

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

# **Environmental and Social Management Plan (ESMP) for Mafalsa Silo, Aswan, Egypt**

**Submitted to: EHCSS**



**Prepared by: SENS**



**January 2025**



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## LIST OF ABBREVIATIONS

Abbreviation	Definition
<b>ARC</b>	Agriculture Research Center
<b>CAPMS</b>	Central Agency for Public Mobilization and Statistics
<b>EEAA</b>	Egyptian Environmental Affairs Agency
<b>EHCSS</b>	Egyptian Holding Company for Silos and Storage
<b>EHS</b>	Environment, Health, and Safety
<b>ESIA</b>	Environmental and Social Impact Assessment
<b>ESCP</b>	Environmental and Social Commitment Plan
<b>ESF</b>	Environmental and Social Framework
<b>ESIA</b>	Environmental and Social Impacts Assessment
<b>ESMP</b>	Environmental and Social Management Plan
<b>FAO</b>	Food and Agriculture Organization
<b>FGD</b>	Focus Group Discussions
<b>GBV</b>	Gender Based Violence
<b>GCSS</b>	General Company for Silos and Storage
<b>GM</b>	Grievances Mechanism
<b>HW</b>	Hazardous Waste
<b>IBA</b>	Important Bird Area
<b>IPM</b>	Integrated Pest Management
<b>MOE</b>	Ministry of Environment
<b>MOHP</b>	Ministry of Health and Population
<b>MOMI</b>	Ministry of Manpower and Immigration
<b>MOSIT</b>	The Ministry of Supply and Internal Trade
<b>MOT</b>	The Ministry of Transport
<b>NCSCR</b>	National Center for Social and Criminological Research
<b>NCW</b>	National Council for Women
<b>OHS</b>	Occupational Health and Safety
<b>PMP</b>	Pest Management Plan
<b>PMU</b>	Project Management Unit
<b>PPE</b>	Personal Protective Equipment
<b>SCA</b>	Supreme Council of Antiquities
<b>SEA/SH</b>	Sexual Exploitation, Abuse and Sexual Harassment
<b>SEP</b>	Stakeholder Engagement Plan
<b>TMP</b>	Traffic Management Plan
<b>WB</b>	World Bank
<b>WBP</b>	World Food Program



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## EXECUTIVE SUMMARY

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

Domestic wheat purchases did not compensate for the significant decline in imports from the Russian Federation and Ukraine. Egypt had projected to increase domestic wheat purchases from an annual average of 4.5 million metric tons to up to 6 million metric tons during the harvest of April to June 2022 by offering higher prices to farmers, but this increase did not, however, compensate for the significant decline in imports from the Russian Federation and Ukraine. Furthermore, the production of bread required locally produced wheat to be mixed with matching quantities of imported wheat to address quality issues. Continued imports were therefore needed for the rest of the year in view of low stock levels.

In this regard, the World Bank will provide support to Egypt with a \$500 million loan to help the country secure its wheat needs in emergencies under 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 (US\$ 112 million). This sub-component will finance the upgrading of Egypt's strategic wheat storage capacity. 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



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located in areas with substantial wheat production. The current Environmental and Social Management Plan (ESMP) focuses on the expansion of the existing Mafalsa Silo subproject. EHCSS expects that the construction of the expansions of Mafalsa Silos will increase the capacity of the existing Silos in storing of grains, as well as improving the resilience of the wheat supply chain and reducing loss and waste. The subproject will not include river transportation. Grain transportation to and from Mafalsa silos rely on trucks. Additionally, a railway diversion will be constructed at a suitable distance from the main railway line to facilitate the unloading of wheat into railway wagons. This railway diversion will include unloading cell and a scale, and an overhead conveyor belt will connect the silo to the railway unloading cell, passing above the Naga hamadi-Asswan road. EHCSS will also construct the wheat receiving pit area and a weighing area on the Egyptian National Railways Right of Way. The receiving pit will have dimensions of 18 meters in length, 3 meters in width, and 3 meters in depth, with a capacity of 70 tons. The railway connection will be implemented after the construction of the silo, and it will be carried out by the Egyptian National Railways (ENR). Because the railway connection will not be implemented contemporaneously with the project activities and the project can be viable without this connection as it relies mainly on grain transport trucks, the railway connection is not considered as an associated facility.

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.

**Project Description:** The main objective of this ESMP is to provide a tool that will ensure an environmentally friendly development and operation of the proposed expansion silos for the Mafalsa Silo Complex. This ESMP 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, designed to effectively address local practices, EEAA requirements and environmental and social conditions, as well as the requirements of the funding organization (ESSs of the World Bank).

Mafalsa Silo is located in the village of Al-Mafalsa in Edfu district, north of Aswan Governorate. The Silo Complex cover an area of 30,000 m<sup>2</sup> and consist of 12 cells each with a capacity of 5 thousand tons of wheat with a total capacity of 60,000 tons, it is equipped with the



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latest storage technology, including inventory management and control system, steaming system and stock temperature control, firefighting system, and wireless system.

The current situation in Mafalsa Silos include twelve main storage cells with a flat concrete bottom with grain bin sweeps with total storage capacity of 60,000 tons, in addition to four lifters for handling wheat and transporting it in a vertical direction, a number of chain belts for handling wheat and transporting it in a horizontal direction, pit hole receive, rotating magnet, truck scale, machinery tower, dust extraction system consisting of three filters, reciprocating sieve, electronic scales, fixed magnet, auxiliary systems (fire extinguishing - fire alarm - aircraft warning - wireless and communications, and administrative and service buildings.

The expansion project will focus on the implementation of additional twelve main storage cells with a flat concrete bottom, including a) excavation works, b) concrete works in accordance with the nature of the soil contained in the soil investigations report and the site's calculation notes, c) the cell sheets will be imported and supplied on site, assembled in different thicknesses, and installed on the concrete base. Importing track belt parts and components, supplying them on site, assembling and installing them. Supplying walkers and belt supports and installing them on site. Implementation of regular concrete slabs in the general site, as well as reinforced concrete slabs in the trailer path. The width of the reinforced concrete slabs will be 12 meters to accommodate up to three trucks at the unloading cells. The total length will be approximately 800 meters, covering the perimeter of both the existing and the new silo cells.

The mobilization phase involves the following activities: a) Site preparation: This includes clearing the site of vegetation and debris (if there are any vegetation in the site), 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 Phase of the expansion of Mafalsa Silos will include the following: a) Construction of the silo expansion: 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. c) Construction of a railway diversion, and overhead conveyor over the Naga Hamadi-Aswan road, plus a wheat receiving pit on ENR Right of Way. The total duration of the Mafalsa Silos expansion project is 17 months. It should be noted that the construction of a railway diversion, an overhead conveyor over the Naga Hamadi-Aswan Road, and a wheat receiving pit on the ENR Right of Way are part of future plans that will be implemented after the completion of the 17-month construction period. Because the railway connection will not be implemented contemporaneously with the project activities and the project can be viable without this connection as it relies mainly on grain transport trucks, the railway connection is not considered as an associated facility. Moreover, the railway connection area, pit and conveyor will be implemented on state owned land and ENR will be responsible for obtaining any necessary permits for future construction.



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The expansion areas, are located on land owned by the Egyptian Holding Company for Silos and Storage (EHCSS), officially allocated by Decree No. 570 of 2013 for silo use, with no prior formal or informal use or disputes.

## Policy, Legal, and Administrative Framework

The environmental and social management of the Mafalsa Silo expansion project adheres to a comprehensive framework regulated by the Egyptian Environmental Affairs Agency (EEAA) and other relevant authorities. This framework includes A) National Regulations, including the following i) Environmental laws and decrees issued by the EEAA, including Law No. 4 of 1994 (amended by Law No. 9 of 2009 and Law No. 105 of 2015) for environmental protection, and ii) Related legislation from line ministries addressing labor, land use, occupational health and safety, waste management, and construction. B) International Standards, including compliance with the World Bank Environmental and Social Framework (ESF), particularly the Environmental and Social Standards (ESSs) relevant to the project, and C) Key Oversight Authorities, including the EEAA oversees compliance with national environmental regulations, while relevant local authorities ensure adherence to sector-specific requirements during project implementation. The project aligns with these national and international regulations to ensure environmental protection, social responsibility, and adherence to best practices throughout its lifecycle.

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

**Physical baseline:** Climatically, Aswan experiences a hot desert climate, characterized by hot summers, minimal annual precipitation and warm winter days with cool nights. The hottest month on average is July, while the coolest month is January. Regarding noise, the area is classified as a residential/ agriculture zone. Key sources of noise include vehicular movement and the operation of water pumps used for irrigation.

Geologically, Aswan Governorate is located in the far south of Egypt, on both sides of the Nile, the silo site located in the Duwi formation sediments. The study area is characterized by wide ranges of elevation of land surface from +1000 m at the upstream, where the basement rocks outcrop, to +65 m at the downstream nearer to the Nile River and the general slope towards the west.

It is important to note that the water resources in the area are considered sensitive due to their distance from the site (the Nile River is about 480m from the west of silo site). There are a branching canal leading from the Nile River, located 350 meters west from the silo site. Wadi Abadi is the nearest natural runoff zone to the silo about 25 km southeast of the mafalsa silo site. The groundwater around the study area is recorded in three main aquifers: Quaternary (alluvial) aquifer, Upper Cretaceous (Nubian sandstone) aquifer and Pre- Cambrian (Fracture

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basement) aquifer. The works of (Abdel Kareem, 2000, Abdel Kader, 2001 and Ezz El-Deen 2006) are taken into consideration. The Quaternary (alluvial) aquifer is detected at Wadi Abadi (near silo location), Wadi El Dir, Wadi El Shoky and Wadi El Myah. The groundwater of the Quaternary (alluvial) aquifer is recorded at depths range from 1.5 m to 65 m. However, based on the results of the borehole investigations conducted at the site, no groundwater table was encountered down to a depth of 15.0 m. This suggests that, although the aquifer is regionally present at varying depths, the water table at the project site is deeper than 15.0 m.

The Silo site in Aswan Governorate is situated between two seismic sources, Zones 2 and 8, each with distinct seismic characteristics. Zone 2, located on the west bank of the Nile River between Assuit and Kom Ombo, has experienced seismic activity, including a notable earthquake in Kom Ombo in 2003, likely associated with the Gebel El-Barqa fault. Zone 8 encompasses the Red Sea region, including the Abo Dabab area and the southeastern Eastern Desert, where fault systems parallel the Red Sea spreading center, driven by the ongoing tectonic movement between the Arabian and African plates, making Abo Dabab the most seismically active zone in the area. The proposed silo site and its surroundings exhibit low amplification of seismic waves during earthquakes, indicating lower seismicity compared to other sites in South Egypt. Therefore, the area can be considered relatively safe for construction, with minimal expected damage, limited to possible loss of balance for individuals. In Upper Egypt, flash floods from intense storms are a major hazard, The silo site is located near the western parts of Wadi Abadi, this site may become unsafe so we recommend that, the government need to drill additional canals in the eastern side and building additional dams to minimize the impacts of flash flood and increase benefits of heavy rainfall which can be considered a source of drinking water which may flood nearby areas and cause destruction to them. **Regarding the construction site and existing silo area**, the site has been graded with proper slopes to drain water away from the premises. In case water enters the site, a submersible pump is used to remove the water that enters the tunnels and the lift station..

Biological baseline: Biologically, the area surrounding Mafalsa Silo is predominantly composed of reclaimed agricultural land and desert terrain and some residential areas, characterized by limited biodiversity.

**Flora:** Studies of the open-water and riparian habitats of the Nile in Aswan and southern Egypt revealed a rich diversity of plant species. a total of 14 species were recorded, with many occurring in areas near the silo site, including common species like *Phragmites australis* and *Eichhornia crassipes*, and rarer species such as *Arthrocnemum macrostachyum* and *Sarcocornia fruticosa*, , *Lemna perpusilla*, *Potamogeton crispus* and *Salsola kali*. Many other species were found in the Nile Bank and are considered as noteworthy species because they have economic uses. These species are: *Eruca sativa* Mill., *Raphanus raphanistrum* L., *Trifolium alexandrinum* L., *Malva parviflora* L., *Sida alba* L., *Mentha longifolia* (L.), *Sonchus oleraceus* L., *Allium roseum* L. According to IBAT tool, there are 3 plant species of potential concern present within 50km radius and these include; *Raphia australis* and based on the IUCN red list (2025) it is classified as vulnerable globally, *Alisma gramineum* classified as data deficient globally according to IUCN red list, and *Aegilops bicornis* classified as near threatened globally by the IUCN Red list (2025).

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No threatened flora species (e.g., IUCN Red List) were identified in the project area and the expansion site is within facility premises and is devoid of any vegetation.

**Mammals:** Rodents form the largest mammalian group in the area, being represented by many species and the most common species – besides of course the feral cats and dogs- are the Field Rat *Arvicanthis niloticus* and the Black Rat *Rattus rattus*, which are nocturnal and feed on vegetables and seeds (NARSS, 2010; BMC Ecology and Evolution, 2022). Burrows are shallow and usually under shrubs. The Red Fox *Vulpes vulpes* was recorded in areas around the Nile Bank (Mohamed, 2018; NARSS, 2010). Individuals and their tracks were seen throughout the area, where it seems to inhabit date and fruit groves, cultivated areas and suburban gardens, commonly seen during daylight hours. It feeds on birds, rodents, and insects. This fox belongs to subspecies *aegyptiaca* which is widespread around drains of Nile Delta and Valley. Three IUCN/internationally threatened mammals and one data deficient mammal were identified by the IBAT tool to be present within 50km Radius from the project site. These are; (1) *Capra nubiana* classified as vulnerable globally by the IUCN and in Egypt it is classified as endangered, (2) *Gazella Dorcas* classified as vulnerable globally and locally, (3) *Hyaena hyaena* classified as near threatened globally and (4) *Plecotus christii* as DD globally according to the IUCN. However, those species are not expected to occur at the project site, as it does not constitute an attractive habitat for those species and they were not sighted by the consultant nor by locals recently and the project activities are not expected to impact those species. Nonetheless, the ESMP includes measures for wildlife hunting and collections.

**Amphibians and Reptiles:** Four species of amphibians and 34 species of reptiles are known from the Nile Valley. Characteristic amphibians include *Sclerophrys regularis*, and *Ptychadena nilotica*. Common reptiles include *Hemidactylus turcicus*, *Chalcides ocellatus*, *Platycephalus florulentus*, *psammophilis sibilans*, and *Naja haje*. *Trachylepis quinquetaeniata*, *Chamaeleo africanus*, *Varanus niloticus*, *Myriopholis cairi*, and *Trionyx triunguis*, are restricted to this habitat in Egypt. Although the *chamaeleo africanus* is classified as least concerns globally based on the IUCN red list (2025), in Egypt it is classified as vulnerable (Baha El Din, 2006). However the species is threatened by reclamation of wetland and therefore the subproject does not pose any risks or threats on this species. The species is threatened by wildlife collectors and the ESMP includes measures for illegal wildlife collection. The *Varanus niloticus* is globally classified as least concern according to IUCN red list (2025), however locally it is classified as vulnerable (Baha El Din, 2006). This species is threatened by collection and trade and leather production. The silos are not expected to contribute as a threat for this species. *Trionyx triunguis* is classified as vulnerable internationally, and endangered locally due to fishermen collections and shell trade (Bahaa El Din, 2006 and IUCN, 2025). The project includes mitigation measures for illegal wildlife collection which may take place by project workers.

**Birds:** Common breeding birds of the Nile Valley include 66 species (Goodman *et al.*, 1989). At least 14 of these are not known to breed outside that habitat. Characteristic species include *Bubulcus ibis*, *Elanus caeruleus*, *Milvus migrans*, *Falco tinnunculus*, *Gallinula chloropus*, *Vanellus spinosus*, , *Streptopelia senegalensis*, *Centropus senegalensis*, *Tyto alba*, *Merops orientalis*, *Galerida cristata*, *Hirundo rustica*, *Motacilla flava*, *Prinia gracilis*, *Corvus cornix*,

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*Passer domesticus*, and others. The Nile Valley with its abundance of water and food available for birds, provide an important, relatively, easy, and safe route for trans-Saharan, palearctic migration. Huge numbers of individuals of many species utilize this route during both spring and autumn migrations. The region also provides wintering habitats for large populations of many palearctic migratory species (Goodman *et al.*, 1989). The Rock Pigeon (*Columba livia*) was also directly observed around the silo site during the field visit conducted on September 26, 2024.

Inquiries with local residents and farmers indicate that certain species are known to occur in the region. According to the IUCN Red List, species such as *Milvus migrans* (Black Kite), *Falco tinnunculus* (Common Kestrel), *Elanus caeruleus* (Black-winged Kite), and *Tyto alba* (Barn Owl) have been reported as commonly observed in the Nile Valley. These local accounts, together with the findings of Goodman *et al.* (1989), support the presence of these characteristic raptors in the area.

The threatened birds include; Three birds *Falco cherrug* and *Neophron percnopterus* and *Aquila nipalensis* are classified as globally endangered by the IUCN,

Ten birds; *Aythya ferina* and *Calidris ferruginea* and *Calidris falcinellus* and *Pluvialis squatarola*, and *Clanga clanga*, and *Aquila heliaca* and *Streptopelia turtur* and *Falco vespertinus* and *Falco concolor* and *Chlamydotis undulata* are globally classified as vulnerable.

Eleven species are globally classified as near threatened which are *Marmaronetta angustirostris* and *Aythya nyroca* and *Limosa limosa* and *Arenaria interpres* and *Calidris canutus* and *Calidris alpina* and *Vanellus vanellus* and *Gallinago media* and *Glareola nordmanni* and *Circus macrourus* and *Lanius senator*

The risk of bird collision is low, as the silo design does not include reflective materials. The project site located within an Important Bird Area (IBA) called Upper Nile. Although the silo area is not an attractive habitat for birds, the silo activities may attract birds during operational phase due to the presence of grains. In addition to agriculture lands in close proximity which support agrobiodiversity and provide suitable habitats for both resident and migratory birds. Therefore, grain spills prevention are present in the ESMP to avoid attracting birds to the silo area.

Since birds of prey are present in this region, risks from hunting and secondary poisoning from rodenticides usage may be present. The ESMP includes measures for wildlife hunting and collection and a pest management plan to prevent secondary poisoning of wildlife.

**Aquatic life/Fish:** The occurrence of different habitats along the Nile Bank resulted in a large variety of fish species inhabiting these ecosystems. *Tilapia zillii* and *Oreochromis niloticus* being prevalent. The project is not expected to impact freshwater species.

**Sensitivity:** The subproject is located at about 50 km from Dababya protected area, 112 km from Saluga and Ghazal Protected Area, 215 km from Wadi Al Allaqi protected areas, 270 km from



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Wadi Al-Asiouty Protectorate, 230 km from Wadi El Gemal Protectorate ,and 488 km from Elba Natural Protectorate. The project site is not near any RAMSAR sites

Moreover, All the islands in the Nile river were declared a Protected Area by Prime Ministerial Decree 1969/1998. The Nile River in Egypt originally included 144 islands and spanned approximately 160 km<sup>2</sup> across 14 governorates, with 95 located along the main Nile course (from Aswan to the Delta Barrage), 30 in the Rosetta Branch, and 19 in the Damietta Branch. However, on June 15, 2017, a new decree by then Prime Minister Sherif Ismail excluded 17 islands from this protection list, among them Warraq, Qorsaya, Dahab, and others, bringing the number of officially protected islands down to 127.

Sobha Island is located approximately 1.23 km west of Silo site. Two other islands referred to as “El-Mohammeed” and “Nag El-Sayeh” are situated around 6.6 km and 10 km to the north, respectively. To the south, another island lies about 4 km away, followed by four additional islands (El-Fuza, Qanadilah, and El-Radeisa) located approximately 12.8 km to 16.5 km from Silo site. All these nearby islands remain on the official protected list and were not among the 17 removed by the 2017 decree.

Disturbance caused by a growing number of fishermen and tourist cruises is increasing. There is a substantial water-pollution problem caused by untreated discharge from sugar, phosphate and dairy factories, as well as from urban areas. Erosion of the Nile banks has become a problem since the construction of the High Dam.

The project site is located within the Upper Nile Important Bird Area (IBA) A1,A4i and A4iii<sup>12</sup>. This IBA is of international significance due to its role as a critical stopover for migratory birds along the East African Flyway. The migratory route is an essential pathway for millions of birds traveling between Europe, Asia, and Africa. Migratory seasons include spring (February to April) and autumn (September to November), with peak migration typically observed in March and October. This is the stretch of the Nile river with the highest concentrations of wintering waterbirds in Egypt. In the winter of 1989/90, 21,100 waterbirds were counted in this region. The islands are particularly attractive to resting waterbirds. This IBA is a critical stopover for migratory birds traveling between Europe, Asia, and Africa along the East African Flyway. Migratory seasons occur in: a) Spring (February–April), birds traveling northward to breeding grounds, and b) Autumn (September–November), birds migrating southward to wintering grounds. Peak migration typically occurs in March and October, making the surrounding area of the project site an essential ecological corridor. According to birdlife website, the islands are particularly attractive to resting

<sup>1</sup> BirdLife International (2025) Site factsheet: Upper Nile. Downloaded from <https://datazone.birdlife.org/site/factsheet/upper-nile> on 19/06/2025

<sup>2</sup> The A1, A4i, and A4iii criteria are used to identify Important Bird Areas (IBAs). A1 identifies sites that hold significant numbers of a globally threatened bird species. A4i identifies sites that regularly hold 1% or more of a biogeographic population of a congregatory waterbird species. A4iii identifies sites that regularly hold at least 20,000 waterbirds.



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waterbirds. *Aythya nyroca* winters in internationally important numbers. *Netta rufina* winters regularly in small numbers, while *Marmaronetta angustirostris* is an irregular and rare winter visitor, last recorded from the area in 1983. This section of the Nile valley is likely to be of importance for staging waterbirds and other migrants, such as *Ciconia ciconia*, during the migration seasons.

*Aythya nyroca* is the IBA triggering species. However, the project area is not considered an attractive site for this bird and the project activities are not expected to impact this species. However, grain spills from silo activities may potentially attract bird species to the site, the ESMP will include measures for grain spills and proper housekeeping measures.

To conclude: The ESMP will ensure mitigation measures are in place in order to not attract birds to the silo area (due to presence of grains), it will also take into consideration any collision risks for migratory birds and will include an effective pest management plan that will take into consideration any secondary poisoning risks which may impact birds of prey. The measures will also include mitigation for wildlife hunting. The expansion silos will be located in a modified desert area surrounded by a storage site and existing silos and some residential buildings. The expansion silos will be within the land of the EHCSS Mafalsa Silos premises and are not expected to cause any habitat loss or destruction. Additionally, although threatened reptiles and mammals are known from the region, the project activities and location do not constitute a threat to those species and the site is not considered attractive to those species.

**Socio-economic baseline:** The Mafalsa Silo is surrounded by scattered buildings and desert terrain.. The closest residential area is Mafalsa village, with the silo site located at its southern boundary, approximately 800 meters from the village center. The area around the project site primarily consists of desert areas, and scattered buildings. Some buildings are located approximately 35 meters to the north and 15 meters to the south of the existing silo site. Additionally, agricultural lands extend along the main road to the west, about 200 meters from the existing silo site and 400 meters from the expansion silo site.

Regarding the socio-economics aspects, Mafalsa Silo is located in the village of Al-Mafalsa in Edfu Center, north of Aswan Governorate. The total area of Edfu Center is 1943.972 km<sup>2</sup>, The center of Edfu includes the city of Edfu (the administrative capital of the center), along with other cities such as Seba'ia West, Redesia Qibli, and Basaliya Bahri. Data indicates that the city of Edfu alone accounts for approximately 14.55% of the center's population. The total inhabited area of the urban is 57,268 Km<sup>2</sup> and the total inhabited area of the rural is 353,663 Km<sup>2</sup> according to Statistical Guide of Aswan Governorate. (2021). The total population of Edfu center is about 483593 inhabitants in 2021 (Egypt Description by Information, 2021). Males' population are 246130 while females are 237463. For the total population of urbans are 145310 in edfu center and 338283 for rural areas. The total population for Al-Mafalsa village is 10941 (5579 males and 5362 for females). Access to electricity in Upper Egypt governorates is 99.0% (Egyptian Human Development Report 2010). Even squatter settlement areas have access to electricity regardless



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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.

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 14th among the governorates of the Republic in the per capita share of the amount of drinking water consumed at a value of 134.05 m<sup>3</sup>/capita, and the percentage of total water loss reached 28.00% (Holding Company for Water and Wastewater, 2024), The reasons for water loss are not specified, but the expected reasons, based on the nature of the region, are due to physical losses such as leakage in the distribution network and aging infrastructure, as well as administrative losses including inaccurate metering and unauthorized connections.

. Aswan has 17 sewage treatment plants with a total design capacity of 208 thousand m<sup>3</sup> per day, and its actual treated sewage amounts to 84.8 million m<sup>3</sup> annually. The total collected sewage quantity reaches 100.27 million m<sup>3</sup> per year (CAPMAS, 2024). The labor force (above 15 years) in Aswan Governorate is estimated to have 478,400 persons among which 422,100 persons are employed, with an unemployment rate of estimated at 11.8, which is higher than the average unemployment rate for the Republic (7.9%), and Aswan is ranked 6th among the governorates of the Republic with the highest unemployment rate. However, female unemployment is significantly higher at 21.7% (CAPMAS, 2024). At the local level, in Edfu Center, the total number of employed people is 183,577, distributed as 134,781 in rural areas and 48,796 in urban areas. In Edfu Center, field observations indicate limited formal employment opportunities, with most residents depending on seasonal agricultural labor and informal trade.

Aswan is an agricultural hub, known for producing sugar cane, hibiscus, wheat, henna, and dates. The cultivated area with canes are more than 50% of the area of the preserved<sup>3</sup> agricultural land (i.e., land designated for agriculture and protected from construction or other non-agricultural uses), 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 adapt themselves to the conditions of the environment and climate. (Industrial development authority – The industrial development in Aswan).

The governorate has extensive electricity coverage and a well-developed road network. Communication infrastructure includes 161 post offices and 50 telephone exchanges with a capacity of 338.76 thousand lines. The number of fixed-line subscribers reached 103.55 thousand subscribers, and the percentage of Internet users reached 48.60%. According to Industrial Development Authority (The Industrial Development in Aswan), Major national projects, "Toshka giant Project": This project aims at fulfilling the Egyptians vision of getting out of the narrow valley to a new one capable of achieving higher levels of development and accomplishment.

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<sup>3</sup> Agricultural land preservation" refers to land specifically designated for agricultural use. These lands are typically not designated for construction, and building on them is usually prohibited to maintain their agricultural value



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Aswan is home to several significant archaeological and cultural sites, including Abu Simbel Temples, the Philae Temple, Wadi es-Sebua Temple, Temple of Beit El-Wali, Edfu and Kom Ombo Temple. These landmarks are located at various distances from mafalsa silo: Abu Simbel Temples lie approximately 328 km to the south, Philae about 118 km south, Wadi es-Sebua Temple 255 km south, and the Temple of Beit el-Wali 124 km south. Edfu Temple is situated just 12 km to the south, while Kom Ombo Temple is around 70 km south. Additionally, important archaeological sites to the north include El-Kab (7 km), Gebel el-Silsila (50 km), Karnak and the Luxor Museum (about 72 km), and Qubbat Al-Hawa (75 km).

The Ministry of Antiquities approval is not required prior to starting the works in Mafalsa silo extension project.

Women in Aswan, particularly in rural areas, face challenges related to unpaid labor, limited rights to land, and low participation in formal decision-making processes, despite their significant role in agricultural activities.

Regarding the land use in the area, Mafalsa grain silo is located east of the Nile. The silo is bordered on the west by a group of agricultural lands that separate it from the Nile River. The Nile River is about 480m from the west of silo site. The silo is bordered by a temporary storage bunker belonging to the Mafalsa existing silos followed by a desert land to the east and to the west it is bordered by a small road that leads to the existing silos from the main Cairo Aswan Eastern Desert Road (Naga Hamadi -Asswan/ Esna-Edfu road) which is followed by agriculture lands bordering the Nile River. It is also noticeable that the silo is located near the Cairo-Aswan Eastern Desert Road/ Naga Hamadi -Asswan/ Esna-Edfu road, about 150 meters away. The northern and southern boundaries of the silo are marked by some buildings, which are located approximately 35 meters to the north and 15 meters to the south of the existing silo site. The farmers utilizing the silo primarily consist of small- and medium-scale farmers from surrounding villages. The grains are transported to the silo using trucks and tractor-driven carts, depending on the scale of production and distance. The majority of farmland in the region is privately owned by small and medium scale farmers, while medium-scale farmers operate larger plots, occasionally employing laborers. Consultations indicated that land ownership in the area is predominantly male. However, a limited number of plots are owned by women, particularly through inheritance or family arrangements. This strategic location of the silo near agricultural lands and transportation routes ensures efficient grain delivery and supports the livelihoods of local farmers and workers, including women actively participating in the agricultural sector.

During stakeholder consultations, several issues were raised regarding the current operation of the Mafalsa Silo. These included:

- **Accessibility for Vulnerable Groups:** Elderly individuals and women reported difficulties accessing silo services due to limited physical support during grain delivery.
- **Transportation Constraints:** Farmers and traders cited a lack of reliable and affordable transportation options for delivering grains.

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- Technical and Infrastructure Limitations: Existing loading and unloading equipment was deemed inadequate to handle peak season demands.
- Long Waiting Times and Limited Capacity: Both farmers and traders experienced significant delays due to full silo cells, resulting in inefficiencies in the supply process.

In response, several mitigation measures have been proposed to improve operational efficiency and ensure inclusive access. These include:

- Enhancing support services and infrastructure for vulnerable groups by establishing on-site support teams, providing ramps and parking for vulnerable groups, applying scheduling and fast-tracking lanes for elderly, women, and small farmers, and ensuring regular engagement to inform them about these tailored services.
- Collaborating with local transport providers and farmer cooperatives,
- Upgrading grain handling equipment, and
- Expanding storage capacity and introducing timeslot scheduling systems.

#### Women's Feedback:

- During the consultation sessions, women living near the silo site expressed strong support for the expansion project.
- They viewed the project as an opportunity, particularly the ease of transporting grain from nearby fields.
- Several women indicated that the expansion may encourage more investment in wheat cultivation, which could lead to increased household income.
- No safety or social concerns were raised by the women.

#### Feedback from Vulnerable Groups:

- Consultations also included vulnerable individuals, such as the elderly and people with disabilities. Their feedback reflected a generally positive outlook on the project.
- They welcomed the initiative's inclusive employment measures, particularly the allocation of roles for persons with disabilities, the company complies with the national quota system (5% of the workforce) in case of any future recruitment. it does not specify a particular type of disability, and if such recruitment occurs, it would normally cover general administrative or supportive functions rather than project-specific technical roles.

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- The elderly appreciated the proposed improvements in grain handling processes, which would minimize physical strain and waiting time.

It is worth mentioning that the existing administrative buildings include ramps for people with disabilities. EHCSS will make sure ramps are also present in the public restroom area and any needed area in their project design

Further details are provided in Section 4.5 of the main report.

#### **Summary of risks and impacts identified and related mitigation measures:**

Identification and analysis of risks and impacts was carried out 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, surface water and groundwater 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. Mitigation measures were identified to ensure that any potentially harmful impacts are minimized and reduced to minor levels.

### **Risks and Impacts during Construction Phase**

#### **1. Environmental Risks**

- Temporary air emissions from dust and equipment exhaust.
- Noise emissions from construction machinery and activities, affecting nearby residents and workers.
- Waste generation of solid and hazardous waste, including construction debris and hazardous waste such as chemicals and fuel.
- Potential soil and water contamination from equipment spills, , improper disposal of hazardous waste, and runoff from construction sites impacting nearby lands.
- Disturbance to Local Biodiversity: Construction activities may temporarily affect bird species and wildlife in the area and may increase risk of bird collision during migratory seasons. Risks on birds from grain spills by the current operations of the existing silos and secondary poisoning of birds of prey and other non -targeted wildlife from the use of rodenticides. Additionally risks of hunting and wildlife collection.

#### **2. Social Risks**

- Temporary disturbance to local communities from construction noise, dust, and increased traffic.
- Potential impacts on accessibility to nearby roads and agricultural lands.

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- **Interruption to Current Silo Operations:** Construction activities could disrupt the logistics of grain supply and the normal functioning of the silo.
- **Risk of Child Labor:** There is a possibility of minors being involved in construction work, necessitating strict adherence to labor regulations.
- **Potential Social Tensions and SEA/SH Concerns:** The proximity of construction workers to local communities may lead to social tensions and increase the risk of incidents related to Sexual Exploitation, Abuse, and Harassment (SEA/SH).
- **Community Dissatisfaction:** Insufficient communication and public engagement may result in unresolved grievances and growing discontent within the community.
- **Labor-Related Risks from Poor Working Conditions:** Workers may face unfair treatment, unsafe environments, and a lack of proper grievance channels during construction.
- **Community Health and Safety Hazards (Traffic-Related):** The movement of construction vehicles could increase the risk of road accidents and traffic congestion in the area.

### 3. Occupational Health and Safety (OHS) Risks

- **Risks of injury from working with heavy machinery and equipment,** excavation work and falling in excavations, falling from heights, exposure to hazardous materials, and welding activities.
- **Exposure to noise, dust, and hazardous materials.**
- **Traffic-related accidents during transportation of materials.**
- **Respiratory Issues:** Workers exposed to dust and air emissions may face respiratory hazards.
- **Confined Space Hazards:** Working in enclosed areas such as silo structures and deep excavations may pose suffocation and entrapment risks

## Risks and Impacts during Operation Phase

### 1. Environmental Risks

- **Biodiversity risks:** Grain waste may attract birds and rodents, potentially disrupting the local ecosystem. Pesticides (rodenticides) used for rodents may pose risks to non-target species. Bird collision risks may increase during migratory seasons.
- **Pesticide Use Risks:** Improper handling and disposal of pesticides used for fumigation may harm non-target species and human health.
- **Biodiversity risks:** Risks of hunting and wildlife collection.

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- Dust and particulates from grain handling may contribute to localized air quality issues.
- Improper disposal of grain waste or pesticide containers may lead to soil and water contamination.
- Ambient Noise risks: Noise generation from operations and machinery.

## 2. Social Risks

- Increased vehicular movement for grain transport may pose safety risks for nearby communities.
- Potential for grain waste affecting nearby residents if waste is not properly managed.
- Access Challenges for Vulnerable Groups: Small farmers and other vulnerable groups may face challenges in accessing silo services and risks of elite capture.
- Risks to Labor: Unfair treatment and unsafe working conditions for silo workers and seasonal workers.
- 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.

## 3. Occupational Health and Safety (OHS) Risks

- Workers may be exposed to pesticides during application and handling, posing inhalation and skin contact hazards.
- Airborne grain dust may cause respiratory issues or create fire and explosion risks during grain discharge.
- Fire and Explosion Risks: Dust accumulation in silo storage combined with potential accidental ignition, can lead to significant fire hazards and explosion risks.
- Confined Space Risks: Maintenance and cleaning operations inside silos pose safety concerns.
- Grain engulfment
- Other physical injuries

## Mitigation Measures during Construction Phase

### 1. Environmental Measures

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- Use water spraying and dust suppression techniques, , such as water spraying, to reduce airborne dust.
- Regular maintenance of construction machinery to minimize air emissions.
- Proper waste management, including segregation and safe disposal of hazardous and non-hazardous waste.
- Spill prevention measures and proper storage of hazardous materials.
- Ensure measures prohibiting wildlife hunting are in place Ensure pest management plan , rodenticide measures and grain spill measures are in place for the current operational silos.

## 2. Social Measures

- Develop and implement a traffic management plan to minimize disturbances.
- Engage local communities to inform them of construction activities and address concerns and to prevent elite capture risks.
- Ensure construction activities are limited to designated areas to prevent interference with local livelihoods.
- Implement strict child labor policies to prevent the employment of minors. Maintain attendance sheets, verify worker IDs, and regular inspections.
- Enforce a grievance mechanism to address community complaints, including SEA/SH-related concerns and train workers on code of conduct and SEA/SH issues.
- Ensure transparent communication with local farmers and silo users to minimize disruptions to existing operations.
- Improvement of Working Conditions: Share information on labor rights, establish grievance mechanisms, and inclusive hiring practices.

## 3. Occupational Health and Safety (OHS) Measures

- Provide appropriate personal protective equipment (PPE) to workers, including helmets, masks, gloves, and safety boots.
- Develop and enforce a site-specific OHS manual and training program, that includes risk assessments and emergency response plans.
- Conduct safety training sessions for workers on handling hazardous materials, emergency evacuation, and safe work practices.
- Implement fall protection measures for workers operating at heights or in confined spaces.
- Ensure first aid and emergency response measures are in place.

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- **Accessibility:** Ensure temporary access facilities for people with disabilities.

## Mitigation Measures During Operation Phase

### 1. Environmental Measures

- Implement proper grain waste management practices to prevent accumulation and mitigate attraction to birds and rodents.
- Use enclosed systems and dust extraction equipment to minimize dust emissions during grain handling.
- Ensure pesticides are stored, applied, and disposed of according to international safety standards.
- Implement grain dust control measures, such as enclosed handling systems and dust extractors.
- **Emission Control:** Regular maintenance of vehicles, pressure tests for fumigation, and install gas sensors.
- **Noise Control:** Conduct regular noise measurements, restrict truck movements, and maintain equipment.
- **Biodiversity Protection:** Follow pest management plans. Ensure proper Pest Management Plan is implemented and remove any dead rodents and avoid secondary poisoning of non targeted species of animals including birds of prey and proper grain spillage measures to minimize impacts on bird species and local wildlife.
- Ensure measures prohibiting wildlife hunting are in place. Ensure pest management plan , rodenticide measures and grain spill measures are in place.

### 2. Social Measures

- Develop a traffic management plan to minimize disruptions and ensure road safety during grain transport.
- Implement control measures for waste management to prevent impact on nearby communities.
- Implement measures to ensure equitable access for small farmers and vulnerable groups. Develop accessible grievance mechanisms, conduct regular stakeholder consultations, and provide continuous project information.
- Enforce fire prevention protocols to mitigate explosion risks in silo storage areas.



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- **Improvement of Working Conditions:** Share information on labor rights, establish grievance mechanisms, and ensure proper OHS for seasonal workers.
- **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. Occupational Health and Safety (OHS) Measures

- Provide Personal Protective Equipment (PPE), such as masks, gloves, and goggles, to workers handling pesticides or exposed to grain dust.
- Train workers on safe pesticide application and grain handling practices.
- Install and maintain fire suppression systems to reduce fire and explosion risks from grain dust.
- Ensure safe procedures for confined space entry, including monitoring air quality and using proper safety harnesses when working from height.

#### Unplanned Events:

Risk management measures for potential fire and explosion events will remain in place, following the emergency response procedures established during construction. These protocols will include equipment checks, and staff training. Additionally, the risk of spills and chemical leaks can be mitigated by establishing effective containment and cleanup procedures. To further safeguard workers, maintaining accessible emergency medical facilities and fully equipped first-aid stations is crucial for promptly responding to workplace accidents. Insurance policies will be implemented for loss of land and properties.

#### ESMP reporting and supervision

Currently EHCSS has a technical consultant who supports the preparation of the bidding documents. EHCSS has also a supervision consultant on board. The plan is that the supervision consultant will constitute the supervision work related to OHS, environment and social risks during construction phase. The supervision consultant will supervise the contractor's environment and social and OHS works. The technical consultant and the supervision consultant work will be finished at the end of the construction work. The supervision consultant will review the C-ESMP developed by the contractor and ensures that the current ESMP's measures are reflected in the C-ESMP. The supervision consultant will review and approves the C-ESMP every 6 months.

A monthly report will be provided by the contractor to the supervision consultant and a quarterly progress report will be provided from the supervision consultant to the WB.



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

**Summary of stakeholders engagement:** Regarding the stakeholder consultation and public participation, the consultant provided comprehensive information about the current project, including its objectives, components, impacts, potential risks and impacts, and mitigation measures and were open to receive feedback and concerns and suggestions

The consultant shared the environmental and social mitigation measures and monitoring measures for the proposed project and welcomed suggestions from the different stakeholders and incorporated them in the ESMP. The consultations were conducted in a manner that was meaningful, informed, and inclusive, in accordance with ESS10. The consultations were open to all participants, and invitations were disseminated widely to all affected stakeholders.

Public consultations were conducted with the local community through site-specific consultations (focus group discussions) conducted on September 26, 2024. The number of consulted people was 19 persons including 8 farmers, 6 women and 5 traders. Several focus group discussions were conducted with the relevant groups, including consultations with farmers including the ones bordering the silo area, grain traders, women, and vulnerable groups in the society. The results of the consultations helped in identifying challenges faced by silo users and their feedback was taken into consideration. One key issue raised was the long waiting time silo users take to submit their grains, because the silos cells are usually full. By increasing the number of cells, the capacity will increase and in turn this will reduce the waiting time to deliver their grains. While there are multiple concerns raised by stakeholders during consultations, including logistical issues and operational efficiency, the primary concern expressed by the majority of stakeholders, particularly farmers and traders, is indeed the long waiting time due to limited storage capacity. This delay affects the timeliness of grain deliveries, increasing transportation costs and posing logistical challenges for both small and large-scale farmers. Increasing the number of silo cells is viewed as the most impactful solution to address this issue directly by expanding storage capacity and, consequently, reducing these delays. Additionally, vulnerable groups, including women and elderly farmers, raised concerns related to accessibility and operational challenges at the silo.

The specific concerns identified during consultations and their mitigation measures are as follows:



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A) Accessibility for Vulnerable Groups: Some farmers, particularly the elderly and women, mentioned difficulties in accessing silo services due to limited assistance during the supply process. This impacts their ability to efficiently deliver grain.

**Mitigation Measures:** a) establish on-site teams specifically trained to assist vulnerable groups during grain delivery, b) incorporate ramps to facilitate easy access for individuals with mobility challenges, c) implement a scheduling system during peak periods hours to reduce congestion and ensure that vulnerable groups receive timely assistance and d) include a fast-tracking lane for elderly and small farmers and separate lane for women, e) include parking space for persons with disabilities and elderly f) engage regularly with small farmers, women and elderly and inform them with the above mentioned services tailored to their needs.

B) Transportation Challenges: Farmers and traders face logistical difficulties, including a lack of adequate transportation support for grain delivery to the silo.

**Mitigation Measures:** a) the Silo Manager will collaborate with local transport providers to secure reliable, cost-effective vehicle services for grain delivery, b) encourage the formation of cooperatives among local farmers to share transportation resources, reducing individual costs and delays, and c) implement a robust traffic management plan to facilitate efficient loading and unloading operations, minimizing delays.

C) Technical and Physical Constraints: Existing facilities at the silo, including loading and unloading equipment, were reported to be insufficient to handle peak harvest demands efficiently.

**Mitigation Measures:** a) the increase in the number of storage cells will expand the overall capacity and reduce congestion, b) the installation of modern, automated loading and unloading systems will accelerate grain handling processes, and c) enhance regular maintenance and inspection schedules to ensure that all equipment is functioning optimally, especially during peak periods and (d) implement a scheduling system during peak periods hours to reduce congestion.

It is worth mentioning that the existing administrative buildings include ramps for people with disabilities. EHCSS will make sure ramps are also present in the public restroom area and any needed area. EHCSS will also upgrade its existing restrooms to accommodate people with disabilities for both genders. All consulted groups mentioned that the project will positively impact them and their community by increasing the sense of security. They believe the project will alleviate the burden of storing wheat and reduce the waiting time for delivering wheat to the silo. The expansion will ensure that wheat needs are met and will contribute to greater stability.

### **Grievance Mechanism Summary:**

#### **Existing grievance mechanism (GM):**

#### **Unified GM channels:**



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

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

### **Localized communication channels (EHCSS):**

At EHCSS level, the complaints are usually received from farmers depositing grains or grain buyers in the silos. The main complaints are about the quality of the seeds that are being deposited and tested immediately on site. In case there are any complaints from farmers and contractor, the complainant can raise their complaints to the Mafalsa silo manager office or through his phone. If it is not resolved it escalates to the customer services office at EHCSS. The silo manager documents and sends the complaints to EHCSS or the farmer/ contractor can reach the customer service through the EHCSS customer service number visible at silo level. The documentation of complaints raised at silo level exists and it will be continuously improved during the project implementation.

- Channels /current contacts are: -
  1. Mafalsa Silo Manager: 01288072365.
  2. Customer service managed by the EHCSS company: 01279671142/01279671143.
  3. The company's official [website: www.ehcss.com](http://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.

Confidential and anonymous channels are available, and complainants can choose either option based on their preference.

### **Workplace grievance summary:**

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

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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 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.

### **Summary and Overview of Grievance Management (GM) Procedures (more details are provided in the main document)**

Workers are encouraged to first raise grievances informally with their direct managers. If the manager is involved in the issue, a formal grievance may be submitted directly. The formal grievance process includes four main steps:

#### **1. Receipt, Acknowledgment & Registration**

- Grievances can be submitted via dedicated channels using a provided template or orally (staff will record oral complaints).
- Anonymous submissions are allowed and must be clearly communicated.
- All grievances are logged, and complainants receive confirmation and a registration number.
- Clear timelines for response must be established and followed.

#### **2. Verification & Assessment**

- Grievances are discussed, investigated, and evidence collected (including field inspections if needed).
- Eligibility is assessed based on:
  - Worker's relationship to the project.
  - Relevance to labor issues (e.g., OHS, wages, discrimination).
- Non-eligible grievances may be redirected to other mechanisms.

#### **3. Response & Feedback**

- Initial response within **5 working days**.
- Straightforward cases resolved within **10 days**; complex cases within **14 days**.
- Serious safety risks are addressed immediately.
- Responses must explain proposed actions and offer choices:
  1. Accept resolution

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2. Request reassessment

3. Pursue other legal or organizational options

- If unsatisfied, workers may appeal within **5 days**. Appeals involve senior staff and possibly a grievance committee. Final response within **7 days** of appeal.

#### **4. Agreement & Implementation**

- Resolved grievances are documented with resolution details.
- Unresolved cases are also logged with final decisions and actions.
- Confidentiality is maintained upon request.
- Total grievances and resolution timelines are tracked.

### **Current and proposed SEA/SH complaints mechanism channels:**

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

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

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



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# 1

## INTRODUCTION

### 1.1. Overview

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.

Domestic wheat purchases did not compensate for the significant decline in imports from the Russian Federation and Ukraine. Egypt had projected to increase domestic wheat purchases from an annual average of 4.5 million metric tons to up to 6 million metric tons during the harvest of April to June 2022 by offering higher prices to farmers, but this increase did not, however, compensate for the significant decline in imports from the Russian Federation and Ukraine. Furthermore, the production of bread required locally produced wheat to be mixed with matching quantities of imported wheat to address quality issues. Continued imports were therefore needed for the rest of the year in view of low stock levels.

To minimize Egypt's dependency on wheat imports in the medium term, and in line with Egypt's Food Security Strategy, embedded in Egypt's 2030 Vision, several priority actions will contribute directly to sustainably increasing the efficiency of the wheat value chain in country. These include are: (i) reduction of losses, currently reaching up to 20 percent of total grain storage through improved silo infrastructure to facilitate market access for local producers and reduce post-harvest losses; (ii) promoting climate-resilient agri-food value chains and ensuring that the agri-food sector further contributes to job creation; (iii) continued investment in early warning systems and mitigation measures; and (iv) continued strengthening of social protection programs.

The proposed operation supports Egypt by mobilizing immediate short-term relief to address supply and price shocks while simultaneously bolstering Egypt's longer term food security strategy and improved nutrition strategy for the poor and vulnerable. This is done in close



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coordination with a wide range of other partners, providing both financial support, investments, and technical assistance. Bank support would be part of a coordinated donor response to address financing needs in the range of US\$1.6 billion based on the information available from partners, covering grain import needs for the year 2022, support to improved storage and support for more efficient and resilient domestic production.

## 1.2. Project Components

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:

- **Component 1:** Emergency Response Measures.
- **Component 2:** Strengthening Preparedness and Response to Shocks.
  - ✓ Sub-Component 2.1. Improving the resilience of the wheat supply chain and reducing loss and waste.
  - ✓ Sub-Component 2.2. Improving farm-level resilience and enabling sustainable domestic cereal production
- **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.

### **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<sup>4</sup> 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

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<sup>4</sup> Use of solar energy and other renewable energy sources will be included in the design of silos.



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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.

This modern grain collection and storage infrastructure would help ensure safe, wasteless and energy efficient storage of grain. Climate change could lead to an increase in insect pests, change in grain drying conditions, surge in fungal diseases in storage facilities due to variability of temperature. Investment in modern storage facilities with state-of-the-art temperature and disease control functions would reduce or eliminate potential impacts of climate change on grain storage and reduce losses and therefore GHG emissions. Integrated with rail and river transportation, the storage infrastructure would ensure more efficient procurement of wheat and other strategic grains domestically, thus improving farmers’ access to markets. It will also increase the overall resilience of Egypt to withstand any future supply shocks.

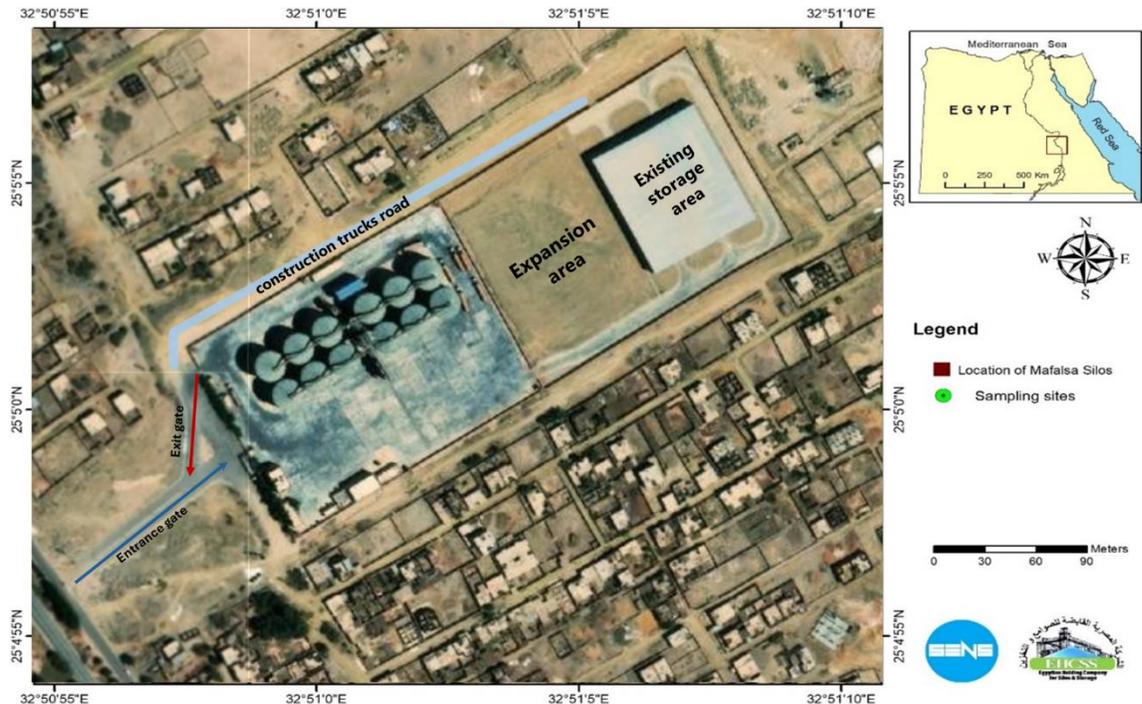
The project will finance the design of silos, civil works, and equipment, including imported equipment and technology components required to assemble field-silos. Government counterpart co-financing is expected to finance local components and local civil works for the construction of silos and the project manager (supervisor) contract. The estimated counterpart co-financing will be around 50 percent. Implementation, including contracting for the design, construction, and supervision of activities, will be managed by EHCSS, which is mandated by its establishment decree to serve as the agency responsible for the management of strategic state-owned grain silos. Currently, EHCSS uses single responsibility turnkey contracts for design, supply, and installation of silos with experienced specialized firms.

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.

The activities under this subcomponent include the expansion of seven existing silos and the construction of three new silos complexes. For each new silo complex, a site specific Environmental and Social Impact Assessment (ESIA) will be prepared, and for each expansion silo, a site specific Environmental and Social Management Plan (ESMP) will be prepared. The current Environmental and Social Management Plan (ESMP) focuses on the expansion of the existing Mafalsa silo subproject.

### 1.3. Location of Mafalsa Silo Complex

Mafalsa Silo is located in the village of Mafalsa in Edfu district, north of Aswan Governorate. The Silos cover an area of 30,000 m<sup>2</sup> and consist of 12 cells each with a capacity of 5 thousand tons of wheat with a total capacity of 60,000 tons, it is equipped with the latest storage technology, including inventory management and control system, steaming system and stock temperature control, firefighting system, and wireless system. Figure (1.1) shows the location of Mafalsa silo complex in Aswan governorate, and table (1.1) shows the coordinates of the location.



**Figure (1.1):** Map showing the location of Mafalsa Silo Complex in Aswan.

**Table (1.1):** Coordinates of Mafalsa Silo Complex.

Point ID	N	E
A	25° 04' 59.68"	32° 50' 55.51"
B	25° 05' 02.93"	32° 51' 01.35"
C	25° 04' 58.86"	32° 51' 03.74"
D	25° 04' 55.83"	32° 50' 58.10"

### 1.4. Objectives



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The main objective of this ESMP is to provide a tool that will ensure an environmentally friendly operation of the proposed expansion silos for the Mafalsa silo complexes. This ESMP 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, designed to effectively address local practices, EEAA requirements and environmental and social conditions, as well as the requirements of the funding organization (ESSs of the World Bank). The specific objectives of this ESMP are to:

- Assess the impacts, and provide measure to avoid, minimize and mitigate the impacts.
- Comply with the Egyptian national environmental and social legal requirements.
- Comply with the World Bank environmental and social policies, standards, and guidelines.
- Identify the practical technical and economically feasible measures needed to prevent, minimize, mitigate the adverse risks and impacts, and offset residual impacts.
- Identify potential opportunities to enhance the environmental and social benefits and sustainability throughout the project life.

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## 2

## PROJECT DESCRIPTION

### 2.1. Project Description

#### 2.2.1 Current Silos Operations

This operation is for the current operation of the Silo, and it will be the same operation after the expansion of Mafalsa Silo, there is no difference in operation before and after the expansion, except for the addition of railway transport for grain delivery, as well as the construction of a wheat receiving pit and a weighing area on the Egyptian National Railways Right of Way. The railway connection will be implemented after the construction of the silo, and it will be carried out by the Egyptian National Railways (ENR). Because the railway connection will not be implemented contemporaneously with the project activities and the project can be viable without this connection as it relies mainly on grain transport trucks, the railway connection is not considered as an associated facility.<sup>5</sup> Moreover, the railway connection area, pit and conveyer will be implemented on state owned land and ENR will be responsible for obtaining any necessary permits for future construction. **Receiving the Wheat:**

- The car loaded with wheat enters the site (There is on site traffic management to arrange the loaded trucks entering the site, and there are different pathway and different waiting line for small scale farmers).
- A sample of the loaded wheat is taken by a neutral committee, and its degree of cleanliness and moisture content are determined using laboratory equipment.
- Accepted vehicles loaded with wheat are weighed on a truck scale and the gross weight of the vehicle is recorded.
- The car is unloaded at the wheat receiving station.
- The empty car is weighed on a truck scale, the empty weight of the car is recorded, and the quantity received is recorded.
- The quantity of wheat received in the silo is recorded in the designated records and the financial dues are paid to the supplier.
- The wheat is stored in the main storage cells.

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<sup>5</sup> The criteria of associated facilities as extracted from the WBG ESF guidance notes “Associated Facilities” means facilities or activities that are not funded as part of the project and are: (a) directly and significantly related to the project; and (b) carried out, or planned to be carried out, contemporaneously with the project; and (c) necessary for the project to be viable and would not have been constructed, expanded or conducted if the project did not exist.” All three criteria must be met for the activity to be considered an associated facility. In this project criteria b and c are not fully met.

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## 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.
- Fumigation and pest control will be provided in Appendix I (Pest Management Plan PMP)

### 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.

## 2.2.2 Description of the implementation of the Mafalsa Silo Expansion Project

### A) The Current Situation

- The existing Silo was constructed and started working on 15/03/2018. EEAA approval No. 2318 was obtained and dated 03/07/2018.
- The main road in front of the existing Silo complex is the Cairo-Aswan Eastern Desert Road, about 150 meters away. It is a major highway connecting Cairo and Aswan governorates in Upper Egypt. It is paved road with two lanes in each direction (figure 1.1. which shows the location of the Silo complex; it also shows the access roads to and from the Silo complex. A diagram is provided in the next section, and site photos were provided in appendix V).
- The area in front of silos includes access roads for grain trucks entering and exiting the silos and parking areas for grain trucks.
- Administrative offices related to silo operations.
- There is a system in the silos that collects dust, and emissions produced during the loading and unloading of grains to and from the silos.
- The water source for the existing facilities in the current Silo is the public water network, the average monthly consumption of water is from 70 to 140 m<sup>3</sup>.
- Wastewater is 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.

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- 12 main storage cells with a flat concrete bottom with grain bin sweeps with the following specifications: -
  - ✓ Storage capacity (5) thousand tons.
  - ✓ Diameter 18.1 metres.
  - ✓ Height 26.8 metres.
- (4) lifters for handling wheat and transporting it in a vertical direction.
- The transformer has a capacity of 1000 kVA, which accommodates 150% of the load of the existing silo. Therefore, it will be sufficient to support the equipment required for the expansion.
- A number of chain belts for handling wheat and transporting it in a horizontal direction.
- Pit hole Receive.
- Rotating magnet.
- Truck scale.
- Machinery tower.
- Dust extraction system consisting of (3) filters.
- Reciprocating sieve.
- Electronic scales.
- Fixed magnet.
- Auxiliary systems (fire extinguishing - fire alarm - aircraft warning - wireless and communications)
- Administrative and service buildings.
- There are 31 employees operating the silos.
- The design of the existing silos include some sort of window shaped boxes on the belt conveyers/elevators to reduce the impacts of explosion in case it happens.

## **B) Expansion Project:**

- Implementation of (12) main storage cells with a flat concrete bottom, including the following (details are provided in Figure 2.1): -
  - ✓ Excavation works (21m cell diameter and 5 m deep excavation depth for each cell).
  - ✓ Concrete works in accordance with the nature of the soil contained in the soil investigations report and the site's calculation notes.
  - ✓ The cell sheets are imported and supplied on site (cell sheets consists of sheets, stiffeners, roof beams, roof sheets, bolts, nuts, and washers), assembled in different thicknesses, and installed on the concrete base (The cell sheets are parts of the Silos that built outside the site for Silos expansion, and then imported and collected in the site to build the Silos).

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✓ The width cell is 21 meters.

- The List of equipment that will be used during the construction work of the Silos expansion include the following: (Loaders, Excavators, Cranes, Welding machines. Concrete mixing trucks, Concrete pumping trucks, and manual equipment). The equipment that will be used for demolishing includes the following: Excavator for demolishing, Bulldozer for collecting and loading rubble into a truck, truck to move the rubble to landfills.
- The list of chemicals includes only the Phostoxin for fumigation during grain storage, b) Cement for structural works during the construction phase, c) Bitumen applied for waterproofing and sealing purposes during construction, d) Paints for coating and protecting surfaces during construction and maintenance, and e) Oil and Lubricants essential for machinery and equipment maintenance during construction and operation phases.
- Importing track belt parts and components, supplying them on site, assembling and installing them.
- The Access Road for the expansion will be from the northern side of the Silo (check figure 1.1).
- The access road that will be used during the construction is planned so as not to disturb existing traffic. This road has been located to avoid disturbing existing silo traffic. Local non-silo traffic uses the main paved roads in the surrounding area.
- Supplying walkers and belt supports and installing them on site.
- Implementation of regular concrete slabs in the general site, as well as reinforced concrete slabs in the trailer path. The width of the reinforced concrete slabs will be 12 meters to accommodate up to three heavy trucks at the unloading cells. The total length will be approximately 800 meters, covering the perimeter of both the existing and the new silo cells. Figure (2.1) shows the expansion project of Mafalsa Silos.
- Removal of the existing wall between the current site and the expansion area, including lighting poles, surveillance cameras, and guard towers. New units will be installed along the newly constructed wall.
- **Road side area** which is used to transfer wheat/items to the storage area and which will be used for the construction trucks for the expansion. The road may need some maintenance. It seems that residential areas are located also close to this road.
- The number of grain trucks will remain the same after expansion
- The total duration of the Mafalsa Silos expansion project is 17 months, It should be noted that the construction of a railway diversion, an overhead conveyor over the Naga Hamadi–Aswan road, and a wheat receiving pit on the ENR Right of Way are part of future plans that will be implemented after the completion of the 17-month construction period.

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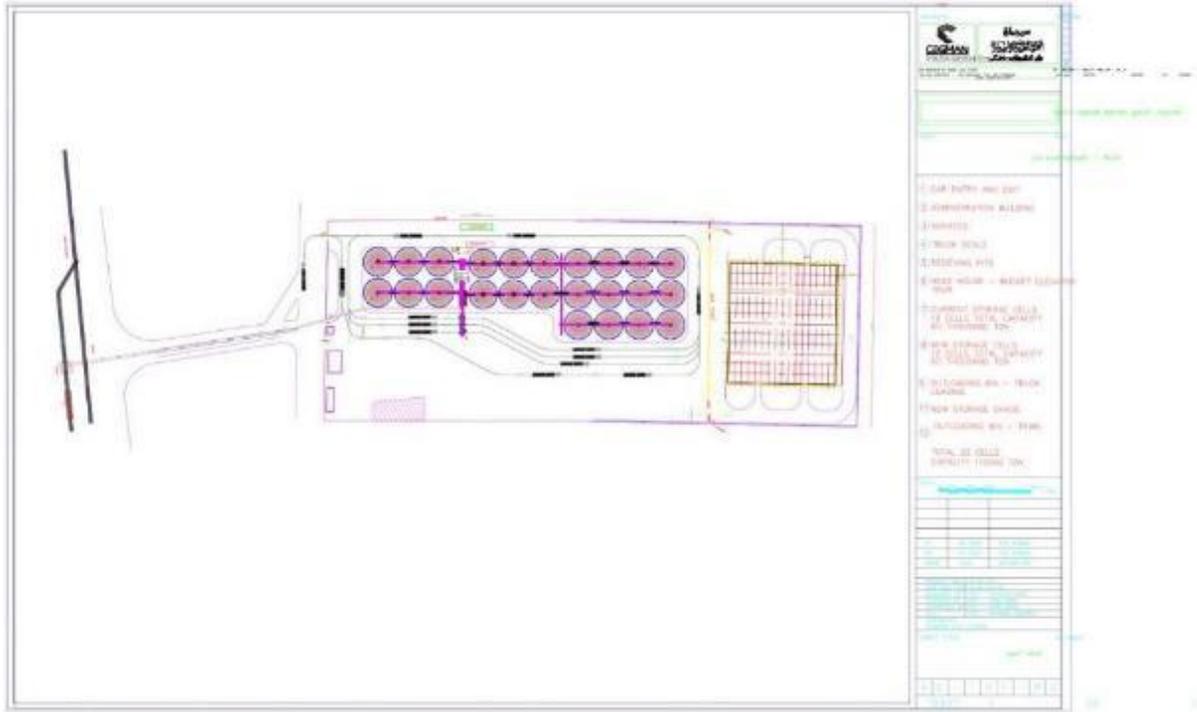
### **Associated facilities assessment:**

- A railway diversion will be constructed at a suitable distance from the main railway line to facilitate the unloading of wheat into railway wagons. This railway diversion for grain disposal and receiving will be constructed by ENR on its right of way (1-2m next to the railway line and will include unloading cell and a scale, and EHCSS will construct an overhead conveyor belt about 5.5m high which will connect the silo to the railway unloading cell, passing above the Naga hamadi-Asswan road and stretching about 150m in length.
- EHCSS will also construct the wheat receiving pit area and a weighing area on the Egyptian National Railways Right of Way. The receiving pit will have dimensions of 18 meters in length, 3 meters in width, and 3 meters in depth, with a capacity of 70 tons.
- The number of employees will increase to 1-2 more employees who will be responsible for the wheat receiving pit on the RoW and to secure the conveyer area.
- Because the railway connection and receiving pits will not be implemented contemporaneously with the project activities and the project can be viable without this connection as it relies mainly on grain transport trucks, the railway connection is not considered as an associated facility.<sup>6</sup> Moreover, the railway connection area, pit and conveyer will be implemented on state owned land and ENR will be responsible for obtaining any necessary permits for future construction. This is a future activity and is not considered an associated facility as explained previously.
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<sup>6</sup> The criteria of associated facilities as extracted from the WBG ESF guidance notes “Associated Facilities” means facilities or activities that are not funded as part of the project and are: (a) directly and significantly related to the project; and (b) carried out, or planned to be carried out, contemporaneously with the project; and (c) necessary for the project to be viable and would not have been constructed, expanded or conducted if the project did not exist.” All three criteria must be met for the activity to be considered an associated facility. In this project criteria b and c are not fully met.

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**Figure (2.1):** Showing the expansion project of Mafalsa Silos.

## 2.2. Construction Phase

- The timeframe/timetable is provided in appendix (V.1)
- The list of equipment was provided in the previous section.
- The required resources and quantities including raw materials, water and electricity will be assigned by the contractor.
- The raw materials needed include the following: (Steel 808 tons, Cement 1664 tons
- Gravel 3800 m<sup>3</sup>, Sand 1900 m<sup>3</sup>, and Water 712 m<sup>3</sup>)
- The water source for the existing silo is the public water network and will be used during construction work.
- 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 number of manpower/workers and their type during the construction phase include the following:
  - ✓ Contract workers are used through (3) manufacturing contractors throughout the year during the project implementation period, as follows: -

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- ✓ 15 workers (carpenters - blacksmith) for civil works since the beginning of the project implementation.
- ✓ 10 workers for public works since the beginning of the project implementation.
- ✓ 60 electromechanical workers during electromechanical installations for a period of five months at the end of the project implementation period.
- Separating the computers from the control room is not possible, as they operate essential systems (SCADA, temperature monitoring, inventory) used by silo operators. The room is fully equipped for safe human use, including ventilation, AC, lighting, and an FM200 fire suppression system, which is safe for operators.
- The contractor will provide temporary offices (caravans) in the site, and the accommodation for the workers will be in rented apartments in the city of Aswan 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

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- 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).
- Most of workers will come from Aswan, and they will not need accommodation, others (minor) will come from outside Aswan, and they will need accommodation (in rented apartments as mentioned). The percentage of workers coming from outside of Aswan is less than 5%. As mentioned in the previous point the number of workers coming from outside of Aswan is very limited, therefore there will be available spaces in the accommodation for them. One to two persons per room of 16m<sup>2</sup> surface area.
- There will be resting areas and toilets for construction workers, separate from those used by the existing silo staff provided by the contractor to their workers. The water source for the existing facilities in the current Silo is the public water network and will be used during construction work
- The recruitment process of workers will be assigned by the contractor according to the Egyptian law which regulate these issues.
- Description of access roads was provided in the previous section.

## A) Mobilization Phase

The mobilization phase involves the following activities:

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- *Site preparation:* This includes clearing the site of vegetation and debris (if there are any vegetation in the site), levelling or flattening the ground.
- *Establishment of construction facilities:* This includes building temporary offices, storage facilities, and workshops. The description of the temporary offices and accommodations was provided in the previous section.
- There will be resting areas and toilets for construction workers, separate from those used by the existing silo staff. *Mobilization of equipment and personnel:* This includes bringing all necessary construction equipment and personnel to the site.

## B) Construction Phase

The construction phase of Mafalsa Silos will include the following:

- *Construction of the silo expansion:* This includes the excavation of the foundation, the construction of the silo foundation and walls, and the installation of the silo roof. The excavated zone will be a circle with 21m diameter, and the depth will be 5m, and the height of the Silo will be 35m.
- *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.
- There will be no need for the construction of any additional facilities.
- Welding work will be used for gathering the Silos cell sheets which imported to the site with metal skeleton in the construction site.
- The demolition will include the removal of the existing wall between the current site and the expansion area, including lighting poles, surveillance cameras, and guard towers. New units will be installed along the newly constructed wall.
- Emergency generator will be used during the construction phase (by the contractor), and during operation phase (by EHCSS). During the operation phase, the generator will start during power cuts from the public electricity network as back up.
- Regarding the maintenance, it is acknowledged that all project phases, including the construction phase, will involve maintenance activities. These activities can have significant environmental impacts due to the generation of hazardous wastes, such as used oils, and industrial solvents. The ESMP includes mitigation measures for generation of hazardous wastes in all phases. Regarding the land Ownership and previous use, the land allocated for the expansion of the Mafalsa Silos is owned by the Egyptian Holding Company for Silos and Storage (EHCSS). The ownership was officially transferred through a Decree No. 570 of 2013, which designated this state-owned land for silo construction purposes. Prior to the allocation, the land was not utilized for formal or informal purposes. The review confirmed no evidence of previous formal or informal land use, encroachment, or ownership disputes. The site has been unoccupied and free of agricultural, residential, or commercial

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activities. The decree to allocate the land near the Mafalsa Silo (for the expansion) can be found in appendix (V) figures (V6).

### C) Construction demobilization Phase

The demobilization phase involves the following activities:

- *Removal of construction facilities:* this includes the removal of all temporary offices, storage facilities, and workshops. The removed construction offices will be collected by the contractor to be transferred to other work sites.
- *Site cleanup:* this includes the removal of all construction debris and the restoration of the site to its original condition; any collected solid waste will be disposed in specific sites for solid waste collection in coordination with the governorate of Aswan as mentioned in previous sections.

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 smalgl 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 maybe longer if the contractor faced any technical problems in the equipment during the start-up.

### 2.3. Operation Phase

The operation phase involves the following activities:

#### A) Receiving the Wheat

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

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## B) Operation and Maintenance

- Operation and maintenance of equipment is carried out in accordance with maintenance programs and operating instructions issued by the relevant sectors on a periodic basis.
- **Silo operation:** This includes the loading, unloading, and storage of grain in the silo.
- The process of handling grains in a silo involves three main stages: loading, storage, and unloading: a) Loading begins with receiving the grains, followed by transporting them to the silo using conveyors, b) During storage, regular aeration and inspections ensure the grains remain in good condition, c) For unloading, grains are discharged using gravity or mechanical systems, controlled to maintain a consistent flow, and then conveyed to transportation vehicles.
- During the operation of the Mafalsa Silo sub-project, pesticides which will be used for fumigation such as Phostoxin tablets, will be delivered to and stored on site. Although pesticides can be beneficial, they also be hazardous if used mishandled or improperly stored. Therefore, they will be managed according to guidelines established in coordination with the governorate to ensure no 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, a gaseous insecticide composed of aluminium phosphide and ammonium carbamate with paraffin as a carrier. It is used in fumigating wheat, barley, and sorghum grains. It is effective against insect pests such as grain beetles, grain borers, and flour moths. The tablets release phosphine gas when exposed to atmospheric moisture, which permeates the grain mass and eradicates insects at all life stages. During silo filling, tablets are introduced through feeding tube openings, preferably with an automatic distribution device.
- The Phostoxin tablets are consumed before expiration, leaving no waste as they evaporate completely. Their containers are designed to prevent gas leakage, and continuous monitoring is in place to ensure this safety measure is in place. Phosphine gas, once released, degrades into harmless byproducts over time, reducing environmental impact. Fumigation is both a preventive and curative measure, eliminating any existing insects or larvae within the grain. There is a sieving unit that removes any remains (i.e. dead insects/pests) based on the size of the grains and separates the grains from the dead pests during the fumigation process.

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- **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.
- Precautions are implemented to protect workers from inhaling phosphine gas. These include the use of phosphine and other fumigant gas detectors to ensure safe concentration levels. These detectors provide continuous monitoring to maintain safe working conditions. In the event of maintenance within the silos, the phosphine atmosphere is replaced with breathable air to ensure worker safety. Additionally, more details regarding the pesticides, more safety requirements for handling Phostoxin, and PPE required for working with Phostoxin are provided in Appendix (I) Pest Management Plan (PMP).
- **Silo maintenance:** This includes the regular inspection and repair of the silo and its equipment.
- Regarding maintenance, as the Mafalsa Silos is an existing operation undergoing capacity expansion, there are already established procedures and experience in managing maintenance wastes. These procedures ensure the safe handling, storage, and disposal of hazardous materials in compliance with environmental regulations. This is ensured by the presence of an operation and maintenance department composed of mechanical and electrical technicians and engineers who are familiar with managing maintenance wastes (see appendix V2 for operation team structure). Additionally, all chemicals or hazardous materials that will be used during the construction phase or operation phase will be collected by registered vendors.

### 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.
- 
- The number of manpower/workers and their type (during operational phase) is provided in appendix (V.2). The number of working hours/day and holidays will

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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 number of workers during the operation phase will remain the same after the expansion. In case conveyer belt and receiving pit and railway diversion will be implemented the number of workers will increase by 1-2 more workers.

## 2.4. 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.

## 2.5. Expected emissions and wastes during the expansion subproject phases

### A) Mobilization and Construction Phase emissions:

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

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Vehicle emissions: Exhaust fumes from construction vehicles and equipment.

Noise pollution: Noise from construction activities and machineries can disrupt surrounding communities.

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 expansion. Excavated materials will be removed and deposited offsite. The estimated volumes will be determined by the contractor during the excavation process, according to the following equation:

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

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

Surface area =  $\pi r^2 = \pi \times 10.5^2 = 346.36 \text{m}^2$

$V = 346.36 \text{m}^2 (\text{surface area}) \times 5 \text{m} (\text{depth}) = 1731.8 \text{m}^3 = 611 \text{ ton of excavation per cell}$ .

$12 \text{ cells} \times 1731.8 \text{m}^3 = 20781.6 \text{m}^3 = 3669.75 \text{ 7332 ton (total excavated material)}$ .

- The location of the disposal sites/landfills will be decided as per the guidance from the governorate of Aswan and in coordination with the relevant authority and based on the principle minimizing environmental impacts and will take into consideration the volume of excavation and distance of disposal area/landfill from the project site. Solid waste management must be managed in compliance with World Bank and other applicable international standards, as well as Egyptian legal and regulatory requirements.

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 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).



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## B) Operational Phase Emissions:

**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 proximity to communities, and distance from the project site.

Domestic sewage from silos workers. Wastewater is 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. This Silo's expansion will not lead to an increase in wastewater discharge. There will be no negative impacts on this operation because there will be no increase in the wastewater production after the expansion of the Silo, and consequently there will be no problems for the local sewage treatment regarding the current treatment capacity. Wastewater that will be generated by the sub-project is due to such activities as facilities cleaning as well as domestic activities. The amount of wastewater will remain the same after project implementation. No direct discharge shall be made into the environment.

The use of water will not increase in expanded silos operations since they do not require water in storage process.

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 Mafalsa 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 Phostoxin. Rodenticides will be selected to be non-acidic and not water based.



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During the operation of the Mafalsa Silo sub-project, pesticides which will be used for fumigation will be delivered to and stored at the site. They will be stored, used, and, as necessary, disposed of 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.

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).

# 3

## POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

### 3.1. Regulatory and Policy Framework at the National Level

#### 3.1.1 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.

##### **Competent Administrative Authorities (CAAs)**

The Competent Administrative Authorities (CAAs) are the entities responsible for issuing licenses for project construction and operation. The CAA for this project is Egyptian Holding Company for Silos and Storage (EHCSS). 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.

#### 3.1.2 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 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 ESMP.

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Throughout the following Chapters, reference to the requirements set out within those legislations is provided under each relevant parameter.

**Table (3.1):** Legislation and guidelines governing the E&S compliance for the project during all phases.

Legislation	Relevant Article and Requirements
<b>Land Use</b>	
Law No. 116 of 1983 Amending some provisions of the Agriculture Law promulgated by Law No. 53 of 1966	<p><i>Article 150</i></p> <ul style="list-style-type: none"> <li>It is prohibited to hollow out agricultural land or to transport soil for use in purposes other than agriculture.</li> <li>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.</li> <li>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.</li> </ul>
	<p><i>Article 152</i></p> <ul style="list-style-type: none"> <li>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.</li> <li>It is considered as agricultural land, the arable land within the agricultural area.</li> </ul> <p>Excluded from this prohibition are:</p> <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>The lands on which the government establishes projects of public benefit, subject to the approval of the Minister of Agriculture.</li> <li>Lands on which projects serving agricultural or animal production are established, which are determined by a decision of the Minister of Agriculture.</li> <li>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.</li> </ol>
Unified Building Law No. 119 of year 2008	<p><i>Article 39</i></p> <p>Apply and receive the construction permit before the start of the implementation. Ensure that all designs abide by the building codes of Egypt</p>
<b>Management of solid waste and hazardous waste generated from the facility</b>	

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**Table (3.1):** Legislation and guidelines governing the E&S compliance for the project during all phases.

<p>Law 4/1994 amended by Law 9/2009 and ER 1095/2011 amended by Decree 710/2012)</p>	<p><i>Articles 28, 29, 33, 37, 39</i></p> <ul style="list-style-type: none"> <li>• Identification: Using the HW lists issued by the competent authority.</li> <li>• Minimization: strive to reduce quantitatively and qualitatively the generation of the HW.</li> <li>• Segregation: HW is to be separated from other types of non-hazardous waste. In addition, the different types of HW must not be mixed.</li> <li>• 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.</li> <li>• Off-site transportation: HW is to be submitted to authorized HW contractors.</li> <li>• Obtaining a license from the competent authority to handle Hazardous waste</li> </ul> <hr/> <p><i>Article 39 and Article 41 of the Executive Regulations</i></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Article 41: The establishment shall undertake necessary precautions to secure the safe storage and transportation of waste. These precautions include the following: <ul style="list-style-type: none"> <li>– Construction waste storage is to be carried out at site such that it does not obstruct movement of vehicles and personnel.</li> <li>– waste subject to emission should be covered to avoid air pollution.</li> <li>– waste is to be submitted to authorized waste contractors</li> </ul> </li> </ul>
<p>Environmental register</p>	
<p>Law 4/1994 and its modifications in 2009</p>	<p><i>Article 22 and Article 23</i></p> <ul style="list-style-type: none"> <li>• Article 22: The official responsible for managing the establishment, according to provisions of this law, shall keep a written record of the impact of his establishment on the environment (Environmental Record). The Executive Regulation shall include a template of the required record and timetable to be kept by the establishments and the data to be entered therein. The EEAA shall follow up these records to ensure their genuineness, take necessary samples and conduct appropriate tests to determine the impact of the establishment activities on the environment and the extent of its compliance with environmental protection standards or the pollutants loads.</li> <li>• If it is transpired that the establishment is not keeping an environmental record, not updating data regularly or is not genuine, or that the establishment is not complying with the standards or loads or violating any provision of this Article, the EEAA shall notify the competent administrative authority to demand the establishment's proprietor to rectify such violation promptly. If he fails to comply within 60 days from the date of his tasking, The Egyptian Environmental Affairs Agency EEAA shall be entitled after notifying the competent administrative authority to taking any of the following measures:</li> </ul>

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**Table (3.1):** Legislation and guidelines governing the E&S compliance for the project during all phases.

	<ul style="list-style-type: none"> <li>– Granting the establishment fixed additional grace period to rectify violations; otherwise, the EEAA shall have the right to proceed with rectification at the expense of the violating establishment.</li> <li>– Halting the violating activity, till the removal of violation traces, without detriment to its workers' wages. In case of grave environmental hazard, the sources of the hazard should be stopped by all necessary means and measures.</li> <li>• Article 23: Expansions and renovations of existing establishments shall be subject to the same provisions set forth in Articles 19, 20, 21 and 22 of this Law.</li> </ul>
	<p><i>Article 17</i></p> <ul style="list-style-type: none"> <li>• The agency shall, in collaboration with the Ministry of Finance, establish a system of incentives that the Agency and the competent administrative departments can present to other agencies, establishments, individuals and others for their environmental protection activities or projects.</li> </ul>
<b>Regulates air and noise emissions</b>	
Law 4/1994 and its modifications in 2009	<p><i>Article 42 and Article 43</i></p> <ul style="list-style-type: none"> <li>• Article 42: 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.</li> <li>• 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.</li> <li>• The Executive Regulation of this law shall define the permissible levels of noise and periods of exposure thereto.</li> <li>• Article 43: The owner of an establishment is held to take all precautions and procedures necessary to prevent the leakage or emission of air pollutants inside the work premises except within the permissible limits as defined by the executive regulations of this Law, whether they result from the nature of the establishment activities or from malfunctioning equipment. He has to provide the necessary protective measures for workers in accordance with the conditions of occupational safety and health, including choosing the appropriate machinery, equipment, material and fuel, taking into account the period of exposure to these pollutants. He must also ensure adequate ventilation and install chimneys and other air purification devices.</li> </ul>
<b>Control of the wastewater discharge</b>	
Ministerial Decree 44/2000, Decree of Law 93/1962 (industrial wastewater disposal)	<p><i>Article 14</i></p> <ul style="list-style-type: none"> <li>• The law prohibits the disposal of domestic, industrial, and commercial wastewater, treated or untreated, in public drainage system without obtaining a prior approval.</li> <li>• Article 14 of the executive regulations set the parameters required regarding the quality of the wastewater discharged to the public sewage network.</li> </ul>

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**Table (3.1):** Legislation and guidelines governing the E&S compliance for the project during all phases.

	<ul style="list-style-type: none"> <li>The owner of the project should abide by the limits stated in article 14 of the Executive regulations of Law 93/1962.</li> </ul>
<b>Biodiversity</b>	
Law 4 of 1994	<p><i>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</i></p> <ul style="list-style-type: none"> <li>Defines fauna and flora which are forbidden to be hunted or disturbed.</li> <li>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.</li> </ul>
<b>Archaeology and cultural heritage</b>	
Law 117/1983	<p><i>Article 20</i></p> <ul style="list-style-type: none"> <li>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.</li> <li>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).</li> </ul>
<b>Occupational health and safety</b>	
Law 4/1994	<p><i>Articles 43 – 45 of Law 4/1994 address air quality, noise, heat stress, and the provision of protective measures to workers.</i></p> <ul style="list-style-type: none"> <li>The owner of the project should abide by the limits stated in Annex 7 of the Executive regulations.</li> <li>In case the limits are exceeded, special protective equipment should be made available (earmuffs, masks...)</li> <li>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)</li> <li>Conduct regular medical check-ups for workers that are facing noise, vibration or heat stress exceeding the limits</li> </ul>
	<p><i>Articles 80-87</i></p> <ul style="list-style-type: none"> <li>Regulates working hours and rest times for workers.</li> <li>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.</li> <li>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.</li> </ul>

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**Table (3.1):** Legislation and guidelines governing the E&S compliance for the project during all phases.

	<ul style="list-style-type: none"> <li>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.</li> </ul>
Law 12/2003 on Labour and Workforce Safety and Book V on Occupational Safety and Health (OSH) and assurance of the adequacy of the working environment	<p><i>Minister of Labour Decree 48/1967, Minister of Labour Decree 55/1983. Minister of Industry Decree 91/1985, Minister of Labour Decree 116/1991.</i></p> <ul style="list-style-type: none"> <li>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 “decree of the minister of labour and manpower number 211/2003”.</li> <li>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</li> </ul> <p><b>Ensuring Labour Environment Security</b></p> <ul style="list-style-type: none"> <li>Article 208: The establishment and its branches shall provide the means of vocational safety and health and ensuring labour environment security in places of work by which to, ensure protection from physical, risks resulting in particular from the following: <ul style="list-style-type: none"> <li>(A) Severity and intensity of heat and chilliness.</li> <li>(B) Noise and vibrations.</li> <li>(C) Lighting.</li> <li>(D) Harmful and dangerous radiation.</li> <li>(E) Atmospheric pressure changes.</li> <li>(F) Static and dynamic elasticity; and</li> <li>(G) Explosion risks.</li> </ul> </li> </ul> <p><i>Article 211 and article 34 of the Decree of the Minister of Labour and Manpower no. 211/2003</i></p> <p>The establishment and its branches shall provide means of protection from chemical dangers resulting from dealing with solid, liquid, and gaseous chemical substances, subject to the following:</p> <ul style="list-style-type: none"> <li>The highest concentration permissible in the chemical materials and the cancer-causing materials to which the workers are exposed shall not be exceeded.</li> <li>The dangerous chemical materials stock shall not exceed the threshold quantities for each of them.</li> <li>Providing the necessary precautions for protection of the establishment and workers on transporting, storing, handling, and using the dangerous chemical materials and disposing of their wastes.</li> <li>Keeping a register for limiting the dangerous chemical materials being handled, comprising all data concerning each material, and a register for recording the status of work environment and exposure of the workers to the danger of chemicals.</li> <li>Placing labels for recognizing all chemical materials handled at work, and indicating their scientific and trade name, their chemical composition, their degree of dangerousness, the safety precautions, and the relevant emergency procedures. The establishment shall obtain the</li> </ul>

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**Table (3.1):** Legislation and guidelines governing the E&S compliance for the project during all phases.

	<p>data mentioned in these materials from the suppliers upon supplying them.</p> <ul style="list-style-type: none"> <li>– Training the work in dealing with the dangerous chemical materials and the cancer-causing substances and enlightening and acquainting them with their dangers and with the methods of safety and protection from these dangers.</li> </ul>
	<ul style="list-style-type: none"> <li>• Article 31: The provisions of the present part shall apply to the contract by virtue of which a worker undertakes to work with and under the management or supervision of an employer in return for a wage.</li> <li>• Article 32: The employer shall draw up a labour contract in Arabic writing, in three copies, of which one copy shall be kept by the employer, one copy to be delivered to the worker, and the third copy shall be deposited with the concerned social insurance office. The contract shall in particular comprise the following data: <ul style="list-style-type: none"> <li>– Name of the employer and the address of the place of work.</li> <li>– The worker's name, qualifications, and profession or craft, his social insurance</li> <li>– number and home address, and all that is necessary for his identification.</li> <li>– Nature and kind of work subject of the contract.</li> <li>– The wage agreed upon, and the method and time of its payment, as well as the rest of benefits in cash and in kind as agreed upon. If no written contract exists, the worker may alone establish his rights by all methods of evidence.</li> </ul> <p>The employer shall deliver to the worker a receipt for the papers and certificates he has deposited with the employer.</p> </li> <li>• Article 33: The period of probation shall be determined in the Labour court and the worker shall not be appointed under probation for a period exceeding three months; nor shall he be appointed under probation for more than with the same employer.</li> </ul>
	<p><b>Wages:</b></p> <ul style="list-style-type: none"> <li>• 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.</li> </ul> <p>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.</p> <p>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.</p>

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**Table (3.1):** Legislation and guidelines governing the E&S compliance for the project during all phases.

	<p>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:</p> <ol style="list-style-type: none"> <li>1-Members on the strength of their positions or experiences.</li> <li>2- Members representing the employers' organizations, to be elected by these organizations; and</li> <li>3-Members representing the General Federation of Egyptian Trade Unions, to be elected by the Federation.</li> </ol> <p>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.</p> <p>The decree forming the council shall determine its other power: the system of work in it.</p> <ul style="list-style-type: none"> <li>• Article 35: Discrimination in wages because of the sex, origin, language, religion, or creed shall be prohibited.</li> <li>• Article 36: The wage shall be determined according to the individual contract, the collective labour agreement, or the statute of establishment. If the wage is not determined in any of these methods' worker shall be entitled 'to a wage of equivalent position if any; other the wage shall be estimated according to the trade usage in the quarter where the work is performed. If no trade usage exists, the committee prescribed in article (71) of the present Law shall estimate the Wage according to the exigencies of justice. This shall all be subject to provisions of articles (34) and (35) of the present law.</li> <li>• 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.</li> <li>• 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 of" subject to the following provisions:             <ol style="list-style-type: none"> <li>(A) Workers appointed with a monthly pay: their wages shall be paid least once per month.</li> <li>(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.</li> <li>(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.</li> <li>(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.</li> </ol> </li> </ul>
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**Table (3.1):** Legislation and guidelines governing the E&S compliance for the project during all phases.

	<ul style="list-style-type: none"> <li>• Article: 39</li> <li>• 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.</li> <li>• 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.</li> <li>• Article 41: If the worker attends at his place of work, at the time determined for work and is ready to exercise his work but is prevented to start his work for reasons due to the employer, he shall be considered as having actually fulfilled his work and accordingly deserves his wage in full. However, if he attends and is barred from exercising his work by imperative reasons beyond the will of the employer, he shall be entitled to half his wage.</li> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> </ul>
<b>Socioeconomics</b>	
Law 94/2003 Protection of Community/Human Rights law	<ul style="list-style-type: none"> <li>• 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.</li> <li>• At the forefront of these rights and freedoms are the right to life and security of individuals, freedom of belief and expression, the right to private property, the right to resort to courts of law, and the right to fair investigation and trial when charged with an offence.</li> </ul>
EEAA EIA guidelines	<ul style="list-style-type: none"> <li>• Paragraph 7 Requirement and Scope of the Public Disclosure</li> <li>• 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</li> </ul>

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**Table (3.1):** Legislation and guidelines governing the E&S compliance for the project during all phases.

	<p>the public consultation on the draft EIA, the draft technical summary in Arabic should be disclosed to all concerned parties.</p>
<p>Interior Minister's Decision No.2777 General Provision on Road Traffic</p>	<ul style="list-style-type: none"> <li>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.</li> <li>Article 3: It is not allowed to leave or throw garbage including dust, stones, and construction materials... etc., impeding movement on roads or causing harm to users thereof. Actions that cause roads to be filthy shall be prohibited. It is not allowed to place or leave anything on the road if it would endanger or obstruct traffic. The responsible for such action shall clear the road immediately. Accordingly, the required caution and warning signs shall be displayed along with red lights, if necessary, until the road is cleared. It is -by no means- allowed to misuse pavements, roads, or any part thereof, obstructing traffic or pedestrians. Public, private, and other companies, authorities, and institutions, in addition to contractors and others shall get a permit from the competent traffic unit before starting any constructions, drilling, or gravelling operations. Moreover, in the morning, they shall display warning boards and red signs, while at night they shall use red lighted lanterns showing the location of the operation, provided that it is visible from a distance of at least 100 meters away from that location. The Competent traffic unit, before granting the permit, shall ensure that all necessary preventive measures shall be taken.</li> <li>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.</li> <li>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.</li> </ul>
	<p><b>Speed</b></p> <ul style="list-style-type: none"> <li>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</li> </ul>

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**Table (3.1):** Legislation and guidelines governing the E&S compliance for the project during all phases.

	<p>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.</p> <ul style="list-style-type: none"> <li>• Article 49: Vehicles may not slow down impeding the traffic with no justification.</li> <li>• Article 50: Subject to this rule, as appropriate to road conditions, the vehicle maximum speed shall be as follows:</li> </ul> <p>In cities:</p> <ul style="list-style-type: none"> <li>– Trailers and semi-trailers: 40 km/h</li> <li>– The rest of vehicles: 60km/h</li> </ul> <p>In residential, tourism and industrial zones</p> <ul style="list-style-type: none"> <li>– All types of vehicles: 40 km/h</li> </ul> <p>Highways or main roads affiliated to the General Authority for Road and Bridges, connecting governorates, and</p> <ul style="list-style-type: none"> <li>– Trucks and semi-trailers: 60km/h</li> <li>– Cargo vehicles: 70km/h</li> <li>– Passengers' vehicles: 90 km/h</li> <li>– The rest of vehicles: 90km/h</li> </ul> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> </ul>
<p>Executive regulations of Traffic Law No. 66 of 1973</p>	<p><b>Licenses to operate express transport Vehicles</b></p> <ul style="list-style-type: none"> <li>• 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.</li> </ul> <p><b>Driving licenses in general</b></p>

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**Table (3.1):** Legislation and guidelines governing the E&S compliance for the project during all phases.

	<ul style="list-style-type: none"> <li>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:             <ol style="list-style-type: none"> <li>Four photographs of the applicant.</li> <li>Evidence of his identity, place of residence and age.</li> <li>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:                 <ol style="list-style-type: none"> <li>Submitting a criminal status report. For employees of the government, one of the local administration units, or the public sector and its branches, an official certificate from the service file stating that they are free of criminal record may suffice.</li> <li>Evidence of his membership in one of the trade unions or one of its branches.</li> <li>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.</li> </ol> </li> </ol> </li> </ul>
Law 24/2018 on the amendment of some provisions of Law No. 10 of 1990 on the land acquisition	<ul style="list-style-type: none"> <li>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.</li> <li>The public benefit report shall be attached to the decision of the President of the Republic or his authorized representative, accompanied by             <ul style="list-style-type: none"> <li>A note stating the project to be executed.</li> <li>A drawing of the overall planning of the project and the real estate necessary for it.</li> </ul> </li> <li>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.</li> <li>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.</li> </ul>
Law 1/2015 on the amendment of some provisions of Law No. 10 of 1990 on the land acquisition	<ul style="list-style-type: none"> <li>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.</li> <li>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</li> </ul>

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**Table (3.1):** Legislation and guidelines governing the E&S compliance for the project during all phases.

	within 15 days from the date of posting and publishing the lists and information of the expropriated properties.
Law No. 12 of the Year 2003 Promulgating Labour Law	<p><b>Child labor:</b></p> <ul style="list-style-type: none"> <li>• Article 98: In applying the provisions of the present Law, an infant/juvenile shall mean any person reaching. <ul style="list-style-type: none"> <li>• fourteen years of age, or past the age of elementary education and not reaching eighteen complete years of age.</li> <li>• 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.</li> </ul> </li> <li>• 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.</li> <li>• 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 (The concerned minister is the one who issue a decree determining the system of employing infants/juveniles not in the laws).</li> <li>• 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 totaling not less than one hour shall be granted for meals and rest. Such <ul style="list-style-type: none"> <li>• period(s) shall be specified in a way by which the infant/juvenile shall not be made to work for more than four unbroken hours. An infant/juvenile shall not be made to work overtime hours or be.</li> <li>• 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.</li> </ul> </li> <li>• Article 102: An employer appointing one or more infants/juveniles shall: <ul style="list-style-type: none"> <li>– Hang on a prominent place at the location of work a copy comprising the provisions prescribed in the present chapter.</li> <li>– Draw up a statement indicating the working hours, and the break periods duly approved by the concerned administrative authority.</li> <li>– 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.</li> </ul> </li> <li>• Article 103: The provisions of the present chapter shall not apply to infants/juveniles working in sheer agricultural labor.</li> </ul>
Pest Management	
	Article 73

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**Table (3.1):** Legislation and guidelines governing the E&S compliance for the project during all phases.

Law no. 53 of 1966, Chapter VI (Planting protection)	<p>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:</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> </ul>
	<p><i>Article 74</i></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> </ul>
	<p><i>Article 80</i></p> <p>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:</p> <ul style="list-style-type: none"> <li>• Types of agricultural pesticides that may be imported and traded, specifying their specifications and import and trading conditions.</li> <li>• Conditions and procedures for licensing the import and trade of pesticides.</li> <li>• Banning the transfer of some types of pesticides from one place to another.</li> </ul>

### 3.1.3 International Legislations

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

#### Biodiversity and Natural Resources:

- In 1951: International Plant Protection Convention

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- 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.

#### **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.

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- 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 10: Stakeholder Engagement and Information Disclosure.

### 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>

### World Bank Limits:

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

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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

### 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 national laws, including: (i) temporary labor influx, and (ii) risk of sexual Exploitation, Abuse and Sexual Harassment (SEA/SH).
3. The lack of a specific role for the official in charge of social aspects in national laws.
4. Not addressing all social risks and impacts in national laws, including: (i) Infrastructure and equipment design and safety, and (ii) safety of services.
5. The Egyptian legislation does not address encroachers and informal settlers. The WB identifies a cut-off date to prevent people influx to the project area. The Egyptian laws does not set a cut-off date per say, particularly if the impacts are related to agricultural lands that might experience changes in crops and tenancy. However, there are specific timelines for the census survey, receiving complaints that could cover the same objective of the cut-off date.
  - Monitoring and Evaluation: Monitoring or evaluation measures are not stipulated in Egyptian regulation.
  - Valuation of compensation: Egyptian regulations use prevailing price in the affected areas to calculate and compensate project affected people for their expropriated property. The prevailing price is assessed by a specialized committee created by the government. For crops, they are valued according to the price lists

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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. However, the Egyptian limits will be applied for the following cases:

- Carbon monoxide limits.
- Sulfur dioxide limits for 1 hour, and 1 year.
- Nitrogen oxide limits for 24 hours.
- Total suspended particulates limits.
- Ozone limits for 1 hour.

#### Comparison of ambient air limits

Parameter	Period	IFC Standards (µg/m <sup>3</sup> )	National Requirement (Residential; Institutional; Educational) (µg/m <sup>3</sup> )
Sulphur dioxide (SO <sub>2</sub> )	10 minutes	500	-
	1 hour	-	300
	24 hours	20	125
	1 year	-	50
Carbon Monoxide (CO)	1 hour	-	30 mg/m <sup>3</sup>
	8 hours	-	10 mg/m <sup>3</sup>
	1 hour	200	200

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Nitrogen Dioxide (NO <sub>2</sub> )	24 hours	-	150
	1 year	40	40
Total Suspended particles (TSP)	24 hours	-	230
	1 year	-	125
Particulate Matter (PM <sub>10</sub> )	24 hours	50	70
	1 year	20	50
Particulate Matter (PM <sub>2.5</sub> )	24 hours	25	50
	1 year	10	15
Suspended Particles (measured as black smoke)	24 hours	-	100

### Comparison of point source limits such as generators

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

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

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

Gap analysis between ESSs and national laws.

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### 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)
<b>Residential; Institutional; Educational</b>	55	45	50	40

### EHCSS and Contractor's Environmental Policy

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

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

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

# 4

## BASELINE / EXISTING ENVIRONMENTAL CONDITIONS

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

The project influence area spreads over four levels. The four levels of the subproject influence area are (a) immediate area of impacts, (b) direct project influence, where project is key impact factor, (c) area where direct project impact is less intensive, and (d) induced, or indirect impacts.

### 4.1. Physical Environment

#### 4.1.1 Weather and 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.

#### 4.1.2 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). All measured values are well below the maximum allowable limits set by the Egyptian Environmental Law No. 4/1994, indicating that the air quality is good and safe. All measured concentrations comply with both Egyptian regulatory limits and IFC/WBG EHS guidelines, with IFC values being more stringent particularly for particulate matter (PM10 and PM2.5).

**Table (4.1):** Measurements of the average air quality around the subproject areas.

	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Allowable Limit (Egyptian Law No. 4/1994)	IFC Guideline (EHS)	Compliance (vs. stricter limit)
<b>SO<sub>2</sub> ppm (max. 1 h)</b>	0.00 3	0.00 8	0.00 5	0.00 4	0.00 9	0.00 7	≈ 0.048 ppm (125 μg/m <sup>3</sup> )	20 μg/m <sup>3</sup> (24 h), 500 μg/m <sup>3</sup> (10 min)	All values below both limits
<b>CO ppm (max. 1 h)</b>	0.5	0.7	0.3	0.6	0.4	0.6	30 mg/m <sup>3</sup> ≈ 26.1 ppm	Not specified	All values below national limit
<b>PM<sub>10</sub> (μg/m<sup>3</sup>)</b>	35	32	35	37	39	31	150 μg/m <sup>3</sup>	50 μg/m <sup>3</sup> (24 h), 20 μg/m <sup>3</sup> (annual)	All values below both limits; IFC more stringent
<b>PM<sub>2.5</sub> (μg/m<sup>3</sup>)</b>	10	15	17	11	12	16	65 μg/m <sup>3</sup>	25 μg/m <sup>3</sup> (24 h), 10 μg/m <sup>3</sup> (annual)	All values below both limits; some close to IFC annual

### 4.1.3 Noise Level

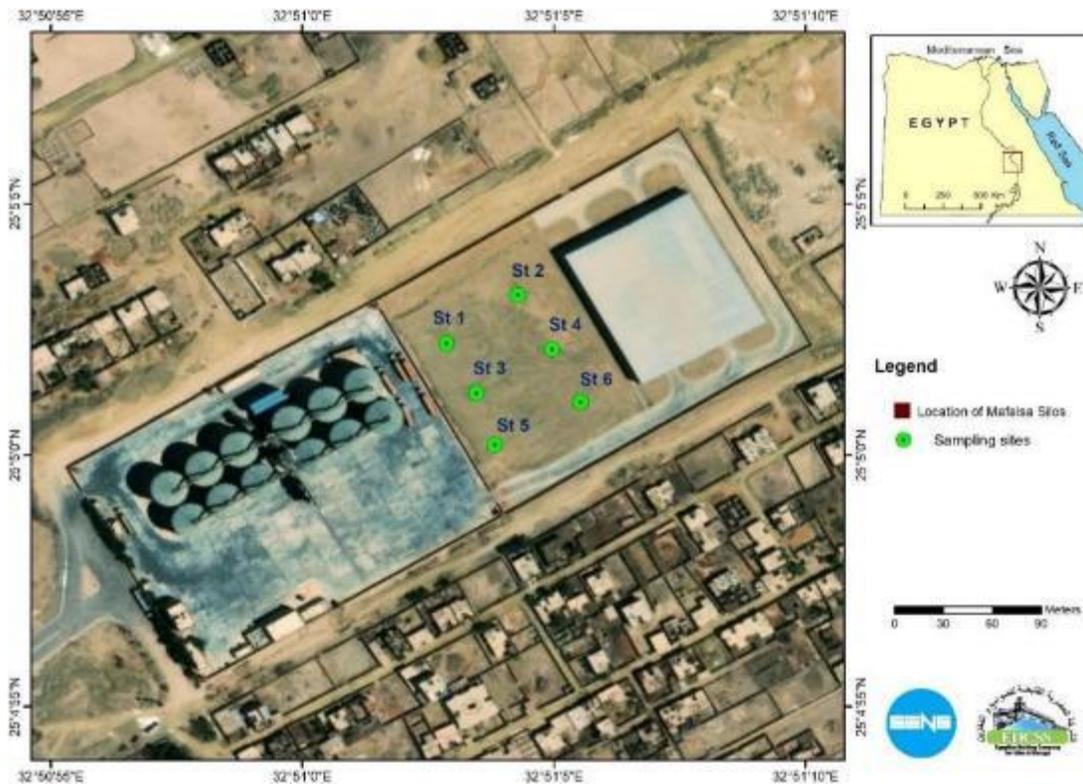
The noise is usually measured by the Noise Pressure Levels (NPL), based on the noise levels that are expected from movement, surrounding areas and activities. The area is characterized as residential area and surrounded by agriculture lands. It was noted that the main sources of noise are the movement of cars and operation of water pumps. . The water pumps are situated within the surrounding agricultural land, approximately 200 meters west of the project area. These pumps

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extract water from the nearest available primary or secondary canals. The closest water source, a primary canal branched from the Nile River, is located about 350 meters to the west of the project site . According to the available baseline noise surveys conducted during daytime (Table 4.1), all the results are within the maximum allowable noise limits set for this area with no exceedances recorded even within subproject sites and surrounding areas.

**Table (4.2):** Measurements of the average noise levels around the project areas.

10 minutes average Leq (dBA)	Points						The permissible limit for sound intensity decibels (A) (Egyptian law) (Residential; institutional; educational,rural)			Noise Level Guidelines (One Hour LAeq (dBA)) (World Bank)	
	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Daytime from 7 am to 6 pm	Evening from 6 pm to 10 pm	Night from 10 pm to 7 am	Daytime 07:00 – 22:00	Nighttime 22:00 - 07:00
	50.4	52.3	51.4	52.5	50.7	53.7	45 - 60	40-55	35-50	55	45



**Figure (4.1):** Map showing the locations of the six noise measurements.

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#### 4.1.4 Geology

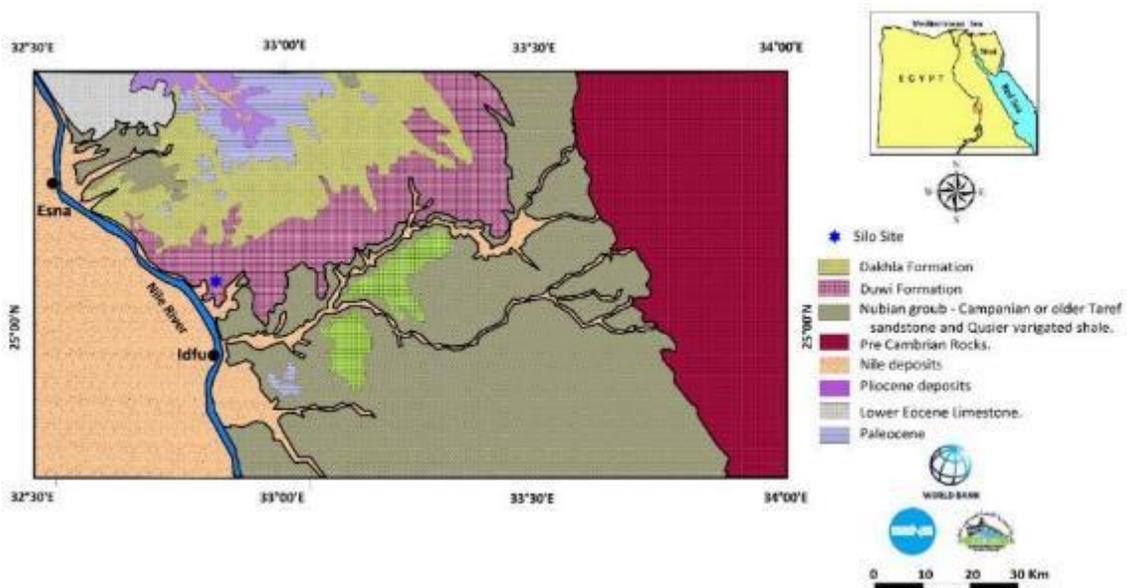
The studied area represents a portion of the Eastern Desert. The geological conditions of the area under consideration play an important role in determining the geomorphic setting and the hydrogeological characteristics. The geologic setting of Esna-Idfu area can be discussed through two main items: the stratigraphic succession and the structural setting:

##### 1-Stratigraphic succession

The project site lies within the sedimentary sequence of the Eastern Desert, ranging from Precambrian to Quaternary in age. Precambrian basement rocks dominate the eastern highlands, while Quaternary deposits cover lowland areas (Conoco, 1987) (Figure 4.2). The grain silo site is located on the Early Maastrichtian Duwi Formation, a lithological unit consisting of limestone, marl, and shale interbedded with phosphate bands and chert (10–30 m thick). This formation offers the following advantages for silo construction:

- **High foundation stability:** Dense limestone and chert layers provide a solid load-bearing stratum.
- **Controlled groundwater seepage:** Low matrix permeability reduces risk of upward water migration into the foundation.
- **Minimal deleterious mineral content:** Phosphate bands do not compromise strength or durability.

Directly beneath the Duwi Formation lies the Quseir Clastic Formation (Campanian; 20–45 m thick), underlain in turn by the older Taref Sandstone (Santonian; 16–60 m thick) across much of the surrounding plateau (see Figure 4.3 for distribution).

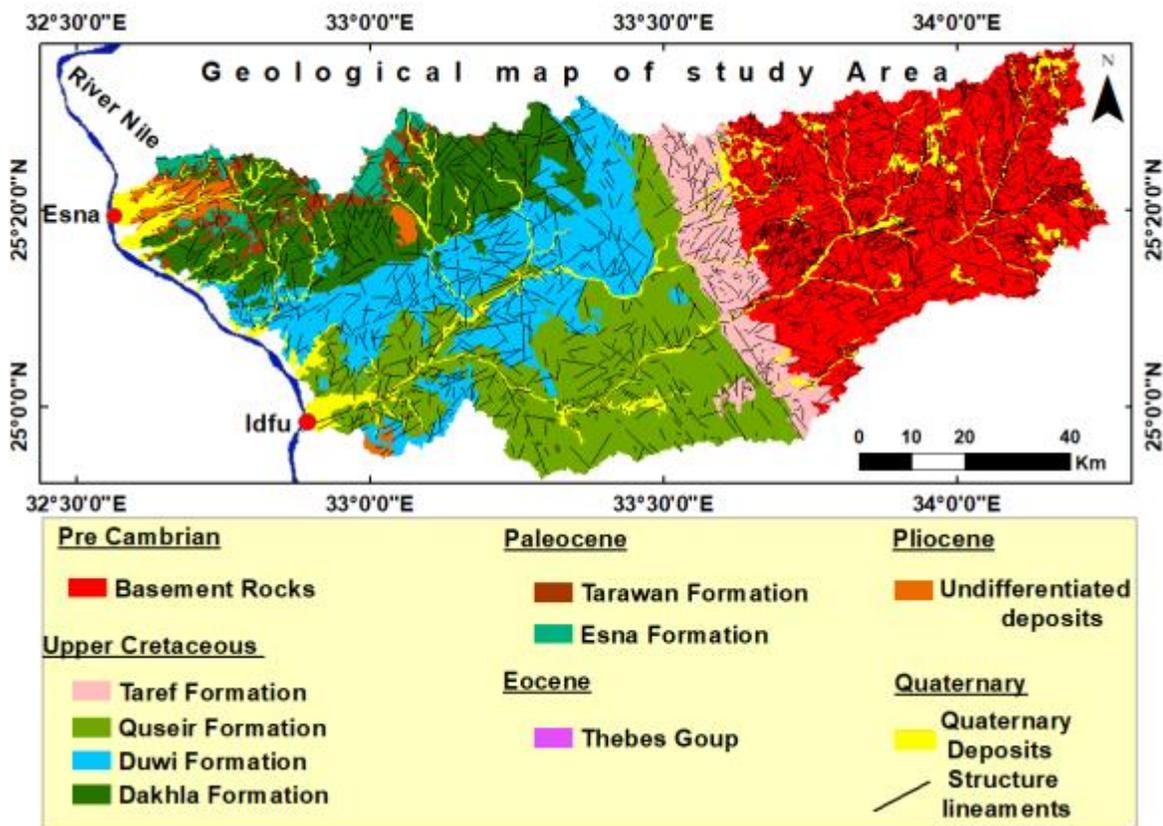


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**Figure (4.2):** Modified geological map of the studied area after Egyptian geological survey map 1978

## 2- Structural Setting

The Eastern Desert is characterized by NE-SW and NW-SE trending faults associated with the Arabian-Nubian Shield. However, the project site is located within the stable Nubian Sandstone Plateau where tectonic activity is minimal. This structural stability, confirmed through lineament analysis (Conoco, 1987), minimizes seismic risk and ensures a safe, long-term operational environment for the silo. Although the site is geologically stable, minor surface runoff from nearby wadis during rare intense storms could be mitigated with appropriate drainage systems. (Figure 4.3).



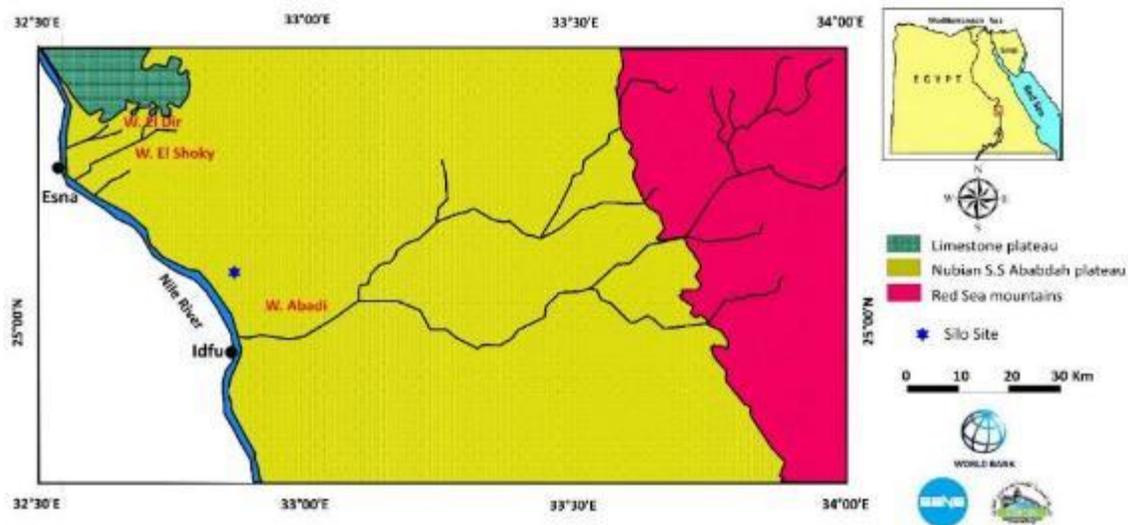
**Figure (4.3):** The distribution of various lithological units associated with extracted lineaments is shown on a geological map of the study area

## Geomorphology and Elevation

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The study area slopes steadily westward from the Red Sea highlands (>1,900 m) to the Nile Valley (~65 m), spanning nearly 1,000 m in elevation. It comprises three geomorphological belts: the River Nile Valley (Young and Old Alluvial Plains at ~80 m), the sandstone tableland (400–600 m) hosting the silo near Wadi Abadi, and the highland terrains of the Red Sea Mountains (Fig 4.4).

a.

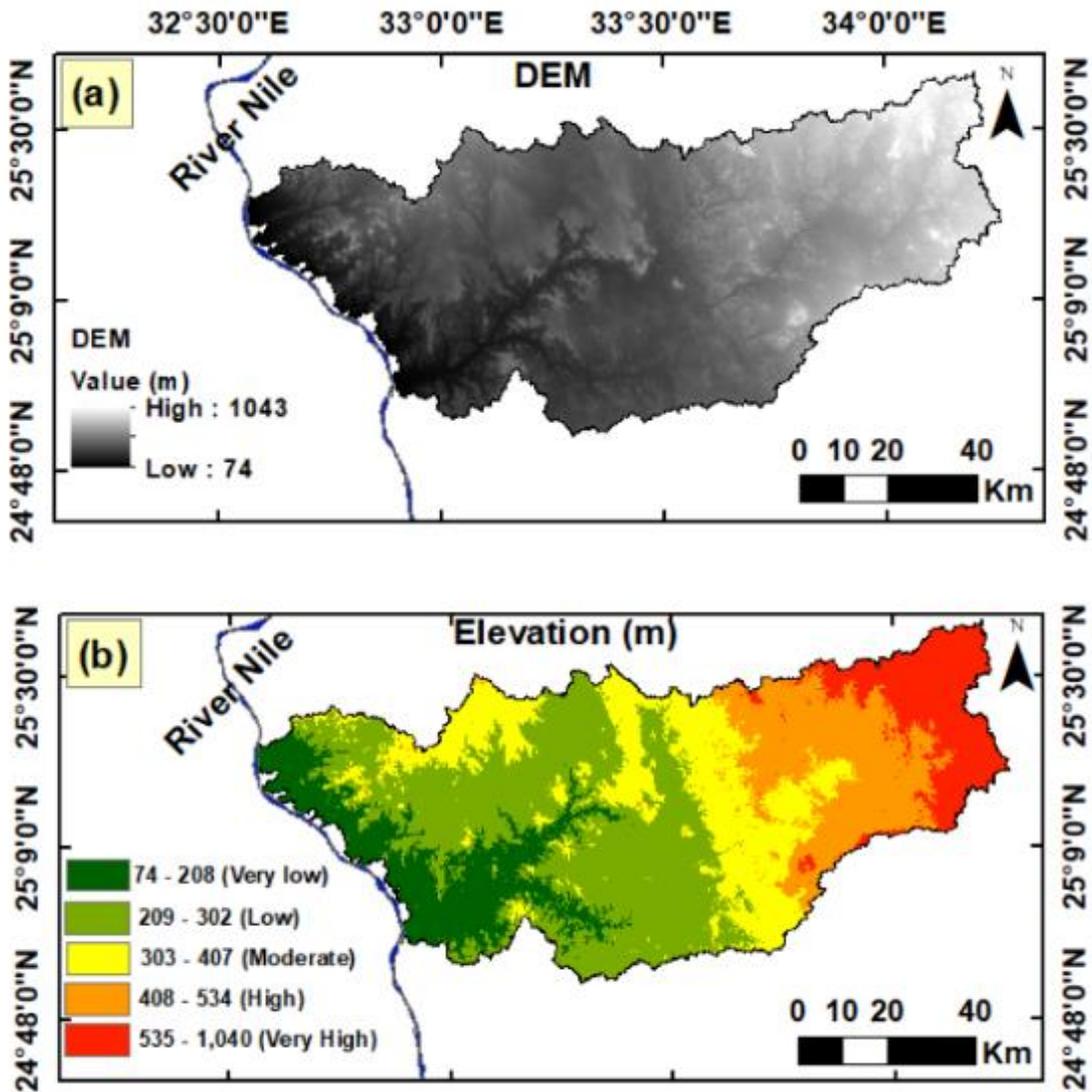


**Figure (4.4):** Main geomorphologic units of the desert environs west Qena (Said, 1962)

The site's terrain is relatively flat, classified within the **very low elevation zone** (74–208 m a.s.l.) based on the digital elevation model (Figure 4.5b). Key geomorphological features influencing the site include:

- **Western Sandstone Tableland (Ababda Plateau):** which hosts the proposed silo, this region's stability and elevation reduce flood risks while ensuring proximity to natural groundwater recharge zones (e.g., Wadi Abadi basins).
- **Nearby Hydrographic Basins:** Including Wadi Abadi and its sub-basins, enhancing surface water availability.
- **Fertile Lowlands:** The site's location near cultivated alluvial plains facilitates access to agricultural markets.

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**Figure (4.5):** Digital elevation model and its derivatives. (a) SRTM-DEM data of the study area; (b) Elevation class map for the study area

#### 4.1.5 Hydrology

The groundwater around the study area is recorded in three main aquifers: Quaternary (alluvial) aquifer, Upper Cretaceous (Nubian sandstone) aquifer and Pre- Cambrian (Fracture basement) aquifer. The works of (Abdel Kareem, 2000, Abdel Kader, 2001 and Ezz El-Deen 2006) are taken into consideration.

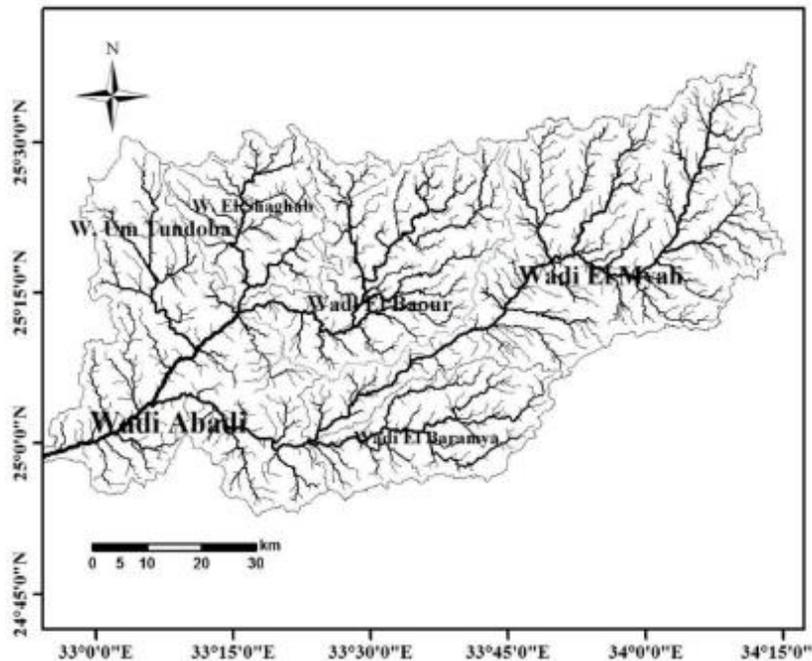
The Quaternary (alluvial) aquifer is detected at Wadi Abadi (near silo location), Wadi El Dir, Wadi El Shoky and Wadi El Myah. The groundwater of the Quaternary (alluvial)

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aquifer is recorded at depths range from 1.5 m to 65 m and the groundwater salinity ranges from 718.9 mg/l to 8294 mg/l. The Quaternary (alluvial) aquifer is recharged from direct precipitation during flash floods and in some localities by upward leakage from the Nubian sandstone aquifer,

The Nubian sandstone aquifer is considered the main aquifer, and it detected only at Wadi Abadi. The Saturated thickness varies from 40 m to 151 m. The groundwater is recorded at depths range from 3 m to 11.9 m. The groundwater salinity ranges from 1224.8 mg/l to 13826.8 mg/l. The stable isotopes revealed that the Nubian sandstone aquifer was recharged mainly during the pluvial periods dominated in the Pleistocene

The Pre- Cambrian basement aquifer is detected only at Wadi El Myah (eastern side) at depths ranges from 11.5 m to 30.6 m and the groundwater salinity ranges from 718.9 mg/l to 8912.8 mg/l. Rain fall is the main recharging source of this aquifer.



**Figure (4.6):** Wadi Abadi main sub-basins.

The hydrogeological characteristics of the studied aquifers are discussed as follows:

### 1- Quaternary aquifer:

The Quaternary alluvial deposits have a wide distribution along the studied area. They exhibit remarkable variations in composition, texture and thickness along the longitudinal profiles of these basins. So, the concerned water bearing formation is considered as

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disconnected aquifer reflecting local variations in the recharge rate, nature and depth of the bedrock, beside the topographic irregularities. Consequently, the hydrologic conditions of this aquifer should be discussed separately in the different hydrographic basins.

### **1.1-Idfu (Wadi Abadi) area:**

The Quaternary aquifer in this area is represented by alluvial deposits which are mainly composed of gravel, sand and silt, vary in thickness from 2 to 10 m. The concerned aquifer is considered semi-confined as it is capped by a silty clay layer. The depth to water ranges from 1.5m to 65m measured in some drilled wells. The groundwater salinity ranges from 1112.7 mg/l to 7640.9 mg/l. The amount of water in this aquifer is low and represented by water lenses mostly accumulated from past rainy periods (Abdel Kader, 2001). The main source of recharge is the direct precipitation, return flow after irrigation and flush floods coming from the mountainous region. The hydraulic conductivity of the aquifer in the central portion is about 80 m/day (Abdel Kareem, 2000).

### **1.2- Esna Area**

The Quaternary aquifer at Esna area represents the main source of groundwater. It is detected at the flood plains of the Nile, and made up of successive layers of sand and gravels with rare occurrence of clay lenses, varies in thickness from 10 m to 55 m. Its water exists under semi-confined condition at shallow depths from the ground surface (Wadi El Sabil). The recharge of this aquifer results mainly from the direct seepage and infiltration from the surface water (River Nile, Kelabya canal and irrigation water). At Wadi El Shoky, the depth to water ranges from 13 m to 60, the groundwater salinity ranges from 718.9 mg/l to 5284.6mg/l. At Wadi El Dir, the depth to water ranges from 18 m to 65, the groundwater salinity ranges from 1717.2 mg/l to 8294 ppm.

### **2-Nubian sandstone aquifer:**

The Nubia sandstone aquifer in Esna-Idfu area is represented by Taref sandstone rocks. It is recorded only in Wadi Abadi and it is considered the main aquifer. The penetrated thickness of the aquifer ranges from 40 m to about 151 m at the downstream portions of Wadi Abadi. The study of Nubian sandstone in Wadi Abadi, depends on the data obtained from (21) drilled wells partially penetrated the Nubian Sandstone aquifer which are distributed only along the main channel of Wadi Abadi, approximately parallel to Idfo-Marsa Alam Road.

The depth to water from ground surface varies from 3m to 11.9 m. The groundwater of the concerned aquifer is detected under confined condition where El-Quseir shale acts as a confining bed over the sandstone water bearing rocks of the aquifer. The piezometric head of this aquifer ranges from 104 m to 123.5 m. The piezometric head attains its highest value at the eastern portion. Consequently, the groundwater flow of the Nubian Sandstone aquifer is from East to West direction. The groundwater salinity ranges from 1225 ppm to 13826.8 ppm.

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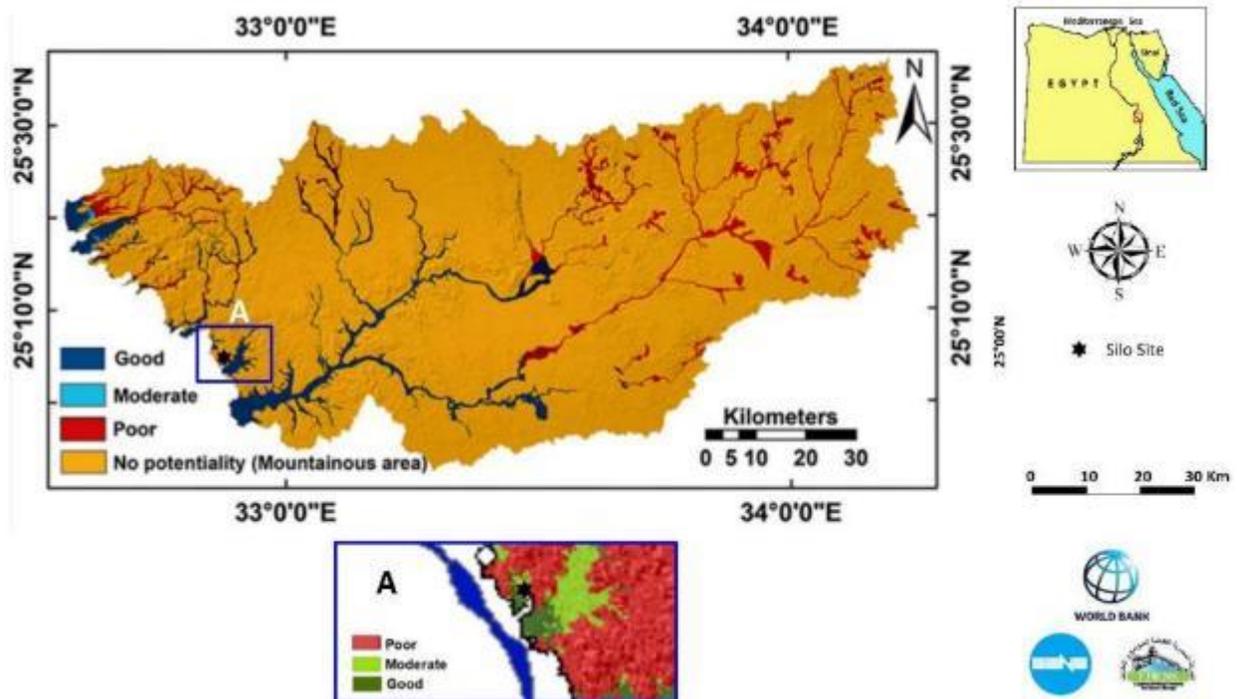
### 3-Fractured basement aquifer:

The groundwater occurs as a free water table condition, where the aquifer water bearing rocks is covered by alluvial deposits increasing gradually in thickness from upstream to downstream. The depth to water ranges from 11.5 m to 30.6 m, the water level ranges from +383.4 m to 406 m. Rainfall is the main recharging source for this aquifer.

### Groundwater Potential Zone (GWPZ)

The groundwater potential zone (GWPZ) map was created using a weighted overlay model that divided the study area into three classes: poor, moderate, and good potential recharge zones occupying 7073.47 km<sup>2</sup> (88.6%), 625.08 km<sup>2</sup> (7.8%), and 281.23 km<sup>2</sup> (3.52%) of the total surface area of the studied locations. The downstream portion of the studied wadies in the northwestern part of the study area near Esna has moderate potentiality. Good potential zones are concentrated in the southwestern part and basement area in the eastern side (Figure 4.7).

The studied silo site located in area between good and moderate groundwater potentiality (figure 4.7). The lineament density and major fractures play a major role in the groundwater potential recharge in the basement area. Based on the results of the borehole investigations conducted at the silo site, no groundwater table was encountered down to a depth of 15.0 m. This suggests that, although the aquifer is regionally present at varying depths, the water table at the project site is deeper than 15.0 m.



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**Figure (4.7):** Groundwater potential zone map (GWPZ)

The result of the petrographic analysis illustrates that the Nubia Sandstone aquifer changes its character throughout the study area and that major fractures play a significant role in groundwater movement and recharging processes. Based on a pumping test downstream of Wadi Abadi, the values of transmissivity were calculated, and they ranged between 78 m<sup>2</sup>/day (well 19) and 346.3 m<sup>2</sup>/day (well 13). The return period and rainfall analyses were used to predict the precipitation in the future for 100 years, illustrating that precipitation is limited and groundwater potentiality should be managed. On the other hand, the analysis and examination of the rainfall data over the study area for the last four decades using satellite based spatial and temporal precipitation (MERRA-2) data were carried out. Our analysis showed that the largest precipitation events occurred in the Wadi Abadi basin, which experienced average annual precipitation through the last four decades of 7.67 mm, while the northwestern part of the study area in the El-Dir basin received only 91 mm. Moreover, the applied weighted overlay model of potential recharging zones illustrated that the good potential recharge areas are located in Wadi Abadi, especially in the upstream portion and some sites in the downstream area (Figure 4.7).

#### **surface water**

The governorate depends almost entirely on Nile water for all its water needs. Occasionally, ground water is utilized in remote areas. The closest water source, a primary canal branched from the Nile River, is located about 350 meters to the west of the project site, while the project itself is approximately 480 meters east away from the Nile River. Wadi Abadi is the nearest natural runoff zone to the silo about 25 km southeast of the mafalsa silo site.

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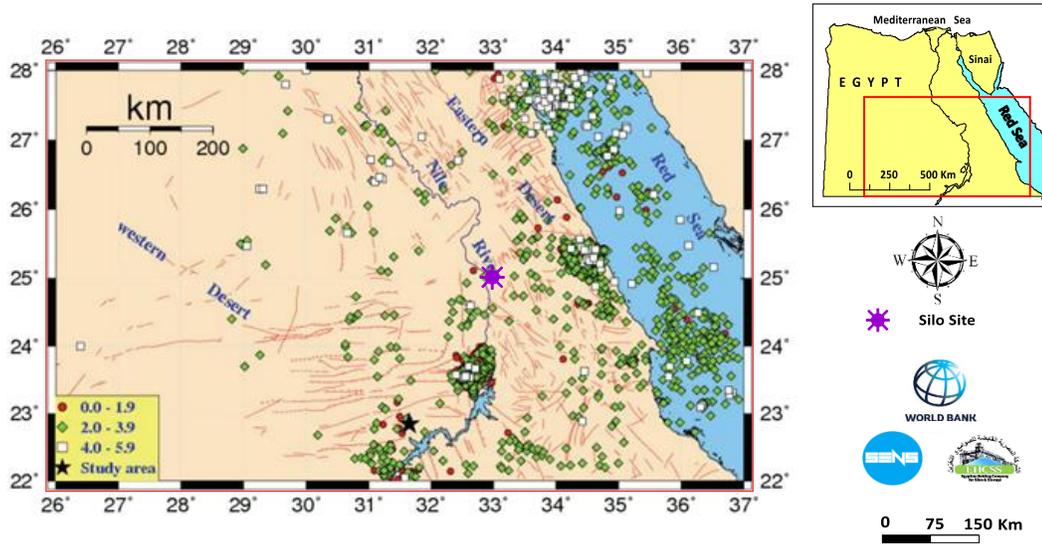
**Figure (4.8): Location of Mafalsa Silo and its distance from the nearest water sources**

#### 4.1.6 Seismicity of the Aswan area

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.

In addition to the collected earthquakes from National and International Bulletins, the regional data used in this study during the period from 1982 to 2006 mainly was located using Aswan, Abu-Simbil, Marsa Alam seismic stations, Aswan seismic network and Egyptian National Seismic Network. According to the spatial distribution of earthquakes that were located in and around the study area as shown in Figure 4.8, several areas having different seismicity level have been represented around silo site and known as: Shedwan Island, Red Sea, Abu Dabbab, East southern corner of the Eastern Desert, Kalabsha, Abu Simbel and southern part of the Western Desert area. Due to the location of Kalabsha and Abu-Simbel near to the study area, so the seismicity of these areas will be discussed in detail as follow.

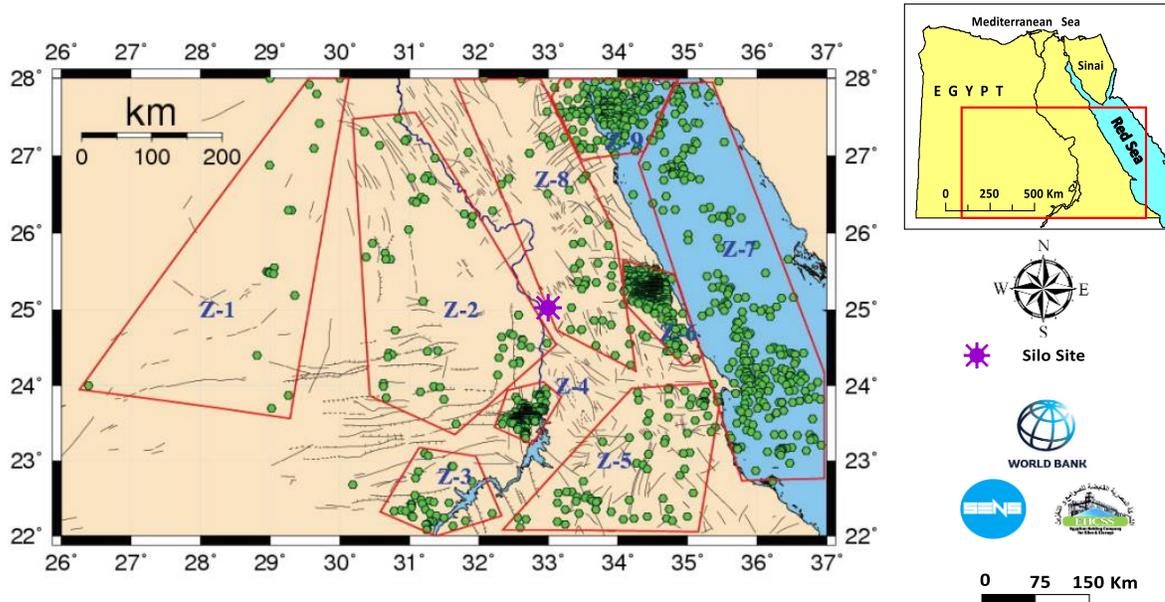
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**Figure (4.9):** Earthquake epicentral distribution in and around the study area during the period 1900 to 2006. Fat-Helbary and Mohamed, 2004

The elaboration of model of seismic sources, i.e., seismogenic zones around silo area was produced by a lot of discussion and critical analyses. After the performed analyses and critical reviews of the obtained results and based on the existing available data, we found that model presented in Figure 4.9 is the most appropriate considering the seismological conditions in South Egypt. Therefore, it has been adopted as a representative model of seismic sources in and around the study area. All further analyses are based on this model. As can be seen in Figure, the adopted model consists of 9 seismic sources named Z-1 to Z-9.

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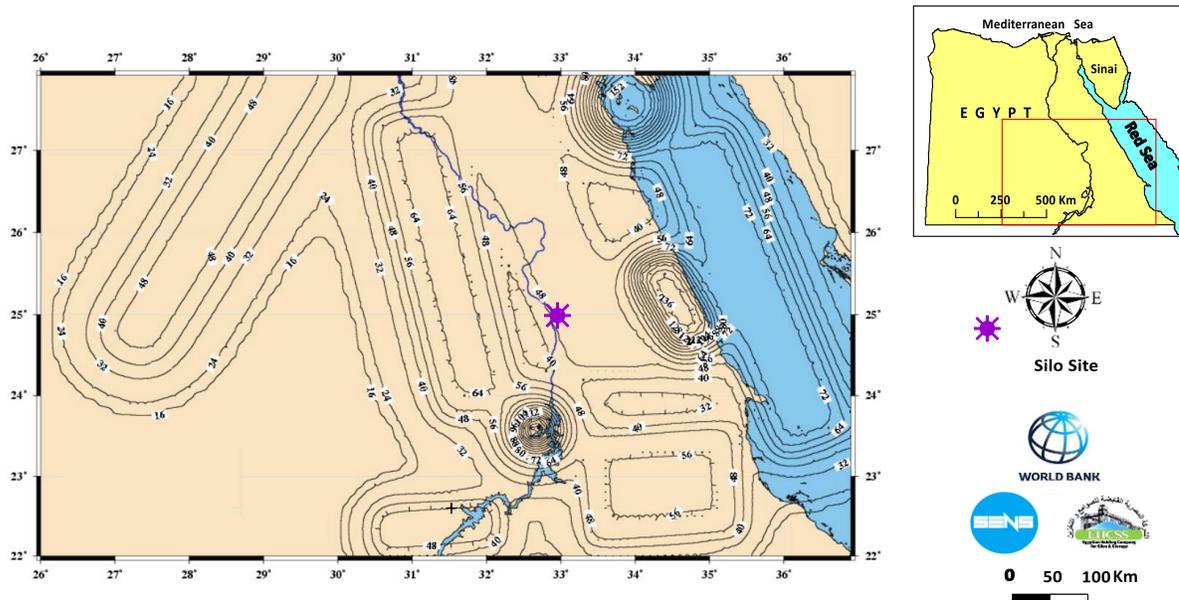
**Figure (4.11):** Proposed seismic source models in and around the study area

According to the spatial distribution of earthquakes that were located around Luxor and Aswan Governorates as shown in Figure (4.10), several areas having different seismicity levels have been represented around. The Silo site lies between two seismic sources (Z2 and Z8). The main characteristics of the individual seismic sources are described as follows.

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

**Zone - 8:** This source represents the Red Sea zone, Abo Dabab zone, North Abo Dabab and the south-eastern corner of the Eastern Desert (Allaqi zone). The fault systems in this area parallel to the fault systems in the Red Sea where the Arabian plate is continuing to rotate away from the African plate along the Red Sea spreading center (Cochran, 1983). Abo Dabab zone is the most active zone in the Red Sea area.

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**Figure (4.1\)**: Seismic hazard map in and around Tushka area for 475 years return period.

The seismic hazard maps and curves can be constructed depending on PGA. The maximum acceleration of the ground that occurs in an event of an earthquake is known as peak ground acceleration (PGA). The PGA is discussed about a particular location. It is the maximum acceleration at the site we considered for the design.

- PGA is considered in the vertical and horizontal design for the design. Mostly the horizontal peak ground acceleration is critical.
- PGA depends on the distance to the structure and to the location where the earthquake occurs. The origin of the earthquake is known as the epicenter.
- In addition, PGA depends on the geology of the ground, how deep the earthquake occurs, etc.
- PGA represents the multiples of the gravitational acceleration ( $g = 9.81 \text{ m/s}^2$ ). For example, Peak ground acceleration can be written as  $0.1g$ .

We do feel the acceleration. Not only earthquakes, but wind also induces acceleration felt when it exceeds a certain level. According to the general considerations, the following can be considered as the critical ranges of human comfort. However, these

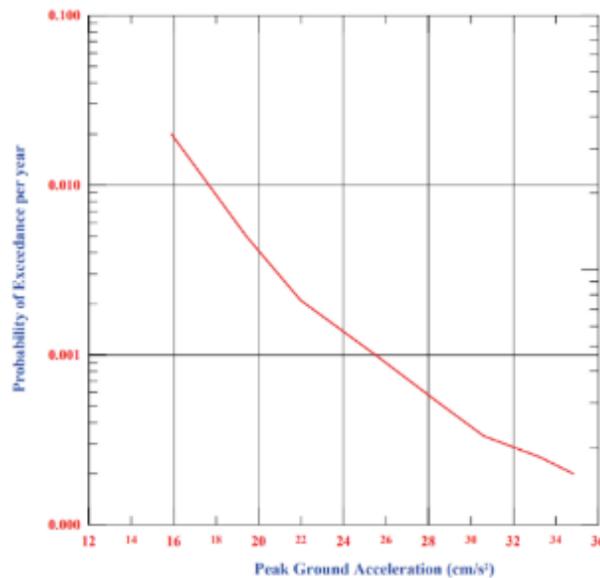
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values may not apply to the building differently. We have to consider the acceleration depending on the factors discussed above when designing.

The hazard curve relates the peak ground acceleration with its annual exceedance

Acceleration	Multiple of damage	Damage/Comfort Level
0.01 m/s <sup>2</sup>	0.001g	People feels movement
0.2 m/s <sup>2</sup>	0.02g	People lose their balance
5 m/s <sup>2</sup>	0.50g	Very High Acceleration. <i>Well designed buildings</i> with a short period of adequate damping would survive.

probability at a selected site in the proposed site with its coordinates is carried out. The resulting hazard curve was calculated for the proposed site as shown in Figure. The figure shows the computed probabilities of exceeding various levels of peak ground acceleration area source model is normalized on an annual basis.



**Figure (4.1):** Seismic hazard curve at the proposed site.

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<sup>2</sup> it means approximately 0.022g and depending on table (), the proposed silo site has a low seismicity activity.

Finally, depending on the previous data, seismic hazard map, tables, and seismic hazard curve, the proposed silo site and surroundings parts are characterized by low amplification of seismic waves (site effect) during earthquakes this mean that it has a low seismicity is comparison with comparing the other sites in South Egypt.; therefore, the territory may be considered relatively safe area for construction the proposed silo, The expected damage from any activity can only make a person lose his balance.

#### 4.1.7 Flash floods of Aswan Governorate

In Upper Egypt, flash floods may occur due to short duration heavy storms that produce large volumes of surface runoff with a high peak discharge value concentrated in a short time. These flood events are considered a significant natural hazard particularly in the Red Sea area. Many studies have been made to determine possible measures to avoid hazards caused by flash floods and mechanisms have been developed to harvest floodwaters.

Depending on the morphometric parameters, an assessment of the degree of hazard due to flooding is estimated according to Aggour (1999) as follows:

- 1- Nine parameters have their effect on the flooding are selected and their relationships with the flash flood hazard have been analyzed.
- 2- Seven of these parameters have a direct proportional relationship with hazard. These are density (D), frequency (F), Area (A), relief ratio (Rr), shape index (Ish), Ruggedness number (Rn) and slope index (SI%), while two parameters have an inverse relationship. These are weighted mean bifurcation ratio (WMRb) and length of overland flow (Lo)
- 3- A scale number for the hazard degree starting with 1 (lowest) to 5 (highest) has been given according to the range-values of these 9 parameters.
- 4- The summation of the degree of hazard of the different parameters for each basin represents the flood hazard of this basin relative to that of the other one (Table3). These values range between 14 (Wadi El Sabil) and 31 (Wadi Abadi). These values have been used to classify the studied ten basins into five orders (1 to 5) representing the flash flood hazard degrees in ascending order as follows:
  - a- Group 1 (14-17.4) with hazard degree 1, is represented by Wadi Khor El Mafalis, W El Shoky and Wadi El Sabil.
  - b- Group 2 (17.5-20.8) with hazard degree 2, is represented by Wadi Khor El Malahaand W El Dir.
  - c- Group 3 (20.9-24.2) with hazard degree 3, is represented by Wadi El Domi, El Sharawna El Keblya and Wadi El Sharawna El Baharya.
  - d- Group 4 (24.3-27.6) with hazard degree 4.
  - e- Group 5 (27.7-31) with hazard degree 5, is represented by Wadi Abadi and W. El Kelabya.

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**Table (4.1):** The determination of the hazard degrees of the chosen parameters main basins.

Parameters	The values of parameters and their related Strength degrees					
	Value	0.036-0.91	0.91-1.785	1.785-2.66	2.66-3.535	3.535-4.41
WMRb	S. Degree	5	4	3	2	1
	Value	0.44-0.666	0.666-0.892	0.892-1.118	1.118-1.34	1.34-1.57
D	S. Degree	1	2	3	4	5
	Value	0.1-0.24	0.24-0.38	0.38-0.52	0.52-0.66	0.66-0.8
F	S. Degree	1	2	3	4	5
	Value	0.32-0.486	0.486-0.652	0.652-0.818	0.818-0.984	0.984-1.15
Lo	S. Degree	5	4	3	2	1
	Value	1.95-3.124	3.124-4.298	4.298-5.472	5.472-6.646	6.646-7.82
SI	S. Degree	1	2	3	4	5
	Value	20-1367.44	1367.44-	2714.88-	4062.32-	5409.76-6757.2
A	H. Degree	1	2	3	4	5
	Value	0.003-0.006	0.006-0.009	0.009-0.012	0.012-0.015	0.015-0.018
Rr	H. Degree	1	2	3	4	5
	Value	0.03-0.142	0.142-0.254	0.254-0.366	0.366-0.478	0.478-0.59
Rn	S. Degree	1	2	3	4	5
	Value	0.25-0.304	0.304-0.358	0.358-0.412	0.412-0.466	0.466-0.52
Ish	S. Degree	1	2	3	4	5
	Value					

**Table (4.2):** Flash flood hazard degrees of the main basins

No.	Basin Name	Hazard degrees of the chosen parameters										Basin Degree
		WMRb	D	F	Lo	Ish	A	Rr	Rn	SI%	Total	
1	W. Abadi	1	4	5	5	3	5	1	5	2	31	5
2	W. El Domi	5	1	1	2	5	1	3	1	2	21	3
3	W. Khor El Mafalis	5	1	1	2	2	1	3	1	1	17	1
4	W. Khor El Malaha	5	1	1	2	4	1	2	1	2	19	2
5	W. ElShoky	5	1	1	2	1	1	2	1	2	16	1
6	W. Al Dir	5	2	2	3	1	1	2	1	2	19	2
7	W. El Kelabya	5	5	3	5	2	1	4	1	2	28	5
8	W. El Sabil	5	1	1	1	1	1	1	1	2	14	1
9	W. El Sharawna Keblya	5	1	1	1	4	1	5	1	3	22	3
10	W. El Sharawna Baharya	5	1	1	2	3	1	5	1	5	24	3

- 5- The summation of the degree of hazard of the different parameters for each sub-basin of W. Abadi represents the flood hazard of this subbasin relative to that of the other one (Table 4.3). These values range between 19 (Wadi El Myah) and 37 (Wadi El Batour). These values have been used to classify the studied five sub-basins into five orders (1 to 5) representing the flash flood hazard degrees in ascending order as follows (Table 5):
- Group 1 (19-22.6) with hazard degree 1, is represented by Wadi El Myah and Wadi El Shaghab.
  - Group 2 (22.7-26.2) with hazard degree 2.
  - Group 3 (26.3-29.8) with hazard degree 3, is represented by Wadi Um Tanduba
  - Group 4 (29.9-33.4) with hazard degree 4, is represented by Wadi El Baramya

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e- Group 5 (33.5-37) with hazard degree 5, is represented by Wadi El Batour

**Table (4.3):** The determination of the hazard degrees of the chosen parameters for Wadi Abadi sub-basins.

Parameters	The values of parameters and their related Strength degrees					
	Value	0.036-0.9108	0.9109-1.7856	1.7857-2.6604	2.6605-3.5352	3.5353-4.41
WMRb	S. Degree	5	4	3	2	1
	Value	1.15-1.82	1.82-1.214	1.214-1.246	1.246-1.278	1.278-1.31
D	S. Degree	1	2	3	4	5
	Value	0.792-0.821	0.821-0.85	0.85-0.88	0.88-0.911	0.911-0.941
F	S. Degree	1	2	3	4	5
	Value	0.38-0.392	0.392-0.404	0.404-0.4161	0.4161-0.428	0.428-0.44
Lo	S. Degree	5	4	3	2	1
	Value	1.22-2.57	2.57-3.92	3.92-5.72	5.72-6.62	6.62-7.79
SI	S. Degree	1	2	3	4	5
	Value	518.91-879.99	879.996-1241.08	1241.08-1602.18	1602.188-1963.25	1963.25-2324.34
A	H. Degree	1	2	3	4	5
	Value	.002-0.0026	0.0026-0.0032	0.0032-0.0038	0.0038-0.0044	0.0044-0.005
Rr	H. Degree	1	2	3	4	5
	Value	0.1-0.154	0.154-0.208	0.208-0.262	0.262-0.316	0.316-0.37
Rn	S. Degree	1	2	3	4	5
	Value	0.25-0.33	0.33-0.41	0.41-0.49	0.49-0.57	0.57-0.65
Ish	S. Degree	1	2	3	4	5
	Value					

**Table (4.5):** Flash flood hazard degrees of the hydrographic of Wadi Abadi basin sub-basins.

No.	Basin Name	Hazard degrees of the chosen parameters										Basin Degree
		WMRb	D	F	Lo	Ish	A	Rr	Rn	SI%	Total	
1	W. El Bramya	5	4	5	4	2	1	4	4	4	33	4
2	W. El Myah	1	1	1	1	1	5	2	5	2	19	1
3	W. Al Batour	3	5	5	5	3	4	4	5	3	37	5
4	W. El Shaghab	1	4	4	4	5	1	1	1	1	22	1
5	W. UmTanduba	2	3	3	4	2	1	5	4	5	29	3

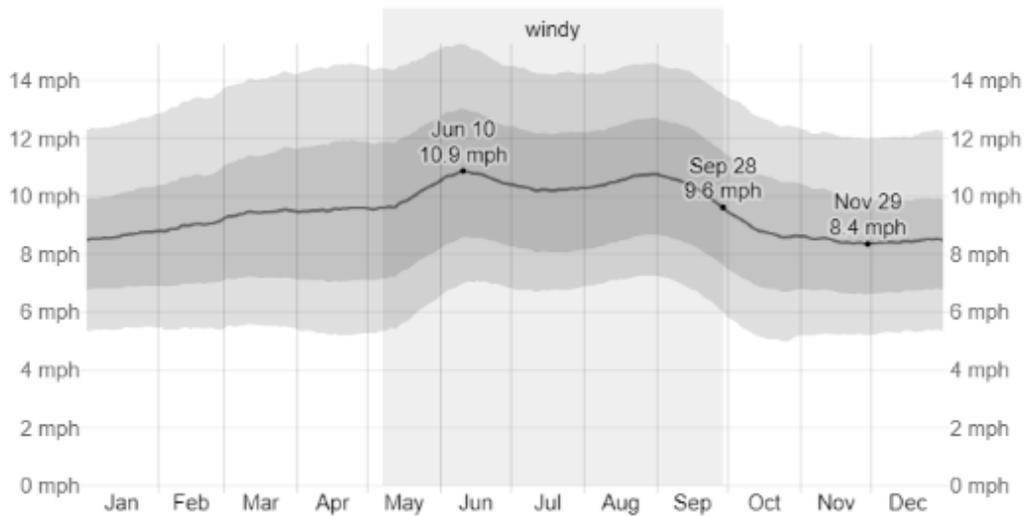
The silo site is located near the western parts of Wadi Abadi, and from the mentioned previous tables this site may become unsafe so we recommend that, the government need to drill additional canals in the eastern side and building additional barriers to minimize the impacts of flash flood and increase benefits of heavy rainfall which can be considered a source of drinking water which may flood nearby areas and cause destruction to them. . **Regarding the construction site and existing silo area**, the site has

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been graded with proper slopes to drain water away from the premises. In case water enters the site, a submersible pump is used to remove the water that enters the tunnels and the lift station .

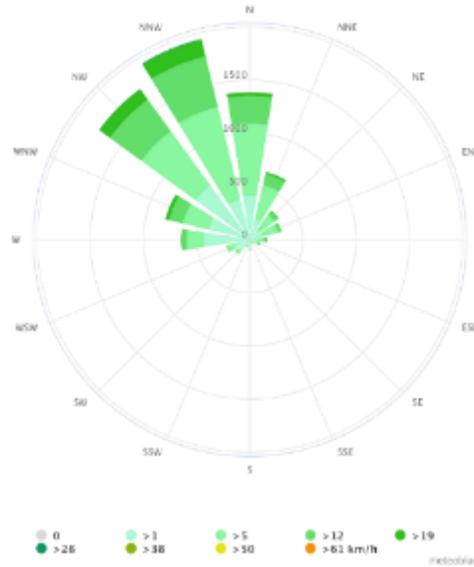
### 4.1.8 Wind Speed and Direction

The average hourly wind speed in Aswan experiences mild seasonal variation over the course of the year. The high wind speed activity 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 (4.1۳): Average Wind Speed in Aswan.**

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**Figure (4.14):** Windrose for Aswan.

## 4.2. Biological Environment

### 4.2.1 Biological Description of Project Site and Surrounding Area

A desktop review, was carried out to obtain some background on the biodiversity of the subproject site and surrounding area. A site visit was then conducted on September 26, 2024 for ground truthing which encompassed an audit on the natural habitat and species in and around the site.

**Habitats:** The surrounding habitats are composed of mainly reclaimed agriculture lands and desert lands (Western Desert).

**Flora:** Studies of the open-water and riparian habitats of the Nile in Aswan and southern Egypt revealed a rich diversity of plant species. A total of 14 species of plants were recorded, with many occurring in areas near the silo site. The common species are: *Phragmites australis*, *Eichhornia crassipes*, *Ceratophyllum demersum*, *Azolla filiculoides* and *Echinochloa stagnina*. The rare species are: *Arthrocnemum macrostachyum*, *Sarcocornia fruticosa*, *Lemna perpusilla*, *Potamogeton crispus* and *Salsola kali*. Many other species were found in the Nile Bank and are considered as noteworthy species because they have economic uses. These species are: *Eruca sativa* Mill., *Raphanus raphanistrum* L., *Trifolium alexandrinum* L., *Malva parviflora* L., *Sida alba* L., *Mentha longifolia* (L.), *Sonchus oleraceus* L., *Allium roseum* L. (Tackholm, 1974; Mashaly et al., 2007; Badry et al., 2019; Abbas et al., 2021). No threatened flora species (e.g., IUCN Red List) were identified in the project area and the expansion site is within facility premises and is devoid of any vegetation.

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**Mammals:** Rodents form the largest mammalian group in the area, being represented by many species and the most common species – besides of course the feral cats and dogs- are the Field Rat *Arvicanthis niloticus* and the Black Rat *Rattus rattus*, which are nocturnal and feed on vegetables and seeds (NARSS, 2010; BMC Ecology and Evolution, 2022).. Burrows are shallow and usually under shrubs. The Red Fox *Vulpes vulpes* was recorded in areas around the Nile Bank (Mohamed, 2018; NARSS, 2010). Individuals and their tracks were seen throughout the area, where it seems to inhabit date and fruit groves, cultivated areas and suburban gardens, commonly seen during daylight hours. It feeds on birds, rodents, and insects. This fox belongs to subspecies *aegyptiaca* which is widespread around drains of Nile Delta and Valley (Osborn & Helmy ,1980).

**Amphibians and Reptiles:** Four species of amphibians and 34 species of reptiles are known from the Nile Valley. Characteristic amphibians include *Sclerophrys regularis*, *Ptychadena nilotica*. Common reptiles include *Hemidactylus turcicus*, *Chalcides ocellatus*, *Platycephalus florulentus*, , *psammophis sibilans*, , and *Naja haje.*, *Chamaeleo africanus*, *Varanus niloticus*, *Myriopholis cairi*, *Psammophis sibilans*, , and *Trionyx triunguis*, , are restricted to this habitat in Egypt (Baha El Din, 2006) .

**Birds:** Common breeding birds of the Nile Valley include 66 species (Goodman *et al.*, 1989). At least 14 of these are not known to breed outside that habitat. Characteristic species include *Bubulcus ibis*, *Elanus caeruleus*, *Milvus migrans*, *Falco tinnunculus*, *Gallinula chloropus*, *Vanellus spinosus*, , *Streptopelia senegalensis*, *Centropus senegalensis*, *Tyto alba*, *Merops orientalis*, *Galerida cristata*, *Hirundo rustica*, *Motacilla flava*, *Prina gracilis*, *Corvus cornix*, *Passer domesticus*, and others. The Nile Valley with its abundance of water and food available for birds, provide an important, relatively, easy, and safe route for trans-Saharan, palearctic migration. Huge numbers of individuals of many species utilize this route during both spring and autumn migrations. The region also provides wintering habitats for large populations of many palearctic migratory species (Goodman *et al.*, 1989). The Rock Pigeon (*Columba livia*) was also directly observed around the silo site during field visits. Inquiries with local residents and farmers indicate that certain species are known to occur in the region. According to the IUCN Red List, species such as *Milvus migrans* (Black Kite), *Falco tinnunculus* (Common Kestrel), *Elanus caeruleus* (Black-winged Kite), and *Tyto alba* (Barn Owl) have been reported as commonly observed in the Nile Valley. These local accounts, together with the findings of Goodman *et al.* (1989), support the presence of these characteristic raptors in the area. The risk of bird collision is low, as the silo design does not include reflective materials.

**Aquatic Life:** The occurrence of different habitats along the Nile Bank resulted in a large variety of fish species inhabiting these ecosystems. *Tilapia zillii* is widely distributed in this habitat on account of its high tolerance to environment; while *Oreochromis niloticus* was the second common species of cichlids as well as *Clarias gariepinus* *Sarotherodon galilaeus* and another cichlid, *Hemichromis bimaculatus*, avoid salty water. Their occurrence was restricted to areas of low chlorosity. The introduced species *Gambusia affinis* shows a similar wide distribution (Bishai and Khalil,1997). The project is not expected to impact freshwater species.

#### **Proximity to Sensitive and Protected Areas:**

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The project site is not within or near any RAMSAR sites or any protected areas. The nearest protected areas include the Dababeya protected area, approximately 50km, the Saluga and Ghazal Protected Area, approximately 112 km, and Wadi Al Allaqi, 180 km east of Aswan around 215 km away from the Silo, and Elba Natural Reserve is located in the far southeastern corner of Egypt, it's 488 km away from the silo. . The site falls within an Important Bird Area (IBA), indicating potential ecological significance for birdlife.

Moreover, All the islands in the Nile river were declared a Protected Area by Prime Ministerial Decree 1969/1998. Sobha Island is located approximately 1.23 km west of Silo site. Two other islands referred to as “El-Mohammeed” and “Nag El-Sayeh” are situated around 6.6 km and 10 km to the north, respectively. To the south, another island lies about 4 km away, followed by four additional islands (El-Fuza, Qanadilah, and El-Radeisa) located approximately 12.8 km to 16.5 km from Silo site. All these nearby islands remain on the official protected list and were not among the 17 removed by the 2017 decree.

Disturbance caused by a growing number of fishermen and tourist cruises is increasing. There is a substantial water-pollution problem caused by untreated discharge from sugar, phosphate and dairy factories, as well as from urban areas. Erosion of the Nile banks has become a problem since the construction of the High Dam.

### Important Bird Areas (IBAs)

The project site falls within the Upper Nile Important Bird Area (IBA) A1, A4i and A4iii<sup>78</sup>. This is the stretch of the Nile river with the highest concentrations of wintering waterbirds in Egypt. In the winter of 1989/90, 21,100 waterbirds were counted in this region. The islands are particularly attractive to resting waterbirds. Although the silo area is not an attractive habitat for birds, the silo activities may attract birds during operational phase due to the presence of grains. In addition to agriculture lands in close proximity which support agrobiodiversity and provide suitable habitats for both resident and migratory birds. This IBA is a critical stopover for migratory birds traveling between Europe, Asia, and Africa along the East African Flyway. Migratory seasons occur in: a) Spring (February–April), birds traveling northward to breeding grounds, and b) Autumn (September–November), birds migrating southward to wintering grounds. Peak migration typically occurs in March and October, making the surrounding area of the project site an essential ecological corridor. According to birdlife website, the islands are particularly attractive to resting waterbirds. *Aythya nyroca* winters in internationally important numbers. *Netta rufina* winters regularly in small numbers, while *Marmaronetta angustirostris* is an irregular and rare winter visitor, last recorded from the area in 1983. This section of the Nile valley is likely to be of importance for staging waterbirds and other migrants, such as *Ciconia ciconia*, during the migration

<sup>7</sup> BirdLife International (2025) Site factsheet: Upper Nile. Downloaded from <https://datazone.birdlife.org/site/factsheet/upper-nile> on 19/06/2025

<sup>8</sup> The A1, A4i, and A4iii criteria are used to identify Important Bird Areas (IBAs). A1 identifies sites that hold significant numbers of a globally threatened bird species. A4i identifies sites that regularly hold 1% or more of a biogeographic population of a congregatory waterbird species. A4iii identifies sites that regularly hold at least 20,000 waterbirds.

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seasons. *Aythya nyroca* is the IBA triggering species. However, the project area is not considered an attractive site for this bird and the project activities are not expected to impact this species. The risk of bird collision is low, as the silo design does not include reflective materials. However, grain spills from silo activities may potentially attract bird species to the site, the ESMP will include measures for grain spills and proper housekeeping measures.



**Figure (4.1°):** Map showing the IBAs in Egypt, including the upper Nile IBA and the silo Site.

**Critical Habitat:**

Data extraction using the Integrated Biodiversity Assessment Tool (IBAT) identified 452 species of plants, animals, insects and fungus as occurring within 50 km of the project area where 410 are internationally classified as Least Concerned (LC).

42 species have international IUCN classification as follows: 3 Endangered (EN), 16 Vulnerable (VU), 14 Near Threatened (NT), and 9 Data Deficient (DD). 33 of those species occur in terrestrial biomes and 28 of those species occur in freshwater biomes where 19 of the species are common between the two types of biomes. Due to the scale and location of the project, reclaimed desert area, about more than 400m away from the Nile River and since it is a localized site and a modified area within the existing premises of EHCSS Mafalsa silos there are no significant risks expected on species that are found in freshwater

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biomes. Additionally, the ESMP includes strict waste and chemicals and spill prevention measures.

Regarding species that are found in terrestrial biomes; only birds may accidentally occur in the site location due to their flying ability and presence of grains. Birds of prey may be at potential risks from secondary poisoning from consuming dead rodents as a result of rodenticides. Several birds are threatened by hunting and collection. However, with proper mitigation measures for grain spills and proper housekeeping measures, and measures for hunting risks, and the presence of a Pest Management Plan (PMP), the impacts of those risks could be made insignificant.

Additionally, consultation with experts and locals (26th of September 2024) suggested that the project would not pose any risks on threatened or endangered mammals or reptiles species and according to the site visits (26th of September 2024), the area is walled, modified and devoid of any vegetation. No Gazelles, Hyenas or Nubian ibex were sighted by locals of the area, those species are not expected to be present at the project site and the project site does not constitute an attractive area for those species. Nonetheless, The ESMP includes mitigation measures for hunting of all types of wild animals if any.

### **Sensitive and Threatened Species in Project Area**

- **Flora:** According to IBAT tool, there are 3 plant species of potential concern present within 50km radius and these include; *Raphia australis* and based on the IUCN red list (2025) it is classified as vulnerable globally, *Alisma gramineum* classified as data deficient globally according to IUCN red list, and *Aegilops bicornis* classified as near threatened globally by the IUCN Red list (2025). No threatened flora species (e.g., IUCN Red List) were identified in the project area and the expansion site is within facility premises and is devoid of any vegetation.
- **Mammals:** Three IUCN/internationally threatened mammals and one data deficient mammal were identified by the IBAT tool to be present within 50km Radius from the project site. These are; (1) *Capra nubiana* classified as vulnerable globally by the IUCN and in Egypt it is classified as endangered, (2) *Gazella Dorcas* classified as vulnerable globally and locally, (3) *Hyaena hyaena* classified as near threatened globally and (4) *Plecotus christii* as DD globally according to the IUCN. However, those species are not expected to occur at the project site, as it does not constitute an attractive habitat for those species and they were not sighted by the consultant nor by locals recently and the project activities are not expected to impact those species. Nonetheless, the ESMP includes measures for wildlife hunting and collections.
- **Amphibians and Reptiles:** Although the *chamaeleo africanus* is classified as least concerns globally based on the IUCN red list (2025), in Egypt it is classified as vulnerable (Baha El Din, 2006). However, the species is threatened by reclamation of

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wetland and therefore the subproject does not pose any risks or threats on this species. The species is threatened by wildlife collectors and the ESMP includes measures for illegal wildlife collection. The *Varanus niloticus* is globally classified as least concern according to IUCN red list (2025), however locally it is classified as vulnerable (Baha El Din, 2006). This species is threatened by collection and trade and leather production. The silos are not expected to contribute as a threat for this species. *Trionyx triunguis* is classified as vulnerable internationally and endangered locally due to fishermen collections and shell trade (Bahaa El Din, 2006 and IUCN, 2025). The project includes mitigation measures for illegal wildlife collection which may take place by project workers.

- **Birds:** The threatened birds include; Three birds *Falco cherrug*, *Neophron percnopterus* and *Aquila nipalensis* are classified as globally endangered by the IUCN, Ten birds; *Aythya ferina*, *Calidris ferruginea*, *Calidris falcinellus*, *Pluvialis squatarola*, *Clanga clanga*, *Aquila heliaca*, *Streptopelia turtur*, *Falco vespertinus*, *Falco concolor* and *Chlamydotis undulata* are globally classified as vulnerable. Eleven species are globally classified as near threatened which are *Marmaronetta angustirostris*, *Aythya nyroca*, *Limosa limosa*, *Arenaria interpres*, *Calidris canutus*, *Calidris alpina*, *Vanellus Vanellus*, *Gallinago media*, *Glareola nordmanni*, *Circus macrourus* and *Lanius senator*, The risk of bird collision is low, as the silo design does not include reflective materials. The project site located within an Important Bird Area (IBA) called Upper Nile. Although the silo area is not an attractive habitat for birds, the silo activities may attract birds during operational phase due to the presence of grains. In addition to agriculture lands in close proximity which support agrobiodiversity and provide suitable habitats for both resident and migratory birds. Therefore, grain spills prevention are present in the ESMP to avoid attracting birds to the silo area.

Since birds of prey are present in this region, risks from hunting and secondary poisoning from rodenticides usage may be present. The ESMP includes measures for wildlife hunting and collection and a pest management plan to prevent secondary poisoning of wildlife.

Table (4.6) includes details of species of conservation concerns

### Critical Habitat Assessment

This section aims to identify the occurrence of critical habitat features based on the five critical habitat criteria defined in the World Bank ESS6.

### Critical Habitat Criteria

Critical habitat is defined in the World Bank ESS as: the areas with high biodiversity importance or value, including:

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- (A) habitat of significant importance to Critically Endangered (CR) or Endangered (EN) species, as listed in the IUCN Red List of threatened species or equivalent national approaches;
- (B) habitat of significant importance to endemic or restricted-range species;
- (C) habitat supporting globally or nationally significant concentrations of migratory or congregator species;
- (D) highly threatened or unique ecosystems;
- (E) ecological functions or characteristics that are needed to maintain the viability of the biodiversity values described in (A) to (D).

Guidance notes to the ESS6 are available, but do not include guidance on methods or thresholds for critical habitat determination.

The following approach has therefore been developed for assessment of critical habitat for the terrestrial conditions applicable to this project:

- Key Biodiversity Areas (KBA) including Important Bird Areas (IBA) and Alliance for Zero Extinction (AZE) sites provide important indicators of potential critical habitat. Careful consideration is also to be given to legally protected areas, Ramsar wetlands of international importance, UNESCO recognized world heritage sites and Government recognized conservation initiatives.
- ESS6 Criterion (A) requires an assessment against both global (IUCN) and national red list ratings. ESS6 critical habitat criterion (A) places an emphasis on national red lists
- Where a significant proportion ( $\geq \pm 0.5\%$ ) of the national or global population of a species has a likely presence within the project area, consideration is to be given for the habitat to have significant importance for the species under ESS6 Criterion (A), (B) or (C).
- By IUCN definition, a CR species faces an extremely high risk of extinction and its continued survival in the wild is in a critical state. Therefore, evidence of use of habitats within the project-affected area by a surviving population of a CR species suggests that these habitat have a significant importance for the species under ESS6 Criterion (A).
- ESS6 Criterion (B) can be achieved for range-restricted species with evidence or believed to occur within the project-affected area where the full extent of that area overlaps a significant proportion ( $\pm 1\%$ ) of a species' distribution range.
- There is no specific guidance for assessment of Criteria (D) and (E) and each situation needs to be assessed on a case-by-case basis.

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The greater project area, defined by an area within an approximately 50 km radius and supports globally and locally threatened species.

Species status was consolidated from both the IUCN Red List (provided by IBAT) and Mammals of Egypt Red Data Listing and Conservation by Basuony et al (2010) and A Guide to the Reptiles and Amphibians of Egypt by Baha El Din (2006).

***Criterion (a) - habitat of significant importance to Critically Endangered or Endangered species, as listed in the IUCN Red List of threatened species or equivalent national approaches.***

The Saker Falcon and the Steppe Eagle both are listed as endangered species by the IUCN. Although the area does not constitute as an attractive habitat for those species, indirect risks from secondary poisoning from the use of rodenticides may occur. The ESMP includes a PMP which includes measures to prevent secondary poisoning by wildlife.

The African Softshell Turtle is listed as endangered in the national listing by Baha El Din (2006), however this species is highly aquatic and the project does not constitute a threat. Since the species suffers from fishermen collection, the ESMP includes measures to mitigate wildlife and biodiversity collection by project workers. Similarly, the Nubian Ibex has an endangered status in the national listing by Basuony et al (2010), however, the species was not sighted in the project site and the project site is not an attractive habitat for this species. The main threat on this species is hunting and the ESMP includes measures to prevent the risk of wildlife hunting.

All species are not expected to be significantly impacted by the project and no net gain requirements are needed.

***Criterion (b) - habitat of significant importance to endemic or restricted-range species.***

Cyprus Wheatear is listed as a restricted range species by the IBAT tool. The project site and activities do not constitute an attractive habitat for this bird. Nonetheless, the species is globally threatened by shooting and collection and therefore the ESMP includes measures to prevent wildlife shooting and hunting.

***Criterion (c) – habitat supporting globally or nationally significant concentrations of migratory or congregatory species.***

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The project falls within the Upper Nile IBA (Criteria A1, A4i and A4iii<sup>9,10</sup>) boundaries. In the winter of 1989/90, 21,100 waterbirds were counted in this region. The islands are particularly attractive to resting waterbirds. This IBA is a critical stopover for migratory birds traveling between Europe, Asia, and Africa along the East African Flyway. Migratory seasons occur in: a) Spring (February–April), birds traveling northward to breeding grounds, and b) Autumn (September–November), birds migrating southward to wintering grounds. Peak migration typically occurs in March and October, making the surrounding area of the project site an essential ecological corridor. According to birdlife website, the Nile islands are particularly attractive to resting waterbirds. The Ferruginous Duck, the triggering species for the Upper Nile IBA relies on freshwater vegetated habitats. No risk is expected from the project on this species since this species is highly aquatic.

The silo area, located on the eastern side of the Nile, in a reclaimed desert area, is considered as an unattractive habitat for these birds (i.e modified desert area, devoid of vegetation and with anthropogenic activities). Nonetheless, grain spills may be a food source for this species. However, no negative impacts are expected from the project activities on this species. Mitigation measures for grain management and spills and proper housekeeping and waste and chemicals and spill prevention measures are present in the ESMP.

***Criterion (d) - highly threatened or unique ecosystems.***

The project site is within EHCSS premises, a modified area with anthropogenic activities and there is no reason for recognition of unique characteristics. The project area is therefore not considered as a critical habitat under this criterion.

***Criterion (e) - ecological functions or characteristics that are needed to maintain the viability of the biodiversity values described above in (a) to (d).***

No specific ecological functions or characteristics have been identified that are essential to maintain the above critical habitat features, and no critical habitat is therefore recognized under this criterion.

**Table (4.6): Species of Concern present within 50km radius (IBAT), protection status, IUCN Red List Status and national status and potential project impact and required action.**

<sup>9</sup> BirdLife International (2025) Site factsheet: Upper Nile. Downloaded from <https://datazone.birdlife.org/site/factsheet/upper-nile> on 19/06/2025

<sup>10</sup> The A1, A4i, and A4iii criteria are used to identify Important Bird Areas (IBAs). A1 identifies sites that hold significant numbers of a globally threatened bird species. A4i identifies sites that regularly hold 1% or more of a biogeographic population of a congregatory waterbird species. A4iii identifies sites that regularly hold at least 20,000 waterbirds.

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Scientific Name	Comm on_ Name	Relevant convention/protection status	IUCN Status	National Status	Habitat and Behavior (extracted from IUCN red list website)	Potential Impact	Measure
<b>Birds</b>							
<i>Falco cherrug</i>	Saker Falcon	Listed under CITES Appendix II It is listed on CMS Appendix I and II	EN	-	Present in shrubland, grassland, inland wetland. It is physically adapted to hunting close to the ground in open terrain, combining rapid acceleration with high maneuverability, thus specializing on mid-sized diurnal terrestrial rodents (especially ground squirrels <i>Spermophilus</i> ) of open grassy landscapes such as desert edge, semi-desert, steppes, agricultural and arid montane areas.	At risk of Secondary poisoning from rodenticides	Mitigation measures for rodenticide management and secondary poisoning are present in ESMP and project PMP to be developed.
<i>Aythya ferina</i>	Common	Listed under CMS Appendix II.	VU	-	This species requires well-vegetated	Although the silo area is	Mitigation measure

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	Pochar d	Agreement on the Conservation of African-Eurasian Migratory Waterbirds			eutrophic to neutral swamps, marshes, lakes and slow-flowing rivers with areas of open water and abundant emergent fringing vegetation. The species is omnivorous, its diet consisting of seeds, roots, rhizomes, the vegetative parts of grasses, sedges and aquatic plants as well as aquatic insects and larvae, molluscs, crustaceans, worms, amphibians and small fish <sup>11</sup>	considered as an unattractive habitats for these birds, grain spills may potentially attract the species. Therefore mitigation measures for grain management and spills and proper housekeeping are present in the ESMP.	s for grain spills and handling are present in the ESMP.
<i>Calidris ferruginea</i>	Curlew Sandpiper	Annex II of the Convention on Migratory Species (CMS) and Annex II of the Agreement on the Conservation of African-	VU	-	It is adapted to aquatic habitats and grasslands and feeds on mollusks and worms	The project site is not a suitable/attractive habitat for this species.	NA

<sup>11</sup>IUCN (2025). [Aythya ferina \(Common Pochard\)](#)

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		Eurasian Migratory Waterbirds (AEWA).					
<i>Calidris falcinellus</i>	Broad- billed Sandpi per	Annex II of the Convention on Migratory Species (CMS) and Annex I of the Agreement on the Conservation of African- Eurasian Migratory Waterbirds (AEWA)	VU	-	this species shows a preference for muddy and boggy areas on the shores of ponds and lakes, but it is also found on shallow freshwater, brackish and saline (sometimes hyper-saline) lagoons, temporary swamps, flooded rice- fields, overgrazed wet meadows. The species mainly overwinters on large, soft intertidal mudflats, in brackish lagoons, on salt pans, sewage farms and saltmarshes. Diet This species is omnivorous, its diet consisting of marine nereid worms, small bivalves and snails, crustaceans	The project site is not a suitable/att ractive habitat for this species.	NA

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					(e.g. amphipods), adult and larval insects (e.g. beetles, flies, grasshoppers, ants), as well as the seeds of aquatic plants.		
<i>Pluvialis squatarola</i>	Grey Plover	Listed under Annex II of the Convention on Migratory Species (CMS) and Annex II of the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA).	VU	-	It is adapted to grassland, wetland and aquatic habitats. the diet of this species consists largely of adult and larval insects such as beetles and Diptera as well as some plant matter (e.g. grass seeds and stems).	Although the silo area is considered as an unattractive habitat for these birds, grain spills may potentially attract the species. Therefore, mitigation measures for grain management and spills and proper housekeeping are present in the ESMP.	Mitigation measures for grain spills and handling are present in the ESMP.
<i>Marmaronetta angustirostris</i>	Marbled Duck	Protected under CMS Appendix I and II.	NT	-	It is adapted to temporary, unpredictable, Mediterranean-type wetlands and breeds in fairly dry, steppe-like areas on shallow freshwater, brackish or	Although the silo area is considered as an unattractive habitat for these birds, grain spills may potentially	Mitigation measures for grain spills and handling are present in the ESMP.

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					alkaline ponds with well vegetated shorelines, and rich emergent and submergent vegetation. <sup>12</sup>	attract the species. Therefore, mitigation measures for grain management and spills and proper housekeeping are present in the ESMP.	
<i>Aythya nyroca</i>	Ferruginous Duck	Appendix III of the Bern Convention and on Appendices I and II of the Bonn Convention/ Convention on the Conservation of Migratory Species of Wild Animals (CMS).	NT	-	The species shows a strong preference for fresh standing water and is very rarely found on flowing streams or rivers. It requires shallow water 30-100 cm deep close to littoral vegetation for feeding and generally avoids large open areas. Although the species is omnivorous, it also feeds on plant material such as seeds, roots and vegetative parts of aquatic plants (Potamogeton spp.,	Although the silo area is considered as an unattractive habitat for these birds, grain spills may potentially attract the species. Therefore, mitigation measures for grain management and spills and proper housekeeping are present in the ESMP.	Mitigation measures for grain spills and handling are present in the ESMP.

<sup>12</sup> ICUN (2025) [Marmaronetta angustirostris \(Marbled Duck\)](#)

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					<p>Ceratophyllum spp., Scirpus spp., Carex spp. and macroalgae Chara spp.) dominates its diet. Animal matter taken includes worms, molluscs (snails), crustaceans, adult and larval insects (beetles, chironomids, dragonflies, waterbugs, caddisflies, flies), amphibians (frogs, tadpoles and spawn) and small fish up to 3 cm long.<sup>13</sup></p>		
<i>Limosa limosa</i>	Black-tailed Godwit	-	NT	-	<p>Present in freshwater, aquatic and grassland habitats. its diet consists of adult and larval insects (especially beetles), annelid and polychaete worms, molluscs, ragworms, crustaceans, spiders, fish</p>	<p>The project site is not a suitable/att ractive habitat for this species.</p>	NA

<sup>13</sup> IUCN (2025) [Aythya nyroca \(Ferruginous Duck\)](#)

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					eggs, and the spawn and tadpoles of frogs		
<i>Arenaria interpres</i>	Ruddy Turnstone	It is listed on Annex II (strictly protected) of the pan-European Bern Convention, Annex II of the Convention on Migratory Species (CMS) and Annex I of the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA).	NT	-	Present in freshwater, aquatic habitats. its diet consists of insects, crustaceans, molluscs (especially mussels or cockles), annelids, echinoderms, small fish, carrion and birds eggs.	The project site is not a suitable/ attractive habitat for this species.	NA
<i>Calidris canutus</i>	Red Knot	Listed under Annex II of the Convention on Migratory Species (CMS) and Annex II of the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA)	NT	-	The species is present in aquatic habitats and grassland habitats. It feeds predominantly on insects (mainly adult and larval Diptera, Lepidoptera, Trichoptera, Coleoptera and bees) and crustaceans and hard-shelled prey, as well as	The project site is not a suitable/ attractive habitat for this species.	NA

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					spiders, snails and worms.		
<i>Calidris alpina</i>	Dunlin	It is listed on Annex II (strictly protected) of the pan-European Bern Convention, Annex II of the Convention on Migratory Species (CMS) and Annex II of the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA).	NT	-	It is a freshwater, aquatic species. This species is omnivorous, consuming mostly adult and larval insects (dipteran flies, beetles, caddisflies, wasps, sawflies and mayflies), and also spiders, mites, earthworms, snails, slugs and plant matter (usually seeds)	Although, the project site is not a suitable/active habitat for this species, mitigation measures for grain spills and handling are present in the ESMP.	Mitigation measures for grain spills and handling are present in the ESMP.
<i>Vanellus vanellus</i>	Northern Lapwing	Listed under CMS Appendix II. Bern Convention Annex III.	NT	-	Species is present in aquatic and shrubland habitats. Its diet consists of adult and larval insects (e.g. beetles, ants, Diptera, crickets, grasshoppers, dragonflies, mayflies, cicadas and Lepidoptera), spiders, snails, earthworms, frogs, small fish (Africa) and seeds or	Although, the project site is not a suitable/active habitat for this species, mitigation measures for grain spills and handling are present in the ESMP.	Mitigation measures for grain spills and handling are present in the ESMP.

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					other plant material.		
<i>Netta rufina</i>		CMS Appendix II.	LC	-	The species inhabits inland deep fresh or brackish reed-fringed lakes, rivers, or saline and alkaline lagoons in open country also occurring (less often) on estuaries, river deltas and other sheltered coastal habitats on passage or during the winter. Diet The diet of this species consists predominantly of the roots, seeds and vegetative parts of aquatic plants. <sup>14</sup>	Although, the project site is not a suitable/active habitat for this species, mitigation measures for grain spills and handling are present in the ESMP.	Mitigation measures for grain spills and handling are present in the ESMP.
<i>Ciconia ciconia</i>	White Stork	Protected under Annex II of the Convention on Migratory Species (CMS), under which it is covered by the African-Eurasian Waterbird	LC	-	This species inhabits, marshes, wetlands, ditches, swamps, grasslands and meadows. It is carnivorous. <sup>15</sup>	The project site is not a suitable/active habitat for this species.	NA

<sup>14</sup> IUCN (2025) [Netta rufina \(Red-crested Pochard\)](#)

<sup>15</sup> IUCN (2025) [Ciconia ciconia \(White Stork\)](#)

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		Agreement (AEWA)					
<i>Neophron percnopterus</i>	Egyptian Vulture	Listed under CITES Appendix II, CMS Appendix I, Raptors MOU Category 1, Bern Convention Appendix II.	EN	-	Present in rocky areas, shrubland, grasslands, inland wetlands. It forages in lowland and montane regions over open, often arid, country, and also scavenges at human settlements. It has a broad diet including carrion, tortoises, organic waste, insects, young vertebrates, eggs and even faeces.	Potential risk: Secondary poisoning from rodenticides	Mitigation measures for rodenticide management and secondary poisoning are present in ESMP and project PMP to be developed.
<i>Clanga clanga</i>	Greater Spotted Eagle	Listed under CITES Appendix II, CMS Appendix I and II. Raptors MoU Category 1.	VU	-	It occurs in wetland, grasslands, forest, freshwater areas. It feeds on, small mammals, waterbirds, frogs and snakes, hunting over swamps, wet meadows.	Potential risk: Secondary poisoning from rodenticides	Mitigation measures for rodenticide management and secondary poisoning are present in ESMP and project PMP to be

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<i>Aquila heliaca</i>	Eastern Imperial Eagle	Listed under CITES Appendix I and II. CMS Appendix I and II.	VU	-	Found near wetlands, grasslands, forests. Feeds on small mammals.	Potential risk: Secondary poisoning from rodenticides.	Mitigation measures for rodenticide management and secondary poisoning are present in ESMP and project PMP to be developed.
<i>Gallinago media</i>	Great Snipe	Listed under CMS Appendix II.	NT	-	Present in wetlands (inland), shrublands, grasslands. Its diet consists predominantly of earthworms as well as gastropods, adult and larval terrestrial insects (beetles), and the seeds of marsh plants.	The project site is not a suitable/ attractive habitat for this species.	NA
<i>Glareola nordmanni</i>	Black-winged Pratincole	Listed under CMS Appendix II. Bern Convention Appendix II.	NT	-	Found in grasslands and inland wetlands.	The project site is not a suitable/ attractive habitat for	NA

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					The species feeds on insects.	this species.	
<i>Circus macrourus</i>	Pallid Harrier	It is listed in Appendix II of CITES, Annex II of the Bonn and Bern Conventions, Annex II of CMS and Category 1 of the Raptors MOU.	NT	-	Found in grasslands, inland wetlands, forests. Feeds on rodents.	Potential risk: Secondary poisoning from rodenticid es.	Mitigati on measure s for rodentic ide manage ment and seconda ry poisoni ng are present in ESMP and project PMP to be develop ed.
<i>Aquila nivalensis</i>	Steppe Eagle	Listed under CMS Appendix I & II. CITES Appendix II. Bern Convention Appendix II. Raptors MOU Category 1.	EN	-	Found in rocky areas such as inland cliffs and mountains, grasslands It feeds mainly on small mammals and termites	Potential risk: Secondary poisoning from rodenticid es.	Mitigati on measure s for rodentic ide manage ment and seconda ry poisoni ng are present in ESMP and project PMP to be develop ed

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<i>Streptopelia turtur</i>	European Turtle-dove	Listed under CMS Appendix II.	VU	-	The species uses a wide variety of woodland types, as well as steppe and semi-desert, frequently relying on agricultural land for feeding. The species mainly feeds on the ground, taking seeds and fruits of weeds and cereals, but rarely also berries, fungi and invertebrates.	Risks: grain spills may attract the bird to the site.	Mitigation measures for grain spills and handling are present in the ESMP
<i>Falco vespertinus</i>	Red-footed Falcon	Listed under CITES Appendix II. CMS Appendix I and II. Raptors MoU Category 1. Bern Convention Appendix II	VU	-	Found in grasslands, inland wetlands, forests. Feeds on small vertebrates and insects.	Potential risk: Secondary poisoning from rodenticides.	Mitigation measures for rodenticide management and secondary poisoning are present in ESMP and project PMP to be developed
<i>Falco concolor</i>	Sooty Falcon	Listed under CITES Appendix II	VU	-	Found in rocky areas (cliffs, mountains)	Potential risk: Secondary	Mitigation measures

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					), shrublands, coastal areas, desert lands. Feeds on small birds and reptiles.	poisoning from rodenticides.	s for rodenticide management and secondary poisoning are present in ESMP and project PMP to be developed
<i>Chlamydotis undulata*</i>	African Houbara	Listed under CITES Appendix I. Bern Convention Appendix II.	VU	-	Found in desert lands and grasslands.  It feeds on invertebrates, small vertebrates and green shoots, with a generalist and opportunistic diet.	Potential risk: Secondary poisoning from rodenticides.	Mitigation measures for rodenticide management and secondary poisoning are present in ESMP and project PMP to be developed
<i>Lanius senator</i>	Woodhat Shrike	Listed under Bern Convention Appendix II.	NT	-	Found in grasslands, forests. This species requires shrub-like or arboreal cover,	Potential risk: Secondary poisoning from rodenticides.	Mitigation measures for rodenticide manage

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					<p>open ground offering rich supply of large insects, and perches with commanding view of area.</p> <p>It is commonly found in semi-open areas with bushes and well-spaced trees, such as open woodland, old orchards, olive (Olea) groves, gardens, and parks or hedgerows with large thorny bushes.</p> <p>It feeds principally on insects but other invertebrates, voles, mice, lizards, frogs and occasionally plant material such as berries are also taken.</p>		<p>ment and secondary poisoning are present in ESMP and project PMP to be developed</p>
<i>Milvus migrans</i>	Black Kite	Listed under CITES Appendix II. CMS Appendix II. Raptors MOU Category 2. Annexe II of the Bern Convention. Annexe II of the Bonn Convention.	LC	-	<p>Found in shrublands, grasslands, inland wetlands and desert areas .</p> <p>It is an extremely versatile feeder, it takes carrion as well as live birds, mammals,</p>	Potential risk: Secondary poisoning from rodenticides.	Mitigation measures for rodenticide management and secondary poisoning are

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					fish, lizards, amphibians and invertebrates, and is even known to forage on vegetable matter such as palm oil fruits; human refuse has become a plentiful food source in many areas.		present in ESMP and project PMP to be developed
<i>Falco tinnunculus</i>	Common Kestrel	Listed under CITES Appendix II, CMS Appendix II, Raptors MOU Category 2.	LC	-	Found in shrublands, grasslands, forests, and tolerates a wide range of open and partially forested habitats. It mainly feeds mainly on small mammals.	Potential risk: Secondary poisoning from rodenticides.	Mitigation measures for rodenticide management and secondary poisoning are present in ESMP and project PMP to be developed
<i>Elanus caeruleus*</i>	Black-winged Kite	Listed under CITES Appendix II,	LC	-	Found in shrublands and desert lands. It occupies relatively open habitats at a range of altitudes (0-3,000 m in Africa), ranging from	Potential risk: Secondary poisoning from rodenticides.	Mitigation measures for rodenticide management and secondary

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					semi-desert to forest margins and clearings within densely forested areas. It feeds on small mammals, reptiles, birds and insects.		poisoning are present in ESMP and project PMP to be developed
<i>Tyto alba</i> *	Barn Owl		LC	-	Found in shrublands, caves, terrestrials and freshwater habitats. This species is found in a great variety of habitats. It mainly occurs in open but not treeless, lowlands, with some trees, including farmland with hedges, ditches, ponds and banks, roadside verges and related rougher terrain, and young conifer plantations, it is also around towns, suburbs, villages or more isolated buildings suitable for daytime roosts and nest-sites and sometimes	Potential risk: Secondary poisoning from rodenticides.	Mitigation measures for rodenticide management and secondary poisoning are present in ESMP and project PMP to be developed.

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					near refuse dumps. It feeds mostly on small mammals, mainly rodents, and birds, but some insects, frogs and lizards.		
<i>Oenanthe cypriaca</i>	Cyprus Wheat ear	Listed under CMS Appendix II.	LC	-	This species inhabits a wide range of habitats, including mountain pine forest clearings, hills and mountains with rough open ground and scattered trees, broken rocky ground, open natural and farmed lowlands, woodland and plantations, gardens, industrial and suburban areas and house compounds. The diet is almost entirely insects, especially ants beetles and grasshoppers but will also take berries and has been recorded taking a lizard. The species is migratory,	No direct risk from the project. Other threats: hunting/shooting	The ESMP includes measures for hunting and collection of wildlife.

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					wintering mostly in Sudan and Ethiopia		
<b>Reptiles</b>							
<i>Trionyx triunguis</i> * *	African Softshell Turtle	Protected under CITES Appendix II	VU	EN	Present in water habitat. <i>Trionyx triunguis</i> inhabits fairly deep water in permanent lakes, rivers, estuaries, coastal lagoons and coastal waters, down to 80 m depth.	No direct risks from the project on this species. Other threats: Threats: fishermen	The ESMP includes measures for hunting and collection of wild animals.
<i>Varanus niloticus</i>	Nile Monitor	This species is listed in Appendix II of CITES.	LC	VU	Present in shrublands and wetlands.	No direct risks from the project on this species. Other threats: Threats collection and trade and leather production	The ESMP includes measures for hunting and collection of wild animals.
<i>Chamaeleo africanus</i>		Listed under CITES Appendix II	LC	VU	Animals are found climbing in vegetation such as reeds and shrubs, or climbing in large trees. It is sometimes found on the ground in sandy areas, and in the dry	The project site is not an attractive area for this species and the project does not pose a direct risk	The ESMP includes measures for hunting and collection of wild animals.

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					season is often seen on paths and roads.	on this species. Other threats: illegal collection	
<b>Mammals</b>							
<i>Capra nubiana</i> *	Nubian Ibex	In Egypt, the Nubian Ibex is protected by Agricultural Law No. 53/1966 and amendment 1012 July 1992. Hunting of this species is totally forbidden, as mentioned in article 117 of the Agricultural Law. The two main protected areas containing core habitat and significant populations of Nubian Ibex in Egypt are St. Katherine Protected Area in South Sinai and Wadi El Gimal Protected Area in the Southern Red Sea Mountains.	VU	EN	Nubian Ibex occur in rocky, desert mountains with steep slopes and hills (which provide vital escape routes), and associated plateaus, canyons and wadis. They consume a wide array of herbaceous and woody plants.	The species is not expected to occur at the project site and was not sighted there by locals or consultant. Threats: hunting	Mitigation measures for hunting of wild animals are embedded in the ESMP.

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<i>Gazella dorcas*</i>	Dorcas Gazelle	The species is listed on the Convention on the Conservation of Migratory Species of Wild Animals (CMS) Appendix I and included in the CMS Sahelo-Saharan Antelopes Action Plan.	VU	VU Rare	This gazelle inhabits a wide range of arid and semi-arid habitats, but avoids extensive areas of dunes and hyperarid areas. It preferentially inhabits sparsely vegetated rocky plains. Its range has been drastically reduced. Inhabits protected areas including Elba National Park and Saint Catherine Protectorate (Egypt).	Not expected to be impacted by the project activities. Not expected to occur at the project site. It was not sighted there by the locals nor by the consultant. Threats: hunting	Mitigation measures for hunting of wild animals are embedded in the ESMP.
<i>Hyaena hyaena*</i>	Striped Hyaena		NT	LC	In most of its range the Striped Hyaena occurs in open habitat or light thorn bush country in arid to semi-arid environments. These animals avoid open desert. Striped Hyaenas are present in numerous protected areas across their vast range. Because they	Not expected to be impacted by the project activities. Not expected to occur at the project site. It was not sighted there by the locals nor by the consultant. Threats: The major	Mitigation measures for hunting of wild animals are embedded in the ESMP.

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					exist outside of formally protected areas in regions where pastoralism is the norm and the potential for human-carnivore conflict is very high.	reasons for the apparent decline include persecution	
<i>Plecotus christii</i> *	Egyptian Long-eared Bat		DD	LC	Roosts in remote buildings outside urban areas and crevices in rocks, caves and mines. Found in mesic habitats along the Nile River and in open arid habitats around oases in the desert (is not found in cultivated habitats).	The project does not pose a risk on this species.	NA
<b>Plants</b>							
<i>Raphia australis</i>	Rafia		VU		The project site is devoid of vegetation	No expected significant impact.	The ESMP includes proper waste and spills management.
<i>Alisma gramineum</i>	Ribbon-leaved Waterplantain		DD		Only present in freshwater biome. The project site is devoid of vegetation	No expected significant impact.	The ESMP includes proper waste and

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							spills manage ment.
<i>Aegilops bicornis</i>	Goat Grass		NT		The project site is devoid of vegetation	No expected significant impact.	The ESMP includes proper waste and spills manage ment.
<b>Arthropods</b>							
<i>Rivetina baetica*</i>	Baetic Groun d Mantis		DD	-	Found in shrublands. This mantid usually is found on the ground in open spaces, with prairies or dry low vegetation.	The project site is not an attractive site to this species. The project is not expected to pose a risk on this species.	
<i>Rivetina baetica ssp. Tenuidenta ta**</i>	Delicat e Teeth Baetic Groun d Mantis		DD	--	Same as above	Same as above	NA
<b>Mollusks</b>							
<i>Bithynia badiella</i>			VU		Only present in freshwater biome.	No expected significant risk from the project	The ESMP includes proper waste and spills manage ment.
<i>Aspatharia chaiziana</i>			DD		Only present in freshwater biome.	No expected significant	The ESMP includes proper

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						risk from the project	waste and spills manage ment.
<b>Fish</b>							
<i>Distichodus nefasch**</i>	Wachone		VU		Only present in freshwater biome.	No expected significant risk from the project	The ESMP includes proper waste and spills manage ment.
<i>Mormyrus niloticus*</i>			NT		Only present in freshwater biome.	No expected significant risk from the project	The ESMP includes proper waste and spills manage ment.
<i>Nannocharax niloticus**</i>	Broadbar Citharine		DD		Only present in freshwater biome.	No expected significant risk from the project	The ESMP includes proper waste and spills manage ment.
<i>Synodontis khartoumensis*</i>			DD		Only present in freshwater biome.	No expected significant risk from the project	The ESMP includes proper waste and spills manage ment.
<i>Enteromius yeiensis**</i>			DD		Only present in freshwater biome.	No expected significant risk from the project	The ESMP includes proper waste

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							and spills management.
<i>Thoracochromis wingatii</i> **			DD		Only present in freshwater biome.	No expected significant risk from the project	The ESMP includes proper waste and spills management.

- **\*non-migratory (not applicable for plants and mollusks)**
- **\*\* movement pattern unknown**
- **EN: endangered, VU: vulnerable, NT: near threatened, DD: Data Deficient**
- **National status: Basuony et al (2010). Mammals of Egypt Red Data Listing and Conservation (mammals)- Baha El Din (2006). A guide to the Reptiles and amphibians of Egypt (Reptiles).**
- **International status: IUCN red list**

To conclude: The ESMP will ensure mitigation measures are in place in order to not attract birds to the silo area (due to presence of grains), it will also take into consideration any collision risks for migratory birds and will include an effective pest management plan that will take into consideration any secondary poisoning risks which may impact birds of prey. The measures will also include mitigation for wildlife hunting. The expansion silos will be located in a modified desert area surrounded by a storage site and existing silos and some residential buildings. The expansion silos will be within the land of the EHCSS Mafalsa Silos premises and are not expected to cause any habitat loss or destruction. Additionally, although threatened reptiles and mammals are known from the region, the project activities and location do not constitute a threat to those species and the site is not considered attractive to those species.

### 4.3. Socio-Economic Aspects

Socioeconomic conditions were assessed through a combination of a desk-based study, site visits, and consultations (conducted on September 26, 2024)

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 in Aswan.



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### 4.3.1 Basic Demographic Characteristics

Aswan Governorate is located in the far south of Egypt on both sides of the Nile between latitudes 00, 22, 40, and 25 north, and between longitudes 20, 31, 30, and 33 east. It is bordered to the north by Luxor Governorate, to the east by the Red Sea Governorate, to the west by the New Valley Governorate, and to the south by the borders of Sudan.

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. According to CAPMAS (2024), the total area of Aswan is 62.73 thousand km<sup>2</sup>, 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 (i.e., four distinct land areas or districts in Aswan, each with a designated size and administrative function. These areas are managed locally and are not related to tribal leadership, but rather reflect administrative land divisions): 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.

Mafalsa Silo is located in the village of Al-Mafalsa in Edfu Center, north of Aswan Governorate. The total area of Edfu Center is 1943.972 km<sup>2</sup>. The total inhabited area of the urban is 57,268 Km<sup>2</sup> and the total inhabited area of the rural is 353,663 Km<sup>2</sup> according to Statistical Guide of Aswan Governorate, (2021). The center of Edfu includes the city of Edfu (the administrative capital of the center), along with other cities such as Seba'ia West, Redesia Qibli, and Basaliya Bahri. Data indicates that the city of Edfu alone accounts for approximately 14.55% of the center's population. The strategic plan for the city of Edfu (No. 256/2022) has been approved, covering an area of over 930 acres (about 3.9 square kilometers), following an increase of 350 acres compared to the previous urban boundary.

#### Mafalsa Village Overview

The silo site is located at the southern boundary of Mafalsa village, approximately 800 meters from the village center. Mafalsa village, where the silo is located, is a rural community in Aswan Governorate. The community primarily relies on agriculture as its main source of livelihood. Farmers in the area grow crops such as wheat, corn, and vegetables, while livestock rearing is also a common economic activity.

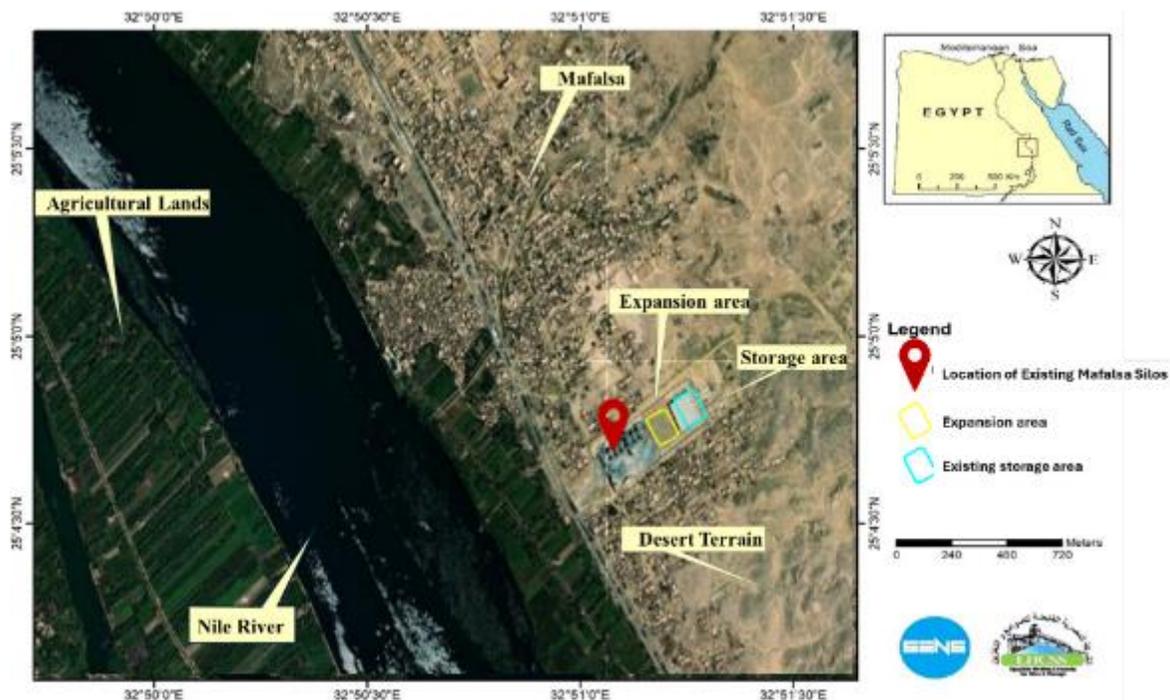
The land use in Mafalsa village is characterized by a mix of agricultural lands, residential areas, and desert terrain. Agricultural lands surround the silo site, predominantly to the west, serving as a vital resource for local food production and economic activities. Desert terrain stretches beyond the immediate vicinity of the silo, particularly to the east, while residential areas are located to the north and south, and closer to the village center.

Basic infrastructure in Mafalsa village includes a primary school, small local markets, and a community healthcare unit, which provide essential services to the residents. For more advanced medical needs, residents travel to Aswan City Hospital. The village is connected to the regional electricity grid and benefits from a piped water supply system, although access to

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sanitation services remains limited, with many households relying on septic tanks or traditional systems.

The silo site is connected to a local paved road leading to the Aswan-Luxor Agricultural Road, facilitating efficient transportation of grains to and from the facility. The proximity of the village to Aswan City, a major urban center in Upper Egypt, enhances its logistical importance for grain storage and distribution. The expansion of Mafalsa Silo is expected to bring positive socioeconomic benefits to the community. Small and medium-scale farmers in the area will benefit from the increased storage capacity, improved access to grain storage facilities, and streamlined grain supply processes. Figure (4.15) shows the location of Mafalsa village and the surrounding area of the subproject site.



**Figure (4.15):** Map showing the location of Mafalsa Silo and the surrounding area including the Mafalsa village, River Nile, agricultural lands, and desert terrain.

**The use of Silo in Grain storage**

Grain storage is a critical component in the grain marketing supply chain, ensuring a consistent supply from the harvest season to other seasons and from years of abundance to leaner years. Storage serves various purposes depending on the user. a) small scale farmers; grain

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storage at the farm level helps ensure food security for the household, facilitates seed preservation, and supports cash flow or barter exchange. Farmers typically store grain inter-seasonally to meet their family's needs. The harvest season, which starts in April and lasts until August, marks the peak period of grain storage for small-scale farmers. b) large scale traders, Traders, operating at a larger scale, use grain storage for limited periods, often days or weeks. Their focus is on buying and selling grain quickly to maximize profits, rather than inter-seasonal storage. C) Commercial entities, commercial storage is used by millers and co-operatives to meet urban demand and ensure stock availability for their operations. Storage at this level is strategic, ensuring business continuity, and d) Government storage, Government involvement in grain storage, managed through specialized departments, or agencies, aims to stabilize supply and demand at the national level. This includes creating reserves for urban populations, enhancing food security, stabilizing prices, and ensuring political stability through economic measures. According to consultation conducted on 26th of September 2024, The farmers utilizing the silo primarily consist of small- and medium-scale farmers from surrounding villages. The grains are transported to the silo using trucks and tractor-driven carts, depending on the scale of production and distance. Women play significant roles in the agricultural value chain, particularly in grain cleaning, sorting, and storage preparation, and occasionally assist in transporting smaller quantities of grain to the silo. The majority of farmland in the region is privately owned by small and medium scale farmers, while medium-scale farmers operate larger plots, occasionally employing laborers. Consultations indicated that land ownership in the area is predominantly male. However, a limited number of plots are owned by women, particularly through inheritance or family arrangements. This strategic location of the silo near agricultural lands and transportation routes ensures efficient grain delivery and supports the livelihoods of local farmers and workers, including women actively participating in the agricultural sector.

### **Challenges Identified in Current Silo Operations by Silo Users**

A series of consultation sessions were conducted with various stakeholder groups. These sessions revealed several recurring issues and challenges related to the current operation of the Mafalsa Silo. The following key concerns and operational constraints were identified:

- A) Accessibility for Vulnerable Groups:** Some farmers, particularly the elderly and women, mentioned difficulties in accessing silo services due to limited assistance during the supply process. This impacts their ability to efficiently deliver grain.
- B) Transportation Challenges:** Farmers and traders face logistical difficulties, including a lack of adequate transportation support for grain delivery to the silo.
- C) Technical and Physical Constraints:** Existing facilities at the silo, including loading and unloading equipment, were reported to be insufficient to handle peak harvest demands efficiently.

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**D) Long Waiting Times and Limited Storage Capacity:** Both farmers and traders reported significant delays in delivering their grains due to silo cells being full during peak harvest periods. This leads to long waiting times, creating inefficiencies in the supply process. Most participants expressed strong support for the silo expansion, noting that it would improve capacity and reduce delivery delays.

### Mitigation Measures Proposed

Based on these findings, several recommendations have been developed to address the operational and social challenges facing silo users:

#### A. Improving Accessibility for Vulnerable Groups

- Train silo personnel to assist elderly and disabled farmers during delivery.
- Incorporate ramps and accessible infrastructure in all public and operational areas.
- Create separate fast-track lanes for elderly, women, and small-scale farmers.
- Allocate dedicated parking for persons with disabilities.
- Launch targeted awareness campaigns to inform vulnerable users about available support services.

#### B. Addressing Transportation Gaps

- Collaborate with local transportation providers to ensure affordable delivery options.
- Promote farmer cooperatives for shared grain transport.
- Implement a traffic and loading management plan to reduce delays and optimize vehicle movement.

#### C. Upgrading Technical Facilities

- Expand the number of storage cells to reduce congestion.
- Install modern automated loading/unloading systems.
- Establish strict maintenance schedules, especially during harvest seasons and inform farmers on maintenance schedules.
- Introduce a timeslot scheduling system during peak periods to manage flow.

It is worth mentioning that the existing administrative buildings include ramps for people with disabilities. EHCSS will make sure ramps are also present in the public restroom area and any needed area in their project design.

Additional information on the consultation outcomes and proposed mitigation measures can be found in Section 7.3.

**Population Profile:** The total population of Edfu center is about 483593 inhabitants in 2021(Egypt Description by Information, 2021). Males' population are 246130 while females are

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237463. For the total population of urbans are 145310 in edfu center and 338283 for rural areas. The total population for Mafalsa village is 10941 (5579 males and 5362 for females).

**Age and Gender Distribution:** The data for age structure shows that most half the population (59.9%) are in the 15-59 age group, and the age-distribution of the population in Aswan Governorate shows that almost 33.6% are less than 15 years old; while those between 15 and 45 years old represent about 47.7% (Source: CAPMAS, 2024).

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.

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 is 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 (4.6):** Demographic Trends in in Aswan, Aswan Governorate - Egypt Description by Information, 2020/2023.

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

### 4.3.2 Living Conditions

**Household Size and Density:** Housing conditions are key indicators of socio-economic development. Poor and vulnerable communities and households often lack access to utility services. A summary of people’s access to the key utility services is given below. According to CAMPAS 2024, average Household Size (persons) in the governorate is Aswan: 4.06 persons/housing unit, while in Edfu Center it is 4.6 persons per housing unit.**Access to Electricity:** According to the World bank data 2022, nearly 100% of Egypt’s population had access to electricity as of 2022, and according to Egypt Human Development Report 2021, the percentage of the Egypt’s population with access to electricity reached 99.7% In 2016/2017. 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.. 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. In Edfu

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Center, 459,369 individuals are connected to the public electricity network, while 551 individuals rely on private generators.

### 4.3.3 Labour Profile

The total labor force (above 15 years) in Aswan Governorate is estimated to have 478,400 persons among which 422,100 persons are employed. The unemployment ratio is estimated at 11.8, which is higher than the average unemployment rate for the Republic (7.9%), and Aswan is ranked 6th among the governorates of the Republic with the highest unemployment rate. 31.98% is the male unemployment rate, which is very remarkably high compared to the female unemployment rate of the Republic (21.7%), and it is ranked 7th among the highest governorates of the Republic in terms of the female unemployment rate (CAPMAS, 2024). At the local level, in Edfu Center, the total number of employed people is 183,577, distributed as 134,781 in rural areas and 48,796 in urban areas. In Edfu Center, field observations indicate limited formal employment opportunities, with most residents depending on seasonal agricultural labor and informal trade. In Edfu Center, field observations indicate limited formal employment opportunities, with most residents depending on seasonal agricultural labor and informal trade.

**Table (4.7):** Labor Market in Aswan, Aswan Governorate - Egypt Description by Information, 2020-2023.

Item	Unit	Value
Total Labor Force (15+ ages)	thousand persons	478,4
No. of employed persons (15+ ages)	thousand employed	422,1
No. of unemployed persons (15-64 ages)	thousand unemployed	44.0
Unemployment Rate (15-64 years)	%	11.8
Male unemployment rate	%	7.4
Female unemployment rate	%	32.0
Youth unemployment rate (15-29 years)	%	23.0

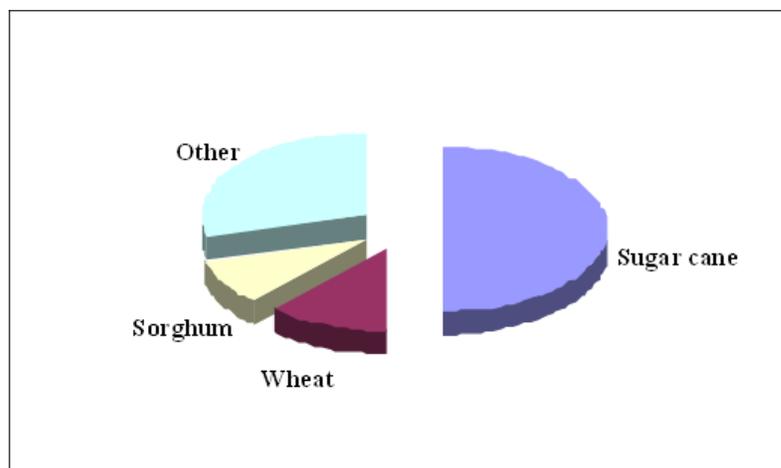
### 4.3.4 Economic Activities and Well Being

**Agriculture 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 the

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preserved<sup>16</sup> agricultural land (i.e., land designated for agriculture and protected from construction or other non-agricultural uses), 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 (4.1V):** Distribution of crops on agricultural areas.

**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 , promote social development, address community needs, and contribute to the overall economic growth. .

<sup>16</sup> Agricultural land preservation" refers to land specifically designated for agricultural use. These lands are typically not designated for construction, and building on them is usually prohibited to maintain their agricultural value.



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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 26998 Ton 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 179750head in 2020, as the number of cows reached 47081head in 2020, while the number of buffaloes reached 10932 head in 2020.

**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 the sugarcane 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. These landmarks are located at various distances from mafalsa silo: Abu Simbel Temples lie approximately 328 km to the south, Philae about 118 km south, Wadi es-Sebua Temple 255 km south, and the Temple of Beit el-Wali 124 km south. Edfu Temple is situated just 12 km to the south, while Kom Ombo Temple is around 70 km south. Additionally, important archaeological sites to the north include El-Kab (7 km), Gebel el-Silsila (50 km), Karnak and the Luxor Museum (about 72 km), and Qubbat Al-Hawa (75 km).

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.

### 4.3.5 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, Egypt's illiteracy rate dropped from 39.4% in 1996 to 29.7% in 2006, and then to 25.8% in 2017. In Aswan, there are 21 research institutions, employing 1,309 researchers. According to CAPMAS 2024, The illiteracy rate (10 years and over) is 19.01% in Aswan, which is less than the illiteracy rate in the Republic of 24.10%. There are 1,358 general pre-university education schools in Aswan, benefiting 404,064 students. Classroom capacity in Aswan is 39.9 students/class, which is less than the classroom capacity of the Republic (47.16 students/class),

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and 96.50% of the total schools. In Edfu Center, 10.23% of individuals hold university degrees, 13.85% have general or Al-Azhar secondary education, and 4.02% hold post-secondary qualifications. The illiteracy rate in Edfu Center is approximately 20.32% (CAPMAS, 2017).

The governmental dropout rates in Aswan are lower than the national rates at the primary education level, but higher at the preparatory school level.

**Table (4.8):** Research Institutions in Aswan, Aswan Governorate - Egypt Description by Information, 2020/2023.

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

**Table (4.9):** Illiteracy Eradication in Aswan, Aswan Governorate - Egypt Description by Information, 2020/2023.

Illiteracy Eradication	Value
Illiteracy rate (10 years and above)	19.1%
Illiteracy rate for males	14.1%
Illiteracy rate for females	24.4%
No. of targeted illiterates	7.24 thousand persons
No. of students enrolled in illiteracy eradication classes	15.54 thousand persons
Percentage of people with illiteracy eradicated to those enrolled in illiteracy eradication classes	19.8%

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.

**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.

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).

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849 public pharmacies in Aswan, a small number (approximately 20) of them providing night services, 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 (4.10):** Hospitals of the Ministry of Health & other Entities in Aswan, Aswan Governorate - Egypt Description by Information, 2020.

Hospitals of the Ministry of Health & other Entities	Value
<b>Hospitals affiliated to the Ministry of Health</b>	
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).

228 family planning units, 21 mobile family planning clinics, and 95 nurseries for children in Aswan. In general, all child mortality rates for Aswan were better than the child mortality rates for the Republic.

#### 4.3.6 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 average per capita of the produced water was 86.8 m<sup>3</sup>, while the average per capita of the consumed water was 64.7 m<sup>3</sup> during the year 2023/2024 in Aswan Governorate. **Potable Water & Sanitation:** The

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

**Table (4.11):** Access to Potable Water & Sanitation in Aswan, Aswan Governorate - Egypt Description by Information, 2020.

Item	Aswan's Values	
Consumption of Potable Water	163.40million m <sup>3</sup>	
Number of connections to public potable water system	328.76thousand households	
No. of sanitation treatment stations	17Station	
Households connected to sanitation system	329.39thousand households	

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 14th among the governorates of the Republic in the per capita share of the amount of drinking water consumed at a value of 134.05m<sup>3</sup>/capita, and the percentage of total water loss reached 28.00% (Holding Company for Water and Wastewater, 2024). The reasons for water loss are not specified, but the expected reasons, based on the nature of the region, are due to physical losses such as leakage in the distribution network and aging infrastructure, as well as administrative losses including inaccurate metering and unauthorized connections. Aswan consumes a large amount of water 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. In Edfu Center, 458,624 individuals are connected to the public water network, while 1,549 individuals rely on sources outside the public network. Aswan has 17 sewage treatment plants with a total design capacity of 208 thousand m<sup>3</sup> per day, and its actual capacity 84.8 million m<sup>3</sup> annually. The total collected sewage quantity reaches 100.27 million m<sup>3</sup> per year (CAPMAS, 2024). In Edfu Center, 107,394 individuals are connected to the public sewage network, 120,124 individuals are served by community-based (private) networks, and 231,753 individuals rely on septic tanks.

Aswan consumes a larger amount of water 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.



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- 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.

**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.

The closest road to the silo is the main Cairo-Aswan Eastern Desert Road

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

### **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 (Community Development Association). 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. 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 (Social Fund for Development), Danida and Shorouk. The CDAs collect fees from the serviced households and the operation is reported to be financially sustainable. The Ministry of Environment has recently followed up on the performance of the waste management system in

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Aswan Governorate<sup>17</sup>, since 2023, further progress has been recorded. Aswan Governorate now generates around 280 tons of municipal solid waste per day, and several large-scale clean-up campaigns have removed over 800 tons of accumulated waste within a week in certain districts. In 2024-2025, the governorate also implemented solar-powered lighting systems along access roads to waste transfer stations, enhancing environmental sustainability. Furthermore, efforts are underway to regulate and integrate informal waste workers (scavengers) into the formal waste system to ensure safer and more inclusive operations.

According to the Ministry of Local Development (2022), significant investments have been directed towards improving the integrated waste management system in Aswan Governorate, with a total value of approximately 55.635 million EGP. A key project includes the completion of a sanitary landfill in Edfu, costing 20.5 million EGP. Furthermore, new equipment and mobile intermediate stations were provided to Aswan city and other areas including Edfu, Kom Ombo, and Nasr Nuba to enhance waste collection and transport efficiency.

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 incinerators, located at Aswan Educational Hospital and Al Ramadi Qebli Hospital, are currently operational but not in compliance with legal requirements. The incinerator, at Aswan Health Insurance Hospital, has been closed due to complaints. These incinerators are part of the broader healthcare waste management system in Aswan, but their legal and operational status has raised concerns.** **4.3.7 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.

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<sup>17</sup> Egyptian Environmental Affairs Agency (EEAA). (2023). Minister of Environment follows up on the performance of waste management system in Aswan Governorate. Retrieved from: <https://www.eeaa.gov.eg/News/22258/Details>

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- 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.

**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 (4.12):** 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 (4.13):** Tourism: Some Important Indicators (Source: Aswan Governorate, Egypt's Description by information, 1/1/2020).

Item	Unit	Value
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**Table (4.13):** Tourism: Some Important Indicators (**Source:** Aswan Governorate, Egypt’s Description by information, 1/1/2020).

No. of Rooms	Room	2569
No. of beds	Bed	5138
<b>Tourism Education:</b>		
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 (4.14):** 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

#### 4.3.9 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 (4.15):** The most important heritage sites in Aswan governorate.

Cultural Heritage Site	Description	Site Features
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**Table (4.15):** The most important heritage sites in Aswan governorate.

Abu Simbel Temples	<p>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 World Heritage Site in 1979, as part of Nubian Monuments from Abu Simbel to Philae.</p> <p>It's 328 km south away from the silo's location.</p>	Ancient Egyptian Monuments
Philae	<p>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.</p> <p>It's around 118 km south away from the silo's location.</p>	Ancient Egyptian & Ptolemaic & Roman Monuments
Wadi es-Sebua Temple	<p>Temple of Ramesses, Wadi es-Sebua Temple, is an ancient Egyptian temple located in Aswan Governorate, Egypt. It was inscribed as a UNESCO World Heritage Site in 1979, as part of Nubian Monuments from Abu Simbel to Philae.</p> <p>It's around 225 km south away from the silo's location</p>	Ancient Egyptian Monuments
Temple of Beit el-Wali	<p>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.</p> <p>It's around 124 km south away from the silo's location</p>	Ancient Egyptian Monuments
Edfu	<p>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</p>	Ptolemaic Monuments

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**Table (4.15):** The most important heritage sites in Aswan governorate.

	<p>the falcon god Horus, was built in the Ptolemaic period between 237 and 57 BC.</p> <p>It's around 12 km south away from the silo's location</p>	
Kom Ombo Temple	<p>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.</p> <p>It's around 70 km south away from the silo's location</p>	Ptolemaic & Roman Monuments
El-Kab	<p>The ancient city of Nekhbet, cult center of Upper Egypt's vulture goddess, spans millennia with monuments like its temple, walls, and New Kingdom tombs—notably Ahmose son of Abana's, famed for inscriptions detailing his Hyksos campaigns.</p> <p>It's about 7 km north from the silo's location.</p>	Ancient Egyptian & Graeco-Roman Monuments
Gebel al-Silsila	<p>Historic sandstone quarry on the Nile used from the Middle Kingdom 2034–1650 BC to the 20th century, supplied stone for Egypt's temples, preserving ancient inscriptions. Key features include the Speos of Horemheb, rock-chapels from Hatshepsut/Thutmose III's era, and shrines/stelae honoring Nile deities.</p> <p>It's about 50 km north from the silo's location</p>	Ancient Egyptian & Graeco-Roman Monuments
Karnak	<p>Ancient Egypt's premier religious complex in Thebes (Luxor). Centered on the Great Temple of Amun, grew from the Middle Kingdom to Roman times. Linked to Luxor Temple via a sphinx-lined avenue for the Opet Festival, it remains a sprawling open-air museum of pharaonic devotion and architectural innovation.</p> <p>It's about 72 km north from the silo's location.</p>	Ancient Egyptian & Ptolemaic & Roman Monuments
Luxor museum	<p>Luxor Museum is a stunning museum that includes a variety of rare artifacts discovered in Luxor, including statues of kings and Gods, in addition to many objects dating to various historical periods of The Egyptian history. Its collection also includes some of King Tutankhamun's objects that were discovered in the Valley of the Kings in Luxor in 1922.</p>	Modern Cultural Institution

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**Table (4.15):** The most important heritage sites in Aswan governorate.

	It's about 72 km north from the silo's location.	
Qubbat Al-Hawa	Qubbat Al-Hawa Cemetery consists of several tombs on the west bank of the Nile across the river from the northern tip of Elephantine Island cut into the rocky slopes of the cliffs. These tombs are those of local governors and high dignitaries from the Old to Middle Kingdoms.  It's about 75 km north from the silo's location.	Ancient Egyptian & Greco-Roman & Medieval Monuments



**Figure (4.18):** Proximity of archaeological sites to the Mafalsa silo site.

The Ministry of Antiquities approval is not required prior to starting the works in Mafalsa silo extension project.

## Natural Protectorates in Aswan

### El-Dababya Protectorate

Located approximately 50 km north of Mafalsa Silo and cover 1 km<sup>2</sup>, it is a globally recognized geological reserve. It preserves a 55–50-million-year-old sedimentary sequence from the Paleocene-Eocene transition, a critical period for studying Earth's climatic and evolutionary shifts

### Saluga and Ghazal Natural Protectorate



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It is spanning 0.5 km<sup>2</sup>, is classified as a wetland and landscape ecosystem located along the Nile River, 112km south of Mafalsa Silo and 3 km north of the Aswan Dam. This unique environment is characterized by dense vegetation dominated by native tree species, creating a critical habitat for a variety of resident and migratory bird populations, including rare and historically significant species that have persisted in the region for centuries.

### **Wadi Al Allaqi Natural Protectorate**

It is located 180km east of Aswan, covering 30,000 km<sup>2</sup> and located 215km south of Mafalsa Silo, is a Desert Protected Area and Biosphere Reserve. Positioned between the Red Sea mountains and the Nile Valley, it features unique geology, rich biodiversity, and key habitats for endangered mammals and reptiles. Once a seasonal river, its transformation due to Lake Nasser has created fertile soils and diverse ecosystems, blending wetland and desert habitats.

### **Wadi Al-Asioutty Protectorate**

Covering 35 km<sup>2</sup> and located 270km north of Mafalsa Silo, this protected area has two main parts, Wildlife Breeding Zone: Focused on breeding endangered animals like deer, goats, and reptiles, and Plant Conservation Zone: Saves plants at risk of extinction, including medicinal herbs, palm trees, and desert plants. Stretching between the Eastern Desert's rocky lands and the Nile Valley, the area's dry environment helps rare animals survive and protects important plants, even with limited water.

### **Nile River Islands Protected Area**

The Nile River Islands Protected Area comprises 127 islands across 16 Egyptian governorates, including Aswan, Cairo, Giza, and Damietta. There are no official sources that precisely define the names and locations of these islands. These islands are distributed along the Nile River serving as vital nature reserves for endemic flora, migratory birds, and rare ecosystems. The Nile River in Egypt originally included 144 islands and spanned approximately 160 km<sup>2</sup> across 14 governorates, with 95 located along the main Nile course (from Aswan to the Delta Barrage), 30 in the Rosetta Branch, and 19 in the Damietta Branch. However, on June 15, 2017, a new decree by then Prime Minister Sherif Ismail excluded 17 islands from this protection list, among them Warraq, Qorsaya, Dahab, and others, bringing the number of officially protected islands down to 127.

Moreover, All the islands in the Nile river were declared a Protected Area by Prime Ministerial Decree 1969/1998. Sobha Island is located approximately 1.23 km west of Silo site. Two other islands referred to as "El-Mohammeed" and "Nag El-Sayeh" are situated around 6.6 km and 10 km to the north, respectively. To the south, another island lies about 4 km away, followed by four additional islands (El-Fuza, Qanadilah, and El-Radeisa) located approximately 12.8 km to 16.5 km from Silo site. All these nearby islands remain on the official protected list and were not among the 17 removed by the 2017 decree.

Disturbance caused by a growing number of fishermen and tourist cruises is increasing. There is a substantial water-pollution problem caused by untreated discharge from

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sugar, phosphate and dairy factories, as well as from urban areas. Erosion of the Nile banks has become a problem since the construction of the High Dam.

### Wadi El Gemal Protectorate

located about 230km southeast of the Silo site, is a vast protected area covers an area of approximately 7,450 km<sup>2</sup> encompassing land and marine ecosystems along Egypt’s Red Sea coast.

### Elba Natural Protectorate

Located in the southern eastern part of the eastern desert, it is 488km away from the silo. It covers 35600 Km<sup>2</sup> and is considered national park protected area known for its unique location and microclimate.



**Figure (4.1<sup>9</sup>):** Proximity of natural protectorates to the Mafalsa silo site.

### 4.3.10 Status of Women:

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



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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).

#### 4.3.11 Land Use:

Mafalsa village is one of the villages affiliated to Edfu Center in Aswan Governorate. Al-Mafalsa grain silo is located east of the Nile. The silo is bordered on the west by the main road followed by a group of agricultural lands that separate it from the Nile River. The Nile River is about 480m from the west of silo site, and to the east, the silo is bordered by a group of desert lands to the east. It is also noticeable that the silo is located near the Cairo-Aswan Eastern Desert Road, about 150 meters away.

As for urban and residential complexes, it is noticeable that there is a residential complex or a group of buildings directly adjacent to the silo from the north and south sides of the silo.

As for facilities, Al-Mafalsa Youth Center is located 2 km away, and the Al-Mafalsa Health Unit is about 600 meters away. There is also Edfu Fever Hospital 19 km away, and Edfu Police Station is also 16 km away. In addition to the Civil Protection Unit in Edfu, which is located 17 km away. Edfu Train Station is located 12 km away.

Lands around Al-Mafalsa grain silos are desert lands with scattered buildings and empty desert areas.. Only lands beside the Nile are agricultural lands. The Mafalsa Silo is surrounded by scattered buildings and desert terrain. The closest village is Mafalsa village, with the silo site located at its southern boundary, approximately 800 meters from the village center. The area around the project site primarily consists of desert areas, and scattered buildings. Some buildings are located approximately 35 meters to the north and 15 meters to the south of the existing silo site. Additionally, agricultural lands extend along the main road to the west, about 200 meters from the existing silo site and 400 meters from the expansion silo site.

#### 4.3.12. 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).

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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.

#### 4.3.13. 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 (4.16):** 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				

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**Table (4.16):** 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.

<b>Urban Governorates</b>	9,0	3,1	10,1	4385
<b>Lower Egypt</b>	27.5	2.7	28.0	8497
<b>Urban</b>	23.0	1.6	23.6	2421
<b>Rural</b>	29.2	3.1	29.8	6076
<b>Upper Egypt</b>	9.4	1.3	10.2	7118
<b>Urban</b>	13.2	2.0	14.5	2380
<b>Rural</b>	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.

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).

# 5

## IDENTIFICATION AND ANALYSIS OF ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS

### 5.1. 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 be also benefitted 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 as a result of the high quality of storage.

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- Reducing the average purchasing price of wheat throughout the year as a result 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 ESMP identifies and quantifies the significance of adverse impacts on the environment from the proposed Mafalsa Silos Complex sub-project. 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 give rise to some concern but is likely to be tolerable in 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).

### **5.1.1 Impact Assessment Methodology:**

#### **A. Identification of area of influence**

##### **Physical:**

- Surface water resources: the Nile River is about 480m from the west of silo site . Due to this proximity, the project may have potential impacts on surface water resources, particularly during construction and operational phases. However, mitigation measures will be implemented to minimize any potential contamination or disruption to these water bodies.
- Soil and Surface water and Groundwater Resources: Groundwater in the silo site is found at the depth more than 15.0 meters. The proximity of the groundwater to the site increases the risk of contamination from construction activities, such as fuel leaks or accidental spills or improper handling of construction materials. Therefore, strict controls will be applied to prevent any adverse impacts on soil and groundwater quality. The Nile river is located at 480m from the west of silo site and the closest canal at more than 300m away west from the project site and the project is located in a reclaimed area within the eastern desert, the project is not expected to have significant runoff risks however the

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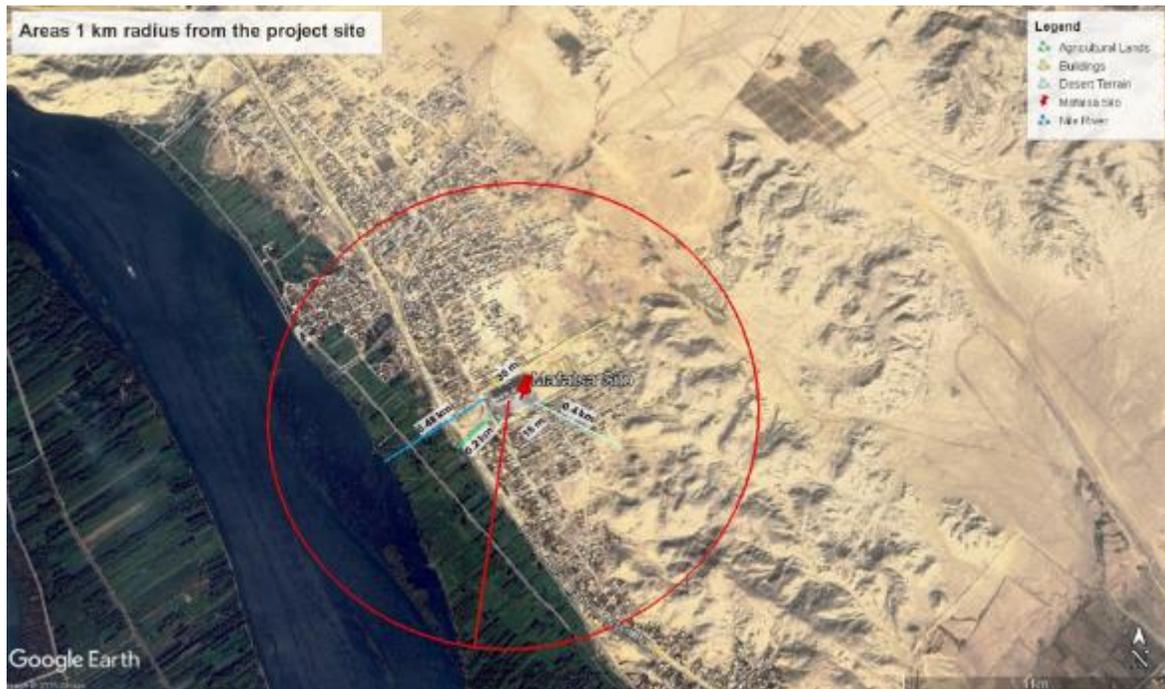
ESMP will include strict control on spills and chemicals to mitigate this risk of surface water contamination.

- **Air, Noise and Vibration receptors:** The Mafalsa Silo is surrounded by reclaimed agricultural lands and desert terrain. The closest village is Mafalsa village, The silo site is located at the southern boundary of Mafalsa village, approximately 800 meters from the village center.. There are bordering residential buildings north and south of the silo area. Air emissions, noise, and vibration generated during the construction and operation phases of the silo expansion could potentially affect the nearby residential areas, as well as the adjacent agricultural lands, which are actively cultivated for crops such as wheat and vegetables. To mitigate these potential impacts, stringent measures will be implemented to monitor and control emissions, noise, and vibration. These measures will ensure that levels remain within acceptable standards, thereby minimizing disruptions to the surrounding community and preserving the quality of the local environment. Wind direction in the silo site area is predominantly northwest (NW) to southeast (SE). Therefore, air emissions from construction activities are likely to travel southeast where there is minimum agriculture lands located in this direction but a few residential buildings. There are residential buildings located to the north and south of the silo site. These residences are primarily occupied by farmers and agricultural workers. Additionally, agricultural lands lie along the main road to the west, approximately 200 meters from the silo site, and may be impacted by vehicle emissions and noise. Stringent mitigation measures will be implemented to protect community health and safety and to minimize any potential adverse effects.
- **Land Use:** The area within the project site primarily consists of agricultural lands, desert areas, buildings, located approximately 35m to the north and 15 m to the south of existing silo site, and the village of Mafalsa, lies on the eastern boundary of the silo site. The land use in this area will be carefully considered, and impacts will be minimized through proper planning and implementation of construction activities.
- **Biological:** The Mafalsa Silo is not located near any RAMSAR sites, and the nearest protected area is Dababeyya Natural Reserve approximately 50 km away, followed by Saluga and Ghazal Protected Area about 112 km away. The project site falls within the Upper Nile Important Bird Area (IBA), as recognized by Birdlife International, given its proximity to the Nile River and agricultural zones that provide

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critical habitats for birds. This IBA serves as a critical migratory route for Palearctic bird species, particularly during spring and autumn migration seasons. The presence of migratory birds near the project site poses a risk of collision, although the silo area is not attractive to wildlife or birds and is devoid of vegetation, birds might be attracted to the silo area due to the presence of grains. Therefore, grain spills and mismanagement during the current operational silo and also during the operation of the new silos should be taken into account in the mitigation measures. The presence of birds of prey and other types of wildlife may also be at risk from secondary poisoning of rodenticides and hunting during both phases of the project as well. The ESMP will ensure that construction and operation activities do not disturb the local flora and fauna.

- Social:** The primary area of influence includes Mafalsa village and other surrounding communities that rely on the silo for grain storage. The project site is primarily surrounded by agricultural lands, desert areas, and a few buildings located approximately 35 meters to the north and 15 meters to the south of the existing silo. The project will have both positive and negative social impacts. Positive impacts include increased employment opportunities and enhanced grain storage capacity. However, potential negative impacts such as noise, dust, and traffic disruptions and community health and safety during construction must be mitigated.



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**Figure (5.1):** Map showing land use within 1km radius from the project site’s centre point

- **Transportation and Infrastructure:** The main roads in the vicinity, including the Cairo-Aswan Eastern Desert Road, about 150 meters away, will experience increased traffic due to the transportation of construction materials and equipment. Additionally, internal roads that will be used to transport grains from farms to the silos and possibly used during construction phase may experience increased traffic. This could lead to increased noise, vibration, and potential safety risks. Mitigation measures, such as a traffic management plan, will be implemented to minimize these impacts. 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 grains from the silos.
- **Health and Safety:** The construction and operation of the silo expansion pose risks to both workers and local communities, including exposure to dust, noise, and potential accidents. Strict adherence to Occupational Health and Safety (OHS) standards will be enforced to ensure the safety of all individuals involved in or affected by the project.
- **Conclusion:** The area of influence for the Mafalsa Silo expansion project encompasses the immediate vicinity, including surface soil, water resources including the Nile River and groundwater resources, nearby agricultural lands, the village of Mafalsa, and key transportation routes. Potential environmental and social impacts have been identified, and appropriate mitigation measures will be implemented to minimize these impacts during both the construction and operation phases of the project.

## **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.

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

➤ **Planned risks and impacts**

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

**Step1: Temporal scale (duration):**

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

**Step 2: Spatial scale:**

Spatial category	Description	Score
Localized	Within the project area and immediate surrounding	1
Study zone/ District/Markaz Level	Within Markaz Abanoub	2
Regional	Governorate level	3
National	Country Level	4
Global	Worldwide	5

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### 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

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

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

### ➤ Unplanned activities risks and impacts

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

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

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

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

- Fire or explosion related to fuel leaks (e.g. from diesel storage tanks) during the construction, operation and decommissioning phases. During these phases, temporary power generation may require diesel fuel storage for the generators.
- Pesticide leaks.
- Fire or explosion related to grain dust.

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

1. **Identify risks:** This included the analysis of potential risks and opportunities. Although risk identification is continuous throughout the life of the sub-project, risks should be managed as soon as possible.
2. **Determine probability:** This ensured focus on mitigation of the risks most likely to affect this sub-project.
3. **Determine the impact:** This process is similar to the evaluation undertaken with respect to planned sub-project activities.
4. **Identify 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.
5. **Monitor and review the risk:** Risk management is a continuous process because conditions change. The ESMP includes procedures for review, 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 Mafalsa, 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.

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- **Moisture Sensors:**
  - Moisture content sensors help maintain optimal storage conditions and prevent mold growth and spoilage.
- **Software for Monitoring Silo Systems:**
  - **Integrated Monitoring Systems:**
    - Software systems that integrate data from various sensors (temperature, moisture, dust) to provide real-time monitoring and alerts.
- **Emergency Response and Risk Management:**
  - **Automated Emergency Shutdown Systems:**
    - Systems that automatically shut down operations if hazardous conditions are detected.

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

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

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**Table:** Likelihood of event-related impact.

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

The various levels of risk in relation to the Mafalsa 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.

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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 significant 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 residents bordering the silo area and impacts of combustion gases (smoke) on surrounding communities. The project site is primarily surrounded by agricultural lands, desert areas, and a few buildings located approximately 35 meters to the north and 15 meters to the south of the existing silo. The village of Mafalsa lies directly along the eastern boundary of the silo site. In the event of a fire or explosion, the surrounding agricultural and desert areas are expected to remain largely unaffected by such events., as silo fires are normally contained within the site (based on past records of silo explosions/fires). while agricultural areas may experience minimal effects, nearby buildings located within 15–35 meters could be exposed to more significant risks in the event of a major explosion or fire.

, given that silo explosions can affect areas over 500 meters away.

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



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gives a significance of **Major**. Mitigation measures will therefore be necessary to reduce the possible impact.

## 5.2. Analysis of Environmental and Social Risks and Impacts for Planned Activities

**Table (5.2a):** 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	<ul style="list-style-type: none"> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Construction phase will result in slight, localized, short term (17 months) dust emissions from construction activities. Therefore, the magnitude of the impact is deemed <b>small</b> the emissions will be limited mainly affecting the work environment but also residential buildings near by 15-35m bordering the silo. The vulnerability of the receptor (Mafalsa village and residents bordering the silo) is <b>high</b>. Therefore, the significance of the impact is <b>Moderate</b>.</li> </ul>	1 Short term	1 Localized	2 Slight	4 Small	<b>High</b>	<b>Moderate</b>	Minor
	Engine Exhaust Gases and other sources of air	<ul style="list-style-type: none"> <li>Exhaust fumes and gaseous emissions such as NOx, Sox and Particulate matter (PM2)</li> </ul>	<ul style="list-style-type: none"> <li>As above, Construction activities will result in slight, localized, short term (17 months), air quality emissions from fuel combustion/burning from construction equipment,</li> </ul>	1 Short term	1 Localized	2 Slight	4 small	<b>High</b>	<b>Moderate</b>	Minor

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
	emissions	and (PM10) from internal combustion engines/ generators/ vehicles and machineries used present another risk to air quality on and close to construction sites.	<p>machineries and transport vehicles. The vehicle exhaust together with dust generated constitute major pollutants which can affect air quality. The most relevant pollutant considered is particulate matter because of its potentially significant increase during the construction phase. Air pollution will have health implications on the workers, visitors and the neighboring community as it causes respiratory diseases and is a visual irritant (see area of influence).</p> <p>Therefore, the magnitude of the impact is deemed <b>small</b>. The emissions will be limited mainly affecting the work environment but also residential buildings near by 15-35m bordering the silo. The vulnerability of the receptor (Mafalsa village and residents bordering the silo) is <b>high</b>. Therefore, the</p>							

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
			significance of the impact is <b>Moderate</b> .							
	Risks on Soil and Water resources contamination	<ul style="list-style-type: none"> <li>The project may impact soil quality surface water and groundwater quality (on the long run) from;</li> <li>Accidental oil and fuel spills from machineries and vehicles used.</li> <li>Runoff risks from pesticides used which could pollute nearby lands/soils</li> </ul>	<ul style="list-style-type: none"> <li>Construction activities resulting in soil, surface water and groundwater pollution is of low probability, as these events are accidental. Spills may result from domestic sewage, accidental oil and fuel spills from machineries and vehicles and diesel generator if used and spills from stored chemicals and materials and wastes.</li> <li>The impacts are slight, localized and short term with an overall magnitude level of <b>negligible-small</b>. The soil and groundwater vulnerability are considered <b>high</b>(groundwater is located at more than 15 m depth), firstly because spills on the soil can be easily contained and cleaned and groundwater is located at a deep level.</li> </ul>	1 Short term	1 Localized	2 Slight	4 Small	<b>high</b>	Moderate	Insignificant/Negligible

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
			<ul style="list-style-type: none"> <li>The significance of the impact is therefore assessed to be Moderate.</li> </ul>							
	Risks on Ambient Noise	<ul style="list-style-type: none"> <li>The following equipment used excavation and grading of the site may produce high noise emissions:               <ul style="list-style-type: none"> <li>the use of heavy machinery, such as trucks, bulldozers, and excavators.</li> <li>the operation of construction equipment, such as generators and compressors.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Construction phase will result in slight, localized, short term (17months) noise emission from machineries and vehicles used. Therefore, the magnitude of the impact is deemed <b>small</b>. The emissions will be limited mainly affecting the work environment but also residential buildings near by 15-35m bordering the silo. The vulnerability of the receptor (Mafalsa village and bordering buildings) is <b>high</b>. Therefore, the significance of the impact is <b>Moderate</b>.</li> </ul>	1 Short term	1 Localized	2 Slight	4 Small	<b>High</b>	<b>Moderate</b>	Minor
	Biodiversity/ pesticides consumption by	<ul style="list-style-type: none"> <li>Impacts on biodiversity may result in the disturbance of wildlife from</li> </ul>	<ul style="list-style-type: none"> <li>This impact is slight, localized and short term. The magnitude of the impact is <b>small</b>. The project is located in a reclaimed desert area, = but is part of the Upper Nile IBA. The</li> </ul>	1 Short term	1 Localized	2 Slight	4 Small	<b>High</b>	<b>Moderate</b>	Minor

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
	non-targeted species/hunting risks	<p>noise, dust, air, light emissions and waste generation including chemicals.</p> <ul style="list-style-type: none"> <li>• Non targeted wildlife may consume rodenticides by accidents or consume the dead rodent if not collected right away and disposed properly and in turn leading to their secondary poisoning.</li> <li>• Bird collision risk</li> <li>• Grain spills from current operational silos</li> </ul>	<p>area is a modified desert area within the EHCSS premises not an attractive place for birds. The presence of grains in the currently operational silos may attract birds in case of spills.. Risks of hunting of wildlife is also present. However, those risks could be easily mitigated by low cost measures. Furthermore, the use of rodenticides may cause secondary poisoning to non targeted species including birds of prey. However, mitigation measures and a PMP are easy to be implemented. Moreover, bird collision risks are low since the silo design and existing silo 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 currently operating silos and expansion silos. . The vulnerability of the receptor is <b>high</b>. Given the</p>							

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
		<ul style="list-style-type: none"> <li>Hunting risks</li> </ul>	high importance of the receptor and the small magnitude level of the impact, the significance of the impacts is assessed to be <b>Moderate</b> .							
	Waste generation (solid, liquid, and hazardous wastes) emissions.	<p><b>Solid waste</b></p> <ul style="list-style-type: none"> <li>Increased waste generation from materials, packaging, debris.</li> <li>Construction waste</li> <li>Large quantity of excavated soil will be generated among other construction waste.</li> </ul> <p><b>Liquid waste</b></p> <ul style="list-style-type: none"> <li>Potential wastewater from concrete</li> </ul>	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 <b>small</b> . There is an existing sewage tank that are emptied regularly at the local sewage network and it could be used to empty workers latrines/toilets. The vulnerability of the receptor (bordering residential buildings and Mafalsa village) is <b>high</b> . The soil and groundwater vulnerability are considered <b>high</b> . The significance of the impact is deemed <b>Moderate</b> ..	1 Short term	1 Localized	2 Slight	4 Small	<b>-High</b>	<b>Moderate</b>	Insignificant/Negligible

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
		mixing, equipment washing, sanitation.  <b>Hazardous waste</b> <ul style="list-style-type: none"> <li>Potentially hazardous waste from paints, solvents, oils, pesticides containers and chemicals.</li> </ul>								
Socioeconomic Aspects	Risks to labor from inappropriate working conditions	<ul style="list-style-type: none"> <li>Unfair treatment (discrimination, delayed payments, unsafe working conditions).</li> <li>Unresolved complaints from the lack of grievance mechanism for workers.</li> </ul>	<ul style="list-style-type: none"> <li>Those risks are of short <b>term, localized</b> with a <b>severity level</b> between <b>slight-moderate</b>. The Magnitude is therefore assessed to be <b>small</b>. The sensitivity of the receptors (construction project workers) is <b>High</b>. Therefore, the risk significance is deemed <b>Moderate</b></li> </ul>	1 Short term	1 Localized	2-3 Slight-Moderate	4-5 Small	<b>High</b>	<b>Moderate</b>	Moderate

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
	Disturbance to Silo operations and users	<ul style="list-style-type: none"> <li>Noise, dust, traffic disruptions.</li> <li>Restricted access to facilities or services. Construction activities and stock-piling of construction material can potentially block the access routes and roads inside and in the vicinity of the silo sites.</li> </ul>	<ul style="list-style-type: none"> <li>The disturbance to silo users is slight (different entrance for construction work was identified), localized (silo area) short term (17 months). The magnitude of the impact is thus deemed <b>small</b>. The sensitivity of the receptors is <b>High</b>. Therefore, the assessment of this impact is deemed <b>Moderate</b>.</li> </ul>	1 Short term	1 Localized	2 Slight	4 Small	<b>High</b>	<b>Moderate</b>	Minor
	Child Labor	<ul style="list-style-type: none"> <li>Exploitation of children in construction work.</li> <li>Hazardous working conditions.</li> <li>Interference with education. Increased vulnerability to</li> </ul>	<ul style="list-style-type: none"> <li>Those risks are, localized and severe in nature. The impact may last for a long term (injuries, loss of educational opportunities etc.) The magnitude is therefore assessed to be <b>moderate</b>. The sensitivity of the receptors (children under the age of 18) is <b>High</b>. Therefore, the risk</li> </ul>	4 Long term	1 Localized	4 Severe	9 moderate	<b>High</b>	<b>Major</b>	Major

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
		exploitation or abuse.	significance is deemed <b>Major</b> .							
	Risks of SEA/SH	<ul style="list-style-type: none"> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>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 <b>small</b>. The sensitivity of the receptor is <b>Medium/Moderate</b>. The overall impact significance is <b>Minor</b>.</li> </ul>	1 Short term	1 Localized	2 Slight	4-5 Small	<b>Medium/Moderate</b>	<b>Minor</b>	Minor
	Community health and safety: Traffic risks and accidents	<ul style="list-style-type: none"> <li>Traffic accidents due to the increase in number of trucks during construction phase may pose a risk on other road users.</li> </ul>	<ul style="list-style-type: none"> <li>The risk is of short term, at district -regional levels and is moderately severe. The magnitude is therefore <b>Small-Moderate</b>. Since the operations of the existing silos will continue and traffic from grain transport vehicles by silo customers will be present, the local community (silo users/clients and other</li> </ul>	1 Short term	2-3 District-regional	3 Moderately Severe	6-7 Small - Moderate	<b>High</b>	<b>Moderate-Major</b>	Moderate

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
		<ul style="list-style-type: none"> <li>Traffic congestions due to the increase in transportation trucks for materials, machineries and wastes to and from the site.</li> <li>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.</li> </ul>	road users) are at risk of increase in road accidents due to the presence of construction trucks. The sensitivity of the receptor is <b>High</b> The overall risk significance level is <b>Major</b> .							
	Communities' discont	This risk can be encountered as a result of:	<ul style="list-style-type: none"> <li>Those risks are of long term, localized with a slight severity level. A Stakeholder Engagement Plan was</li> </ul>	4 Long term	2-3 District-regional	2 Slight Severity	8-9 Moderate	<b>High</b>	<b>Major</b>	Moderate

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
	nt/dissatisfaction	<ul style="list-style-type: none"> <li>lack of transparency in information sharing including information about the impacts and mitigation measures</li> <li>Lack of consultation</li> <li>Risks of increase in unresolved complaints</li> </ul>	<p>formulated to inform on the project design and community's needs. The Magnitude is therefore assessed to be <b>Moderate</b>. The sensitivity of the receptors (construction project workers) is <b>High</b>. Therefore, the risk significance is deemed <b>Major</b></p>							

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
	Risks on 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 and the subproject is located within an existing facility's premises.	NA	NA	NA	NA	NA	NA	NA	NA
OHS Aspects	Occupational Health and Safety (OHS) risks/ Lack of OHS considerations	<ul style="list-style-type: none"> <li>The use of hazardous materials and chemicals and wastes can pose a risk to worker health (i.e. cement, paints, bitumen, oil etc.).</li> <li>Falls from heights are a possible cause</li> </ul>	<ul style="list-style-type: none"> <li>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 <b>moderate</b>. The sensitivity of the receptor is <b>High</b> prior mitigation measures. Therefore, the risk significance is deemed <b>Major</b></li> </ul>	4 Long-term	1 Localized	4 Severe	9 Moderate	<b>High</b>	<b>Major</b>	Moderate

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
		<p>of injuries in construction (silo rooftop areas/ use of scaffoldings etc.).</p> <ul style="list-style-type: none"> <li>• Electrical hazards can cause serious injuries or death.</li> <li>• Removal of electrical poles</li> <li>• Machinery can cause crushing injuries or amputations/moving loads.</li> <li>• Dust and fumes can irritate the eyes, nose, and throat, and can also cause respiratory problems.</li> <li>• Noise emissions may disturb workers.</li> </ul>								

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
		<ul style="list-style-type: none"> <li>• Falling into excavated zones.</li> <li>• Working during bad weather conditions (dust storm, heat wave, rainy seasons etc.).</li> <li>• Injuries and burns from welding activities.</li> <li>• Accidents while transporting materials and machinery to and from the subproject site.</li> <li>• Accidental loads falling on workers while being lifted by cranes.</li> <li>• Physical injuries from physical activities and wrong lifting techniques, wrong posture</li> </ul>								

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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
		<p>while conducting any work.</p> <ul style="list-style-type: none"> <li>• Slip trip and fall</li> <li>• Injuries and cuts from machineries and hand arm vibration syndrome from machineries used</li> <li>• Working in confined area (risk of asphyxia while working inside the silos) during construction phase.</li> <li>• Risks of electrocution while installing the Silos.</li> <li>• Getting hit by moving load/vehicle/machine</li> </ul>								



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Factors	Impacts / Risks	Description	Impact Summary	Magnitude Level				Receptor Sensitivity	Impact Significance Level	Impact significance after mitigation measures implementation (table 6.1)
				Temporal scale	Spatial scale	Severity	Total			
		<ul style="list-style-type: none"> <li>Injuries from demolishing equipment and activities</li> </ul>								

**Table (5.2b):** 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	<ul style="list-style-type: none"> <li>Fire and explosion risks from badly stored fuel/ poorly stored/installed generator and mishandling of chemicals during construction phase and explosion from existing silo operations (unpredicted events) can lead to the death of workers in silos construction area and existing silo users and nearby residents. Potential damage to nearby</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>Fire and explosion risks from existing silo operations may also occur and may impact OHS of construction workers as well as silo workers and visitors/clients. The existing silos have fire and explosion prevention measures in their designs. As described in the unplanned risk</li> </ul>	<ul style="list-style-type: none"> <li>Occasionally</li> </ul>	<ul style="list-style-type: none"> <li><b>Major</b></li> </ul>	<ul style="list-style-type: none"> <li><b>Major</b></li> </ul>	<ul style="list-style-type: none"> <li>Major</li> </ul>

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Factors	Impacts/risks	Description	Impact Summary	Probability of occurrence	Level of risk	Impact significance level	Impact significance after mitigation measures implementation (table 6.1)
		buildings may occur from explosion of existing silo which may cause injuries to communities and individuals in those areas.	assessment section, industry-based data classifies the risk probability of occurrence to be <b>occasionally</b> .  <ul style="list-style-type: none"> <li>Impacts from fire and explosion may be irreversible (life threatening/ loss of lives) and therefore the risk level is deemed <b>Major</b>.</li> <li>The impact significance is deemed <b>Major</b>.</li> </ul>				
Catastrophic events/ extreme events (fire and explosion)	Risk of property loss	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:	<ul style="list-style-type: none"> <li>Fire and explosion events resulting from construction activities due to badly stored fuel and mishandling of chemicals and generator mismanagement can lead to potential loss of stored grain in the existing silos/socio-economic losses. This risk may impact</li> </ul>	<ul style="list-style-type: none"> <li>Occasionally</li> </ul>	<b>Moderate</b>	<b>Moderate</b>	Minor

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Factors	Impacts/risks	Description	Impact Summary	Probability of occurrence	Level of risk	Impact significance level	Impact significance after mitigation measures implementation (table 6.1)
		<ul style="list-style-type: none"> <li>Loss of stored grains and loss of storage area</li> <li>Potential damage to nearby buildings and farmlands.</li> </ul>	<p>farmers who are in the process of unloading their grains and before receiving their payment. The risk may also lead to temporary economic losses to other farmers and traders due to silo damages which may temporarily stop the grain buying and selling activities. 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. Risks of damage to surrounding facilities from fire events may also occur.</p> <ul style="list-style-type: none"> <li>Fire risks are not expected to reach neighboring areas as fire risks are expected</li> </ul>				

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Factors	Impacts/risks	Description	Impact Summary	Probability of occurrence	Level of risk	Impact significance level	Impact significance after mitigation measures implementation (table 6.1)
			<p>to be contained within project site boundaries.</p> <ul style="list-style-type: none"> <li>• Therefore, based on the above, the risk level is <b>Moderate</b>.</li> <li>• Moreover, Contractors usually follow Egyptian regulations for fuel and hazardous chemicals handling and proper safety measures.</li> <li>• Furthermore, the existing silos have their own firefighting systems and procedures. Therefore, the probability of this risk to occur is <b>Occasionally</b>.</li> <li>• The overall impact significance is therefore deemed <b>Moderate</b>.</li> </ul>				

**Table (5.3a):** 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	<ul style="list-style-type: none"> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Those impacts are intermittent but long-term (mainly during loading and unloading seasons), localized and slightly severe. The magnitude is <b>moderate</b> due to the long-term nature of the project..</li> <li>The emissions will be limited mainly affecting the work environment and bordering residential areas and lands.</li> <li>The sensitivity of the receptor is <b>high</b> (Mafalsa village).</li> </ul>	4 Long term	1 Localized	2 Slightly Severe	7 Moderate	<b>High</b>	<b>Major</b>	Insignificant/Minor

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
			<ul style="list-style-type: none"> <li>The overall assessment is deemed <b>Major</b></li> </ul>							
	Gaseous emissions from Engine Exhaust fumigation and other sources	<ul style="list-style-type: none"> <li>The major activities at this phase are maintenance procedures and transport of many cars during the daytime. Trucks transporting grains, generators will release exhaust emissions, containing carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), oxides of nitrogen (NOX), and particulate matter (PM).</li> <li>Fumigation emissions from silos</li> </ul>	<ul style="list-style-type: none"> <li>Those impacts are long-term localized and slightly severe. The magnitude level is <b>moderate</b>.</li> <li>The emissions will be limited mainly affecting the work environment and immediate vicinity including residential buildings.</li> <li>The sensitivity of the receptor is <b>high</b> (Mafalsa village).</li> <li>The overall assessment is deemed <b>Major</b>.</li> </ul>	4 Long term	1 Localized	4 Severe	9 Moderate	<b>High</b>	<b>Major</b>	Insignificant/ Minor

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		<p>and airborne drift from pesticides application may also reduce ambient air quality</p> <ul style="list-style-type: none"> <li>• Odors emanate from fermenting grains. A major contributor to the odor is dimethyl disulfide which has been identified as a key component of the emitted volatiles. This is often accompanied by hydrogen sulfide, dimethyl sulfide and dimethyl trisulfide which is</li> </ul>								

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		<p>particularly odiferous. These odors can become a nuisance, causing temporary symptoms such as headache and nausea but can be lethal when emitted in excess.</p> <ul style="list-style-type: none"> <li>Grain storage structures can develop potentially hazardous atmospheres due to gases produced from fermenting grains. Fermenting or molding grain produce carbon dioxide (CO<sub>2</sub>), nitric oxide (NO), and also</li> </ul>								

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		<p>compounds known to be respiratory irritants such as nitrogen dioxide (NO<sub>2</sub>) and nitrogen tetroxide (N<sub>2</sub>O<sub>4</sub>). However, individual reactions to silo gas depend on the concentration of inhaled gas and length of exposure. While low NO<sub>2</sub> concentrations can cause coughing, labored breathing, and nausea, high concentrations can cause</p>								

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		fluid to fill the lungs.								
	Impacts on Soil and long-term risks on ground Water and surface water quality from trucks and machineries	<ul style="list-style-type: none"> <li>• Soil contamination and water pollution are accidental and mainly due to:               <ul style="list-style-type: none"> <li>➤ Mismanagement of chemicals and wrong storage and handling and disposal use of machine lubricants</li> <li>➤ Fuel spills of trucks transporting grains to and from the Silo Complex in Mafalsa.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• 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 tank on the soil are of low probability, as these events are accidental. The silo management have a sewage collection tank that is regularly emptied in the public sewage network. The magnitude of the impact is deemed <b>moderate</b>.</li> </ul>	4 Long term	1 Localized	2 Slightly Severe	7 Moderate	<b>Low</b>	<b>Minor</b>	Insignificant

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		<p>➤ Inappropriate waste disposal from the offices and inappropriate sewage disposal which may contaminate the soil.</p> <p>Spills may also result from result from badly stored chemicals and materials and wastes.</p> <p>Badly stored and bad disposal off fumigation chemical (Phostoxin) may pose risk of</p>	<ul style="list-style-type: none"> <li>The soil and surface and groundwater vulnerability are considered <b>low</b>, firstly because spills on the soil can be easily contained and cleaned and groundwater is located at more than 15m in depth and risks of runoffs are very low during operation phase.</li> <li>The significance of the impacts is therefore assessed as <b>Minor</b></li> </ul>							

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		contamination Accidental spills from generator								
	Ambient Noise	<ul style="list-style-type: none"> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>Construction phase will result in slight, localized, long-term noise emission from silos operations. Therefore, the magnitude of the impact is deemed <b>moderate</b>. The emissions will be limited mainly affecting the work environment. The vulnerability of the receptor (Mafalsa village and bordering residential</li> </ul>	4 Long term	1 Localized	2 Slightly Severe	7 Moderate	<b>High</b>	<b>Major</b>	Insignificant/Minor

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		<p>machinery in and around the Silos project site</p> <ul style="list-style-type: none"> <li>noise from the generator.</li> </ul>	<p>buildings) is <b>high</b>. Therefore, the significance of the impact is <b>Major</b></p>							
	Biodiversity/hunting risks	<ul style="list-style-type: none"> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>This impact is slight, localized and long-term. The magnitude of the impact is <b>moderate</b>. The project is located in a reclaimed desert area, = but is part of the Upper Nile IBA. The area is a modified desert area within the EHCSS premises not an attractive place for birds. The presence of grains in the currently operational</li> </ul>	4 Long term	1 Localized	2 Slightly Severe	7 Moderate	<b>High</b>	<b>Major</b>	Insignificant/Minor

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		<p>can pollute the air and water, which can harm animals if any.</p> <ul style="list-style-type: none"> <li>• Bird collision risks</li> <li>• Grain spills risks</li> <li>• Hunting risks</li> </ul>	<p>silos may attract birds in case of spills.. Risks of hunting of wildlife is also present. However, those risks could be easily mitigated by low cost measures. Furthermore, the use of rodenticides may cause secondary poisoning to non targeted species including birds of prey. However, mitigation measures and a PMP are easy to be implemented. Moreover, bird collision risks are low since the silo design and existing silo</p>							

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
			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 expansion silos design. The vulnerability of the receptor is <b>High</b> . Given the high importance of the receptor, the significance of the impacts are							

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
			assessed to be <b>Major</b> .							
	Waste Management	<p><b>Solid waste</b></p> <ul style="list-style-type: none"> <li>Ongoing generation from silo operations, maintenance work, offices.</li> </ul> <p><b>Liquid waste</b></p> <ul style="list-style-type: none"> <li>Potential wastewater from grain washing, equipment cleaning, sanitation (water use is minimal).</li> </ul> <p><b>Hazardous waste</b></p> <ul style="list-style-type: none"> <li>Potentially hazardous waste from pesticide use, grain fumigation, maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>This impact is slight, localized and long-term. The emissions will be limited mainly affecting the work environment. With proper management (handling, storage and disposal of wastes), the risks can be easily contained. Therefore, the magnitude of the impact is deemed <b>moderate</b>. The vulnerability of the receptor (Buildings nearby and Mafalsa village) is <b>medium</b>. The</li> </ul>	4 Long term	1 Localized	2 Slightly Severe	7 Moderate	<b>High</b>	<b>Major</b>	Insignificant/Minor

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
			soil and groundwater vulnerability are considered <b>high</b> . The significance of the impact is deemed <b>Major</b> .							
	Risks to labor and lack of appropriate work conditions and risks on Seasonal Workers	<ul style="list-style-type: none"> <li>Silo workers and seasonal workers may face unfair treatment (discrimination, delayed payments, unsafe working conditions and unresolved complaints from the lack of grievance mechanism.</li> <li>Workers may face occupational health and safety hazards (e.g., grain dust</li> </ul>	<ul style="list-style-type: none"> <li>Those risks are of long-term, <b>localized</b> with a <b>severity level Severe</b>. The Magnitude is therefore assessed to be <b>Moderate</b>. The sensitivity of the receptors (construction project workers) is <b>High</b>.</li> <li>The risks are therefore deemed <b>Major</b>.</li> </ul>	4 Long term	1 Localized	4 Severe	9 Moderate	<b>High</b>	<b>Major</b>	Moderate

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		<p>exposure, machinery accidents)</p> <ul style="list-style-type: none"> <li>• 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:               <ul style="list-style-type: none"> <li>➤ There is a contractor that brings seasonal workers to empty seed bags and conducting cleaning activities including</li> </ul> </li> </ul>								

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		<ul style="list-style-type: none"> <li>silos cleaning.</li> <li>➤ The cleaning specialists remove the grains from the bottom and sides of the silos. Cleaning is done every beginning of the season</li> </ul>								
	Risks on vulnerable populations	<ul style="list-style-type: none"> <li>Gender, ethnicity and other social stratification of beneficiaries may lead to disproportionate distribution of project benefits especially on vulnerable populations (minorities, women, disabled and</li> </ul>	<ul style="list-style-type: none"> <li>This risk is long-term, district level, moderately severe. The magnitude is therefore <b>moderate</b>.</li> <li>The sensitivity of the receptor is <b>high</b>.</li> <li>The impact level is therefore deemed <b>Major</b>.</li> </ul>	4 Long term	2 District	3 Moderately Severe	9 Moderate	<b>High</b>	<b>Major</b>	Minor-Moderate

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		very poor populations) as follows: <ul style="list-style-type: none"> <li>Limited access to silo services by small farmers and vulnerable populations due to elite capture.</li> <li>Risk of unequal access to food distribution channels and purchasing power which can lower food accessibility to vulnerable population.</li> <li>Technical and Physical Constraints: Existing facilities at the silo, including</li> </ul>								

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		loading and unloading equipment, were reported to be insufficient to handle peak harvest demands efficiently								
Socio-economic Aspects	<p>Risks on children/child labor/children present in silos during grain transport</p> <p>Risks of child labor by seasonal workers subcontractors</p>	<ul style="list-style-type: none"> <li>• Presence of children in grain handling or transport and loss of educational opportunities.</li> <li>• Children being Exposed to hazardous substances or working conditions.</li> </ul>	<ul style="list-style-type: none"> <li>• 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 <b>Moderate</b>. The sensitivity</li> </ul>	4 Long term	1 Localized	4 Severe	9 Moderate	<b>High</b>	<b>Major</b>	Major

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
			of the receptors (children below the age of 18) is <b>High</b> . Therefore, the risk significance is deemed <b>Major</b> .							
	Risks of SEA/SH	<ul style="list-style-type: none"> <li>Potential SEA/SH among staff and visitors.</li> </ul>	<ul style="list-style-type: none"> <li>Those risks are long-term, localized with a severity level of slightly severe because the risks can be easily mitigated with low-cost measures. The magnitude is deemed <b>Moderate</b>. The sensitivity of the receptor is <b>Medium/Moderate</b>. The overall impact</li> </ul>	4 Long-term	1 Localized	2 Slightly severe	7 Moderate	<b>Medium/Moderate</b>	<b>Moderate</b>	Minor

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
			significance is <b>Moderate</b> .							
	Community health and safety: Traffic risks and accidents	<ul style="list-style-type: none"> <li>Risks of increase in traffic and road accidents during high storage seasons.</li> <li>Transportation Challenges: Farmers and traders face logistical difficulties, including a lack of adequate transportation support for grain delivery to the silo.</li> </ul>	<ul style="list-style-type: none"> <li>The risk is of long-term, at district - regional levels and is moderately severe. The magnitude is therefore <b>Large</b>. Local community including silo customers are at risk of road accidents. The sensitivity of the receptor is <b>High</b> The overall risk significance level is <b>Major</b>.</li> </ul>	4 Long term	2-3 District - Regional	3 Moderately Severe	9-10 Large	<b>High</b>	<b>Major</b>	Moderate

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
Occupational Health and Safety (OHS)	Risks from silo operations on workers	<ul style="list-style-type: none"> <li>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.</li> <li>Gaseous exposures from trucks causing severe respiratory irritation,</li> <li>Falling from height or accidently falling in silos while working at</li> </ul>	The OHS risks are long-term, localized and severe. The magnitude is therefore, <b>moderate</b> . The sensitivity of the receptor is <b>High</b> . The overall risks are assessed to <b>Major</b> .	4 Long term	1 Localized	4 Severe	9 Moderate	<b>High</b>	<b>Major</b>	Moderate

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		height during maintenance <ul style="list-style-type: none"> <li>• Asphyxia from working in confined areas while conducting maintenance works.</li> <li>• Grain dust is a fire hazard, and a fire at the silos could cause serious injuries or death.</li> <li>• Grain dust explosions can also cause serious injuries or death.</li> <li>• Risks from grain engulfment</li> <li>• Risks of being entangled in unguarded auger and potential injuries</li> </ul>								

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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		<ul style="list-style-type: none"> <li>• Risks of burns from hot surfaces</li> <li>• Noise and vibration emissions from silos operations and units,</li> <li>• Unhygienic practices</li> <li>• Handling of toxic substance, chemicals and wastes, such as pesticides and rodenticide especially during application</li> <li>• Risks of skin and eye burns and irritation from handling, storing and disposing chemicals and empty</li> </ul>								



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Factors	Risks and Impacts	Description	Impact Significance	Magnitude level				Receptor sensitivity	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
				Temporal	Spatial	Severity	Total			
		containers and other types of wastes including domestic waste.								

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**Table (5.3b): Risks and impacts 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 industries	<ul style="list-style-type: none"> <li>• Fire and explosion during existing silo operations (unpredicted events) can lead to the death of workers and silo users and nearby residents.</li> <li>• Phostoxin/Aluminum phosphide may ignite spontaneously and may lead to explosion</li> <li>• Risk of leaks of Phostoxin during transportation</li> <li>• Fire risks from transformer</li> <li>• Potential damage to nearby buildings may occur from explosion of existing silo which may cause injuries to communities and individuals in those surrounding areas.\</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Fire and explosions from silo operations may occur. Additionally, temporary power generation may require diesel fuel storage, which may lead to fire and explosion.</li> <li>• Possible impacts include severe to fatal impacts on workers and residents bordering the silo area. and impacts of combustion gases (smoke) on surrounding communities</li> <li>• 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 <b>occasional recurrence</b>. The worst-case impacts are rated as <b>Major</b> since impacts from fire and explosion may be irreversible (life threatening).</li> <li>• The impact significance is therefore deemed <b>Major</b>.</li> </ul>	<ul style="list-style-type: none"> <li>• Occasionally</li> </ul>	<ul style="list-style-type: none"> <li>• Major</li> </ul>	<ul style="list-style-type: none"> <li>• Major</li> </ul>	<ul style="list-style-type: none"> <li>• Moderate</li> </ul>

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Factors	Impacts/risks	Description	Impact Summary	Probability of occurrence	Level of risk	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
Catastrophic events/ extreme events (fire and explosion)	Risk of property losses	<ul style="list-style-type: none"> <li>Catastrophic events such as explosions and fire events can produce major negative impacts on the livelihood of silo users.</li> <li>Catastrophic events such as fire and explosions can lead to property damage in neighboring buildings.</li> </ul>	<ul style="list-style-type: none"> <li>Fire and explosion from silo operations can lead to loss of stored grain in the existing 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. Loss of lands and properties next to silo areas is also a risk. 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.</li> <li>Therefore, the risk level is <b>Moderate</b>.</li> <li>Risks of damage to surrounding facilities from fire and explosion events is also <b>Moderate</b>.</li> <li>Moreover, the silos have their own heat sensors and firefighting systems and procedures.</li> </ul>	<ul style="list-style-type: none"> <li>Occasionally</li> </ul>	<ul style="list-style-type: none"> <li>Moderate</li> </ul>	<ul style="list-style-type: none"> <li>Moderate</li> </ul>	<ul style="list-style-type: none"> <li>Minor</li> </ul>

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Factors	Impacts/risks	Description	Impact Summary	Probability of occurrence	Level of risk	Impact significance level	Impact significance after mitigation measures implementation (table 6.2)
			<ul style="list-style-type: none"> <li>The probability of this risk occurring is <b>occasional</b>.</li> <li>The overall impact significance is therefore deemed <b>Moderate</b>.</li> </ul>				
Catastrophic events/ extreme events	Pesticides leaks	<ul style="list-style-type: none"> <li>Pesticides during fumigation activities may leak into the atmosphere and cause health and safety and environment risks.</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>The design of the silos takes into consideration pesticides leaks.</li> <li>This impact may occur if improper management/ maintenance of silos and leak tests are not performed on a regular basis. Since fumigation is carried out almost every month. The probability of the risk is deemed <b>Likely</b>.</li> <li>Since risks may cause skin and lung injuries to workers and community nearby, the level of the risk is <b>Moderate</b>.</li> </ul>	<ul style="list-style-type: none"> <li>Likely</li> </ul>	<ul style="list-style-type: none"> <li>Moderate</li> </ul>	<ul style="list-style-type: none"> <li>Moderate</li> </ul>	<ul style="list-style-type: none"> <li>Minor</li> </ul>



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# 6

## ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

### 6.1. 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.

### 6.2 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.

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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.

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## **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 existing 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

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- 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 persons can need 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.

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- Periodic checks and drills to test how well the system is working.

The **Emergency Evacuation Plan (EEP)** specific to the Mafalsa 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 (firefighting, 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 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.

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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 **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.
- 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.

Regarding the ESF issues requiring mitigation for all expansion silos, the following measures will be implemented to ensure safety and compliance during the construction phase:

1. **Food Safety:** As the existing silos will continue to operate during construction, measures will be taken to prevent dust and industrial debris contamination. Protective barriers and dust suppression techniques will be employed to ensure that the operational silos remain free from contamination, thereby maintaining food safety standards.



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2. **Fire and Explosion Safety:** It is crucial to ensure that fire and explosion safety equipment remains operational and fully connected throughout the construction phase. Plans are in place to provide safe and uninterrupted access for fire trucks and ambulances to the existing silos. This will ensure prompt response capabilities in case of emergencies, minimizing any risk to the facility and personnel.
3. **Fire Safety Monitoring:** All silos, including the existing ones, will be equipped with temperature and CO<sub>2</sub> sensors. These sensors will enable continuous monitoring of fire risks, allowing for early detection and intervention to prevent potential fire hazards.

### 6.3 Mitigation Measures

Mitigation measures during both construction and operation phases are provided in Tables (6.1 and 6.2). The contractors are required to develop their own construction ESMP (C-ESMP) and update it every 6 months based on table 6.1 below and management plans present in this ESMP. The supervision consultant is responsible for ensuring all mitigation measures here are reflected in the C-ESMP and for reviewing and approving the C-ESMP.

**Table (6.1):** 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 due to airborne Dust	<ul style="list-style-type: none"> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>Use dust sweeping methods to reduce water usage in dust suppression</li> <li>Ensure water conservation measures and practices are in place for concrete mixing by ensuring the use</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and subcontractor</li> <li>Supervised by Environmental specialist, social specialist for reporting on grievance.</li> </ul>	20,000

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>of best practice concrete/water ratios</p> <ul style="list-style-type: none"> <li>• During pneumatic drilling/wall destruction dust shall be suppressed by ongoing water spraying and/or installing dust screen enclosures at site.</li> <li>• The surrounding environment (sidewalks, roads) shall be kept free of debris to minimize dust.</li> <li>• There will be no open burning of construction / waste material at the site.</li> <li>• Transportation trucks shall be properly covered to minimize dust and air emissions.</li> <li>• Use ready mix concrete whenever possible.</li> <li>• Spray water on roads to minimize dust emissions because of vehicles moving.</li> <li>• Ensure vehicles and trucks use paved roads wherever possible.</li> <li>• Speed limits shall be enforced on unpaved roads, to be &lt;30km/hr.</li> </ul>		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>Implement preventive maintenance program for vehicles and equipment working on site and promptly repair vehicles with visible exhaust fumes.</li> <li>Using newer equipment for more fuel-efficient alternatives</li> <li>Using low sulfur content diesel</li> <li>Ensure turning off vehicles when not in use.</li> <li>Ensure Grievance mechanism is functional to address workers and community complains regarding air emissions.</li> <li>Schedule construction activities to avoid rainfall and high wind periods to the extent practical</li> </ul>		
	Gaseous emissions from Engine Exhaust Gases	<ul style="list-style-type: none"> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>Implement preventive maintenance program for vehicles and equipment working on site and promptly repair vehicles with visible exhaust fumes.</li> <li>Procurement of energy efficient equipment and</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and subcontractor</li> <li>Supervised by Environmental specialist, social specialist for</li> </ul>	15,000

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
		on and close to construction sites.	<p>machineries from certified contractors.</p> <ul style="list-style-type: none"> <li>Using newer equipment for more fuel-efficient alternatives</li> <li>Inspect machineries regularly</li> <li>Using low sulfur content diesel</li> <li>Ensure workers turnoff vehicles when not in use.</li> <li>Ensure Grievance mechanism is functional to address workers and community complains.</li> <li>In case a generator will be used, conduct air emission tests stipulated under the current legislation for generators</li> <li>Ensure regular machine and vehicle maintenance.</li> <li>Ensure energy conservation measures and practices are in place by raising awareness to workers on good practices and measures above.</li> </ul>	reporting on grievance	
	Risks on Soil and Water	The project may impact soil quality and groundwater quality (on the long run).Even in the presence of	<ul style="list-style-type: none"> <li>Include spill prevention kits on site to control and</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and subcontractor</li> </ul>	15,000

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
	resources contamination	<p>deep groundwater, the project may pose long-term contamination risks due to the potential infiltration from:</p> <ul style="list-style-type: none"> <li>Accidental oil and fuel spills from machineries and vehicles and generator used.</li> <li>Runoff risks from pesticides used which could pollute nearby lands/soils</li> </ul>	<p>contain and clean up any potential spills.</p> <ul style="list-style-type: none"> <li>Use offsite equipment fueling and oil stations as much as possible or dedicated fueling areas onsite.</li> <li>Perform periodical maintenance on equipment and machinery.</li> <li>Cover on-site stockpiles of soil and fill.</li> <li>Establish appropriate erosion and sediment control measures.</li> <li>Schedule construction activities to avoid rainfall and high wind periods to the extent practical</li> <li>Ensure all chemicals are labelled, stored, handled, and disposed according to their safety data sheets (SDSs) by trained workers.</li> <li>All chemicals are stored on insulated areas from the ground and in secondary containment.</li> <li>Conduct regular maintenance of equipment to minimize leakage risks.</li> </ul>	<ul style="list-style-type: none"> <li>Supervised by Environmental specialist, social - specialist for reporting on grievance.</li> </ul>	

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>• Conduct regular groundwater quality testing during the construction phase to detect any contamination early in case of spills.</li> <li>• Develop and implement a pest management plan for rodenticides (refer to Annex I).</li> <li>• 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.</li> <li>• Store fuel in secondary containment on concrete bases</li> <li>• Monitor fuel used to detect leakage</li> <li>• Ensure the Grievance mechanism is functional to address workers and community complaints.</li> <li>• Train workers on emergency response procedures for spills, including immediate containment and reporting protocols.</li> </ul>		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
	Risks on Ambient Noise	<ul style="list-style-type: none"> <li>• The following equipment used in excavation and grading of the site may produce high noise emissions:               <ul style="list-style-type: none"> <li>○ the use of heavy machinery, such as trucks, bulldozers, and excavators.</li> <li>○ the operation of construction equipment, such as generators and compressors.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Construction noise will be limited to restricted times agreed to in the permit.</li> <li>• Avoid construction work in the evening.</li> <li>• Reduce workers' exposure to noise.</li> <li>• Ensure noise does not exceed the safety limits stipulated in the Egyptian environmental law in addition to occupational safety and health standards.</li> <li>• Provide workers in areas of activities with high noise levels with earplugs.</li> <li>• The contractor must train all workers before starting construction work on the danger of noise and how to avoid them.</li> <li>• Restricting the movement of lorry cars/trucks to prevent noise in the early morning and late evening periods.</li> <li>• Ensure all machines and vehicles are turned off when not in use.</li> <li>• Keep machineries and vehicles in good working conditions and perform maintenance regularly</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor and subcontractor</li> <li>• Supervised by Environmental specialist, social specialist for reporting on grievance.</li> </ul>	17,500

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>Monitor noise and vibration levels to confirm the effectiveness of measures implemented.</li> <li>Select equipment with low noise emissions and that is technically and financially feasible.</li> <li>Ensure Grievance mechanism is functional to address workers and community complaints.</li> </ul>		
	Biodiversity/ pesticides consumption by non-targeted species/ hunting of wild animals/ disturbance to IBA and birds from construction works and current silo operations from grain spills.	<ul style="list-style-type: none"> <li>Impacts on biodiversity may result in the disturbance of wildlife from noise, dust, air, light emissions and waste generation including chemicals.</li> <li>Non targeted wildlife may consume rodenticides by accidents or consume the dead rodent if not collected right away and disposed properly and in turn leading to their secondary poisoning.</li> <li>Impacts on bird migratory route and IBA as the project site is located within an IBA area</li> </ul>	<ul style="list-style-type: none"> <li>Follow measures present in the pest management plan to avoid consumption of pesticides by non-targeted species or secondary poisoning.</li> <li>Follow measures for air, noise, waste emissions reduction.</li> <li>Add, aviation obstruction lighting which is used to enhance visibility of airplanes and birds in order to avoid any collision or obstacles will be used.</li> <li>Regular cleaning and maintenance to promptly remove any spilled grain</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and subcontractor</li> <li>Supervised by Environmental Specialist.</li> </ul>	20,000

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
		<ul style="list-style-type: none"> <li>Grain spills from current operational silos attracting birds to the site</li> <li>Potential threat to local wildlife due to unauthorized hunting activities</li> </ul>	<ul style="list-style-type: none"> <li>Ensure good housekeeping is implemented</li> <li>Place clear signage in and around the facility to prohibit hunting and trapping</li> <li>Include a no-hunting clause in all contractor and worker agreements and provide awareness on hunting risks</li> <li>Implement strict penalties due to hunting or wildlife collection</li> <li></li> </ul>		
	Waste generation (solid, liquid, and hazardous wastes) emissions.	<p><b>Solid waste</b></p> <ul style="list-style-type: none"> <li>Increased waste generation from materials, packaging, debris.</li> <li>Construction waste</li> <li>Large quantity of excavated soil will be generated among other construction waste.</li> </ul> <p><b>Liquid waste</b></p> <ul style="list-style-type: none"> <li>Potential wastewater from concrete mixing, equipment washing, sanitation.</li> </ul>	<p>Develop a waste management procedure with the following requirements:</p> <p><b>Waste management:</b></p> <ul style="list-style-type: none"> <li>Proper handling of raw material to minimize waste.</li> <li>Waste collection and disposal pathways and sites will be identified for all major waste types expected from demolition and construction activities.</li> <li>Wastes will be segregated by type (solid, hazardous, liquid, construction wastes).</li> </ul>	Contractor and subcontractor	30,000

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
		<p><b>Hazardous waste</b></p> <ul style="list-style-type: none"> <li>Potentially hazardous waste from paints, solvents, oils, pesticides containers and chemicals.</li> </ul>	<ul style="list-style-type: none"> <li>Construction waste will be collected and disposed properly by licensed collectors and disposed in site approved by the responsible municipality/government authority.</li> <li>The records of waste disposal will be maintained as proof for proper management as designed.</li> <li>Whenever feasible the contractor will reuse and recycle appropriate and viable materials.</li> <li>Avoid accumulation of organic wastes and food remains.</li> <li>Implement pest and rodent control measures by following the PMP in annex 1.</li> <li>Ensure the reuse or recycling of materials.</li> <li>Adopt measures to reduce or eliminate the use of toxic or hazardous raw materials.</li> <li>Ensure raw materials are not sought from ecologically sensitive zones.</li> <li>Record grievances.</li> </ul> <p><b>Wastewater:</b></p> <ul style="list-style-type: none"> <li>Workers will use existing onsite latrines/toilets.</li> </ul>		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>- Construction vehicles and machinery will be washed only in designated areas.</li> <li>- Open urination and defecation shall be prohibited.</li> <li>- Record grievances.</li> </ul> <p><b>Hazardous chemicals, materials, and waste:</b></p> <ul style="list-style-type: none"> <li>- Temporarily storage on site of all hazardous or toxic substances will be in safe containers labelled with details of composition, properties, and handling information.</li> <li>- 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.</li> <li>- Spill prevention kits shall be present on site and any spills should be removed instantly</li> <li>- The wastes shall be transported by specially licensed carriers and disposed in a licensed facility.</li> <li>- Paints with toxic ingredients or solvents or lead-based paints will not be used.</li> <li>- All chemicals and hazardous materials should be stored,</li> </ul>		



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>handled, and disposed according to their materials safety data sheets (SDSs) and by trained workers.</p> <ul style="list-style-type: none"> <li>- Record grievances.</li> <li>- Workshop area/ machine maintenance and oiling will be carried out on concrete bases to avoid soil contamination.</li> <li>- Store E-waste separately according to manufacturer's guidelines and dispose of hazardous waste (including e-waste) through certified waste disposal services to ensure safe and environmentally friendly handling.</li> </ul> <p><b>Pest Management Plan (for onsite worker camps and facilities):</b></p> <ul style="list-style-type: none"> <li>- Ensure a suitable pest and rodent management plan (annex 1) is in place and carefully followed.</li> <li>- Ensure guidelines of hazardous materials and wastes are followed.</li> </ul>		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
Socioeconomic Aspects	Risks to labor from inappropriate working conditions	<ul style="list-style-type: none"> <li>Unfair treatment (discrimination, delayed payments, unsafe working conditions).</li> <li>Unresolved complaints from the lack of grievance mechanism for workers.</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>Workers will be made aware of their rights regarding working hours, days off, salaries.</li> <li>All workers will sign contracts</li> <li>A grievance mechanism (present in chapter 7) will include channels for workers. Workplace grievances will be handled in a positive manner with no retaliation, and this will be communicated to workers.</li> <li>Workplace grievance will also be established for contracted workers and subcontractors.</li> <li>Provision of anonymous grievances</li> <li>Follow project level Labor Management Plan (LMP).</li> <li>Implement inclusive hiring practices for vulnerable populations by selecting lower income individuals</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and subcontractor</li> <li>Supervised by Environmental specialist, and social specialist for reporting on grievance.</li> <li>PMU</li> </ul>	20,000

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>Providing jobs to 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.</li> <li>Regular inspections by the food security Project Management Unit (PMU) will be performed.</li> </ul>		
	Disturbance to Silo operations and users	<ul style="list-style-type: none"> <li>Noise, dust, traffic disruptions.</li> <li>Restricted access to facilities or services. Construction activities and stock-piling of construction material can potentially block the access routes and roads inside and in the vicinity of the silo sites.</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>Dust suppression and noise mitigation measures will be followed as stated in the above sections.</li> <li>Access roads and time schedule for construction material and workers shall be determined prior to construction work in coordination with the traffic authority which will minimize pedestrian interactions with construction vehicles.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and subcontractor</li> <li>Supervised by Environmental specialist, and social specialist for reporting on grievance.</li> </ul>	14,000

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>Regarding the onsite traffic management during the construction phase, there will be a separate road for the construction trucks than the existing road for grain trucks</li> <li>The contractor will be asked to create a barrier between the location of the existing silos and the location of the storage area. A special entrance will be allocated to this area to minimize the impact on the existing Silos and its operation.</li> <li>The contractor and the site engineer should choose a location for temporary storage of construction materials and equipment and wastes before construction work starts to ensure no traffic disruptions due to routes blockages occurring on site.</li> <li>Perform: regular maintenance of vehicles and trucks</li> <li>Ensure low speed and good driving practices on site.</li> <li>Construction site to be fenced and guarded by security</li> </ul>		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>personnel in order to prevent any unauthorized access to the site.</p> <ul style="list-style-type: none"> <li>• Ensure implementing the Labor Management Plan (LMP) and train workers on the code of conduct (present in project's LMP and in annex V).</li> <li>• Report any major injuries and accidents to the WB within 48 hours.</li> <li>• 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.</li> <li>• Safety signage should be placed at the work sites.</li> <li>• Develop and implement the traffic management plan in appendix II.</li> </ul>		
	Child Labor	<ul style="list-style-type: none"> <li>• Exploitation of children in construction work.</li> <li>• Hazardous working conditions.</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain daily attendance sheets to verify that workers do not include staff under 18 years.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor and subcontractor</li> <li>• Supervised by</li> </ul>	14,000



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
		<ul style="list-style-type: none"> <li>Interference with education.</li> </ul>	<ul style="list-style-type: none"> <li>Maintain a copy of IDs of workers to prevent hiring workers under 18 years.</li> <li>Fines and penalties will be set in case child labor is detected</li> <li>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.</li> <li>EHCSS will check labor policies of the contractor.</li> <li>The contractor will ensure primary suppliers do not employ child labor by checking the supplier's labor requirements and OHS procedures and by communicating their policies on child and forced labor to the primary supplier</li> <li>Regular inspection will be conducted by the environmental and social specialists and the Food Security PMU (Project Management Unit)</li> <li>Ensure implementing the Labor Management Plan (LMP).</li> </ul>	<p>Environmental specialist, social specialist for reporting on grievance.</p> <p>PMU</p>	

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
	Risks of SEA/SH	<ul style="list-style-type: none"> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>Appropriate signposting to be added at the sites which will inform workers of key rules and regulations to follow.</li> <li>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.</li> <li>Workers must read and sign the code of conduct.</li> <li>Establish an accessible Grievance Mechanism with channels to receive different types of grievances including SEA/SH grievances (see SEA/SH related grievance in chapter 7).</li> <li>Provision of anonymous grievances.</li> <li>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.</li> <li>Ensure developing and implementing the Labor Management Plan (LMP) and</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and subcontractor</li> <li>Supervised by Social specialist for reporting on grievance.</li> <li>PMU</li> </ul>	14,000



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>train workers on the code of conduct.</p> <ul style="list-style-type: none"><li>• Implement the stakeholder engagement plan (SEP)</li></ul>		

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	Community health and safety: Traffic risks and accidents	<ul style="list-style-type: none"> <li>• Traffic accidents due to the increase in number of trucks during construction phase which may pose a risk on other road users.</li> <li>• Traffic congestions due to the increase in transportation trucks for materials, machineries and wastes to and from the site.</li> <li>• 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.</li> </ul>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• 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 expansion, 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.</li> <li>• The safety record of vehicles in purchase or leasing should be present.</li> <li>• Perform regular maintenance of vehicles and trucks</li> <li>• Minimize pedestrian interactions with construction vehicles by selecting appropriate time for truck movement in coordination with local authority.</li> <li>• Pedestrian lanes/zones are present on site.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor and subcontractor</li> <li>• Contractor and subcontractor</li> <li>• Supervised by Environmental specialist, and social specialist for reporting on grievance.</li> </ul>	15,000
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			<ul style="list-style-type: none"> <li>• Presence of flagman for site arrangement</li> <li>• Ensure transport vehicles maintain speed limit and good driving practices.</li> <li>• Conduct drug check-ups on workers.</li> <li>• Ensure workers have driving license for trucks.</li> <li>• Use locally sourced materials whenever possible to minimize transport distances.</li> <li>• 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.</li> <li>• Unusual traffic delays or accidents caused during construction, or any complaints received should be reported in the monthly report prepared by the construction supervisor.</li> <li>• Report any major injuries and accidents to the WB within 48 hours.</li> <li>• 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.</li> </ul>		
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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
	Lack of stakeholder engagement and proper grievance mechanism	<ul style="list-style-type: none"> <li>Risks of untransparent sharing of information</li> <li>Risks of increase in unresolved complains</li> </ul>	<ul style="list-style-type: none"> <li>The local construction and environment inspectorates and communities have been notified of upcoming activities related to the expansion of the Silo.</li> <li>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).</li> <li>All legally required permits have been acquired for construction.</li> <li>Develop a well communicated and accessible grievance mechanism for community members to address any complaints (chapter 7).</li> <li>Develop communication channels with surrounding communities</li> <li>Presence of complaint boxes on site and banners including numbers for grievance submission</li> <li>Provide information to farmers and different stakeholders on the progress of the project including civil works and on mitigation measures and grievance redress mechanisms</li> </ul>	<ul style="list-style-type: none"> <li>Silo manager, Social Specialist</li> </ul>	14,000



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>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.</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• 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</li> <li>• 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.</li> <li>• Incorporate ramps to facilitate easy access for individuals with</li> </ul>		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			mobility challenges as a design measure		
	Risks on Cultural Heritage and archeological sites	<ul style="list-style-type: none"> <li>Impacts on archaeological and historic sites during the construction phase are expected to be negligible since there are no archeological sites nearby and the subproject is located within an existing facility's premises.</li> </ul>	<ul style="list-style-type: none"> <li>In case of any finds/discoveries apply chance find procedure as follows:               <ul style="list-style-type: none"> <li>Stop excavation and construction activities immediately in the area,</li> <li>Delineate the site.</li> <li>Ensure the site is secured to prevent any damage or losses of archaeological objects. Add signs and barriers around the site.</li> <li>Notify the Silo Managers and Environmental Specialist who should immediately notify the responsible local authorities (Supreme Court of Antiquities) (within 24 hours or less).</li> <li>Responsible local authorities and SCA will decide on the way forward and appropriate procedures.</li> <li>Construction work could resume only after permission is obtained</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Contractor and subcontractor</li> <li>Supervised by Environmental specialist</li> <li>Silo Manager</li> </ul>	<ul style="list-style-type: none"> <li>Not Applicable</li> </ul>

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>from the SCA and any relevant authority. These procedures must be taken into consideration in the construction contracts.</p> <ul style="list-style-type: none"> <li>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.</li> <li>Workers shall be made aware of the chance find procedure.</li> </ul>		
Occupational Health and Safety (OHS)	Risks on workers’ health and safety	<ul style="list-style-type: none"> <li>The use of hazardous materials and chemicals and wastes can pose a risk to worker health (i.e. cement, paints, bitumen,oil etc.).</li> <li>Falls from heights are a possible cause of injuries in construction (silo rooftop areas/ use of scaffoldings etc.).</li> <li>Electrical hazards can cause serious injuries or death.</li> <li>Machinery can cause crushing injuries or amputations/moving loads.</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>Develop a site specific OHS Manual to include the results of the OHS risk assessment, responsibilities and staffing, preventative measures, mitigation measures,</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and subcontractor</li> <li>Supervised by the OHS Specialist with support from the Environmental specialist, and social specialist for reporting on grievance.</li> </ul>	50,000

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
		<ul style="list-style-type: none"> <li>Dust and fumes can irritate the eyes, nose, and throat, and can also cause respiratory problems.</li> <li>Noise emissions may disturb workers.</li> <li>Falling into excavated zones.</li> <li>Working during bad weather conditions (dust storm, heat wave, rainy seasons etc.).</li> <li>Injuries and burns from welding activities.</li> <li>Accidents while transporting materials and machinery to and from the subproject site.</li> <li>Accidental loads falling on workers while being lifted by cranes.</li> <li>Injuries from demolishing equipment and activities</li> <li>Physical injuries from physical activities and wrong lifting techniques, wrong posture while conducting any work.</li> <li>Slip trip and fall</li> <li>Injuries and cuts from machineries and hand arm vibration syndrome from machineries used</li> <li>Physical injuries from physical activities and wrong lifting techniques, wrong posture while conducting any work</li> </ul>	<p>emergency plans, training program, etc.</p> <ul style="list-style-type: none"> <li>Ensure the adequate implementation of occupational health and safety provisions on-site such as providing the personal protective equipment (PPE) to the workers including ear mufflers, masks, eye goggles, head helmets and safety boots are adhered by workers.</li> <li>Workers' PPE will comply with international good practice (always hardhats, as needed masks and safety glasses, harnesses, and safety boots).</li> <li>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.</li> <li>Follow the labor management procedures (LMP) and the</li> </ul>		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
		<ul style="list-style-type: none"> <li>Getting hit by moving load/vehicle/machine</li> <li>Working in confined area (risk of asphyxia while working inside the silos) during construction phase.</li> <li>Risks of electrocution while installing the Silos electrical units.</li> <li>Removal of electrical poles</li> <li>Generator and fuel fire hazard and gas emissions.</li> </ul>	<p>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.</p> <ul style="list-style-type: none"> <li>Prohibit all forms of child and forced labor.</li> <li>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 maintaining accident and incident investigation reports.</li> <li>Provide medical and life insurance for all workers</li> <li>Provide potable water supply and regular breaks to workers.</li> <li>Encourage workers to ask for help.</li> <li>Raise awareness to workers on proper posture and hand lifting techniques to avoid back and muscle injuries</li> <li>Train drivers on traffic safety rules and measures (e.g., leave safe distance and avoid</li> </ul>		



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>distractions with mobile phones).</p> <ul style="list-style-type: none"> <li>• Conduct drug check-ups on workers.</li> <li>• Ensure workers have driving license for trucks.</li> <li>• Use locally sourced materials whenever possible to minimize transport distances.</li> <li>• 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</li> <li>• Arrange work site vehicles and set speed limits and use a flagman for guiding vehicles and workers.</li> <li>• Provide site boundaries by installing suitable physical boundaries (barriers, tape, or fence)</li> <li>• The contractor should prepare and implement an Occupational Health and safety Management Plan (appendix III).</li> <li>• The contractor is provided with safety performance</li> </ul>		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>procedures and safety and hazard information.</p> <ul style="list-style-type: none"> <li>• Contractors observe safety practices.</li> <li>• Ensure proper housekeeping is maintained.</li> <li>• Use dust suppression techniques and provide dust masks and ear muffers during excavation and noisy activities.</li> <li>• Inspect equipment and machines before usage.</li> <li>• Provide soap and water and disinfectants at the site.</li> <li>• Workers' accommodation if needed should be according to international standards (i.e. EBRD/IFC guidance note for workers accommodation).</li> <li>• Any accidents should be communicated to the WB within 48 hours.</li> <li>• 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.</li> </ul>		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>• Provide awareness training to workers on physical handling to avoid back and muscle injuries.</li> <li>• ensure safe removal of electrical poles by licensed personnel</li> <li>• provide temporary lighting if needed</li> <li>• Check weather forecasts prior to conducting any work.</li> <li>• Workers to strictly maintain safe distance (marked) between demolishing zone and equipment</li> </ul> <p>Falling in excavated zones (5m deep).</p> <ul style="list-style-type: none"> <li>• Mark excavated holes with physical boundaries (barriers, tape, or fence) and provide signs alerting workers and machines of excavated zones.</li> <li>• Maintain a buffer zone between workers and excavations</li> <li>• Providing safe means of access and egress from excavations, such as graded</li> </ul>		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>slopes, graded access route, or stairs and ladders</p> <ul style="list-style-type: none"> <li>• Ensure presence of a well-fixed ladder for entering and existing excavations and ensure workers are wearing proper PPEs including dust masks, head helmets and fall prevention devices while entering and existing the excavated zone.</li> <li>• Keep excavated piles away from the excavated areas by 2 m.</li> <li>• Ensure a flagman is present for movements at work site.</li> <li>• Always check if workers are present within dredged zones prior to establishing any foundations.</li> </ul> <p>Handling hazardous chemicals and wastes</p> <ul style="list-style-type: none"> <li>• 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.</li> </ul>		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>• Ensure chemicals and materials and hazardous wastes are properly labeled.</li> <li>• Bitumen safety measures<sup>18</sup>:</li> <li>• Store handle and dispose of bitumen according to SDS and manufacturer’s guidelines. For fire risks of bitumen ensure Water spray, foam, dry powder or carbon dioxide are used and stored next to bitumen. Do not use water jet as an extinguisher.</li> <li>• Store away from oxidizing agents. Store in accordance with local regulations. Use containers made of carbon steel and stainless steel.</li> <li>• All handling should only take place in well-ventilated areas.</li> <li>• PPEs include: Wear tight-fitting, chemical splash goggles or face shield. Thermally insulated protective gloves. Change</li> </ul>		

<sup>18</sup> [https://www.neste.com/files/pdf/5jSubFKwtrYoTqetXkhDIH-10507\\_bitumen.pdf](https://www.neste.com/files/pdf/5jSubFKwtrYoTqetXkhDIH-10507_bitumen.pdf)

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>protective gloves regularly. Protective gloves should be according to standards EN 374 and EN 407.</p> <ul style="list-style-type: none"> <li>• PPEs are temperature resistant.</li> <li>• At high concentrations a breathing apparatus must be used (self-contained or fresh air hose</li> <li>• At high concentrations a breathing apparatus must be used (self-contained or fresh air hose breathing apparatus). Filter must be changed often enough. Respirator according to standard EN 140.</li> <li>• First aid: If it is suspected that volatile contaminants are still present around the affected person, first aid personnel should wear an appropriate respirator or self-contained breathing apparatus. If spray/mist has been inhaled, proceed as follows. Remove person to fresh air and keep comfortable for breathing. If breathing stops, provide</li> </ul>		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>artificial respiration. Get medical attention if symptoms are severe or persist. Do not induce vomiting. Get medical attention. In case of skin contact remove contaminated clothing and rinse skin thoroughly with water. Continue to rinse for at least 10 minutes. Do not use the following: Solvent. No attempt must be made to remove the bitumen adherent to the skin at the worksite. In the case of a circumferential burn with adhesion of the bitumen, the adhering material should be split to prevent a tourniquet effect as it cools. If adhesive bonding occurs, do not force skin apart. Get medical attention. In case of eye contact Rinse immediately with plenty of water. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention.</p> <p>Risks of falling loads on workers</p> <ul style="list-style-type: none"> <li>• Close the lifting /crane area with fence to prevent access to the lifting area during lifting work.</li> </ul>		



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>• Install warning signs for lifting activities.</li> <li>• Prevent accessibility to non-workers at lifting zones or any construction zone.</li> <li>• Ensure all workers are standing at a safe distance from the lifting zone.</li> <li>• Carry out lifting work by well trained, qualified, and certified lifting team.</li> <li>• Ensure a flagman is present on site to manage workers and machineries movements.</li> <li>• Provide workers with all necessary Personal Protective Equipment PPEs and safety materials.</li> <li>• Use well-maintained cranes for lifting that are appropriate for the weight; well checked and tested.</li> <li>• Secure loads when lifting and use strong and reliable fixation materials to make sure that the load is well tighten.</li> <li>• Lifting device capacity shall be higher than the maximum calculated static load at that point.</li> </ul>		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>An ultimate load shall be <math>\geq 4</math> times the maximum static load.</li> </ul> <p>Risks from falling from height/working at height:</p> <ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>Do not move ladders when workers are standing on them.</li> <li>Inspect scaffolds and ladders prior usage.</li> <li>Installation of guardrails with mid-rails and toe boards at the</li> </ul>		



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>edge of any fall hazard area where practical.</p> <ul style="list-style-type: none"> <li>• 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:               <ul style="list-style-type: none"> <li>○ 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.</li> <li>○ Training and use of personal fall arrest systems, such as full body harnesses and energy absorbing lanyards able to support 5000 pounds.</li> </ul> </li> </ul> <p>Risks from working in confined spaces/entering the silos:</p>		



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>• 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,</li> <li>• Carry gas tests prior to entering the silo to confirm its safety.</li> <li>• Measure oxygen content prior entering the silo and ventilate silo prior entering</li> <li>• Ensure the breathing apparatus was inspected prior to entering.</li> <li>• Adhere to oxygen breathing devices/breathing apparatus while working in silos.</li> <li>• Always ensure workers in confined areas are supervised and checked up on regularly.</li> <li>• Ensure worker receive a confined aid training prior to working in silos.</li> <li>• Develop a rescue plan for confined space.</li> <li>• Ensure adhering to safety ropes and lanyards.</li> </ul>		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>All machineries are stopped before entering silos</li> <li>Ensure an emergency stop button to stop augers.</li> <li>Keep shirts, and hair properly tightened to avoid being tangled in augers.</li> </ul> <p>Risks from welding activities and burns:</p> <ul style="list-style-type: none"> <li>Train workers on welding safety measures prior to conducting any welding work.</li> <li>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.</li> <li>Use only well-maintained equipment and regularly maintain equipment.</li> <li>Inspect equipment prior usage.</li> <li>Avoid welding activities at areas with high risks of fire hazards.</li> <li>Welding activities should be avoided during rainy periods and avoiding damp areas.</li> </ul>		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>Carry welding activities at well-ventilated areas.</li> </ul> <p>Risks from electrocution while performing electrical work.</p> <ul style="list-style-type: none"> <li>Ensure only trained workers/electricians perform such work.</li> <li>Ensure workers adhere to insulated PPEs.</li> <li>Never work during rainy periods.</li> <li>If construction work to be carried out on elevated areas, ensure working from height measures are followed.</li> <li>keep a safe distance between workers and high voltage lines and clearly define the distance</li> <li>ensure a proper grounding technique to prevent any accidental contacts with high voltage lines that may result in electrical shocks,</li> <li>use voltage detectors to verify the line is completely de energized before starting the work,</li> </ul>		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>where possible use remote control devices to operate high voltage equipment from a distance,</li> <li>follow national standards and best practice guidelines and OHS regulations, avoid working in harsh weather condition and wet/rainy periods .</li> </ul> <p>Emergency and fire risks:</p> <ul style="list-style-type: none"> <li>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.</li> <li>Ensure presence of fire prevention and mitigation measures including fire extinguishers and spill prevention kits next to generator and fuel and next to silo units.</li> <li>Monitor generator fuel consumption</li> <li>Carry regular maintenance on generator</li> </ul>		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>• Wear masks while working close to generators to avoid inhaling emitted gas</li> <li>•</li> <li>• Train workers on emergency and fire prevention plans.</li> <li>• Avoid working in bad weather conditions (dust storm, rainy periods, heat waves) and check weather forecast before conducting any work.</li> <li>• Presence of PPEs and fire extinguishers.</li> <li>• Presence of first aid kits on site.</li> <li>• Material and banners indicating the nearest police station and hospital (with accident and emergency facilities) should be posted at the site.</li> <li>• Provide first aid kits in different places of the work site and trained workers on first aid.</li> <li>• The presence of emergency procedures to transfer sick or injured workers on site to the nearest hospital.</li> <li>• Provide fire extinguishers on work sites.</li> </ul>		



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>All silos must be equipped with temperature and CO2 sensors to monitor the risks</li> <li>The existing silos must continue to be connected to fire and explosion safety equipment during construction phase of the expansion site and gas detectors must remain connected and functional. Regular inspections on gas detectors must be performed.</li> <li>The existing silos have separate entrances from the expansion silo areas / construction site which will be used for ambulances and firefighting trucks in case risk emerge.</li> <li>The entrance will remain uninterrupted, and no cars will be allowed to park there, and a flagman will be present for site arrangement and vehicle movements.</li> <li>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</li> </ul>		



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>the Aswan firefighting unit (8.4km drive), police inspection unit (9km drive) and ambulance unit (11.4 km drive).</p> <ul style="list-style-type: none"> <li>• There are also firefighting measures signs added on the walls.</li> <li>• The Security guard working for the police unit also notifies the firefighting unit through walkie talkie.</li> <li>• Silo gate and area are quickly emptied to allow the firefighting unit to enter (see appendix VIII for more details on existing fire safety measures).</li> <li>• Ensure corrective actions are implemented instantly</li> <li>• Report any major injuries to WB within 48 hours.</li> </ul>		

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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	<ul style="list-style-type: none"> <li>• Fire and explosion risks from badly stored fuel/ poorly stored/installed generator and mishandling of chemicals during construction phase and explosion from existing silo operations (unpredicted events) can lead to the death of workers in silos construction area and existing silo users.</li> <li>• Potential damage to nearby buildings may occur from explosion of existing silo which may cause injuries to communities and individuals in those areas.</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Follow similar measures present in the section above under “emergency and fire risks”</li> <li>• The design of the existing silos include some sort of window shaped boxes on the belt conveyers/elevators to reduce the impacts of explosion in case it happens.</li> <li>• Ensure proper grievance procedure is followed.</li> <li>• The current operating silos have explosion reduction systems in their designs including heat sensors and automated dust removal systems to reduce explosion risks and fire risks.</li> <li>• The existing silo has a plastic window to reduce explosion magnitude.</li> <li>• Develop and implement a fire and emergency response plan</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor and subcontractor.</li> <li>• Silo management (existing) Supervised by OHS Specialist, Environmental specialist, and social specialist for reporting on grievance.</li> <li>• PMU.</li> </ul>	25,000



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>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.</li> <li>Ensure firefighting equipment are serviced quarterly by fire service providers.</li> <li>Install fire and emergency exits at appropriate locations within the construction site and existing silos sites.</li> <li>Ensure good ventilation is maintained within the existing silos and for fuel and generator area and follow Safety Data Sheet for storage and handling and disposal of different chemicals used.</li> <li>Regularly perform maintenance on generators and other units.</li> <li>Install fire extinguishers and spill prevention kits next to generator and fuel.</li> </ul>		

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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>• Train staff on fire safety and have fire marshals on standby</li> <li>• Conduct fire drills and fire safety audits for construction workers and existing silo workers.</li> <li>• Use automated monitoring systems to detect any malfunctions or wear in the conveyor structure.</li> <li>• Implement warning systems or signals for vehicles and pedestrians near the conveyor area.</li> <li>• Install safety barriers, nets, and regular maintenance protocols to prevent falling items.</li> </ul>		
Unplanned events	Risk of property losses	<p>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:</p> <ul style="list-style-type: none"> <li>• Loss of stored grains and loss of storage area. Farmers and traders will not be able to sell and buy grains at the silo</li> </ul>	<ul style="list-style-type: none"> <li>• Silo management unit provides instant grain deposit receipt to farmers who deposited their grains.</li> <li>• Ensure proper grievance procedure under chapter 7 is followed.</li> <li>• Immediately report to the WBG any major events / incidents within 48 hours</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor and subcontractor.</li> <li>• Silo management.</li> <li>• Supervised by OHS Specialist, Environmental Specialist, and Social Specialist for reporting on grievance (in case of explosion risks)</li> </ul>	



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Factors	Impacts/risks	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
		<ul style="list-style-type: none"> <li>Potential damage to nearby buildings.</li> </ul>	<ul style="list-style-type: none"> <li>Mafalsa silo has a damage insurance.</li> </ul>	from existing silos).	

**Table (6.2):** 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	<ul style="list-style-type: none"> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Grain trucks should be properly covered to minimize dust and air emissions.</li> <li>Spray water for dust suppression.</li> <li>Minimize using water during dust suppression by applying dust sweeping methods.</li> <li>Maintain proper housekeeping</li> <li>Check weather forecasts prior to loading and unloading activities.</li> <li>Ensure vehicles and grain trucks use paved roads wherever possible.</li> <li>Speed limits shall be enforced on unpaved roads, to be &lt;30km/hr.</li> <li>Ensure turning off vehicles / grain trucks when not in use.</li> <li>The design of the silo includes automated grain dust extraction systems.</li> <li>Ensure Grievance mechanism is functional to address operation workers and community complains.</li> </ul>	<ul style="list-style-type: none"> <li>Silo Management Environmental specialist, and social specialist for reporting on grievance.</li> </ul>	10,000
	Gaseous emissions from Engine	<ul style="list-style-type: none"> <li>The major activities at this phase are maintenance procedures and transport of</li> </ul>	<ul style="list-style-type: none"> <li>Ensure turning off vehicles / grain trucks when not in use.</li> </ul>	<ul style="list-style-type: none"> <li>Silo Management Environmental specialist, social</li> </ul>	10,000

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
	Exhaust Gases and from fumigation process	<p>many cars during the daytime. Trucks transporting grains and generator will release exhaust emissions, containing carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), oxides of nitrogen (NOX), and particulate matter (PM).</p> <ul style="list-style-type: none"> <li>Fumigation emissions from silos and airborne drift from pesticides application may also reduce ambient air quality</li> </ul>	<ul style="list-style-type: none"> <li>Maintain trucks and vehicles belonging to EHCSS in good working conditions and perform regular maintenance and maintain a maintenance log.</li> <li>Ensure Grievance mechanism is functional to address operation workers and community complains</li> <li>Provide awareness raising on energy reduction measures to workers.</li> <li>Gas tight Pressure tests must be carried out when grains are added and prior to each fumigation activity</li> <li>Pressure tests need to be part of the annual maintenance of silos.</li> <li>Monitor and maintain and repair seals regularly when silos are empty</li> <li>Add gas sensors around silos</li> <li>Perform regular maintenance on generators and other units</li> <li>Follow the PMP in annex I</li> </ul>	specialist for reporting on grievance.	
	Impacts on Soil and long-term risks on ground Water	<ul style="list-style-type: none"> <li>Sources of soil contamination are accidental and lubricant/fuel spills of</li> </ul>	<ul style="list-style-type: none"> <li>Include spill prevention kits on site to control and contain and clean up any potential spills from</li> </ul>	<ul style="list-style-type: none"> <li>Silo Management</li> <li>Environmental specialist, social</li> </ul>	10,000

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
	Quality from trucks and machineries and any potential chemical	<p>trucks transporting grains to and from the Silo Complex in Mafalsa. Other sources also include inappropriate waste disposal from the offices and inappropriate sewage disposal which may contaminate the soil. Spills may also result from result from badly stored chemicals and materials and wastes.</p> <ul style="list-style-type: none"> <li>• Badly stored and bad disposal off fumigation chemical (Phostoxin) may pose risk of contamination</li> <li>• Accidental spills from generator and soil contamination from battery</li> </ul>	<p>grain trucks immediately during the operation.</p> <ul style="list-style-type: none"> <li>• Perform periodical maintenance on equipment used during the operation phase, for example during loading and uploading of grains.</li> <li>• Schedule operation activities to avoid rainfall and high wind periods to the extent practical</li> <li>• Ensure all chemicals are labelled, stored, handled, and disposed according to their safety data sheets (SDSs) and manufacturer's guidelines by trained workers.</li> <li>• All chemicals are stored on insulated areas from the ground and in secondary containment.</li> <li>• Ensure the grievance mechanism is functional to address operation workers and community complaints.</li> <li>• Ensure good housekeeping</li> <li>• Wastewater is collected in an existing tank and regularly disposed in the sewage network. Wastewater amount is not expected to increase with expansion work.</li> </ul>	specialist for reporting on grievance.	

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>• Presence of fire extinguishers and CO2 extinguishers next to stored chemicals.</li> <li>• Ensure Phostoxin is stored in tight containers, ensure the storage area of Phostoxin is equipped with good ventilation system.</li> <li>• Do not store Phostoxin next to water and sewage areas and strictly store in dry areas.</li> <li>• Remove any spills based on directions by manufacturers.</li> <li>• Coordinate with a local certified contractor to dispose hazardous chemicals and wastes.</li> <li>• Generator and fuel and are stored on concrete base and well-ventilated zones.</li> <li>• Store fuel in secondary containment on concrete bases.</li> <li>• Monitor fuel used to detect any leakage.</li> <li>• Inspect soil around generator and fuel storage area and detect if any soil color changes occur.</li> </ul>		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>Ensure proper concrete base is maintained, and ventilation is functional.</li> </ul>		
	Noise	<ul style="list-style-type: none"> <li>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</li> <li>Noise from the generator</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>Restricting the movement of grain trucks to prevent noise in the early morning and late evening periods in coordination with local authority.</li> <li>Ensure all vehicles are turned off when not in use.</li> <li>Monitor noise levels during operation activities to confirm the effectiveness of measures implemented.</li> <li>Select equipment with low noise emissions and that is technically and financially feasible.</li> <li>Conduct regular maintenance to equipment and units and generator to reduce noise emissions</li> <li>Ensure Grievance mechanism is functional to address workers and community complaints.</li> </ul>	<ul style="list-style-type: none"> <li>Silo Management</li> <li>Environmental specialist, and social specialist for reporting on grievance.</li> </ul>	8,750

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>Regular health checkups to ensure protection from noise.</li> </ul>		
	Biodiversity	<ul style="list-style-type: none"> <li>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 (also, secondary poisoning from Rodenticides ),(b) the emission of pollutants from vehicles and machinery can pollute the air and water, which can harm animals if any, C) Potential threat to local wildlife due to unauthorized hunting activities and collection, and E) Grain spills from current operational silos attracting birds to the site.</li> </ul>	<ul style="list-style-type: none"> <li>Follow measures present in the pest management plan to avoid consumption of pesticides by non-targeted species or secondary poisoning.</li> <li>Follow same measures for air, noise and wastes emissions.</li> <li>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, and the risk of collision is higher when the buildings are made of glass which is not the case in the silos</li> <li>Install clear warning signs around the site stating the prohibition of hunting/trapping.</li> <li>Enforce a strict no-hunting and no-wildlife collection policy across the facility.</li> <li>Implement strict penalties for wildlife collection and hunting</li> </ul>	<ul style="list-style-type: none"> <li>Silo Management Environmental specialist</li> </ul>	8,000

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>• Ensure good housekeeping measures are maintained and no spilled grains observed</li> <li>• Ensure proper grain handling procedures during loading/unloading to minimize spills</li> <li>• Install physical barriers or collection trays to contain any accidental spills</li> <li>• Implement regular cleaning schedules around silo areas.</li> <li>• Train staff on safe rodenticide use and ecological risks according to the PMP.</li> <li>• Use covered conveyors and enclosed transfer systems wherever possible.</li> <li>• Train staff on best practices to minimize grain losses during handling</li> </ul>		
	Waste Management	<p><b>Solid waste</b></p> <ul style="list-style-type: none"> <li>• Ongoing generation from operations, maintenance, offices.</li> </ul> <p><b>Liquid waste</b></p>	<p><b>Waste management:</b></p> <ul style="list-style-type: none"> <li>- Waste collection and disposal pathways and sites will be identified for all major waste types expected from the operation activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Silo Management Environmental specialist, and social specialist for reporting on grievance</li> <li>• Waste contractors</li> </ul>	12,500

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
		<ul style="list-style-type: none"> <li>Potential wastewater from grain washing, equipment cleaning, sanitation (water use is minimal).</li> </ul> <p><b>Hazardous waste</b></p> <ul style="list-style-type: none"> <li>Potentially hazardous waste from pesticide use, grain fumigation, maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>Wastes will be segregated by type (solid, hazardous, and liquid wastes).</li> <li>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.</li> <li>The records of waste disposal will be maintained as proof for proper management as designed.</li> <li>Avoid accumulation of organic wastes and food remains.</li> <li>Implementing pest and rodent control measures (Annex 1).</li> <li>Record grievances.</li> </ul> <p><b>Wastewater:</b></p> <ul style="list-style-type: none"> <li>The approach to handling sanitary wastes and wastewater from the existing silos must be approved by the local authorities.</li> <li>Wastewater/sewage from toilets/latrines (existing offices) will be collected in existing tank and disposed at the closest sanitation network. Wastewater amount is not expected to increase with expansion work.</li> <li>Record grievances.</li> </ul>		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p><b>Hazardous chemicals, materials, and waste:</b></p> <ul style="list-style-type: none"> <li>- Temporarily storage on site of all hazardous or toxic substances will be in safe containers labelled with details of composition, properties, and handling information.</li> <li>- The containers of hazardous substances shall be placed in a leak-proof container to prevent spillage and leaching.</li> <li>- The wastes shall be transported by specially licensed carriers and disposed in a licensed facility.</li> <li>- All chemicals and hazardous materials should be stored, handled, and disposed according to their safety data sheets (SDSs) and by trained workers.</li> <li>- Remove any spills regularly based on directions by manufacturers.</li> <li>- Coordinate with a local certified contractor to dispose hazardous chemicals and wastes (see baseline for names of certified contractors)</li> <li>- Record grievances.</li> <li>- For E-waste ensure they are stored separately according to their manufacturer’s guidelines, and they are disposed by E-waste contractors.</li> </ul>		

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p><b>Pest Management Plan (fumigation in silos, rodenticides around site and offices):</b></p> <ul style="list-style-type: none"> <li>- Follow and develop the pest management plan (PMP) annex 1 and ensure fumigation and pesticides applications and handling are carried according to the PMP</li> <li>- Ensure guidelines of hazardous materials and wastes are followed.</li> </ul>		
Socio-economic Aspects	Risks to labor and lack of appropriate work conditions and Workers	<ul style="list-style-type: none"> <li>• Silo workers and seasonal workers may face unfair treatment (discrimination, delayed payments, unsafe working conditions and unresolved complaints from the lack of grievance mechanism.</li> <li>• Workers may face occupational health and safety hazards (e.g., grain dust exposure, machinery accidents).</li> <li>• Seasonal workers including cleaning workers during</li> </ul>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Workers should be made aware of their rights regarding working hours, days off, salaries</li> <li>• All workers will have valid signed contracts</li> <li>• A grievance mechanism (present in chapter 7) will include channels</li> </ul>	<ul style="list-style-type: none"> <li>• Subcontractors for seasonal workers supervised by social specialist and environment health and safety specialist</li> <li>• Silo Management Social specialist and environment health and safety specialist for silo operations</li> <li>• EHCSS</li> </ul>	12,500

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
		<p>operational phase are at risk from working from height and confined areas, utilizing child labor and improper PPEs, from the following activities:</p> <ul style="list-style-type: none"> <li>➤ There is a contractor that brings seasonal workers to empty seed bags and conducting cleaning activities including silos cleaning.</li> <li>• The cleaning specialists remove the grains from the bottom and sides of the silos. Cleaning is done every beginning of the season</li> </ul>	<p>for workers. Workplace grievances will be handled in a positive manner with no retaliation, and this will be communicated to workers</p> <ul style="list-style-type: none"> <li>• Provision of anonymous grievances.</li> <li>• Implement the project level labor management plan (LMP) which also addresses to subcontracted workers.</li> <li>• Subcontractor will provide all the needed PPEs and safety tools with supervision of the silo management.</li> <li>• Subcontractor and silo management will ensure proper OHS mentioned in this document are followed by seasonal workers and subcontractors.</li> <li>• The silo management will provide the following based on consultation: <ul style="list-style-type: none"> <li>○ Providing industrial security equipment for site employees in accordance with occupational safety and health requirements.</li> <li>○ Paying transportation</li> </ul> </li> </ul>		

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>allowances to site employees and providing cars to reduce the burden of transportation to and from the sites due to the distance of the silo sites from residential areas and considering establishing silos in places close to residential areas and with available means of transportation.</p> <ul style="list-style-type: none"> <li>○ 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 <b>hours are achieved.</b></li> <li>● PMU will conduct regular inspections on silos.</li> </ul>		
	Risks on vulnerable populations	<ul style="list-style-type: none"> <li>● 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: <ul style="list-style-type: none"> <li>➢ Limited access to silo services by small</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Develop a well communicated and accessible grievance mechanism for community members to address any complaints including anonymous grievances (see GM in chapter 7)</li> <li>● Provide various grievance channels to obtain grievances.</li> <li>● Ongoing stakeholder consultation will include female farmers, disabled and vulnerable</li> </ul>	<ul style="list-style-type: none"> <li>● Silo Management, and Social Specialist</li> </ul>	8,000

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
		<p>farmers and vulnerable populations due to elite capture.</p> <p>Risk of unequal access to food distribution channels and purchasing power which can lower food accessibility to vulnerable population.</p> <ul style="list-style-type: none"> <li>Existing facilities at the silo, including loading and unloading equipment, were reported to be insufficient to handle peak harvest demands efficiently.</li> <li>Farmers and traders face logistical difficulties, including a lack of adequate transportation</li> </ul>	<p>populations through regular focus group discussions.</p> <ul style="list-style-type: none"> <li>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 groups as per the SEP document.</li> <li>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</li> <li>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</li> <li>For other vulnerable groups such as persons with disabilities use</li> </ul>		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
		support for grain delivery to the silo	<p>preferred means of communications using Arabic language and tailored means of communications for different types of disabilities.</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Include a separate fast-tracking lane for women.</li> <li>• the design will include accessible restrooms for persons with disabilities of both genders.</li> </ul> <p>Provide the following on site based on consultation results:</p> <ul style="list-style-type: none"> <li>• Organizing the operations of supplying and dispensing wheat from silos to reduce the accumulation of cars around and inside the site</li> <li>• Reducing the waiting time for wheat suppliers to reach the silos.</li> <li>• Expediting the procedures for disbursing wheat suppliers' dues.</li> </ul>		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>Using laboratory equipment to settle disputes that may arise between suppliers and the sorting committee regarding the degree of wheat cleanliness.</li> <li>Providing yards and waiting areas equipped with bathrooms segregated by sex for wheat suppliers.</li> <li>establish on-site teams specifically trained to assist vulnerable groups during grain delivery</li> <li>incorporate ramps to facilitate easy access for individuals with mobility challenges as a design measure</li> <li>implement a scheduling system during peak periods hours to reduce congestion and ensure that vulnerable groups receive timely assistance and d) include a fast-tracking lane for elderly and small farmers and separate lane for women</li> <li>include parking space for persons with disabilities and elderly</li> <li>engage regularly with small farmers, women and elderly and</li> </ul>		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>inform them with the above mentioned services tailored to their needs.</p> <p>For Technical and Physical Constraints:</p> <ul style="list-style-type: none"> <li>the increase in the number of storage cells will expand the overall capacity and reduce congestion</li> <li>the installation of modern, automated loading and unloading systems will accelerate grain handling processes</li> <li>enhance regular maintenance and inspection schedules to ensure that all equipment is functioning optimally, especially during peak periods</li> <li>implement a scheduling system during peak periods hours to reduce congestion and inform farmers on maintenance schedule.</li> <li>Designate accessible parking spots and clearly marked accessible entrances.</li> <li>Ensure that public areas and facilities within the silo are accessible for the people with</li> </ul>		

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>disabilities, including restrooms and workstations.</p> <p>For logistical difficulties:</p> <ul style="list-style-type: none"> <li>the Silo Manager will collaborate with local transport providers to secure reliable, cost-effective vehicle services for grain delivery</li> <li>encourage the formation of cooperatives among local farmers to share transportation resources, reducing individual costs and delays</li> <li>implement a robust traffic management plan to facilitate efficient loading and unloading operations, minimizing delays.</li> </ul>		
	<p>Risks on child labor/children present in silos during grain transport</p> <p>Risks of child labor by seasonal workers subcontractors</p>	<ul style="list-style-type: none"> <li>The presence of children in grain handling or transport and loss of educational opportunities.</li> <li>Children being Exposed to hazardous substances or working conditions.</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>Ensure implementing the Labor Management Plan (LMP)</li> </ul>	<ul style="list-style-type: none"> <li>Subcontractor for seasonal workers supervised by social specialist and OHS Specialist</li> <li>Silo Management, Social specialist and OHS Specialist</li> <li>EHCSS</li> </ul>	7,000

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>For silo workers, maintain a copy of IDs of workers to prevent hiring workers under 18 years.</li> <li>The silo management will add signs and banners on the dangerous of child labor and will raise the awareness of silo users.</li> <li>For subcontractors of the seasonal workers, awareness on danger of child labor and penalties will be communicated and will be part of the subcontractor's contract. fines and penalties will be set in case child labor is detected.</li> <li>EHCSS will check labor policies of the contractor.</li> <li>Regular inspection will be conducted by the Food Security PMU (Project Management Unit).</li> </ul>		
	Risks of SEA/SH	<ul style="list-style-type: none"> <li>Potential SEA/SH among staff and visitors.</li> </ul>	<ul style="list-style-type: none"> <li>Follow same measures for this risk present in construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>Silo Management, and social specialist</li> </ul>	7,000
	Community health and safety: Traffic risks and accidents	<ul style="list-style-type: none"> <li>The risk of road accidents may increase during high storage seasons. The number of grain transport trucks is expected to increase.</li> <li></li> </ul>	<ul style="list-style-type: none"> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>Silo Management, and social specialist with support from Environmental Specialist</li> </ul>	7,500



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>the silos and routes widths and capacities) appendix II.</p> <ul style="list-style-type: none"> <li>• Access roads for grain trucks shall be determined in coordination with the traffic authority.</li> <li>• EHCSS truck drivers:</li> <li>• Ensure truck drivers have valid license</li> <li>• Ensure truck drivers received training on good practice driving such as maintaining speed limits and wearing seat belts</li> <li>• Ensure drug check-ups are regularly conducted on truck drivers.</li> <li>• Monitor unusual traffic delays or accidents.</li> <li>• Ensure regular maintenance is conducted for the trucks.</li> <li>• Avoid peak hours.</li> <li>• For onsite traffic Pedestrian lanes/zones are present on site.</li> <li>• Presence of flagman for site arrangement</li> </ul>		

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>Follow, develop and implement the traffic management plan (appendix II) and GM (chapter 7).</li> <li>Report any major injuries and accidents to the WB within 48 hours.</li> <li></li> </ul>		
Occupational Health and Safety (OHS)	Risks on workers health and safety	<ul style="list-style-type: none"> <li>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.</li> <li>Gaseous exposures from trucks and generator causing severe respiratory irritation,</li> <li>Falling from height or accidentally falling in silos while working at height during maintenance</li> <li>Asphyxia from working in confined areas while conducting maintenance works.</li> <li>Grain dust is a fire hazard, and a fire at the silos could</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>Wear masks while working close to generators to avoid inhaling emitted gas</li> <li>Check weather forecasts prior to loading and unloading to prevent grain dust emissions</li> <li>Ensure regular site cleaning is kept.</li> </ul>	<ul style="list-style-type: none"> <li>Silo Management, OHS Specialist with support of Environmental specialist, and social specialist for reporting on grievance</li> <li>Subcontractor for seasonal workers supervised by Silo management OHS Specialist with support of Environmental specialist, and social specialist for reporting on grievance</li> </ul>	19,500

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
		<p>cause serious injuries or death.</p> <ul style="list-style-type: none"> <li>• Generator and fuel fire hazard and gas emissions</li> <li>• Grain dust explosions can also cause serious injuries or death.</li> <li>• Risks from grain engulfment</li> <li>• Risks of being entangled in unguarded auger and potential injuries</li> <li>• Risks of burns from hot surfaces</li> <li>• Noise and vibration emissions from silos operations and units,</li> <li>• Unhygienic practices</li> <li>• Handling of toxic substance, chemicals and wastes, such as pesticides and rodenticide especially during application</li> <li>• Risks of skin and eye burns and irritation from handling, storing and disposing chemicals and empty containers and other</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure toilets are well kept and cleaned regularly</li> <li>• Provide ear muffers to workers working near noisy units.</li> <li>• 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.</li> <li>• 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 maintaining accident and incident investigation reports.</li> <li>• 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.</li> </ul>	<ul style="list-style-type: none"> <li>• EHCSS</li> </ul>	



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
		types of wastes including domestic waste	<ul style="list-style-type: none"> <li>Prohibit all forms of child and forced labor.</li> <li>Provide medical and life insurance for all workers</li> <li>Material/banner indicating the nearest police station and hospital (with accident and emergency facilities) should be posted at the site.</li> <li>Provide first aid kits in different places on the work site and trained workers in first aid.</li> <li>The presence of emergency procedures to transfer sick or injured operation workers on site to the nearest hospital.</li> <li>All workers should be trained in handling, storing, and disposing of all types of chemicals and wastes according to their safety data sheets (SDSs).</li> <li>Ensure workers handling chemicals and pesticides are properly trained.</li> <li>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.</li> <li>Ensure vehicles are regularly maintained.</li> </ul>		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>• Conduct drug check-ups on workers.</li> <li>• Report any major incident to WB within 48 hours.</li> <li>• 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.</li> <li>• All workers entering the silo must adhere to safety-line. body harness and breathing apparatus and must be supervised and in case of grain engulfment, they can be pulled away.</li> <li>• Gas detectors are in place and continuously monitor gas emissions to maintain safe working conditions. In the event of maintenance within the silos, the phosphine atmosphere is replaced with breathable air to ensure worker safety.</li> <li>• Apply same measures present under construction phase for silo workers as well as any seasonal workers including specific measures for working in confined areas, handling chemicals and hazardous wastes, falling from</li> </ul>		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>height, electrocution and follow EHCSS emergency procedures.</p> <ul style="list-style-type: none"> <li>• Ensure grain augers (if present) and grain elevators are turned off prior to conducting any operational and maintenance works inside the silos.</li> <li>• Follow safety procedures in the pest management plan annex I.</li> <li>• Food security PMU will conduct regular inspections</li> <li>• Ensure fuel and generator area are located on concrete base, well-ventilated and fuel is in secondary containment, presence of spill prevention kits and follow Safety Data Sheet for storage and handling and disposal of different chemicals used.</li> <li>• Regularly perform maintenance on generators transformers and other units</li> <li>• Install fire extinguishers and spill prevention kits next to generator and fuel</li> <li>• All silos must be equipped with temperature and CO2 sensors to monitor the risks.</li> <li>• The existing silos must remain connected to fire and explosion safety equipment and gas detectors must remain connected and functional. Regular</li> </ul>		

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>inspections on gas detectors must be performed.</p> <ul style="list-style-type: none"> <li>The entrance will remain uninterrupted, and no cars will be allowed to park there and a flagman will be present for site arrangement and vehicle movements.</li> <li>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 Aswan firefighting unit (8.4km drive), police inspection unit (9km drive) and ambulance unit (11.4 km drive).</li> <li>There are also firefighting measures signs added on the walls</li> <li>The Security guard working for the police unit also notifies the firefighting unit through walkie talkie</li> <li>Silo gate and area are quickly emptied to allow the firefighting unit to enter (see appendix VIII for more details on existing fire safety measures).</li> </ul> <p><b>Handling Phostoxin (fumigation):</b></p>		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>• Keep ignition sources away</li> <li>• Do not smoke.</li> <li>• Protect against electrostatic charges.</li> <li>• Keep protective respiratory device available</li> <li>• Store away from water, acids, bases, strong oxidizing agents and strong reducing agents</li> <li>• Do not store with acids</li> <li>• Store products in a locked, dry, cool, well-ventilated area away from heat. Post as a pesticide storage area.</li> <li>• Do not store in buildings inhabited by humans or domestic animals.</li> <li>• Do not breathe dust/fume/gas/mist/vapors/spray.</li> <li>• Do not allow contact with water</li> <li>• Respiratory protection will most likely be required during cleanup of spilled aluminum phosphide fumigants. If the concentration of phosphine (hydrogen phosphide, PH<sub>3</sub>) is unknown, NIOSH/MSHA approved SCBA or its equivalent must be worn. Full-face gas mask canister combinations may only be worn</li> </ul>		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>at concentrations no higher than 15 ppm.</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Wear tightly sealed goggles.</li> <li>• Wear face protection.</li> <li>• Wear respiratory protection.</li> <li>• Wash thoroughly after handling.</li> <li>• 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.</li> <li>• 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.</li> </ul>		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>• If on skin: Wash with plenty of water.</li> <li>• If skin irritation occurs: Get medical advice/attention</li> <li>• If inhaled: Remove person to fresh air and keep comfortable for breathing</li> <li>• If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.</li> <li>• Specific treatment is urgent (see supplementary first aid instructions on this Safety Data Sheet).</li> <li>• If swallowed: Immediately call a poison center/doctor.</li> <li>• Keep containers tightly closed and proper ventilation.</li> <li>• Containers to be disposed based on SDSs and manufacturers recommendations.</li> <li>• Properly label and store the material according to its MSDS.</li> <li>• During fumigation, EHCSS staff and workers are required to gather and stand at a safe distance from the silos</li> </ul> <p><b>Seasonal Workers</b></p>		

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>The silo's manager and OHS Specialists make sure that the cleaning workers for silos have the capacity to work in silos and aware of the OHS measures and how to use PPEs properly and knowledge about risks in working in silos.</li> <li>The manager and OHS Specialists reviews safety measures with cleaning workers before entering the silos.</li> <li>Silos are emptied before the worker enters</li> <li>All machineries are shut down before the worker enters the silo</li> <li>The LMP has procedures to deal with contractors and subcontractors obtained by EHCSS, on the labor rights and OHS for seasonal workers.</li> <li>Follow child labor mitigation measures.</li> </ul>		
Unplanned risks	Catastrophic events can produce major negative impacts on OHS, health and safety of silo users	<ul style="list-style-type: none"> <li>Fire and explosion during existing silo operations (unpredicted events) can lead to the death of workers and silo users.</li> <li>Potential damage to nearby buildings may occur from</li> </ul>	<p>The existing facility and expansion facility include the following:</p> <ul style="list-style-type: none"> <li>Guidelines attached to walls on fire fighting</li> <li>The presence of water firefighting system</li> <li>Presence of FM 200 and FMD fire extinguishers in control room</li> </ul>	<ul style="list-style-type: none"> <li>Silo Management, OHS Specialist, Environmental specialist, and social specialist for reporting on grievance.</li> <li>EHCSS/PMU</li> </ul>	20,000

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
	including non-workers and individuals in neighboring industries	<p>explosion of existing silo which may cause injuries to communities and individuals in those surrounding areas.</p> <ul style="list-style-type: none"> <li>• Phostoxin/Aluminum phosphide may ignite spontaneously and may lead to explosion.</li> <li>• Risk of leaks of Phostoxin during transportation</li> <li>• Fire risks from generators</li> </ul>	<ul style="list-style-type: none"> <li>• Presence of CO<sub>2</sub> fire extinguisher in electricity room</li> <li>• Presence of water hose in machine towers</li> <li>• There is heat thermometer to calculate heat in silos and there is a ventilation system to adjust the weather condition within the silo.</li> <li>• The bucket elevators have heat sensors as well</li> <li>• All filters for dust must be activated before any machine is operating in silo</li> <li>• The silos include systems to reduce impact of explosion (design phase) including windows and gates</li> <li>• Ensure corrective actions are taken</li> </ul> <p>In addition to the above, the silo management will:</p> <ul style="list-style-type: none"> <li>• Develop and implement a fire and emergency response plan</li> <li>• 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</li> </ul>		

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>• Ensure firefighting equipment are serviced quarterly by fire service providers</li> <li>• Install fire and emergency exits at appropriate locations within the silos</li> <li>• Ensure good ventilation is maintained within the silos and generator room and appropriate extinguishers are placed</li> <li>• Train staff on fire safety and have fire marshals on standby</li> <li>• Conduct fire drills regularly and fire safety audits annually Follow EHCSS evacuation procedures, OHS plan and firefighting procedures. Immediately report to the WBG any major events / incidents within 48 hours.</li> <li>• Ensure proper grievance procedure is followed.</li> </ul> <p><b>Phostoxin/Aluminum phosphide management according to its SDS<sup>19</sup>:</b></p> <ul style="list-style-type: none"> <li>• Never allow the buildup of phosphine gas (hydrogen phosphide, PH<sub>3</sub>) to exceed explosive concentrations. Open containers of metal phosphides in open air only</li> </ul>		

<sup>19</sup> For more information and guidance on Phostoxin follow [https://label.westernpest.com/files\\_techservices/live/degesch.phostoxin052418.sds.pdf](https://label.westernpest.com/files_techservices/live/degesch.phostoxin052418.sds.pdf)

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>and never in a flammable atmosphere</p> <ul style="list-style-type: none"> <li>Do not confine spent or partially spent dust from metal phosphide fumigants as the slow release of phosphine gas (hydrogen phosphide, PH<sub>3</sub>) 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.</li> <li>Do not store next to water and wet areas and do not dispose in sewage</li> <li>Do not allow to enter sewers/surface or ground water.</li> <li>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.</li> <li>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</li> </ul>		



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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>gallon. Do not add more than about 1 to 1.5 kg (2 to 3 lbs.) to a bucket. If on-site wet deactivation using deactivation solution is not feasible, transport the uncovered buckets in open vehicles to a suitable area according to local authority and manufacturer's guidelines. Small amounts of spillage, from about 4 to 8 kg (9 to 18 lbs.) may be spread out over the ground in an open area to be deactivated by atmospheric moisture. Alternatively, spilled aluminum phosphide fumigants may be deactivated by using the deactivating solution as noted on the SDS and guidelines of manufacturer.</p> <ul style="list-style-type: none"> <li>• Inform relevant authorities in case of seepage in water resources or sewage system</li> <li>• In case of fire, use CO2, sand, extinguishing powder. Do not use water. Use firefighting measures that suit the environment.</li> <li>• 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</li> </ul>		

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
			<p>worn at concentrations no higher than 15 ppm.</p> <ul style="list-style-type: none"> <li>As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear to prevent contact with skin and eyes. Wear a NIOSH/MSHA approved full-face gas mask – phosphine gas canister combination may be used at levels up to 15 ppm or following manufacturers’ use conditions instructions for escape. Above 15 ppm or in situations where the phosphine gas concentration is unknown, a NIOSH/MSHA approved SCBA must be worn.</li> <li>Follow EHCSS evacuation procedures, OHS plan and firefighting procedures.</li> <li>Immediately report to the WBG any major events / incidents within 48 hours.</li> <li>Ensure proper grievance procedure is followed.</li> <li>Storage precautions mentioned in the document for Phostoxin will be considered also during the transportation of these pesticides.</li> </ul>		
Unplanned risks	Risk of property losses	<ul style="list-style-type: none"> <li>Catastrophic events such as explosions and fire events</li> </ul>	For socio-economic risks:	<ul style="list-style-type: none"> <li>Silo Management, Social specialist</li> </ul>	

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Factors	Risks and Impacts	Description	Mitigation Measures	Responsibility	Budget (USD/Year)
		<p>can produce major negative impacts on the livelihood of silo users.</p> <ul style="list-style-type: none"> <li>Catastrophic events such as fire and explosions can lead to property damage in neighboring buildings.</li> </ul>	<ul style="list-style-type: none"> <li>Silo management unit provides instant grain deposit receipt to farmers who deposited their grains</li> <li>Ensure proper grievance procedure under chapter 7 is followed.</li> <li>and raise awareness to farmers and grain buyers on the grievance mechanism.</li> <li>Mafalsa silo has a damage insurance.</li> <li>Ensure proper grievance procedure is followed.</li> <li>Immediately report to the WBG any major events / incidents within 48 hours.</li> </ul>	<ul style="list-style-type: none"> <li>EHCSS</li> </ul>	
Unplanned risks	Pesticides leaks	<ul style="list-style-type: none"> <li>Pesticides during fumigation activities may leak into the atmosphere and cause health and safety and environment risks.</li> </ul>	<ul style="list-style-type: none"> <li>Pressure tests must be carried out prior to handing over.</li> <li>Gas tight Pressure tests must be carried out when grains are added and prior to each fumigation activity.</li> <li>Pressure tests need to be part of the annual maintenance of silos</li> <li>Monitor and maintain and repair seals regularly when silos are empty.</li> <li>Add gas sensors around silos.</li> </ul>	<ul style="list-style-type: none"> <li>Silo Management, and Environmental Specialist /EHCSS</li> </ul>	



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## 6.4 Training and Awareness

The policy and objectives of this ESMP 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 ESMP. 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 Mafalsa 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 ESMP of Mafalsa 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 ESMP.
- The potential consequences of departure from specified operating procedures.

Generally, the EHCSS will provide three forms of training in Mafalsa site: a) Site induction, b) Environmental and social management training, and c) Toolbox talk training.

Records of induction and training will be kept in the environmental and social file on the Mafalsa 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: a) Emergency response training, b) Emergency kit training, c) Environmental and social auditing; and d) sampling and monitoring.

All environmental and social training records are to be held at the EHCSS and Mafalsa Silo office. The environmental and social manager will have responsibility for maintaining and updating these records. As a requirement of each training session a record should be completed with the date of the training exercise, a description of the training content, the name of the trainer and trainees, and the signature of the trainer and relevant manager. The principal contractors and sub-contractors may use its own format if available.



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### 6.4.1. Training Requirements

Experienced, well-trained personnel are essential for the successful implementation of this plan. EHCSS and contractors and sub-contractors will ensure that persons engaged in 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 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. All other workers personnel will attend a training session before the beginning of operation and during seasonal operation as environmental and social issues and incidents warrant. Additional training sessions will be held for newly assigned personnel prior to commencing work on the project.

All workers personnel will attend the training session prior to entering the operation site. All workers' personnel shall sign an acknowledgement of having attended the appropriate level of training. To ensure successful compliance, workers personnel shall attend repeat or supplemental training if compliance is not satisfactory or as new, significant new issues arise. All visitors and any other personnel without specific work assignments shall be required to attend a safety and environmental and social awareness orientation.

#### OHS Training Requirements:

All workers involved in the construction and operation of the silo expansion must receive OHS training on the following topics:

- General OHS principles: This should include training on hazard identification and risk assessment, safe work practices, and emergency procedures.
- Silo-specific hazards: This should include training on the following hazards: a) falling from heights, b) confined space hazards, c) silo dust explosions, d) grain entrapment, and e) machinery hazards.
- Silo-specific safety procedures: This should include training on the following procedures: a) safe work practices for silo construction and maintenance, b) Silo lockout/tagout procedures, and c) Silo emergency response procedures.

OHS training will be provided by a qualified trainer and will be tailored to the specific tasks that each worker will be performing. Workers should be retrained on OHS procedures on a regular basis, and refresher training should be provided whenever new hazards are identified or when there have been changes to work procedures.

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### 6.4.2. Site Induction

Prior to working on site all personnel and subcontractors 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.

### 6.4.3. Task-Specific Training

The environmental and social manager will determine activities and personnel required to have specific instructions, 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.

## 6.5. 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 who supports the preparation of the bidding documents. EHCSS has also a supervision consultant on board. The plan is that the supervision consultant will constitute the supervision work related to OHS, environment and social risks during construction phase. The supervision consultant will supervise the contractor's environment and social and OHS works. The technical consultant and the supervision consultant work will be finished at the end of the construction work.

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

**Table (6.3):** Roles and responsibilities at Mafalsa Silo for the Emergency Food Security and Resilience Support Project.

Staff and Individuals	Responsibility
All Staff including workers and sub-contractors	<p>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:</p> <ul style="list-style-type: none"> <li>• Undertake all activities in accordance with the agreed plans of management, procedures, and work methods.</li> <li>• Ensure that they are aware of the contact person(s) regarding environmental and social matters.</li> <li>• Report any activity that has resulted, or has the potential to result, in an environmental and social incident.</li> <li>• Ensure they attend the environmental and social training provided.</li> </ul>
Contractors	<ul style="list-style-type: none"> <li>• Prepare Contractors' ESMP (C-ESMP) based on the WB approved ESMP, get clearance from EHCSS and implement</li> <li>• Take actions to mitigate all potential negative impacts</li> <li>• Hire/appoint qualified Environmental Specialist, OHS specialist, and Social Specialist to be endorsed by EHCSS.</li> <li>• Actively communicate with local residents and take actions to prevent disturbance during construction and operation.</li> <li>• Ensure all the construction and operation activities having sufficient documents from the related organization.</li> <li>• Ensure that all staff and workers understand the procedure and their tasks in the environmental and social management program.</li> </ul>
Silo Manager	<ul style="list-style-type: none"> <li>• 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 (Mafalsa Silo in Aswan). In addition, the Silo Manager will:</li> <li>• Assume overall responsibility for the effective implementation and administration of the ESMP.</li> </ul>

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**Table (6.3):** Roles and responsibilities at Mafalsa Silo for the Emergency Food Security and Resilience Support Project.

	<ul style="list-style-type: none"> <li>• Ensure that the ESMP is included in the workers and contractor’s contract</li> <li>• Ensure that the ESMP is given to the applicable construction and operation supervisor and the contractors.</li> <li>• In conjunction with the construction and operation supervisor; undertake regular inspections of the workers and contractor’s site as well as installation works to check for compliance with the ESMP in terms of specifications outlined in this document.</li> <li>• Inspections shall take place at least once a week and copies of the monitoring checklist contained in the file.</li> <li>• Keep a register of all incidents (accidents, injuries, complaints, legal transgressions, etc) and other documentation related to the ESMP.</li> <li>• Responsible for the overall management of all operation activities including all related OHS and quality control activities at the silo site.</li> <li>• Provide environmental and social advice on matters specified in the conditions of approval, project contracts, licenses and permits.</li> <li>• Facilitate induction and training programs for all persons involved in the construction works.</li> <li>• Liaise with all relevant government authorities such as the EEAA.</li> <li>• Implement and review compliance with the EHS management system and associated environmental and social documents.</li> <li>• In addition, the Silo Manager is responsible for: <ul style="list-style-type: none"> <li>• Apprise the Site Foreman of requirements of the EHS management system, and their responsibilities within them.</li> <li>• Allocate resources to meet the requirements of the EHS management system.</li> <li>• Investigate complaints to determine effective resolution.</li> <li>• Maintain all necessary monitoring records and reports.</li> <li>• Take action in the event of an emergency and allocating the required resources to minimize the environmental and social impact.</li> <li>• Share the monthly environmental, health, safety and social report with EHCSS/PMU</li> <li>• Report to EHCSS/ PMU any activity that has resulted, or has the potential to result, in an environmental and social and OHS incident.</li> </ul> </li> </ul>
Technical Consultant	<ul style="list-style-type: none"> <li>• Responsible for bidding documents preparation</li> <li>•</li> </ul>
Supervision Consultant	<ul style="list-style-type: none"> <li>• Responsible for supervising the ESMP implementation during construction phase by the contractor.</li> <li>• Responsible for reviewing the C-ESMP and ensuring the measures from the this site specific Mafalsa ESMP are embedded in the C-ESMP</li> <li>• Reviews and approves the C-ESMP every 6 months</li> </ul>

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**Table (6.3):** Roles and responsibilities at Mafalsa Silo for the Emergency Food Security and Resilience Support Project.

	<ul style="list-style-type: none"> <li>Responsible for providing the monthly and quarterly progress reports</li> </ul>
Environmental Specialist	<p><b>During the construction phase:</b></p> <ul style="list-style-type: none"> <li>Identify potential environmental impacts of the construction activities.</li> <li>Ensure that construction activities comply with environmental regulations and standards.</li> <li>Develop and implement waste management plans to minimize the environmental footprint.</li> <li>Monitor air, and soil quality to prevent contamination and mitigate any adverse effects.</li> <li>Ensure that construction activities do not harm local wildlife and habitats.</li> </ul> <p><b>During the operation phase:</b></p> <ul style="list-style-type: none"> <li>Continuously monitor environmental parameters to ensure compliance with regulations.</li> <li>Promote and implement sustainable practices in the operation of the silo.</li> <li>Oversee the management of operational waste to minimize environmental impact.</li> <li>Prepare and submit regular environmental reports to regulatory authorities.</li> <li>Conduct training sessions for staff on environmental best practices and compliance requirements.</li> </ul>
Occupational Health and Safety Specialist (OHS)	<p><b>During the construction phase:</b></p> <ul style="list-style-type: none"> <li>Develop and implement a comprehensive safety plan for the construction site.</li> <li>Conduct regular risk assessments to identify potential hazards and implement measures to mitigate them.</li> <li>Provide training for all workers on health and safety protocols and emergency procedures.</li> <li>Investigate any accidents or incidents to determine causes and prevent recurrence.</li> <li>Ensure compliance with all occupational health and safety regulations and standards.</li> </ul> <p><b>During the operation phase:</b></p>

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**Table (6.3):** Roles and responsibilities at Mafalsa Silo for the Emergency Food Security and Resilience Support Project.

	<ul style="list-style-type: none"> <li>• Develop and oversee the implementation of workplace safety programs and policies.</li> <li>• Provide continuous training for employees on health and safety practices and emergency response.</li> <li>• Conduct regular health check-ups and monitor the health of workers to prevent occupational illnesses.</li> <li>• Ensure that emergency response plans are up to date and conduct regular check.</li> <li>• Investigate any workplace incidents to improve safety measures and prevent future occurrences.</li> <li>• Maintain records of safety incidents and prepare reports for regulatory authorities and internal review.</li> </ul>
Social Specialist	<p><b>During the construction phase:</b></p> <ul style="list-style-type: none"> <li>• Facilitate communication and engagement with local communities to address their concerns and incorporate their feedback into the project.</li> <li>• Conduct and manage social impact assessment to understand the social implications of the construction activities.</li> <li>• Establish and manage a grievance mechanism to address community complaints and concerns.</li> <li>• Organize and participate in stakeholder meetings to ensure transparent communication.</li> </ul> <p><b>During the operation phase:</b></p> <ul style="list-style-type: none"> <li>• Maintain positive relationships with the local community and address any ongoing concerns.</li> <li>• Continuously monitor the social impact of silo operations and make necessary adjustments to mitigate negative impacts.</li> <li>• Maintain an effective grievance mechanism to handle any complaints from the community.</li> <li>• Document and report on social performance and community engagement activities.</li> </ul>
Sub-Contract Personnel	<p>All sub-contract personnel must carry out the work in accordance with contract instructions and shall conduct their activities in an environmentally and socially sound manner. All sub-contract personnel will undergo environmental and social and OHS induction before they commence any work on the site.</p>

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## 6.6. Environmental and Social Monitoring

Monitoring is an essential part of the ESMP. 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 ESMP 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 ESMP. 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.



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**Table (6.4):** Monitoring measures during construction phase. Note the budget for the monitoring measures during the construction phase was calculated for two years (the construction period).

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Factors	Impacts/risks	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing <sup>20</sup>	Budget (USD/Year)
Environmental	Risks on Ambient air due to airborne Dust  Gaseous emissions from Engine Exhaust Gases	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Visual inspections</li> <li>Spot check measurements of ambient air quality</li> <li>Review of maintenance records of machinery- according to Egyptian national requirements</li> <li>Recording and documentation of complaints/ Grievance records</li> <li>Monthly report.</li> </ul>	<ul style="list-style-type: none"> <li>Daily inspections onsite of weather conditions and operating machinery and excavation and construction activities</li> <li>Prior to procurement of machinery for maintenance log and monthly onsite: verification of maintenance records.</li> <li>Weekly for grievance</li> </ul>	<ul style="list-style-type: none"> <li>Weather conditions: visual ambient dust levels; windy conditions.</li> <li>Operating vehicles and machinery: dust generation and black exhaust emissions observed.</li> <li>Dust generated during construction activities (earthworks)/visible dust cloud.</li> <li>Compliance for machinery inspection records and number of maintenances performed.</li> <li>Number of grievance records related to air emissions.</li> </ul>	<ul style="list-style-type: none"> <li>Construction site and surroundings</li> <li>Point source: machinery, equipment, and vehicles exhaust and generators.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and subcontractor</li> <li>Environmental specialist, social specialist for reporting on grievance.</li> </ul>	20,000
	Risks on Soil and Water resources contamination	<ul style="list-style-type: none"> <li>The project may impact soil quality and groundwater quality (on the long run) from.</li> <li>Accidental oil and fuel spills from machineries and vehicles used and generators.</li> <li>Runoff risks from pesticides used which could pollute nearby lands/soils</li> </ul>	<ul style="list-style-type: none"> <li>Visual inspection of site: backfilling and restoration</li> <li>Visual inspection on soil</li> <li>Inspection of equipment and machinery used and associated maintenance records.</li> <li>Grievance records.</li> <li>Fuel consumption records</li> <li>Regular groundwater quality monitoring tests</li> </ul>	<ul style="list-style-type: none"> <li>Daily visual inspection especially during excavation and backfilling</li> <li>Daily visual inspection on soil.</li> <li>Daily visual inspection on chemicals storage and proper labelling.</li> </ul>	<ul style="list-style-type: none"> <li>Change in soil colour.</li> <li>Maintenance records for equipment and machineries and number of maintenances performed</li> <li>Number of grievance records and complaints related to soil, contamination</li> </ul>	<ul style="list-style-type: none"> <li>Construction site and surrounding.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and Subcontractor</li> <li>Environmental Specialist, social Specialist for reporting on grievance.</li> </ul>	20,000

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			during the construction phase should be included to detect any potential contamination early	<ul style="list-style-type: none"> <li>• Prior the start of the construction activities and monthly for: inspection of machinery records.</li> <li>• Weekly for grievance</li> <li>• Monthly for fuel consumption and water tests.</li> </ul>	<ul style="list-style-type: none"> <li>• Significant decrease in stored fuel</li> <li>• Groundwater tests show parameters above legal limit and international recognized limits.</li> </ul>			
Risks on Ambient Noise	<ul style="list-style-type: none"> <li>• The following equipment used excavation and grading of the site may produce high noise emissions: <ul style="list-style-type: none"> <li>○ the use of heavy machinery, such as trucks, bulldozers, and excavators.</li> <li>○ the operation of construction equipment, such as generators and compressors.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Inspection and tests of operating machineries and vehicles onsite for proper functioning.</li> <li>• Grievance records.</li> </ul>	<ul style="list-style-type: none"> <li>• Weekly noise tests</li> <li>• Daily inspection of operating machinery onsite</li> <li>• Prior the start of the construction activities and monthly for: inspection of machinery maintenance records.</li> </ul>	<ul style="list-style-type: none"> <li>• Noise level below permissible levels applicable by zone (nearby community).</li> <li>• Maintenance records for equipment and number of maintenances performed and inspection of proper noise enclosure fitting</li> <li>• Time logs for work/construction activities.</li> <li>• Number of grievance records related to noise emissions.</li> </ul>	<ul style="list-style-type: none"> <li>• Construction site and surroundings.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor and Subcontractor</li> <li>• Environmental Specialist, social Specialist for reporting on grievance.</li> </ul>	15,000	

<sup>20</sup> The PMU will ensure provision of Environment, Social and OHS monitoring supervision during construction work

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	<p>Biodiversity/ pesticides consumption by non-targeted species</p> <ul style="list-style-type: none"> <li>• Impacts on biodiversity may result in the disturbance of wildlife from noise, dust, air, light emissions and waste generation including chemicals.</li> <li>• Non targeted wildlife may consume rodenticides by accidents or consume the dead rodent if not collected right away and disposed properly and in turn leading to their secondary poisoning.</li> <li>• Bird collision into the silo construction site during migratory seasons</li> <li>• Risks of hunting</li> <li>• Grain spill from current operational silo</li> </ul>	<ul style="list-style-type: none"> <li>• Surveys at project site and surroundings</li> </ul>	<ul style="list-style-type: none"> <li>• Daily on site and surrounding.</li> </ul>	<ul style="list-style-type: none"> <li>• Presence of dead animals or birds</li> </ul>	<ul style="list-style-type: none"> <li>• Project site and surroundings</li> </ul>	<p>Contractor and Subcontractor</p> <ul style="list-style-type: none"> <li>• Environmental Specialist.</li> </ul>	16,000
<p>Waste generation (solid, liquid, and hazardous wastes) emissions.</p>	<p><b>Solid waste</b></p> <ul style="list-style-type: none"> <li>• Increased waste generation from materials, packaging, debris.</li> <li>• Construction waste</li> <li>• Large quantity of excavated soil will be generated among other construction waste.</li> </ul> <p><b>Liquid waste</b></p> <ul style="list-style-type: none"> <li>• Potential wastewater from concrete mixing, equipment washing, sanitation.</li> </ul>	<ul style="list-style-type: none"> <li>• Visual inspection on site and surrounding.</li> <li>• Inspect waste storage sites.</li> <li>• Inspect soil colour.</li> <li>• Review of maintenance records of machines and generators.</li> <li>• Grievance records related to waste and pollution.</li> </ul>	<ul style="list-style-type: none"> <li>• Daily inspection on site and surrounding and waste areas.</li> <li>• Weekly inspection on waste receipt</li> <li>• Monthly inspection on machine maintenance records</li> <li>• Weekly on grievance</li> </ul>	<ul style="list-style-type: none"> <li>• Presence of waste in undesignated areas.</li> <li>• Change in soil colour.</li> <li>• Presence of waste receipt.</li> <li>• Number of maintenances performed on equipment and machines.</li> <li>• Number of grievances recorded.</li> </ul>	<p>Project site, waste storage area and surrounding</p>	<ul style="list-style-type: none"> <li>• Contractor and subcontractor</li> <li>• Environmental specialist, social specialist for reporting on grievance.</li> </ul>	30,000

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		<p><b>Hazardous waste</b></p> <ul style="list-style-type: none"> <li>Potentially hazardous waste from paints, solvents, oils, pesticides containers and chemicals.</li> </ul>						
Socioeconomic Aspects	Risks to labor from inappropriate working conditions.	<ul style="list-style-type: none"> <li>Unfair treatment (discrimination, delayed payments, unsafe working conditions).</li> <li>Unresolved complaints from the lack of grievance mechanism for workers.</li> </ul>	<ul style="list-style-type: none"> <li>Inspection of documents, labor contracts and LMP</li> <li>Grievance records.</li> </ul>	<ul style="list-style-type: none"> <li>Prior the start of any work for labor contracts and LMP and awareness sessions records to workers on their rights.</li> <li>Weekly for grievance.</li> <li>Monthly inspections by the PMU.</li> </ul>	<ul style="list-style-type: none"> <li>Presence of grievance mechanism in place and adequate LMP</li> <li>Number of awareness sessions performed to workers on their rights</li> <li>Number of contracted workers /presence of contracts versus number of actual workers.</li> <li>Number of grievances reported from workers and number of solved grievances.</li> <li>Number of visits conducted by the PMU.</li> </ul>	<ul style="list-style-type: none"> <li>Site location</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and subcontractor</li> <li>Environmental specialist, social specialist for reporting on grievance.</li> </ul>	20,000
	Disturbance to silo operations and users	<ul style="list-style-type: none"> <li>Noise, dust, traffic disruptions.</li> <li>Restricted access to facilities or services. Construction activities and stock-piling of construction material can potentially block the access routes and roads inside and</li> </ul>	<ul style="list-style-type: none"> <li>Inspection of community grievance log.</li> <li>Inspection of proper safety signage, fencing delimiting construction site, detour signage</li> </ul>	<ul style="list-style-type: none"> <li>Daily safety inspection of site and surrounding.</li> <li>Weekly inspection of records reports, grievance logs.</li> </ul>	<ul style="list-style-type: none"> <li>Number of reported complaints from community and surrounding industries if any and number of solved complaints</li> </ul>	<ul style="list-style-type: none"> <li>Site and surrounding communities.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and Subcontractor</li> <li>Social specialist with support from</li> </ul>	14000

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	in the vicinity of the silo sites.	<ul style="list-style-type: none"> <li>• Inspection on signed code of conduct (COC)</li> </ul>	<ul style="list-style-type: none"> <li>• Before implementing construction work for the code of conduct</li> <li>• Monthly inspections by the PMU.</li> </ul>	<ul style="list-style-type: none"> <li>• Presence of a separate entrance for the construction trucks/machineries and signages</li> <li>• Number of workers who signed the code of conduct versus number of actual workers.</li> </ul>		Environment Specialist	
Child Labor	<ul style="list-style-type: none"> <li>• Exploitation of children in construction work.</li> <li>• Hazardous working conditions.</li> <li>• Interference with education.</li> </ul>	<ul style="list-style-type: none"> <li>• On site inspection and ID inspection</li> <li>• Workers logs inspections</li> <li>• Inspection on contractor's labor policies</li> <li>• Grievance mechanism</li> </ul>	<ul style="list-style-type: none"> <li>• Daily for ID inspections</li> <li>• Prior to starting any work for child labor policies inspection and for awareness sessions to contractors</li> <li>• Weekly for grievances</li> <li>• Upon occurrence for penalties</li> </ul>	<ul style="list-style-type: none"> <li>• Number of workers below the age of 18.</li> <li>• Presence of contractor's policy on child labor</li> <li>• Number of awareness sessions provided to contractor on child labor</li> <li>• Number of visits conducted by the PMU</li> <li>• Number of recorded grievances related to child labor</li> <li>• Number of penalties/ fines.</li> </ul>	<ul style="list-style-type: none"> <li>• On site</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor and Subcontractor</li> <li>• Social Specialist and OHS Specialist</li> </ul>	15,000
Risks of SEA/SH	<ul style="list-style-type: none"> <li>• 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&gt;=.</li> </ul>	<ul style="list-style-type: none"> <li>• Complaint records.</li> <li>• Inspection on LMP and CoC.</li> <li>• Inspection on signposts.</li> </ul>	<ul style="list-style-type: none"> <li>• Weekly for complaints.</li> <li>• Prior the start of any work for LMP and COC and awareness</li> </ul>	<ul style="list-style-type: none"> <li>• Number of complaints regarding SEA/SH and number of solved complaints</li> <li>• Presence of LMP and code of conduct</li> </ul>	<ul style="list-style-type: none"> <li>• On site and surrounding.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor and Subcontractor.</li> <li>• Social Specialist.</li> </ul>	14,000

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			<ul style="list-style-type: none"> <li>• Inspection on contractor's SEA/SH policies.</li> </ul>	<ul style="list-style-type: none"> <li>• sessions on SEA/SH and contractor's policies.</li> <li>• Daily for signposts.</li> </ul>	<ul style="list-style-type: none"> <li>• Presence of SEA/SH in contractor's policies</li> <li>• Number of awareness sessions provided to workers on SEA/SH</li> <li>• Number of workers who signed the COC versus actual number of workers</li> <li>• Presence of signposts.</li> </ul>			
Community health and safety: Traffic risks and accidents	<ul style="list-style-type: none"> <li>• Traffic accidents due to the increase in number of trucks during construction phase may pose a risk on other road users.</li> <li>• Traffic congestions due to the increase in transportation trucks for materials, machineries and wastes to and from the site.</li> <li>• 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.</li> </ul>	<ul style="list-style-type: none"> <li>• Traffic management plan in place</li> <li>• Grievance records</li> <li>• Accidents log inspection</li> <li>• Maintenance log inspection</li> </ul>	<ul style="list-style-type: none"> <li>• Prior the start of work for the traffic management plan</li> <li>• Weekly for grievances</li> <li>• Weekly for accidents log</li> <li>• Monthly for maintenance log.</li> </ul>	<ul style="list-style-type: none"> <li>• Number of traffic complaints</li> <li>• Number of incidents, injuries to local communities and workers with details</li> <li>• Number of maintenances performed</li> </ul>	<ul style="list-style-type: none"> <li>• On site and District-regional level</li> </ul>	Contractor and Subcontractor	<ul style="list-style-type: none"> <li>• Social Specialist with support from Environmental Specialist</li> </ul>	16,000
Lack of stakeholder engagement and proper grievance mechanism	<ul style="list-style-type: none"> <li>• Risks of untransparent sharing of information</li> <li>• Risks of increase in unresolved complains</li> </ul>	<ul style="list-style-type: none"> <li>• Community consultations/consultation records</li> </ul>	<ul style="list-style-type: none"> <li>• Prior the start of any work for permits, documents signage and</li> </ul>	<ul style="list-style-type: none"> <li>• Presence of required permits</li> <li>• Number of complaints received</li> </ul>	<ul style="list-style-type: none"> <li>• Site location and surrounding.</li> </ul>	<ul style="list-style-type: none"> <li>• Social Specialist</li> <li>• Silo Manager</li> </ul>		14,000

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			<ul style="list-style-type: none"> <li>• Inspection on required permits and documents.</li> <li>• Complaint records inspection</li> <li>• Signage and posting are present on site.</li> </ul>	<ul style="list-style-type: none"> <li>• posting and previous consultation records.</li> <li>• Weekly for complaints received</li> <li>• Monthly for consultations</li> </ul>	<ul style="list-style-type: none"> <li>• versus number of solved complaints</li> <li>• Presence of signage on site</li> <li>• Presence of consultation records and stakeholder types (including small farmers, women, disabled farmers and other vulnerable groups)</li> <li>• Number of consultations performed</li> <li>• Presence of complaint boxes and banners including number for grievance</li> <li>• Presence of LMP.</li> </ul>			
	Risks on Cultural Heritage and archeological sites	<ul style="list-style-type: none"> <li>• Impacts on archaeological and historic sites during the construction phase are expected to be negligible since there are no archeological sites nearby and the subproject is located within an existing facility's premises.</li> </ul>	<ul style="list-style-type: none"> <li>• Document with chance find procedure</li> <li>• Awareness logs on chance find procedures</li> </ul>	<ul style="list-style-type: none"> <li>• Before and during construction works.</li> </ul>	<ul style="list-style-type: none"> <li>• Presence of cultural artifacts and number of encounters.</li> <li>• Number of workers aware of the chance find procedure</li> </ul>	<ul style="list-style-type: none"> <li>• Project work site.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor and Subcontractor</li> <li>• Environmental Specialist</li> <li>• Silo Manager</li> </ul>	Not applicable
Occupational Health and Safety (OHS)	Risks of injuries and accidents	<ul style="list-style-type: none"> <li>• The use of hazardous materials and chemicals and wastes can pose a risk to worker health (i.e. cement, paints, bitumen , oil etc.).</li> <li>• Falls from heights are a possible cause of injuries in</li> </ul>	<ul style="list-style-type: none"> <li>• Visual inspection for proper use of PPE, emergency preparedness, fire extinguishers adequate signage for health and safety</li> </ul>	<ul style="list-style-type: none"> <li>• Daily site inspection and surrounding. for PPEs and proper safety measures (i.e. barriers and fences are in</li> </ul>	<ul style="list-style-type: none"> <li>• Number of recorded incidents and injuries and type.</li> <li>• Number of non-compliances including not wearing PPEs</li> </ul>	<ul style="list-style-type: none"> <li>• Site location and surrounding and rented apartments for workers,</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor and Subcontractor</li> <li>• Occupational Health and Safety</li> </ul>	45,000

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	<p>construction (silo rooftop areas/ use of scaffoldings etc.).</p> <ul style="list-style-type: none"> <li>• Electrical hazards can cause serious injuries or death.</li> <li>• Machinery can cause crushing injuries or amputations/moving loads.</li> <li>• Dust and fumes can irritate the eyes, nose, and throat, and can also cause respiratory problems.</li> <li>• Noise emissions may disturb workers.</li> <li>• Falling into excavated zones.</li> <li>• Working during bad weather conditions (dust storm, heat wave, rainy seasons etc.).</li> <li>• Injuries and burns from welding activities.</li> <li>• Accidents while transporting materials and machinery to and from the subproject site.</li> <li>• Injuries from demolishing equipment and activities</li> <li>• Accidental loads falling on workers while being lifted by cranes.</li> <li>• Physical injuries from physical activities and wrong lifting techniques, wrong posture while conducting any work.</li> </ul>	<p>measures etc. and fencing.</p> <ul style="list-style-type: none"> <li>• Visual inspection for good housekeeping and storage of hazardous materials and equipment.</li> <li>• Verification of training records including daily induction for general construction related risks and hazards, proper use of PPE.</li> <li>• Inspection of complaints and grievance reports and register.</li> <li>• Inspection of employment contracts.</li> <li>• Records about occupational injuries and infectious diseases among workers.</li> <li>• Records of GM and complaints.</li> <li>• Perform gas tests for silos/confined areas</li> <li>• Inspection of insurance policies and attendance sheets.</li> <li>• Report major accidents to WB</li> <li>• Checking meteorological conditions/forecasts prior the start of work daily.</li> </ul>	<p>place, fire extinguishers, presence of flagman banners with emergency measures and daily induction for OHS risks etc)</p> <ul style="list-style-type: none"> <li>• Prior entering silos for gas emissions</li> <li>• Monthly on workers accommodation.</li> <li>• Weekly inspection of GM</li> <li>• Monthly inspection on training records and maintenance of equipment.</li> <li>• Major accidents reported within 48 hours</li> <li>• Prior start of construction work for OHS plan</li> </ul>	<ul style="list-style-type: none"> <li>• Presence of potable water supply and disinfectants</li> <li>• Presence of fire extinguishers on site.</li> <li>• Number of grievances and solved grievances.</li> <li>• Presence/proof of valid insurance coverage for all workers on site</li> <li>• Presence of trainings materials and records of trained personnel and type of trainings.</li> <li>• Number of maintenances performed on equipment.</li> <li>• Number of major accidents reported within 48 hours.</li> </ul>		<p>Specialist with support of Environmental Specialist, social Specialist for reporting on grievance.</p>
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		<ul style="list-style-type: none"> <li>Slip trip and fall</li> <li>Injuries and cuts from machineries and hand arm vibration syndrome from machineries used</li> <li>Physical injuries from physical activities and wrong lifting techniques, wrong posture while conducting any work</li> <li>Getting hit by moving load/vehicle/machine</li> <li>Working in confined area (risk of asphyxia while working inside the silos) during construction phase.</li> <li>Risks of electrocution while installing the Silos.</li> </ul>						
Unplanned events	Catastrophic event can produce major negative impacts on OHS and public health and safety	<ul style="list-style-type: none"> <li>Fire and explosion risks from badly stored fuel/ poorly stored/installed generator and mishandling of chemicals during construction phase and explosion from existing silo operations (unpredicted events) can lead to the death of workers in silos construction area and existing silo users.</li> <li>Potential damage to nearby buildings may occur from explosion of existing silo which may cause injuries to</li> </ul>	<ul style="list-style-type: none"> <li>Presence of fire safety measures (i.e fire extinguishers) Incidence report/log</li> <li>Report major accidents to WB</li> <li>Grievance log.</li> </ul>	<ul style="list-style-type: none"> <li>Daily for safety measures, presence of fire extinguishers and PPEs in place</li> <li>Daily for corrective actions</li> <li>Monthly for incident log</li> <li>Report of major accidents within 48 hours to WB</li> <li>Monthly for grievances.</li> </ul>	<ul style="list-style-type: none"> <li>Number of incidences and near misses</li> <li>Number of injuries</li> <li>Number of fire events</li> <li>Presence of fire extinguishers</li> <li>Number of grievances and number of solved grievances</li> <li>Number of major accidents reported</li> </ul>	<ul style="list-style-type: none"> <li>Site location and surrounding</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and Subcontractor</li> <li>Occupational, Health and Safety Specialist, Environmental Specialist, and Social Specialist for reporting on grievance.</li> </ul>	30,000



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		communities and individuals in those areas.			to WBG within 48 hours.			
Unplanned events	Risk of property losses	<p>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:</p> <ul style="list-style-type: none"> <li>Loss of grains and loss of storage area</li> <li>Potential damage to nearby buildings.</li> </ul>	<ul style="list-style-type: none"> <li>Complaint records inspection</li> <li>Insurance records inspection for silos</li> <li>Payment receipt inspections</li> </ul>	<ul style="list-style-type: none"> <li>Weekly for complaints</li> <li>Monthly on insurance papers and policies</li> <li>Report of major accidents within 48 hours to WB</li> </ul>	<ul style="list-style-type: none"> <li>Number of complaints and number of solved complaints</li> <li>Presence of payment receipts</li> <li>Presence of insurance papers</li> <li>Number of major accidents reported to WBG within 48 hours</li> </ul>	<ul style="list-style-type: none"> <li>District and regional level Site location (existing silo users)</li> </ul>	<ul style="list-style-type: none"> <li>Occupational, Health and Safety Specialist, Environmental Specialist, and Social Specialist for reporting on grievance</li> </ul>	

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**Table (6.5):** monitoring measures during operational phase. Note the budget for the monitoring measures during the operational 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	<ul style="list-style-type: none"> <li>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.</li> <li>The major activities at this phase are maintenance procedures and transport of many cars during the daytime. Trucks transporting grains and generators will release exhaust emissions, containing carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), oxides of nitrogen (NO<sub>x</sub>), and particulate matter (PM). Regular maintenance to silos trucks (belonging to EHCSS) and machinery will reduce</li> </ul>	<ul style="list-style-type: none"> <li>Visual inspections</li> <li>Spot check measurements of ambient air quality</li> <li>Review of maintenance records according to Egyptian national requirements</li> <li>Recording and documentation of complaints/ Grievance records</li> <li>Monthly report.</li> <li>Pressure tests for fumigation</li> </ul>	<ul style="list-style-type: none"> <li>Daily inspections onsite of weather conditions</li> <li>Monthly Verification of maintenance records.</li> <li>Monthly for fumigation pressure tests</li> <li>Weekly for grievances related to air emissions</li> </ul>	<ul style="list-style-type: none"> <li>Weather conditions: visual ambient dust levels; windy conditions.</li> <li>Operating vehicles and grain trucks: dust generation and black exhaust emissions observed.</li> <li>Dust generated during operation work (loading and uploading of grains).</li> <li>Onsite ambient air quality compliance with WB limits and national limits for PM</li> <li>Compliance for inspection records.</li> <li>Number of grievance</li> </ul>	<ul style="list-style-type: none"> <li>Silo Complex site and surroundings.</li> <li>Point source: equipment, grain trucks and vehicles and generator exhaust.</li> </ul>	<ul style="list-style-type: none"> <li>Silo management</li> <li>Environmental specialist, social specialist for reporting on grievance</li> </ul>	10,000

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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/Year)
		<p>equipment failure and loss of integrity.</p> <ul style="list-style-type: none"> <li>Fumigation emissions from silos and airborne drift from pesticides application may also reduce ambient air quality</li> </ul>			<p>records related to air emissions.</p> <ul style="list-style-type: none"> <li>Number of maintenances performed</li> <li>Number of pressure tests performed versus number of fumigation activities</li> </ul>			
	Impacts on Soil and long-term risks on ground Water Quality from trucks and machineries and any potential chemical	<ul style="list-style-type: none"> <li>Sources of soil contamination are accidental and lubricant/fuel spills of trucks transporting grains to and from the Silo Complex in Mafalsa. Other sources also include inappropriate waste disposal from the offices and inappropriate sewage disposal which may contaminate the soil. Spills may also result from result from badly stored chemicals and materials and wastes and generator and fuel</li> </ul>	<ul style="list-style-type: none"> <li>Visual inspection of site: backfilling and restoration</li> <li>Visual inspection on soil</li> <li>Inspection of equipment used during the operation phase and associated maintenance records.</li> <li>Grievance records.</li> </ul>	<ul style="list-style-type: none"> <li>Daily visual inspection especially during loading and uploading of grains.</li> <li>Daily visual inspection on soil.</li> <li>Daily visual inspection on stored chemicals and proper labeling and presence of fire extinguishers</li> <li>Weekly for grievances</li> </ul>	<ul style="list-style-type: none"> <li>Change in soil colour.</li> <li>Maintenance records.</li> <li>Number of grievance records and complaints related to soil, geology, and topography.</li> <li>Number of spills</li> <li>Significant decrease in fuel consumption</li> </ul>	<ul style="list-style-type: none"> <li>Silo Complex and surrounding.</li> </ul>	<ul style="list-style-type: none"> <li>Silo Management</li> <li>Environmental specialist, social specialist for reporting on grievance.</li> </ul>	10,000

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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/Year)
			<ul style="list-style-type: none"> <li>Generator fuel consumption records.</li> </ul>	<ul style="list-style-type: none"> <li>Monthly for fuel consumption.</li> </ul>				
	Noise	<ul style="list-style-type: none"> <li>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</li> <li>The use of generator.</li> </ul>	<ul style="list-style-type: none"> <li>Inspection of operation activities for proper functioning.</li> <li>Noise Tests</li> <li>Maintenance records</li> <li>Grievance records.</li> </ul>	<ul style="list-style-type: none"> <li>Daily inspection of operating activities onsite</li> <li>Weekly for noise tests and grievances</li> <li>Monthly for maintenance records</li> </ul>	<ul style="list-style-type: none"> <li>Noise level below permissible levels applicable by zone (nearby community).</li> <li>Maintenance records for equipment and inspection of proper noise enclosure fitting.</li> <li>Number of grievance records related to noise emissions.</li> </ul>	<ul style="list-style-type: none"> <li>Silo Complex site and surroundings.</li> </ul>	<ul style="list-style-type: none"> <li>Silo Management</li> <li>Environmental specialist, social specialist for reporting on grievance.</li> </ul>	7,500
	Biodiversity	<ul style="list-style-type: none"> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>Surveys at project site and surroundings</li> </ul>	<ul style="list-style-type: none"> <li>Daily on site and surrounding.</li> </ul>	<ul style="list-style-type: none"> <li>Presence of dead animals</li> <li>Presence of grain spills</li> <li>Presence of migratory bird flocks or concentrations in the silo area</li> </ul>	<ul style="list-style-type: none"> <li>Silo Complex location and surroundings</li> </ul>	<ul style="list-style-type: none"> <li>Silo Management</li> <li>Environmental specialist</li> </ul>	8,000

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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/Year)
		<p>machinery can pollute the air and water, which can harm animals if any.</p> <ul style="list-style-type: none"> <li>Risks of hunting</li> <li>Grain spill from current operational silo</li> </ul>						
	Waste Management	<p><b>Solid waste</b></p> <ul style="list-style-type: none"> <li>Ongoing generation from operations, maintenance, offices.</li> </ul> <p><b>Liquid waste</b></p> <ul style="list-style-type: none"> <li>Potential wastewater from grain washing, equipment cleaning, sanitation (water use is minimal).</li> </ul> <p><b>Hazardous waste</b></p> <ul style="list-style-type: none"> <li>Potentially hazardous waste from pesticide use, grain fumigation, maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>Visual inspection on site and surrounding.</li> <li>Inspect waste storage sites.</li> <li>Inspect soil colour.</li> <li>Review of maintenance records.</li> <li>Presence of labels on wastes and materials</li> <li>Grievance records related to waste and pollution.</li> </ul>	<ul style="list-style-type: none"> <li>Daily inspection on site and surrounding and waste areas.</li> <li>Weekly inspection on waste receipt</li> <li>Weekly for grievances related to waste.</li> </ul>	<ul style="list-style-type: none"> <li>Presence of waste in undesignated areas.</li> <li>Change in soil colour.</li> <li>Presence of waste receipt.</li> <li>Number of maintenances performed in the sites.</li> <li>Number of grievances recorded.</li> </ul>	Silo complex site, waste storage area and surrounding	<ul style="list-style-type: none"> <li>Silo Management Environmental specialist, social specialist for reporting on grievance</li> </ul>	15,000

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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/Year)
Socio-economic Aspects	Risks to labor and lack of appropriate work conditions and risks on Seasonal Workers	<ul style="list-style-type: none"> <li>Silo workers and seasonal workers may face unfair treatment (discrimination, delayed payments, unsafe working conditions and unresolved complaints from the lack of grievance mechanism.</li> <li>Workers may face occupational health and safety hazards (e.g., grain dust exposure, machinery accidents).</li> <li>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: <ul style="list-style-type: none"> <li>➤ There is a contractor that brings seasonal workers to empty seed bags and conducting cleaning activities including silos cleaning.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Inspection of documents, labor contracts including seasonal labor and LMP</li> <li>Grievance records</li> <li>Inspection on signage and boxes for grievance</li> </ul>	<ul style="list-style-type: none"> <li>Prior the start of any work for labor contracts and LMP and awareness sessions provided to workers including seasonal workers on their rights</li> <li>Weekly for grievances</li> <li>Monthly inspections by the PMU</li> </ul>	<ul style="list-style-type: none"> <li>Presence of grievance mechanism in place and adequate LMP and awareness sessions records to workers on their rights</li> <li>Presence of grievance boxes and signage on site</li> <li>Number of contracted workers /presence of contracts versus number of actual workers observed</li> <li>Presence of contracts for seasonal workers.</li> <li>Number of grievances reported from workers and number of</li> </ul>	<ul style="list-style-type: none"> <li>Site location</li> </ul>	<ul style="list-style-type: none"> <li>Silo Management Social specialist and environment health and safety specialist</li> <li>EHCSS</li> </ul>	10000

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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/Year)
		The cleaning specialists remove the grains from the bottom and sides of the silos. Cleaning is done every beginning of the season			<p>solved grievances</p> <ul style="list-style-type: none"> <li>Number of visits conducted by the PMU.</li> </ul>			
	Vulnerable populations	<ul style="list-style-type: none"> <li>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: <ul style="list-style-type: none"> <li>Limited access to silo services by small farmers and vulnerable populations due to elite capture.</li> </ul> </li> <li>Risk of unequal access to food distribution channels and purchasing power which can lower food accessibility to vulnerable population.</li> </ul>	<ul style="list-style-type: none"> <li>Inspection of community grievance log</li> <li>Reviewing community consultation reports and outreach minutes of meetings.</li> <li>Site inspection for separate lines (small farmers vs big farmers) and presence of grievance boxes and signs.</li> </ul>	<ul style="list-style-type: none"> <li>Weekly inspection of records reports, grievance logs.</li> <li>Number of grievances and number of solved grievances</li> <li>Every 2 months for community consultation reports and outreach</li> <li>Monthly site inspection by PMU</li> </ul>	<ul style="list-style-type: none"> <li>Number of reported complaints from community if any and number of solved complaints</li> <li>Number of female complainers</li> <li>Number of consultations and FGDs performed and targeted group types</li> <li>Number of incidents, injuries to local communities from operations</li> <li>Presence of fast-tracking line for small farmers</li> <li>Presence of grievance boxes and signage on site.</li> </ul>	<ul style="list-style-type: none"> <li>Site and surrounding communities/district level</li> </ul>	<ul style="list-style-type: none"> <li>Silo Management Social Specialist</li> </ul>	7,000



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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/Year)
	<p>Risks on child labor/children present in silos during grain transport</p> <p>Risks of child labor by seasonal workers subcontractors</p>	<ul style="list-style-type: none"> <li>• Presence of children in grain handling or transport.</li> <li>• Children being exposed to hazardous substances or working conditions.</li> </ul>	<ul style="list-style-type: none"> <li>• Site inspection</li> <li>• Visitors ID inspection</li> <li>• Seasonal workers ID inspection</li> <li>• Awareness records</li> <li>• Grievance Log</li> </ul>	<ul style="list-style-type: none"> <li>• Daily for visitors' ID inspection and seasonal workers ID inspections</li> <li>• Prior the start of any work for for awareness sessions to subcontractors on child labor</li> <li>• Weekly for grievances</li> <li>• Upon occurrence for penalties</li> </ul>	<ul style="list-style-type: none"> <li>• Number of children present in silos</li> <li>• Number of children present near loading and unloading activities</li> <li>• Number of children identified during maintenance works</li> <li>• Number of awareness sessions provided to subcontractor on child labor</li> <li>• Number of visits conducted by the PMU</li> <li>• Number of recorded grievances related to child labor</li> <li>• Number of penalties/ fines.</li> </ul>	<ul style="list-style-type: none"> <li>• Site area</li> </ul>	<ul style="list-style-type: none"> <li>• Social specialist and OHS Specialist</li> <li>• EHCSS</li> </ul>	7,000

ESMP for Mafalsa Silo, Aswan Governorate, Egypt

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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/Year)
	Risks of SEA/SH	<ul style="list-style-type: none"> <li>Continued potential for SEA/SH among staff and visitors.</li> </ul>	<ul style="list-style-type: none"> <li>Same measures as in construction phase</li> </ul>	<ul style="list-style-type: none"> <li>Same measures as in construction phase</li> </ul>	<ul style="list-style-type: none"> <li>Same measures as in construction phase</li> </ul>	<ul style="list-style-type: none"> <li>Same measures as in construction phase</li> </ul>	<ul style="list-style-type: none"> <li>Silo management Social Specialist</li> </ul>	7,000
	Community health and safety: Traffic risks and accidents.	<ul style="list-style-type: none"> <li>Risks of road accidents may increase during high storage seasons.</li> </ul>	<ul style="list-style-type: none"> <li>Inspection of community grievance log</li> <li>Accidents log</li> <li>Maintenance log</li> </ul>	<ul style="list-style-type: none"> <li>Weekly for grievance log</li> <li>Weekly for accidents log</li> <li>Monthly for maintenance log</li> </ul>	<ul style="list-style-type: none"> <li>Number of accidents</li> <li>Number of maintenances performed</li> <li>Number of grievances submitted.</li> </ul>	<ul style="list-style-type: none"> <li>Silo area</li> <li>District area/communities around silos</li> <li>District /regional area for accidents</li> </ul>	<ul style="list-style-type: none"> <li>Silo Management Social specialist</li> </ul>	8,000
Occupational Health and Safety (OHS)	Injuries and accidents to workers	<ul style="list-style-type: none"> <li>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.</li> <li>Gaseous exposures from trucks causing severe respiratory irritation,</li> <li>Falling from height or accidentally falling in silos while working at height during maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Visual inspection for proper use of PPE, emergency preparedness, fire extinguishers adequate signage for health and safety measures etc.</li> <li>Visual inspection for good housekeeping and storage of hazardous materials.</li> </ul>	<ul style="list-style-type: none"> <li>Daily site inspection and surrounding.</li> <li>Monthly inspection on training records and maintenance of equipment</li> <li>Prior entering silos for gas test</li> <li>Major accidents reported within 48 hours.</li> </ul>	<ul style="list-style-type: none"> <li>Number of recorded incidents and injuries and near misses during operation work and type.</li> <li>Presence of fire extinguishers on site.</li> <li>Presence of first aid equipment on site</li> <li>Number of grievances and</li> </ul>	Silo complex site and surrounding.	Silo Management Occupational Health and Safety Specialist (OHS) with support of Environmental specialist, social specialist for reporting on grievance including on subcontractor of seasonal workers EHCSS	19,000

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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/Year)
		<ul style="list-style-type: none"> <li>Asphyxia from working in confined areas while conducting maintenance works.</li> <li>Grain dust is a fire hazard, and a fire at the silos could cause serious injuries or death.</li> <li>Grain dust explosions can also cause serious injuries or death.</li> <li>Risks from grain engulfment</li> <li>Risk of fire from diesel generator and fuel and toxic gaseous emissions</li> <li>Risks of being entangled in unguarded auger and potential injuries</li> <li>Risks of burns from hot surfaces</li> <li>Noise and vibration emissions from silos operations and units,</li> <li>Unhygienic practices</li> </ul>	<ul style="list-style-type: none"> <li>Inspection of complaints and grievance reports.</li> <li>Records about occupational injuries and infectious diseases among operation workers.</li> <li>Records of GM and complaints.</li> <li>Perform gas tests for silos/confined areas</li> <li>Inspection of insurance policies and attendance sheets.</li> <li>OHS training records</li> <li>Report major accidents to WB</li> </ul>		<ul style="list-style-type: none"> <li>solved grievances.</li> <li>Presence/proof of valid insurance coverage for all workers on site</li> <li>Presence of trainings materials and records of trained personnel and type of trainings.</li> <li>Number of maintenances performed on equipment.</li> <li>Number of gas tests performed and results</li> <li>Number of major accidents reported within 48 hours.</li> </ul>			

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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/Year)
		<ul style="list-style-type: none"> <li>Handling of toxic substance, chemicals and wastes, such as pesticides and rodenticide especially during application</li> <li>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.</li> </ul>						
Unplanned risks	<p>Catastrophic events can produce major negative impacts on OHS, health and safety of silo users including non-workers and individuals in neighboring industries.</p> <p>Phostoxin/Aluminum phosphide may ignite spontaneously and may lead to explosion</p>	<ul style="list-style-type: none"> <li>Fire and explosion during existing silo operations (unpredicted events) can lead to the death of workers and silo users.</li> <li>Potential damage to nearby buildings may occur from explosion of existing silo which may cause injuries to communities and individuals in those surrounding areas.</li> </ul>	<ul style="list-style-type: none"> <li>Incidence log</li> <li>Site inspection on safety measures</li> <li>Grievance log</li> <li>Report major accidents to WB</li> <li>Fire drills records</li> <li>Pressure tests</li> </ul>	<ul style="list-style-type: none"> <li>Monthly for incidence log and for grievance</li> <li>Daily for site inspection</li> <li>Daily for corrective actions</li> <li>Daily for safety measures and PPEs in place</li> <li>Daily for presence of fire extinguishers</li> </ul>	<ul style="list-style-type: none"> <li>Number of incidents</li> <li>Number of injuries</li> <li>Number of corrective actions taken</li> <li>Number of grievances and number of solved grievances</li> <li>Number of fire extinguishers</li> <li>Presence of evacuation and</li> </ul>	<ul style="list-style-type: none"> <li>Silo site area and surrounding and district-regional level (silo users)</li> </ul>	<ul style="list-style-type: none"> <li>Silo Management, Occupational Health and Safety Specialist, Environmental specialist, and social specialist for reporting on grievance.</li> <li>EHCSS</li> </ul>	15,000

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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/Year)
	Risk of leaks of Phostoxin during transportation.			<ul style="list-style-type: none"> <li>Report of major accidents within 48 hours to WB</li> <li>Monthly fire drills</li> <li>Monthly Pressure tests and maintenance performed</li> </ul>	<ul style="list-style-type: none"> <li>emergency plans</li> <li>Number of fire drills performed</li> <li>Number of pressure tests and silos gate maintenance performed</li> <li>Number of major accidents reported within 48 hours.</li> </ul>			
Unplanned risks	Risk of property losses	<ul style="list-style-type: none"> <li>Catastrophic events such as explosions and fire events can produce major negative impacts on the livelihood of silo users.</li> <li>Catastrophic events such as fire and explosions can lead to property damage in neighboring buildings.</li> </ul>	<ul style="list-style-type: none"> <li>Complaint records inspection</li> <li>Insurance records inspection for silos</li> <li>Payment receipt inspections</li> </ul>	<ul style="list-style-type: none"> <li>Weekly for complaints</li> <li>Monthly on insurance papers and policies</li> <li>Report of major accidents within 48 hours to WB.</li> </ul>	<ul style="list-style-type: none"> <li>Number of complaints and number of solved complaints</li> <li>Presence of payment receipts</li> <li>Presence of insurance papers</li> <li>Number of major accidents reported to</li> </ul>	<ul style="list-style-type: none"> <li>District and regional level Site local (silo users)</li> </ul>	<ul style="list-style-type: none"> <li>Silo Management, and social specialist</li> <li>EHCSS</li> </ul>	



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Factors	Risks and Impacts	Description	Monitoring Methods	Monitoring frequency	Monitoring indicators	Monitoring Locations	Responsibility and Staffing	Budget (USD/Year)
					WBG within 48 hours			
Unplanned risks	Pesticides leaks	<ul style="list-style-type: none"> <li>Pesticides during fumigation activities may leak into the atmosphere and cause health and safety and environment risks.</li> </ul>	<ul style="list-style-type: none"> <li>Leak test</li> <li>Maintenance repair log</li> <li>Report major accidents to WB</li> </ul>	<ul style="list-style-type: none"> <li>Leak tests/pressure tests prior handing over</li> <li>Leak tests prior fumigation event</li> <li>Seasonal for repair and maintenance of seals</li> <li>Report of major accidents within 48 hours to WB</li> </ul>	<ul style="list-style-type: none"> <li>Number of incidences/leaks</li> <li>Number of injuries as result of leak</li> <li>Number of grievances and solved grievances</li> <li>Number of major accidents reported to WBG within 48 hours.</li> </ul>	<ul style="list-style-type: none"> <li>Silo site area and surrounding</li> </ul>	<ul style="list-style-type: none"> <li>Silo Management Environmental Specialist /EHCSS</li> </ul>	10,000

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### 6.6.1. Monitoring Strategy

The monitoring strategy proposed for the 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 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.

### 6.6.2. 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 during the construction and operation and maintenance phase. The monitoring plan will be in accordance with the main principles of the EHCSS ESMP. The monitoring sampling map is provided in the appendix (V.4)

### 6.6.3. 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 consulting firms during construction phase and the one during operation phase responsible for ESMP implementation and supervision during each phase (see section 6.5 roles and responsibilities) will support Silos in managing programs to monitor air, noise, and soil quality, as well as chemicals and waste management. Several physical, chemical, and biological characteristics will be monitored regularly throughout the year to track the impacts of the EHCSS's operations.

### 6.6.4. 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.

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Social audits should be undertaken quarterly during the operation phase. Monitoring of social aspects will be carried out by a) communicating with stakeholders, b) reviewing the feedback from stakeholders, and c) review of complaints.

### 6.6.5. 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 EHCCS, 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.

### 6.6.6. Monitoring Reporting

The consultant SENS, in cooperation with EHCCS, prepared a plan for reporting the monitoring results for approval by the World Bank and EEAA as following:

Table (6.6): Timetable for reporting of the monitoring results for Mafalsa Silo.

Every Year	Items	Description
A	The air, noise, and soil quality Report	<ul style="list-style-type: none"> <li>• one report in each season (4 per year)</li> <li>• One final report annually</li> </ul>
B	OHS report	<ul style="list-style-type: none"> <li>• one report in each season (4 per year)</li> <li>• One final report annually</li> </ul>
C	The Social condition Report	<ul style="list-style-type: none"> <li>• one report in each season (4 per year)</li> <li>• One final report annually</li> </ul>

### 6.7. Budget for Implementation of ESMP

The total Budget for implementation of the ESMP for Mafalsa Silo is provided in Table (6.7).

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

No.	Categories	Description of Items	Budget (USD / yearly)	Total (USD)
<b>A Mitigation Measures during Construction phase*</b>				
1	Environmental Mitigation Measures	Dust control measures	10,000	20,000
		Control of engine emissions	7,500	15,000
		Soil and water contamination measures	7,500	15,000
		Noise reduction measures	8,750	17,500
		Biodiversity protection measures	10,000	20,000
		Waste management systems	15,000	30,000
2	Socioeconomic Mitigation Measures	Improvement of working conditions	10,000	20,000
		Disturbance to Silo operations and users	7,000	14,000
		Child labor prevention measures	7,000	14,000
		SEA/SH prevention measures	7,000	14,000
		Community health and safety measures	7,500	15,000
		Stakeholder engagement	7,000	14,000
3	OHS Mitigation Measures	Safety training	15,000	30,000
		Provision of PPE	10,000	20,000
4	Catastrophic Events Mitigation Measures	Fire and explosion prevention measures	12,500	25,000
Total budget for mitigation measures during construction phase			<b>140,500</b>	<b>281,000</b>
<b>B Mitigation Measures during Operation phase**</b>				
5	Environmental Mitigation Measures	Dust control measures	10,000	10,000
		Emission control systems	10,000	10,000
		Soil and water contamination measures	10,000	10,000
		Noise reduction measures	8,750	8,750
		Biodiversity protection measures	8,000	8,000
		Waste management systems	12,500	12,500
6	Socioeconomic Mitigation Measures	Improvement of working conditions	12,500	12,500
		Risks on vulnerable populations	8,000	8,000
		Child labor prevention measures	7,000	7,000
		SEA/SH prevention measures	7,000	7,000
		Community health and safety measures	7,500	7,500
7	OHS Mitigation Measures	Safety training	12,500	12,500
		Provision of PPE	7,000	7,000
8	Catastrophic Events Mitigation Measures	Fire, explosion, and leakage prevention measures	20,000	20,000
Total budget for mitigation measures during operation phase			<b>139,500</b>	<b>139,500</b>
<b>C Monitoring during Construction Phase*</b>				
9	Environmental Monitoring	Air quality monitoring	10,000	20,000
		Soil and water contamination monitoring	10,000	20,000

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		Noise level monitoring	7,500	15,000
		Biodiversity monitoring	8,000	16,000
		Waste management compliance monitoring	15,000	30,000
10	Socioeconomic Monitoring	Work conditions inspections	10,000	20,000
		Disturbance to Silo operations and users	7,000	14,000
		Child labor monitoring	7,500	15,000
		SEA/SH prevention monitoring	7,000	14,000
		Community health and safety monitoring	8,000	16,000
		stakeholder engagement	7,000	14,000
11	OHS Monitoring	safety audits	10,000	20,000
		Health check-ups and monitoring	12,500	25,000
12	Catastrophic Events Monitoring	Fire and explosion safety monitoring	15,000	30,000
Total budget for monitoring during construction phase			<b>134,500</b>	<b>269,000</b>
<b>D</b>	<b>Monitoring during Operation Phase**</b>			
13	Environmental Monitoring	Air quality monitoring	10,000	10,000
		Soil and water contamination monitoring	10,000	10,000
		Noise level monitoring	7,500	7,500
		Biodiversity monitoring	8,000	8,000
		Waste management compliance monitoring	15,000	15,000
14	Socioeconomic Monitoring	Work conditions inspections	10,000	10,000
		Vulnerable Populations	7,000	7,000
		Child labor monitoring	7,000	7,000
		SEA/SH prevention monitoring	7,000	7,000
		Community health and safety monitoring	8,000	8,000
15	OHS Monitoring	Safety audits	9,000	9,000
		Health check-ups and monitoring	10,000	10,000
16	Catastrophic Events Monitoring	Fire, explosion, and leakage safety monitoring	15,000	15,000
		Pesticides Leaks	10,000	10,000
Total budget monitoring during operation phase			<b>117,500</b>	<b>117,500</b>
<b>Total Budget</b>				<b>807,000</b>

**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.

# 7

## STAKEHOLDERS CONSULTATIONS 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 project design / implementation and increases project sustainability. Consultations were conducted before and during the preparation of the ESMP to identify the environmental and social risks and impacts and mitigation measures of the project. The consultation related to the ESMP followed the ESS10 and the SEP principles.

### 7.1. Key Stakeholders

The key stakeholders relevant to the scope of the assessment in the current activity of the project include the following:

- a) *The Egyptian Holding Company for Silos and Storage (EHCCS):*  
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. EHCCS 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 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.

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*g) Small Farmers:*

They are at risk of exclusion from the benefits of the 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 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 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 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 project to assess the impact of the 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 project design.

## **7.2. Previous consultations for Dandara - Al—Marashda – Assiut - as part of the ESMP preparation**

1- Consultations were conducted with EHCSS silo's stakeholders including Mafalsa Silo in order to increase their awareness on of the benefits of establishing silos, which are as follows:

- Providing highly advanced storage capacity within the country.
- Eliminating the percentage of wheat losses resulting from poor storage, which reaches about 10%.
- The country maintains 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

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quality of the grain as a result of the high quality of storage.

- Reducing the average purchasing price of wheat throughout the year as a result 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.
- Providing new job opportunities for young people in construction areas.

#### 2- Work to resolve stakeholders' complaints as follows:

- 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 for wheat suppliers.
- Studying the establishment of new silos near agricultural areas to reduce the burden of distance on farmers during the wheat supply.

#### 3- Working to resolve site employee complaints

#### 4- Providing a suitable work environment for site employees.

- 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 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.

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### 7.3. Site-Specific Consultations

The consultations were conducted with the local community through site-specific consultations (focus group discussions) during the site visit on the 26th of September 2024. Group discussion is an effective method of consulting because it encourages the sharing and discussion of opinions and ideas related to the proposed project.

Several focus group discussions were conducted with the relevant groups as part of the preparation of the ESMP, including consultations with farmers and grain traders. The number of consulted people was 19 persons including 8 framers, 6 women and 5 traders, and their type was farmers, traders, women, and vulnerable groups as presented in the next section. During the consultations, the ESMP consultant team explained to stakeholders the findings and results of the ESMP study including project design, findings, risks, impacts including possible impacts on bordering communities and agricultural lands, including noise, dust, and traffic-related risks during construction and operation phases, risks to current silo users due to construction activities, such as temporary disruptions or delays during peak supply periods, potential risks to laborers working on the silo expansion, including occupational health and safety hazards, and mitigation measures and were open to receive feedback and concerns and suggestions.

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

- The main problem faced by farmers from the current silos operations was the long waiting time to submit their grains, because the Silos cells were already full. increasing the number of cells will increase the capacity and will reduce the waiting time to deliver their grains.
- The number of produced grains ranges from two to 28 tons per year.
- Most of the farmers sell their grains to the Silo in Mafalsa, some of them sell their grains in the supply locations, and in the local market.
- Most of the farmers confirmed that the expansion of the silo will decrease the waiting time to deliver their grains, and the process will be faster for them.
- None of the farmers has concerns about the impact of the silo expansion on wheat prices.
- None of the farmers have concerns about the silo's impact on the environment.
- Their expectations regarding the expansion of the silo were that the supply process would be faster than before.
- Bordering communities, including residential buildings and agricultural lands located next to the silo, were also consulted. The feedback from these stakeholders indicated that they have no significant concerns regarding the expansion project. The bordering communities expressed confidence in the measures outlined in the Environmental and Social Management Plan (ESMP) to mitigate potential risks, such as dust, noise, traffic safety, and waste management.

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### **Grain Traders Feedback:**

- The amount of wheat that traders sell varies between 50 and 150 tons per year, and some of them sell above 150 tons.
- Most of the Traders sell their grains to the Silo in Mafalsa, some of them are growing it or buying it from other farmers and few of them sell their grains in the market.
- The Traders' opinion in the impact of the expansion of the silo that it would make the buying and selling process faster for them than before.
- None of the traders has concerns about the impact of the silo expansion on wheat prices.
- None of the traders have concerns about the silo's impact on the environment.
- Most of the traders mentioned that the expansion of the silo will facilitate the delivering process of grains, few of them mentioned that it will facilitate the grain collection

### **Women's Feedback:**

- During the consultation sessions, women living near the silo site expressed strong support for the expansion project.
- They viewed the project as an opportunity, particularly the ease of transporting grain from nearby fields.
- Several women indicated that the expansion may encourage more investment in wheat cultivation, which could lead to increased household income.
- No safety or social concerns were raised by the women.

### **Feedback from Vulnerable Groups:**

- Consultations also included vulnerable individuals, such as the elderly and people with disabilities. Their feedback reflected a generally positive outlook on the project.
- They welcomed the initiative's inclusive employment measures, particularly the allocation of roles for persons with disabilities, the company complies with the national quota system (5% of the workforce) in case of any future recruitment. It does not specify a particular type of disability, and if such recruitment occurs, it would normally cover general administrative or supportive functions rather than project-specific technical roles.
- 
- The elderly appreciated the proposed improvements in grain handling processes, which would minimize physical strain and waiting time.
- These groups also saw the expansion as a step toward broader community development, offering potential benefits in employment and local trade.

Additionally, vulnerable groups, including women and elderly farmers, raised concerns related to accessibility and operational challenges at the silo.

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### Main concerns and mitigation measures:

**A) Accessibility for Vulnerable Groups:** Some farmers, particularly the elderly and women, mentioned difficulties in accessing silo services due to limited assistance during the supply process. This impacts their ability to efficiently deliver grain.

Mitigation Measures: a) establish on-site teams specifically trained to assist vulnerable groups during grain delivery, b) incorporate ramps to facilitate easy access for individuals with mobility challenges, c) implement a scheduling system during peak periods hours to reduce congestion and ensure that vulnerable groups receive timely assistance and d) include a fast-tracking lane for elderly and small farmers and separate lane for women, e) include parking space for persons with disabilities and elderly f) engage regularly with small farmers, women and elderly and inform them with the above mentioned services tailored to their needs.

**B) Transportation Challenges:** Farmers and traders face logistical difficulties, including a lack of adequate transportation support for grain delivery to the silo.

Mitigation Measures: a) the Silo Manager will collaborate with local transport providers to secure reliable, cost-effective vehicle services for grain delivery, b) encourage the formation of cooperatives among local farmers to share transportation resources, reducing individual costs and delays, and c) implement a robust traffic management plan to facilitate efficient loading and unloading operations, minimizing delays.

**C) Technical and Physical Constraints:** Existing facilities at the silo, including loading and unloading equipment, were reported to be insufficient to handle peak harvest demands efficiently.

Mitigation Measures: a) the increase in the number of storage cells will expand the overall capacity and reduce congestion, b) the installation of modern, automated loading and unloading systems will accelerate grain handling processes, and c) enhance regular maintenance and inspection schedules to ensure that all equipment is functioning optimally, especially during peak periods and (d) implement a scheduling system during peak periods hours to reduce congestion

It is worth mentioning that the existing administrative buildings include ramps for people with disabilities. EHCSS will make sure ramps are also present in the public restroom area and any needed area in their project design.

A grievance mechanism for silos activities are currently being developed by EHCSS, including channels to submit grievances and timeframe for solving grievances already existing, including grievance for public grievance, SEA/Grievance (to be explained more in the next section and in the appendix IV, which focus on SEA/SH), and workplace grievance.

## 7.4. Grievance Mechanism

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confidential and anonymous channels are available, and complainants can choose either option based on their preference.

### **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 ESMP. This grievance mechanism has been designed in accordance with the World Bank's ESS10 requirements (paragraphs 26–27) to ensure it remains accessible, inclusive, transparent, impartial, and effective, with no cost to complainants and full protection against retaliation.

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:

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

All complaints are kept confidential and ID information of complainants is protected to ensure nonretaliation and transparency. Multi-level entry to the system is defined as allow those who are authorized from the relevant Government departments to enter the electronic

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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.

**Table (7.1): Summary of Alignment Between EHCSS GM and World Bank ESS10.**

<b>ESS10 Requirement</b>	<b>ESMP / EHCSS Implementation</b>
Multiple accessible channels	National portal, hotline for unified government complaints system: 16528, app, WhatsApp, field offices, EHCSS customer service lines
Defined response timelines	Acknowledgment within 5 days; final response within 10–14 days; immediate for urgent risks
Confidentiality & non-retaliation	Anonymous submissions allowed; data protection; dignity of complainants
Transparency & record-keeping	Electronic logging, classification, referral, and resolution tracking

### **Localized GM at EHCSS level**

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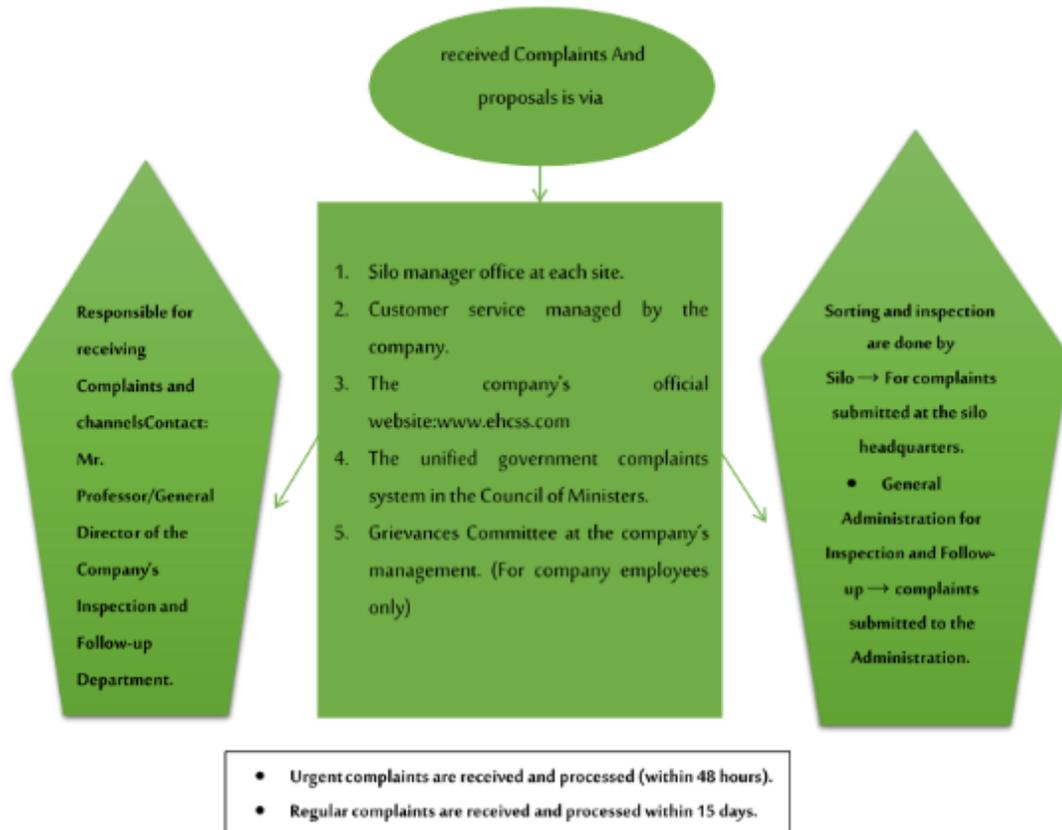
During the preparations for food security project EHCSS confirmed that they receive complaints and feedback at a timely manner from Egypt's portal and it is by mandate they must give feedback within a specific timeframe from receiving the complaint.

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 and grain buyers in the silos. The main complaints are about the quality of the seeds that are being deposited and tested immediately on site. In case there are any complaints from farmers and contractor, the complainant can raise their complaints to the Mafalsa Silo manager office or through his phone number 01288072365. If it is not resolved it escalates to the customer services office at EHCSS. The silo manager documents and sends the complaints to EHCSS or the farmer/ contractor can reach the customer service through the EHCSS customer service number visible at silo level.

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 VII.



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**Figure (7.1):** 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.

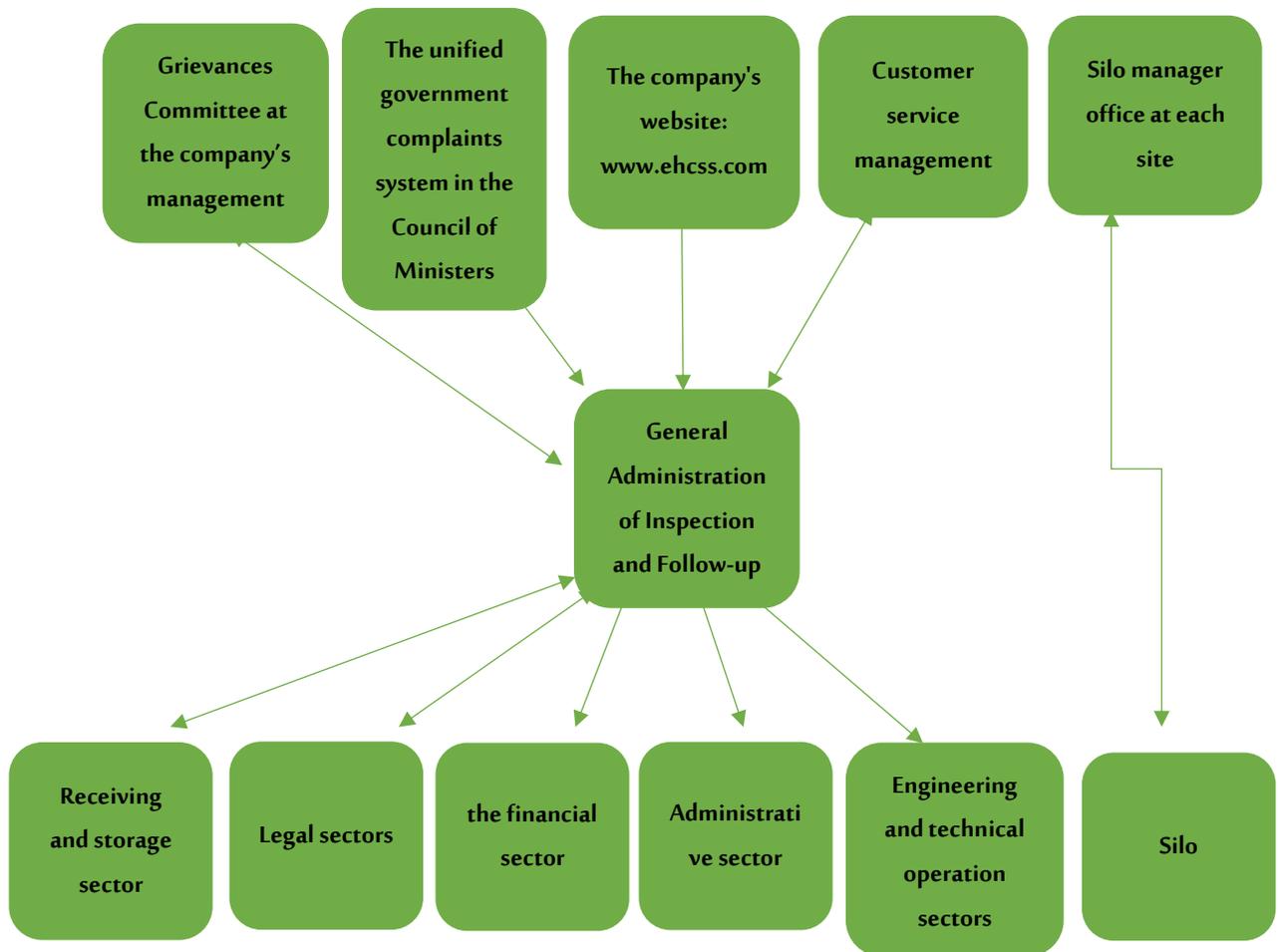
Below is the detailed procedure:

- 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) Mafalsa Silo Manager: 01288072365
  - (2) Customer service managed by the EHCSS company: 01279671142/01279671143.
  - (3) The company's official [website: www.ehcss.com](http://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.

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**Figure (7-2):** 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 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.

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- 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 a 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 with 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.

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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 attend/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 consent) in order to help achieve a transparent process. The GRM staff should send their response within 7 days from 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 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

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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.

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

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# 8

## SUMMARY AND CONCLUSIONS

- 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.

### 8.1. Summary and Conclusions

The ESMP of the proposed extension of Mafalsa Silos has reviewed the impacts of the project on the existing environmental, biological, and social factors. Potential impacts were identified and analyzed, and subsequently mitigation measures and improvement controls were identified to ensure that any potentially harmful impacts are minimized and reduced to minor levels.

There are no environmentally significant impacts that should prevent the proposed of Mafalsa Silos in the identified site, provided that the recommended mitigation and management measures are implemented. Most significant 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. The loss of habitat, disturbance, or any interaction in the project site is not

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anticipated to have a significant negative impact on terrestrial ecosystem in the area. The construction of the expansion will have both positive and negative social impacts. It will create employment and business opportunities for the local community during both the construction and operational phases. The ESMP will tackle all identified environment, social and OHS risks and impacts throughout the project phases.

Overall, the proposed project needs to be viewed as a whole and be determined on the vast array of potential benefits that it will bring to Egypt. EHCSS expects that the construction of the expansions of Mafalsa Silos will increase the capacity of the existing Silos in storing of grains, as well as improving the resilience of the wheat supply chain and reducing loss and waste.

# 9

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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

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Mafalsa Silo is located in the village of Al-Mafalsa in Edfu district, north of Aswan Governorate. The silo has a capacity of 60 thousand tons of wheat, and consists of 12 metal cells, each with a capacity of 5 thousand tons of wheat. The Silo consist of 12 cells each with a capacity of 5 thousand tons of wheat with a total capacity of 60,000 tons, it is equipped with the latest storage technology, including inventory management and control system, steaming system and stock temperature control, 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 note<sup>21</sup> “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.<sup>20</sup> The Borrower will not use any pesticides or pesticide products or formulations unless such use is in compliance with the EHSGs. In addition, the Borrower will also not use any pesticide products that contain active ingredients that are restricted under applicable international conventions or their protocols or that are listed in, or meeting, the criteria of their annexes, unless for an acceptable purpose as defined by such conventions, their protocols, or annexes, or if an exemption has been obtained by the Borrower under such conventions, their protocol, or annexes, consistent with Borrower commitments under these and other applicable international agreements. The Borrower will also not use any formulated pesticide products that meet the criteria of carcinogenicity, mutagenicity, or reproductive toxicity as set forth by relevant international agencies. For any other pesticide products that pose other potentially serious risk to human health or the environment and that are identified in internationally recognized classification and labelling systems, the Borrower will not use pesticide formulations of products if: (a) the country lacks restrictions on their distribution, management, and use; or (b) they are likely to be used by, or be accessible to, lay personnel, farmers, or others without training, equipment, and facilities to handle, store, and apply these products properly”

According to paragraph 23 of the guidance note “The following additional criteria apply to the selection and use of such pesticides: (a) they will have negligible adverse human health effects; (b) they will be shown to be effective against the target species; and (c) they will have minimal effect on nontarget species and the natural environment. The methods, timing, and frequency of pesticide application are aimed to minimize damage to natural enemies. Pesticides used in public health programs will be demonstrated to be safe for inhabitants and domestic animals in the treated areas, as well as for personnel applying them; (d) their use will take into account

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<sup>21</sup> WBG (2018). Guidance Note on ESS3. Retrieved from <https://documents1.worldbank.org/curated/en/112401530216856982/ESF-Guidance-Note-3-Resource-Efficiency-and-Pollution-Prevention-and-Management-English.pdf>

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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, 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.**

<b>Chapter One: Agricultural pest control</b>	
<b>Article No.</b>	<b>Subject</b>
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	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

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		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	<p>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.</p> <p>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.</p>			
Article 38 law 4/1994	<p>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</p>			
Article 39 law 4/1994	<p>When carrying out excavation, drilling, construction, or demolition work, or transporting the resulting waste or dust,</p>			

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	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.	
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## 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,	

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	and the recommendations of the Ministry of Agriculture regarding their use.	
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## 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,

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- 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 threshold level, and accordingly, physical, biological, or chemical approaches can be recommended.

- **Sequential sampling method**

Sampling should be performed frequently after fixed intervals for best observations, and to gather information about population changes from time to time. For example, those stored grain pests stored above 20°C should be visited after a gap of 25–30 days. Grains held below 20°C

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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 Mafalsa Silo uses the fumigation method in pest control, and this is done 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 is calculated based on the severity of the infection, as the infection depends on the duration and time of storage, infection in Mafalsa Silo 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	Glue forte Live traps	<ol style="list-style-type: none"> <li>1. Around the silo wall from the inside.</li> <li>2. Around warehouses from the outside.</li> <li>3. Around the administrative building.</li> </ol>

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2	Flying insects	Sticky traps	Flyribbon attractive	Inside the administrative building and at the doors.
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**Table I.3:** A form for the record of conducting the disinfection and pest control process.

Control type (check mark)			Control area	Active substance used with concentration	Usage rate	Amount of pesticide used	Method used for control
Disinfection	Rodent control	Reptile control*					
√	√	√	Tunnel	—	100 cm <sup>3</sup> 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

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certain situations, maintenance of  $-4^{\circ}\text{C}$  to  $0^{\circ}\text{C}$  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  $\text{O}_2$  atmosphere is blown at the base of the containers, bins, and other stored chambers, forcing out the existing  $\text{O}_2$  rich atmosphere is a convenient method for infestation control.
- **Sanitation:** All bins, containers, granaries, and other stored places should be cleaned using shovels, brooms, vacuum cleaners to clear old grains, dust, spider web, and fines from all cracks and crevices, windows, doors, vents, fans, elevators, and floor. Even a small old grain or fines left in any place where new grains are to be stored can harbour insects that can infest the whole grain. A suitable dryer should be used to remove the moisture from bins. To improve storability, especially in the case of wet, damaged, or immature grains, grain cleaners can be used frequently (Ahmad *et al.*, 2021).

## **h) Aeration Cooling**

### **Temperature effects on grain insects**

- The common grain pests increase by 20-25 times a month at high temperatures ( $30-35^{\circ}\text{C}$ ) and moistures (14-16% grain moisture for wheat, equivalent to 70-80% relative humidity (RH)).
- Reducing grain temperature slows insect development. For example, flour beetles can complete their development in three weeks at  $35^{\circ}\text{C}$  and 70% RH but take ten weeks at  $22.5^{\circ}\text{C}$  and 70%RH.
- Although adult grain insects live a long time at cool temperatures, their young stages stop developing at temperatures below  $15^{\circ}\text{C}$  for weevils or  $20^{\circ}\text{C}$  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

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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 other health disorders. The repeated application of insecticides leads to insecticide residues, secondary pest outbreaks (Burrill *et al.*, 2021).

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.

## 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)<sup>22</sup> and IFC guidelines for annual crop production (2016)<sup>23</sup>):

- 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 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)<sup>24</sup>:

- Keep ignition sources away
- Do not smoke.
- Protect against electrostatic charges.
- Keep protective respiratory device available

<sup>22</sup> FAO (2001). Guidelines on Good Practice for Ground Application of Pesticides

<sup>23</sup> 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>

<sup>24</sup> For more information and guidance on Phostoxin follow [https://label.westernpest.com/files\\_techservices/live/degesch.phostoxin052418.sds.pdf](https://label.westernpest.com/files_techservices/live/degesch.phostoxin052418.sds.pdf)

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- 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, PH<sub>3</sub>) 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 are 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<sup>25</sup>:

<sup>25</sup> For more information and guidance on Phostoxin follow  
[https://label.westernpest.com/files\\_techservices/live/degensch.phostoxin052418.sds.pdf](https://label.westernpest.com/files_techservices/live/degensch.phostoxin052418.sds.pdf)

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- Never allow the buildup of phosphine gas (hydrogen phosphide, PH<sub>3</sub>) 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, PH<sub>3</sub>) 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 CO<sub>2</sub>, 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, PH<sub>3</sub>) 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 NIOSH/MSHA approved full-face gas mask – phosphine gas canister combination may be used at levels up to 15 ppm or following manufacturers' use conditions instructions for escape. Above 15 ppm or in situations where the phosphine gas concentration is unknown, a NIOSH/MSHA approved SCBA must be worn.

### **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:

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- **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.

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

Specific management measures for rodenticides shall be followed (Adapted from EBPF, (n.d)<sup>26</sup> and Tobin, (2005)<sup>27</sup>).

- 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

<sup>26</sup> EBPF (n.d). Guideline on Best Practice in the Use of Rodenticide Baits as Biocides in the European Union

<sup>27</sup> Tobin, M. E., & Fall, M. W. (2004). Pest control: rodents.

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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.
- 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

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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: -

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- **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).



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## 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 Mafalsa Silo consists 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 tests, 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 are related to the preparation of Specific Pest Management Plans, capacity building, training, and awareness-raising campaigns.

## Appendix II: Traffic Management Plan (TMP)

### 1. Background

The safety of workers and road users during construction is dependent on the ability of contractors to effectively manage the risks. The risk management process is embodied in the contractor's Traffic Management Plan (TMP) which is a document that details the way activities in the road corridor will be carried out. The TMP is a site-specific plan that covers the design, implementation, maintenance and removal of Temporary Traffic Management (TTM) measures while work or activities are carried out in the road corridor (road, footpath or berm). The plan details how road users, particularly vulnerable cyclists and pedestrians, will be directed around a work site, crashes, or other temporary road disruption, to minimize inconvenience while providing safe conditions for both the road user and the workers carrying out the activity. The assessment needs to consider: (i) the existing regulatory environment for TTM and how it reflects good practice; (ii) the capacity of contractors to effectively implement TTM; and (iii) the ability of the IA and the Supervision Engineer (SE) to enforce TTM standards.

Monitoring of the adherence of contractor vehicles to the Contractor's TMP is essential. These plans need to clearly define as a minimum: (i) the approved haul routes for all construction traffic; (ii) maximum speed limits (which are often lower than the legal speed limit) at locations on the route (for example 40 km/h or 30 km/h when vulnerable users are present, such as during school hours starting 200m before to 200m after a school), and the hours at which vehicles operate and; (iii) Temporary Traffic management (TTM) in work zones. The SE is to monitor and report on the contractor's adherence to the TMP.

Construction vehicles and equipment on public roads are specifically mentioned in World Bank ESS4. This is because they are often large and unwieldy and not well suited for operation in mixed traffic on normal roads. Examples include large, self-propelled excavators, cranes and graders. In energy projects, there is frequent use of large, specialized vehicles that carry equipment and pre-fabricated elements.

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 Mafalsa Silo and workplace and the surrounding area serves an important role. The Mafalsa silo is located on the Cairo Aswan Eastern Desert Road. This road does not have a traffic jam (check the location map of Mafalsa Silo in figure 1.1).

They are designed for the following purposes:



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- **Safety:** a traffic management plan eliminates or reduces the chances of accidents that may occur while working in the Mafalsa 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.

Key stakeholder groups could include roadside communities, transport providers and users, commuters, vulnerable road users (pedestrians, motorcyclists, and bicycle riders), traffic police, non-governmental organizations (NGOs), and post-crash service providers. Processes for engagement will depend on available and feasible communication means, and may include door-to-door surveys, opportunistic surveys, informal discussions, focus groups and community meetings. These consultations may provide useful information on relevant patterns of behavior and risk exposure but should not be used as a guide to what will work to address risk.

There is various stakeholder groups concerned by this TMP. Project Workers are the individuals and groups engaged in the sub-project Implementation Phase such as direct workers, contracted workers, workers bringing supplies and materials to the work site, and community workers. Affected Communities are the individuals and groups directly exposed to project construction activities and that may also face ongoing exposure to operations once construction is completed.

Road Users are the public using the project road either during construction or operation phases. Statistically, during the operation phase, this group are by far the dominant contributor to traffic-related FSIs. Vulnerable road users are pedestrians, cyclists, and motorcyclists. Well over 50% of deaths in LMICs are these three road user groups. These users are most at risk of an FSI in the event of a crash with a motor vehicle. Ideally, vulnerable users should be protected through segregation—such as through the provision of footpaths or dedicated cycle/motorcycle lanes. As segregation is impossible in many situations, the next option is speed management: vulnerable road users require a low-speed environment to interact with traffic.

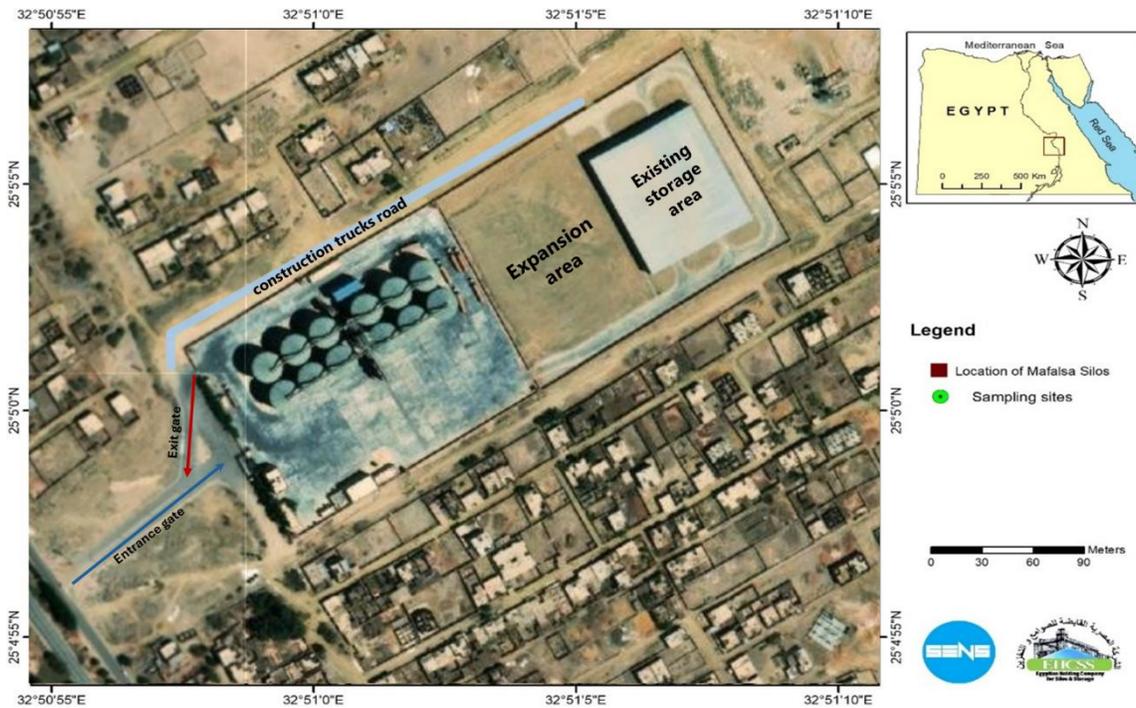
## 2. Mafalsa Silo

- **Current traffic to Mafalsa Silos**

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Mafalsa Silo is located in the village of Al-Mafalsa in Edfu district, north of Aswan Governorate. The silo has a capacity of 60 thousand tons of wheat, and consists of 12 metal cells, each with a capacity of 5 thousand tons of wheat. The Silo Complex cover an area of 20,000 m<sup>2</sup> and consist of 12 cells each with a capacity of 5 thousand tons of wheat with a total capacity of 60,000 tons, it is equipped with the latest storage technology, including inventory management and control system, steaming system and stock temperature control, firefighting system, and wireless system.

The number of trucks that deal with the silo ranges from 50 per day in the harvest and supply season, and to 20 per day on normal days of the year (according to Silo Manager). There are no specific schedules to deliver grains to silos, the expected average wait time for trucks to load or unload grains depends on the weight of grains to be delivered. But in general, all the trucks deliver the grain to the Silo on the same day on which they arrive.



**Figure (II.1): Mafalsa Silo.**

- **Traffic during construction phase**

The main road that will be used for transporting construction equipment will be the Cairo Aswan Eastern Desert Road (which is located in front of the existing Silo). Roads

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with lowest population densities will be selected to transfer equipment from construction contractor equipment storage area to the main road. The roads will be identified by the contractor as part of their C-ESMP in coordination with the consulting firm contracted by EHCSS during the construction phase and approved by the EHCSS and /or their approved consulting firm (see section 6.5 on the roles and responsibilities)

The access road of the construction trucks will be different road than the road that currently used by the grain trucks.. This road is located to the north of the silo site,so, it will not interrupt the flow and access of grain trucks to the current operating/existing silos.

- **Traffic after silos expansion phase/operational phase**

After the construction phase the traffic will be normal for the grain trucks as it was before the construction of the expansion. And there will be no trucks for the construction.

It is important to clarify that the expansion will not lead to an increase in the number of operation trucks. Instead, the number of days allocated for loading and unloading grains will increase.

The capacity of the Mafalsa Silos for loading and unloading will remain unchanged after the expansion. Therefore, while the storage capacity will increase, the logistics of truck operations will continue as before, with the same number of trucks being utilized. The extended days for loading and unloading will accommodate the increased storage volume without necessitating additional trucks.

Since the number of trucks will not increase, there will be no impact on traffic as a result of the construction and operation of the expansion. This approach ensures efficient grain management while maintaining existing transportation operations and minimizing any potential traffic disruptions.

The silo design consultant will develop a traffic management plan during operation phase in coordination with EHCSS. Main roads leading to the silo were provided in Figure (II.1).

### **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

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- 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 Mafalsa expansion Silos. 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 Mafalsa 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:

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- 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 (Mafalsa 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 avoid 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 expansion, as well as it will be considered in the plan for construction and operational phase to avoid peak hours.

Projects need to undertake baseline data collection to not only establish the appropriate project interventions to address road safety risks, but also as a way of assessing whether the project improved or worsened the situation. Stakeholder engagement will also usually provide detailed guidance on prevailing road safety issues.

Increased traffic volume during any sub-project phase may result from:

- Sub-project-related vehicle fleets (e.g. heavy construction trucks or additional grain carriers reflecting the increased grain storage capacity).
- Project-related pedestrian, bicycle, or motor traffic.

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- Induced traffic, (that is, local vehicles altering their usage patterns to or from another corridor to compensate for changes in traffic patterns caused by the sub-project, sometimes to avoid congestion or arrive more quickly at destinations).

A traffic study concerning potentially affected local offsite roads will be implemented prior to the site preparation phase of the sub-project. Projects need to undertake baseline data collection to not only establish the appropriate project interventions to address road safety risks, but also as a way of assessing whether the project improved or worsened the situation. Stakeholder engagement will also usually provide detailed guidance on prevailing road safety issues.

**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

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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

Regarding the onsite traffic management during the construction phase, there will be a separate road for the construction trucks than the existing road for grain trucks.

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.
- Reducing speed is very important where administrative control measures are the only reasonably practicable approach. Speed limits should be implemented and enforced and

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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.

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### 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).

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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.

### 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.

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- 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

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be returned to the consignor and on the delivery, document left with the recipient. (Records Required)

- If any grain cannot be unloaded and is redirected, the Driver must record the destination of the grain.

#### **Monitoring:**

- Regular monitoring will be carried out, the frequency of monitoring will be based on the schedule of the work in the construction of the expansion, 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 Mafalsa 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, day's 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 controller's 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:

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- 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 expansion of Mafalsa Silos as well 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 OHSMP. 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.

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- **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.

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- **Mechanical risks:** Risks of falling from heights, sudden disintegration or breakage of gears or large parts of silo filling machines.
- **Life threatening risks:** Some of the previously mentioned risks, whether chemical, physical, biological, and mechanical, each of them contains risks that threatening life such as inhaling toxic gases, sudden explosion of huge parts of machinery because of their disintegration, sudden fall from heights, exposure to electric shock, exposure to fire and collision with large vehicles or trucks located inside the silo. These risks are avoided as much as possible, and when they occur, they will be dealt with quickly with first aid by trained workers, with immediate transportation to the nearest health care unit.

### A) *Occupational Hygiene*

The H&S expert must guarantee dedication to occupational health risk monitoring and reporting, as well as the implementation of controls to lower risk in line with all applicable laws and, whenever practical, with adherence to recognized best practices. Specific assessments of occupational hygiene will be performed using recognized procedures and relevant standards. For the following workplace health risks, ongoing evaluations must be done, and controls must be put in place as necessary.

#### ✓ *Sanitation and Good Hygiene*

H&S Expert is required to provide workers with suitable facilities including:

- A reasonable distance between restrooms and each workspace.
- Clean, well-maintained sanitation and hygiene facilities.
- Dining establishments with enough seating, tables, and facilities for hand washing and waste disposal.
- Potable water supplies accessible to all employees.

Additionally, employees are not permitted to misuse or harm any given sanitation or hygiene facilities or purposefully pollute work areas.

### B) *Safety*

#### ✓ *Personal Protective Equipment (PPE)*

To safeguard employees and visitors from danger, the H&S expert must make sure that everyone wears or uses the personal protective equipment that is offered. According to the 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

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- 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
<b>Eye and face protection</b>	Flying particles, molten metal, liquid chemicals, gases or vapors, light radiation.	Safety Glasses with side-shields, protective shades, etc.
<b>Head protection</b>	Falling objects, inadequate height clearance, and overhead power cords.	Plastic Helmets with top and side impact protection.
<b>Hearing protection</b>	Noise, ultra-sound.	Hearing protectors (ear plugs or earmuffs).
<b>Foot protection</b>	Falling or rolling objects, pointed objects. Corrosive or hot liquids.	Safety shoes and boots for protection against moving & falling objects, liquids, and chemicals.
<b>Hand protection</b>	Hazardous materials, cuts or lacerations, vibrations, extreme temperatures.	Gloves made of rubber or synthetic materials (Neoprene), leather, steel, insulating materials, etc.
<b>Respiratory protection</b>	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.
<b>Body/leg protection</b>	Extreme temperatures, hazardous materials, biological agents, cutting and laceration.	Insulating clothing, body suits, aprons etc. of appropriate materials.

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### ✓ *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 blower processes simultaneously. Sound levels of 100 dB or more for even short periods of time, can result in permanent hearing loss. Therefore, it requires the protection of workers in high-noise work areas can be protected by using Personal protective equipment (PPE) such as ear plugs or earmuffs can significantly reduce the noise level. Other interventions would include limiting the worker's exposure by maintaining the tractors and machinery in good condition and requiring that the workers rotate out of the high noise area after shorter work sessions of no more than 10-15 minutes for 100 dB levels.

### ✓ *Fall Prevention*

To lessen the risk of a person falling from one level to another, a health and safety expert must ensure that all employees who participate in works where there is a risk of falling carry out those works in a controlled manner. H&S experts therefore carry out comprehensive risk assessments, checking the condition of ladders, handrails and cages and the integrity of the silo roof. In addition to ensuring that they are well trained in dealing with fall accidents. So, if a worker falls or is injured while working at heights, or suffers a heart attack, heat stroke, or sprains his ankle while on top of the silo, a rapid rescue will be carried out to safely lower the stricken individuals by trained silo workers on site as immediate assistance without relying on requesting external assistance, because any delay may be crucial to their health.

### ✓ *Machinery inspection*

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.

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✓ ***Warning Signs***

The H&S expert must make sure that there is enough safety signs put on buildings and roadways to deter accidents, identify dangers, point out where fire and safety equipment is located, and provide instructions on what to do in an emergency.

✓ ***Driving Safety***

The H&S expert is required to make sure that anyone who is allowed to operate a vehicle in a silo area or a silo vehicle on a public road has a valid driver's license and is adhering to the applicable traffic laws for that type of vehicle.

All employees operating vehicles on silo property are required to follow all traffic regulations, adhere to road conditions, and follow any applicable traffic (transportation) management plans.

✓ ***Fire Safety Requirements***

- The quantity and size of staircases and emergency exits for fast evacuate.
- Regular drills in accordance with the fire safety plan, testing and monitoring of fire safety equipment on a regular basis, and training for fire wardens.
- Data processing rooms, telecommunication switches, and process control rooms—areas containing priceless or essential equipment—are protected by fixed extinguishing systems and fixed fire extinguishing/suppression systems.
- Employee Alarm Systems: By ensuring that alarm systems function correctly and that protocols are in place to notify employees of workplace emergencies, employee alarm systems can lessen the severity of workplace accidents and injuries.
- Portable fire extinguishers, which help reduce the damage caused by these fires. Fire extinguishers, when used correctly, can put out a minor fire or contain a fire until further assistance arrives, saving lives and protecting property.
- There is already a plan for escape routes, and evacuation in case of emergency in Mafalsa Silo (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 Unit in Edfu, which is located 17 km away from the Mafalsa Silo.

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### 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 (rented apartments in the city of Aswan as mentioned previously), 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

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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.

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- 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 belonging to the health care unit of Al-Mafalsa. For example, the Al-Mafalsa Health Unit is about 600 meters away from the Silo.
- 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.

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### ✓ *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 incidentsThese 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

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- 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.

<b>a. Fatalities (number)</b>	<b>b. non-fatal injuries (number)</b>	<b>c. Total time lost non-fatal injuries (days)</b>
a.1 Immediate	b.1 Less than one day	
a.2 Within a month	b.2 Up to 3 days	c.1 Up to 3 days
a.3 Within a year	b.3 More than 3 days	c.2 More than 3 days



**Figure (III.1):** Fire equipment, Fire exit, warning, and prohibition safety and First aid signs.

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**Figure (III.2):** Personal Protective Equipment (PPE).

## 7. Implementation of OHSMP

Implementation of OHSMP in Silos project involves several steps and considerations including the following:

- Establishing a Safety Culture:** Make safety and health a core value in the workplace. This involves creating a culture where safety is prioritized, and everyone understands its importance.
- Employee / Workers Participation:** Management should lead by example and actively involve employees /workers in the development and implementation of the OHSMP. This can be done through regular communication, training, and encouraging employee feedback and participation.
- Defining OHSMP 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.
- Developing a Reporting System:** Implementing a reporting system that allows employees to report any safety and health issues or concerns. This system should be

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easily accessible and encourage timely reporting. There is already a Grievance Mechanism system and GM channels for workers in the Silo.

- e) **Providing Training:** Ensure that all employees / workers receive appropriate training on safety procedures, hazard identification, and emergency response protocols. Training should be ongoing and tailored to specific job roles and tasks. Training take place in the training center in EHCSS in Cairo.
- f) **Conducting Inspections:** Regularly inspect the workplace to identify hazards and assess the effectiveness of safety measures. Inspections should be documented, and any identified hazards should be addressed promptly. Inspections are carried out according to planned schedules by EHCSS.
- g) **Implementing Hazard Controls:** Take steps to control and mitigate identified hazards. This may involve implementing engineering controls, administrative controls, or personal protective equipment (PPE).
- h) **Monitoring and Reviewing:** Continuously monitor and review the effectiveness of the OHSMP. This can be done through regular audits, incident investigations, and feedback from employees. Make necessary adjustments and improvements to the plan as needed. The monitoring and reviewing are carried out internally in the Silo according to planned schedules by EHCSS.
- i) **Compliance:** Ensure compliance with relevant occupational health and safety regulations and standards. Stay updated on any changes in regulations and make necessary adjustments to the OHSMP to remain compliant.
- j) **Documentation:** Maintain proper documentation of the OHSMP, including policies, procedures, training records, incident reports, and any other relevant documentation. This documentation should be easily accessible and regularly reviewed.



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## Appendix IV: Sexual Exploitation Abuse and Sexual Harassment Plan

**Table (IV):** SEA/SH Prevention and Response Action Plan:



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Action to Address SEA/SH Risks	Who is Responsible for Action	Project Update/ Comments	Notes	Ongoing Risk Management & Timeline	Estimated Budget
<p><b>Agree with PMU/EHCSS and MALR on Code of Conduct (CoC) that is focused on SEA/SH</b></p> <p><b>Clearly define the SEA/SH requirements and expectations in the bid documents.</b></p> <p><b>Biding documents should:</b></p> <ul style="list-style-type: none"> <li><b>emphasize that the construction company must comply with all relevant laws and regulations concerning sexual harassment and abuse prevention in the workplace.</b></li> <li><b>Specify that the construction company must establish clear and accessible reporting mechanisms for incidents or suspicions of sexual abuse and harassment</b></li> </ul>	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



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Action to Address SEA/SH Risks	Who is Responsible for Action	Project Update/ Comments	Notes	Ongoing Risk Management & Timeline	Estimated Budget
<b>Sensitize PMU/ EHCSS Team including Supervising Engineer and Silo managers/staff on the SEA/SH risks at project level.</b>	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.	<ul style="list-style-type: none"> <li>• Prior to the construction</li> <li>• Prior to Wheat Season (March-April) and throughout operation of the silo</li> </ul>	As needed bringing in experts in GBV and SEA/SH to conduct the sensitization sessions



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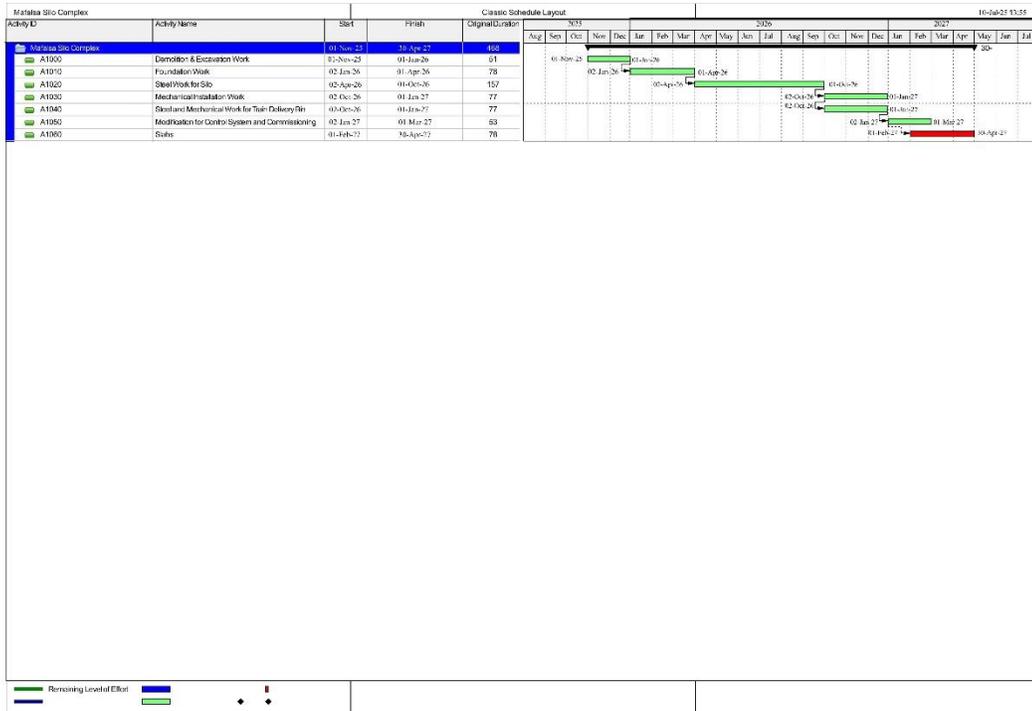
Action to Address SEA/SH Risks	Who is Responsible for Action	Project Update/ Comments	Notes	Ongoing Risk Management & Timeline	Estimated Budget
<p><b>Establish GRM mechanism for SEA/SH cases. as per Stakeholder Engagement Plan (SEP)</b></p> <ul style="list-style-type: none"> <li>- <b>Setup safe uptake channels for SEA/SH that is separate and confidential.</b></li> <li>- <b>Ensure coordination and collaboration with National Council for Women is done to refer cases as needed.</b></li> <li>- <b>Disclose the information related to NCW hotline to allow access to safe referral to different services in case of SEA/SH incidents</b></li> <li>- <b>Ensure the information is disseminated at silo level and all staff and users are aware of how to report SEA/SH cases.</b></li> </ul>	PMU, contractor and silos management		Focal Point for social aspect with good knowledge about SEA/SH needs to be assigned by the contractor and the Supervision engineer	<ul style="list-style-type: none"> <li>• Disseminate information to staff at silo level.</li> <li>• Regularly assess confidentiality of reporting and introduce any enhancement to reinforce the survivor centered principles.</li> <li>• Ongoing monitoring and reporting on GRM to verify it is working as intended.</li> <li>• Follow a survivor centered approach to ensure, as appropriate, that reported cases/survivors are receiving the appropriate services.</li> </ul>	<p>Travel cost to silo.</p> <p>Posters and others to disseminate SEA/SH uptake channel in silo.</p>



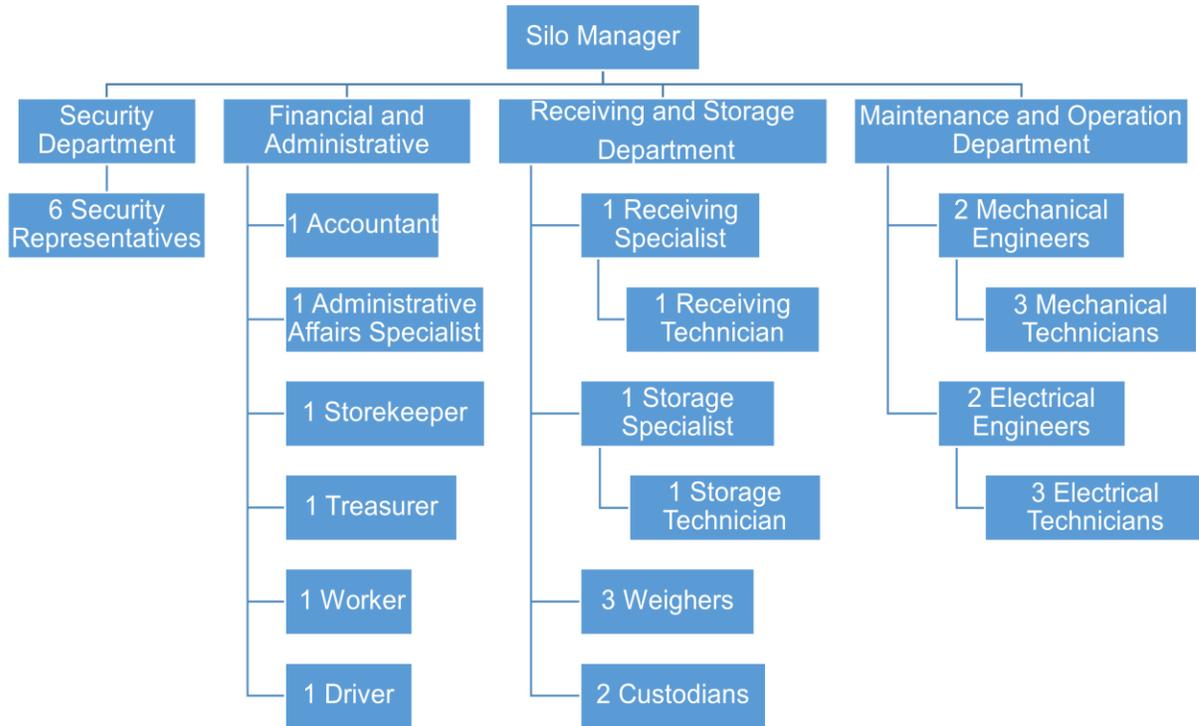
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Action to Address SEA/SH Risks	Who is Responsible for Action	Project Update/ Comments	Notes	Ongoing Risk Management & Timeline	Estimated Budget
<p><b>Map out SEA/SH prevention and response services and introduce the project SEA/SH risks to services providers namely:</b></p> <ul style="list-style-type: none"> <li>- <b>Contact person at National Council for Women to support in case management Procedures.</b></li> <li>- <b>Contacts related to other services (health, legal, psychosocial) in coordination with NCW.</b></li> </ul>	PMU, contractor and silos management		Coordinate with National Council for Women to identify contact person and inform them of SEA/SH risks at project level.	<ul style="list-style-type: none"> <li>• Update mapping as appropriate</li> </ul>	<p>Travel cost to silo.</p> <p>Training cost of contact persons.</p>
<p><b>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.</b></p>	PMU, contractor and silos management		Coordination with MALR to engage with women farmers.	<ul style="list-style-type: none"> <li>• Monitoring of implementation of Stakeholder Engagement Plan.</li> <li>• Ongoing consultations</li> </ul>	Cost of implementing the SEP.
				Report as part of the ESF reports	Cost included in the contractor's agreement.

# Appendix V: Mafalsa Subproject Documents and Figures



**Figure (V.1): Time Schedule for the Mafalsa Silo subproject.**



**Figure (V.2):** Current Administrative structure of Mafalsa Silo Complex in Aswan.

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**Figure (V.3):** Some photos from Mafalsa Silo Complex in Aswan. Observed pigeons (*Columba livia*) concentrated at silo areas due to grain spills. The ESMP will take this risk into consideration.

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**Figure (V.4):** Some photos of consultation at Mafalsa Silo Complex in Aswan.

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مصر شعبان ٢٠٢٤  
مزارع

الأسئلة التي سوف يتم طرحها في الاجتماعات التشاورية مع المجموعات المختلفة التي قد تتأثر بمشروع توسعة الصوامع وزيادة قدرتها الاستيعابية

أ) أسئلة للمجموعات المختلفة من المزارعين:

1. ما هي كمية القمح التي تنتجها كل فدان؟
2. أين تقع الحبوب الخاصة بك حاليا؟
3. كيف سيؤثر توسع الصوامع على انضمامكم الزراعي وانضمامكم من تخزين الحبوب؟
4. كيف سيؤثر توسع الصوامع وزيادة قدرتها الاستيعابية على تسهيل أو صعوبة بيعك وشيكك للقمح؟
5. ما هي مخاوفكم بشأن تأثيرات توسع الصوامع على أسعار القمح؟
6. ما هي مخاوفكم بشأن تأثيرات توسع الصوامع على البيئة؟
7. ما هي توقعاتكم بشأن توسع الصوامع؟

ب) أسئلة للمجموعات المختلفة من التجار والمكائيلين للحبوب:

1. ما مقدار الحبوب التي تشتريها وتبيعها كل عام؟
2. أين تقوم حاليا بشراء وبيع الحبوب الخاصة بك؟
3. كيف سيؤثر توسع الصوامع على عملية شراء وبيع الحبوب أميل أو أكثر صعوبة بالنسبة لك؟
4. ما هي مخاوفكم بشأن تأثيرات توسع الصوامع على أسعار الحبوب؟
5. ما هي مخاوفكم بشأن تأثيرات توسع الصوامع على البيئة؟
6. كيف سيؤثر توسع الصوامع على دوركم في إدارة الحبوب وبيعها؟
7. ما هي التغييرات التي تتوقعها في شكل نتيجة ترسعة الصوامع؟

ج) أسئلة للمجموعات المختلفة من النساء:

1. كيف تتشارك النساء في عملية إنتاج الحبوب وبيعها واطاها؟
2. كيف سيؤثر توسع الصوامع على عملك أميل؟
3. أين تقع الحبوب الخاصة بك حاليا؟
4. ما هي مخاوفكم بشأن تأثيرات توسع الصوامع على سلامتك وأمنك؟
5. هل هناك أي مخاوف تتعلق بالسلامة أو إمكانية الوصول للصوامع أو فرص العمل للنساء؟
6. ما هي التغيرات الاجتماعية المحتملة (الإيجابية والسلبية) المتوقعة نتيجة توسع الصوامع؟

مزارع / سمير موريس خليل

الأسئلة التي سوف يتم طرحها في الاجتماعات التشاورية مع المجموعات المختلفة التي قد تتأثر بمشروع توسعة الصوامع وزيادة قدرتها الاستيعابية

أ) أسئلة للمجموعات المختلفة من المزارعين:

1. ما هي كمية القمح التي تنتجها كل فدان؟
2. أين تقع الحبوب الخاصة بك حاليا؟
3. كيف سيؤثر توسع الصوامع على انضمامكم الزراعي وانضمامكم من تخزين الحبوب؟
4. كيف سيؤثر توسع الصوامع وزيادة قدرتها الاستيعابية على تسهيل أو صعوبة بيعك وشيكك للقمح؟
5. ما هي مخاوفكم بشأن تأثيرات توسع الصوامع على أسعار القمح؟
6. ما هي مخاوفكم بشأن تأثيرات توسع الصوامع على البيئة؟
7. ما هي توقعاتكم بشأن توسع الصوامع؟

ب) أسئلة للمجموعات المختلفة من التجار والمكائيلين للحبوب:

1. ما مقدار الحبوب التي تشتريها وتبيعها كل عام؟
2. أين تقوم حاليا بشراء وبيع الحبوب الخاصة بك؟
3. كيف سيؤثر توسع الصوامع على عملية شراء وبيع الحبوب أميل أو أكثر صعوبة بالنسبة لك؟
4. ما هي مخاوفكم بشأن تأثيرات توسع الصوامع على أسعار الحبوب؟
5. ما هي مخاوفكم بشأن تأثيرات توسع الصوامع على البيئة؟
6. كيف سيؤثر توسع الصوامع على دوركم في إدارة الحبوب وبيعها؟
7. ما هي التغييرات التي تتوقعها في شكل نتيجة ترسعة الصوامع؟

ج) أسئلة للمجموعات المختلفة من النساء:

1. كيف تتشارك النساء في عملية إنتاج الحبوب وبيعها واطاها؟
2. كيف سيؤثر توسع الصوامع على عملك أميل؟
3. أين تقع الحبوب الخاصة بك حاليا؟
4. ما هي مخاوفكم بشأن تأثيرات توسع الصوامع على سلامتك وأمنك؟
5. هل هناك أي مخاوف تتعلق بالسلامة أو إمكانية الوصول للصوامع أو فرص العمل للنساء؟
6. ما هي التغيرات الاجتماعية المحتملة (الإيجابية والسلبية) المتوقعة نتيجة توسع الصوامع؟

مزارع / خاتمة حرمي السكار

الأسئلة التي سوف يتم طرحها في الاجتماعات التشاورية مع المجموعات المختلفة التي قد تتأثر بمشروع توسعة الصوامع وزيادة قدرتها الاستيعابية

أ) أسئلة للمجموعات المختلفة من المزارعين:

1. ما هي كمية القمح التي تنتجها كل فدان؟
2. أين تقع الحبوب الخاصة بك حاليا؟
3. كيف سيؤثر توسع الصوامع على انضمامكم الزراعي وانضمامكم من تخزين الحبوب؟
4. كيف سيؤثر توسع الصوامع وزيادة قدرتها الاستيعابية على تسهيل أو صعوبة بيعك وشيكك للقمح؟
5. ما هي مخاوفكم بشأن تأثيرات توسع الصوامع على أسعار القمح؟
6. ما هي مخاوفكم بشأن تأثيرات توسع الصوامع على البيئة؟
7. ما هي توقعاتكم بشأن توسع الصوامع؟

ب) أسئلة للمجموعات المختلفة من التجار والمكائيلين للحبوب:

1. ما مقدار الحبوب التي تشتريها وتبيعها كل عام؟
2. أين تقوم حاليا بشراء وبيع الحبوب الخاصة بك؟
3. كيف سيؤثر توسع الصوامع على عملية شراء وبيع الحبوب أميل أو أكثر صعوبة بالنسبة لك؟
4. ما هي مخاوفكم بشأن تأثيرات توسع الصوامع على أسعار الحبوب؟
5. ما هي مخاوفكم بشأن تأثيرات توسع الصوامع على البيئة؟
6. كيف سيؤثر توسع الصوامع على دوركم في إدارة الحبوب وبيعها؟
7. ما هي التغييرات التي تتوقعها في شكل نتيجة ترسعة الصوامع؟

ج) أسئلة للمجموعات المختلفة من النساء:

1. كيف تتشارك النساء في عملية إنتاج الحبوب وبيعها واطاها؟
2. كيف سيؤثر توسع الصوامع على عملك أميل؟
3. أين تقع الحبوب الخاصة بك حاليا؟
4. ما هي مخاوفكم بشأن تأثيرات توسع الصوامع على سلامتك وأمنك؟
5. هل هناك أي مخاوف تتعلق بالسلامة أو إمكانية الوصول للصوامع أو فرص العمل للنساء؟
6. ما هي التغيرات الاجتماعية المحتملة (الإيجابية والسلبية) المتوقعة نتيجة توسع الصوامع؟

مزارع / صوفى مصطفى

الأسئلة التي سوف يتم طرحها في الاجتماعات التشاورية مع المجموعات المختلفة التي قد تتأثر بمشروع توسعة الصوامع وزيادة قدرتها الاستيعابية

أ) أسئلة للمجموعات المختلفة من المزارعين:

1. ما هي كمية القمح التي تنتجها كل فدان؟
2. أين تقع الحبوب الخاصة بك حاليا؟
3. كيف سيؤثر توسع الصوامع على انضمامكم الزراعي وانضمامكم من تخزين الحبوب؟
4. كيف سيؤثر توسع الصوامع وزيادة قدرتها الاستيعابية على تسهيل أو صعوبة بيعك وشيكك للقمح؟
5. ما هي مخاوفكم بشأن تأثيرات توسع الصوامع على أسعار القمح؟
6. ما هي مخاوفكم بشأن تأثيرات توسع الصوامع على البيئة؟
7. ما هي توقعاتكم بشأن توسع الصوامع؟

ب) أسئلة للمجموعات المختلفة من التجار والمكائيلين للحبوب:

1. ما مقدار الحبوب التي تشتريها وتبيعها كل عام؟
2. أين تقوم حاليا بشراء وبيع الحبوب الخاصة بك؟
3. كيف سيؤثر توسع الصوامع على عملية شراء وبيع الحبوب أميل أو أكثر صعوبة بالنسبة لك؟
4. ما هي مخاوفكم بشأن تأثيرات توسع الصوامع على أسعار الحبوب؟
5. ما هي مخاوفكم بشأن تأثيرات توسع الصوامع على البيئة؟
6. كيف سيؤثر توسع الصوامع على دوركم في إدارة الحبوب وبيعها؟
7. ما هي التغييرات التي تتوقعها في شكل نتيجة ترسعة الصوامع؟

ج) أسئلة للمجموعات المختلفة من النساء:

1. كيف تتشارك النساء في عملية إنتاج الحبوب وبيعها واطاها؟
2. كيف سيؤثر توسع الصوامع على عملك أميل؟
3. أين تقع الحبوب الخاصة بك حاليا؟
4. ما هي مخاوفكم بشأن تأثيرات توسع الصوامع على سلامتك وأمنك؟
5. هل هناك أي مخاوف تتعلق بالسلامة أو إمكانية الوصول للصوامع أو فرص العمل للنساء؟
6. ما هي التغيرات الاجتماعية المحتملة (الإيجابية والسلبية) المتوقعة نتيجة توسع الصوامع؟

Figure (V.5): Examples of the consultations feedback at Mafalsa Silo Complex in Aswan





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### 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.7): Contractor Code of Conduct.**

**The detailed code of conduct is present in the project LMP.**

## Appendix VI: Emergency Evacuation Plan

The evacuation plan is considered one of the important means of civil protection requirements that aims to reduce human losses to the minimum possible extent by removing all people present, without exception, from inside buildings or dangerous and vulnerable areas to an area where security and safety are available.

### 1. Objectives of the Evacuation Plan

Reducing or preventing human losses to the least possible extent, whether injuries or deaths, by evacuating the building of its occupants, preventing any overcrowding in escape routes, preserving property to limit the area of the event, and working to prevent it from spreading to another area.

- Confront the event in an optimal way to reduce losses to a minimum.
- Study the causes of the event (positives - negatives) and work to avoid the negatives.
- Working to restart the facility safely.

### 2. Reasons for Evacuation

The building is evacuated in the event of an emergency, such as (a fire, a building collapse, or the spread of smoke).

### 3. Evacuation Direction

Evacuation is always carried out downward towards the surface of the ground through escape routes (which are the transportation paths taken by the occupants of the building from any point in it to outside the building in the open air on the public road or in a safe place), and it is prohibited to evacuate upward to the top of the facilities and buildings except in special cases.

### 4. Plan Elements

Forming a special committee consisting of a chairman and a group of members responsible for managing and implementing the evacuation plan. It consists of building employees, for example (mechanical engineer, electrical engineer, occupational health and safety expert, security specialist, receiving specialist, mechanical technician, electrical technician). This committee is devoted to the following: supervising the building's civil protection plan, organizing civil defense services to confront emergency situations, calling external assistance, and assessing the situation, organizing building evacuation operations and ensuring that each individual is aware of his role at the time of the accident, ensuring the adequacy of civil protection devices to perform their mission by continuing experiments and evaluating them and avoiding what is revealed.

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The individuals participating in the evacuation plan are divided into groups and each group is assigned to a specific task:

- Guidance and counselling group (works to direct people to nearby escape routes).
- Organization group (organizing the evacuation process on floors).
- Anti-rebound group (located at the building exits to prevent entry into the building).
- Confrontation group (which is the fire and rescue group).
- Aid group (working to provide aid in the safe area).
- A group of technicians (represented in gas, plumbing, elevators, air conditioners, and switches).
- Inspection group (working to ensure that there are no people in the building after the evacuation process).

## 5. Implementing the Evacuation Plan

- Ensure that everyone who contributes to the evacuation plan is trained on an ongoing basis so that they can perform their role and act automatically in times of danger.
- It is necessary to have explanatory signs or guide signs drawn with arrows that guide everyone to what they must do when implementing the evacuation plan. They should be in four colors (red - green - yellow - blue), and each color 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.
- Inform firefighting unit in the district about the emergency
- 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.

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- Fighting fires using existing 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.



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## Appendix VII: 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

## Appendix VIII: Current Procedure for Fire and evacuation plan

### Current Procedure for Fire and evacuation plan:

#### The existing facility include the following to reduce risks and fire explosions:

- There is a dust filter system to suppress dusts and reduce risks of fire and explosion
- All filters for dust must be activated before any machine starts operating in the silo
- There is heat thermometer to calculate heat in silos and there is a ventilation system to adjust the weather condition within the silo.
- The bucket elevators have heat sensors as well
- The silos include systems to reduce impact of explosion (design phase) including windows and gates
- The silo conveyers and system include plastic windows that release pressure from the silo.
- There is an alarm system.
- Guidelines attached to walls on fire fighting
- The presence of 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 in electricity room and self-activated fire extinguisher/system
- Presence of water hose in machine towers

#### Firefighting and Evacuation procedure:

- Responsible personnel: OHS specialist:
- Fire in electricity room or control room:
  - In case of fire, the heat sensors and smoke detector technologies will be activated.
  - An alarm system/awareness system will be activated (in the form of noise)
  - The self-activated firefighting system will be activated in electricity rooms and in control rooms.
- Fire in machine tower:
  - In case of fire in machine tower: there are water hose /extinguishers in each floor of the tower.
- In case of heat change within silo:
  - The sensor for heat change within the silo is activated
  - An alarm system is activated and reaches the control system
  - The OHS specialist and trained workers (15 worker) go up the machine tower and open-air gates to reduce pressure in silos. There are gates

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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 Edfu firefighting unit, which is located 17 km away, police inspection unit (16km drive) and Al-Mafalsa Health Unit is about 600 meters away. There is also Edfu Fever Hospital 19 km away
- 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.

**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.
- Al-Mafalsa Health Unit is about 600 meters away and Edfu Fever Hospital 19 km away.

**Existing facility OHS procedures**

Procedure for silo workers inside silo:

1. Gains 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 are linked to a rope. This rope can be pulled by the worker to open those gates.