



**Environmental Impact Assessment Study for the
New Composting Plant Project in Deir Abi Said /
Koura District**

**Executive Summary
Environmental and Social Impact Assessment Study
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Introduction

The Ministry of Local Administration and the United Nations Development Program have established a plant for the production of processed organic compost in the Husainiyat area based on the technical specifications approved by Ministry of Environment and Ministry of Agriculture to sell the product, and will establish the same successful environmental and social experience in Deir Abi Said area in Koura District in Irbid Governorate. The management and implementation of the project will include joint cooperation between the Ministry of Local Administration and the United Nations Development Program, whereby the plant will apply best practices through open air treatment systems for organic waste to produce processed natural compost of high quality and value with economic quantities in accordance with Jordanian specifications.

This study aims to analyze and develop the environmental and social impact assessment of the composting plant to be implemented in the Koura region, as detailed in this report.

The project is located in the Koura district within the municipality of Rabieh Koura, which is adjacent to the new Deir Abi Said, which is one of the nine administrative divisions (Liwa) in Irbid Governorate and is located to the southwest of the city of Irbid, about 25 km away and with an area of 210 km², and includes 22 villages. The center of the Koura District is the city of Deir Abi Said. The population of the Koura District is estimated at 162,000 census, including about 82,000 males and 80,000 females. It includes three municipalities:

- Rabieh Koura Municipality.
- The new Deir Abi Said Municipality.
- Barqash Municipality.

It was clear that the site is located inside a closed municipal solid waste dumpsite, where an old waste transfer station was rehabilitated for the purpose of closing the dumpsite permanently, and it is adjacent to this project.



Figure 1: Project Location

Project Goals

The project aims to:

- Improving and developing waste management in general in Jordan in line with the 2015 National Waste Management Strategy.
- Empowering women economically and enhancing their roles and representation at the local level.
- Strengthening institutional capacities to keep pace with the process of empowering women through their involvement in the solid waste management sector by establishing and operating a composting plant from animal manure and the remains of green farms.
- Securing sustainable jobs for beneficiaries, especially in the agricultural production sector, according to the government's current directions during the crisis of the emerging corona virus pandemic -2019.
- Providing the appropriate awareness and training for the local community in the ways of dealing and managing waste.
- Providing environmental friendly ways and means that can be benefited from and according to the principles of the green economy.
- Solving the problems related to the use of untreated manure, and its environmental effects, which will contribute to saving costs and improving production for the farmers whom will be using the product.

Project Description

The proposed project is to establish and operate a plant for the production of organic compost in Koura District in Irbid Governorate. It is located on 15 dunums of land, out of which, 10 dunums will be used for the proposed plant in the first phase. It will be used to provide job opportunities, capacity building and appropriate training for around 32 male and female beneficiaries of the local community. The project will be designed to empower women economically, enhance their roles and representation at the local level, and strengthen institutional capacities to keep pace with the process through the solid waste management sector. Within this project, a composting plant will also be established and operated that receives animal manure and the remains of green farms (part of agricultural waste) and works to secure a number of sustainable jobs for the beneficiaries in the region.

In this project, the raw materials from animal manure and green waste resulting from farms will be collected and treated by mixing and grinding, and placed in long rows for a period of not less than three months to completely decompose aerobically with continuous stirring to improve porosity and oxygen content, mixing or removing moisture, and redistributing the cooler and hotter parts of the heap to produce high-quality organic product used as organic compost in agriculture. This method is suitable for the production of large quantities of compost. The process of producing organic compost takes approximately 3 months and it is carried out in tight long rows in an open space where organic waste is regularly turned over to obtain an effective result.

Stages of an Environmental Impact Assessment Study

1. Consultation Procedures

As mentioned in the Terms of Reference for this project and in coordination with the United Nations Development Program, the Ministry of Local Administration and the Ministry of Environment; The consultant conducted two consultative sessions (one in Koura District and the other in Amman). Public consultations and stakeholder engagement were conducted to obtain views and ideas about the project, which may assist in the assessment of potential environmental and social impacts and the development of strategies to enhance project benefits and appropriate mitigation measures for any negative impacts.

2. Description of the Current Environment (baseline studies)

The consultant reviewed the available design documents prepared by another consultant appointed by the Employer to obtain the necessary overview and information related to the project for the preparation of the detailed Environmental and Social Impact Assessment study. The review and evaluation took the following into account:

- Assessing the existing situation in terms of the environment and the available infrastructure.
- Evaluate the proposed equipment in terms of environmental standards, functionality and safety.
- The functions of the proposed design (eg, if there is sufficient space for maneuvers, etc.) taking into account local environmental conditions.

The current environment was assessed in such a way as to ensure that as much data relevant to the current environmental situation as possible was collected. Using all available monitoring data, available data that can be accessed from other organizations, as well as available publications, and studies and research. This was the starting point towards further required investigations (as detailed below) and baseline studies, which are the key environmental components of an ESIA that will be carried out in order to assess and update the potential impacts of the project.

The main purpose of the base studies is to secure knowledge of the current conditions at the site, in order to monitor and predict future changes and analyze the possible outcomes of the project. A detailed description of the environment has been made. The basic data required includes:

- Physical environment: geology, soil topography, ambient air quality, meteorology, surface and ground water hydrology, natural resources, current sources of noise, air emissions, current water pollution discharges, and incoming water quality.
- Biological environment: fauna and flora, including rare or endangered species, sensitive habitats, including parks or reserves, important natural sites, etc.
- Socio-cultural environment (disaggregated by gender, socioeconomic classes, including direct and indirect, short and long-term, and cumulative

impacts): population, land use, planned development activities, community structure including gender, employment, income distribution, goods and recreational services, public health and property Cultural (including archaeological sites, historical sites, cemeteries and burials).

- **Legal and Institutional Framework:**
The Environmental Impact Assessment study took into account the legal and institutional framework, including national and international legislation and relevant guidelines applicable to the project, with a careful study of their requirements.

3. Detailed sub-studies

Air quality

Possible impacts on ambient air quality during construction and operation, including nuisance and odor to surrounding communities, were evaluated. The measurements of ambient air quality were conducted as per the requirements of the Ministry of Environment.

Noise

Existing noise was measured on site as well as in the vicinity of the proposed project. The noise levels that may occur during the various stages of development were also indicated in this scheme, so that all noise sources within the site or the surrounding area were identified, and noise levels were measured at the site for a period of three continuous days according to the requirements of the Ministry of Environment. The expected noise levels for each source were calculated, which may reach the receptors on site as well as externally and compare them with the Jordanian noise limits of the Ministry of Environment.

Climate and Meteorology

Data was collected on wind speed and direction, precipitation, temperature and evaporation. The data collection method ensured interpretation of data from the nearest weather station.

Geology and Soil

Thickness, porosity (primary and secondary), and major geological structures play an important role in soil contamination and possibly deep groundwater intrusion. Data related to contour mapping, regional geology and soil classification were collected and analyzed.

Hydrology and Surface Water

The watersheds and sub-catchments including the site and surrounding environment were identified to understand the boundary conditions of surface and groundwater systems. Data were collected on catchment areas, stream flow and water level. A hydrological study was carried out to determine the potential risks of flooding. The location, condition, and characteristics of surrounding water bodies and water-retaining structures were determined.

Groundwater

The boundaries of the groundwater system under the site and the surrounding areas, especially the depth to the main aquifers, as well as the characteristics of the aquifer were identified to determine the potential leakage in terms of quantity and quality. Data was collected on groundwater flow patterns, aquifer characteristics, depth of the water table, pressure gauge level and groundwater quality according to availability. Characteristics and impact on groundwater wells in the area, if any, were evaluated. The impact of the water supply needed for project development and maintenance was also evaluated.

Biodiversity

Conservation of biodiversity, preservation of ecosystem services and sustainable resource management are fundamental to this project. A detailed inventory of species and habitats within the project site and surrounding area has been provided which included data collection from literature sources and field surveys. Special emphasis has been placed on identifying endemic plants and animals, rare and endangered species, the diversity and people's use of terrestrial plants and animals,.... etc. Any impacts on any natural areas, protected areas or habitats of important species was assessed to prevent and avoid any potential adverse effects. The precautionary approach was eventually applied to the proposed mitigation measures.

The study connected the expected target biological environment to the units of its physical environment. The effects of the expected impacts that may occur for these physical environment units according to the project activities on aspects of the biological environment in the project area were studied.

Socioeconomic Status

It primarily begins with literature data collection including current publications of the General Statistics Department, field surveys, and visits to local municipalities, governmental organizations, and members of the public in the study area. The data primarily covered issues relevant to the project. Based on the results of the above activities and information about the project, the potential impacts of the project activities on socio-economic conditions were evaluated.

A study was conducted to determine the potential social impacts of the proposed development to include all groups of the surrounding community in the project area, the most important of which are farmers, women and land owners.

Landuse

All existing and proposed land uses including farms, conservation areas, residential and commercial have been adequately described and presented on land use plans. The land use section described any need for land acquisition.

Traffic and Roads

Potential impacts on traffic and community facilities during construction or during operation are included. Traffic and road plans were studied during the construction and operation phases, on site and in the vicinity, including traffic volume and impact on the area.

Public and Occupational Health and Safety

The study included the consideration of all potential risks to public health (surrounding communities), as well as occupational health and worker safety, and assessment of current conditions in relation to the intended project activities.

Cultural and Archaeological Issues

Any cultural or archaeological sites, their importance and proximity to the site have been identified and evaluated. A review of the available data was performed. The records of the Directorate General of Antiquities indicate no potential archaeological sites that could be of interest. A physical survey was conducted for parts for which no prior information is available.

4. Valued Environmental Components (VECs) Assessment

This section included an assessment of the positive and negative impacts of the project to identify measures that could be taken to reduce the negative impacts on the surrounding environment. This was done by describing and evaluating impacts on Valued Environmental Components (VECs) as identified during the baseline review and stakeholder consultation process and based on information obtained through the surveys provided and the available literature.

The potential impacts of significant issues during construction, operation/maintenance and decommissioning phases are addressed in the ESIA. This included the identification and evaluation of the major positive and negative (direct and indirect, short-term and long-term, and cumulative, if any) environmental, social and economic impacts that may result from the establishment, operation and decommissioning of the project. VECs are generally defined as environmental features or components of the environment that are valued by society and that may be at risk from human activity from natural hazards.

5. Assessment and Mitigation Measures

Occupational Health and Safety

- An occupational health and safety plan must be prepared before the actual operation of the plant to minimize the resulted impacts in the site itself and the surrounding.
- Conducting periodic measurements of the ambient air quality.

Ground or Surface Water Pollution

- Using sufficient and appropriate drainage networks at the site boundaries to collect the stormwater and suspended materials and then transfer them to collection tanks for reuse in the decomposition processes.
- The use of suitable materials and sealants in the yards of the site with the use of sufficient slope to direct rainwater to the drainage network and collection tanks.
- It is recommended to study the situation of the closed dumpsite to reduce its negative effects on the region.
- Conducting periodic measurements of the quality of groundwater from the nearest well below the site.

Flood:

- Providing suitable drainage around the site to protect the project parts.

Earthquakes:

- Compliance with the requirements of the Jordanian building code for earthquakes.

Biodiversity

The site is generally considered to be of low environmental importance due to its natural environment and the barren land of the site. In addition, most species of plants, animals and birds near the project site are considered to be of least importance and are common in the steppe habitat. From a biodiversity perspective, the area is somewhat degraded due to human activities which affected the biodiversity of the site. The project site is not located within or near areas of significant environmental importance (i.e., nature reserves and Important Bird Areas).

Social and Economic Situation

Employment:

It is expected that the subcontractors will be provide employment opportunities for local workers during site preparations, construction, transportation and the provision of materials necessary to complete the project, so there will be a positive impact on the employment of local labor within the vicinity. And if necessary, the project can provide job opportunities for specialists in the environment and agriculture during the operation of the project. In addition to this, the project constitutes an existing opportunity to provide investment and work opportunities for citizens within the project area in relation to agricultural activities in addition to supporting and developing the role of women in providing suitable job opportunities during the operation of the plant .

Aesthetic Effect:

The site will be affected by some negative effects of the general landscape during the construction phase as a result of the excavation, construction, transportation of debris and others, in addition to the operation phase, where heaps of organic compost, but these effects will be limited and can be avoided.

Landuse:

The project is not expected to affect the landuse of the site, which are mainly open lands.

Project Added Value:

This project is expected to constitute a positive vital addition in the disposal of farm residues of manure and green waste and transforming them into useful and economically viable products. It will also be a source of increased employment and income opportunities for the people of the region directly, and for women in particular.

Immigrant Workers:

It is expected that the workforce will contain a number of expatriate workers during the construction phase, whether within the construction or transportation works.

Community Participation:

It will be necessary to add activities that enable the local community to participate and collaborate in the operation and marketing of the project.

Infrastructure:

This project is not expected to affect the infrastructure in a significant way. It is certain that the access roads will be used by vehicles and contractors' machinery during construction, which is a temporary period.

Archaeology

Given that the site (within the given coordinates) was used as a dumpsite for decades and was closed at a later stage, in addition, several years ago, the site was reclaimed and a transfer station was established in it that is still operating. Added to that, there are no surface evidence indicating the presence of archaeological remains in it. Given the importance of the proposed project to the region and the surrounding municipalities, there is no objection to proceeding with the execution of the project, provided that the Department of Antiquities is informed in the event of any traces appearing during excavation (Chance Find) for the proposed buildings of the composting plant and stop the working immediately until the site is evaluated by the Department of Antiquities officials.

Environmental and Social Management Plan (ESMP)

The Environmental Management Plan is the link between the project owner and the regulatory authorities (Ministry of Environment). This document is an environmental contract between the Ministry and the project owner. The owner is obligated to implement everything stated in the Environmental Management Plan document, including the following:

- Implementation of all the preventive measures proposed in the environmental impact assessment study.
- The owner will establish an environmental department or designate a specialized staff to manage the environmental issues related to the project.
- Providing appropriate environmental and public safety training for all employees.
- Implementation of the environmental monitoring program.

The Environmental Management Plan document reviews the necessary precautions included in the Environmental Impact Assessment study, the main procedures for dealing with waste, the responsibility and training needs for appropriate environmental management in addition to the monitoring program.