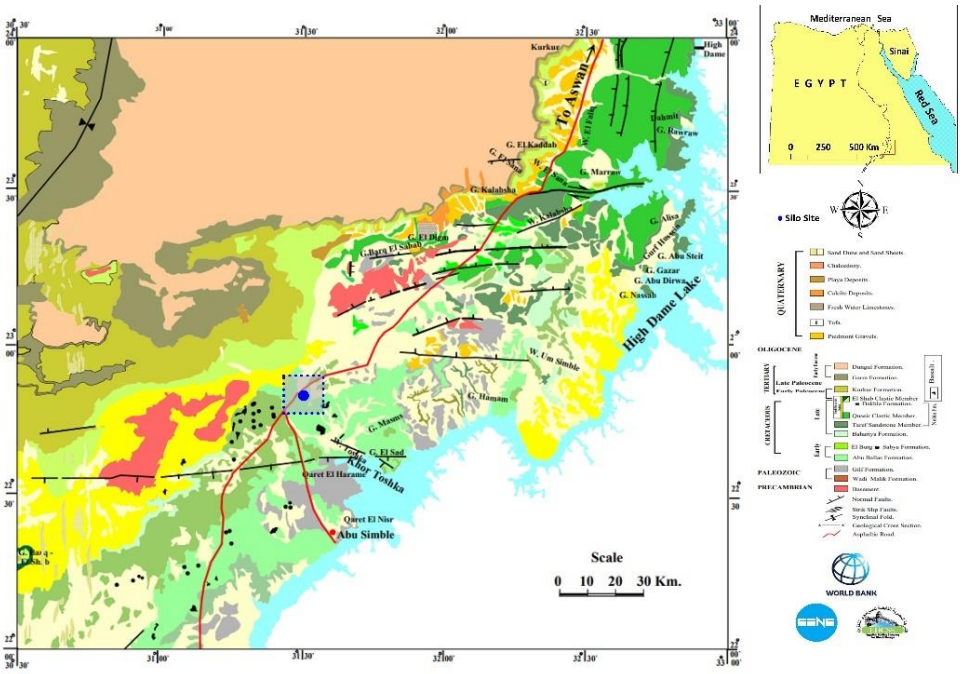

Figure (4.6): Geological map of the study area (modified after Issawi and Osman, 1993), the location of the Silo is highlighted in blue color.

B) Geomorphology

According to (Altorkomani, 1999), the topographic elevations in Toshka area are subdivided into three groups; the lowlands topography group (less than 150 masl), which constitutes only 1,020 km2 (about 2.1% of Toshka total area (48,903 km^2)). These lowlands occupy the central part of the study area. The moderate relief topography group (150– 300 masl), which comprises about 77.63% of the Toshka total area. These topographic elevations are related to the hillslopes, isolated hills and pediplains. The less dissected mountaineous topography group (more than 300 masl), occupies about 20.27% of Toshka total area and embraces mainly the northern and northeastern parts (Sinn El-Kaddab Plateau). However, this group comprises also small areas at the most southern parts of the study area.

The main geomorphologic units recognized in the study area are as follows (Figure 4.7); a) Structural platform, Sinn El-Kaddab Plateau, b) Scarp faces, c) Pediplain of Nubia Sandstones, d) Inverted wadis, e) Accumulated alluvial fans and playas, f) Lowlands and depressions, g) Sand sheets and sand dunes, h) Tors of igneous and metamorphic rocks of low lands and hills, i) Occasionally tidal zones, and j) Wadis and main drainage channels

Some additional geomorphologic features and details were also recognized in the study area, such as: broad wadis (dry valley), V-shaped drainage lines (channels), structural lineaments and water points. Perhaps one of the most outstanding features of Lake Nasser is its very complex nature.

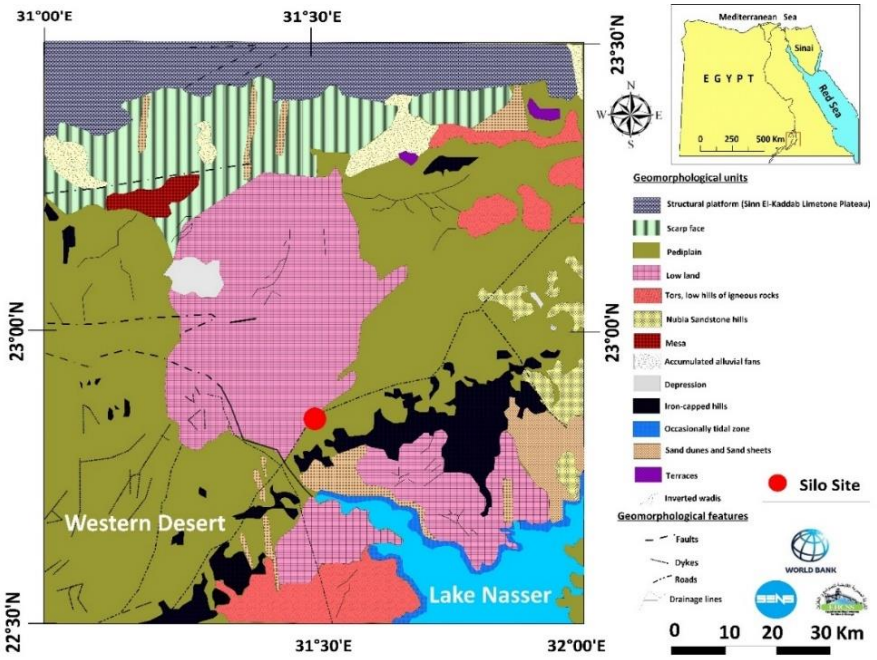

Figure (4.7): Geomorphological map of Toshka area and surroundings (as interpreted from Landsat TM image, Bands 7 4 2, taken in 1984**)**.

The Figure below is a digital elevation model (DEM) for the topographic heights surrounding the study area.

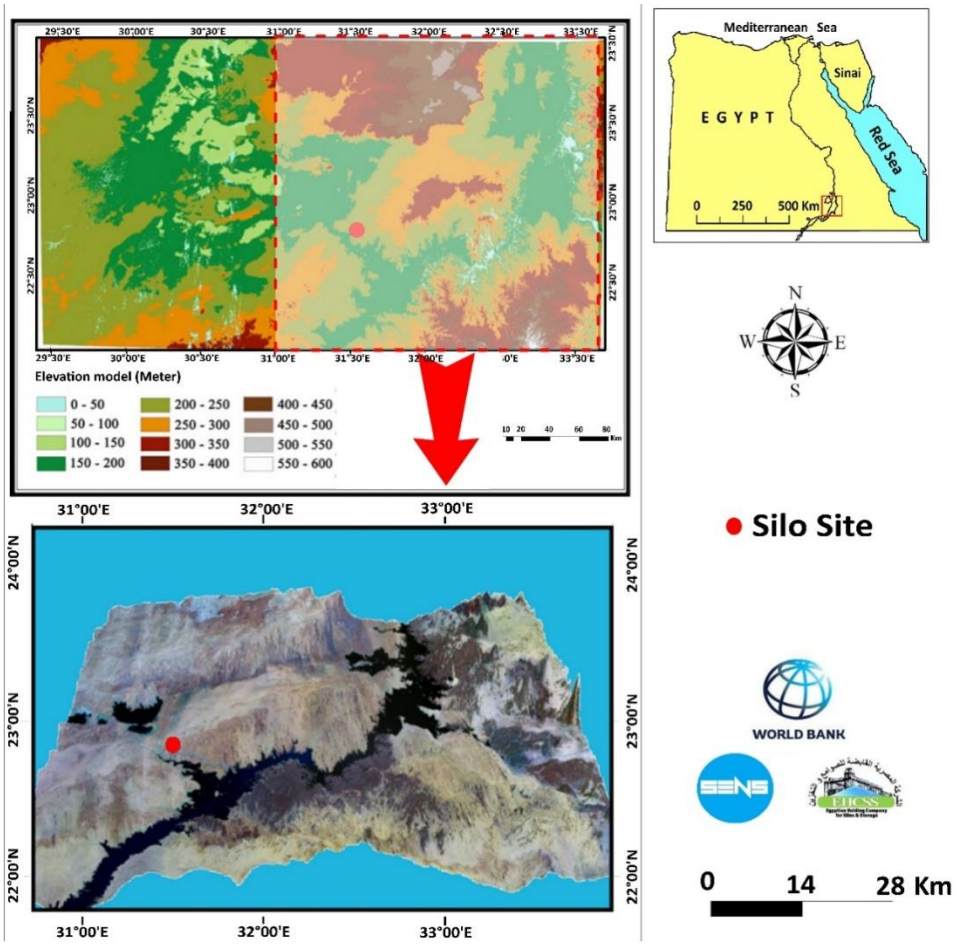

Figure (4.8):3D digital elevation model and topographic highs for Lake Nasser surroundings.

C) Hydrogeology

The water bearing formations in the area are represented by the two main aquifers: the Quaternary and the Nubia aquifer. To investigate hydrogeological conditions in the study area, the available hydrogeological data were collected and investigated. The data include lithology of the existing wells, water table data, extraction data, and seasonal depth to water table, etc. The result of the collected data is subjected to detailed review, organized, and analyzed to revel the hydrogeological conditions on the area and to monitor the geo-environmental impact of the sub-project on the groundwater and the High Dam Lake (HDL) in the area.

Quaternary Aquifer

The Quaternary aquifer is composed of sandy facies mixed with clay deposits; it is of reduced thickness, ranges between 5 and 10 m. The groundwater of this aquifer is of limited quantity and therefore the Quaternary aquifer is of little hydrological importance. The number of drilled wells tapping this aquifer is limited and accordingly the available data about the Quaternary aquifer are also limited.

Nubia Aquifer

The Nubian aquifers underline southeast Egypt and exist in Libya, Chad, and Sudan. The aquifer is unconfined in the western part of the western desert of Egypt (east Oweinat) but not in the entire Nubian region. (Robinson, et al. 2007), pointed out that the sandstone is highly porous with an average bulk porosity of 20%, exceeding any secondary porosity introduced by fracturing. (Thorweihe and Heinl,1993) suggested that the groundwater of the Nubian aquifer system is fossil water that infiltrated locally in the past and that groundwater surface slops to the NE, indicating inflow across the Libyan and Sudan borders to the Egyptian depressions. (Sabed, and Zeid, 2003) also concluded that the groundwater formed from in situ precipitation during the Late Pleistocene to Eary Holocene times. Using environmental isotopes and Hydrogeochemical techniques they determined that the main bulk of water is “fossil” and that contributions from recent recharge are insignificant. For more detailed study of the Nubian aquifer system in the western desert, are available in (Thorweihe,1990) and (Patterson, et al.2005).

Based upon the lithology of the drilled wells in the area, four hydrogeological cross-sections were made (Figure). The review of these sections indicated that groundwater in the Nubian aquifer resides in continental sandstone that unconformable overlies basement rocks and is covered by Quaternary deposits. It is the main groundwater aquifer system in the area and composed mainly of sand, sandstone intercalated with clay. The aquifer is of multilayered nature and represents the eastern fringes of the multilayered artesian aquifer of the Western Desert of Egypt. In Toshka, the aquifer system is composed of three horizons partially separated by two confining horizons. The first horizon belongs to the Qusier Clastics, Upper Member of the Nubia Formation (it crops out in the area southwest of Aswan at the foot slope of the Sin El Kaddab scarp and stretches to the Nile bank). The thickness of this horizon is 40 m in the north and 100m.

The second horizon belongs to the Taref Sandstone, the lower member of the Nubia Formation (it crops out at the scarp base between Gabal Derwa and Aswan Gharb village). This horizon is composed mainly of sandstone with minor varicolored clay intercalations. The thickness of the Taref Sandstone varies from 110 m in the northeast to 140 m to the southwest. The third horizon belongs to the Mesozoic-Paleozoic undifferentiated sandstones. This horizon directly overlies the basement complex. The thickness of this horizon is about 70 m and extends northeast to southwest as indicated in the cross sections and ranging between 40 m and 100 m (northwest southeast).

Groundwater Flow, Recharge and Discharge

In order to determine the groundwater flow in the Nubia aquifer, water levels at the existing wells tapping the aquifer are collected during December 2006 and mapped using GIS and given in Figure (4.9) Generally, groundwater in the Nubia aquifer is flowing from east to west and is greatly affected by the basement complex uplift (which acts as a barrier for groundwater flow), the local geological structure (i.e., fault systems), the high thickness of the impervious beds (i.e., clay and shale) and their hydrologic properties are the main factors controlling the groundwater flow. The surrounding populated areas draw water from Lake Nasser.

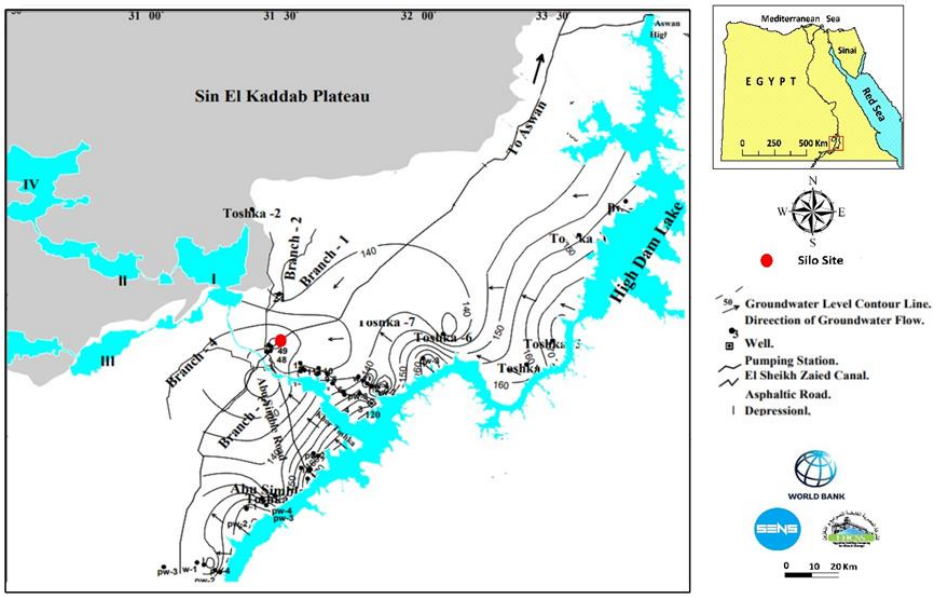

Figure (4.9): Water table map (December 2009) in the study area showing the direction of groundwater flow of the Nubia Aquifer.

Changes in Groundwater Level

To investigate the changes in groundwater level in the area, data concerning the water elevation in the existing wells were collected and analyzed during the period from 1998 to 2006 (Figure). Groundwater extracted from these wells is used for land reclamation in the areas. The extracted water is used to supplement the surface water for land reclamation in the area. It is noticed that there is a drop in water levels during that period ranging between 1 to 14 meters in the study area. The highest drop in water level is observed at well No. 4 (drop is estimated as 14 meter) reflecting the high rate of extraction. Such a drop indicated that the extraction rate of water is much

higher than the recharging rate. The drop is expected to continue with the continuous extraction of groundwater leading to aquifer depletion in the area.

The depth to groundwater at the silo site is approximately 80 m depending on the contour map for the depth to groundwater and the hydrogeological cross-sections were made located around and near the silo site in the Toshka area.

Surface Water

Regarding the surface water, Lake Nasser is located at a considerable distance away from the proposed location of the subproject about 17 km from project site to the nearest point of the lake. The nearest canal is Sheikh Zayed Canal which is located about 6 km from the proposed site for the subproject and obtains its water from Lake Nasser.

Flood Risk

Regarding the risk of flooding, the silo site is located on the western side of the Nile River (in the western Desert of Egypt), and depending on the topographic gradient, flooding take place when the water moves from areas with high elevations to areas with low elevations (such as the Red Sea Mountains to lowlands until they flow into the Nile River), but in the case of the western Desert (where the location of the silo exist) there is no risk of flooding.

Seismicity and Seismic Hazards

Toshka area located at the southeastern part of western Desert, in the distance between 200 to 260 km south of the Aswan High Dam. This area is characterized by a complex tectonic and structural history. Toshka New City (Figure 4.10) is an urbanization sub-project that is a relatively large-scale regional development sub-project, and it will be good if the assessment of seismic hazard is being incorporated in the planning stage.

Seismic hazard is defined as the probability that the ground-motion amplitude exceeds a certain threshold at a specific site. The hazard-relevant quantity calculated is the Peak Ground Acceleration (PGA), a commonly used parameter in earthquake engineering. The methodology applied is based on the generally accepted concept by Cornell (1968). In this study the main target is to study the seismicity and to calculate the seismic hazard due to this activity in the study area and surrounding area based on probabilistic seismic hazard computation using the seismic source models in the area.

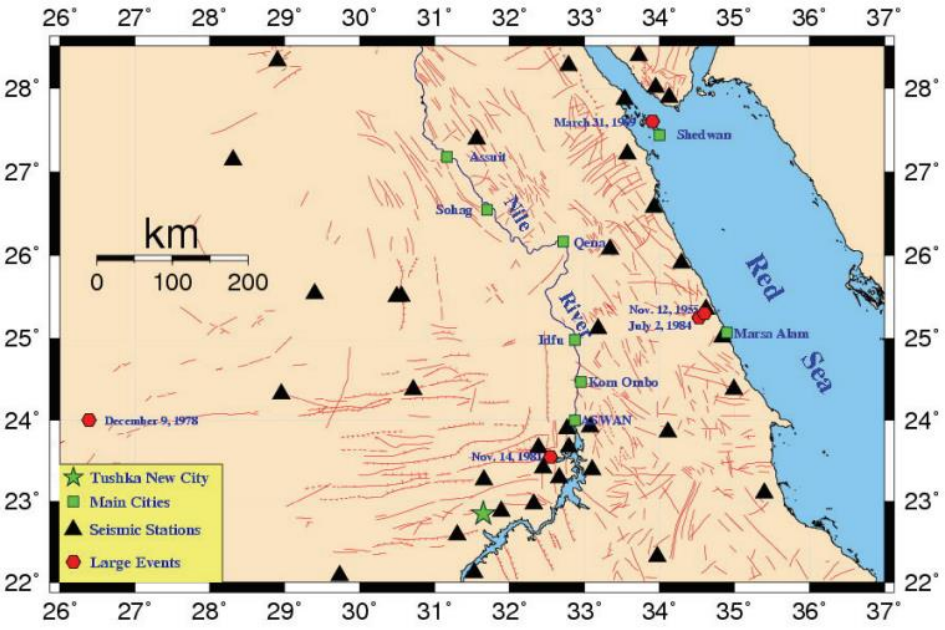

Figure (4.10): Location map of Toshka New City site and surrounding area.

The resulting hazard curve was calculated for the proposed site as shown in Figure (4.10-1). The figure shows the computed probabilities of exceeding various levels of peak ground acceleration area source model is normalized on an annual basis.

From the seismic hazard curve, the calculated maximum acceleration with 90 percent probability of not being exceeded in 50 years of exposure time (475 years return period) at the proposed site was about 22 cm/s^2 it means approximately 0.022g

In conclusion, based on the seismic hazard map, and seismic hazard curve, the proposed silo site and the surrounding area is characterized by low amplification of seismic waves (site effect) during earthquakes, which means it has a low seismicity in comparison to other areas in Southern Egypt; therefore, the risk of seismicity is very low.

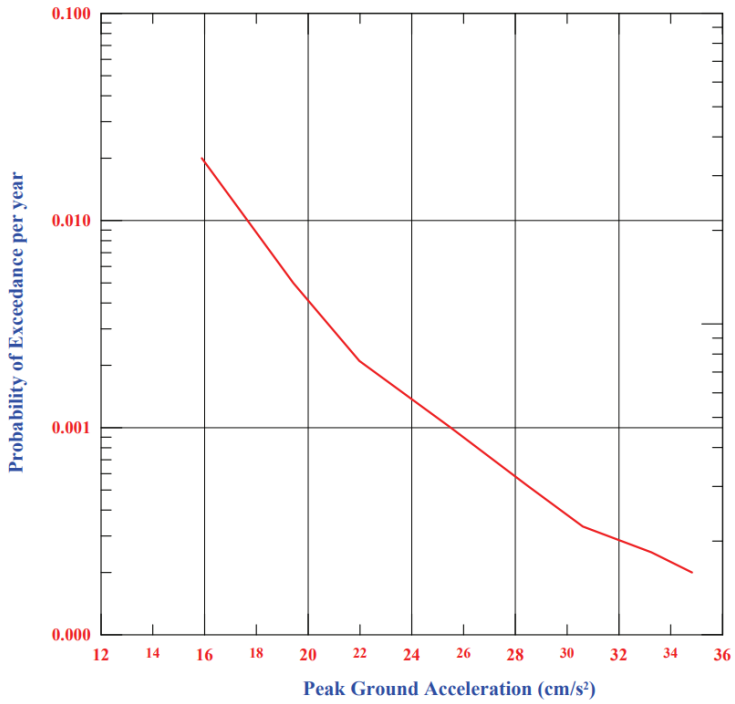

Figure (4.10-1): Seismic hazard curve at the proposed site.

Potential for Groundwater Development

To determine the potential for groundwater development, the type of aquifer and land use need to be assessed. The Nile River aquifer has a high potential near the Nile River stem, and it decreases to reach limited potential at the fringes of the aquifer. The Nubian Sandstone aquifer has low or zero potential especially in the desert areas where no land reclamation has occurred, and the aquifer is non-renewable.

4.1.4 Air Quality

Ambient Air Quality

The air in Aswan city is quite clean and comply with the air quality standards stipulated in the Egyptian Law for Environment No 4 of 1994 (El Tahtawy, H., & Kerim, G. A. 2003). Aswan Governorate is affected by the continental tropical air mass. Its source is the hot and dry tropical continental lands of the African desert or the desert of the Arabian Peninsula. It is attracted by the onset of spring depressions, but its arrival continues throughout the summer and is accompanied by a rapid rise in temperature and a decrease

in relative humidity. It stirs up sand and dust and causes major losses to agricultural crops (Abdel-Menaem, 2019).

4.1.5 Soil Quality

Particle Size Distribution and Soil Texture

The table below, showed that several categories were found in the surface and subsurface (0–30 and 30–60 cm, respectively) layers, according to the relative distributions of sand, silt, and clay as represented on a soil-texture triangle (Al-Soghir *et al*., November 2022).

The data showed that the sand distribution ranged from 45.20 to 73.80 and 42.60 to 71.20%, with averages of 61.25 and 59.01%; the silt distribution ranged from 17.34 to 28.40 and 6.80 to 29.50%, with averages of 22.97 and 23.76%; and the clay distribution ranged from 8.50 to 26.40 and 7.90 to 27.90%, with averages of 15.78 and 17.23% in the surface and subsurface samples, respectively. Accordingly, the soil texture was predominantly sandy loam in about two thirds of the area (68.75 and 62.50%) in both layers. Samples 7, 10, and 15 (about 18.75%) in the surface layer, and samples 23, 26, 30, and 31 (about 25.00%) in the subsurface layer, were classified as sandy clay loam. The loamy texture (about 12.50%) was only present in the surface layer, whereas the clay loam texture (18.75%) was only present in the subsurface layer (Al-Soghir *et al*., November 2022).

Table (4.1): Spatial distribution of particle size distribution and assigned soil texture in surface and subsurface (0–30 and 30–60) layers in Toshka area, Aswan, Egypt (Al-Soghir *et al*., November 2022).

Depth (cm)	Sample No	Particle Size Distribution			Texture
		Sand	Silt	Clay	
		(%)			
0–30	1	53.6	27.1	19.3	Sandy loam
	2	70.4	20.3	9.3	Sandy loam
	3	45.2	28.4	26.4	loam
	4	70.8	19.3	9.9	Sandy loam
	5	72.5	18.6	8.9	Sandy loam
	6	61.9	23.5	14.6	Sandy loam
	7	47.5	27.2	25.3	Sandy clay loam
	8	73.8	17.6	8.6	Sandy loam
	9	72.5	19.0	8.5	Sandy loam
	10	51.1	25.3	23.6	Sandy clay loam
	11	45.7	28.2	26.1	loam
	12	70.1	20.3	9.6	Sandy loam

	13	62.1	24.2	13.7	Sandy loam
	14	59.5	24.1	16.4	Sandy loam
	15	49.6	27.0	23.4	Sandy clay loam
	16	73.3	17.4	8.9	Sandy loam
30-60	17	43.1	29.4	27.5	Clay loam
	18	69.8	19.1	11.2	Sandy loam
	19	42.6	29.5	27.9	Clay loam
	20	68.0	21.7	10.3	Sandy loam
	21	70.1	20.4	9.5	Sandy loam
	22	59.5	24.0	16.5	Sandy loam
	23	48.9	26.5	24.6	Sandy clay loam
	24	71.2	19.5	9.3	Sandy loam
	25	73.7	18.4	7.9	Sandy loam
	26	48.1	27.0	24.9	Sandy clay loam
	27	43.3	29.5	27.2	Clay loam
	28	69.9	20.8	9.3	Sandy loam
	29	64.3	23.5	13.2	Sandy loam
	30	51.5	26.1	22.4	Sandy clay loam
	31	49.4	26.5	24.1	Sandy clay loam
	32	70.8	19.3	9.9	Sandy loam

4.2. Biological Environment

4.2.1. Bio-ecological zones

Toshka Project in Aswan, Egypt, is a large-scale land reclamation and irrigation project designed to transform a portion of the Western Desert into arable land. The project involves diverting water from Lake Nasser and the Nile River to create new agricultural areas in the desert. In the context of bio-ecological zones, the Toshka area experiences significant changes due to human intervention, but it's essential to understand the natural ecological zones that existed before the project began.

The natural bio-ecological zones in the area include the following:

Desert Zone: The dominant natural biome in the Toshka area is the desert, characterized by arid conditions, limited vegetation, and extreme temperature variations. Desert plants and animals adapted to these harsh conditions would have inhabited this zone.

Nile River Zone: The Nile River is a vital source of life in Egypt, and the Toshka area would have had a narrow strip of fertile land along the riverbank. This zone supported various plants and animals adapted to riparian habitats.

Oasis Zone: Occasionally, you may find small oasis areas in desert regions, where underground water sources emerge, allowing for more abundant vegetation and wildlife. These areas would have supported unique flora and fauna.

Lake Nasser Zone: Lake Nasser, a massive artificial reservoir created by the Aswan High Dam, borders the Toshka area. The lake zone would have featured wetland habitats and supported aquatic life, including fish and various waterfowl.

It's important to note that the Toshka Project, through extensive irrigation and land reclamation, has altered the natural ecological zones significantly. New agricultural zones have been created, and the desert has been partially transformed into farmland.

El-Shabrawy and Dumont (2009) showed that at the beginning of the Toshka Lakes' formation, truncated Nile fauna and flora invaded the Toshka Lakes, resulting in a rich population of fish from the lakes. With time, the lakes suffered a rapidly increasing salinity, and the fauna and flora were impoverished, and life in the lakes started to decline.

Toshka Lakes: In 2002, the estimated total surface area of the Toshka lakes was 1,540 km^2, distributed over lakes 1, 2, 3 and 4 as follows: 449, 265, 20 and 807 km2. But in 2006, the lake surface area had dropped to 937 km2, significantly below that of 2001. Lake 3 vanished, and the surface areas of lakes 1, 2 and 4 had become 286, 101 and 550 km2, respectively. Areas of swamp and sand dunes had started forming between the former and present shorelines. The calculated stored water volumes in Toshka lakes 1, 2, 3, and 4 for the year 2002 were 6.78, 2.21, 0.044 and 16.23 × 109 m^3; by the year 2006 these had declined to 3.45, 0.44, 0 and 8.78 × 109 m3 (El Bastawesy *et al*., 2007).

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

4.2.2. Terrestrial Ecosystems

Flora and Fauna:

Flora: A desktop review covered the wider Toshka area. The vegetation survey by Sheded et al., (2012) focused on the southwestern desert of Egypt and the wider Toshka region. Vegetation survey of 124 stands in the Southwestern Desert of Egypt (Toshka area) identified 79 species of angiosperms belonging to 25 families. 54 species (68.3%) are annuals (including one hydrophyte), and 25 species (31.7%) are perennials. Grasses (Poaceae or Gramineae) contributed 21.5% of the total flora, considered the most dominant family in the Southwestern Desert. Two herbaceous species were recorded for the first time in this region: *Eragrostis lepida* and *Enarthrocarpus pterocarpus*. Eleven vegetation clusters were obtained and categorized into five distinct groups according to soil composition and chemical characteristics. Many weeds appear

in the extreme arid desert due to the recent extensive and intensive anthropogenic effects (Sheded *et al*., 2012).

Water-loving mesophytic plants, both annuals and perennials, established themselves on the shores of the lake. The lakeshore and available water attracted developers who began commercial agriculture on the western side of the lake's shores, taking advantage of the low slope gradient of the Western Desert.

Seventy-nine species were recorded in the present study belonging to 71 genera and 25 families. The Graminae is the largest family, represented by 17 species, followed by Leguminosae (7 species), Compositae and Chenopodiaceae (each with 6 species), Cyperaceae (5 species), Cruciferae (4 species), Amaranthaceae and Palmae (each with 3 species).

The recorded species in Southwestern Egyptian Desert with their families, Ph: Phanerophytes, Ch: Chamaeophytes, He: Hemicryptophytes, G: Geophytes, H.: Hydrophytes and A: Therophytes (Annuals). life forms and floristic categories. The floristic categories coded as follows: (COSM: Cosmopolitan, PAL: Palaeotropical, PAN: Pantropical, SA-SI: SaharoSindian, S-Z: Sudano-Zambezian, ME: Mediterranean, and IR-TR: IranoTuranian).

Sheded (2002) recorded 81 species in Toshka area, of which 58 were weed species recorded for the first time. In this study the author recorded most of the species belonging to Pantropical (29.6%), Palaeotropical (17.3%) and Cosmopolitan (16%) elements while the Saharo-Sindian element comprised only 2.1% of recorded species.

Species richness varied considerably in different locations in the studied area. The largest number of species were recorded in the areas subjected to intensive human activities particularly in the newly reclaimed lands (El-Waleid Farms, Toshka Depression, East Uweinat Farms, and shores of Lake Nasser). Most of the recorded species in these locations are weeds; it is new vegetation for the southern part of the Western Desert which was not recorded before intensive land reclamation began.

The most floristically poor area is the part the desert plateau along the Toshka – East Uweinat road where only the following six species were recorded: *Tamarix nilotica*, Hyphaene thebaica, Phoenix dactylifera, Capparis decidua, *Cornulaca monacantha* and *Phragmites australis* (Alaily *et al*., 1987).

The consultant (SENS) team conducted a site visit to the proposed location for the construction of the Toshka Silo. It was carried out on October 3, for three days. The proposed location for the construction of Toshka Silo was characterized by a desert area without any natural vegetation growing in the area. Photographs of the subproject site show that it is devoid of vegetation (figure 3.1). The vegetation of the wider area as described in the desktop review was

not observed at the subproject area and there are no threatened or endemic flora species present at the subproject site.

Mammals: Mammalian species which represent these habitats are Dorcas Gazelle (*Gazella dorcas*), Red fox (*Vulpes vulpes*) has most recently been assessed under The IUCN Red List of Threatened Species in 2016. *Vulpes vulpes i*s listed as Least Concern, and Rüppell's Sand Fox (*Vulpes rueppleii*) has most recently been assessed for The IUCN Red List of Threatened Species in 2015. Vulpes rueppellii is listed as Least Concern and other small mammals which were recorded before in such western desert habitats (Soliman and Mohallal, 2014).

Dorcas Gazelles are a rare mammal, classified as vulnerable (VU) in Egypt by Basuony et al., (2010) and globally as Endangered (EN) by the IUCN Red List due to habitat loss and hunting. The lack of vegetation in the area, and the dryness of the area renders the area unattractive to Gazelles.

Striped Hyaena (*Hyaena hyaena*) has most recently been assessed under The IUCN Red List of Threatened Species in 2014. *Hyaena hyaena* is listed as Near Threatened. Land modification in the area and habitat loss may be considered as main factors reducing the probability of their presence in the project area.

Regarding reptiles, the venomous Desert Horned Viper (*Cerastes cerastes*), classified as least concern by the IUCN, often present near vegetated areas may can be present in desert areas with no vegetation (Baha El Din, 2006) and according to the IUCN and Baha El Din (2006) It can endure extreme hyperarid habitats. Concerning other reptiles and amphibians, there is no evidence/indicators (or established literature) regarding their presence in the area of study, confirmed by consulting with EEAA.

Birds: Many species nest at the Nile River bank. Key avian species which represent these habitats include wheatears, larks, shrikes, and warblers, also raptors and some species of Corvidae. The Nile River is located at a significant distance to the project site.

During the site visit of the consultation team to the area of study (the proposed location for the construction of the Silo) did not observe any migratory birds in the area. It was noted based on the consultations with local residents that they previously observed migratory birds particularly raptors in the area. It is worth noting that, the site visit was conducted in October 2023 during one of the birds' migratory seasons. There are two seasons for migratory birds crossing Egypt; spring season (from February to April), and Autumn season (from September to November), The site visit in October was carried out within the Autumn season and no migratory birds were observed. However, the risks and measures were considered in case they will appear.

Moreover, the risk of bird collision during migratory season is low, since the silo design already include aviation obstruction lighting which is 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.

Regarding nesting sites, the nearest water body is Sheikh Zayed which is 6 km away from the silo site, and it is a paved water way without any side vegetation, therefore, this location is not considered as a suitable location for nesting. On the other hand, lake Nasser which is 17 km away from the silo site is an IBA and IPA which is suitable and more attractive for resting nesting.

There exists no evidence or established literature concerning the presence of particular raptor species within the designated subproject site although consultations with locals confirmed their presence. Furthermore, the information available is predominantly derived from prior research and firsthand observations conducted during onsite visits, supplemented by inquiries made to local residents regarding their observations.

Most of the birds of prey including raptors are protected by CITES and included in CITES appendix II. Coordination efforts will be initiated with the Ministry of Environment to enhance and consolidate mitigation measures, ensuring the protection of environmentally sensitive species from any potential harm.

Lake Nasser is considered as an IBA area, The Lake Nasser IBA and IPA is located at about 17km away from the project site and there is a bird migratory route over lake Nasser. The subproject site is located west of Lake Nasser. Coordination with the ministry of Environment and Environmental protection sector in the EEAA will be carried out to enhance and consolidate mitigation measures, ensuring the protection of environmentally sensitive species from any potential harm.

Aquatic Ecosystems: the subproject site is located about 17 km to the nearest point of lake Nasser. The new farmed lands around Lake Nasser khors have created new habitats that never previously existed in the area. Planting of small gardens near houses and the constant irrigation of crops two or five years ago enabled many weeds to penetrate these habitats.

Most of the perennial weeds of the newly farmed land are represented by a central core of large shrubs of *Tamarix nilotica*, *Sesbania sesban*, *Ricinus communis*, *Ziziphus spina-christi* and Phragmites australis, which must have existed before the reclamation, when these farms were part of the Eastern and Western Deserts. Respectively a few specimens of the desert perennials, *Hyoscyamus muticus*, *Aerva javanica*, *Salsola baryosma*, *Pulicaria arabica* and *Morettia philaeana*, are also recorded. The perennials have the lowest value here (32.3%) and this trend is dissimilar to the spectra reported for Egyptian flora (Hassib 1951).

The weeds of irrigated agricultural crops in the southern border of Egypt grow in habitats that never previously existed in the area. Some of these weeds are plants from the local flora of the

region. Among them are plants which were typical to ruderal habitats in deserts and make use of environmental conditions which are like their typical niche, and other species such as *Imperata cylindrica* which were normally confined to desert. Mostly, they have wind dispersed diaspores that reach the constantly irrigated plots and establish themselves there. Species such as *Hyoscyamus muticus* grow regularly in desert wadies and establish themselves at the margins of irrigated plots where it is not too wet.

Many of these weed's species, such as *Ammi majus*, *Convolvulus arvensisSisymbrium iro*, *Cichorium pumilum*, *Trifolium resupinatum*, *Melilotus indicus*, *Trigonella hamosa*, *Portuiaca oleracea* and *Brassica nigra*, were derived from other agricultural areas in Egypt (the Delta) where the plants, seeds, manure, and agricultural equipment originated. The other weeds were from the local flora of the desert and lake shore habitats that can withstand the new environment. These species grow in the relatively dry microhabitats near the fields or establish themselves in the abandoned fields.

Fish: Data on fish production and Fishing Societies of Lake Nasser were kindly provided by the General Authority for Fish Resources Development and General Authority of Agricultural Projects, High Dam Lake Development Branch (HDLD). The shoreline of Lake Nasser is divided into five "Fishing Regions". Each region represents a territory of a fishermen society.

In the beginning, the Nile water carried freshwater ichthyofauna to the newly formed lakes, and some species tolerant of strong environmental fluctuations survived and adapted. They include *Oreochromis niloticus*, *Lates niloticus*, *Hydrocynus forskalii*, *Sarotherodon galilaeus* and *Alestes nurse*. Beside "wild fish", tilapia fry was released to the first lake, such that *O. niloticus* and *S. galilaeus* formed 60% of the total catch. The Nile Perch Lates niloticus contributed another 25%. There are 4, 8 and 40–75 boats that are operational in the first, second and fourth lake, respectively. The fish landings from 2000 to 2004 show a steady increase from 2001 onwards; in 2004, more than 7,000 tons of fish was produced. However, it is unlikely that it will be possible to maintain this figure, because of the rapid increase in salinity of the lakes. Kim & Sultan (2002) and Eugene et al. (2003) estimate that the recharge from these lakes to the Nubian aquifer has been rising over the years (105 m3 y−1 in 1998 to 106 m3 y−1 in 2002), such that currently the recharge from the Toshka lakes should almost be at par with recharge from Lake Nasser.

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 (4.2): Nature Conservation Sector (Protected areas near the study area in Aswan)
Source: Nature Conservation Sector in EEAA).

No.	Protectorates Names	Declaration Date	Area Km^2	Governorate	Prime Ministerial Decree
6	Saluga and Ghazal Protectorate	1986	0.5	Aswan	**Decree** 928/1986
11	Wadi Alaqi Protectorate	1989	30000	Aswan	**Decrees** 945/1989 and 2378/1996

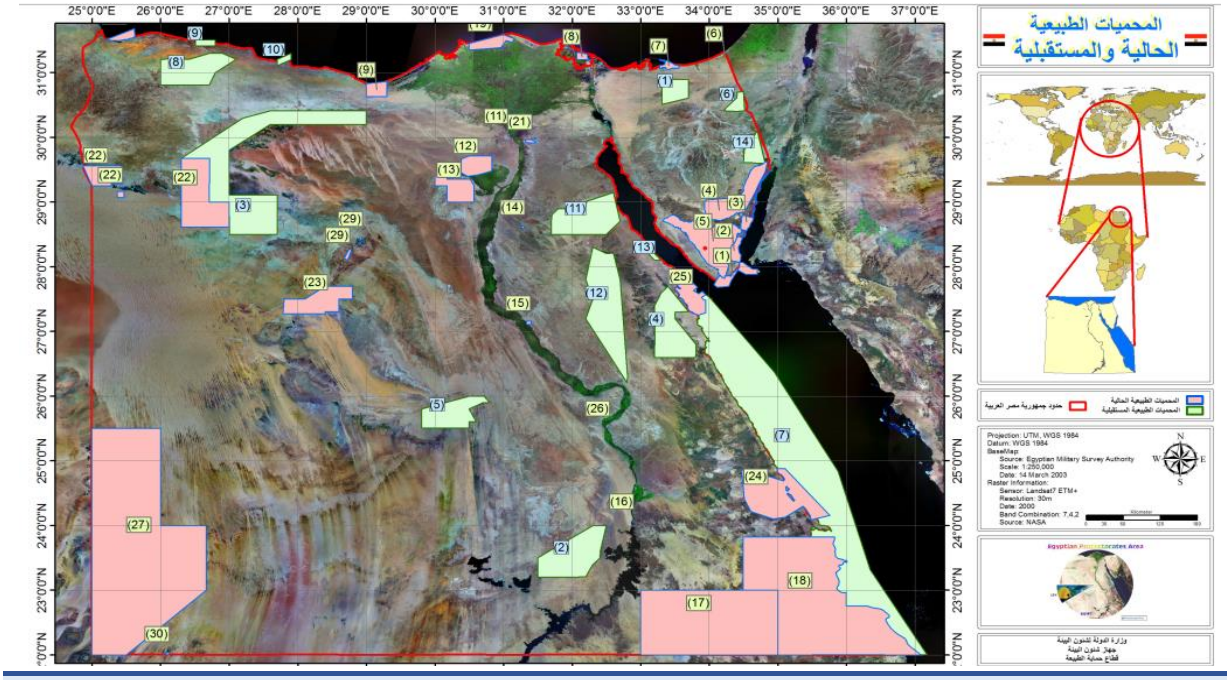

Figure (4.11): Future and Present Natural reserves in Egypt **(Source:** Nature Conservation Sector in EEAA).

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

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.

Wadi Al Allaaqi

Wadi Al-Allaqi Protectorate in Aswan was established as a protected area around the year 1989 AD and was announced by UNESCO as Biosphere Reserve during the year 1993 AD. It is also considered one of the largest dry rivers in Egypt, and its area is about thirty thousand square kilometers. The flow of water from Aswan High Dam has created an area of lakes in Wadi EL Allaqi. It is inhabited by the Bejas nomadic tribes living on and benefiting from the resources of the land, including using medicinal plants, producing charcoal for fuel, taking advantage of nickel and copper and more. The protectorate contains different types of plants including some plants which grow annually and others which exist all the time, in addition to the availability of medicinal plants. Moreover, it is a home for several species of animals, birds, reptiles producing venom and more. It is said that the Wadi Al-Allaqi witnessed gold mining activity in past years before becoming a protectorate. The area consists of around nine residential areas which include eight comprising ancient gold workings and one filled with copper and nickel.

The distance between the project area and Saluga and Ghazal protected area is 196.5km, and between the project area and Wadi Al Allaaqi is 304km.

The Kurkur-Dungul

The Kurkur-Dungul area is located in the Southwestern Desert of Egypt is a unique hyper-arid region, in which one of the oldest civilizations appeared. The sedimentary record of the area is represented by Cretaceous Nubia Sandstone, Paleocene, Eocene and Quaternary deposits. The sedimentary sequences of the area are the end products of characteristic geomorphic processes developed in response to balanced constructive and destructive mechanisms. The area encompasses an outstanding variety of landforms of third order extent including River Nile, Nubian Plain, oases, playas, isolated crystalline hills and Sinn El-Kaddab limestone plateau. Beside these geomorphic features, there is also a number of small-scale characteristic landforms including terraces, terrestrial carbonates including travertine, conglomerate and scattered sheets of gravel, flint and sand as well as, deep-seated, strike-slip faults and accompanied folds. All these landforms were developed mainly in response to tectono-magmatic and seismic activities, sea level fluctuation and climatic changes. The main natural agents of changes include the interaction of Tethys Sea, rain falls, tectonics, weathering, erosion, and wind action. Damming of the Nile and the subsequent accelerated seismic effects as well as sand dune encroachment turned the area to be one of the most dynamic regions in the Arabian-Nubian Shield. Its landforms are susceptible to substantial changes in very short periods of time.

The distance between the project area and Kurkur-Dungul area is 144.7km, and it's a proposed protected area.

Other sensitive areas

Lake Nasser is the largest artificial lake in the world, located in southern Egypt, south of Aswan, and north of Sudan. The name Lake Nasser is given to the largest part that is located within the borders of Egypt and represents 83% of the total area of the lake, while the remaining part located within the borders of Sudan is called Lake Nubia. It was formed as a result of the water collected in front of the High Dam after its construction from 1958 to 1970.

Description of the lake

- The length of the lake is 500 km.
- The area of the lake is about 5,250 square kilometers.
- The average width of the lake is 12 km.
- The maximum width of the lake is 35 km and is near the Tropic of Cancer.
- The total storage capacity is 162 billion cubic metres.
- Dead storage capacity is 32 billion cubic metres.
- Its depth is 180 meters (590 feet).

Fish Wealth

The lake currently produces about 26,000 tons annually, and it is expected that the annual production of fish will increase to 80,000 tons annually in the event of increasing the number of fish hatcheries, establishing fishing ports attached to ice and refrigerator factories, and establishing factories for manufacturing and canning fish. One of the most famous fish in the lake is *Nile tilapia* (Abdelazzem, 2015).

Lake Nasser holds dual classifications as an Important Bird Area and an Important Plant Area (Figure 4.12), while the Wadi Al-Allaqi, Saluga and Ghazal, and Kurkur-Dungul Protectorates are designated as Important Plant Areas. These classifications have been conferred by BirdLife International and PlantLife organizations, signifying the ecological significance and conservation value of these regions for avian and plant biodiversity, respectively. There is also a bird migratory route over the lake.

Conclusion:

Project activities: It is unlikely to entail any potential impacts on the protected areas as a result of the project, including Important Bird Areas, and Important Plant Areas, throughout any phase of the sub-project. The sub-project site is situated at a considerable distance from these protected areas and ecologically sensitive zones and will not pose the potential risk to harm

their ecological integrity. However, the project site may attract birds including migratory birds during operational phase due to the presence of grains and the nature of the project. The potential presence of Gazelles and Hyaenas will also be considered in the mitigation plan in order to prevent disturbing them. The Lake Nasser IBA and IPA[2] is located at about 17km away from the project site and there is a bird migratory route over lake Nasser.

It is worth noting that the site visit was conducted in October 2023 during birds the migratory season. There are two seasons for migratory birds crossing Egypt; spring season (from February to April), and Autumn season (from September to November), The site visit in October was carried out within the Autumn season.

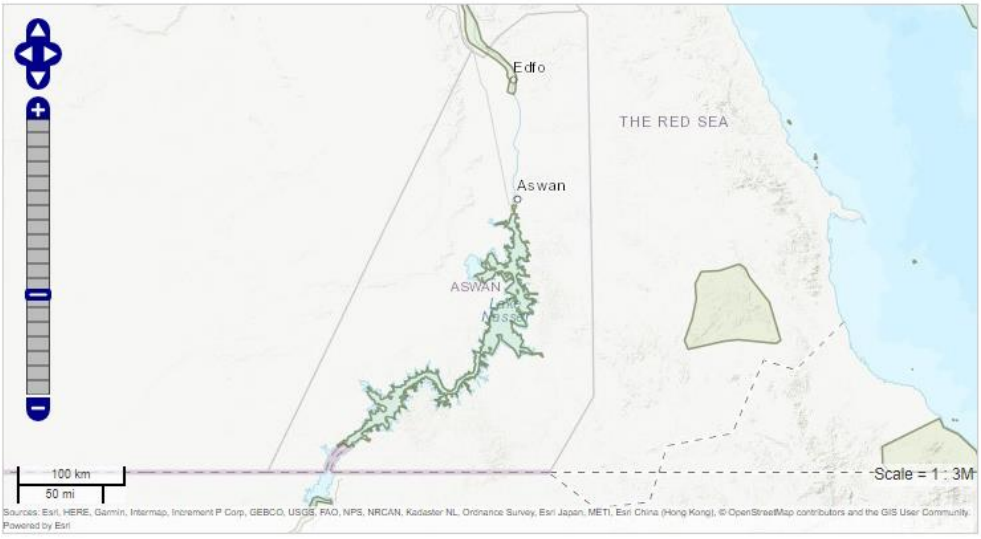

Figure (4.12): Map showing the location of the Lake Nasser (which represented as IBA, IPA, and migratory route), The distance between the subproject site and the nearest point in Lake Nasser is about 17 km.

[2] For details on Lake Nasser IPA, refer to https://www.plantlifeipa.org

Figure (4.13): Map showing the distance from the Lake Nasser IBA and IPA to the project site

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:

Toshka area lies in the southeastern of the Western Desert, Egypt, covering an area of 15,000 km^2. It is located in the west of the High Dam Lake (HDL), between latitudes 22°30′ and 23°30′ N and 31°00′ and 32°00′ E. New Toshka is located in Aswan Governorate, southeast of the Aswan-Abu Simbel Road, Al-Waleed Bin Talal Farm, and north of the Sheikh Zayed Canal. The city is 90 km from the city of Abu Simbel.

Administrative Structure:

Aswan is one of the governorates of the southern Upper Egypt region, which includes (Sohag - Qena - Aswan - Red Sea - Luxor), it is the gateway to Egypt from the south, and it is the link between the northern and southern parts of the Nile Valley, and it is also the point of contact between Egypt and Africa. The total area of Aswan is 62.73 thousand km2, and only 1.60% of its total area is inhabited, and there are 5 centers, and 10 cities, and 39 rural local units, and it ranks 17th among the governorates of the Republic in terms of population, 1562.68 thousand people.

Aswan consists of one section that consists of four sheikhs: The first with an area of 1172 feddans, the second is 5198 feddans, the third is 2758 feddans and Aswan Dam sheikh is 5537 feddans.

4.3.2 Basic Demographic Characteristics

Population Profile:

Based on information from Aswan CAPMAS 2017, there was no population in Toshka, but it is expected that population of the new city of Toshka will reach 80,000 inhabitants in the next few years. However, their current population is very limited and mainly encompasses workers working in new agriculture projects in the reclaimed desert lands in the area.

The New Toshka extends over an area of 3,000 acres to accommodate 80,000 people, provides 30,000 job opportunities, and integrates with the rural villages surrounding the Toshka project. It includes services, agricultural manufacturing, and recreational activities. The first phase is being implemented to accommodate 17,000 people at a cost of 500 million pounds by establishing 1,000 housing units and service centers.

The Toshka area is a new area with limited human activities. It was built by the government to attract people to this area, the number of people and activities are very limited, and there is no information regarding the recent numbers of people.

There are some agricultural activities in the area surrounding the proposed location for the construction of Toshka Silo (Figure 4.12).

Activities in surrounding area:

The surrounding area of the Toshka Silos Site is composed of desert habitats with limited human activities including several large land reclamation projects (public and private sectors owned) including a reclaimed farm area by The National Company for the Reclamation and Cultivation of Desert Lands and privately owned silos and agriculture lands by a foreign company. The reclaimed lands mainly use center pivot systems to irrigate the lands in addition to drip irrigation. There reclaimed lands include several irrigated crops such as wheat, palm date trees, mangoes, corn etc. For more details on the reclaimed agriculture lands and activities in the surrounding area, refer to Toshka Development Project and Toshka Al-Khair Project under section 4.3.5 (Economic Activities and Well Being). The nearest town to the subproject site is the new Toshka, which is located about 5 km to the east of the proposed subproject site (Figure 4.14). There is also a small residential complex located 4.5 km west of the subproject site. The Toshka power transformer is located 5.3km west of the subproject site and the Sheikh Zayed Canal is located at 6km west of the subproject site. The nearest road is the Aswan-Abu Simbel Road

located at 200m away north of the subproject site. For further demonstration on surrounding area, see figure 4.15 below.

There are several water pumping stations that transfer water from the Sheikh Zayed Canal and several branched canals to the reclaimed lands which originally obtained the water from Lake Nasser. For more information see section 4.3.8 Investment and Development and 4.3.13. (Land Use)

Figure (4.14): Some photographs from the study area showing including agricultural activities in the area surrounding the proposed location for the construction of Toshka Silo, and residential area.

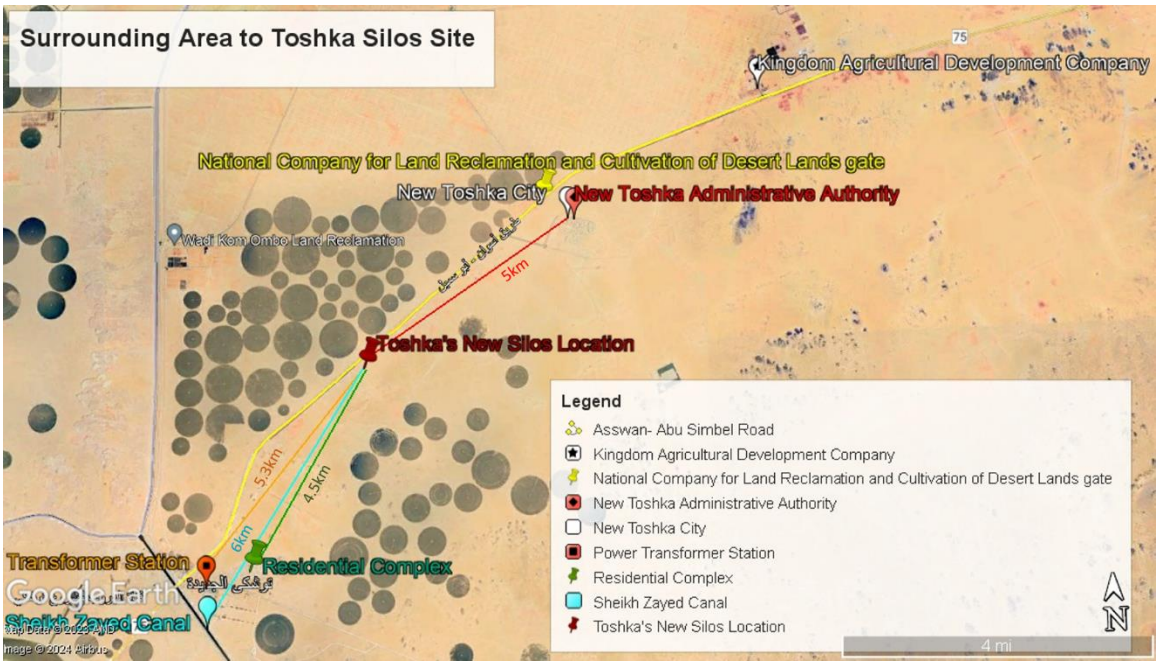

Figure (4.15): Map showing the proposed location for the construction of Toshka Silo and the surrounding area with distances.

Additionally, Abu Simbel is the nearest settlement (after the new Toshka) located near the proposed location for the construction of Toshka Silo (about 55 km). Table (4.3) shows the population figures in Abu Simbel.

Table (4.3): Population Figures in Abu Simbel (CAPMAS, 2023).

Area	Population		Total Population
	Male	Female	
Abu Simbel city	4452	3865	8317

Age and Gender Distribution:

The data for age structure shows that most half the population (57.6%) are in the 15-59 age group, and the age-distribution of the population in Aswan Governorate shows that almost 30.0% are less than 15 years old; while those between 15 and 45 years old represent about 50.0% (Source: 2006 National Census).

The sex structure of Aswan Governorate is quite keenly balanced with approximately 49.20% of the population being female. There are small variations between urban and rural areas.

Rate of Natural Increase:

According to Egypt Description by Information for Aswan Governorate, the birth rate in Aswan Governorate is 25.3 births per 1000 persons, while mortality rate stands at 5.6 per 1000 persons. That gives a natural growth rate of 19.7per thousand persons in Aswan. The Statistical yearbook - Vital Statistics reported tables from 2020 that the newly born mortality rate 6.7 per 1000, while infant mortality is 13.5 per thousand live births. The under-five-year-old mortality rate stood at 19.1 per 1000.

Table (4.4): Demographic Trends in in Aswan, Aswan Governorate - Egypt Description by Information, 2019/2020.

Demographic Trends	Value
Average Household Size (persons)	4.48
Natural Growth Rate (per 1,000 persons)	19.7
Birth Rate (Births per 1,000 persons)	25.3
Mortality Rate (Deaths per 1,000 persons)	5.6

4.3.3 Living Conditions

Household Size and Density

A household is defined as “individuals who do or do not belong to a particular household and who live in one dwelling.” They manage their living activities together and represent a single social and economic unit.” Average Household Size (persons) in the governorate is Aswan: 4.48 persons/housing unit.

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:

Access to electricity in Upper Egypt governorates is 99.0% (Egyptian Human Development Report 2010). Even squatter areas have access to electricity regardless of their legality. According to Egypt Description by Information for Aswan governorate, 25.33% of the energy consumed is used for industrial purposes and the rest for lighting and other household use.

Access to water and sanitation network:

The governorate depends almost entirely on Nile water for all its water needs. Occasionally, ground water is utilized in remote areas. Accessibility to potable water is high in Aswan Governorate, and almost all the households in Aswan city have access to running potable water. Aswan ranks 9th among the governorates of the Republic in the per capita share of the amount of drinking water consumed at a value of 76.06 m3/capita, and the percentage of total water loss reached 28.00%. Aswan has 17 sewage treatment plants with a design capacity of 200.68 thousand m3 per day, and its actual capacity 187.41 thousand m3 / day.

4.3.4 Labot Profile

The total labor force (above 15 years) in Aswan Governorate is estimated to have 4203 hundred persons among which 3761 hundred persons are employed. The unemployment ratio is estimated at 10.5.10.4% is the unemployment rate, which is higher than the average unemployment rate for the Republic (7.9%), and Aswan is ranked 8th among the governorates of the Republic with the highest unemployment rate.31.98% is the female unemployment rate, which is very remarkably high compared to the female unemployment rate of the Republic (21.7%), and it ranked 7th among the highest governorates of the Republic in terms of the female unemployment rate.

Table (4.5): Labor Market in Aswan, Aswan Governorate - Egypt Description by Information, 2019/2020.

Item	Unit	Value
Total Labor Force (15+ ages)	Hundred persons	4203
No. of employed persons (15+ ages)	Hundred employed	3761
No. of unemployed persons (15-64 ages)	Hundred unemployed	440
Unemployment Rate (15-64 years)	%	10.5
Male unemployment rate	%	7.4
Female unemployment rate	%	32.0
Youth unemployment rate (15-29 years)	%	23.0

Table (4.6): No. of Employed Egyptians in Aswan (15 years +) according to Age Groups, CAPMAS 2017.

	Sex	Age Groups (15 years +)											
		+65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	Total
Urban	Males	5,124	3,932	8,784	10,974	12,579	14,554	17,663	18,930	16,797	13,156	4,282	126,775
	Females	5,427	3,988	5,237	6,254	7,335	7,778	9,561	11,035	11,908	8,224	2,896	79,643
	Total	10,551	7,920	14,021	17,228	19,914	22,332	27,224	29,965	28,705	21,380	7,178	206,418
Rural	Males	8,116	6,834	12,440	14,105	16,870	18,906	24,565	28,612	30,675	26,621	8,874	196,618
	Females	7,011	5,456	7,550	9,217	10,789	10,963	14,047	16,202	19,148	14,707	5,382	120,472
	Total	15,127	12,290	19,990	23,322	27,659	29,869	38,612	44,814	49,823	41,328	14,256	317,090
Total	Males	13,240	10,766	21,224	25,079	29,449	33,460	42,228	47,542	47,472	39,777	13,156	323,393
	Females	12,438	9,444	12,787	15,471	18,124	18,741	23,608	27,237	31,056	22,931	8,278	200,115
	Total	25,678	20,210	34,011	40,550	47,573	52,201	65,836	74,779	78,528	62,708	21,434	523,508

Table (4.7): No. of Employed Egyptians in Aswan (15 years +) according to Educational Status, CAPMAS 2017.

	Sex	Age Groups (15 years +)													
		Ph.D.	Master	High diploma	University	Above intermediate	Technical intermediate	General / Azhar secondary	preparatory	Primary	Intellectual education	Literacy classes	Read and write	Illiterate	Total
Urban	Males	374	222	555	21993	6647	56499	10500	5428	5081	236	687	3393	15159	126774
	Females	130	120	270	11537	3715	24110	6378	4542	3750	129	389	2585	21986	79641
	Total	504	342	825	33530	10362	80609	16878	9970	8831	365	1076	5978	37145	206415
Rural	Males	75	58	382	16231	7487	85635	23465	13152	7253	323	1249	6307	35000	196617
	Females	9	41	226	7551	3266	27769	9858	16144	6121	113	842	4266	44268	120474
	Total	84	99	608	23782	10753	113404	33323	29296	13374	436	2091	10573	79268	317091
Total	Males	449	280	937	38224	14134	142134	33965	18580	12334	559	1936	9700	50159	323391
	Females	139	161	496	19088	6981	51879	16236	20686	9871	242	1231	6851	66254	200115
	Total	588	441	1433	57312	21115	194013	50201	39266	22205	801	3167	16551	116413	523506

4.3.5 Economic Activities and Well Being

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

Agriculture Products and Production

The agricultural activity in the governorate of Aswan is considered to be an important activity which still absorbs 28.5% of the total employed people in the Governorate, it has been found when examining the possibilities for the development of civilization to this sector such as land suitable for reclamation that reach up to 1.3 million acres including lands suitable for reclamation around Lake Nasser.

Among the most important agricultural crops which are famous in Aswan sugar cane, hibiscus, wheat, henna, and dates. The cultivated area with canes are more than 50% of the area of agricultural land preservation, Palm cultivation comes in the second and then the crop of hibiscus, The governorate is characterized by maintaining the production of date with varieties and high quality, maintaining 1.8 million Palms that produces about 93 tons of dates, and there is also a lot of medicinal and aromatic plants, which lend themselves to the conditions of the environment and climate. (Industrial development authority – The industrial development in Aswan).

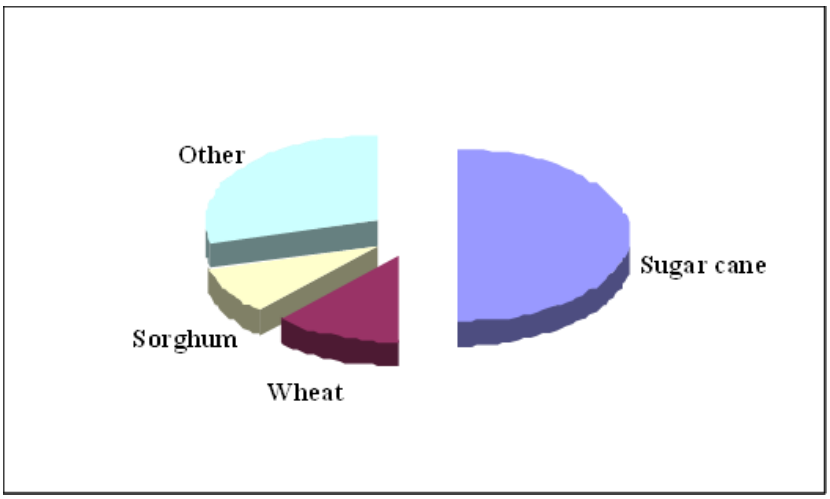

Figure (4.16): Distribution of crops on agricultural areas.

Toshka Development Project

In 1996 the Toshka project was initiated to reclaim and cultivate several hundred thousand feddans of the Western Desert using water from Lake Nasser. The project involved the installation of the world's largest pumps, which will carry water into a long canal. Twenty-four pumps have been installed to raise water to a canal. The canal is 70 km long and will have the capacity to provide 25 million m3 per day. Four irrigation areas totaling 540,000 feddans are being planned

for agriculture, and establishment of integrated agricultural and industrial communities based on agricultural produce, mining, and power production (El-Tahtawy *et al*.,2003).

Toshka project was launched on January 9, 1997, where water has been pumped into Sheikh Zayed Canal in 2003, within the framework of the state's plan to expand the populated area from 5% to 25% of the total area of Egypt, affecting all demographic, economic and social consequences (State Information Service Information Sector).

The project aims to cultivate about 540 thousand feddans, to create a new delta in the south of the Nile Valley, and to provide organic crops. It promotes exportation of grapes, cantaloupe, green beans to the European markets, as well as the cultivation of different types of crops, salient of which are corn, barley, wheat, artichoke, strawberry, grapes, and asparagus (State Information Service Information Sector).

Toshka is located in the Western Desert about 225 km to the south of Aswan. The project contributes to the establishment of an integrated agricultural and industrial communities based on taking advantage of agricultural raw materials, and include industries based on local raw materials, mining, and energy production (State Information Service Information Sector).

The state has taken a set of measures to revive Toshka project where Engineer Ibrahim Mahlab, the former Prime Minister visited the site of the project on July 23, 2014, to identify the hindering problems. On December 17, 2014, the Ministry of Housing, Utilities and Urban Communities has also launched (108) the first phase of implementation of the new city of Toshka, (109) by providing utilities to the first phase, which is going to be implemented later, within the framework of South Valley Development Project (State Information Service Information Sector).

On April 4, 2015, the Minister of Agriculture and Irrigation inspected tests on obtaining water flowing from new groundwater wells experiments in Toshka project. Those tests include drilling 50 new wells for groundwater to reclaim and cultivate 10 thousand feddans (State Information Service Information Sector). The results confirmed that there was sufficient groundwater flow and that the quality of the water met the standards necessary for agricultural use. This positive outcome indicated that the planned reclamation and cultivation could proceed, highlighting the potential for increased land use and crop production in the Toshka area. The project demonstrated a significant step towards sustainable agriculture and food security in Egypt through innovative water management practices.

Toshka Al-Khair Project

Toshka farm area is about 60,000 feddans, the largest farm in Egypt. It is mainly irrigated from Toshka canal through a pumping station with 7 pumps to supply about 7,000 cubic meters of water per hour. As for the date farm in Toshka, 40,000 acres were allocated for the cultivation of high-quality date palm trees. 20 thousand acres of Toshka farm were allocated for the

cultivation of strategic crops, such as corn and wheat, in addition to 200 acres allocated for the grape farm, out of the total area of 300 thousand acres that were cultivated by the National Company for the Reclamation and Cultivation of land at the level of the Republic (see Figure 4.15 above). Moreover, the investment value of the farm is to be maximized through breeding and producing thousands of sheep livestock.

Project Goals:

- Overcoming the food gap through increasing the agricultural area by nearly 500 thousand feddans, then reaching one million feddans in the future.

- Maximizing the return on available resources and increasing the Egyptian agricultural exports, the matter which helps narrowing the trade balance deficit.
- Providing job opportunities for young people, especially in the Upper Egyptian governorates.
- Encouraging the reconstruction and development of these areas thus alleviating the human pressure on the Nile Valley and Delta.
- The project helps achieving self-sufficiency of wheat, so that we only need to import less than a quarter of our wheat needs.

Cultivated Lands in the governorate:

The total area of cultivated land in the governorate is 214.01 thousand feddans (90,070.39 hectares). The cropped area is 271.06 thousand feddans. The most important agricultural crops in the governorate are Sugarcane, hibiscus, wheat, henna, and dates. The area cultivated with wheat represents more than 50% of the agricultural land area in the governorate, and the governorate produces a quarter of the republic's cane production.

The governorate is distinguished by the production of many high-quality varieties of dates, as there are 1.8 million palm trees in the governorate that produce about 93 thousand tons of dates, about 1/10 of Egypt's production of dates. The governorate also has a group of medicinal and aromatic plants that are suitable for the governorate's environmental and climatic conditions. The most important agricultural projects in the governorate: the Toshka project, the valley areas project, the Wadi Al-Saayda project, the Wadi Al-Naqra project, and the coastal agricultural project.

Fisheries: Fish wealth is one of the important resources that contribute to increasing the national agricultural output. Therefore, attention should be paid to development projects of this wealth to maximize its utilization too, and social development meet all needs and to reflect on economy.

Fishing primarily takes place on Lake Nasser, although some fishing activity is going on in the river Nile. Fishing is a major activity in Lake Nasser and is a significant source of fish for the

Egyptian market. Fish Production in 2020 was around 26998Ton which classified into 76 Ton of Neil Tilapia, 1194 Ton of *Procambarus clarkii* and other species.

Livestock: Numbers of livestock and animals (Cows - Buffalo - sheep - goats - Camel) in Aswan reached about 179750headin 2020, as the number of cows reached 47081head in 2020, while the number of buffaloes reached 10932 head in 2020.

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

Governorate	Cows	Buffaloes	Sheep	Goats	Camels	Other Animals	Total
Aswan	47081	10932	50130	19140	38050	14417	179750

Industrial Activity: Aswan Governorate contributes to enhancing industrial activity through many industries, the most important of which are sugar, chemical, fertilizer, and phosphate industries, in addition to preparing & packing fishes.

The industry in Aswan depends on the agricultural main crops, especially thesugarcane upon which the sugar industry depends.

Tourism: Aswan Governorate is the most important tourist area in Egypt, its southern gate and the link between the two parts of the Nile Valley, north and south, and the point of contact between Egypt and Africa. Aswan has many distinctive therapeutic tourist places, and the competent authority is establishing many therapeutic complexes and hospital centers to increase the therapeutic tourist attraction there. Aswan has many natural reserves that contain various types of birds, plants, and animal, plant and natural resources. Aswan Governorate has many historical and archaeological temples that attract many tourists, such as the Philae Temple, the Kom Ombo Temple, and the Abu Simbel Temple, in addition to the Kalabsha Temple.

There are many important Coptic tourist monuments in the governorate. Such as the monastery of Anba Pachomius and the monastery of Anba Hydra, in addition to Islamic tourist attractions such as the Akakhan cemetery, the tribal cemetery, and the Anani Sea cemetery.

4.3.6 Social Services Profiles

Education:

Education is one of the most important criteria for measuring the progress of people and their ability to advance and improve their standard of living. 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.Aswan Governorate is considered one of the governorates that enjoy proper education levels in the different levels of education.

In Aswan, there are 21 research institutions, employing 1,309 researchers. The illiteracy rate (10 years and over) is17.70% in Aswan, which is less than the illiteracy rate in the Republic of 24.10%. There are 1,285 general pre-university education schools in Aswan, benefiting 320.66 thousand students. Classroom capacity in Aswan is 37.51 students/class, which is less than the classroom capacity of the Republic (47.16 students/class), and 96.50% of the total schools.

Governmental dropout rates in Aswan were lower for primary education and higher for preparatory school than dropout rates in the Republic.

Table (4.9): Research Institutions in Aswan, Aswan Governorate - Egypt Description by Information, 2019/2020.

Research institutions	Value
No. of research institution affiliated to:	21 Institution
Ministries	0 Institution
Universities	21Institution
No. of research in research institutions	1309 Researcher

Table (4.10): Illiteracy Eradicationin Aswan, Aswan Governorate - Egypt Description by Information, 2019/2020.

Illiteracy Eradication	Value
Illiteracy rate (10 years and above)	17.7%
Illiteracy rate for males	13.5%
Illiteracy rate for females	21.9%
No. of targeted illiterates	7.24 thousandpersons
No. of students enrolled in illiteracy eradication classes	15.54 thousandpersons
Percentage of people with illiteracy eradicated to those enrolled in illiteracy eradication classes	19.8%

Table (4.10): Illiteracy Eradicationin Aswan, Aswan Governorate - Egypt Description by Information, 2019/2020.

Table (4.11): Public Pre-University Education in Aswan Governorate - Egypt Description by Information, 2019/2020.

Public Pre-University Education	Value
Total number of schools	1285 School
No. of governmental schools	1240School
No. of private schools	45 school
No. of students	320.66 thousand students
No. of classrooms	8.55 thousand classrooms
Average classroom capacity	37.51 Student/ Classroom
No. of teachers	17.77 thousand teachers
Students per teacher	18.05 Student/teacher
Dropout rate in the primary education	0.12 %
Dropout rate in the preparatory education	2.71%

Table (4.12): Al-Azhar Pre-University Education in Aswan, Aswan Governorate - Egypt Description by Information, 2019/2020.

Al-Azhar Pre-University Education	Value
No. of Al-Azhar institutes	232 Institute
No. of students	23.24thousand Students
No. of classrooms	1070Classroom
Average classroom capacity	21.72Student/ Classroom
Percentage of female students to total number of students	43.75 %
No. of teachers	2779Teacher
Students per teacher	8.36Student/ Teacher
No. of institutes provided with computers	157Institute

There are 96 technical schools in Aswan, concentrated in industrial schools 59.38%, commercial schools 27.08%, and agricultural schools 7.29%, benefiting 43.18 thousand students. The average classroom capacity in technical education is 36.75 students/classroom.

In New Toshka city a specialized school has already been established for all educational levels at a cost of 6 million pounds, in addition to the presence of a school for the basic education stage and a nursery for children.

Health:

Health services spread nationwide, which vary between hospitals of the Ministry of Health, Rural and specialized. The private sector also plays a significant role in this field.

Table (4.13): Hospitals of the Ministry of Health & other Entitiesin Aswan, Aswan Governorate - Egypt Description by Information, 2020.

Hospitals of the Ministry of Health & other Entities	Value
Hospitals affiliated to the Ministry of Health	
Public and central hospitals	6 Hospital
Ophthalmology hospitals	1 Hospital
Dermatology hospitals	0 Hospital
Fever hospitals	2 Hospital
Chest hospitals	3 Hospital
Hospitals affiliated to the health insurance authority	1 Hospital
University hospitals	1 Hospital
Educational hospitals and institutions	0 Hospital
Railways authority hospitals	0 Hospital
Private sector hospitals	16 Hospital
Oncology centers	1 center

730 physicians working in Aswan, and the number of citizens per physician reached 2.14 thousand citizen/ physician, which is higher than the average of the Republic (1.33), and 5915 nursing staff members, and the number of citizens per nurse reached 0.26 thousand person/Nurse, which is better than the republic's average (0.68).

Table (4.14): Medical Team & Nursing staff in Aswan, Aswan Governorate - Egypt Description by Information, 2020.

Medical Team & Nursing staff	Value
No. of working physicians	730Physician
No. of citizens per physician	2140.66Person / Physician

Table (4.14): Medical Team & Nursing staff in Aswan, Aswan Governorate - Egypt Description by Information, 2020.

No. of working dentists	199Dentist
No. of working pharmacists	484Pharmacist
No. of working nursing staff	5915Nurse
No. of citizens per nurse	264.19Person / Nurse

1740 total number of hospital beds in the governorate, 78.39% of which belong to government hospitals and the rest belong to the private sector, 898.09 population per bed in Aswan, which is higher than the republic's average (775.54).

849 public pharmacies in Aswan, one of which provides night service, and has 999.96 thousand health insurance beneficiaries, representing 64.88% of the governorate's population, and 56.48 thousand cases were treated at state expense inside Egypt from Aswan, at a cost of 124,79 million pounds.

Table (4.15): Supportive Medical Services & Health Insurance in Aswan, Aswan Governorate - Egypt Description by Information, 2020.

Supportive Medical Services & Health Insurance	Value
No. of beds in governmental hospitals	1364
No. of beds in private hospitals	376
Population per bed	898.09
No. of public pharmacies	849
No. of night service pharmacies	1
No. of ambulances	107
No. of physiotherapy centers	0
No. of health insurance beneficiaries	999.96
Percentage of beneficiaries of health insurance system (% of total population)	64.68

228 family planning units, 21 mobile family planning clinics, and95 nurseries for children in Aswan. In general, all child mortality rates for Aswan were better than the child mortality rates for the Republic.

Table (4.16): Health Care for Childhood and Motherhood in Aswan, Aswan Governorate - Egypt Description by Information, 2020.

Health Care for Childhood and Motherhood	Value
No. of fixed family planning units	228Unit
No. of mobile family planning clinics	21Clinic
Percentage of deliveries under medical supervision	98.94%
No. of premature infant incubators in public and central hospitals	95Incubator
Neonatal mortality rate	6.7Dead neonatal /Thousand live births
Infant mortality rate	13.5Dead infant / Thousand live births
Under-five-year-old mortality rate	19.1Dead child / Thousand live births

New Toshka city includes a fully equipped health unit, which was built and prepared at a cost of 5.5 million pounds. Work is also underway to equip some hospitals and other pharmacies.

4.3.7 Infrastructure

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

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 Aswan.

Water Supply: The governorate depends almost entirely on Nile water for all its water needs. Occasionally, ground water is utilized in remote areas. Accessibility to potable water is high in Aswan Governorate, and almost all the households in Aswan city have access to running potable water.

Sewage Treatment: Aswan has 17 sewage treatment plants with a design capacity of 200.68 thousand m^3 per day, and its actual capacity 187.41 thousand m^3/day.

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

Table (4.17): Access to Potable Water & Sanitation in Aswan, Aswan Governorate - Egypt Description by Information, 2020.

Item	Aswan's Values	Jazan 's values
Consumption of Potable Water	163.40million m^3	90million m^3
Number of connections to public potable water system	328.76thousand households	122,280 Households
No. of sanitation treatment stations	17Station	14 Station
Households connected to sanitation system	329.39thousand households	23,789 House holds

Aswan ranks 9th among the governorates of the Republic in the per capita share of the amount of drinking water consumed at a value of 76.06 m^3/capita, and the percentage of total water loss reached 28.00%. Aswan has 17 sewage treatment plants with a design capacity of 200.68 thousand m^3 per day, and its actual capacity 187.41 thousand m^3/day.

Aswan consumes a larger amount of water than Jazan because Aswan is a busy market and tourist center, and it has more connections to the public water system because of its large number of hotels. Moreover, the consumption could be larger because of the water loss in Aswan due to many reasons, among these reasons are:

- The networks are damaged and exposed to constant fractures, which causes them to lose a large percentage of water.
- Water lost inside the station during disinfection and washing of pipes and washing of filters and tanks.
- Residents' encroachments on the network and the extension of water lines without the company's knowledge (surreptitiously).
- Meters are subject to malfunction and inaccuracy.

According to Egypt Description by Information 2020, 329.39 thousand households in Aswan are connected to the sanitation and sewage networks.

New Toshka city's sewage is collected at two lifting stations and from there via flushing lines to the treatment station which uses the natural oxidation lake method.

A treatment plant will be constructed in four identical stages, and the total amount of design disposal is estimated at approximately34,640 m3/day, and the total expected area of the treatment plant is 264 acres.

Implementing a drinking water network with a length of 11 km (diameters 100 - 600 mm), a water outlet with a capacity of 75 thousand cubic meters/day (civil works) and 10 thousand cubic meters/day (electromechanical works) and a water station with a capacity of 10 thousand cubic meters/day out of a total of 75 thousand cubic meters/day.

Electricity:

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 (4.18): Access to Electricity in Aswan, Aswan Governorate - Egypt Description by Information, 2020.

Item	Unit	Value
Total Electricity Production	Million kwh/year	13525.74
Total Electricity Consumption	Million kwh/year	3269.00
Electricity Consumption for Industrial Purposes	Million kwh/year	828.00
Electricity Consumption for Lighting	Million kwh/year	2441.00
No. of Subscribers in the Electricity Grid	Thousand subscribers	525.84
Per Capita Share of Electricity	kwh yearly/Person	525.84

3269 million Kwh is the amount of electricity used in Aswan, and it ranks 11th among the governorates of the Republic in terms of per capita energy consumption, which amounted to 2091.91 kw/hour per capita.

According to Egypt Description by Information for Aswan governorate, 25.33% of the energy consumed is used for industrial purposes and the rest for lighting and other household uses. The number of electricity subscribers in Aswan is 525.84 thousand.

Implementing the electrical supply of the city with electricity from Toshka Transformer Station (2) (see Figure 4.15 above)., implementing the main distributor, implementing a medium and low voltage network with a length of about 142 km, and implementing (2) sub-distributors to feed the stations.

Roads:

The length of the paved roads network was 5194 km, as 98.26% of the governorate's roads are paved, compared to 1.74% of dirt roads.

Table (4.19): Roads and Transportation in Aswan, Aswan Governorate - Egypt Description by Information, 2020.

Item	Unit	Value
Length of paved roads	Km	5468
No. of bridges	Bridge	5
Fixed bridges	Bridge	2
Movable bridges	Bridge	0
Upper bridges	Bridge	3
No. of licensed vehicles	Thousand vehicles	101.58
No. of licensed taxi cabs	Thousand taxi caps	6.86
Commercial ports	Port	0
Civilian airports	Airport	2

The closest road to the silo is the main Aswan-Abu Simbel Road

Communication:

There are 161post offices and 50 telephone exchanges with a capacity of 338.76thousand lines. The number of fixed-line subscribers reached 103.55thousand subscribers, and the percentage of Internet users reached 48.60%.

New Toshka city's future needs for the target year are estimated at 30,640 telephone lines, 1,560 correspondence circuits, and optical fiber glass will be used as a communication medium.

Table (4.20): Communication and Telegraph Offices and Public Telephone Cabins & Internet Centers in Aswan Governorate, Aswan Governorate - Egypt Description by Information, 2020.

Item	Unit	Value
No. of telephone exchanges	Exchange	50
Capacity of telephone exchanges	Thousand lines	338.76
No. of telephone landlines	Thousand lines	103.55
Percentage of internet users	%	48.60
No. of governmental operating post offices.	Post offices	161

Table (4.20): Communication and Telegraph Offices and Public Telephone Cabins & Internet Centers in Aswan Governorate, Aswan Governorate - Egypt Description by Information, 2020.

Population per post office	Thousand persons/ post office	9.7

Waste Management:

Only about 35% of the generated waste is registered as being collected by public services. This does not mean that 65% of the waste is left in the streets or disposed of in the suburbs. It is evident that virtually none of the generated waste generated in rural areas is collected by public service systems. In Edfu and El Nuba Markaz, there are a limited number of Villages, which have simple waste collection system operated by CDA. Aswan City has the best coverage of public waste collection, followed by Edfu City, Daraw City and Kom Ombo City.

There are nine waste disposal sites in Aswan Governorate. Two of the existing sites are controlled (Aswan and Balana) and the remaining seven are uncontrolled. There are plans for upgrading the uncontrolled site to controlled facilities.

Collection and disposal of solid waste is the responsibility of the city councils. Solid waste collection and management in Aswan City is being privatized and new facilities for solid waste-controlled landfill and transfer station of solid waste from Nile cruisers have recently been established with GTZ support.

Waste collection in the tourist areas is carried out by a private company under contract to the Tourist Development Authority. There is much less solid waste on these streets than in other parts of the city. Recently a tender was held for collection of solid waste in Aswan City, Kom Ombo and Edfu. The service by the private company starts in August 2003. In some villages Community Development Associations (CDAs) are managing solid waste collection after initial support by SDF, Danida and Shorouk. The CDAs collect fees from the serviced households and the operation is reported to be financially sustainable.

The responsibility for industrial waste rests with the industries. Filter cake from sugar production is used as fertilizer. Silicon dust from KIMA Industries and excess dust from the ferrosilicon plant in Edfu is disposed of in the desert. So is urea-formaldehyde dust from the wood factory in KomOmbo.

Two of the other incinerators are functioning but not in compliance with the law (i.e., the incinerators at Aswan Educational Hospital and Al Ramadi Qebli Hospital), and the fourth has been closed due to complaints (Aswan Health Insurance Hospital).

Table (4.21): Amount of garbage collected at the level of the governorates of the Republic in 2022CAPMAS 2022.

Item	Unit	Value
Daily garbage	Tons	600
Average collected per day	Tons	515
Average collected annually	Tons	187867
% Collection efficiency	%	0.9

4.3.8 Investment and Development

According to Industrial Development Authority (The Industrial Development in Aswan), Major national projects, "Toshka giant Project ": This project aims at fulfilling the Egyptians dream of getting out of the narrow valley to a new one capable of achieving higher levels of development and accomplishment.

Furthermore, the Toshka project aims to plant about one million Feddans irrigated with the water of the Nile received through the Sheikh Zayed Canal from Lake Nasser. Thus, it would allow establishing new integrated agricultural and industrial communities attractive for workers. the most important elements of the project, started in January 1997, are as follows:

- Mubarak Giant Lifting Station, pumping water from Lake Nasser to the beginning of Sheikh Zayed Canal
- Sheikh Zayed Canal has a length of 50 km.
- Four branches of the canal for reclaiming about 540 thousand acres in various centers of Aswan and the other governorates as well as more than 1000 jobs in South Valley Agricultural Development Company, mostly for workers from Aswan.
- providing 10000 work opportunities.

Figure (4.17): Water pumping stations on Sheikh Zayed Canal from Lake Nasser to Toshka

According to Egypt's Projects Map, Projects that have been completed until June 2020 in Toshka New City:

- Implementation of (51) medium housing buildings with a total of (612) units.
- Implementation of (51) social housing buildings with a total of (612) units.
- Implementing an industrial zone with an area of 19.1 acres: including 36 plots of land for small and diversified industries with areas ranging from 500 square meters to 650 square meters - 29 plots of land for craft workshops with areas ranging from 300 square meters to 500 square meters - a fire unit - a recovery point - Mosque - commercial consumables - butane gas warehouse.
- Implementation of a drinking water network with a length of 11 km (diameters 100 - 600 mm).
- Implementing a power outlet of 75,000 cubic meters/day (civil works) and 10,000 cubic meters/day (electromechanical works). (not yet completed).
- Implementation of a local water station of 10,000 cubic meters/day out of a total of 75,000 cubic meters/day.
- The roads of this urgent stage will be implemented for a total of 23 km.
- The city was supplied with electricity from Toshka transformers (2), the alternative, a separate and low voltage network about 142 km^2, and (2) sub-distributors to feed the stations.
- Planting works at the main entrance and some roads and sites for large body areas, excavation engineering for windbreaks.

According to Ministry of Water Resources and Irrigation, Investment prospects in Toshka:

First: agricultural investment:

- The region's climate is characterized by warmth and dryness, which helps fruits and vegetables ripen earlier than in neighboring countries.
- Some crops, such as grapes, cantaloupe, and green beans, are exported to European markets.
- Different types of crops are grown such as: Agriculture on the water of Sheikh Zayed Canal and its branches: Corn - barley - wheat - artichokes - strawberries - grapes - asparagus.
- Beach agriculture on both sides of Toshka Creek and the sides of the depressions: Watermelon - cantaloupe.

Second: Animal investment:

The region is characterized by the spread of crops that are suitable for animal feed, which leads to the availability of red meat and dairy products and the manufacture of their products.

Third: Industrial investment:

The region has mineral resources such as lead, precious stones, and iron.

Basalt rocks are available in the area.

Many complementary agricultural industries are being established, such as organic fertilizer, sorting and packaging of vegetables and fruits, and refrigerators and freezers.

Fourth: Tourism investment:

The region has a distinctive desert nature, especially around the Toshka Depression and Lake Nasser.

The project area is located near the Pharaonic antiquities' areas in Abu Simbel.

Tourism:

Aswan Governorate is the most important tourist area in Egypt, its southern gate and the link between the two parts of the Nile Valley, north and south, and the point of contact between Egypt and Africa.

The following is the most important information related to tourism in the governorate:

- Aswan is considered a major attraction for tourists because it is located on the quiet banks of the Nile River and contains many historical monuments.
- The competent tourism authority within the governorate is constantly working to implement projects to achieve a qualitative shift in the tourism sector in addition to highlighting the distinctive cultural facade of Aswan Governorate.

- Aswan has many distinctive therapeutic tourist places, and the competent authority is establishing many therapeutic complexes and hospital centers to increase the therapeutic tourist attraction there.
- Aswan has many natural reserves that contain various types of birds, plants, and animal, plant, and natural resources.
- Aswan Governorate has many historical and archaeological temples that attract many tourists, such as the Philae Temple, the Kom Ombo Temple, and the Abu Simbel Temple, in addition to the Kalabsha Temple.
- There are many important Coptic tourist monuments in the governorate. Such as the monastery of Anba Pachomius and the monastery of Anba Hydra, in addition to Islamic tourist attractions such as the Akakhan cemetery, the tribal cemetery, and the Anani Sea cemetery.

The competent authorities are working hard to protect all important historical monuments by protecting them from the rising water levels of Lake Nasser by moving them to higher places.

Table (4.22): Tourism: No. of Hotels & Resorts (Source: Aswan Governorate, Egypt's Description by information, 1/1/2020).

No. of Hotels & Resort (Hotel & Resort)	5 Stars	4 Stars	3 Stars	2 Stars and less	Under Classification
20	5	3	3	7	2

Table (4.23): Tourism: Some Important Indicators (**Source:**Aswan Governorate, Egypt's Description by information, 1/1/2020).

Item	Unit	Value
No. of Rooms	Room	2569
No. of beds	Bed	5138
Tourism Education:		
No. of hotels & tourism schools	School	6

4.3.9 Fishing and Fisheries

Fish wealth is one of the important resources that contribute to increasing the national agricultural output. Therefore, attention should be paid to development projects of this wealth to maximize its utilization too, and social development meet all needs and to reflect on economy.

Fishing primarily takes place on Lake Nasser, although some fishing activity is going on in the river Nile. Fishing is a major activity in Lake Nasser and is a significant source of fish for the Egyptian market.

Table (4.24): Fish Production Fisheries According to Governorate (**Source:** CAPMAS "Annual Bulletin of Statistics and Fish Production, 2020).

Administrative Cities	Nasser Lake	Fresh Water	Fish Farms	Rice Fields	Total
Aswan	25728	1270	-	-	26998

Quantity: Ton

4.3.10. Archaeology and Cultural Heritage

Aswan Governorate, located in southern Egypt, is considered one of the most important governorates in the Egyptian Republic, as it is famous for its distinguished location on the banks of the Nile River and the distinctive archaeological sites located on its land, in addition to its warm climate and distinctive botanical islands in it, as it was one of the most important cities for the Pharaohs due to its strategic location. It was a strong center for the military army at that time and a special base for the wars that the region fought at that time. In ancient times, Aswan was called (Sunu), meaning (market), because it was a large commercial center for many commercial caravans. The following table represents the most important heritage sites in Aswan Governorate:

Table (4.25): The most important heritage sites in Aswan governorate.

Cultural Heritage Site	Description	Site Features
Abu Simbel Temples	The Abu Simbel Temples are two massive rock temples at Abu Simbel, a village in Nubia, southern Egypt. The construction of the temple complex started in approximately 1264 BC and lasted for about 20 years, until 1244 BC. The site was inscribed as a UNESCO	Ancient EgyptianMonuments

Table (4.25): The most important heritage sites in Aswan governorate.

	World Heritage Site in 1979, as part of Nubian Monuments from Abu Simbel to Philae. It's 65 km away from the silo's location.	
Philae	Philae is currently an island in the reservoir of the Aswan Low Dam, downstream of the Aswan Dam and Lake Nasser, Egypt. It was the site of an Ancient Egyptian temple complex. The temple complex was later dismantled and relocated to nearby Agilkia Island as part of the UNESCO Nubia Campaign project. The most ancient was a temple among them was dedicated to Isis and was built in the reign of Nectanebo I during 380-362 BC. Philae was inscribed as a UNESCO World Heritage Site in 1979, as part of Nubian Monuments from Abu Simbel to Philae. It's around 220 km away from the silo's location.	Ancient Egyptian & Ptolemaic & RomanMonuments
Wadi es-Sebua Temple	Temple of Ramesses, Wadi es-Sebua Temple, is an ancient Egyptian temple located is Aswan Governorate, Egypt. It was inscribed as a UNESCO World Heritage Site in 1979, as part of Nubian Monuments from Abu Simbel to Philae. It's around 150 km away from the silo's location	Ancient EgyptianMonuments
Temple of Beit el-Wali	Temple of Beit El-Wali is a rock-cut Ancient Egyptian temple in Nubia which was built by Pharaoh Ramesses II and dedicated to the deities of Amun-Re, Re-Horakhti, Khnum and Anuket.It was inscribed as a UNESCO World Heritage Site in 1979, as part of Nubian Monuments from Abu Simbel to Philae. It's around 205 km away from the silo's location	Ancient Egyptian Monuments
Edfu	Temple of Edfu is an ancient Egyptian temple, located on the west bank of the Nile in Edfu, Upper Egypt. The city was known in Greco-Roman times as Apollonopolis Magna, after the chief god Horus-Apollo. It is one of the best-preserved shrines in Egypt. The temple, dedicated to the falcon god Horus, was built in the Ptolemaic period between 237 and 57 BC. It's around 335 km away from the silo's location	Ptolemaic Monuments

Table (4.25): The most important heritage sites in Aswan governorate.

Kom Ombo Temple	Temple of Kom Ombo is an unusual double temple in the town of Kom Ombo in Aswan Governorate, Upper Egypt. It was constructed during the Ptolemaic dynasty, 180-47 BC. Some additions to it were later made during the Roman period. Much of the temple has been destroyed by the Nile, earthquakes, and later builders who used its stones for other projects. It's around 263 km away from the silo's location	Ptolemaic & Roman Monuments

4.3.11. Child Labour Indicators

According to Central Agency for Public Mobilization and Statistics (CAPMAS) has issued a press release on November 20th, 2022, Percentage of child labor aged 5-17 years who did economic activities or household chores decreased to 5.6% compared to 7% in 2014.The highest percentage of child labor was in Upper Egypt, which reached 7.4%, while the lowest percentage of child labor was in the Frontier and urban governorates, where it was recorded (2.6% and 2.7%, respectively).

When comparing the percentage of child labor between urban and rural areas, it became clear that percentage of child labor in rural areas is the highest, reaching 8.4% in Rural Upper Egypt and 5.7% in Rural Lower Egypt.

There are 1.6 million working children, or 9.3% of the children in Egypt, which represents one out of every ten children. And 82.2% of them are exposed to poor and unsafe working conditions.

The survey indicated that the older the child, the higher his exposure to poor working conditions; As 83% of all working male children between 12-17 years are exposed to poor working conditions, and this percentage increases in the age group 15-17 years to reach 89%, while the percentage among females in the same age group reaches 93%

According to data from the Central Agency for Public Mobilization and Statistics, the phenomenon of child labor in Egypt includes 1.6 million children in the age group of 12-17 years, a large percentage of whom are about 65% working in the agricultural sector, and about 20% working in the industrial and mining sector.

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 were exposed to violence sexual.

Strangers' male were the perpetrators of the vast majority of 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. Most women who were recently exposed to violence at the hands of any family member, close person, or those in the surrounding environment did not seek any service or contact the official authorities to confront the violence they were exposed to.

Table (4.26): 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

A retrospective descriptive study of reported sexual assault victims to Aswan Forensic Medicine Authority (records from 1st of January 2010 to 31st of December 2015). Records of sexual assaults (46 cases) were analyzed as regard type of assault and interval between the assault and reporting to authorities.

Table (4.27) demonstrates that the highest percentage of sexual assaults were encountered in 2012 records representing 28.26% (13 cases) followed by 2014 with 17.40% (8 cases), then 2010 with percentage of 15.22% (7 cases), and lastly the years of 2011, 2013 and 2015 with 6 cases recorded in each year (13.04%).

Male victims represented 54.3 % (25 cases) of reported cases, while females represented 45.7% (21 cases). 91.3% of victims were unmarried while married victims represented 8.7% of cases only (one male and three females).

Table (4.27): Distribution of sexual assaults through years of the study duration and its relation to population (2010-2015).

Year	Frequency (percentage)	Population of Aswan Governorate*
2010	7 (15.22%)	1278978
2011	6 (13.04%)	1308589
2012	13 (28.26%)	1340279
2013	6 (13.04%)	1374985
2014	8 (17.40%)	1412300
2015	6 (13.04%)	1431488

Table (4.28): Distribution of victims according to gender and marital status, Source (CAPMAS, 2016).

	Males	Females	Total
	25 (54.3%)	21 (45.7%)	46 (100%)
Married	1	3	4 (8.7%)
Unmarried	24	18	42 (91.3%)

According to the WB's background note on gender equality and climate change (2024), women in Egypt bear the responsibility for unpaid care including household chores, children raising and family care. Additionally, women have less rights to land than men, low access to financial resources, services and technologies and low participation in their community's formal decision-making processes particularly in rural areas and specifically in the agriculture sector.

Women farmers are responsible for the following activities: sowing seeds, weeding, cultivating, harvesting crops, selling products, and taking care of gardens. Yet, despite their major support in agriculture activities, their important roles in agriculture activities are not recognized due to gender bias. ((SYPE 2010-2014) survey and ILOSTAT 2020).

Over 71 percent of Egyptian women in rural areas are reported to be working in unprotected informal jobs (most of them working without pay in family businesses). Even when considering only formal employment in agriculture, men are mainly employed as full-time workers (FAO, 2022).

4.3.13 Other Main infrastructures in Toshka

The Toshka area, has undergone significant development aimed at transforming it into a viable agricultural and residential region. The Toshka Project, is a large-scale initiative to create a new agricultural area using water from Lake Nasser.

New Toshka

The new city of Toshka was established by Presidential Decree No. 199 of 2000, and its location was modified by Presidential Decree No. 268 of 2006, with the aim of creating an integrated urban community that supports the Toshka agricultural project located northeast of the Sheikh Zayed Canal.

Toshka Depression (Toshka Lakes)

The Toshka Depression is located south of the Western Desert (west of the Nile Valley) and is divided into four secondary depressions that are partially connected to each other. Its area is 13,142 km2, and thus it ranks second in terms of area among the depressions of the Western Sahara, while the depth of the bottom of the depression is 102 meters above sea level at its lowest level, and thus it ranks seventh among the depressions of the Western Sahara in this characteristic. Most of the depression's terrain is located between levels of 175-200 m. The establishment of the Toshka spillway canal and the transfer of surplus water from Lake Nasser to the depression gave the region the name Toshka Lakes due to the receding water in it, which some experts estimated its storage capacity at 80 to 120 billion cubic meters. Due to the nature of the slope of the land, it is not possible to return it again to the course of the Nile River or Lake Nasser. Its storage capacity reaches 162 billion cubic meters.

Wadi Toshka (Khor Toshka)

Khor Toshka branches off from Lake Nasser and empties into Wadi Toshka in the Western Desert. It has a Nile drainage system that is considered one of the largest natural

Nile drainage networks in the system extending from the Egyptian-Sudanese border to the Kalabsha Valley, west of the Nile, with a drainage network length of 928.9 km.

Toshka spillway

Toshka spillway is a group of concrete weirs "Toshka weirs" established at the point where the Toshka spillway channel connects with the Toshka depression to regulate the process of water falling in what is known as Toshka Falls.

Toshka spillway channel

The canal is located west of Lake Nasser and east of the Toshka area, connecting Lake Nasser and the Toshka Depression through the mainstream of Wadi Toshka. Digging the canal began in 1977 by deepening the course of Wadi Toshka and began operating it in 1982. The canal begins at kilometer 32.8 from the canal axis with a free outlet at a level of 178 meters. Concrete foundations 10 meters long and 750 meters wide are followed by a water filter area built of graded stone along the length. 10 meters to protect the channel outlet from corrosion. The length of the canal is 22 km and its width at its entrance is 750 m. This width gradually decreases until it reaches 350 m. The canal ends with a downstream weir about 2 km before its entrance into the Toshka depression. The canal was part of the plan to build the High Dam, and its main function was to avoid any increase in the water level of Lake Nasser beyond the prescribed limit of 178 m, so as not to negatively affect the body of the High Dam, especially in cases of high floods. The canal's construction was completed in November 1996.

The spillway channel was later widened and deepened in several stages with the aim of increasing the channel's drainage capacity to reach 220 million cubic meters per day when needed to drain high flood waters that exceed the carrying capacity of Lake Nasser and store them in the Toshka Lakes.

Toshka station for high-speed electric train (In progress)

It is one of the stations of the high-speed electric train project, which will provide a clean, smart and sustainable transportation system, to serve the Toshka area as an agricultural-industrial area and a new development area.

Toshka Agricultural Project

The Toshka project is one of the three sides of the South Valley Development Project, which consists of (the Toshka project, the East Owainat project, and the Darb Al-Arbaeen project). The project is subject to the supervision of the Ministry of Water Resources and Irrigation and the Ministry of Agriculture and Land Reclamation.

Toshka Pump Station (Mubarak Pump Station)

It is a giant water lifting station for pumping water from Lake Nasser to the Sheikh Zayed Canal and then to its four branches. The station is connected to a main control room with all barrages at the canals and control barrages with an electronic link system, so that the amount of water coming out of the station units is controlled according to actual irrigation needs. The station is located on the left side (western side) of Lake Nasser, approximately 8 km north of Khor Toshka. The station consists of 24 pump units, including three reserve units and three units for future expansions. The maximum static lift of the station is 54 metres, ensuring continuity of operation when the water level in Lake Nasser drops to the minimum storage limit.

The design capacity of the station is 25 million cubic meters per day in the first phase. The construction of the station was completed, and final testing experiments were conducted for 21 lifting units, at a total cost of establishing the station about 1,480 million pounds.

Sheikh Zayed Canal (formerly South Valley Canal)

The Sheikh Zayed Canal begins with a concrete structure with a length of 3.35 km and a bottom width of 9.5 meters. It consists of two U-shaped units in order to overcome the problem of low levels in the region, as it connects the expulsion basin of the Mubarak Pump Station, which has a concrete structure, and the relatively high level. Sheikh Zayed Canal, which has a low level.

Main channel

It is about 50 km long and its bottom is 30 meters wide. A bridge (main mouth bridge) was constructed on the canal to control water levels, as well as a subsidiary canal near its end that connects it to the Toshka spillway canal to drain water in excess of safe operating levels. The channel branches at its end into two directories: subdirectories (1) and (2) and subdirectories (3) and (4).

Electricity station (existing)

Transformer stations and electricity transmission and distribution lines include:

- Toshka transformer station (1) to serve Mubarak pump station.
- Toshka transformer station (2) to feed repair stations (1), (2), (3) and (4)
- Repair station (1) to service sub-reins (1) and (2)
- Repair station (2) for Zamam service branch (4)
- Repair station (3) to serve the 12,275kilometer lift station on branch (3).
- Repair station (4) to serve lift stations at kilometer 16,370 and kilometer 23,203 on branch (3).

- Electricity transmission and distribution lines with a length of 280 km.
- Three electrical distribution panels.

New Toshka City Services

All these services in New Toshka are functioning.

- A mosque
- A health unit.
- A commercial center.
- A school.
- A water station.
- Basic education and nursery school.

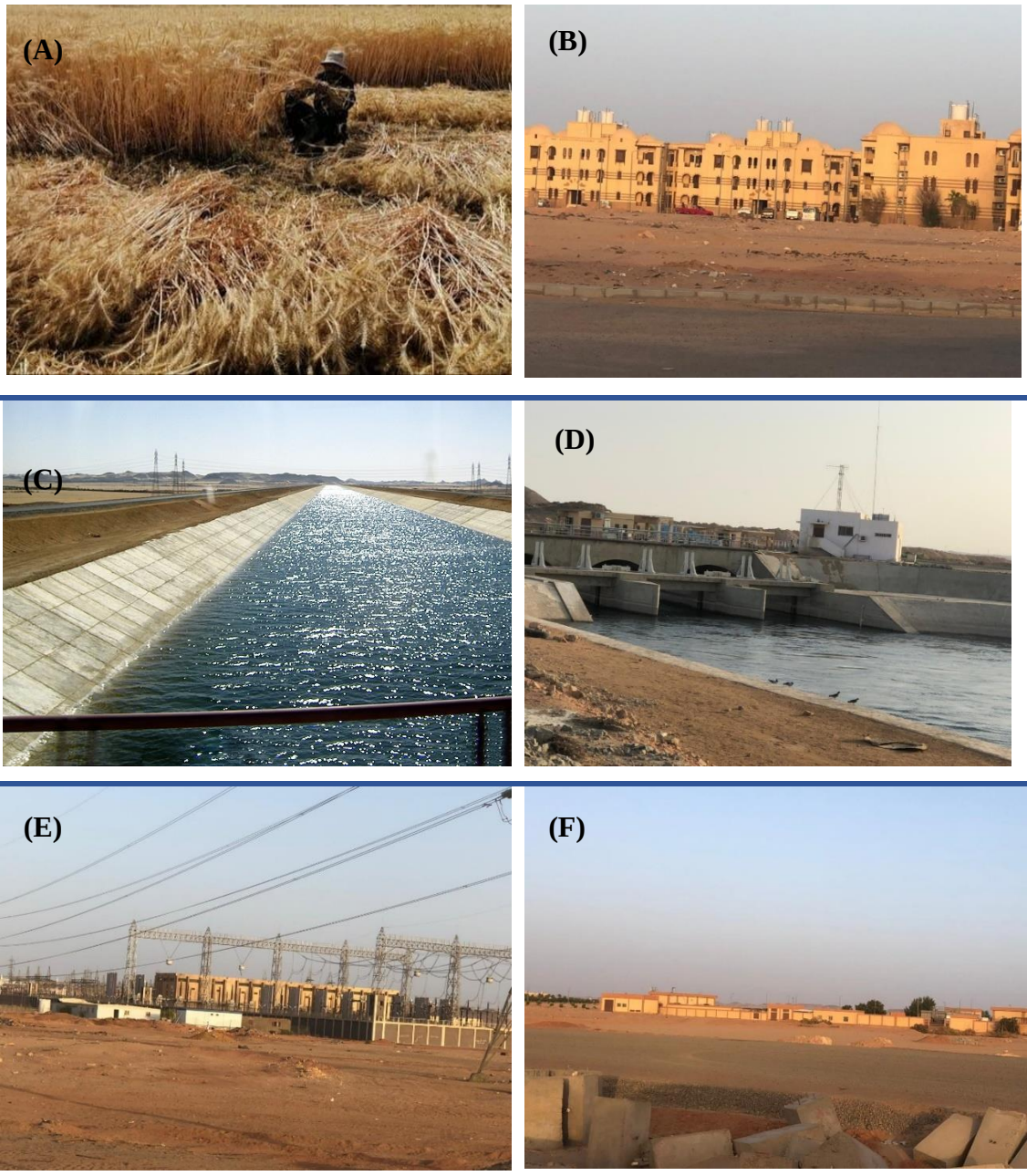

Figure (4.18): Some photographs showing the different land use in the study area. (A) agricultural development area, (B) residential area in the New Toshka, (C) Sheikh Zayed Canal, (D) bridge over the water canal, (E) Electricity station, and (F) infrastructure and utilities.

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 Toshka Silo Complex as component 2.1 in Emergency Food Security and Resilience Support Project (P178926):

- No development (No action).
- Alternatives of the location of Toshka 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:

- 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 Toshka 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 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 favourable 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 unrealistic 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 Silo is approved by EHCSS after many discussions. Three options of the location of Toshka Silo were suggested as following:

- **Option A (Preferred):** the location described in the sub-project drawing.
- **Option B:** in Southern part of land.
- **Option C:** in Northern part of land.

After reviewing the different alternatives of location of Toshka Silo Complex in Aswan. Option (**A)** was preferred according to many economic, social, environmental, and engineering considerations. So, the consultant (SENS) recommended option (**A)** as the suitable location for Toshka Silo Complex in Aswan.

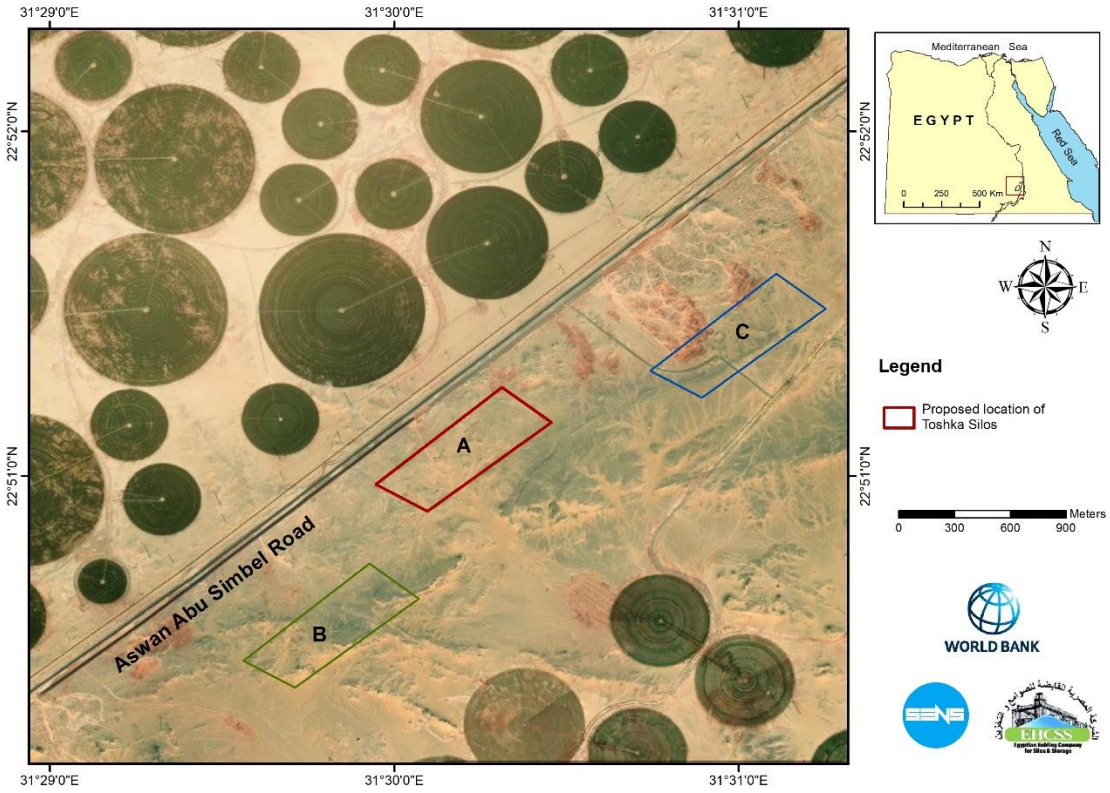

Figure (5.1): Map showing the three alternatives of location of Toshka Silo Complex.

This alternative for the location was chosen in consultation with the company EHCSS and the engineering consultant for the Toshka silo complex construction sub-project because of the advantages of this location that are summarized in the following:

- Close to the main roads leading to the silo complex.
- The level of the ground in that area.
- Close to the wheat production areas in Toshka.
- Geotechnical studies that confirm the validity of the construction process.

Also, from an environmental standpoint (SENS), this location is very suitable for establishing the silo complex in Toshka.

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 Toshka Silo was selected to minimize impacts on local biodiversity, avoiding social impacts. The design

of Toshka 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

- 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 Toshka 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 Toshka 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 storage capacity of the cells in Toshka is large and amounts to about 10,000 tons of wheat for each cell in the new complex.

The presence of the Toshka silo complex in a desert area far from the main cities and close to the wheat production areas imposes certain arrangements for the units of the silo complex to be implemented to consider the nature and location of the silos as well as the workers in them.

The engineering drawing was reviewed and consulted with the project's engineering consultant and the company's management, and it was found that the arrangement of the units, which include the location of the cells, administrative offices, workers' housing, and gates, is appropriate and could be the best alternative to the other alternatives that were studied for arranging the units within the silo complex in Toshka.

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.

- 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 Toshka. 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: Surface water (Lake Nasser) is located at about 17 Km (the distance from the silo site to the nearest point of Lake Nasser. Sheikh Zayed Canal is located about 6 km away from the silo site location. Therefore, the sub-project is unlikely to have an impact on surface water resources.
- Sub-surface water resources: Groundwater is located at a deep level. Therefore, the project is unlikely to have an impact on groundwater resources (for example through fuel leaks or leaks of other substances) additionally the project will use water obtained from Lake Nasser and will not use groundwater. The amount of water used during construction phase will be temporary and a small amount of water will be used during

the operational phase. The estimated quantity of water during the construction phase will be about 3404 m3/ whole construction period 2 years. While during the operation phase, water will mainly be used, for drinking and sanitation purposes in the Toshka Silo Complex site (the average monthly consumption of water is from 70 to 140 m^3).

- Air, Noise and Vibration receptors: The subproject is located in a desert area. However, the closest agriculture reclaimed land is located 0.3km west of the silo site. The closest community is new Toshka which is located at 4 to 5 Km away east of the proposed silo site. Since the most prevailing direction of the wind is mainly Northwest and North Northwest, air emissions will most likely travel towards the southeast where there are no residential areas or local communities present. Some huge, reclaimed lands are present southeast of the project site which may be impacted by construction works mainly from dust. However, they are located at about 0.95km away from the edge/borders of the construction site (see figure 6.1 below). Additionally, noise and vibration are located at significant distance from the residential areas (the closest area is located at 4 to 5km away to the east).
- Land use within 1 km radius from the project site mainly encompasses the reclaimed agriculture lands, and part of Aswan / Abu Simbel Road.
- Traffic receptors including noise, vibration from vehicles, additional traffic and associate increase of accident risk will be mainly on the Aswan / Abu Simbel Road as most of the heavy traffic is expected to use this road which is located more than 150m away north from the project site. Traffic risks on the nearest residential area (The New Toshka city) is considered as low since the distance to the main road (Aswan / Abu Simbel Road) is about 700 – 800m. The traffic related to the Silo will not pass through these residential areas.
- 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. Additionally, there is only one road (Aswan / Abu Simbel Road) that will be used during the transportation of the equipment during the construction phase, and also will be used during the operational phase.
- **Biological:** the subproject is located at about 17 km from the nearest point of Lake Nasser which is considered as IBA and IPA and also

Bird's migration route, and is located at a significantly long distances to the nearest protected areas and sensitive areas (more than 100km away). Therefore, an area of influence for possible impacts on biodiversity is not required.

- **Social:** the area of influence for social risks and impacts are the communities using the silo throughout Aswan governorate including but not limited to the New Toshka area. Social area of influence could include road infrastructure including Aswan / Abu Simbel main road (access road to project). Social area of influence also includes the farmers who will benefit from storing wheat at the grain silos, and another from local stakeholders who will be able to withdraw wheat from the silos.
- **Cultural heritage sites:** All heritage sites are located at significant distances from the project site (refer to baseline). Yet, the ESIA will include a chance find procedure in the mitigation measures during construction works.

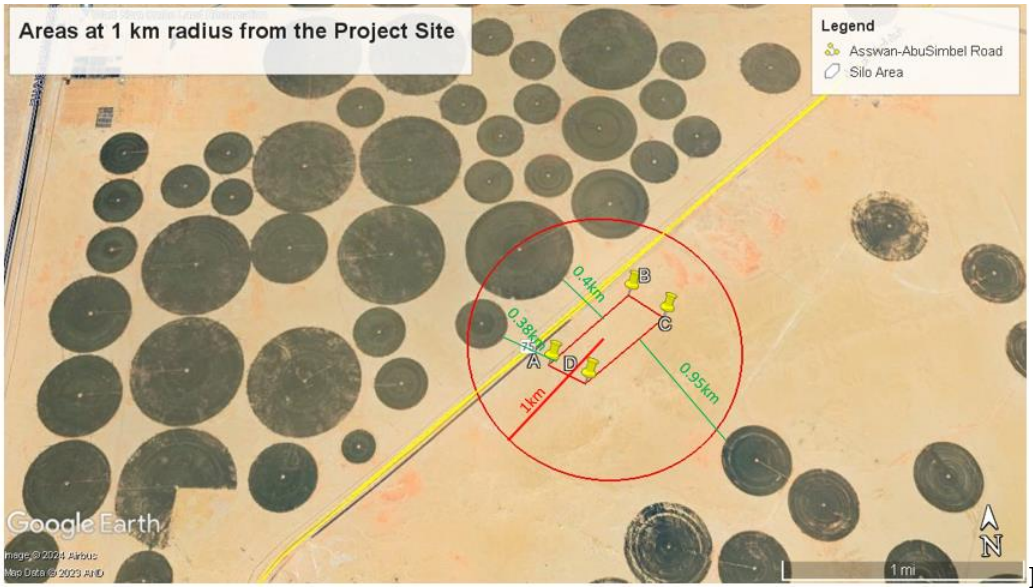

Figure (6.1): Map showing land use within 1km radius from the project site's centre point.

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
- 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
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:

- 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

➢ **<u>Unplanned activities risks and impacts</u>**

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:

- 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 Toshka, 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:**
  - **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.

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 Toshka Silo sub-project have been defined as follows:

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

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 Toska silo site is a desert area, 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 (16 months) dust emissions from construction activities. Therefore, the magnitude of the impact is deemed s**mall** the emissions will be limited, mainly affecting the work environment. The vulnerability of the receptor (industrial zone with food industry) is **medium.** Therefore, the significance of the impact is **Minor.**	1 Short term	1 Localized	2 Slight	4 Small	**Medium**	**Minor**	Insignificant/Negligible
	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 engines/	• As above, Construction activities will result in slight, localized, short term (16 months), air quality emissions from fuel combustion/burning from construction equipment, machineries and transport vehicles. The vehicle exhausts together with dust generated constitute major pollutants	1 Short term	1 Localized	2 Slight	4 small	**Medium**	**Minor**	Insignificant/Negligible

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			
		generators/ vehicles and machineries used present another risk to air quality on and close to construction sites.	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 (industrial zone with food industry) is **medium**. Therefore, the significance of the impact is **Minor.**							
	Risks on Soil and	• The project may impact soil	• Construction activities resulting in soil and	1	1	2	4	**Low**	**Insignificant**	Insignificant/Negligible

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			
	Water resources contamination	quality and groundwater quality (on the long run) from; • Accidental oil and fuel spills from 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.	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 slight, localized and short term with an overall magnitude level of **negligible-small.** The soil and groundwater vulnerability are considered **low,** firstly because spills on the soil can be easily contained and cleaned and groundwater is located at a deep level. • The significance of the impacts is therefore assessed to be **insignificant**.	Short term	Localized	Slight	Small			

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 from the establishment of electricity connection to the silo may lead to contamination of soils if 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	• 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 new Toshka is located at more than 4km away. Therefore, the significance of the impact is **Minor.**	1 Short term	1 Localized	2 Slight	4 Small	**Medium**	**Minor**	Insignificant/ Negligible

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 compressors.								
	Biodiversity/ pesticides consumption by non-targeted species The risk of hunting and disturbance of wild animals in case they are present Bird collision risk	• 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 rodenticides by accidents or consume the dead rodent if not collected right away and disposed properly and in turn leading to	• This impact is slight, localized and short 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. The presence of gazelles and hyenas although unlikely. The lack of vegetation in the area, and the dryness of the area renders the area unattractive to Gazelles. Moreover, bird collision risks are low as explained in the baseline section (the risk of bird collision during migratory season is low, since the silo design already include aviation obstruction lighting which is used to enhance visibility of airplanes and birds in order to avoid any collision or obstacles, and the risk of collision is higher	1 Short term	1 Localized	2 Slight	4 Small	**high**	**Moderate**	Minor

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			
		their secondary poisoning.	when the buildings are made of glass which is not the case in the silos). The vulnerability of the receptor is **high.** Given the high importance of the receptor and the short term duration of the risk, the significance of the impacts are assessed to be**Moderate .**							
	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.	This impact is slight, localized and short 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 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	1 Short term	1 Localized	2 Slight	4 Small	**Low-Medium**	**Insignificant-minor**	Insignificant/Negligible

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			
		• 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 electricity connection to the silo. **Liquid waste** • Potential wastewater from concrete mixing, equipment	of the impact is deemed **Insignificant- Minor**.							

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			
		washing, sanitation. **Hazardous waste** • Potentially hazardous waste from paints, solvents, oils, pesticides containers and chemicals. • E-wate may be generated during the establishment of the eclectricity connection to the silo.								
Socioeconomic Aspects	Risks to labor from inappropriate working	• Unfair treatment (discrimination, delayed payments, unsafe working conditions).	• 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	1 Short term	1 Localized	2-3 Slight-Moderate	4-5 Small	**High**	**Moderate**	Moderate

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			
	conditions	• Unresolved complaints from the lack of grievance mechanism for workers.	project workers) is **High.** Therefore the risk significance is deemed M**oderate**							
	Child Labor	• Exploitation of children in construction work. • Hazardous working conditions. • Interference with education. Increased vulnerability to exploitation or abuse	• 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 significance is deemed **Major.**	4 Long term	1 Localized	4 Severe	9 moderate	**High**	**Major**	Major

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 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 risks and accidents	• Traffic accidents due to the increase in number of trucks during construction phase may pose	• 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

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			
		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.								

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			
	Communities' discontent /dissatisfaction	This risk can be encountered as a result of • lack of transparency in information sharing including information about the impacts and mitigation measures • Lack of consultation • Risks of increase in unresolved complaints	• 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 communities needs. The Magnitude is therefore assessed to be **Moderate.** The sensitivity of the receptors (construction project workers) is **High.** Therefore, the risk significance is deemed **Major**	4 Long term	2-3 District-regional	2 Slight Severity	8-9 Moderate	**High**	**Major**	Moderate

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			
		NA	NA	NA	NA	NA	NA	**NA**	**NA**	NA
	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.								
OHS Aspects	Occupational Health and Safety (OHS) risks/ Lack of OHS considerations	• The use of hazardous materials and chemicals and wastes can pose a risk to worker health (i.e. cement, paints, oil etc.). • Falls from heights are a possible cause of	• The risks are long-term (Major injuries which may result in long-term health impacts, loss of limb etc), localized and are severe. The magnitude of the risks is deemed **moderate**. The sensitivity of the receptor is **High** prior mitigation measures**.** Therefore, the risk significance is deemed **Major**	4 Long-term •	1 Localized	4 Severe	9 Moderate	**High**	**Major**	Moderate

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			
		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.								

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			
		• 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 being lifted by cranes. • Physical injuries from physical activities and wrong lifting techniques, wrong posture								

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			
		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 while installing the Silos. • Getting hit by moving load/vehicle/machine.								

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 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 hazardous materials, such as contaminated soil or water. • High temperatures								

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			
		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 Electrocution and fire risks. • Workers may need to climb poles or structures, increasing the								

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			
		risk of falls from height. • Risk of accidents involving machinery used for digging and cable laying. • Potential exposure to hazardous materials such as old or damaged insulation, batteries and e-waste. • High temperatures may cause heat stress or sunstroke among workers.								

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**. • The impact significance is deemed **Major**.	• Seldom	• **Major**	• **Moderate**	• Moderate

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)	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 center pivot 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 center pivot 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.** • Moreover, Contractors usually follow Egyptian	• Occasionally	• **Moderate**	• **Moderate**	• Minor

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

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	4 Long term	1 Localized	2 Slightly Severe	7 Moderate	**Medium**	**Moderate**	Insignificant

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			
			deemed **Moderate**							
	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). • Exhaust fumes and gaseous emissions such as NOx, Sox and Particulate matter (PM2) and	• 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	4 Long term	1 Localized	4 Severe	9 Moderate	**Medium**	**Moderate**	Minor

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			
		(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 • Odors emanate from fermenting grains. A major contributor to the odor is dimethyl disulfide which has been identified	deemed **Moderate**							

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			
		as a key component of the emitted volatiles. This is often accompanied by hydrogen 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 produced								

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			
		from fermenting grains. Fermenting or molding grain produces carbon dioxide (CO2), nitric oxide (NO), and also compounds known to be respiratory irritants such as nitrogen dioxide (NO2) and nitrogen tetroxide (N2O4). However, individual reactions to silo gas depend on the concentration of inhaled gas and length of exposure. While low NO2 concentrations can cause coughing, labored breathing, and nausea, high concentrations can								

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			
		cause fluid to fill the lungs.								
	Impacts on Soil and long-term risks on ground Water quality from trucks and machineries	• Soil contamination and water pollution are accidental and mainly due to: ➢ Mismanagement 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 Toshka. ➢ Inappropriate waste disposal	• The operation and maintenance phase may result in long-term, localized and slightly severe risks on soil contamination. 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	4 Long term	1 Localized	2 Slightly Severe	7 Moderate	**Low**	**Minor**	Insignificant

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			
		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 chemical (Phostoxin) may pose risk of contaminationAccidental spills from generator	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 contained and cleaned and groundwater is located at a deep level. • The significance of the impacts is therefore assessed as							

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			
			Minor/insignificant.							
	Ambient 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 fans and pumps, conveyer belts, motors and other units, and c) the movement of vehicles and machinery in and around the Silos project site	• Construction phase will result in slight, localized, long-term noise emission from silos operations. Therefore, the 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	4 Long term	1 Localized	2 Slightly Severe	7 Moderate	**Medium**	**Moderate**	Insignificant

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			
		• noise from the generator.	residential area is in The New Toshka is located at more than 4km away. 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 machinery can pollute the air and	• This impact is slight, localized and prolonged-term**.** The magnitude of the impact is **small**. Moreover, bird collision risks are low as explained in the baseline section (the risk of bird collision	3 Prolonged-term	1 Localized	2 Slightly Severe	6 Small	**High**	**Moderate**	Minor

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			
		water, which can harm animals if any. • Hunting of wild animals or collection for trade by occur/presence of hyaenas and gazelles • Bird collision risks	during migratory season is low, since the silo design already include aviation obstruction lighting which is 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). The vulnerability of the receptor is							

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			
			high (Gazelles and Hyaenas and migratory birds). Given the high importance of the receptor, 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	4 Long term	1 Localized	2 Slightly Severe	7 Moderate	**Low-Medium**	**Minor-Moderate**	Insignificant

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.	disposal of wastes), the risks can be easily contained. Therefore, the 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	• Silo workers and seasonal workers may face unfair	• Those risks are of **longterm-**, **localized** with	4	1	4 Severe	9 Moderate	**High**	**Major**	Moderate

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			
	appropriate work conditions and risks on Seasonal Workers	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	a **severity level** equals to **Severe.** The Magnitude is therefore assessed to be **Moderate.** The sensitivity of the receptors (construction project workers) is **High.** • The risks are therefore deemed **Major.**	Longterm	Localized					

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			
		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 the silos. Cleaning is done every beginning of the season								
	Risks on vulnerable	• Gender, ethnicity and other social	• This risk is long-term,	4	2	3	9	**High**	**Major**	Minor-Moderate

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			
	populations	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	district level, moderately severe. The magnitude is therefore **moderate**. • The sensitivity of the receptor is **high.** The impact level is therefore deemed **Major.**	Long term	District	Moderately Severe	Moderate			

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			
		food accessibility to vulnerable population.								
Socio-economic Aspects	Risks on children/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 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	4 Long term	1 Localized	4 Severe	9 Moderate	**High**	**Major**	Major

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			
			Moderate. The sensitivity of the receptors (children below the age of 18) is **High.** Therefore, the 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	4 Long-term	1 Localized	2 Slightly severe	7 Moderate	**Medium/Moderate**	**Moderate**	Minor

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			
			magnitude is deemed **Moderate**. The sensitivity of the receptor is **Medium/Moderate.** The overall impact significance is **Moderate.**							
	Community health and safety: Traffic risks and accidents	• Risks of increase in traffic and road accidents during high storage seasons.	• 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.	4 Long term	2-3 District-Regional	3 Moderately Severe	9-10 Large	**High**	**Major**	Moderate

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 sensitivity of the receptor is **High** The overall risk significance level is **Major.**							

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			
Occupational Health and Safety (OHS)	Risks from silo operations	• Risks on workers respiratory system: Grain dust pollution while loading and	The OHS risks are long-term, localized and severe. The	4 Long term	1 Localized	4 Severe	9 Moderate	**High**	**Major**	Moderate

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			
	on workers	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 accidently falling in silos while working at height during maintenance • Asphyxia from working in confined areas while conducting maintenance works.	magnitude is therefore, **moderate**. The sensitivity of the receptor is **High.** The overall risks are assessed to **Major**.							

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 potential injuries • Risks of burns from hot surfaces • Noise and vibration emissions from								

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			
		silos operations and units, • Unhygienic practices • 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								

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 snake and/or scorpion bites								

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	• 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	• Occasionally	• Major	• Major	• Moderate

Factors	Impacts/risks	Description	Impact Summary	Probability of occurrence	Level of risk	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
		may lead to explosion • Risk of leaks of Phostoxin during transportation • Fire risks from transformer	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 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	Risk of property losses	• Catastrophic events such as explosions	• Fire and explosion from silo operations can lead to loss of	• Occasionally	• Moderate	• Moderate	• Minor

Factors	Impacts/risks	Description	Impact Summary	Probability of occurrence	Level of risk	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
events (fire and explosion)		and fire events can produce major negative impacts on the livelihood of silo users and nearby agriculture lands and irrigation systems.	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 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				

Factors	Impacts/risks	Description	Impact Summary	Probability of occurrence	Level of risk	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
			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. • 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	• Likely	• Moderate	• Moderate	• Minor

Factors	Impacts/risks	Description	Impact Summary	Probability of occurrence	Level of risk	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
			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 and groundwater resources are considered as Valued Environmental Components (VECs) in and around the project area, which may be affected by the cumulative development and other external factors. There are national plans to increase agriculture reclaimed lands in Toshka which may put pressure on water resources. The number of reclaimed lands is about 720 thousand feddans according to ministry of agriculture during press conference conducted in May 2024 and is expected to reach 1 million feddan in the coming years.

Nonetheless, the reclaimed lands mainly rely on surface water obtained from Lake Nasser (see socio-economic baseline). The land size of the reclamation projects is regulated based on the water availability which is regulated by the Ministry of Water Resources and Irrigation (MWRI). In other words, new agriculture land areas are decided based on water availability which is regulated by MWRI.

Lake Nasser capacity is around 168 billion m3/year. The Toshka area relies largely on water obtained from Lake Nasser. The present amount of water pumped from Lake Nasser to Toshka is around 25million m3/day (around 9 billion m3/year). There is an international supervisor that monitors the amount of water pumped from Lake Nasser to Toshka (25millionm3/day).

Other stressors on the lake include climate change and an increase in water evaporation (El-Shirbeny & Abutaleb (2018)). Climate data predicted an increase in evaporation rate by 2% in the year 2050 (El-Mahdy et al., 2021) Increased global competition on water resources may also put pressure on Lake Nasser water budget (Abd Ellah, 2020).

The Toshka silos will rely on surface water from Lake Nasser obtained from the water network and will not use groundwater resources (located at a deep level). A small connection will be linked to the existing water network. The amount of water used during the construction phase will be temporary and a small amount of water will be used during the operational phase. The estimated quantity of water during the construction phase will be about 1702 m3/year or 3404 m3 /2 years (construction period). While during the operation phase, water will mainly be used, for drinking and sanitation purposes in the Toshka Silo Complex site (the average monthly consumption of water is expected to range between 70 to 140 $m^{3/}$month= 105m3/month as monthly average= 1260m3/year).
The percentage of water that will be used during construction phase from the total amount of water pumped to Toshka is less than 10^{-5}% (0.15×10^{-5}%)/year whereas the percentage during operational phase is significantly lower 0.11×10^{-5}%. Both are largely negligible.

The contribution of the project in reducing Lake Nasser ‘s water amount is negligible and government plans on the increase of land reclamation areas in Toshka will carry on whether the silo will be established or not. The silos will not lead to more reclaimed lands however it will be established to serve for the agriculture lands in the area and to respond to the expected increase in crop production as planned by the government. Therefore, the project

is unlikely to contribute to the cumulative impacts on groundwater and surface water resources.

7 MITIGATION MEASURMENTS

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 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 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

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.

- 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 Toshka 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 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 (the construction period).

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.	• 24,000

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	• 20,000

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	• 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.	• Contractor and subcontractor • Supervised by Environmental specialist, Social Specialist for reporting on grievance.	• 20,000

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		• Risk of the establishment of water connection to get water into the silo may lead to soil contamination. • Risk of establishment of electricity connection to the silo may lead to soil contamination.	• All chemicals are stored on insulated areas from the ground and in secondary containment. • 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.		

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.		
	Risks on Ambient Noise	• The following equipment used in excavation and grading of the site may produce high noise emissions: o the use of heavy machinery, such as trucks, bulldozers, and excavators. o the operation of construction equipment, such as generators and compressors.	• Construction noise will be limited to restricted times agreed to in the permit. • 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.	• Contractor and subcontractor • Supervised by Environmental specialist, Social Specialist for reporting on grievance.	• 18,000

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• Restricting the movement of lory 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.		
	Biodiversity/ pesticides consumption by non-targeted species/ risks of hunting and disturbing of wildlife in case they occur in the area. Bird collision risks	• Impacts on biodiversity may result in the disturbance of wildlife 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	• 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 measures for air, noise, waste emissions reduction. • Raise awareness to workers on the importance of preserving wildlife and the importance of gazelles and hyenas	• Contractor and subcontractor • Supervised by Environmental Specialist.	• 20,000

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		properly and in turn leading to their secondary poisoning. • Bird migratory route is located near the project site	• 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.		
	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. • Establishment of water connection to get water into the silo generate solid waste.	Develop a waste management procedure with the following requirements: **Waste management:** - Proper handling of raw material to minimize waste. - 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.	Contractor and subcontractor Supervised by Environmental specialist, Social Specialist for reporting on grievance.	36,000

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		• 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. • Establishment of electricity connection to the silo generate e-waste if the batteries and cables are used..	- 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. - 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 Toshka Silo		

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			- 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 - 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		

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			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 saperately 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.		
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.	• Contractor and subcontractor • Supervised by Environmental specialist, Social Specialist for reporting on grievance.	• 24,000

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• 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	• PMU	
			•	•	•
				•	
	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	• Contractor and subcontractor • Supervised by Environmental specialist, Social	• 12,000

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• 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.	Specialist for reporting on grievance. PMU	
	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	• 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.	• Contractor and subcontractor • Supervised by Social Specialist for reporting on grievance. • PMU	• 16,000

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		• Risks from security personel (ie use ov violence etc)	• 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 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.		

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			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		

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			- Use of firearms should be strictly managed by a responsible person in the security team following the 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.		

	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.	• 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. • 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	• Contractor and subcontractor • Contractor and subcontractor • Supervised by Environmental specialist, Social Specialist for reporting on grievance.	24,000

			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		

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	• Silo manager, Social Specialist	• 24,000

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 • Silo Manager	• Not Applicable

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 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.	• Contractor and subcontractor • Supervised by Environmental	• 54,000

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	• 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 the personal protective equipment (PPE) to the workers including ear mufflers, masks, eye googles, 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	specialist, Social Specialist for reporting on grievance.	

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.	effectiveness of prevention and control of exposure 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)		

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		• Risks of electrocution while installing the Silos. • Risks of snake and/or scorpion bites	• The contractor should prepare and implement an Occupational Health and safety Management Plan (appendix III). • 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.		

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			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 • 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.		

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• Ensure chemicals and materials and hazardous wastes are properly labeled 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. • 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.		

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• 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. • 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:		

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			○ 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. • Adhere to oxygen breathing devices/breathing apparatus while working in silos. • Always ensure workers in confined areas are supervised and checked up on regularly.		

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• 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 Risks from electrocution while performing electrical work.		

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• 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.		

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:** o Use barriers and warning signs around excavation sites.		

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			○ Provide adequate lighting for night work. • **Heavy Machinery Accidents:** ○ 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 Electrocution:**		

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			○ 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. ○ Ensure all electrical installations comply with relevant safety standards. ○ Ensure the area is dry and away from any wet areas while performing the work • **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.		

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			○ Train workers on the handling and disposal of hazardous materials. ○ 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.		

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
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 • 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. • 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	• Contractor and subcontractor • Silo management supervised by Environmental specialist, Social specialist and OHS specialist for reporting on grievance. • PMU	• 30,000

Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• 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) agriculture lands and irrigation systems nearby	• Ensure proper grievance procedure under chapter 7 is followed. • Immediately report to the WBG any major events / incidents within 48 hours	• Contractor and subcontractor • Silo management • Supervised by Environmental Specialist, Social specialist, and OHS specialist for reporting on grievance (in case of explosion risks from the silos)	

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.	• Silo Management Environmental specialist, Social Specialist for reporting on grievance.	• 12,000

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• The design of the silo includes automated grain dust extraction systems. • 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 (NOX), and particulate matter (PM). • Emissions from generator when used • Fumigation emissions from silos and airborne drift from pesticides application may	• 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	• Silo Management Environmental specialist, Social Specialist for reporting on grievance.	• 9,000

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		also reduce ambient air quality	• 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 • 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 Toshka. 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	• 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.	• Silo Management Environmental specialist, Social Specialist for reporting on grievance.	• 10,000

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		chemicals and materials and wastes. • Badly stored and bad disposal off fumigation chemical (Phostoxin) may pose risk of contamination • Accidental spills from generator and transformer and soil contamination from battery	• Schedule operation 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) 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.		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• • 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. • 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		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			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 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		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• Monitor fuel used to detect any leakage		
	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.	• Silo Management Environmental specialist, Social Specialist for reporting on grievance.	• 9,000

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• Conduct regular maintenance to equipment and units to reduce noise emissions • Ensure the Grievance mechanism is functional to address workers and community complaints. • Regular health check ups 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.	• Silo Management Environmental specialist	• 10,000

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		• Bird migratory route is located near the silo (risk of collision)	• 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 • The silo design already include aviation obstruction lighting which are used to enhance visibility of airplanes and birds in order to avoid any collision or obstacles,		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			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 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)	**Waste management:** • Waste collection and disposal pathways and sites will be identified for all major waste types expected from the operation activities. • 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.	• Silo Management Environmental specialist, Social Specialist for reporting on grievance • Waste contractors	• 18,000

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• 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. • 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,		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			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 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.		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• 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 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	• The project owner and contractor will share information related to labor rights and working conditions, labor grievance mechanisms, and will ensure	• Subcontractors for seasonal workers supervised by Social Specialist and environment health and safety specialist	• 12,000

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		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 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	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 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.	• Silo Management Social Specialist and environment health and safety specialist for silo operations • EHCSS	

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		silos. Cleaning is done every beginning of the season	• 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 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		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			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		

	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 on local levels and conduct focus group discussions (FGD) with women and vulnerable	• Silo Management Social Specialist	• 10,000

			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 • 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 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. • 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.		

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	• 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	• 6,000

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			will be 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	• 8,000
	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	• 10,000

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 • Follow, develop and implement the traffic		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			management plan (appendix II) and GM (chapter 8) • Report any major injuries and accidents to the WB within 48 hours.		
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 accidently falling in silos while working at 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 and	• 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. • Check weather forecasts prior to loading and unloading to prevent grain dust emissions	• Silo Management Environment Health and Safety 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 specialist, Social	27,000

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		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 and rodenticide especially during application • Risks of skin and eye burns and irritation from handling, storing and	• Ensure regular site cleaning is kept. • Ensure toilets are well kept and cleaned regularly • Provide ear mufflers 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 and control of exposure to occupational hazards, and	Specialist for reporting on grievance EHCSS	

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		disposing chemicals and empty containers and other types of wastes including domestic waste • Risks of snake and scorpion bites	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.		

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		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• Ensure careful control of substances entering or leaving the site • 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 engulfement, they can be pulled away. • Apply same measures present under construction phase for silo workers as well as any seasonal workers including specific		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			measures for working in confined areas, handling chemicals and hazardous wastes, falling from height, electrocution 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.		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			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		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			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		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			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 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.		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			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. 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		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			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 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 area in case they are present.		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• 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** • 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	• Develop and implement a fire and emergency response plan	• Silo Management Environmental specialist, social specialist and OHS	25,000

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
		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..	• 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 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	specialist for reporting on grievance. • EHCSS/PMU	

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			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 local or regional fire brigade) that may be required to supplement site capacity for fighting fire and explosions. • The system includes sensors and blowers		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			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 SDS[3]: • Never allow the buildup of phosphine gas (hydrogen phosphide, PH3) to exceed explosive concentrations. Open containers of metal		

[3] For more information and guidance on Phostoxin follow https://label.westernpest.com/files_techservices/live/degesch.phostoxin052418.sds.pdf

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			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		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			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		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			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'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		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			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 fire fighting 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		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			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		

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			where the phosphine gas concentration is unknown, a NIOSH/MSHA approved SCBA must be worn. Follow EHCSS evacuation procedures, OHS plan and fire fighting 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 transporation of these pestisides.		
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	• Silo Management Social Specialist • EHCSS	

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• Ensure proper grievance procedure under chapter 7 is followed. • and raise awareness to farmers and grain buyers on the grievance mechanism. • The silo will has 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	• Silo Management Environmental Specialist /EHCSS	

Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/year)
			• 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		

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 Toshka 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 Toshka 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 Toshka 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 Toshka 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.

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

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 permeant staff in the Toshka silo.

Table (7.3): Roles and responsibilities at Toshka Silo for the Emergency Food Security and Resilienc 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.

Table (7.3): Roles and responsibilities at Toshka Silo for the Emergency Food Security and Resilienc 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 (Toshka 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 contracto contracts. • Ensure that the ESMP is given to the applicable construction a operation supervisor and the contractors. • In conjunction with the construction and operation supervisor; underta regular inspections of the workers and contractor's site as well as t installation works to check for compliance with the ESMP in terms of t specifications outlined in this document. • Inspections shall take place at least once a week and copies of t monitoring checklist contained in the file. • Keep a register of all incidents (accidents, injuries, complaints, leg transgressions, etc) and other documentation related to the ESMP.

Table (7.3): Roles and responsibilities at Toshka Silo for the Emergency Food Security and Resilienc Support Project.

	• Responsible for the overall management of all operation activities including all related OHS and quality control activities at the silo site. • 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.

Table (7.3): Roles and responsibilities at Toshka Silo for the Emergency Food Security and Resilienc Support Project.

	• Ensure that construction activities do not harm local wildlife and habitats.
	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.

Table (7.3): Roles and responsibilities at Toshka Silo for the Emergency Food Security and Resilienc Support Project.

	• 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. • 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

Table (7.3): Roles and responsibilities at Toshka Silo for the Emergency Food Security and Resilienc Support Project.

	environmental and social and OHS induction before they commence any work on the site.

7.6. Environmental and Social Monitoring

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[4]	Budget (USD/yesr)
Environmental	Risks on Ambient air due to airborne Dust Gaseous emissions from Engine Exhaust Gases	• 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. • 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.	• 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 • Monthly report.	• Daily inspections onsite of weather conditions and operating machinery and excavation and construction activities • Prior to procurement of machinery for maintenance log and monthly onsite: verification of maintenance records. • Weekly for grievance	• 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. • Compliance for machinery inspection records and number of maintenance performed. • Number of grievance records related to air emissions.	• Construction site and surroundings • Point source: machinery, equipment, and vehicles exhaust and generators if used.	• Contractor and subcontractor • Environmental specialist, social specialist for reporting on grievance.	20,000
	Risks on Soil and Water	• The project may impact soil quality and groundwater quality	• Visual inspection of site: backfilling and restoration	• Daily visual inspection especially during	• Change in soil colour.	• Construction site including generator	• Contractor and Subcontractor	18,000

	resources contamination	(on the long run) 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	• Visual inspection on soil • Inspection of equipment and machinery used and associated maintenance records. • Grievance records. • Fuel consumption records	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 maintenance performed • Number of grievance records and complaints related to soil, contamination • Significant decrease in stored fuel	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.	• Weekly noise tests	• Noise level below permissible levels applicable by zone (industrial,	• Construction site and surroundings.	• Contractor and Subcontractor •	16,000

[4] The PMU will ensure provision of Environment, Social and OHS monitoring supervision during construction work

		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.	• Grievance records.	• Daily inspection of operating machinery onsite • 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.	20,000

		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 on grievance.	36,000

		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 number of actual workers	• Site location	• Contractor and subcontractor • Environmental specialist, social specialist for reporting on grievance.	24,000

					• 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 grievances related to child labor	• On site	Contractor and Subcontractor • • Social Specialist and OHS Specialist	16,000

					• 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	20,000

	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 Environmental Specialist	24,000
	Lack of stakeholder engagement and proper	• Risks of untransparent sharing of information	• Community consultations/consultation records	• Prior the start of any work for permits, documents signage and	• Presence of required permits • Number of complaints	• Site location and surrounding.	• Social Specialist • Silo Manager	20,000

	grievance mechanism	• Risks of increase in unresolved complains	• Inspection on required permits and documents. • Complaint records inspection • Signage and posting are present on site	posting and previous consultation records • Weekly for complaints received • Monthly for consultations	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) • Number of consultation 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 • Environmental Specialist • Silo Manager	Not Applicable
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.). • 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.	• Visual inspection for proper use of PPE, emergency preparedness, fire extinguishers adequate signage for health and safety measures etc. and fencing. • 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.	• Daily site inspection and surrounding. for PPEs and proper safety measures (i.e barriers and fences are in place, fire extinguishers, presence of flagman banners with emergency measures and daily induction for OHS risks etc) • Prior entering silos for gas emissions	• Number of recorded incidents and injuries and type. • Number of non-compliances including not wearing PPEs • Presence of potable water supply and disinfectants • Presence of fire extinguishers on site. • Number of grievances and solved grievances. • Presence/proof of valid	• Site location and surrounding and rented apartments for workers,	• Contractor and Subcontractor • Occupational Health and Safety Specialist with support of Environmental Specialist, social Specialist for reporting on grievance.	48,000

		• 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 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	• 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.	• 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	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.			

		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.						
Unplanned events	Catastrophic event can produce major negative	Fire and explosion risks from badly stored fuel/ poorly stored/installed generator and	• Presence of fire safety measures (i.e fire extinguishers,)Incidence report/log	• Daily for safety measures, presence of fire	• Number of incidences and near misses • Number of injuries	• Site location and surrounding	Contractor and Subcontractor	30,000

	impacts on OHS and public health and safety	mishandling of chemicals during construction phase (unpredicted events) can lead to the death of workers	• Report major accidents to WB • Grievance log	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 fire events • Presence of fire extinguishers • Number of grievances and number of solved grievances • Number of major accidents reported to WBG within 48 hours		• Occupational, Health and Safety Specialist, Environmental 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 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	• Complaint records inspection • Insurance records inspection for silos • Payment receipt inspections	• Weekly for complaints • Monthly on insurance papers and policies • Report of major accidents within 48 hours to WB	• Number of complaints and number of solved complaints • Presence of payment receipts • Presence of insurance papers • Number of major accidents reported to WBG within 48 hours	• District and regional level Site location	• Occupational, Health and Safety Specialist, Environmental Specialist, and Social Specialist for reporting on grievance	

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	• 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.	• Silo Complex site and surroundings. • Point source: equipment, grain trucks and vehicles exhaust.	• Silo management Environmental specialist, social specialist for reporting on grievance	10,000

Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
		emissions, containing carbon monoxide (CO), sulfur dioxide (SO2), oxides of nitrogen (NOX), and particulate matter (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			• Number of grievance records related to air emissions. • Number of maintenance performed • Number of pressure tests performed versus number of fumigation activities			

Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
		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 .						
	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 Toshka. Other sources also include inappropriate waste disposal from the offices and inappropriate	• Visual inspection of site: backfilling and restoration • Visual inspection on soil • Inspection of equipment used during the operation phase and associated	• Daily visual inspection especially during loading and uploading of grains. • Daily visual inspection on soil. • Daily visual inspection on stored chemicals and	• Change in soil colour. • Maintenance records. • Number of grievance records and complaints related to soil, geology, and topography. • Number of spills	• Silo Complex and surrounding.	• Silo Management • Environmental specialist, social specialist for reporting on grievance.	8,000

Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
		sewage disposal which may contaminate the soil. Spills may also result from result from badly stored chemicals and materials and wastes, generator and transformer.	maintenance records. • Grievance records. • Generator fuel consumption records	proper labeling and presence of fire extinguishers • Weekly for grievances • Monthly for fuel consumption	• Significant decrease in fuel consumption			
	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	• Inspection of operation activities for proper functioning. • Noise Tests • Miantenance records • Grievance records.	• Daily inspection of operating activities onsite • Weekly for noise tests and grievances • Monthly for maintenance records	• Noise level below permissible levels applicable by zone (industrial, nearby community). • Maintenance records for equipment and inspection of proper noise enclosure fitting. • Number of grievance records related to noise emissions.	• Silo Complex site and surroundings.	• Silo Management • Environmental specialist, social specialist for reporting on grievance.	9,000

Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
		around the Silos project site • The use of generator.						
	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. • Disturbance of wild animals and hunting and or trading of animals	• 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	10,000

Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
		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	12,000

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	• 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	• Site location	• Silo Management Social specialist and environment health and safety specialist • EHCSS	12,000

Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
		height and confined 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 the silos. Cleaning is done every beginning of the season			• Number of grievances reported from workers and number of solved grievances • Number of visits conducted by the PMU			
	Vulnerable populations	• Gender, ethnicity and other social stratification of beneficiaries may	• Inspection of community grievance log	• Weekly inspection of records reports,	• Number of reported complaints from community and	• Site and surrounding communities./district level	• Silo Management Social Specialist	• 12,000

Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
		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	• Reviewing community consultation reports and outreach minutes of meetings. • Site inspection for separate lines (small farmers vs big farmers) and presence of grievance boxes and signs.	grievance logs. • Number of grievances and number of solved grievances • Every 2 months for community consultation reports and outreach • Monthly site inspection by PMU	surrounding industries if any and number of solved complaints • Number of female complainers • 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			

Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
		purchasing power which can lower food accessibility to vulnerable population.						
	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. • Children being exposed to hazardous substances or working conditions.	• Site inspection • Visitors ID inspection • Seasonal workers ID inspection • Awareness records • Grievance Log	• Daily for visitors' ID inspection and seasonal workers ID inspections • Prior the start of any work for for awareness sessions to subcontractors on child labor • Weekly for grievances • Upon occurrence for penalties	• Number of children present in silos • Number of children present near loading and unloading activities • Number of children identified during maintenance works • Number of awareness sessions provided to subcontractor on child labor	• Site area	• Social specialist and OHS Specialist • EHCSS	6,000

Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
					• 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. • Risks from security personnel (i.e violence)	• 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	8,000
	Community health and safety: Traffic risks and accidents	• Risks of road accidents may increase during high storage	• Inspection of community grievance log	• Weekly for grievance log	• Number of accidents	• Silo area	• Silo Management Social specialist	12,000

Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
		seasons~~. The number of grain transport trucks is expected to increase~~.	• Accidents log • Maintenance log	• Weekly for accidents log • Monthly for maintenance log	• Number of maintenance performed • Number of grievances submitted	• District area/communities around silos • District /regional area for accidents		
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 accidently falling in silos while	• 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	• 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. • Presence/proof of valid insurance	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	22,000

Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
		working at 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	and grievance reports. • 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		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.			

Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
		• 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 • 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	• Fire and explosion during	• Incidence log	• Monthly for incidence log	• Number of incidents	• Silo site area and surrounding and	• Silo Management OHS specialist,	15,000

Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
	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 Risk of leaks of Phostoxin during transportation	silo operations (unpredicted events) can lead to the death of workers and silo users.	• Site inspection on safety measures • Grievance log • Report major accidents to WB • Fire drills records • Pressure tests	and for grievance • Daily for site inspection • Daily for corrective actions • Daily for safety measures and PPEs in place • Daily for presence of fire extinguishers • Report of major accidents within 48 hours to WB • Monthly fire drills • Monthly Pressure tests and	• Number of injuries • Number of corrective actions taken • Number of grievances and number of solved grievances • 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	district-regional level (silo users)	Environmental specialist, and Social specialist for reporting on grievance. • EHCSS	

Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
				maintenance performed	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 accidents within 48 hours to WB •	• Number of complaints and number of solved complaints • Presence of payment receipts • Presence of insurance papers • Number of major accidents reported to WBG within 48 hours	• District and regional level Site local (silo users)	• Silo Management Social specialist • EHCSS	
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	• Number of incidences/leaks • Number of injuries as result of leak • Number of grievances and solved grievances	• Silo site area and surrounding	• Silo Management Environmental Specialist /EHCSS	

Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/year)
				• Report of major accidents within 48 hours to WB	• Number of major accidents reported to WBG within 48 hours			

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 Toshka 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 Toshka 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.

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 Toshka 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

7.8. Budget for Implementation of ESMP

The total Budget for implementation of the ESMP for Toshka Silo is provided in Table (7.4).

Table (7.4): Budget for implementation of the ESMP for Toshka Silo.

No.	Categories	Description of Items	Budget (USD / yearly)	Total (USD)
A	**Mitigation Measures during Construction phase***			
1	Environmental Mitigation Measures	Dust control measures	12,000	24,000
		Control of engine emissions	10,000	20,000
		Soil contamination measures	10,000	20,000
		Noise reduction measures	9,000	18,000
		Biodiversity protection measures	10,000	20,000
		Waste management systems	18,000	36,000
2	Socioeconomic Mitigation Measures	Improvement of working conditions	12,000	24,000
		Child labor prevention measures	6,000	12,000
		SEA/SH prevention measures	8,000	16,000
		Traffic management measures	12,000	24,000
		Community health and safety measures	12,000	24,000
3	OHS Mitigation Measures	Safety training	15,000	30,000
		Provision of PPE	12,000	24,000
4	Catastrophic Events Mitigation Measures	Fire and explosion prevention measures	15,000	30,000
	Total budget for mitigation measures during construction phase		**161,000**	**322,000**
B	**Mitigation Measures during Operation phase****			
5	Environmental Mitigation Measures	Dust control measures	12,000	12,000
		Emission control systems	9,000	9,000
		Soil contamination measures	10,000	10,000
		Noise reduction measures	9,000	9,000
		Biodiversity protection measures	10,000	10,000
		Waste management systems	18,000	18,000
6	Socioeconomic Mitigation Measures	Improvement of working conditions	12,000	12,000
		Child labor prevention measures	6,000	6,000
		SEA/SH prevention measures	8,000	8,000
		Traffic management measures	10,000	10,000
		Community health and safety measures	10,000	10,000
7	OHS Mitigation Measures	Safety training	15,000	15,000
		Provision of PPE	12,000	12,000
8	Catastrophic Events Mitigation Measures	Fire, explosion, and leakage prevention measures	25,000	25,000
	Total budget for mitigation measures during operation phase		**166,000**	**166,000**

C	**Monitoring during Construction Phase***			
9	Environmental Monitoring	Air quality monitoring	10,000	20,000
		Soil contamination monitoring	9,000	18,000
		Noise level monitoring	8,000	16,000
		Biodiversity monitoring	10,000	20,000
		Waste management compliance monitoring	18,000	36,000
10	Socioeconomic Monitoring	Work conditions inspections	12,000	24,000
		Child labor monitoring	8,000	16,000
		SEA/SH prevention monitoring	10,000	20,000
		Traffic management monitoring	12,000	24,000
		Community health and safety monitoring	10,000	20,000
11	OHS Monitoring	safety audits	12,000	24,000
		Health check-ups and monitoring	12,000	24,000
12	Catastrophic Events Monitoring	Fire and explosion safety monitoring	15,000	30,000
	Total budget for monitoring during construction phase		**146,000**	**292,000**
D	**Monitoring during Operation Phase****			
13	Environmental Monitoring	Air quality monitoring	10,000	10,000
		Soil contamination monitoring	8,000	8,000
		Noise level monitoring	9,000	9,000
		Biodiversity monitoring	10,000	10,000
		Waste management compliance monitoring	12,000	12,000
14	Socioeconomic Monitoring	Work conditions inspections	12,000	12,000
		Child labor monitoring	6,000	6,000
		SEA/SH prevention monitoring	8,000	8,000
		Traffic management monitoring	12,000	12,000
		Community health and safety monitoring	12,000	12,000
15	OHS Monitoring	Safety audits	10,000	10,000
		Health check-ups and monitoring	12,000	12,000
16	Catastrophic Events Monitoring	Fire, explosion, and leakage safety monitoring	15,000	15,000
	Total budget monitoring during operation phase		**136,000**	**136,000**
	Total Budget			**916,000**

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.

8 STAKEHOLDER CONSULTAION AND PUBLIC PARTICIPATION

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 assessment in the current activity of the sub-project include the following:

a) *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.

b) *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.

c) *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.

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:*
Included other relevant stakeholders not mentioned in the previous section.

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 (one and one discussions which was carried out during the site visit conducted in October 3rd 2023, for three days) and virtual meetings with big companies in the area (which carried out in July 14th 2024) as follows:

- One on one discussions were conducted with different group of different social categories related to the project (3rd of October 2023)
  - Local community including farmers, neighboring residents working in the nearest farms to the silo's site.
  - Local community in Aswan (expected to move to the Toshka city including women, with the percentage of males being the majority. In terms of professional classification, the vast majority of individuals were working as farmers.

- Virtual consultation was conducted with existing companies around the silo (14th of July 2024) including the following:
  - Private sector companies: Al Raghi Company which encompasses reclaimed agriculture lands and silos
  - The National Company for the Reclamation and Cultivation of Desert Lands.

During the consultations, the ESIA consultant team explained to the public and private companies and the consulted local communities the results of the ESIA study including project design, risks, impacts and mitigation measures and were open to receive feedback and concerns and suggestions.

Figure (8-1): Virtual consultation of Toshka Silo ESIA with private sector company Al Raghi and the National Company for the Reclamation and Cultivation of Desert Lands .

Results from the virtual consultation for Toshka Silo with the private company and The National Company for the Reclamation and Cultivation of Desert Lands:

- Emission of high temperatures from exposure of metal silos to direct sunlight was flagged. It was suggested to create a fence of plants around the silo site to reduce the impact of increasing the temperature in the site. This will be communicated and considered during design.
- Impact of the construction of any administrative buildings or any other buildings on natural vegetation in the area was flagged. The ESIA consultant team explained that there will be no impact on natural vegetation because the silo is located in a bare soil without any vegetation in the area.

The consulted companies also inquired about the transportation of the grains to and from the silo and the ESIA consultant team explained that the main road Aswan / Abu Simbel which is 150 m away from the silo site will be used for the transportation of grains to and from the silo during the operation phase, and it will be also during the construction phase for the transportation of the machinery that will be used during the construction of the Silo.

- The consulted companies also had some additional specific inquiries that are summarized below along with the responses shared:
  - ✓ How the subproject will affect the country's economy: It will have a positive impact, because during the harvesting season, about 30% of the harvest could be lost because of traditional storage of grains. But after the construction of Toshka Silo, the percentage of loss will be reduced, and the grain will be stored in efficient way without loss in comparison to the traditional methods. Additionally, having Toshka Silo close to the agriculture development projects will reduce the loss which take place during the transportation of the grains to other silos which take long time and increase the probability of grain loss during the transportation process.
  - ✓ Job opportunities in Toshka silo: The construction of Toshka silo complex will provide job opportunities to the local people, including workers, engineers, drivers, and supportive jobs as long as the needed technical capacity is available locally.
  - ✓ Potential for hazards (fires and explosions resulting from grain dust accumulation) in these silos: The occurrence of any accidental incidents in terms of fires or explosion is very limited due to the presence of the required precautions and safety measures. Additionally, there is no dust produced from the silos because they are fully equipped with ventilation stations.

- ✓ mpacts on workers' health and safety during operation: The impact on the workers during the operation phase is limited, there are some concerns about other impacts including a) sunstroke from high temperatures, and b) stings by scorpions which can be dealt with considering the safety and occupational health measures.

- ✓ Noise impacts: During the construction, there will be noise resulting from the use of heavy machines in the construction work, and during the operation phase the source of noise will be mainly due to the loading and unloading of grains and the movement of the truck to and from the silo. Noise impacts are addressed and explained in the ESIA.

- ✓ Air quality impacts: There will be no impact from the silo during operation on air quality except during the harvest time due to the presence of some dust, and this will be controlled through mitigation measures.

- ✓ Project impacts in relation to increase in violence and child labor: Child labor risk during both construction and operation is limited because there are measures in place to tackle this risk and ensure that contactors and operators comply with the national law (e.g. ID check to confirm age is above 18 years old). Regarding the risk of violence (including SEA/SH, there is a plan that is prepared and will be implemented including having a code of conduct in place to adhere to…etc.).

Results from the one on one consultation onsite with farmers from surrounding areas and Aswan:

The consulted people (14 individuals residing in New Toshka and Aswan including women) mentioned that there are positive impacts from the subproject including the development of the area around the subproject and the provision of job opportunities for local people within the project in construction and operation. There are also no concerns about the subproject and no impact on their families and daily movements.

As for women, the subproject will not affect their families or children. They have no concerns regarding safety or accessibility.

For farmers, who are the group that deals most with silos, the subproject has positive impacts. From their point of view, it is very useful for them as it will reduce the cost of transportation. In addition, this project will facilitate the process of supplying wheat. They have no concerns about wheat prices, as they are unified and fixed. They also mentioned that the project will have a positive environmental impact.

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:

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

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 Toshka Silo finished and then after the operation of Toshka silo, the complainant can raise their complaints to the Toshka silo manager. If it is not resolved

it escalates to the customer services office at EHCSS. After the construction of Toshka 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.

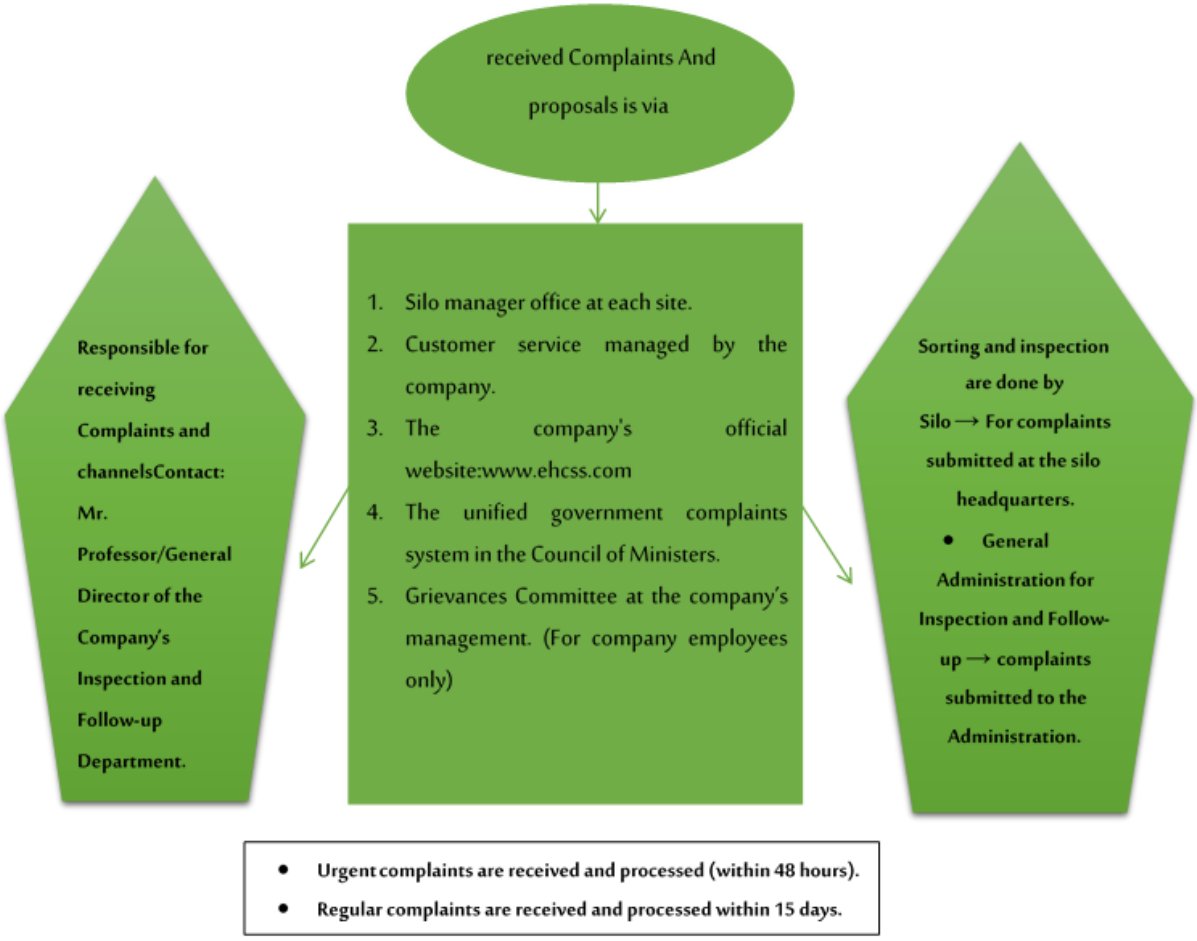

Figure (8.2): Scheme of proposed grievance procedures.

Procedures and standards for sorting, processing and tracking complaints

- 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) Toshka Silo Manager
  (2) Customer service managed by the EHCSS company: 01279671142/01279671143.
  (3) The company's official website: www.ehcss.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.

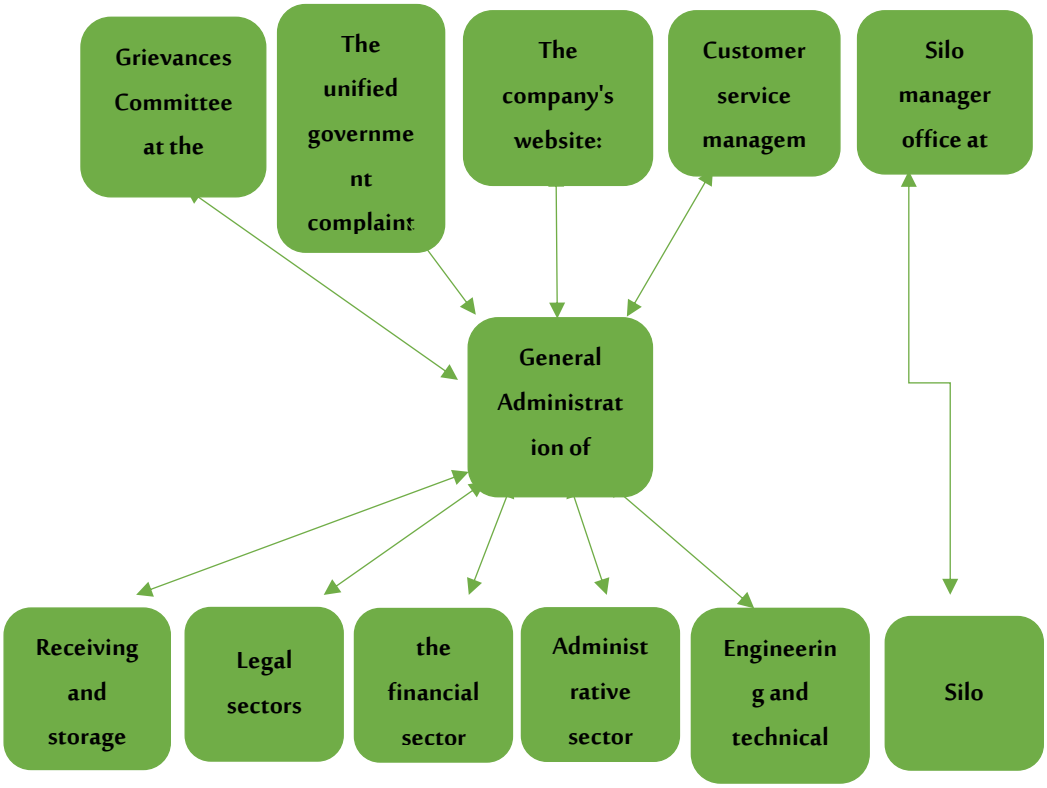

Figure (8.3): Organizational structure to receive complaints.

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;

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. Clean and announced standards for the time frame of the response should be established, announced and adhered to.

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

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

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/ncwegyptpage

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

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.

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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.

3. Pest Management Targeted Silos

The Toshka Silo Complex will be established in the Toshka area in Aswan Governorate, with a storage capacity of up to 300 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 (EHSGs) and applicable international conventions and good international practices.

World Bank criteria for Pesticide Selection and Use

According to paragraph 22 of the ESS3 guidance note5 "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 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

[5] 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

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 EHSGs.

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.
		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 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.

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
  - 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 thresh hold 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**

  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 Toshka 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**

I. 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.

II. 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.

Table I.3: A form for the record of conducting the disinfection and pest control process.

Control type (check mark)					

Disinfection	Rodent control	Reptile control*	Control area	Active substance used with concentration	Usage rate	Amount of pesticide used	Method used for 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. 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 (30-35ºC) 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 35ºC and 70%RH but take ten weeks at 22.5ºC and 70%RH.
- Although adult grain insects live a long time at cool temperatures, their young stages stop developing at temperatures below 15ºC for weevils or 20ºC for most other species.
- 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:

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.
- 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)[6] and IFC guidelines for annual crop production (2016)[7]):
  - 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.

Safety requirements for Handling Phostoxin (fumigation) [8]**:**

- Keep ignition sources away
- Do not smoke.
- Protect against electrostatic charges.

[6] FAO (2001). Guidelines on Good Practice for Ground Application of Pesticides
[7] 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
[8] For more information and guidance on Phostoxin follow https://label.westernpest.com/files_techservices/live/degesch.phostoxin052418.sds.pdf

- 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
- 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 SDS[9]:
- 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 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

[9] For more information and guidance on Phostoxin follow https://label.westernpest.com/files_techservices/live/degesch.phostoxin052418.sds.pdf

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)[10] and Tobin, (2005)[11]).

- 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.
- 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.

[10] EBPF (n.d). Guideline on Best Practice in the Use of Rodenticide Baits as Biocides in the European Union
[11] Tobin, M. E., & Fall, M. W. (2004). Pest control: rodents.

- 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.

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 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.
- 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 Toshka 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 Toshka Silo and workplace serves an important role. The Toshka silo is located on the Aswan/Abou Simbel 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 Toshka 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. Toska 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. Additionally, there is only one road (Aswan / Abu Simbel Road) that will be used during the transportation of the equipment during the construction phase, and also will be used during the operational phase.

- **Current traffic to Toshka Silos**

The Toshka Silo Complex will be established in the Toshka area in Aswan Governorate, with a storage capacity of up to 300 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.

- **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.

- **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.

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 accomidate 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 / Abu Simbel) which is 150 m away from the silo site. This road is a newly constructed highway specifically designed to handle heavy traffic and large vehicles.

Route for Big Equipment

- **Port of Entry:**

- Safaga port on the Red Sea.

- **Transportation Route from Port:**
  - From the Port of Safaga:
    - transportation through the main roads to the Toshka 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 Toshka 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.

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 Toshka 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, we'd be considering some basic elements in this traffic management plan.

- 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 (Toshka 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. There is no information about the number of cars and trucks unrelated to the project per day and including peak hours. But, in general, it will be considered in the plan for construction and operational phase to avoids peak hours,
- 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 Toshka 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.
- Earplugs or earmuffs.
- Safety glasses or goggles.

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

- 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 Toshka 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 for agricultural projects like Toshka.
- 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

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 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:

- 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: -

- 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:

- Rregular 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.

4.1. Site Supervisor

The Site Supervisor or Silo Manager of Toshka 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.

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.

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 Toshka 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

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:

- **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**: Risksof falling from heights, sudden disintegration or breakage of gears or large parts of silo filling machines.
- **Life threating risks**:Some of the previously mentioned risks, whether chemical, physical, biological, and mechanical, each of them contains risks that threating life such asinhaling 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

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.

	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 blowering 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 siloworkers on site as immediate assistance without relying on requesting external assistance, because any delay may be crucial to their health.

✓ ***Machinery inspection***

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 are 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).

✓ ***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 Aswan.

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 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.
- 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***

- 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, 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 take into account 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.

- 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.

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.

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:

a) **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.

b) **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.

c) **Defining OHSM Competence:** Assessing the competence needed for employees and contractors to effectively implement the OHSMP. Providing training, or other methods

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.

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.** **Biding 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

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 need 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.

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: Toshka Silo Subproject Documents and Figures

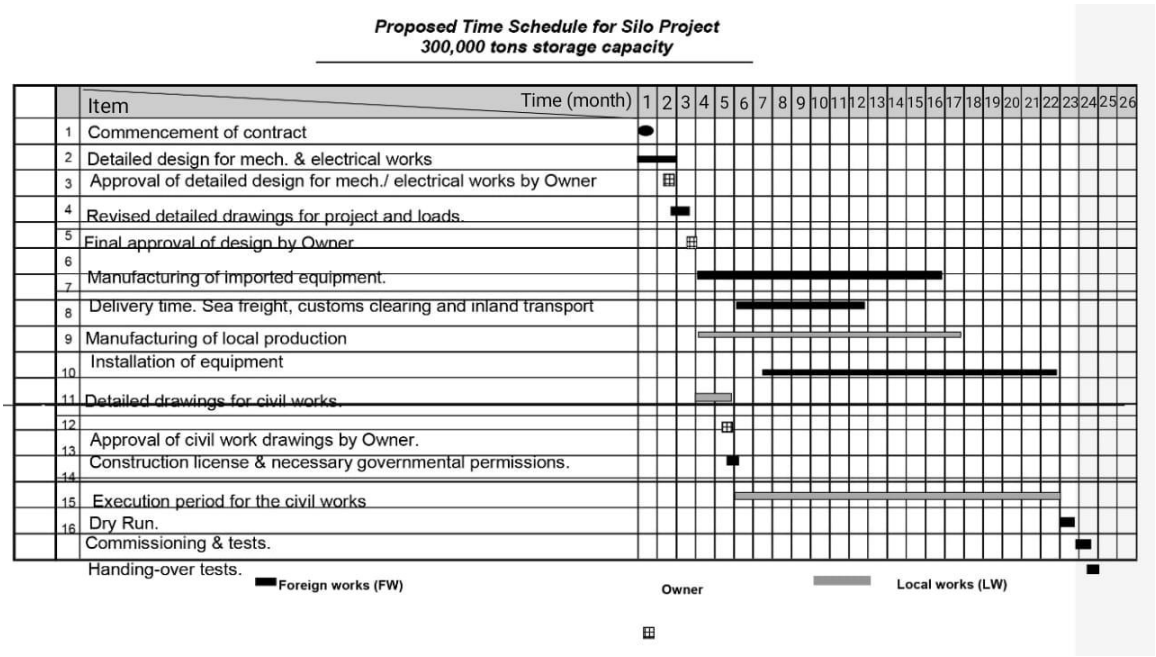

Figure (V.1): Time Schedule for the Toshka Silo project.

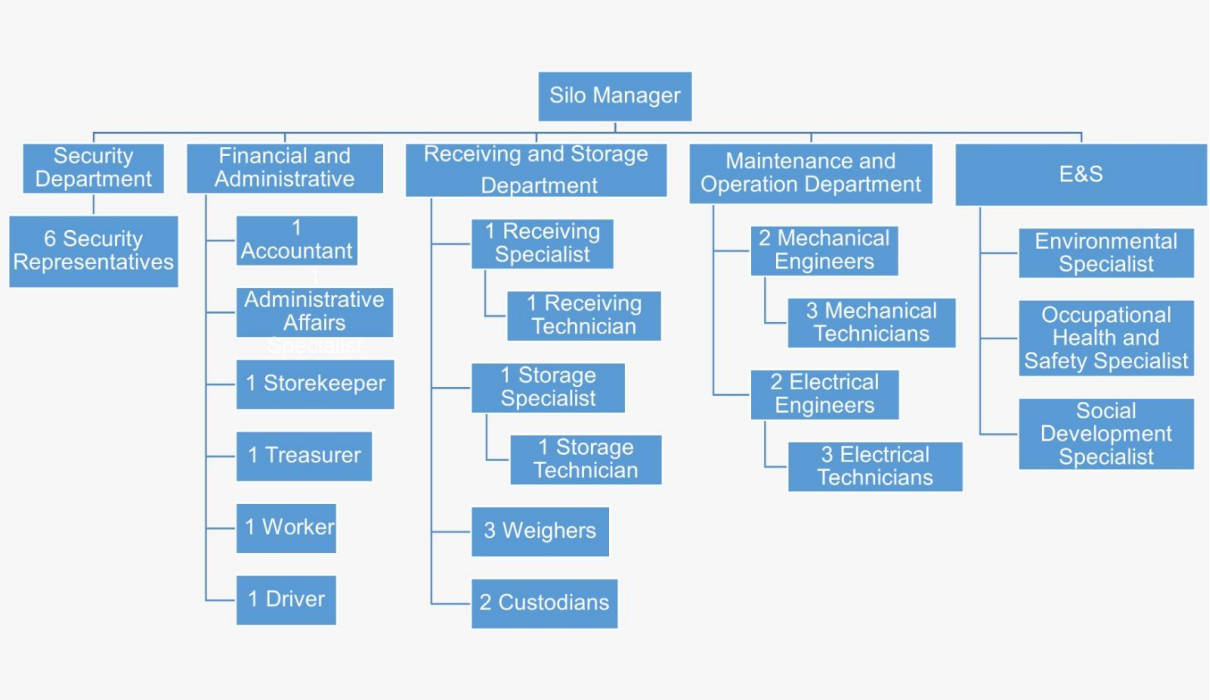

Figure (V.2): Administrative structure of Toshka Silo Complex.

Figure (V.3): Some photos from the surrounding area of the proposed location for the construction of Toshka Silo Complex.

Figure (V.4): Some photos of consultation at Toshka Silo Complex.

Figure (V.5): Some photos of consultation of Toshka Silo.

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.

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.6): Contractor Code of Conduct.

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

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

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 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

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.

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: _____

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.

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.
- 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.

Appendix VIII: Emergency Response Plan

Creating an emergency response plan for Toshka 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.

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.

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 tour: 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.

- 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 (64km drive), police inspection unit (5.1km drive) and ambulance unit (5.1 km drive).
- The firefighting unit and the health unit of the National Company for the Reclamation and Cultivation of Desert Lands located near the project site will be used.
- 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 5.1km drive from the silo site transfers injured to the main Hospital located at about 225km drive away. Since the Hospital is located at a far away distance, the National Company for the Reclamation and Cultivation of Desert Lands (neighboring agriculture land) agreed that EHCSS could use their health care unit in case of emergency.

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:

- 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.

Appendix X: Grievance Log Form

Ref No.	How Was grievance submitted	Classification of complaints	Date of Submission of Grievance	Name and Contact Information	Description of Grievance	Actions Taken to Resolve the Grievance	Mean of Communication for the Solution reached	Has grievance been resolved (Y/N) if not explain why