# Annex A

# Investment Survey

# INVESTMENT SURVEY

This report documents the results of the survey that was performed to study the issues related to enterprises in food, pharmaceutical, agriculture and supporting service sectors with the potential for growth and export from the Agro-industrial Park in the future. The survey sample consists of 50 enterprises from the different five sectors (food processing, perishable food, animal feeds, supporting services, and pharmaceutical sectors). Based on the results of this survey, the following findings can be drawn:

- It is noted that the Palestinian market generally consists of small and medium sized enterprises (SMEs).
- On the average, the highest investment capital was found in the enterprises of the food processing sector followed by those in the pharmaceutical sector. Both of which have higher annual sales than the other surveyed sectors.
- Animal feeds and perishable food sectors showed the highest percentage of raw materials in the total production cost.
- The share of raw materials in the domestic market significantly varies by the kind of raw materials, some of which are imported from Israel, Jordan, Europe and other countries while the share of production in the domestic market is much higher (up to 82% of the production on the average) than that in the export market.
- The maximum number and size of outgoing trucks on the daily average basis was found to be 60 trucks and 30 tons respectively, while incoming trucks was found to be 30 trucks and 30 tons respectively.
- Many Palestinian enterprises do not have either national or international certificates at present. Less than 15 enterprises surveyed obtained a certificate from Palestinian Standards Institute (PSI) and less than ten has ISO 9001.
- As for business development services, which are expected to be provided in the Agro-industrial Park, about one fourth of the surveyed enterprises selected customs clearance services as their best choice. Meanwhile, shipping services was selected by 20% of the enterprises as their best choice.
- As for the incentives for investment in exporting, income tax exemption/reduction, simplification of security check, and raw materials/products access were prioritized.
- All the surveyed companies are interested in investing in the Agro-industrial Park. Three fourths of the surveyed enterprises are willing to invest in a short term (three years), and most of them have selected Jericho as the primary region for investment.
- More than half of the surveyed enterprises have selected Jordan as their best choice for the future target market, while one fourth of them selected the Gulf countries (mainly Saudi Arabia and the United Arab Emirates).

## A.1 Introduction

In order to clarify the investment climate in Palestine, the investment survey collected data on both the actual market performance and potential investment opportunities in the abovementioned five sectors, in the West Bank area.

**Sample and Survey**

- The field work was carried out from May to July in 2008 in cooperation with the Palestinian Federation of Industries (PFI). Most of the data and replies were based on the fiscal year of 2007, and each of the enterprises' establishment years.
- The number of the sample enterprises[1] is 50 in the five sectors of enterprises.
- The sample enterprises varies in their sizes from micro to large manufacturers based on the number of employees or the production amount and sales, and they are geographically distributed in the major Palestinian cities in the West Bank, i.e., Hebron, Jerusalem, Jericho, Ramallah, Nablus, Tubas, Tulkarem, Salfit, Jenin, and Bethlehem.
- The food sector includes wheat, confectionary, salads, sesame, pickles, mineral water, pasta, meat, herbs and seasonings, and dairy products. Table A-1 presents the number of companies surveyed by sub-sector within the above five sectors.
- In this study the average exchange rate is considered to be 1 JD = 5.5 NIS and 1 USD = 4.3 NIS for the year 2007, which is applied in calculating the capital and the annual sales.

This survey was performed to understand the issues related to formal enterprises in food, agriculture and supporting services sectors, that have the potential for growth and exports, as they establish in the Agro-industrial Park. More detailed analysis can be performed based on future work plans, as determined in the course of this survey.

**Table A-1 Sample Enterprises by Sub-sector in Palestine**

| Sector | Sub-sector | No. of Enterprises |
|---|---|---|
| Food processing | Confectionary | 9 |
| | Dairy products | 6 |
| | Mineral water | 6 |
| | Meat products | 3 |
| | Pickles products | 3 |
| | Salad | 2 |
| | Juices, baking powder, vinegar | 2 |
| | Pasta products | 2 |
| | Sesame derivatives | 2 |
| | Wheat derivatives | 1 |
| | Herbs and seasonings | 1 |
| | Sub-total | 37 |
| Perishable Food | Dates, grapes and pomegranate | 1 |
| Animal Feeds | Animal feeds | 2 |
| Supporting Services | Freight | 3 |
| | Packaging | 2 |
| Pharmaceutical | Generic medicine | 5 |
| **Total** | | **50** |

[1] The sample enterprises are selected based on the PFI database of member enterprises.

## A.2 Characteristics of Factories

### (1) Labor

Based on the survey, the average, maximum and minimum numbers of permanent and seasonal employees are presented in the table below. About 40% of Palestinian factories hire seasonal employees as shown in the examples of ice cream producers who only work in the summer season, or herb manufacturers who work seasonally according to herb harvesting cycle. It is noted that the average number of seasonal employees among enterprises who hire seasonal employees is ten.

**Table A-2 Average Permanent and Seasonal Worker**

| N=50 | No. of Permanent workers | No. of Seasonal workers |
|---|---|---|
| Average | 57 | 10 |
| Maximum | 265 | 80 |
| Minimum | 4 | 0 |

Source: JICA Study Team
Note: Numbers are rounded to the nearest whole number.

### (2) Production

The production amount of the enterprises in the food processing and perishable food sectors is measured by the unit tons/year. This unit could not be applied to the pharmaceutical manufacturers because their products consist of generic medicines with much less weight but with greater profits. It also could not be applied to the supporting services, as they offer services for packaging and freight, where packaging weight is included in the food sector production. For these reasons, this section will focus only on the production of factories in the food processing and perishable food sectors. Based on this survey, as shown in the following table, the average amount of finished products of enterprises in the food processing sector is less than 10,000 tons/year, while the maximum and minimum amount of production is about 162,000 tons/year and 40 tons/year respectively.

**Table A-3 Annual Production by Sector**

| Sector | | Annual Production Unit: ton/year | | |
|---|---|---|---|---|
| | | Average | Max | Min |
| Food processing | N=29 | 8,180 | 162,000 | 40 |
| Perishable Food | N=3 | 300 | 600 | 150 |

Source: JICA Study Team
Note: Numbers are rounded to the nearest number.

### (3) Annual Sales

Table A-4 presents a summary of the estimated annual sales by sector. It is noted that the food processing sector has both the highest maximum and lowest minimum annual sales. The big gap between the maximum and minimum annual sales in the food processing sector, as compared to those in the other sectors, indicates that there is a wider range of enterprise scale in said sector.

Table A-4 also shows that the pharmaceutical has the highest mean annual sales among the sectors.

**Table A-4 Annual Sales by Sector *(Estimate)***

| Sector | Annual Sales | | Unit: 1,000 NIS |
|---|---|---|---|
| | Mean | Max | Min |
| Food processing | 14,231 | 80,238 | 100 |
| Perishable Food | 1,500 | 1,500 | 1,500 |
| Animal Feeds | 7,250 | 13,500 | 1,000 |
| Supporting Services | 1,044 | 2,750 | 100 |
| Pharmaceutical | 21,618 | 44,000 | 1,090 |

Source: JICA Study Team
Note: Numbers are rounded to the nearest 1,000.

### (4) Capital

Table A-5 shows a summary of the survey results of investment capital for each sector.

**Table A-5 Capital by Sector**

| Sector | Capital | | Unit: 1,000 NIS |
|---|---|---|---|
| | Mean | Max | Min |
| Food processing | 8,933 | 86,000 | 165 |
| Perishable Food | 3,440 | 3,440 | 3,440 |
| Animal Feeds | 2,943 | 5,500 | 385 |
| Supporting Services | 517 | 880 | 165 |
| Pharmaceutical | 32,350 | 66,550 | 3,000 |

Source: JICA Study Team
Note: Numbers are rounded to the nearest 1,000.

### (5) Total Costs

In this survey, the percentage of raw materials cost in the total production cost was also inquired. The total production cost consists of labor, administrative, utilities, raw materials and other costs.

Figure A-1 indicates the percentage and standard deviation of raw materials cost in the total production cost. Animal feed and perishable food sectors show higher values while pharmaceutical and supporting services sectors indicate lower values. Moreover, it is noted that the pharmaceutical sector, which has a low average percentage, imply its higher possibility of performing well in the international market than the other sectors. High standard deviation in the food processing sector is caused by the big difference in enterprise size by sub-sector.

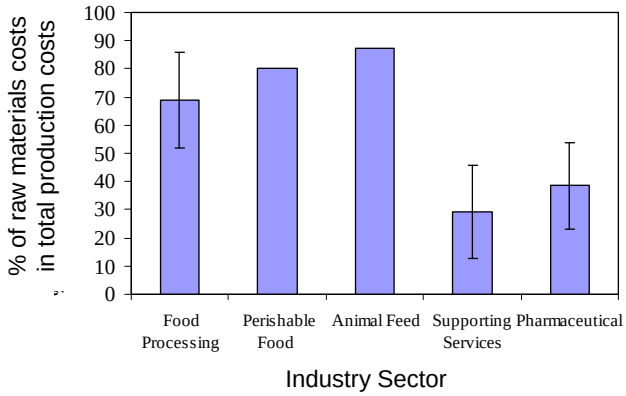



**Figure A-1 Percentage and Standard Deviation of Raw Material in Total Production Cost for Each Sector**

Source: JICA Study Team
Note: Perishable food and animal sectors with two sample enterprise have no standard deviation

### (6) Land and Location Characteristic

Most enterprises in this survey have only one location for their production process. Warehouses and offices (administrative or distribution agents) are not considered in quantifying the number of locations. Nevertheless, the pharmaceutical sector, in order to obtain registration certificate, is required to have more than one location as per Palestinian Good Manufacturing Practice (GMP), in accordance with the Ministry of Health (MoH). Due to GMP, pharmaceutical enterprises are unable to produce all kinds of generic medicines in the same building. The survey results show that the average land area size is about 0.90 ha (9 donums).

### (7) Raw Materials

Large amounts of raw materials are imported from different countries such as Israel, Jordan, and European countries while one third are procured domestically as shown in Figure A-2. Figure A-2 shows that origins of raw materials vary significantly according to category. It is noted that ratio of imported meat is 100 %, which are mostly from Israel. For the 95 % bottles which are imported, three fourths are from Europe. The domestic markets for additives and spices accounts about half of the share. For vegetables and packing materials, domestic markets' share is about a quarter while more than 40 % is imported from Israel.

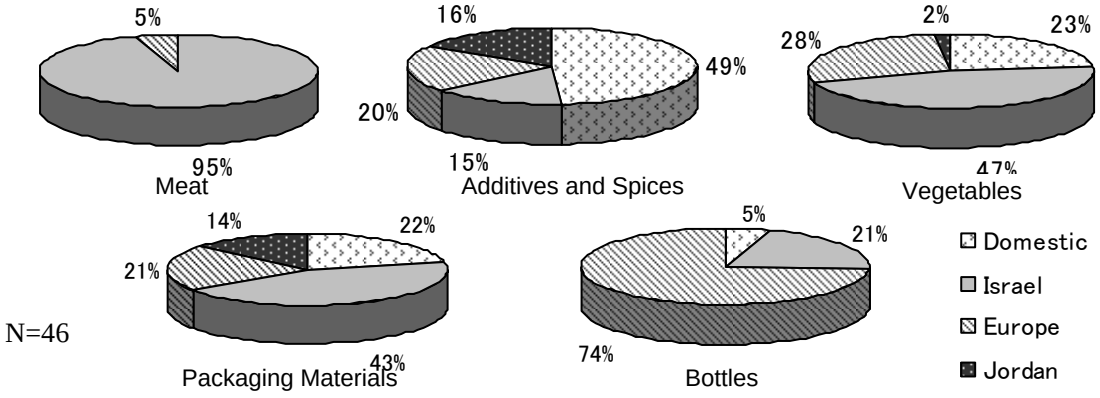



**Figure A-2 Percentage of Domestic and Imported Raw Materials**

Source: JICA Study Team

## A.3 Utilities and Facilities

### (1) Water and Electricity

It was found out during the survey that the maximum electrical capacity for all the surveyed companies is 3,000 amperes and 220 volts. The highest average electricity consumption was 3.86 million kW/month. As for the water consumption, the maximum supply requirement was 20,000 $m^3$/month, noting that the perishable food sector requires a large amount of irrigation water for farming. The second highest water consumption during the peak period was 6000 $m^3$/month. It was also found that about 70% of the surveyed enterprises have their own water sources.

### (2) Wastewater and Solid Waste Management

Wastewater and solid waste management almost does not exist at the production level. Nevertheless, in order to export Palestinian products, it would be essential to plan a new investment on the basis of green environment, for example, in acquiring the solid waste and wastewater treatment units. This is a prerequisite to obtain the environmental certificate, ISO9001.

### (3) Road Designing

Table A-6 summarizes the maximum number and sizes of incoming and outgoing trucks for each sector. It is noted that the food sector has the maximum number and size of incoming (raw materials) and outgoing (manufactured products) trucks. The maximum number and size of outgoing trucks were found to be 60 trucks and 30 tons, respectively, while those of incoming were 30 trucks and 30 tons, respectively.

**Table A-6: Maximum Number and Size of In-coming and Out-going Trucks by Sector**

| Sector | No. of in-coming trucks on daily average | The most frequently used *size* for in-coming trucks in tons | The maximum size for in-coming trucks in tons | No. of out-going trucks on daily average | The most frequently used size for out-going trucks | The maximum size for out-going trucks in tons |
|---|---|---|---|---|---|---|
| Food Processing Industry | 30 | 40 | 40 | 30 | 350 | 2000 |
| Perishable Food Industry | 3 | 10 | 10 | 3 | 10 | 1 |
| Animal Feeds | 2 | 40 | 80 | 4 | 10 | 4 |
| Supporting Services | 12 | 35 | 40 | 1 | 15 | 15 |
| Pharmaceutical | 3 | 6 | 15 | 3 | 3.5 | 4 |

Source: JICA Study Team

## A.4 Potential Investment Plan

### Certificates

Securing recognized certificates is one of the keys to expand the scale of activities of the business enterprises, especially in the global market. It was found out during the survey that at present, almost half of the surveyed enterprises do not have either national or international certificates. Less than 15 enterprises obtained Palestinian Standards Institute (PSI) certificate, and less than 10 have ISO 9001. This indicates that most of the Palestinian products are traded in the domestic market only. Few manufacturers with these certificates belong to the pharmaceutical sector which has been expanding their business activities in the international markets.

The following figure shows the certificates currently obtained and planned to be obtained by the surveyed enterprises.

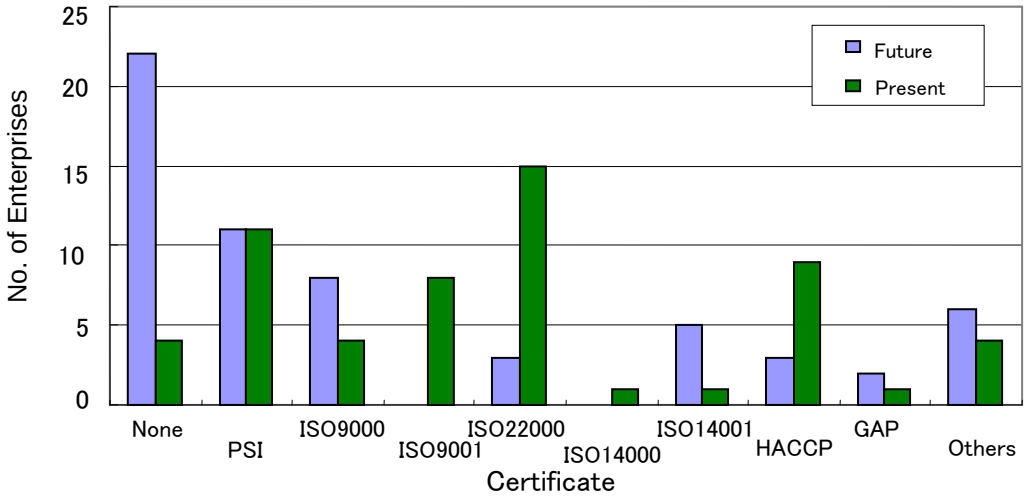



**Figure A-3 Certificates currently obtained and planned to be obtained in the future**
Source: JICA Study Team

## A.5 Agro-industrial Park

### (1) Business Development Services

In this survey, the enterprises have determined the top four among the following ten services: i) information technology (IT), ii) marketing information, iii) quality control, iv) customs clearance, v) packaging, vi) shipping, vii) secretarial , viii) seminar and training, ix) exhibition, and x) other suggested services. As shown in Figure A-4, it is noted that 26% of the surveyed enterprises are involved in customs clearance, 20% engaged in shipping services, 20% in the IT services, and 20% in marketing information.

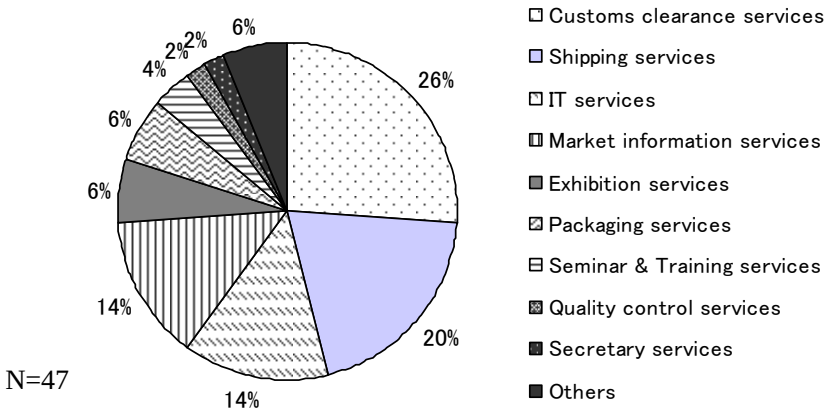



**Figure A-4 The Most Needed Services for Business Development**

Source: JICA Study Team

**(2) Incentives for investment in the Agro-industrial Park**

In terms of the incentives for promoting investment in the Agro-industrial Park, Figure A-5 shows that the best incentive preferred by the potential Palestinian investors was income tax exemption/reduction (26%), simplification of security check (22%), and raw materials/products access (18%). Furthermore, 56% of the investors have selected simplification of export/import procedures, and exemption of duties as the second best incentive. Moreover, 24%, 16% and 12% have selected raw materials/products access, simplification of security check and financial access, respectively, as their third best incentive.

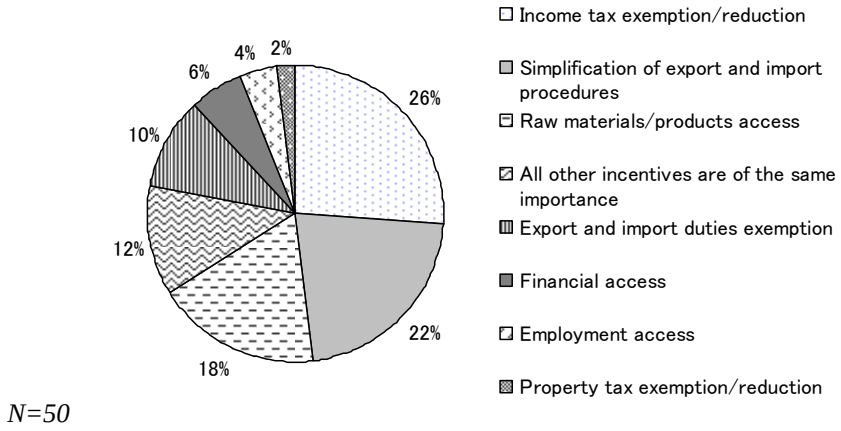



**Figure A-5 Incentives for investment**

Source: JICA Study Team

**(3) Best Region for Investment**

In the survey, as shown in Figure A-6, it was also found out that most of the surveyed enterprises have selected Jericho as the best region for investment, while 14% selected it to be only the second best because of its geographical merits for exporting. This indicates that majority is considering the potential for exporting their products and competing in the regional or international market.

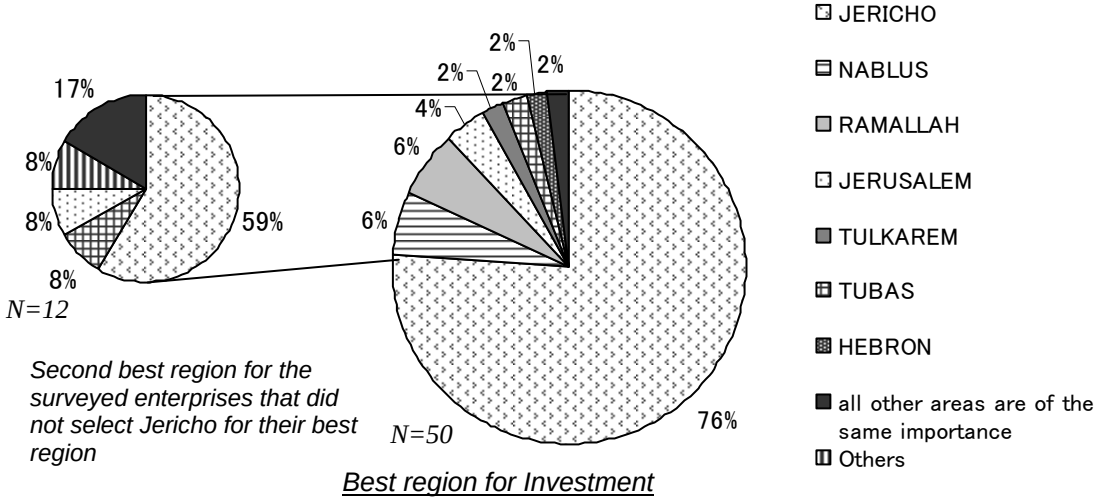



**Figure A-6: Selection of region for investment**

Source: JICA Study Team

### (4) Investment climate

As shown in Table A-7, the investment climate of the Agro-industrial Park is optimistic. About 41 investors are willing to invest in a short term (three years), and the rest in the next 10 years. All of the surveyed companies expressed their willingness to invest in the Agro-industrial Park.

**Table A-7: Willingness to Invest in the Agro-industrial Park by Sector**

| **Answer** | Food Processing | Pharmaceutical | Animal Feed | Perishable Food | Supporting Services | **Total** |
|---|---|---|---|---|---|---|
| Yes, in the short run | 30 | 4 | 2 | 1 | 4 | **41** |
| Yes, in the long run | 7 | 1 | 0 | 0 | 1 | **9** |
| No | 0 | 0 | 0 | 0 | 0 | **0** |
| Total | 37 | 5 | 2 | 1 | 5 | **50** |

Source: JICA Study Team

### (5) Domestic and International Market Activities

Based on Figure A-7, it was found out in the survey that the domestic market's share (up to 79% of the production on the average) is much higher than that of the international market. Few manufacturers have not ventured into exports mainly because they are micro and small-sized enterprises, with no international certificates that require higher investment and knowledge in order to obtain.

The share of production for exports is very small (not exceeding 21%). The major countries importing Palestinian products are Israel, Jordan and the Gulf States. The Europe market is not yet accessible for many Palestinian products. Other neighboring countries are importing very low percentage of Palestinian products, which are mainly pharmaceutical commodities. It is noted that the pharmaceutical sector is regarded as strong in exporting activities as it invested more to obtain certification and BDS, as compared to all other sectors.

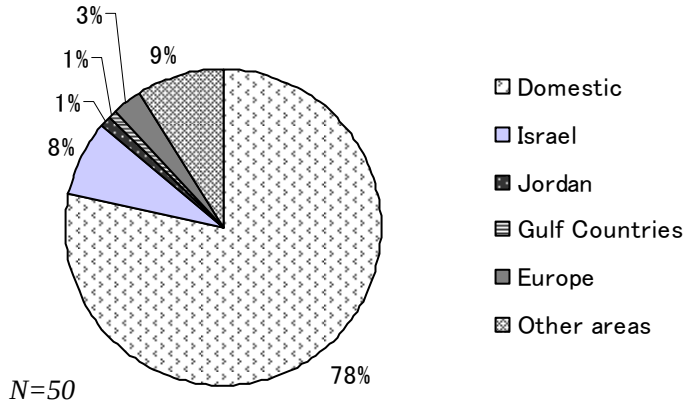



**Figure A-7 Share of Domestic and Foreign Market for Products**

Source: JICA Study Team

### (6) Target Market

In this study, the markets to be targeted for future investment have been selected by priority, from among the following markets: Domestic, Israel, Jordan, Gulf countries, Europe, and other areas. Figure A-8 presents the target future markets of the surveyed companies. It is realized that more than half of the surveyed enterprises have selected Jordan as their best market for the future while about one fourth selected the Gulf countries (mainly Saudi Arabia and the United Arab Emirates).

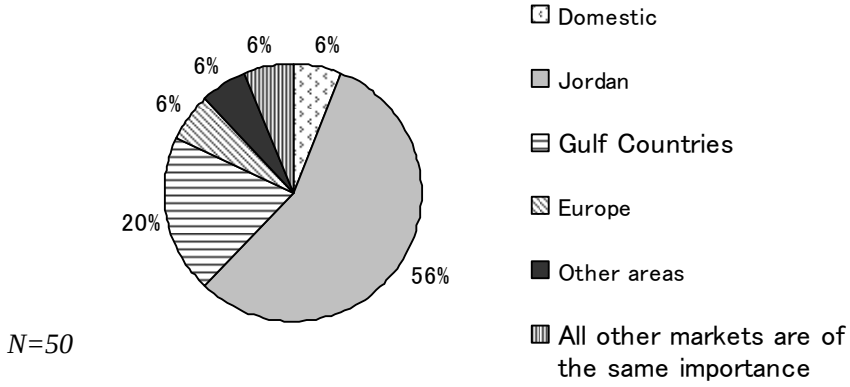



**Figure A-8 Target Market for the Future**

Source: JICA Study Team

# Annex B

# Environmental Impact Assessment

Executive Summary

B.1 Introduction

B.2 Description of the Agro-industrial Park Development

B.3 Legal and Administrative Framework

B.4 Analysis of Alternative Plans

B.5 Existing Environmental and Socio-economic Conditions

B.6 Potential Environmental and Social Impacts and Mitigation Measures (Stages I and II)

B.7 Potential Environmental and Social Impacts and Mitigation Measures (Stages III)

B.8 Environmental Monitoring and Management Plan

B.9 Public Consultation

Attachment

1. TOR for EIA
2. Matrix of Scoping based on the Palestinian Environmental Components Standard
3. Minutes of Meeting (first, second and third stakeholders meetings)
4. List of Participants (first, second and third stakeholders meetings)

# Executive Summary

## 1. Preface

According to the "Palestinian Environmental Assessment Policy", industrial projects are among the fourteen types of projects that require Environmental Impact Assessment (EIA). Since the Agro-industrial Park Development is regarded as an industrial estate project, this Feasibility Study includes EIA.

The objectives of the EIA are:

- To grasp the existing environmental conditions for the selected site for the Agro-industrial Park and its surroundings by collecting necessary information and data on the physical, and socio-economic conditions through conducting field survey
- To identify, anticipate and assess the environmental and social impacts caused by the Agro-industrial Park development
- To analyze alternative plans and recommend mitigation measures and environmental monitoring and management plan.

The EIA report is largely divided into three parts. The first part is the basic study consisting of i) legal and administrative framework for relevant laws/regulations and stakeholders, ii) analysis of alternative plans and iii) existing environmental and socio-economic conditions. The second part presents the potential impacts and mitigation measures in case of simultaneous development of stages I and II, and stage III. The third part is the environmental monitoring and management plan (EMMP)

## 2. Methodology of the EIA

The EIA was conducted through the following methods.

(1) Collection and analysis of data and information on the existing environmental and socio-economic conditions

All necessary data and information on physical, ecological, socio-economic and cultural aspects of the environment condition for the selected site and its surrounding area were analyzed. These were based on the field survey, interviews and data collected from relevant agencies.

(2) Scope of Works

The detailed scope of works for the EIA was firstly studied in the beginning of the Part 2 Study (Phase II). This was carried out by reviewing the provisional scoping prepared in the Phase I Study, with reference to the existing and collected data and information related to the environmental and social factors. The first stakeholders meeting was then held on 10 June 2008 in order to officially articulate the scope of works for the EIA. The comments raised by participants were reflected into the scope of works. The detailed scope of works for the EIA study was tabulated in a matrix form (Attachment 2) of the EIA report.

(3) Legal and Administrative Frameworks

Relevant laws and regulations such as the Palestine Environmental Law, Palestinian Environmental Assessment Policy, Industrial Estates and Industrial Free Zones Law, other water-related laws and regulations were reviewed to clarify the legal and regulatory conditions for the natural resources such as land, water and wildlife/plantation. The review was also intended to define the role/mandate of the relevant organizations concerning environmental monitoring and management.

(4) Assessment of Potential Impacts

The assessment of potential impacts aims to identify positive, negative, direct and indirect impacts caused by the Agro-industrial Park development during the three stages, namely, pre-construction, construction and operation stages. The Agro-industrial Park development includes on-site infrastructures (land preparation work, internal road, water distribution facilities, wastewater treatment network facility, solid waste collection system, logistic and center facility and factory) and off-site infrastructures (access road, power supply, water supply, wastewater treatment facility and solid waste treatment facility).

(5) Analysis of Alternative Plans

The analysis of alternative plans starts with justifying the Agro-industrial Park development project by comparing “with project” and “zero option”. The analysis includes comprehensive evaluation of the sites identified in the course of the Study. The main element of this section is to analyze the alternatives for on-site and off-site infrastructures. This section is intended to assess and recommend the best or the better alternative for infrastructural facility proposed in the engineering study, in line with socio-economic and environmental considerations.

(6) Mitigation Measure

Mitigation measure is supposed to minimize, reduce and eliminate identified negative impacts due to project implementation stages (pre-construction, construction and operation). Proposed mitigation measures are those that require utilization of appropriate technology, systems and construction method, related to the construction and operation activities of the infrastructures such as wastewater and solid waste treatment facilities.

(7) EMMP

EMMP consists of a detailed plan describing the system of environmental monitoring and the execution of mitigation measures. It aims to reduce environmental and social impacts on the project during the construction/operation stages. EMMP includes parameters, methods and system, schedule and frequency and implementing organization for the monitoring of major environmental factors (groundwater quality, effluent wastewater from factory, air pollutants emission, noise/vibration, and solid waste) in the Agro-industrial Park development.

(8) Public Consultation

The EIA study covers a wide range of issues, and thus requires extensive discussions on the

socio-economic and environmental impacts caused by the project. Consequently, three stakeholders meetings were held in the course of the study parts 2 and 3.

a) First Stakeholders Meeting (10 June 2008)

The first stakeholders meeting was held in Jericho, where a group discussion was organized to determine anticipated negative environmental impacts due to project implementation and to clarify the Terms of Reference (TOR) for the EIA study.

b) Second Stakeholders Meeting (15 October 2008)

The second stakeholders' meeting was held in Jericho to discuss the interim results of the EIA study and obtain comments on the EIA study from the participants.

c) Third Stakeholders Meeting (26 October 2008)

The third stakeholders meeting was held in Jericho Municipality mainly to obtain comments on the EIA study from the local community.

Public consultation was executed in the process of preparation and implementation of the EIA Study, in accordance with the Environmental Assessment Guideline. A wide range of stakeholders were invited for the meetings including representatives from the project implementer (PIEFZA), EQA, project-related government ministries, Jericho Municipality, local communities, NGOs, donors, universities, investors and all others concerned.

## 3. Description of the Project

(1) Mission

The Agro-industrial Park will be vital for the economic upgrading of the JRRV, which contribute to the future goals, i.e. "improvement in agriculture", "promotion of agro-industry" and "enhancement of export competitiveness of Palestinian export industries".

(2) Development Concept and Priority Industries

The basic concept of the Ago-industrial Park development is to create a thematic industrial park, where people are involved in a variety of production activities related to "Human Well-Being." Priority industries for the park are businesses that deal with fresh vegetables and fruits, and food processing industry.

(3) Development Plan

Location: The southern fringe of the Jericho Municipality

Profile of Land Parcels:

| Lot No. | Area | Jurisdiction | Ownership |
|---|---|---|---|
| I | 11.5 ha | Area A | State-owned Land (PNA) |
| II | approx. 50.0 ha | Area A | Privately-owned Land (Al Hussein Family) |
| III | approx. 50.0 ha | Area C | Privately-owned Land (Al Hussein Family) |
| Total | 111.5 ha | | |

Source: JICA Study Team

## Stage-wise Development Plan

The Agro-industrial Park shall be developed in three stages. Stage I development (Lot I) is provisionally scheduled to commence in 2009. Lot I was secured by the PNA and is ready for development. Lot II shall be developed in Stage II upon reaching an agreement with its private land owner, while anticipating a possible large demand of investment. The simultaneous development of Stages I and II would be possible on the conditions that investment demand for Lots I and II is to be secured. Stage III development (Lot III) shall require an agreement with its private land owner and would need a long lead time for special coordination/agreement with the Israeli authorities due to its location (Area C).

## Required infrastructure development

The Agro-industrial Park requires on-site and off-site infrastructures as summarized below.

**Required Infrastructure**

| Category | Off-site Infrastructure | On-site Infrastructure |
|---|---|---|
| Land reclamation | - | Excavation and embankment, and *Wadi* improvement |
| Road | Access roads of A-1 and A-2 | Internal road network |
| Power supply facilities | Transmission line from the New Dead Sea Substation | Internal distribution line network with transformer |
| Telecommunication facilities | Transmission line from closest telecommunication facility | Distribution line network |
| Water supply facilities | Transmission pipeline from water sources and water treatment facility | Water supply tank and internal distribution pipeline network |
| Wastewater treatment facilities | Wastewater treatment facilities | Collection pipeline network of wastewater, and the redistribution pipeline network of reclaimed water |
| Solid waste treatment facilities | Solid waste treatment facilities | Vehicles for solid waste management |
| Security facilities | - | Site security systems |
| Building | BDS Center building | Rental factories, office buildings |
| Logistics/Green/Open Space | - | Distribution area, storage area, parking area, green zone and park |

Source: JICA Study Team

### 4. Analysis of Alternative Plans

Analysis of alternative plans were made for i) project alternatives, ii) sites for the Agro-industrial Park, and iii) alternatives for on-site and off-site infrastructures.

Project alternatives

The analysis of “zero option” concludes that:

- An independent approach to "improvement in agriculture" and "enhancement of export competitiveness of Palestinian enterprises" sometimes fails to place an emphasis on industrial linkage between agriculture and food processing industries

- Various factories will be planned and established separately in the industrial zone in the JRRV in the future. Treatment and management of wastewater and solid waste that will be conducted by each factory will have negative impacts to the surrounding areas

The analysis of "with project" concludes that:

- The Agro-industrial Park would contribute to strengthening of linkage between agriculture and food processing industry, regional economic development including employment creation in the JRRV and export facilitation.
- Wastewater and solid waste treatment facilities planned for the Agro-industrial Park shall be developed and managed in a proper manner, which would have less impact to surrounding areas as compared to separate wastewater and sold waste management for each factory.

Site selection for the Agro-industrial Park development

The eight candidate sites were identified for the Agro-industrial park development within Jericho City (seven sites) and outside Jericho City (one site located in Tubas). These identified sites were evaluated based on criteria for physical conditions such as land status, road access, land scale, readiness of infrastructure and proximity to the border. The candidate site was politically agreed among stakeholders during the Second Technical Level Meeting of the *Four-party Consultative Unit* held in October 2007. Said site is in a fairly good condition in terms of accessibility to the major arterial roads and the border (the Allenby Bridge) but would incur substantial development cost due to required improvement of the *Wadi*. The candidate site and its surrounding area located far from the center (residential and business area) of Jericho City is preferable since it would cause less negative environment impacts to a smaller populated area.

The alternatives for on-site and off-site infrastructures

Proposed alternatives for on-site and off-site infrastructure were analyzed based on environmental and socio-economic aspects. The best or better alternative is determined and recommended considering the least negative environmental impacts caused.

a) Alternatives for access roads

The engineering study proposed the merging of the existing Roads 1 and 2 during Stage 1, as road improvement. One of the alternatives for road improvement during Stage I was improvement work for either of the existing roads only. Eventually, the EIA concluded that the improvement considering the merging of said existing roads would be environmentally recommendable than just selective improvement works. This was realized considering that inbound transportation would be dispersed to the Agro-industrial Park during operation stage, resulting in less negative impacts to the surrounding area.

Access roads of A-1 and A-2 were proposed during Stages II and III. Access road A-2 was assessed to be more appropriate than access road A-1 in terms of transportation efficiency, social and environmental concerns and financial costs.

b) Water supply

The three water supply alternatives consisting of i) existing agricultural wells, ii) water supply system of Jericho Municipality and iii) water supply from Mekorot were proposed in the engineering study. The EIA focused on water quality of three water supply alternatives since water quality required for food processing must be equivalent to that of drinkable water as stipulated in "Second Modified Draft of Drinking Water Quality Guidelines" published by PSI. The EIA recommends that water supply system of Jericho Municipality should be used during Stage I and existing agricultural wells can be used provided that those wells are to be properly treated.

c) Wastewater treatment facility and solid waste management

Alternative for off-site wastewater treatment facility is assumed to be a public sewerage system that has not been realized yet. There is currently no appropriate alternative for the proposed oxidation ditch process until public sewerage system is constructed. The EIA concludes that the proposed wastewater treatment facility shall be used until the construction of a public sewerage system.

The proposed solid waste management consists of collection and recycler system as on-site methods. It also includes composting/solar drying/external transportation to dump the remaining 10% of generated solid waste as off-site methods. There seems to be no alternatives for the proposed systems. The EIA therefore concludes that the proposed systems are to be properly managed while recognizing the importance of capacity development of stakeholders such as JCspd and private companies undertaking solid waste treatment.

**5. Existing Environmental and Socio-economic Conditions**

Physical and Ecological Environment

| Category | Brief description |
|---|---|
| Location/Topography /Geology/Soil | The candidate site is located in a desert land with a gradual slope of around 1.4% from west down to east. Its soil condition consists mostly of sandy soils, which is determined from soil sampling and laboratory test conducted in May 2008. A *Wadi* (dried-up river) crosses the center part of the candidate site from the west to east direction. The *Wadi* has a small run-off discharge only after rainfalls during the winter season. |
| Climate | The candidate site has a predominantly Mediterranean climate which prevails over the Jericho area. Hot dry summer is experienced from June to September with a temperature of over 28℃, and a short winter with rains from November to March. The annual rainfall in said area is less than 200 mm. |
| Vegetation/ Flora and Fauna | There are no rare vegetation, flora and fauna in and around the site. Millions of migratory birds pass through the JRRV area, including in and around the site. However, these are not identified as rare species. |
| Water resource | Available water resources around the site are mainly from groundwater wells and springs. There are 17 agricultural wells, located between Jericho City Center and the candidate site. Ein-Sultan Springs is a main spring in Jericho, located in the northwest of the city center. |

Socio-economic Environment

| Category | Brief description |
|---|---|
| Population | There are no inhabitants in the candidate site. According to the Palestinian Central Bureau of Statistics (PCBS), the population of Jericho City was 20,416 in 2006. Most of the population is concentrated in the central part of the city. Jericho City has the lowest population density among the major cities in the West Bank, with 69 persons per $km^2$. |
| Land use | The site is located in an unused land situated in the southern part of the city. Existing land uses in the surrounding area include irrigation and industry. There exists a steel factory on the northeast side of the site. Most urban functions are concentrated in the center, including administrative and commercial functions, wholesale markets, religious buildings, and recreational spots. |
| Economic activities | Major economic activities in Jericho are tourism and agriculture. In the Jericho Governorate, the tertiary industry including commerce, restaurants, hotels and services has a large share of economic output, with a total of 60.9% in 2007. A large number of employments in Jericho are in the tourism sector. The agricultural sector is also important in Jericho but its employment share is only 15.6%. |
| historical and cultural heritage | Jericho has a number of significant historical and cultural heritage sites which are located at the crossroads of the east-west tourist corridor from Jerusalem to Amman in Jordan, and at the north-south tourist corridor from Tiberias to Eilat in Israel. Jericho is known among foreign tourists as a pilgrimage destination. The total number of visitors to Jericho and the Jordan Valley Governorate in 2007 was 636,637[1], of which 52.5% are foreign visitors (Palestinians and Arab Israelis). In Jericho and Jordan Valley, major tourism resources and facilities are concentrated in Jericho. Most visitors seem to be visit Jericho more often. |
| Infrastructure (Road) | There are two existing roads leading to the Agro-industrial Park. One starts from the center of Jericho Municipality leading to the steel factory, right next to the site. Most part of the road near the center of the city is paved while the road section (1.8 km long and 14 m wide) from the new vegetables and fruit market to center of Jericho was rehabilitated by EU. Other sections near the Agro-industrial Park are unpaved. The other existing road (unpaved) towards the west direction, leading to the Jericho Regional Hospital, traverses an agriculture land. Its present condition is very poor. There is an unpaved old road from the steel factory leading to Route 90. However this road is unused and not connected to Route 90 as it is located in Area C, which is under the control of Israel. |
| Indigenous community | Bedouins community camps exist along the existing road from the site to Jericho Regional Hospital. Bedouins is an ethnic community with indigenous lifestyle and have no land ownership rights. |

## 6. Potential Environmental and Social Impacts and Mitigation Measures

(1) Stage I and II

Anticipated environmental and social impacts according to three implementation stages, i.e., pre-construction, construction, and operation, are summarized in the following table. In the operation stage, components of infrastructure are classified as either “on-site” or “off-site.”

[1] Tourist statistic data by governorate in Palestine, 2007, Ministry of Tourism and Antiquities

Pre-construction Stage

| Environmental category | Environmental factors | Anticipated impacts | Mitigation measure |
|---|---|---|---|
| Socio-economic environment | Land use and land value | Land adjacent to the site is sloped with Wadi will be a restriction on future development.<br>Project site is a desert land with no green area. Land price along the access roads could appreciate. | *Wadi* improvement will be implemented so that the site development for industrial estate becomes possible.<br>Illegal land buying and selling is restricted. Speculative investment on land surrounding the site is also restricted. |
| | Indigenous community | There is a Bedouins' community area near the project site, along the existing road 1. Passing of construction vehicles on said access road and its improvement works will directly impact their living and activity, if they are not relocated away from the existing area before the construction stage. | Land occupied by Bedouins belongs to Al Hussein Family. Hence, Bedouins have no ownership rights over the land. Jericho municipality is responsible for the issue on resettlement of the Bedouins. At present, there are no legal procedures, laws or guidelines for relocating the Bedouin in Palestine. To mitigate the issue stated by the Ministry of Local Government and the Jericho Governorate, the Jericho Municipality has to carry out discussions with Al Hussein Family and establish a related committee, which will include members from the Jericho Governorate. The Jericho Governorate is responsible in following-up the tasks of the committee. An appropriate action for the resettlement of Bedouins including explanation of the project to Bedouins and provision of alternative locations which needs to be discussed and decided in the committee during the pre-construction stage. |

Construction Stage

| Environmental category | Environmental factors | Anticipated impacts | Mitigation measure |
|---|---|---|---|
| Physical and ecological environment | Air quality | Dust, odors, and fumes generated due to construction activities particularly, land grading and road construction, are the main causes of the deteriorating air quality. When Khamaseen wind (hot, dry, and sandy), blows from Saudi Arabia, impact of dust is very severe. Exhaust gas emitted from the construction vehicles during the construction work may also cause air pollution. | Install construction sheets or fence around the construction site in order to prevent dust propagation around the site.<br>Sprinkling of water by sprinkler truck.<br>Set regulation for efficient construction vehicles with less exhaust gas emission and control traffic volume and speed of those utilizing the access roads. |
| | Flora and fauna | Noise, vibration and exhaust gas during construction works pose as negative impacts to migratory birds passing through the site and its surrounding areas in the JRRV. | Monitoring of birds and data collection by Palestine Wildlife Society need to be carried out for the analysis of detailed impacts. |
| | Water resource | The construction stage can affect mainly surface water considering proximity of the site to *Wadi*. The contamination can be related to any oil spills or from dust and fumes that might have accumulated on the surface of the ground. W*adi* has no running waters all year round except mainly during the winter and spring seasons. In case construction takes place during said seasons, precautions should be taken related to any kind of spill. | Appropriate safety operation and management of the construction work needs to be taken to avoid contaminations. Regular monitoring of the construction work and inspection of construction equipments are required.<br>A plant for turbid water treatment should bee installed. |

| Environmental category | Environmental factors | Anticipated impacts | Mitigation measure |
|---|---|---|---|
| Socio-economic environment | Employment and local economy | Construction work creates large employment opportunities in Jericho, which is a positive impact due to the project. It consequently encourages construction businesses in Jericho and will also boost local economy. | |
| | Land use and land value | Land use around the park and access roads will change. Land value along the access roads will appreciate. It will have impacts to existing land use and land owners along and near the access roads. | Appropriate control of development along the access roads is required based on land use plan for Jericho Municipality. Illegal land buying and selling shall be restricted. |
| | Traffic movement | Construction vehicles may create traffic congestion at the security checkpoint of Jericho City in the peak time of construction work. This will affect movement of tourism transportation arriving and leaving Jericho City, during tourist peak season (March-April, November-December). | Reduce construction work during the day time and impose work shifts at night time. Control of traffic volume for construction vehicles during the tourist peak time in order to minimize traffic congestion. Provide priority lane for construction vehicles at security checkpoint of Jericho City.<br>Introduction of an advanced registration system for carrying construction materials and equipment. |
| Health and safety | Air emission | Dust, odors, and exhaust gas from the construction work induce negative impacts to the surrounding area of the project sites. Local residents along the access roads (1, 2 and road toward Road no. 449) may be affected by dust and exhaust gas from construction vehicles. | Install construction sheet or fences around the construction site in order to prevent dust propagation<br>Set regulation for efficient construction vehicle with less exhaust gas emission and control traffic volume and speed of the motorists.<br>Sprinkle of water using sprinkler truck. |
| | Noise and vibration | Construction vehicles and equipment will cause noise and vibration during the construction work. Particularly, heavy construction vehicles passing through the access roads will create noise and vibration and induce negative impacts against residents especially along said access roads. | Using sound-insulated equipment and setting up fence around the construction site will reduce the average noise level during the construction activities. Work equipment should be well maintained to minimize noise level. Control of traffic volume and speed of construction vehicle will reduce noise and vibration and minimize impacts against residents along and near the access roads. |
| | Health and safety | Construction workers are subjected to potential risks of accident and injury. Severe heat conditions pose as threat to construction activities. | Construction works may be shifted from day time to night time.<br>Wearing safety devices shall be compulsory for construction workers.<br>Implementation of safety patrol. |

Operation Stage

| On-site/off-site /other | Environmental component | Anticipated impacts | Mitigation measure |
|---|---|---|---|
| On-site infrastructure | Water resource | Surface water<br>Partial erosion in *Wadi* will be anticipated due to water flow because of presence of sandy clay.<br>Ground water<br>Contamination of ground water in case raw sewage is spilled in the site. | Design of *Wadi* improvement for preventing partial erosion of *Wadi* including improvement of channel (width, depth) and protection works.<br><br>Wastewater treatment facilities are developed in each stage within the park site. Oxidation ditch process of wastewater treatment facilities is expected to reduce the impact of increased nutrients and pollutants getting into the ground water. |
| | Wastewater | Overflow of the collection system or any leakage of wastewater outside of | Wastewater treatment facilities including pre-treatment facility are |

| On-site/off-site /other | Environmental component | Anticipated impacts | Mitigation measure |
|---|---|---|---|
| | | the waste water treatment and collection system, will contaminate the soil, ground water and emit foul smell. | considered as a mitigation measure. Proper planning of wastewater collection facilities, designed to meet hourly maximum discharge, shall be implemented to avoid overflow of wastewater. |
| | Solid waste | Positive:<br>Reducing the volume of on-site waste, sorting different waste for reuse, removal of sludge<br>Negative:<br>Attract insects and birds and deterioration of air quality around site, foul smell, impact causing poor handling and stage management | Proper management and operation of solid waste facilities and handling and capacity building are indispensable. Using appropriate deodorizing substance such as rock wool and zeolite for deodorizing system. |
| Off-site infrastructure | Access road | Dust, fume, noise and vibration from truck and commuting vehicles to/form the Agro-industrial Park will have an impact to the area along the road.<br>Possible appreciation of land price along the access road. | Control of traffic volume and speed of vehicles passing the access road.<br>Illegal land buying and selling shall be restricted. |
| | Water supply | Alternative 1 (Water supply from existing wells) is not drinkable if untreated.<br>Stage II requires combination with other water alternatives.<br>Ground water level of wells (Alternative1) could reduce due to excessive water pumping. | Carry out desalination and disinfection to meet the water quality standard.<br><br>Control of pumping water from wells. |
| | Wastewater | Impact may be caused by mismanagement in operation and maintenance, leading to breakdown of the system. Anticipated impacts are soil and ground water, and odor. | Proper operation and maintenance for wastewater treatment facilities shall be carried out by a responsible operator. Regular monitoring is indispensable. |
| | Solid waste | Positive:<br>Compost will be an important income generation source.<br>Negative:<br>Possibility of causing offensive odor while transporting the wastes from the park to the land fill site.<br>Water could be polluted when rain water is pours on the solid waste.<br>Risk of flammable gases evaporating could lead to fire at the land file site. | Proper operation and maintenance for solid waste facilities (off-site) shall be carried out by a responsible operator. Regular monitoring is indispensable.<br>Installation of roof over the facilities for mitigating water pollution. |
| Health and safety | Health and safety | Any negative impacts related to air quality, noise, contamination will directly or indirectly affect the workers. | Heath and safety guidelines and plan should be prepared by each factory inside the park. |
| Socio-economic | Creation of employment | It was planned that the Agro-industrial Park will accommodate 63 factories with estimated 2,370 employees up to the stage II development. This induces positive impacts to Jericho City, regardless of its relatively small number. | |
| | Population Growth and housing demand | Population of Jericho City will increase due to inflow of population from other areas due to the Agro-industrial Park development.<br>Potential increase of housing and accommodation demands for employees and visitors after the stage II development. | Residential projects (JDECO, New residential complex housing project) are ongoing, will partially accommodate the increasing housing demands due to the Agro-industrial Park development. |

Source: JICA Study Team

(2) Stage III

After the Stage II development, Stage III posed as real challenge for the Agro-industrial Park development in the Jericho area. Its local economy is expected to further improve due to large development and job creation during this stage. The main concern is that the designated site (Lot III) is located in area C, which requires approval from Israeli prior to its development. These critical issues including land acquisition and approval for land development of Lot III should be discussed carefully between Palestinian and Israeli governments, as well as concerned stakeholders, before implementing the Stage III development. During such stage, environmental factors which might impact environmental and social conditions consist mainly of issues related to water supply, wastewater, and solid wastes. Anticipated environmental and social impacts due to these factors are described in B. 7 of the EIA Report.

## 7. Environmental Monitoring and Management Plan (EMMP)

(1) Demarcation of Responsibility

PIEFZA is the implementing agency for the development of the Agro-industrial Park as well as the proponent for the EIA study. Therefore, it would be the leading organization in conducting related activities for the EMMP.

An operation and management enterprise will take the responsibility for environmental monitoring inside the Agro-industrial Park (on-site infrastructure). Meanwhile PIEFZA, EQA, relevant ministries/agencies and Jericho Municipality will be responsible for monitoring the negative factors affecting the surrounding environment such as ambient air, supply water quality, solid waste and noise. The contractor will also be responsible for monitoring the air quality, noise, vibration, site safety and traffic problems, and will report findings to authorized site supervisors during the construction stage.

An environmental officer from PIEFZA will be assigned to handle the required documentations for obtaining environmental permission. He should also assist each tenant factories in complying with the rules and regulations on environmental matters such as pre-treated wastewater, air emission, and hazardous material.

Environmental Monitoring and Inspection Department under the General Directorate of Environmental Protection in EQA is responsible for the management of environmental monitoring of the related activities in the Agro-industrial Park. EQA is planning to assign an expert who can provide technical assistance to the environmental officer in order to obtain required permits and efficiently perform monitoring activities.

(2) Environmental Monitoring Components

The following environmental components are to be monitored during pre-construction, construction and operation stages.

| Stage | Pre-Construction | Construction stage | Operation stage |
|---|---|---|---|
| Environmental monitoring components | ・ Land use<br>・ Indigenous community | ・ Air quality monitoring<br>・ Site and worker's safety<br>・ Noise and vibration monitoring<br>・ Construction waste management | ・ Wastewater treatment effluents monitoring<br>・ Groundwater monitoring<br>・ Air emission monitoring<br>・ Ambient air quality<br>・ Solid waste and hazardous waste monitoring<br>・ Noise and vibration monitoring<br>・ Water resources<br>・ Operational health and safety plan |

(3) Environmental Monitoring Program

The environmental monitoring program covers (i) the parameters to be monitored, (ii) standards to be followed, (iii) location of sampling and/or observation, (iv) duration and/or frequency of monitoring, and (v) supervision responsibility. The concept of the monitoring program should be further discussed to obtain consensus with PIEFZA, EQA and other concerned agencies, prior to the implementation of the Agro-industrial Park development. Proposed environmental monitoring program by stage is tabulated in B.8 of the EIA Report.

(4) Training

The designated environmental officer in the Agro-industrial Park, in cooperation with the experts from EQA should be responsible for conducting trainings on the use of the guidelines, to those in-charge of environmental monitoring in each tenant enterprise. Additionally, training of employees working for tenant companies is also recommended concerning basic knowledge on environmental, health and safety, and potential hazards.

## B.1 Introduction

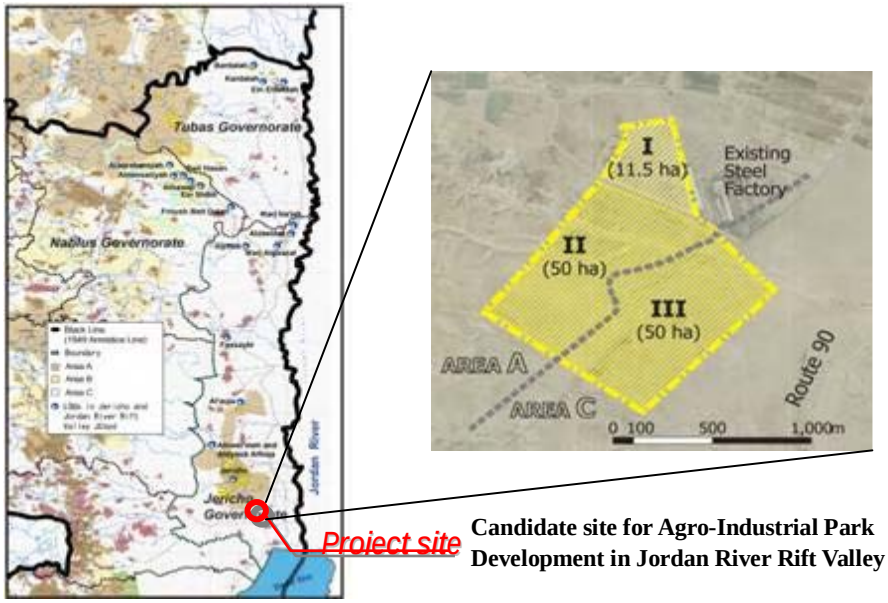
### (1) Background

The Agro-industrial Park development would be a significant project to fulfill its missions in line with the industrial development strategy and the Japanese initiative for the "Corridor for Peace and Prosperity". The "*Feasibility Study on Agro-industrial Park Development in the Jordan River Rift Valley*" (the Study) is one of the major core inputs under this initiative. The Study consists of two phases, the Pre-Feasibility Study (Phase I: April-August 2007) and the Feasibility Study (Phase II - Part 1: December 2007- February 2008; Part 2: April-August 2008; Part 3: September 2008-November 2008).

According to the "Palestinian Environmental Assessment Policy", industrial projects are among the fourteen types of projects that require Environmental Impact Assessment (EIA). This EIA Report was prepared in the course of the Study parts 2 and 3, based on various comments obtained from participants during the stakeholder meetings.

### (2) Study Area

The Study area includes the selected site for the Agro-industrial Park, consisting of Stage I (11.5 ha), Stage II (50 ha), Stage III (50 ha) and surrounding areas. Location of the site is shown in Figure B-1-1.




Source: JICA Study Team

**Figure B-1-1 Location of the Study Area and Candidate Site for the Agro-industrial Park Development**

### (3) Objectives of the EIA

The objectives of EIA are:

- To grasp the existing environmental conditions for the selected site for the Agro-industrial Park and its surroundings by collecting necessary information and data on physical and socio-economic conditions through field survey

- To identify, anticipate and assess the environmental and social impacts caused by the Agro-industrial Park development
- To develop and recommend alternative plans, mitigation measures and environmental monitoring and management plan

**(4) Methodology of the EIA**

**Collection and Analysis of Data and Information on Existing Environmental and Socio-economic Conditions for the Selected Site and Its Surrounding Area**

The following environmental factors in terms of physical, ecological, socio-economic and cultural aspect of environment were analyzed for the selected site and its surrounding area. These were based on field surveys, interviews and data collected from relevant agencies. Detailed environmental components are described as part of the Valued Environmental Components in the terms of reference (TOR) for the EIA (Attachment 1).

(i) Biophysical, Resource and Land Use Components
- Climate and air quality
- Surface water hydrology and quality
- Groundwater hydrology and quality
- Terrain and natural hazards
- Soils and vegetation
- Wildlife resources and use
- Aquatic resources and use
- Recreation and tourism resources and use
- Forest resources and use
- Agricultural resources and use
- Mineral resources and use

(ii) Economic Components
- Direct employment and income
- Indirect/induced employment and income
- Labor market conditions
- Sources of supplies, materials and services
- Transportation requirements
- Infrastructural development requirements and costs
- Government revenues/costs
- Indirect/induced economic development opportunities

(iii) Cultural and Heritage Components
- Archeological sites
- Traditional use sites
- Historic sites and landscape

(iv) Social Components
- Social/demographic profile
- Population
- Housing and accommodation

- Land and water use
- Transportation and traffic
- Community service delivery
- Local government revenues/costs
- Social support services
- Community stability, cohesion and well being
- Gender equity

(v) Health Components

- Supply of health facilities and services
- Community water supply and watershed
- Wastewater treatment and discharge
- Ambient air and water quality
- Worker health and safety
- Noise
- Local community health

**Scope of Works**

During the Phase I Study period, provisional scoping was conducted by the JICA Study Team in cooperation with EQA, based on the latter's official scoping format. At that time, scoping area for the EIA was not yet determined. The candidate site for the Agro-industrial Park development was then identified and agreed among the stakeholders during the Second Technical Meeting on October 2007. The JICA Study Team reviewed the provisional scope of works and information and verified these in relation to the infrastructure components and other environmental factors presented in the course of the Part 2 of the Phase II Study. In the scoping process, potential environmental impacts caused by the Agro-industrial Park development were discussed among the participants of the first stakeholders meeting held on 10 June 2008, and are shown as "Scoping Matrix based on the Palestinian Environmental Components Standard" in Attachment 2. The TOR for the EIA was then prepared stipulating the "Specific EIA Requirements" shown in Attachment 1.

**Assessment of Potential Impacts**

The Agro-industrial Park development is an industrial estate project encompassing off-site infrastructures such as access roads including improvement of existing roads, water supply facilities, power supply facilities, wastewater treatment facility. It also includes on-site infrastructures such as internal roads, water distribution facilities, waste water treatment (pre-treatment) and distribution facilities and solid waste management facilities and buildings. The objective of the EIA is to identify positive, negative, direct and indirect impacts caused by the Agro-industrial Park Development during both the construction and operation stages. Air quality, noise, water resource, water quality, water use, wastewater treatment and solid waste management and construction vehicles and equipment were anticipated as the major environmental factors.

**Analysis of Alternative Plans**

This section deals with the analysis of alternative plans, starting from the justification of the Agro-industrial Park development by comparing the social and environmental impacts of "with project" and "zero option". Subsequently, analysis of alternative plans by infrastructure component (off-site and on-site) infrastructures was presented in the Study.

The objective of this section is to analyze environmental and socio-economic impacts for each alternative. In the analysis, the best or better alternative is chosen and recommended as the appropriate mitigation measures.

The analysis of alternative plans includes the following:

- Project alternatives (including zero option)
- The site selection for the Agro-industrial Park development in JRRV
- The alternatives for on-site and off-site infrastructures (access roads, water supply, wastewater treatment and solid waste management)

**Mitigation Measures**

Mitigation measures focus on cost effective and practical mitigation measures to minimize, reduce and eliminate identified negative impacts for each implementation stage such as pre-construction, construction and operation. Proposed mitigation measures are those that require utilization of appropriate technology, systems and construction method, related to the construction and operation of infrastructures such as wastewater and solid waste treatment facilities.

**Environmental Monitoring and Management Plan (EMMP)**

EMMP consists of a detailed plan for environmental monitoring and management system for the implementation of mitigation measures. It aims to minimize, reduce and eliminate identified negative impacts on the project during the construction/operation stages. EMMP includes monitoring parameters, monitoring methods and system, monitoring schedule and frequency and implementing organization. It also includes the cost for monitoring the major environmental factors during the Agro-industrial Park development such as groundwater quality, effluent wastewater from factory, air pollutants emission, noise/vibration, and solid waste.

**Public Consultation**

Stakeholders meeting aimed to present relevant information on the Agro-industrial Park development and review its development plan. It also intends to determine the TOR for EIA and corresponding report, which are required in the process of preparation and implementation of the EIA Study, based on the environmental assessment guideline. Stakeholders meeting was initiated and implemented by PIEFZA with the assistance of EQA. A wide range of stakeholders were invited for the meeting, including the representatives from the project proponent (PIEFZA), EQA, project related government ministries (Ministry of Planning, Ministry of National Economy, Ministry of Local Government, Ministry of Transport, Ministry of Agriculture,

Ministry of Health, Ministry of Tourism and Antiquities, Palestinian Water Authority, and Palestinian Energy Authority), Jericho Municipality, local communities, NGOs, donors, universities, investors and all others concerned.

During the EIA Study, three stakeholders meetings were held in Jericho City as follows:

- First Stakeholders Meeting (Scoping session, 10 June, 2008)
- Second Stakeholders Meeting (Result of EIA Study, 15 October, 2008)
- Third Stakeholders Meeting with residential communities in Jericho (Result of EIA Study, 26 October, 2008)

Furthermore, a press release was initiated as an additional means for disseminating information to the public regarding the project and results of EIA study. The outcome of the first and second stakeholders meetings were reported on local newspapers.

## B.2 Description of the Agro-industrial Park Development

### (1) Objectives

The present Jordan River Rift Valley (JRRV) is assessed as low in value-added features due to relatively low production in agriculture. It is expected that the Agro-industrial Park will be vital for its economic upgrading, which will contribute to a challenging future goals, i.e. “improvement in agriculture”, “promotion of agro-industry” and “enhancement of export competitiveness of Palestinian export industries”.

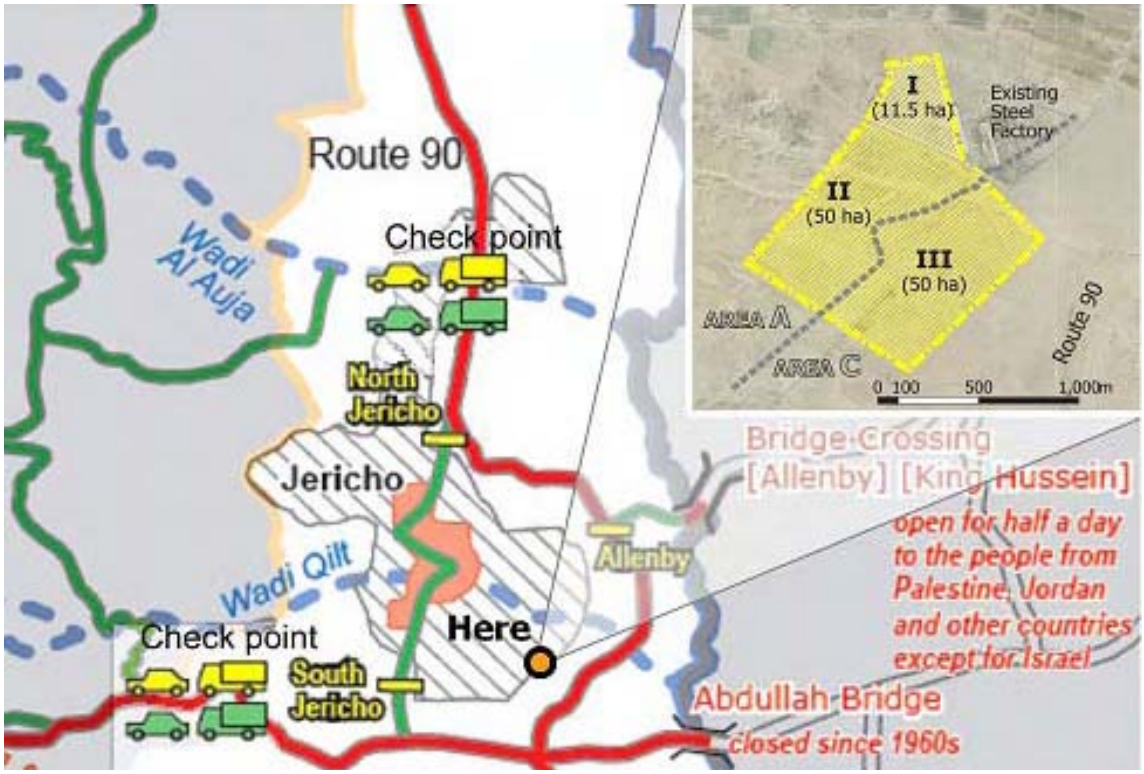
### (2) Development Concept and Priority Industries

The basic concept for the Ago-industrial Park development is to create a thematic industrial park, where people have a variety of production activities related to “Human Well-Being” which was proposed in the Phase I Study (Pre-feasibility). Business dealing with fresh fruits and vegetables, and food processing industry are considered to be promising industries for the Agro-industrial Park.

### (3) Development Plan

**<u>Location of Agro-industrial Park</u>**

The candidate site for the Agro-industrial Park is located in the southern fringe of Jericho Municipality, as shown in Figure B-2-1.




Source: JICA Study Team

**Figure B-2-1 Location of the Candidate Site**

The site is comprised of three land parcels, summarized in Table B-2-1.

**Table B-2-1 Profile of Land Parcels**

| Lot No. | Area | Jurisdiction | Ownership |
|---|---|---|---|
| I | 11.5 ha | Area A | State-owned Land (PNA) |
| II | approx. 50.0 ha | Area A | Privately-owned Land (Al Hussein Family) |
| III | approx. 50.0 ha | Area C | Privately-owned Land (Al Hussein Family) |
| Total | 111.5 ha | | |

Source: JICA Study Team

Note: Based on the information from Ministry of National Planning. Lot name I, II and III are tentative ones.

**Basic Concept of Land Use**

The basic concept of land use was set up as follows:

**(i) Factory, Distribution and Storage**

The standard land size per factory is 0.25 ha. Different land sizes of factories would be also available for large and SMEs. Parking space for employees and visitors would be appropriately arranged. Distribution and storage facilities are ideally located near the entrances.

Infrastructure

The basic infrastructure required for the Agro-industrial Park is as follows:

- Power supply facilities: Power supply line of 33 kV would be installed from the new Dead Sea Power station to the Agro-industrial Park.
- Water supply facilities: Appropriate areas would be allocated in lands with relatively high elevations.
- Wastewater treatment facilities: Appropriate areas would be allocated in lands with relatively low elevations.
- Solid waste treatment facilities: Appropriate areas would be allocated considering its odor and impact to the neighborhood.
- Internal roads: Major and minor road network would be arranged for smooth transportation inside the Agro-industrial Park.

Business Development Service (BDS) Center

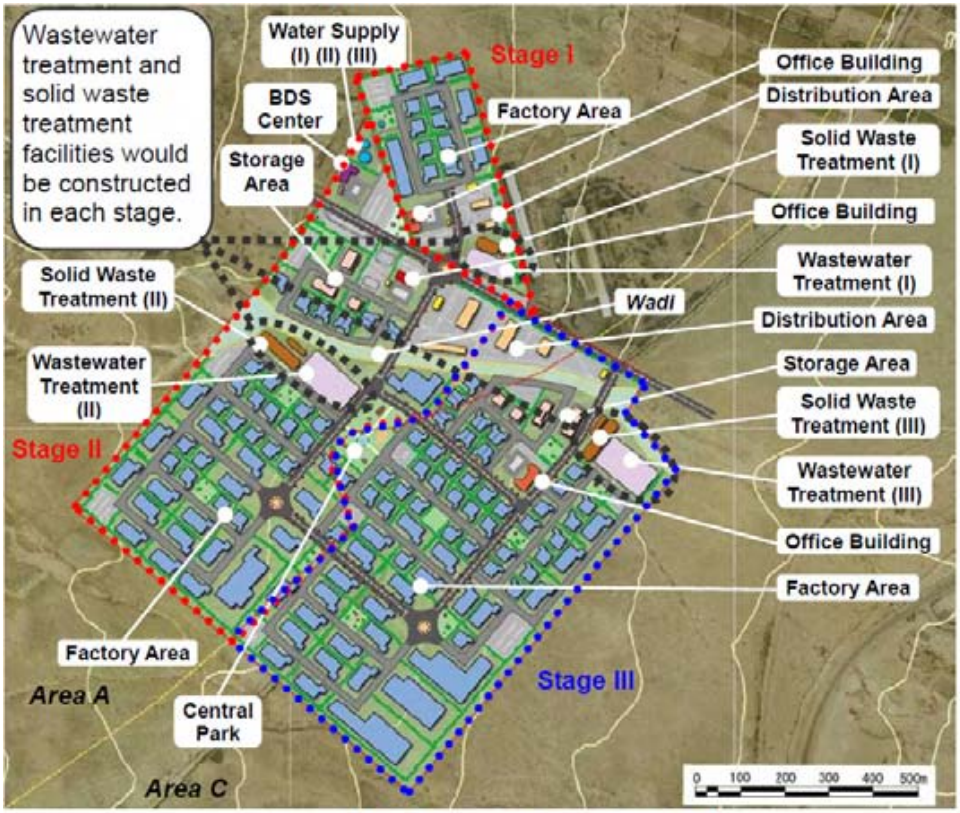
The Agro-industrial Park in Jericho is expected to be the promotional base of agrobusiness industries. BDS Center would be established in the Agro-industrial Park to support its tenant companies. In the BDS Center, exhibition halls, seminar rooms, business support offices and other necessary functions would be proposed.

Office Building

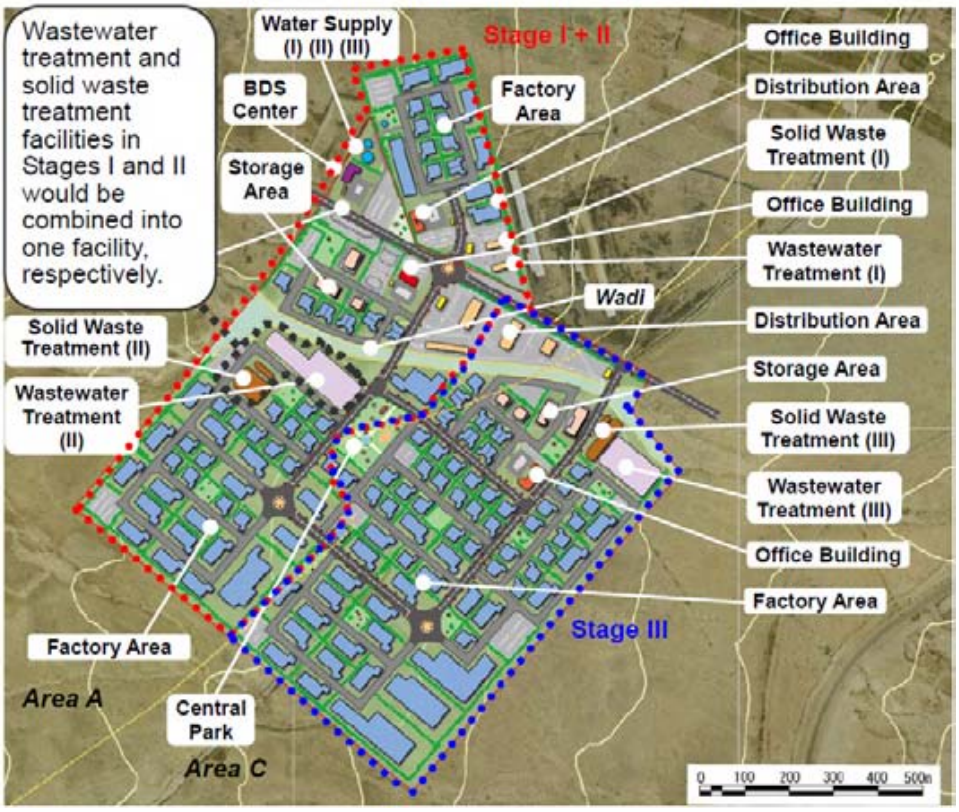
In order to effectively utilize common facilities in the Agro-industrial Park, locations of operation and maintenance offices, security offices, wholesale service (procurement of raw materials) company offices, clinics, canteens and fire stations would be properly identified.

Green and Open Space

Greeneries and parks shall be arranged appropriately in view of well-being, improvement of workplaces, as well as fire spread prevention. The existing alignment of *Wadi* would be modified forming an artificial canal with sufficient capacity against water flow to cope with probable large-scale floods. The corresponding land use plan is shown in Figure B-2-2.




Stage-wise Development of Stage I, II and III




**Simultaneous Development of Stages (I+II) and II**

Source: JICA Study Team

**Figure B-2-2 Land Use Plan**

Based on the land use plan, the preliminary composition of type of industries and land size of factories is shown in Table B-2-2.

**Table B-2-2 Number of Tenants by Type of Industries and Land Size**

| | Priority Industries | Area in the land use plan | Number of tenants | | | | | Ratio of number of factories |
|---|---|---|---|---|---|---|---|---|
| | | | **I** | **II** | **I+II** | **III** | **I+II+III** | |
| a) | Agribusiness dealing with fresh vegetables and fruit | Factory area | 1 | 2 | 3 | 4 | 7 | 5% |
| b) | Food processing industries | | 12 | 45 | 57 | 66 | 123 | 90% |
| c) | Packaging services | | 1 | 2 | 3 | 4 | 7 | 5% |
| Sub-total | | | 14 | 49 | 63 | 74 | 137 | 100% |
| d) | Logistics and transportation | Distribution area | 1 | 7 | 8 | 7 | 15 | |
| e) | Trading service | Office building | 1 | 1 | 2 | 1 | 3 | |
| Total | | | 16 | 57 | 73 | 82 | 155 | |
| Land size per factory (floor area is 50% of Lot size per factory) | ~0.25 ha/factory | | 2 | 8 | 10 | 12 | 22 | 15% |
| | 0.25 ha/factory | | 7 | 24 | 31 | 36 | 67 | 50% |
| | 0.5 ha/factory | | 4 | 15 | 19 | 23 | 42 | 30% |
| | 0.5 ha~/factory | | 1 | 2 | 3 | 3 | 6 | 5% |
| Total | | | 14 | 49 | 63 | 74 | 137 | |

Source: JICA Study Team

The following facilities would be provided at each lot to serve the operations of the Agro-industrial Park:

- Power supply from JDECO
- Telecommunication line from PALTEL
- Drinkable water supply
- Wastewater collection and treatment facilities
- Solid waste collection and treatment facilities
- Major and minor internal roads with parking areas and their rights of way
- Standard factory building
- Other common facilities such as canteens and security systems, etc.

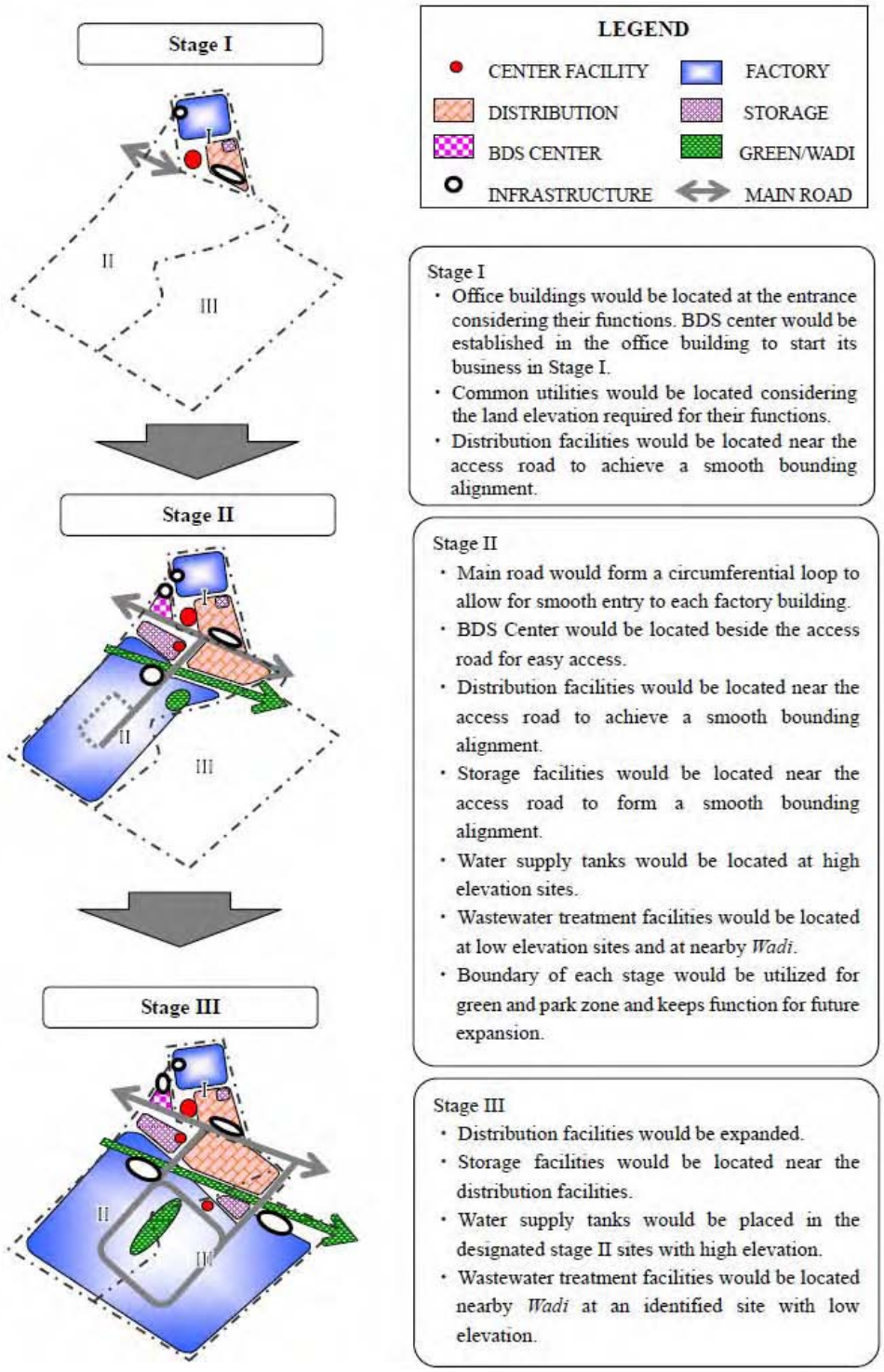
**Stage-wise Development Plan**

The Agro-industrial Park shall be developed in three stages. Stage I development is provisionally scheduled to commence in 2009, starting from a relatively small scale development in the lot of Area A (Lot I: 11.5 ha). Lot 1 was secured by the PNA and is ready for development[2]. Lot II which is approximately 50.0 ha shall be developed as in stage II, upon reaching an agreement with the private land owner, while anticipating a possible large demand of investment. It is ideal to implement stages I and II simultaneously if the investment demand, assessed through further study on investment potential for the Agro-industrial Park, is deemed sufficient.

[2] It has been reported by the Ministry of Planning (MoP) that the state-owned land (Stage I) was secured to use for the Agro-industrial Park at the Cabinet meeting held on 18 February 2008.

Lot III for the stage III development is also a privately-owned land requiring agreement with its private owner. Since the land is located in Area C, it is supposed that stage III development would require a long lead time for special coordination/agreement with the Israeli authorities.

Figure 2-3 illustrates a schematic sequence of the stage-wise development, with notations on planning.




Source: JICA Study Team

**Figure B- 2-3 Schematic Sequence of the development stages**

**Required Infrastructure Development**

The following infrastructures are required for the Agro-industrial Park, which is basically divided into two categories as follows:

- Off-site infrastructures:
  - Facilities to be located outside the Agro-industrial Park, and
  - Facilities on public nature to be located inside the Agro-industrial Park.
- On-site infrastructures:
  - Facilities to be located inside the Agro-industrial Park

Accordingly, the facilities for wastewater and solid waste treatment and BDS Center located inside the Agro-industrial Park are categorized as off-site infrastructures since these are public in nature.

Based on the above categories, demarcation of required infrastructures is shown in Table B-2-3 below.

**Table B-2-3 Demarcation of Required Infrastructure**

| | Category | Off-site Infrastructure | On-site Infrastructure |
|---|---|---|---|
| 1 | Land reclamation | - | Excavation and embankment, and *Wadi* improvement |
| 2 | Road | Road improvement/ Access roads | Internal road network |
| 3 | Power supply facilities | Transmission line from the New Dead Sea Substation | Internal distribution line network with transformer |
| 4 | Telecommunication facilities | Transmission line from closest telecommunication facility | Distribution line network |
| 5 | Water supply facilities | Transmission pipeline from water sources and water treatment facility | Water supply tanks and internal distribution pipeline network |
| 6 | Wastewater treatment facilities | Wastewater treatment facilities | Collection pipeline network of wastewater, and the redistribution pipeline network of reclaimed water |
| 7 | Solid waste treatment facilities | Solid waste treatment facilities | Vehicles for solid waste management |
| 8 | Security facilities | - | Site security systems |
| 9 | Building | BDS Center building | Rental factory, Office buildings |
| 10 | Logistics/Green/Open Space | - | Distribution area, Storage area, Parking area, Green zone and Park |

Source: JICA Study Team

**Development Design**

On the basis of functions and facilities required for the Agro-industrial Park, off-site and on-site infrastructures are preliminarily planned as summarized in Tables B-2-4 and B-2-5.

**Table B-2-4 Off-site Infrastructure**

| Item | | Stage I | Stage II | **Initial Completion** | Stage III | **Total Completion** |
|---|---|---|---|---|---|---|
| A.1 | Land | 1)Area required for existing roads improvement<br>2)Area required for water supply system<br>3)Area of foundation of transmission line | Area required for construction of existing road I, 2 and A-2 with 20 m in width | Stage I+II | − | Stage I+II |
| A.2 | Existing and Access Roads | 1)Improvement of existing road 2 from new fruit and vegetable market to access road 1 (1.2 km)<br>2)Improvement of existing road 1 (3.5 km) | Improvement of existing road 1 (4.7 km) existing road 2 (1.2 km) and construction of access road A-2 (1.3 km) | Stage I+II | − | Stage I+II |
| A.3 | Power supply facilities | Electricity from JDECO with 33kV TL(No.1) of 4 km in length | − | Stage I only | | Stage I only |
| A.4 | Telecommunication facilities | Connection from PALTEL station of 3.5 km in length | − | Stage I only | − | Stage I only |
| A.5 | Water supply facilities | Water system of Jericho municipality for main supply<br>Mekorot Water for backup | Water from irrigation wells for main supply | Stage I+II | Water supply from Mekorot Water for additional supply | Stage I+II+III |
| A.6 | Wastewater treatment facilities | Daily throughput: 470 $m^3$/day | Daily throughput: 1,650 $m^3$/day | Daily throughput: 2,120 $m^3$/day | Daily throughput: 2,450 $m^3$/day | Daily throughput: 4,570 $m^3$/day |
| A.7 | Solid waste treatment facilities | Equipment and facilities for composting | Same as Stage I | Stage I+II | Same as Stage I | Stage I+II+III |
| A.8 | Building structure | Function of BDS Center in office buildings | BDS Center | Stage I+II | − | Stage I+II+III |

Source: JICA Study Team

**Table B-2-5 On-site Infrastructure**

| Item | | Stage I | Stage II | **Initial Completion** | Stage III | **Total Completion** |
|---|---|---|---|---|---|---|
| B.1 | Land | State-owned land 11.5 ha | Privately-owned land 50 ha | State-owned land 11.5 ha, Privately-owned land 50 ha | Privately-owned land 50 ha | State-owned land 11.5 ha, Privately-owned land 100 ha |
| B.2 | Land reclamation | 11.5 ha | 50 ha | 61.5 ha | 50 ha | 111.5 ha |
| B.3 | *Wadi* improvement | - | Protection with gabion at both abutments and downstream of culvert | Stage II only | Same as Stage II | Stage II + III |
| B.4 | Internal road | Major road:0.2 km<br>Minor road:0.7 km | Major road: 0.9 km<br>Minor road: 2.8 km | Major road: 1.1 km<br>Minor road: 3.5 km | Major road:1.4 km<br>Minor road: 3.8 km | Major road:2.4 km<br>Minor road:7.3 km |
| B.5 | Storm water drainage channel | Drain ditch beside roads and pipe culverts | Same as Stage I | Stage I + II | Same as Stage I | Stage I + II+III |
| B.6 | Power | Distribution lines and | Power demand: | Power | Power | Power |

| | | | | | | |
|---|---|---|---|---|---|---|
| | distribution facilities | transformer<br>Power demand:<br>2.5 MW | 10.0 MW | demand:<br>12.5 MW | demand:<br>12.5 MW | demand:<br>25.0 MW |
| B.7 | Tele-communication distribution facilities | Connection lines to factories and public building | Same as Stage I | Stage I + II | Same as Stage I | Stage I + II+III |
| B.8 | Water distribution facilities | 0.10<br>MCM/year | 0.40<br>MCM/year | 0.50<br>MCM/year | 0.50<br>MCM/year | 1.00<br>MCM/year |
| B.9 | Wastewater collection and Reclaimed water redistribution facilities | Collection pipes:<br>840m<br>Redistribution pipes<br>860m | Collection pipes<br>3,600m<br>Redistribution pipes: 3,900m | Collection pipes: 4,400m<br>Redistribution pipes: 4,760m | Collection pipe: 4,100m<br>Redist pipe<br>4,300m | Collection pipe: 8,540m<br>Redist<br>9,060m |
| B.10 | Solid waste collection facilities | Vehicles, storage yard and container | Same as Stage I | Stage I + II | Same as Stage I | Stage I + II+III |
| B.11 | Security facilities | Security system for detection of hazardous materials, etc. | Same as Stage I | Stage I + II | Same as Stage I | Stage I + II+III |
| B.12 | Building structure | Rental factory<br>Office buildings | Office buildings | Stage I + II | Office buildings | Stage I + II+III |

Source: JICA Study Team

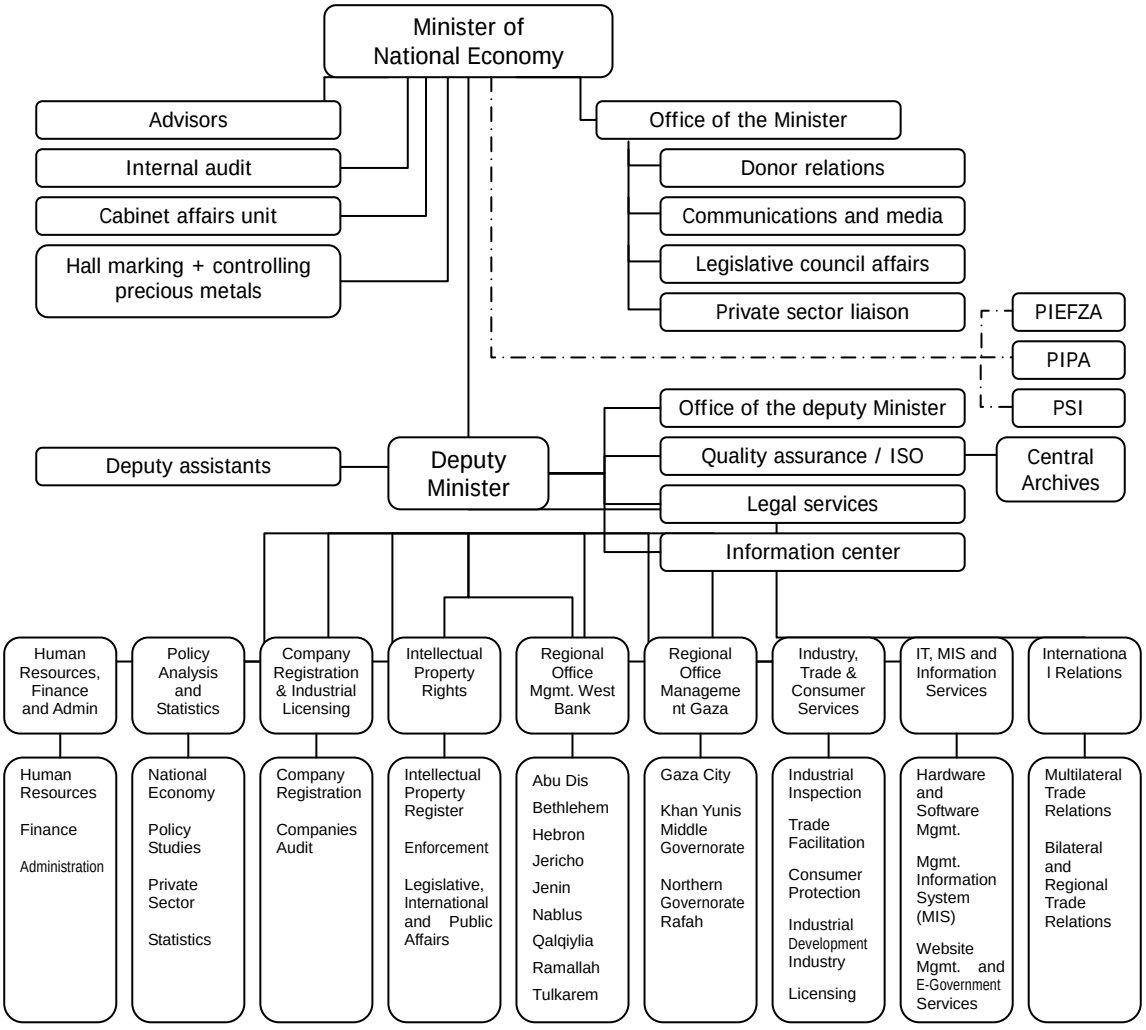
### (4) Organizational and Institutional Framework

**The Ministry of National Economy (MoNE)**

MoNE, the higher administrational body of the Palestinian Industrial Estates and Free Zones Authority (PIEFZA), is responsible for company registration and industrial licensing (industrial licenses for operation, etc.) for investment procedure, industrial inspection for renewal of operation license, and export certificate. The agency, also responsible for industrial promotion, has been conducting modernization and upgrading of Palestinian enterprises in order to enhance their competitiveness, particularly the SMEs.

Figure B-2-4 illustrates the present organizational structure of MoNE, in which PIEFZA is situated directly under the minister, as a functional unit in charge of industrial estate development.

The Companies Registrar is responsible for issuance of registration certificates in compliance with the Companies Law of 1964 under the Jordanian rule and still deemed enforceable in the West Bank. The Department of Industry, Trade and Consumer Services is responsible for a wide range of services, including industrial licensing, industrial inspection, trade facilitation, consumer protection and industrial development. The Industrial Licensing Section is the sole unit designated to issue licenses to investors prior to their operation. The Trade Facilitation Section is designated to certify the origin of certificate signed by the Chamber of Commerce, when manufacturers export products. The Industrial Inspection Section supported by regional offices of MoNE regularly inspects operation of the registered enterprises. The industrial development section engaged in industrial promotion programs is the unit responsible for the BDS Platform.




Source: MoNE, as of June 2008

**Figure B-2-4 Organization Structure of Ministry of National Economy**

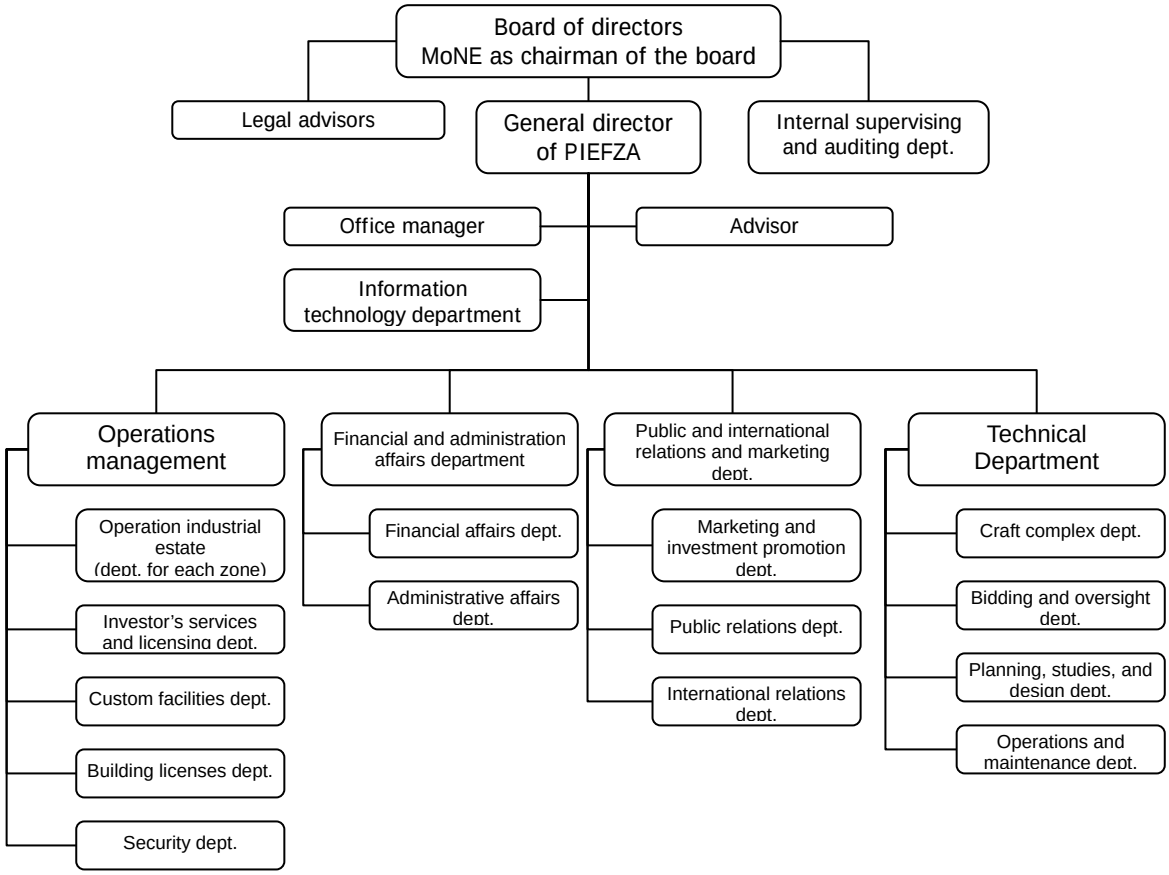
PIEFZA is responsible for promotion of industrial estate development in Palestine since its establishment in 1998, after the enactment of Palestinian Industrial Estates and Free Zones Law (PIEFZL). Principal missions of PIEFZA are stipulated as follows:

- Formulation of policies for industrial estates and free zones development, and preparation and permission of industrial estate development
- Application control of investment to industrial estates and free zones in Palestine
- Construction of industrial estates and free zones directly or indirectly through concessionaire to the private developer, and necessary infrastructures development
- Necessary contract administration, budget implementation, and selection of developer
- Monitoring and evaluation of the operation performance of industrial estates and free zones

PIEFZL states that PIEFZA's main role is to serve as one-stop shop where all the necessary investment information, advice, permits, licenses and official registrations for the establishment of the factories/companies are available to (potential) investors. It stipulates that the tasks of PIEFZA shall include development of industrial estates either directly or indirectly, through a developer[3].

[3] Article 5.5, PIEFZL.

**Organization of PIEFZA GAZA**




Source: PIEFZA, as of June 2008

**Figure B-2-5 Organization Structure of PIEFZA GAZA**

The figure B-2-5 shows the organization chart of PIEFZA, Gaza, where PIEFZA undertakes the O&M of off-site infrastructures in the areas of wastewater monitoring, maintenance/troubleshooting of water supply facility, and monitoring of Gaza Industrial Estate (GIE) operation regarding any service issues on power distribution system.

## B.3 Legal and Administrative Framework

### (1) Relevant Laws and Regulations

**Industrial Estates and Industrial Free Zones Law**

In order to provide a legal framework for industrial estates and free zones operating in the West Bank and Gaza, Law No. 10 on Industrial Estates and Industrial Free Zone was issued by Presidential decree in November 1997, and passed in November 1998. PIEFZA was established in 1998 as an autonomous agency under the MoNE, after the enactment of Law No. 10.

This law consists of following 11 chapters with 53 Articles:

- Chapter 1: Definition and general provisions,
- Chapter 2: Objectives and tasks of PIEFZA,
- Chapter 3: Board of Directors,
- Chapter 4: Finance,
- Chapter 5: Establishment of Industrial Estates and Industrial Free Zones,
- Chapter 6: Development and operation of Industrial Estates and Industrial Free Zones,
- Chapter 7: Procedures inside the Industrial Free Zone,
- Chapter 8: Movement of goods in and out of the Industrial Free Zone,
- Chapter 9: Right and duties of licensed projects,
- Chapter 10: Dealing in foreign currency, and
- Chapter 11: Penalties

Standard Operation Procedures were developed for PIEFZA to successfully carry out its designated responsibilities. Environmental permitting procedures were also agreed upon between PIEFZA and the Environmental Quality Authority (EQA). These procedures clarify that the investors has to obtain the environmental permits in order to operate within industrial estates and free zones.

PIEFZA prepared an environmental manual for the operation of industries and tenants within industrial estates in West Bank and Gaza. This manual was designed for GIE. It is noted that GIE was the first industrial estate developed by a private developer and implemented by PIEFZA.

**Palestine Environmental Law**

The Palestine Environmental Law called “Environmental Law (No (7) 1999)”, which was enacted in 1999, serves as the principal guideline for environmental management covering a wide range of environmental issues with a total of 82 articles.

The objectives of the law are:

- Protection of the environment by preventing all types of pollution
- Protection of public health and welfare
- Preservation of biodiversity and improvement of those areas, which are environmentally degraded.
- Promotion of public awareness and encouragement of sustainable resource development for the benefit of the present and the future generations

The major issues covered under the environmental law are protection of the environment (land, air, water and marine environment), natural, historical and archaeological areas. It also contains provision of environmental plans and enforcement tools including impact assessment, licensing, inspection and administrative procedures, and penalties.

**Palestinian Environmental Assessment Policy**

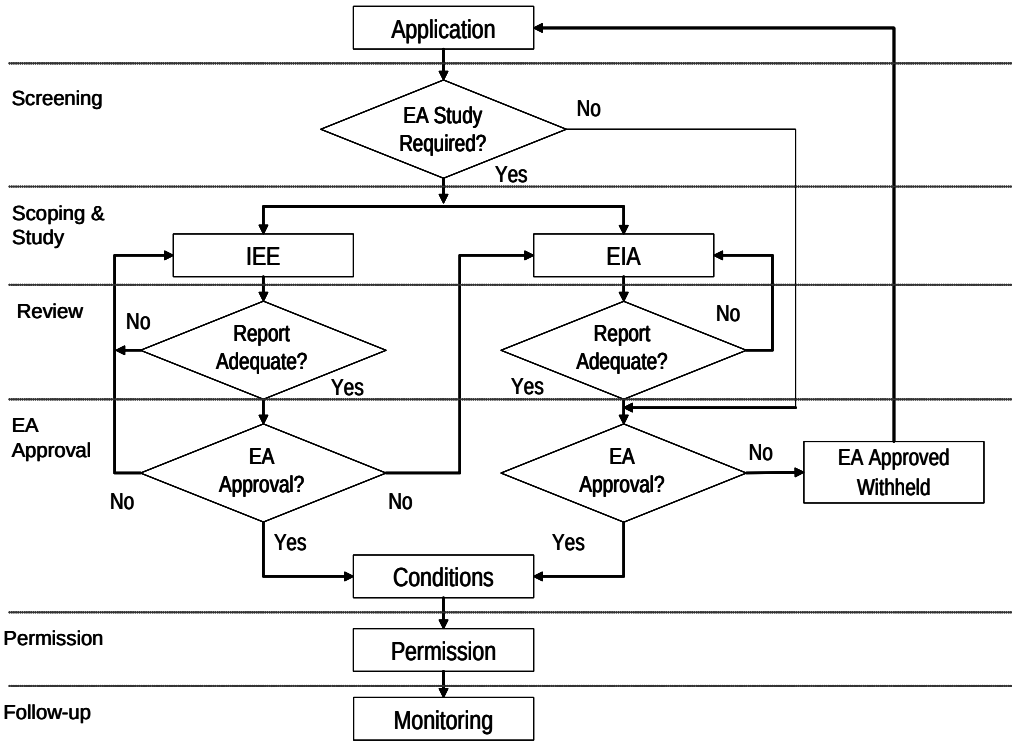
The Environmental Impact Assessment (EIA) regulations were defined under the aforementioned law. *"Palestinian Environmental Assessment Policy"*, which was established by Ministry of Environment Affairs (MEnA) and approved by the Ministerial Council in resolution No: 27-23/4/2000 on 23 April 2000 It defines guidelines and procedures on Environmental Assessment (EA) more clearly. This policy is widely referred to on a practical basis. MEnA was changed to Environmental Quality Authority (EQA) in 2002.

**(i) Outline of Environmental Assessment (EA)**

Article 3 of the policy stipulates the principles underlying the policy and it clearly mentions that "EA should begin as early as possible since it serves the better planning of development activities from the viewpoint of environment. Preparation of the studies and reports must be carried out by specialists qualified to carry out the work."

**(ii) Procedure of Environmental Assessment**

According to the Palestinian Environmental Assessment Policy, two kinds of EA studies, Initial Environmental Evaluation (IEE) and EIA, may require any development studies and actions including technical cooperation projects. The policy mandates the implementation of EIA in the following types of development projects: 1. power plants; 2. quarries and mines; 3. wastewater treatment plants including main sewers; 4. cement plants; 5. solid waste disposal sites; 6. hazardous waste disposal sites; 7. plants producing, storing or using hazardous substances; 8. airports and landing strips; 9. seaports; jetties and harbors; 10. refineries; 11. industrial estates; 12. major dams and reservoirs; 13. major roads; and 14. steel mines. A flowchart of the EA administrative procedures is given in Figure B-3-1. The necessary actions to be taken for EIA through the EA procedure are summarized in Table B-3-1.




Source: EQA

**Figure B-3-1 EA Administrative Procedures**

**Table B-3-1 Necessary Actions for EIA Approval**

| Proponents | EQA | EA Committee* |
|---|---|---|
| 1. Preparation of EIA report in the proponent's expense<br>2. Sending the EIA report to EQA | 1. Initial review of the EIA report<br>2. Advice to proponents<br>3. Sending final EIA report to EA committee | 1. Review of the final EIA report<br>2. Environmental approval can be issued or not<br>- EIA report is inadequate: Request of re-submittal of EIA report to proponents<br>- EIA report is adequate: Issuing of EA approval |

Remark: EA (Environmental Assessment) Committee is an inter-agency and shall be established with members from the following governmental agencies, EQA, Ministry of Industry, Ministry of Local Government, Ministry of Transport, Ministry of Agriculture, Ministry of Health, Ministry of Tourism and Antiquities, Ministry of Planning, and Palestinian Water Authority and Palestinian Energy Authority.

Source: EQA

### iii) Information Disclosure and Stakeholders Participation

Stakeholder meetings were held to clarify the scope of works for EIA, which was prepared and implemented by the proponent of the project, PIEFZA, with the assistance of EQA. The meeting aimed to provide relevant information on the proposed project and discuss the scope of EIA, and alternatives, and make a draft TOR for the EIA and EIA Report. Any comments and recommendations received from the participants during the stakeholders meeting were taken into consideration for the finalization of the TOR. Participants at the stakeholders meeting were PIEFZA, project related

government ministries and departments, Jericho Municipalities, local communities and NGOs, investors and all people concerned.

**(iv) General Environmental Items**

General Environmental Items to be described in the EIA report are as enumerated in Table B-3-2.

**Table B-3-2 Environmental Component to be Evaluated**

| Category | √ | Environmental Component |
|---|---|---|
| Biophysical, Resource and Land Use Components | √ | Climate and air quality |
| | √ | Surface water hydrology and quality |
| | √ | Groundwater hydrology and quality |
| | √ | Terrain and natural hazards |
| | √ | Soils and vegetation |
| | √ | Wildlife resources and use |
| | √ | Aquatic resources and use |
| | √ | Recreation and tourism resources and use |
| | √ | Forest resources and use |
| | √ | Agricultural resources and use |
| | √ | Mineral resources and use |
| Economic Components | √ | Direct employment and income |
| | √ | Indirect/induced employment and income |
| | √ | Labor market conditions |
| | √ | Sources of supplies, materials and services |
| | √ | Transportation requirements |
| | √ | Infrastructure development requirements and costs |
| | √ | Government revenues/costs |
| | √ | Indirect/induced economic development opportunities |
| Cultural and Heritage Components | √ | Archaeological sites |
| | √ | Traditional use sites |
| | √ | Historic sites and landscape features |
| Social Components | √ | Social/demographic profile |
| | √ | Population |
| | √ | Housing and accommodation |
| | √ | Land and water use |
| | √ | Transportation and traffic |
| | √ | Community service delivery |
| | √ | Local government revenues/costs |
| | √ | Social support services |
| | √ | Community stability, cohesion and well being |
| | √ | Gender equity |
| Health Components | √ | Supply of health facilities and services |
| | √ | Community water supply and watersheds |
| | √ | Waste treatment and discharge |
| | √ | Ambient air and water quality |
| | √ | Public health risks |
| | √ | Workers' health and safety |
| | √ | Noise |
| | √ | Local community health |

Source: EQA

**Environmental Laws and Regulations to be referred to in Different Jurisdictions**

The environmental laws and regulations to be applied differ depending on the site location (Area A, B, or C) as shown in Table B-3-3.

When the site location is close to area C, Israeli authority usually requires the PNA to submit the EIA report. Hence, this is the case of lot III, where stage III development is planned. According to COGAT Tel Aviv, it would take two to six months before approval is issued.

**Table B-3-3 Environmental Laws and Regulations to be Applied (West Bank)**

| Area | A | B | C |
|---|---|---|---|
| International Agreement | Oslo II Agreement | | |
| Laws/Regulations to be Applied | PNA Law | | Israeli Civil Administration<br>+ PNA Law<br>+ Jordanian Law (pre 1967) |
| Regulations to be Applied | PNA Regulation | | Israeli Regulation<br>+ Israeli Military Orders<br>+ PNA Regulation |

Source: EQA
PNA: Palestinian National Authority

The regulation imposed by the Israeli Civil Administration is a general guideline stating what should and should not be done. A regulation is an actual interpretation of the law, setting the procedures and policies, and who will be accountable for what.

**Water-related Laws and Regulations**

**(i) Water Law**

The current water law promulgated on July17, 2002 consists of 44 articles. The "Water Law" repeals the previous laws and any other legislation irrelevant to this law. It also reaffirms the PWA's mandate and its full responsibility for the management of water resources and wastewater in Palestine.

**(ii) History of Water-related Laws**

Legislation in Palestine is complicated. This is attributed to the long history of occupation when Palestine was governed by a sequence of different laws. An outline of the series of laws in the past is summarized in Table B-3-4.

**Table B-3-4 Water Related Laws Introduced to Palestine**

| | Epoch | Laws Introduced |
|---|---|---|
| 1 | Jordanian Legislation (1948-1967) | 1. Land and Water Settlement Law No.40/1952<br>The law provides for a settlement and registration of land and water rights in the Jordanian Land Registry. The law provides for procedures on the registration process.<br>2. Water Control Law No.31/1953<br>This law prescribes rules relating to the construction of irrigation structures in Irrigation Areas, Water Allocations. Tables were prepared to detail the quantities allocated to each land parcel and the quantity of irrigated land.<br>3. Municipalities Law No.29/1955<br>This law detailed the powers of the municipalities and stipulated that the council would be responsible for the provision of water to the residents, determination of the means for including installations of pipelines, the organization of water allocations, determination of tariffs and fees, and the prevention of pollution of springs, canals, pools, and cisterns.<br>4. Law on the Organization of Matters of Drinking Water in the Jerusalem District No.9/1966<br>This law created a Municipal-Regional Water Authority with the responsibility as well as the powers for the supply of water in the district of Jerusalem, including to Ramallah, Bethlehem and their neighboring townships and villages. The legal norms which were applicable to the West Bank on the eve of the 1967 war included the Ottoman Laws, the British Mandatory Ordinances and the Jordanian Laws. |
| 2 | Israeli Military Orders (1967-1995) | 1. Military Order on Powers Concerning Water Laws No.92/1967<br>The order provided that any and all of the powers in the sphere of water laws which were held by the Government of the Hashemite Kingdom of Jordan would be held henceforth by a person to be appointed by the Military Commander.<br>2. Military Order Amending Law No.31/1953 on Water Control No.158/1968<br>The order added a provision to the Jordanian Law to the effect that henceforth not only Irrigation Installations in Irrigation Areas were put under the control of the authorities but that the centralized control is extended to include all water production installations. The Order provided that the erection, possession and operation of any water production installation would require henceforth a license.<br>3. Military Order on Land and Water Settlement No.291/1969<br>This order amended the Jordanian Law on Water and Land Organization of 1952 and provides that any water and land settlement which has not yet been completed in accordance with the Jordanian Law is put in abeyance and may not prevent real estate transactions.<br>4. Military Order Amending the Law on the Regulation of the Natural Resources No.457/1972<br>The Order provides that the assessment of the value of land and water quotas for the purpose of compensation is to be made by an official body appointed by the Military Commander. |

| | Epoch | Laws Introduced |
|---|---|---|
| 3 | Palestinian Legislation (1995-To Date) | 1. Presidential Decree No.5/1995<br>The decree established the Palestinian Water Authority.<br>2. Law No.2/1996<br>This law established the Palestinian Water Authority and defined its objectives, functions and responsibilities. This law gave the Palestinian Water Authority the mandate to manage the water resources, execute the water policy, establish, supervise and monitor water projects, and to initiate coordination and cooperation between the stakeholders in the water sector.<br>3. Presidential Decree No.66/1997<br>The decree established the internal regulations of the Palestinian Water Authority and the rules of procedures.<br>4. Palestine Water Law No.3/2002<br>The Water law No.3/2002, which was signed on 17 July 2002 by the President, mentioned and assured these responsibilities; Develop, Supervise, and Manage Water Sector .The available Water Policy which states that "Water resources should be developed and managed efficiently in order to meet present and future needs in an environmentally sustainable way", was the guide in stipulating the Water Law. The Water Law includes within its articles the institutional framework of each level in the water sector, the roles of each level, and some water regulations. |

Source: "Water Legislation in Palestine" provided by PWA

**(iii) Water Laws and Regulations by Jurisdiction**

The water laws and regulations to be applied differ depending on the site location (Area A, B, or C) as shown in Table B-3-3.

According to Oslo II Bilateral Agreement, Article 40 Water and Sewage, all development of water resources and systems irrespective of area jurisdiction shall require the prior approval of the Joint Water Committee (JWC).

The procedure of water-related decisions by land jurisdiction type is shown in Figure B-3-2.

In Area A and Area B, the procedure starts from PWA and ends with JWC, while in Area C, it starts from PWA and ends with Civil Administration (CA) at Beit El, which is located at the outskirts of Ramallah City.

With the approval of JWC (and CA in case of Area C), PWA issues a license for the project in question in order to proceed to the next step (planning and design).

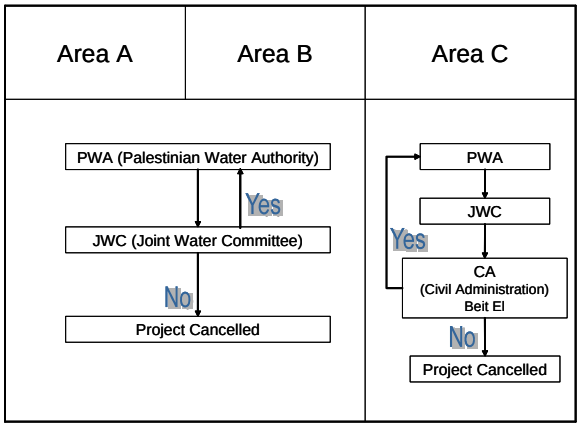



**Figure B-3-2 Procedure of Water-related Decisions by Land Jurisdiction Type**

### (iv) Palestinian Standard of Water-Related Regulation

Environmental standard provides a framework for environmentally-friendly development of any planned infrastructure/facilities. It also minimizes risk associated with potential environmental hazard and consequently its adoption as technical regulations are justified for their ability to protect the environment.

Palestine has already made a great stride in the standards that focus mainly on public health. Most of these standards are based on the values from neighboring countries like Jordan, Israel and international organizations like World Health Organization (WHO).

Regulations for Ground Water Pollution Control

These regulations were prepared in cooperation between EQA and PWA. These were enacted on 16 January 2006 in order to regulate groundwater pollution by contamination of ground water or restoration of polluted water and obtain an acceptable water quality in accordance with prevailing standards. Especially, in the case of: 1) boring of new wells and obtaining of a new license; or, 2) taking actions around/at well head, project implementers shall comply with the regulations. Additionally, expected pollutants by activities and regulated substances are listed as appendices.

Palestinian Guideline for Drinking Water

Quality of drinking water is regulated under the guideline of Palestinian Standardization Institutes. The indicators and corresponding values are shown in the following table.

**Table B-3-5 Palestinian Guideline for Drinking Water**

| **Chemical Properties** | | | |
|---|---|---|---|
| Indicator | Value | Indicator | Value |
| Ca | < 100 mg/L | Mn | < 0.1 mg/L |
| Mg | < 100 mg/L | NO3 | < 70 mg/L |
| Na | < 200 mg/L | SO4 | < 200 mg/L |
| K | < 10 mg/L | PO3 | < 0.6 mg/L |
| Fe | < 0.3 mg/L | Phenol | < 0.002 mg/L |
| Zn | < 5 mg/L | F | < 1.5 mg/L |
| Pb | < 0.01 µg/L | Cl | < 250 mg/L |
| Cd | < 0.005 mg/L | HCO3 | < 350 mg/L |
| Cu | < 1 mg/L | CaCO3 | < 500 mg/L |
| **Physical and Biological Properties** | | | |
| Indicator | Value | Indicator | Value |
| Temperature | 25 degree Celsius | Total coliform | 0-3 |
| Turbidity | < 5 NTU | PH | 6.5 – 7.5 |
| Faecal coliform | 0 | Color, taste, odor | To be acceptable |

Source: Drinking Water published by Palestinian Standardization Institutes (2005)

Palestinian Standards for Treated Wastewater

The following table shows the treated wastewater quality by basic indicators and maximum acceptable values.

**Table B-3-6 Treated Wastewater Quality by Basic Indicators**

| Indicator | Discharge to sea | Groundwater recharge by infiltration | Dry fodders | Green fodders | Gardens, play grounds, parks | Industrial and cereal crops | Forests | Fruiting trees |
|---|---|---|---|---|---|---|---|---|
| COD | 200 | 150 | 200 | 150 | 150 | 200 | 200 | 150 |
| DO | > 1 | > 1 | > 0.5 | > 0.5 | > 0.5 | > 0.5 | > 0.5 | > 0.5 |
| TDS | - | 1,500 | 1,500 | 1,500 | 1,200 | 1,500 | 1,500 | 1,500 |
| pH | 6 - 9 | 6 - 9 | 6 - 9 | 6 - 9 | 6 - 9 | 6 - 9 | 6 - 9 | 6 – 9 |
| Fat oil & grease | 10 | 0 | 5 | 5 | 5 | 5 | 5 | 5 |
| Phenol (mg/L) | 1 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| MBAS | 25 | 5 | 15 | 15 | 15 | 15 | 15 | 15 |
| NO3 (mg/L) | 25 | 15 | 50 | 50 | 50 | 50 | 50 | 50 |
| NH4 (mg/L) | 5 | 10 | - | - | 50 | - | - | - |
| Org-N (mg/L) | 10 | 10 | 50 | 50 | 50 | 50 | 50 | 50 |
| Cl (mg/L) | - | 600 | 500 | 500 | 350 | 500 | 500 | 400 |
| SO4 (mg/L) | 1,000 | 1,000 | 500 | 500 | 500 | 500 | 500 | 500 |
| Na (mg/L) | - | 230 | 200 | 200 | 200 | 200 | 200 | 200 |
| Mg (mg/L) | - | 150 | 60 | 60 | 60 | 60 | 60 | 60 |
| Ca (mg/L) | - | 400 | 400 | 400 | 400 | 400 | 400 | 400 |

Source: Treated wastewater published by Palestinian Standardization Institutes (2003)

Quality of treated wastewater is divided into following categories:

| Type of Quality | BOD | TSS | FC |
|---|---|---|---|
| (A) High quality treated wastewater | 20mg/l | 30mg/l | Less than 200/100ml |
| (B) Good quality treated wastewater | 20mg/l | 30mg/l | Less than 200/100ml |
| (C) Mid quality treated wastewater | 40mg/l | 50mg/l | Less than 1000/100ml |
| (D) Low quality treated wastewater | 60mg/l | 90mg/l | Less than 1000/100ml |

Remark:
BOD: Biochemical oxygen demand, TSS: Total suspended solids, FC: Fecal coliform
Source: Treated Waste Water, Palestinian Standards, PSI 2003-742, PSI

Palestinian Standards for Industrial Effluent Wastewater

Palestine Standards for industrial effluent wastewater are primarily concerned with both requirements and characteristics of wastewater emitted by factories and discharged into surface water, ground water, or water resources refined for the purpose of irrigation excluding wastewater used in purification plants.

*Required Limitation of poisonous materials*

The concentration of the following poisonous materials in industrial effluent wastewater should not exceed the defined limits as shown in the following table.

**Table B-3-7 Maximum Allowable Poisonous Materials in Industrial Effluent Wastewater**

| Material | Maximum Permitted Limit (mg/liter)[4] | | | |
|---|---|---|---|---|
| | Refined[5] for Irrigation | Natural Groundwater Supply | Discharged into | |
| | | | Sea | Floods, rivers, valleys, water clusters |
| Lead | 1.0 | 0.1 | 0.1 | 0.1 |
| Selenium | 0.02 | 0.05 | 0.02 | 0.02 |
| Arsenic | 0.1 | 0.05 | 0.1 | 0.05 |
| Total Chrome | 0.1 | 0.05 | 0.3 | 0.1 |
| Cyanide | 0.1 | 0.1 | 1.0 | 0.1 |
| Cadmium | 0.1 | 0.02 | 0.07 | 0.01 |
| Mercury | 0.001 | 0.001 | 0.001 | 0.001 |
| Nickel | 0.2 | 0.1 | 0.02 | 0.2 |

Source: Industrial Effluent Wastewater, Palestinian Standards, PSI 1998-227, PSI

*Required Limitation of Concentration of Contaminants*

The concentration of the following materials in an industrial effluent wastewater should not exceed the limits indicated in the following table.

**Table B-3-8 Maximum Allowable Concentration of Contaminants in Industrial Effluent Wastewater**

| Material | Maximum Permitted Limit (mg/liter) | | | |
|---|---|---|---|---|
| | Refined[6] for Irrigation | Natural Groundwater Supply | Discharged into | |
| | | | Sea | Floods, rivers, valleys, water clusters |
| Chemical oxygen demand | -[5] | 150 | 200 | 150 |
| Dissolved oxygen[7] | 1 | 1 | 5 | 1 |
| Total dissolved solids | 2000[8] | 1500 | - | 3000 |
| Total suspended solids | 100 | - | - | 50 |
| Fat, oil and grease | 5 | - | 10 | 15 |
| Phenol | 0.002 | 0.002 | 1 | 0.002 |
| Detergents | - | 15 | - | 25 |
| Nitrate | 50[9] | 12 | - | 12 |
| Ammonia | 5 | 5 | 12 | 5 |
| Total nitrogen | 50 | - | 125 | - |
| Phosphate-phosphor | - | - | - | 15 |
| Chloride | 300 | 500 | - | 500 |
| Fluoride | - | 1.5 | - | 1.5 |
| Sodium | - | 400 | - | - |
| Magnesium | - | - | - | - |
| Calcium | - | - | - | - |
| Sodium absorption ratio | 9 | - | - | - |
| Bicarbonate | 500 | - | - | - |
| Sulphate | 400 | 500 | - | 500 |
| Aluminum | 5 | 0.3 | - | 5 |
| Boron | 1 | 1 | - | 1 |
| Copper | 0.2 | 2 | 0.1 | 2 |
| Iron | 5 | 1 | 2 | 1 |
| Manganese | 0.2 | 0.2 | 0.2 | 0.2 |

Source: Industrial Effluent Wastewater, Palestinian Standards, PSI 1998-227, PSI

[4] The unit mg/liter; but monthly average is not adopted due to high toxicity of elements.
[5] It depends on the kind of crops, quantities of production, and methods of irrigation adopted, as well as the kind of soil, climate, and groundwater in the area.
[6] It depends on the kind of crops, quantities of production, and methods of irrigation adopted as well as the kind of soil, climate, and groundwater in the area
[7] The value of dissolved oxygen should be minimum level.
[8] The permitted value depends on total dissolved solids concentration in basin water and factories' source of water affected by effluent wastewater.
[9] The permitted value depends on the kind of irrigation (drip irrigation, surface irrigation, and sprinkler irrigation).

*Physical Parameter*

The physical characteristics of industrial effluent wastewater must meet the following criteria in the following table

**Table B-3-9 Physical Parameter in Industrial Effluent Wastewater**

| Material | Maximum Permitted Limit (mg/liter) | | | |
|---|---|---|---|---|
| | Refined for Irrigation | Natural Groundwater Supply | Discharged into | |
| | | | Sea | Floods, rivers, valleys, water clusters |
| hydrogen number | 6.5-8.4 | 6.5-9.0 | 5.5-9.0 | 6.5-9.0 |
| color | - | 15 | 75 | 15 |
| change in temperature | - | - | ±4 | ±4 |

Source: Industrial Effluent Wastewater, Palestinian Standards, PSI 1998-227, PSI

*Microbiological Requirements*

Microbiological requirements should meet the criteria of industrial effluent wastewater indicated in the following table.

**Table B-3-10 Microbiological Requirements in Industrial Effluent Wastewater**

| Material | Maximum Permitted Limit (mg/liter) | | | |
|---|---|---|---|---|
| | Refined for Irrigation | Natural Groundwater Supply | Discharged into | |
| | | | Sea | Floods ,rivers ,valleys ,water clusters |
| Count of coliforms per 100ml | - | - | 500 | - |
| Count of faecal coliforms per 100ml | 1000[10] | 500[11] | - | 1000[11] |
| Intastinal nematodes cyte/liter | less than 1 | - | - | less than 1 |
| Biochemical oxygen demand | - | 20 | - | 20 |

Source: Industrial Effluent Wastewater, Palestinian Standards, PSI 1998-227, PSI

**Laws Related to Solid Waste and Hazardous Materials**

There are articles related to “Solid Waste” (Article 7 – Article 10), and “Hazardous Substance and Waste” in (Article 11 – Article 13) in the “Environmental Law (No (7) 1999)”, which provide very basic PNA policies.

On practical basis, there is a draft by-law issued by EQA in 2005 regarding “Dealing and Management of Solid Waste”, which were based on articles 7, 8, 9, 23 of “Environmental law (No (7) 1999)”. This by-law is composed of 31 articles which mainly aim at assuring good management of solid waste through the implementation of appropriate methods to reduce negative impacts on the environment (mainly groundwater). According to this draft by-law, interested parties should take appropriate measures to reduce produced amount of solid waste. Local authorities are responsible for the management of solid waste according to the type generated and its characteristics. This by-law is applicable to those who carry or discharge wastes or to those who are in charge of operation of the dumping sites or waste treatment plants.

[10] The instructions of authoritative commodities must be taken into account.

There regulations are also applicable to limited areas or beneficiaries. In Jericho City, there are regulations for Joint Council for Solid Waste Management in JJRRV which were approved by the general body meeting of Joint Councils for Services, Planning and Development (JCspd) in August 2006. The regulations are made up with 32 articles, which mainly provide a basic system for solid waste management.

**Land-related Laws and Regulations**

**(i) Land-related Laws**

The land-related laws and regulations would differ depending on the land jurisdiction (Area A, B, or C) as shown in Table B-3-11.

**Table B-3-11 Land-Related Regulations to be Applied (West Bank)**

| Area | A | B | C |
|---|---|---|---|
| Laws to be Referred to | Jordanian Law (pre 1967) | | Israeli Civil Administration |
| Regulations to be Applied | PNA | | Israeli Military Orders |

Source: PLA

There are two Jordanian laws. These are called "Old Registration System" and "New Registration System" for land registration as shown in Table B-3-12. In case that an industrial park is constructed in an unregistered land, the "New Registration System" will be applied since it is an identified as a public work.

**Table B-3-12 Land Registration Systems (West Bank)**

| Law | Old Registration System | New Registration System |
|---|---|---|
| Law Number | 6/64 | 40/52 |
| Effective since | 1964 | 1952 |
| Nature | Jordanian Law | Jordanian Law |
| Scope of Application | Individual registration of personal parcels | - Public registration in unison of the whole or a part of "locality" on a large scale<br>- Land registration for public development |

Source: PLA

**(ii) Land Expropriation**

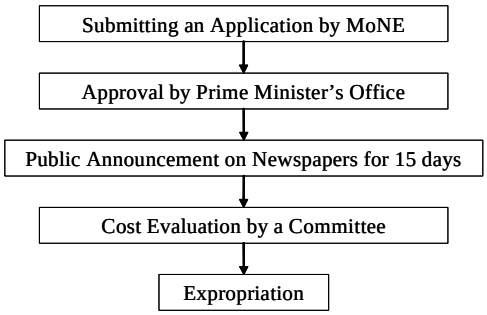
The land-related laws and regulations to be referred to would differ depending on the land jurisdiction (Area A, B, or C) as shown in the following table.

**Table B-3-13 Land-Related Laws and Regulations**

| Area | A | B | C |
|---|---|---|---|
| Laws to be Referred to | PNA | | PNA + Israeli Civil Administration* |
| Regulation to be applied | PNA | | PNA + Israeli Military Orders* |

* In case of obtaining permission from Israel regarding Area C, these law and regulation are basis for their judgment.
Source: PLA (2007)

Land expropriation and related matters are specified in the Expropriation Law (No.2/1953). In case that land expropriation is to be executed in private lands, the procedure of expropriation will be similar to the flowchart in Figure B-3-3.




MoNE: Ministry of National Economy
Source: PLA (2007)

**Figure B-3-3 Typical Procedure of Land Expropriation**

**(iii) Status of Waqf**

According to Palestinian Liberation Organization (PLO)-Negotiations Supporting Unit (NSU), definitions of Waqf is described as shown in Table 3-14.

**Table 3-14 Definitions of *Waqf***

| Version | Definition | Source |
|---|---|---|
| 1. | Mortmain; inalienable estate; tail general; gift left in perpetuity; dedication | Faruqi's Law Dictionary, Arabic-English, Second Revised Edition, 1983 (New Impression 1997 |
| 2. | Keeping assets, whether real estate or movable, from circulation, and limit benefiting from them to certain persons or parties. Waqf is two kinds: temporary and eternal. If it is temporary, the Waqf will be considered the ownership of the person who declared it, as long as he is alive, and his heirs after his death. The beneficiary can benefit from the assets for a specified period. When it expires, his right in them will cease, and the assets will return to the person who declared the Waqf and his heirs. A Waqf will not be considered Waqf Sehih ["full Waqf"] unless a legal certificate issued in its regard. | Translation from Faruqi's Law Dictionary, English-Arabic, Third Revised Edition |

Source: PLO, NSU

It is the Ministry of Religion which is responsible for the lease contract of waqf. Usually, a lease contract can be extended every 49 years, which is based on the Jordanian law.

**(2) Administrative Framework**

**<u>Public Sector</u>**

**(i) Ministry of National Economy (MoNE)**

MoNE plays an important role in the development of the agro-industrial park. A representative of MoNE is a chairman of the Board of Directors of PIEFZA. MoNE as the primary agency for PIEFZA, is responsible for company registration and industrial licensing for investment procedure, industrial inspection for renewal of operation license, and export certificate for shipping of exports. MoNE is also responsible for the industrial promotion and support modernization and upgrading of Palestinian industrial enterprises in order to enhance their competitiveness, especially for the SMEs.

**(ii) Ministry of Planning (MoP)**

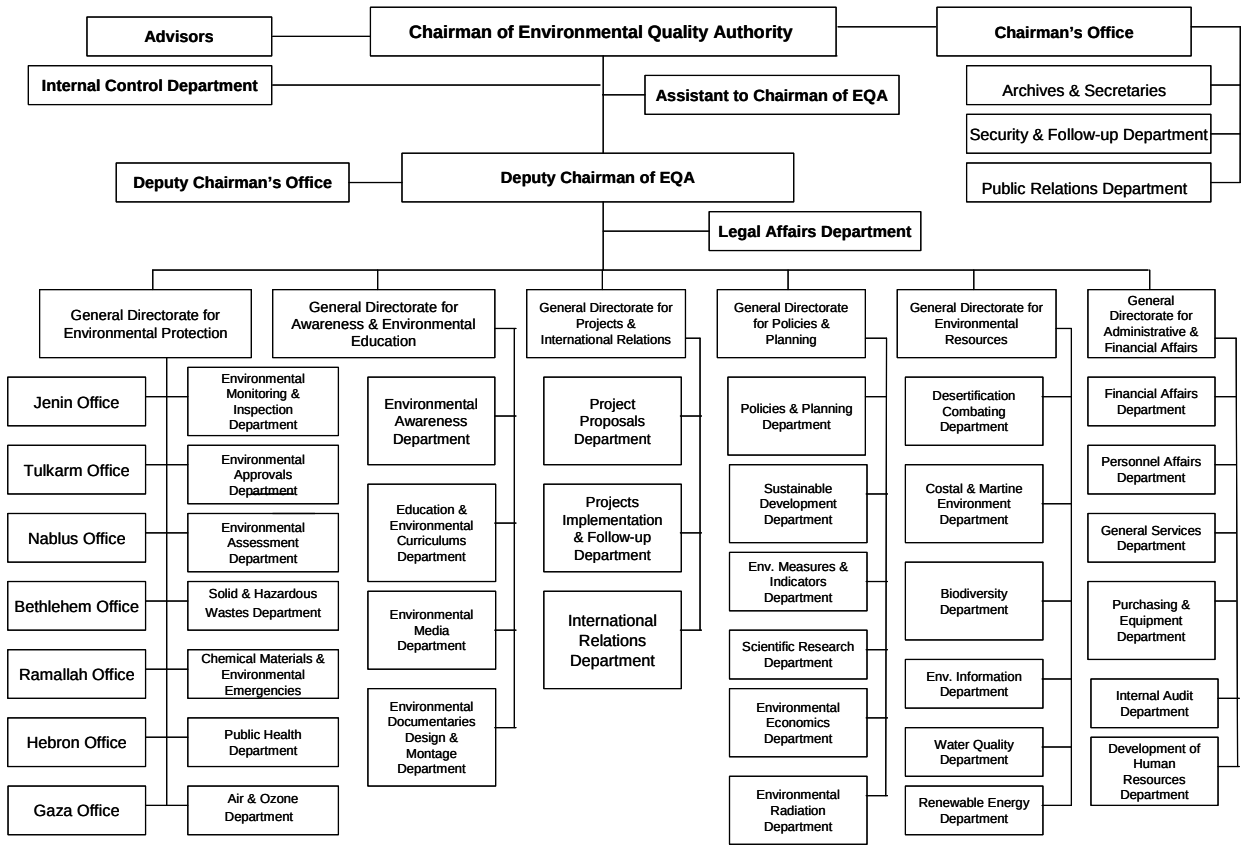
MoP has the main responsibility of leading the cross-sector planning, developing comprehensive development policies with the participation of all relevant Palestinian institutions, and coordinating and

supporting sector planning in the concerned ministries and institutions. Its goal is to ensure the consistency with the comprehensive cross-sector approaches and plans. In this context, MoP develops different plans and programs and introduces them along with their policy foundations to the cabinet for deliberation and approval. Consequently, it is referred to the legislative council for ratification.

**(iii) Environment Quality Authority (EQA)**

By Presidential Decree No. 17, The EQA was established in June 2002 as the successor body to the former MEnA during the administrative reforms. EQA's main task is to protect and manage the environmental resources, including water, soil, air, natural resources, nature and biodiversity, and prevent public health risks. These responsibilities are envisaged in the field of planning, monitoring, licensing and enforcement. The organization chart of the EQA is as shown in Figure B-3-4.

"Environment Assessment Department" under "General Directorate for Environmental Protection" is responsible for overseeing the EA process.




Source: EQA

**Figure B-3-4 Organization Chart of the Environment Quality Authority (EQA)**

### (iv) Palestinian Industrial Estates and Free Zone Authority (PIEFZA)

PIEFZA was established based on Law No. 10 (Palestinian Industrial Estates and Free Zone Law) in November 1998. PIEFZA is an autonomous agency under the MoNE. The responsibilities of the PIEFZA were described in the previous sections, (1) PIEFZA's Mandate and Experience in Industrial Park Development and 2.5 Organizational and Institutional Framework.

PIEFZA has a Board of Directors formed by 12 members, with a representative from MoNE acting as chairperson. Other members of the Board of Directors are from Finance, Planning, Local Governments, EQA and others.

PIEFZL states that PIEFZA's main role is to serve as "One-Stop Shop," where investors can obtain all necessary permits, licenses and official registrations for the establishment of their factories/companies. Present organization structure of PIEFZA is presented in the previous sections (3) Operation and maintenance and 2.5 Organizational and Institutional Framework.

## Other Involved Public Agencies

### (i) Authorities and Ministries Concerned with Environmental Issues

Although the main agency concerned related to environmental matters is EQA, other ministries and authorities are also involved in different domains as shown in Table B-3-15.

**Table B-3-15 Environmental Responsibilities for Different Authorities and Ministries**

| | | MOP | HPC | MOLG | MOH | MONE | PWA | PENRA | MOA | MOTr | MOTo |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Land Use Planning | X | X | | | | | | | | |
| 2 | Solid Waste Management | | | X | | | | | | | |
| 3 | Medical Waste Management | | | | X | | | | | | |
| 4 | Hazardous Waste Management | | | | | X | | | | | |
| 5 | Water Resources, Wastewater Management, and Sanitation | | | | | | X | | | | |
| 6 | Energy Saving and Conservation | | | | | | | X | | | |
| 7 | Use of Agrochemicals and Protection of Biodiversity | | | | | | | | X | | |
| 8 | Environmental Aspects of Traffic Infrastructure | | | | | | | | | X | |
| 9 | Protection and Management of Cultural Heritage | | | | | | | | | | X |

Source: Palestinian Environmental Strategy (EQA)

Note: MOP: Ministry of Planning, HPC: Higher Planning Council, MOLG: Ministry of Local Government, MOH: Ministry of Health, MONE: Ministry of National Economy, PWA: Palestinian Water Authority, PENRA: Palestinian Energy & Natural Resources Authority, MOA: Ministry of Agriculture, MOTr: Ministry of Transportation. MOTo: Ministry of Tourism and Antiquities

These ministries and agencies compose the Environmental Assessment Committee (EAC), whose responsibilities are described as follows.

- Ensure adequate scoping of EA studies
- Prepare and to approve TOR for EA studies

- Review EA reports
- Make recommendations for the chairman of EQA who leads EAC in making decisions.
- Assist EQA to ensure compliance of individual projects with environmentally approvable conditions.

**(ii) Ministry of Public Works and Housing (MPWH)**

MPWH is responsible for public works with the West Bank and Gaza Strip. MPWH will be involved in access road and traffic planning regarding the off-site infrastructures for the Agro-industrial Park development.

**(iii) Ministry of Agriculture (MoA)**

MoA plays an important role in managing the agricultural resources in Palestine. Its responsibilities are to ensure food security, develop isolated areas and rain-fed agricultural sectors, improve the skills of the workers in both private and public agriculture sectors, and establish cooperation with the Palestinian Water Authority (PWA) for rehabilitation of water sources, their protection from pollution and promotion of their rational and economic use for agricultural production.

MoA issues the agricultural laws, which includes following regulations:

- Regulation of water use in agriculture,
- Additional water resources related to crop requirements and soil types in cooperation with the PWA, and
- Regulation of the use of agro chemicals in cooperation with EQA.

At present, as agriculture sector improvement related to the feasibility study of the Agro-industrial Park development in JRRV, the JICA's technical cooperation project called "Agricultural Productivity and Extension System Improvement Project in JRRV" has been carried out under the responsibility of MoA. Agriculture sector improvement is an important issue for the future development of JRRV, which is to be implemented under the responsibility of MoA. Additionally, ago-industrial promotion will be a new challenge to be jointly implemented by MoNE and MoA for purposes of enhancing a high value-added market based on sufficient quality, quantity and safety of local agriculture produce.

**(iv) Palestinian Water Authority (PWA)**

PWA was established in compliance with Decree 90/1995 and Water Law No. 3. It is responsible for the regulation of the Palestinian wastewater permits including collection, discharge, treatment, sludge handling and reuse. According to the Water Control Directorate of PWA, the roles and responsibilities in the water sector in Palestine have been scattered, fragmented and unclear. In order to create a sustainable water control system, the PWA has decided to restructure the water sector separating the existing organizations into decision making, regulatory and service delivery levels, and to clarify their roles. The overall existing and future institutional framework of the water sector is as shown in Table 3-15. Based on this framework, institutional reconstruction is supposed to take effect at the following three (3) levels:

a) Cabinet of Ministers and National Water Council (Decision Making Level)
   This level is responsible for approving policies, strategies and regulations of the water sector.

b) PWA (Regulatory Level)

PWA is a regulator and supervisor of the sector of which task shall be carried out at two (2) different levels: economic and environmental.

c) Bulk Water Utilities (Service Delivery Level)

The bulk water utilities are responsible for the implementation of all PWA's national investments in infrastructures. PWA has been trying to secure the water supply in Palestine by drilling new wells, as well as the construction and maintenance of the main trunk lines to convey water among the different Palestinian communities.

d) Regional Water Utilities (Service Delivery Level)

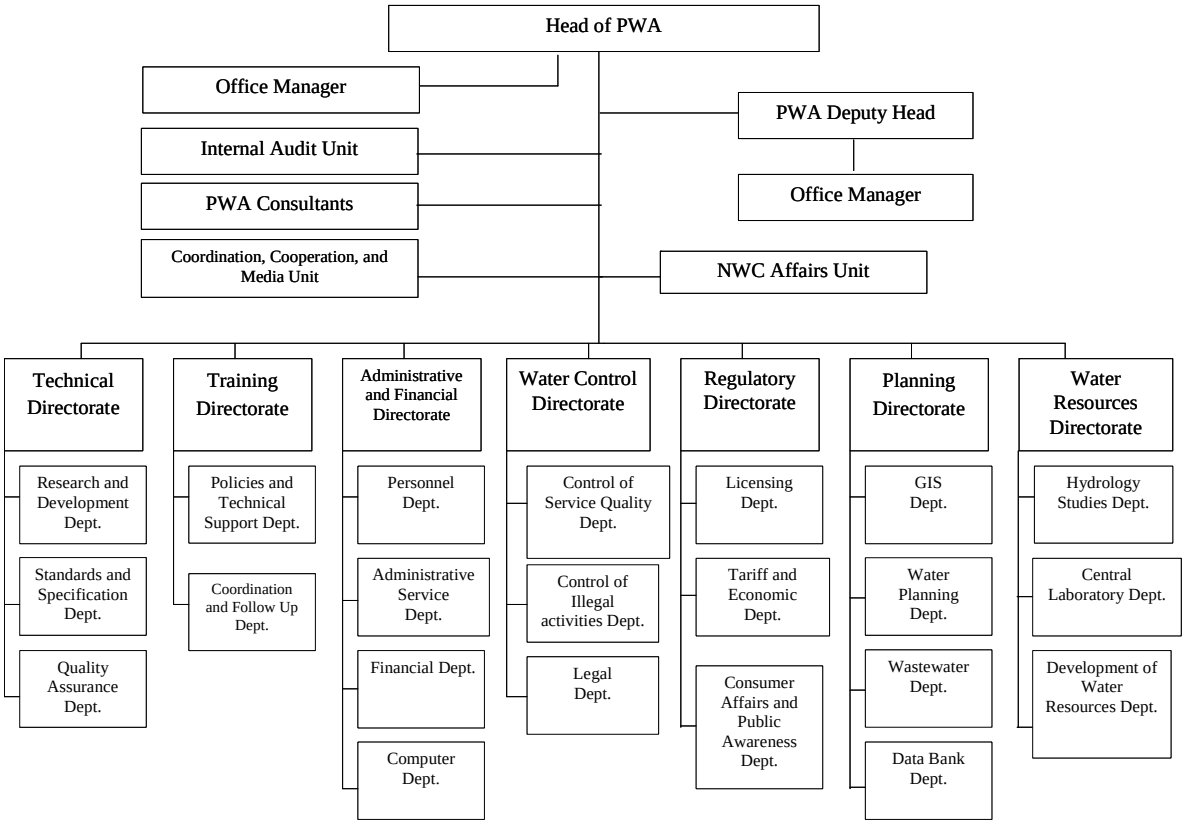
There will be four regional utilities providing the Palestinians with necessary services including water supply and waste water treatment: one is in Gaza (currently established and in operation) and the other three will be in the West Bank (North, Central, and South).

**Table B-3-16 Current & Future Institutional Framework of the Water Sector**

| | Current Framework | Future Framework | Level |
|---|---|---|---|
| 1 | Cabinet of Ministers | Cabinet of Ministers | Decision Making Level |
| 2 | National Water Council | National Water Council | |
| 3 | Palestinian Water Authority | Palestinian Water Authority | Regulatory Level |
| 4 | West Bank Water Department | Bulk Water Utilities | Service Delivery Level |
| 5 | Water & Wastewater Sub-utilities<br>Municipal Water Department<br>Village Councils Water Departments<br>Joint Services Councils | Regional Water Utilities | |
| 6 | Well Owners and Farmers Spring Users | Water Users' Associations | |

Source: "Institutional Reforms in the Water Sector and the Future Water Institutions in Palestine"

The organization chart of the PWA is as shown in Figure B-3-5. PWA is responsible for water and wastewater management at the regulatory level. The Water Control Directorate is the supreme responsible entity for overall management of water services.




Source: JICA Study Team

**Figure B-3-5 Organization Chart of the Palestinian Water Authority (PWA)**

### (v) Joint Water Committee (JWC)

a) Entity of JWC

JWC was established under Oslo II agreement Article 40 to deal with all water-related issues in the West Bank. This committee is made up of an equal number of representatives of Israel and the PNA. All decisions shall be made by consensus, including the agenda, procedures and other related matters. No mechanism has yet been established to settle disputes where a consensus cannot be attained.

b) Functions and Rules

The function of the JWC shall be to deal with all water and sewage related issues in the West Bank including the following:

- Coordinated management of water resources.
- Coordinated management of water and sewage systems.
- Protection of water resources and water and sewage systems.
- Exchange of information relating to water and sewage laws and regulations.
- Overseeing the operation of the joint supervision and enforcement mechanism.
- Resolution of water and sewage related disputes.
- Cooperation in the field of water and sewage, as detailed in this Article.
- Arrangements for water supply from one side to the other.

- Monitoring systems. The existing regulations concerning measurement and monitoring shall remain in force until the JWC decides otherwise.
- Other issues of mutual interest in the sphere of water and sewage.

**(vi) Palestinian Land Authority (PLA)**

The organization chart of the PLA is not available as of July 2007. However a simplified structure with important departments could be identified as shown in Figure B-3-6. PLA is responsible for all land related matters in Palestine. Surveying Department and State Department will be the first contact for overall land related information about Jericho City.

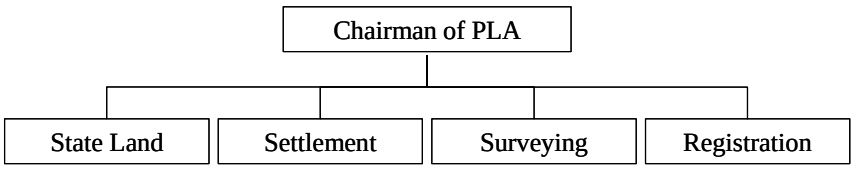



**Figure B-3-6 Organization Chart of the PLA**

**(vii) Palestinian Federation of Industries (PFI)**

PFI was established in 1999 and is responsible for enhancing effective developing the industrial sectors from the environmental view by engaging industries in the modification of technologies. PFI is expected to support in improving the Palestinian industrial sector conditions and tackling Palestinian industrial pollution through an effective environmental management system. In addition, it collects and disseminates important information such as industrial data and statistics to industrial associations, companies, government and international organizations.

**(viii) Palestinian Investment Promotion Agency (PIPA)**

PIPA was established in1998 as an autonomous agency of the PNA under the Investment Promotion Law. PIPA has a mission to create and maintain a competitive investment environment by providing high-quality services and incentives to foreign and domestic investors, and facilitate cooperation between the private sector and government.

**(ix) Palestinian Trade Center (PalTrade)**

PalTrade is a national trade development organization dedicated to improving Palestinian competitiveness by providing sector-based services to the business communities. The Business Development Service (BDS) is expected to be established in the Agro-industrial Park in order to support tenant companies and promote further investment in the park. It plays an important role in the Palestine BDS market. PalTrade provides BDS to its members such as promotion, marketing, e-marketing, web page design and other related services.

**(x) Municipality of Jericho**

The Municipality of Jericho is responsible for the provision of public and social services for Jericho City. The municipality will be involved in supporting the off-site infrastructure development such as water

supply, wastewater treatment and access roads for the Agro-industrial Park development in JRRV. Said development is expected to create employment inside and outside the park. The municipality will be requested to provide various services including housing, schools and community facilities for commuting workers and those residing in Jericho City.

**(xi) Joint Councils for Services, Planning and Development (JCspd)**

JCspd was created by Ministry of Local Government (MoLG) through by-law in 1998 and Basic Regulations of JCspd No. 1 of 2006 for the Local Authorities Law of 1997. JCspds are expected to be engaged in planning from a region-wide perspective and provide public services that are commonly needed by participating LGUs. The LGUs are categorized into municipalities (with a population of 5,000 or more), village councils and project committees. There exist nine JCspds in JRRV area in 2007, of which six are located in Jericho Governorate.

JCspds for solid waste management in Jericho and JRRV was established in 2006, and consist of 17 local governments, which is responsible for collection, transportation, treatment and disposal of solid waste in said areas. Development of landfill site, procurement of equipment and capacity development have been supported through JICA technical cooperation project. Collection and transportation of solid waste for the Agro-industrial Park will be undertaken by JCspds for solid waste management in Jericho and JRRV.

**Private Sector**

**(i) Jerusalem District Electric Company (JDECO)**

JEDCO is a private electric company for providing service of generating and distributing electrical power to Jerusalem and West Bank. Currently, JEDCO is only distributing electricity without power generation facilities. The present power supply in Jericho is 45 MVA in total, which consists of 20 MVA from Jordan power system through two underground circuits of 33kV, 15 MVA from Jerusalem through a JDECO-owned 33kV line, and 10MVA also from Jerusalem through an Israeli-owned 33kV lines. The JDECO power system in Jericho largely depends on Jordan power system. The power intended for the Agro-industrial Park on Jericho will be supplied by JDECO through 33 kV line from a new switching station located 4 km from the park.

**(ii) PALTEL**

PALTEL is a private telecommunication company, which is also the national telecommunication provider in Palestine. The required number of telecommunication lines will be provided by PALTEL. Necessary connection line from the area station of PALTEL to the on site station and each factory/building for the Agro-industrial Park will be installed by PALTEL.

## B.4 Analysis of Alternative Plans

This chapter deals with analysis of alternative plans, starting from the justification of the Agro-industrial Park by comparing social and environmental impacts of "with project" and "without project", then analysis of alternative plans by infrastructural component planned for off-site and on-site development. In the analysis, the best or better alternative is chosen and recommended as the appropriate mitigation measures for the anticipated impacts caused by the Agro-industrial Park development.

The analysis of alternative plans includes the following:

- Project alternatives (including zero option)
- The site selection for the Agro-industrial Park development in JRRV
- The alternatives of on-site and off-site infrastructure (Roads/access roads, water supply, wastewater treatment and solid waste management)

**(1) Project Alternatives**

**Zero option (without the Agro-industrial Park development)**

The present JRRV is assessed as low in value-added due to relatively low production in agriculture. There exist only a few companies dealing with fresh fruits and vegetables in the JRRV. The manufacturers in the food processing sector are mostly small and medium-sized enterprises and their products are mainly for domestic market. Without the Agro-industrial Park development, the PNA would make independent approach to "improvement in agriculture" and "enhancement of export competitiveness of Palestinian enterprises". Such an independent approach sometimes fails to place an emphasis on industrial linkage between agriculture and food processing industries. The "zero option" would thus not lead to enhancement of export competitiveness supported by a stable supply of high quality of raw materials. In case of without the project, it is expected that various factories will be planned and established separately in the industrial zone in the JRRV in the future. Treatment and management of wastewater and solid waste will be conducted by each factory. This kind of wastewater and solid waste management will cause negative impacts to surrounding areas.

**With Project (with the Agro-industrial Park development)**

The Agro-industrial Park was planned as the collective base for production and distribution of high value-added fresh vegetables and fruits and processed foods in the JRRV. It is expected to contribute to i) strengthening of linkage between agriculture and food processing industry, ii) regional economic development and employment creation in the JRRV and iii) export facilitation. It would also trigger off smooth movement of goods and people to and from the Agro-industrial Park since it is regarded as a symbolic project based on the initiative "*Corridor for Peace and Prosperity*". In case of implementing the project, factory and infrastructure facilities such as wastewater and solid waste treatment facilities will be developed in the Agro-industrial Park area in the proper manner. It involves a common management of wastewater and solid waste in the park area with less impact to surrounding areas, which is less

complicated as compared to a separate system for each factory. Thus the Agro-industrial Park development is assessed as the best project alternative.

**(2) Alternatives for Site Selection**

**Comparison of Alternative Sites**

During the Phase 1 (Pre-feasibility study: March 2007-August 2007), eight candidate sites were identified for the Agro-industrial park development within and outside of Jericho City. Out of them, the four sites were selected when JICA conducted the Project Formulation Mission in 2006, as a preparatory work for this Study, while another four sites have been additionally identified after the commencement of the Study, through official coordination meetings among the stakeholders concerned. Those identified sites were evaluated based on the criteria on physical conditions such as land ownership, road access, and site condition and land availability.

The following photographs show the locations of the alternative sites.

**Photo: Satellite Image of Alternative Site (No.1)**

**Photo: Satellite Image of Alternative Site (No.2, No.3)**

**Photo: Satellite Image of Alternative Sites (No.4, No.5, No.7, No.8)**

**Photo: Satellite Image of Alternative Site (No.6)**

Source: JICA Study Team


**Figure B-4-1 Location of Alternative Sites**

Physical conditions in and around the alternative sites including advantages/disadvantages are summarized in Table B-4-1.

**Table B-4-1 Physical Condition and Advantages/Disadvantages of Alternative Sites (No.1-No.4) (1/2)**

| Site Name / Comparison Items | | No. 1<br>Tubas | No. 2<br>E- Jericho | No. 3<br>E- Jericho | No. 4<br>SE- Jericho |
|---|---|---|---|---|---|
| **Physical Condition** | | | | | |
| Estimated Area | | 68 ha | 57 ha | 50 ha | 200 ~ 300 ha |
| Land Jurisdiction | | A | A (14ha), C (43ha) | C | C |
| Land Ownership | | Government | Arab Dev. Society (positive for development) | Arab Dev. Society (positive for development) | *Waqf* land, Managed by Min.of Religion |
| Road Access | | - Needs road improvement<br>- 30 km from Damiya Bridge<br>- 80 km from Allenby Bridge | - 3 km from Allenby Bridge<br>- 40 km from Damiya Bridge<br>- Close to R-90 | - 3 km from Allenby Bridge<br>- 40 km from Damiya Bridge<br>- Directly facing R-90 | - 10 km from Allenby Bridge<br>- 45 km from Damiya Bridge<br>- Close to R-90 |
| Condition of other off-site infra. | Water Supply | Ground water (250$m^3$/hr.) | Drill a new well, or allocation of agricultural water | Drill a new well, or allocation of agricultural water | Drill a new well, or allocation of agricultural water |
| | Power Supply | Available by transmission | Distribution line of 11 kV (JEDCO) available | Distribution line of 11 kV (JEDCO) available | Distribution line of 33 kV (JEDCO), up to the iron factory |
| Site Condition | Geography | - Hilly land<br>- Stony soil | - Flat land<br>- Already graded | - Flat land<br>- Already graded | - Almost flat land<br>- *Wadi* in North edge and South edge |
| | Current Land Use | Unused | Partially used for agriculture | Unused | Unused |
| Land Availability | | Designated for agro-industrial park, and ready for immediate development | Part of the area A is ready for development<br>Procedure for the area C development | Procedure for the area C development | Procedure for the area C development |
| **Advantages/Disadvantages** | | | | | |
| Advantages | | Ready for development | In front of the gate for Allenby Bridge. | Near the gate for Allenby Bridge. | Scalability in development |
| Disadvantages | | Hamrah check point | Less scalability | Less scalability<br>Needs setback (500m) from R-90 | Land lease only (49 yr. by law)<br>Needs setback (500m) from R-90 |

Source: Feasibility Study on Agro-industrial Park Development in the Jordan River Rift Valley (Phase I) Main Report September 2007

**Table B-4-1 Physical Condition and Advantages/Disadvantages of Alternative Sites (No.5-No.8) (2/2)**

| Site Name / Comparison Items | | **No. 5** SE- Jericho | **No. 6** S- Jericho | **No. 7** SE- Jericho | **No. 8** S- Jericho |
|---|---|---|---|---|---|
| **Physical Condition** | | | | | |
| Estimated Area | | about 200ha | about 900 ha | 150 ha | about 200ha |
| Land Jurisdiction | | A | A | C | A and C |
| Land Ownership | | Private and Public | Private Land (Al Hussein family) | *Waqf* land, Managed by Min.of Religion | Private (A) and *Waqf* (C) |
| Road Access | | - Needs road improvement<br>- 10 km from Allenby Bridge<br>- 45 km from Damiya Bridge | - Needs access road<br>- 12 km from Allenby Bridge<br>- 45 km from Damiya Bridge | - 10 km from Allenby Bridge<br>- 45 km from Damiya Bridge<br>- Close to R-90 | - Needs road improvement<br>- 10 km from Allenby Bridge<br>- 45 km from Damiya Bridge |
| Condition of other off-site infra. | Water Supply | Drill a new well, or allocation of agricultural water | Allocation of agricultural water | Allocation of agricultural water | Allocation of agricultural water |
| | Power Supply | Distribution line of 33 kV (JEDCO), up to the iron factory | Distribution line of 33 kV (JEDCO) | Distribution line of 33 kV (JEDCO), up to the steel factory | Distribution line of 33 kV (JEDCO), up to the steel factory |
| Site Condition | Geography | - Flat land | - Flat land<br>- *Wadi* is flowing in the middle | - Almost flat land<br>- *Wadi* in the South part of the land | - Flat land |
| | Current Land Use | - Agricultural use<br>- Including construction site for the community center in the central part of the land | - Agricultural use in the north<br>- Vacant land in the south | Unused | - Agricultural use<br>- Including construction site for the community center in the central part of the land |
| Land Availability | | Needs conversion of land use (agricultural use) before starting development | The southern part of the land is ready for development | Procedure for the area C development<br>Limited land area due to the shape of land and *Wadi* | Needs conversion of land use (agricultural use) before starting development |
| **Advantages/Disadvantages** | | | | | |
| Advantages | | --- | Scalability in development.<br>Large part of the land is designated for industrial development by MoP (1997). | --- | --- |
| Disadvantages | | Land acquisition<br>Limited available land | *Wadi* running thru.<br>Land acquisition.<br>Needs access road in the area C. | Land lease only (49 yr. by law)<br>Needs setback (500m) from R-90 | Land acquisition<br>Limited available land |

Source: Feasibility Study on Agro-industrial Park Development in the Jordan River Rift Valley (Phase I) Main Report September 2007

Based on the summarized information above, the five assessment criteria were chosen, namely, i) accessibility, ii) scalability, iii) land availability, iv) readiness of infrastructure and v) partnership promotion.

*Accessibility* can be assessed positive if the distance from/to arterial roads or international gateways such as Allenby Bridge and Damiya Bridge is short.

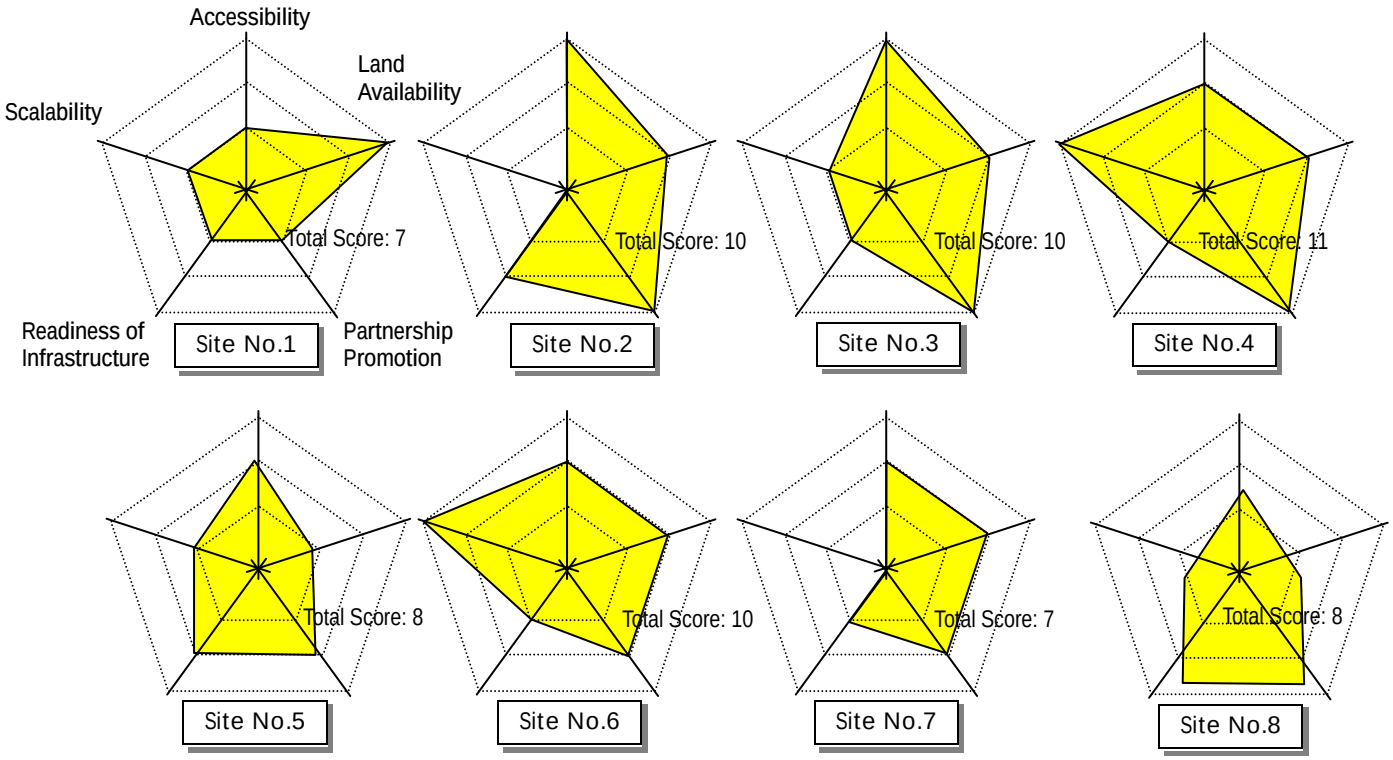
*Scalability* is represented by the size of the land available for development. It can simply be understood that 100 ha of land is better than 10 ha in terms of scalability of development.

*Land availability* is defined by a composition of several factors, i.e. land ownership, land jurisdiction, geographical condition, current land use, etc. For instance, an unused flat land in the area A with one owner is preferable than another agricultural land with various owners, in order to hasten commencement of development.

*Readiness of Infrastructure* is determined based on the availability of the off-site infrastructures (access road, electricity, water, etc.).

*Partnership promotion* is an additional criterion which the JST takes into consideration with the context "Corridor for Peace and Prosperity". If the location is close to the borders, this criterion would be assessed positive (strategic) as stated.

Figure B-4-2 shows the results of assessment (rating) on each alternative site.




Source: Feasibility Study on Agro-industrial Park Development in the Jordan River Rift Valley (Phase I) Main Report September 2007

**Figure B-4-2 Technical Assessment on the Alternative Sites**

The result of the rating can be briefly described according to site, as follows:

Site No.1 governs in Land Availability as the land is fully owned by the government and has already been designated for an industrial park use. However, other criteria are rated as inferior compared to those of other alternative sites.

Site No.2 is superior in Accessibility and Partnership Promotion because its location is very close to the gate for Allenby Bridge and to the Route 90. Meanwhile scalability is limited and availability of the land is rather complicated as a mixture of the area A (14 ha) and C (43 ha). Supposing that this site is selected for the industrial park development, the part in the area A that could be developed is too small. Moreover, the remaining part in the area C seems to take long years for development, since it requires necessary special coordination with Israel.

Site No.3, closely located to the No.2, is also superior in Accessibility and Strategic Characteristics. However, its readiness of infrastructure is poorer than the latter as it is located outside Route 90. Land availability maybe its disadvantage, making an early development very difficult since it is in the jurisdiction of area C.

Site No.4 and Site No.5 have similar characteristics in location. The only difference is in land availability, though the rating is at same level. In particular terms, Site No.4 is unused and situated fully in area C, while Site No.5 is currently used for agriculture and situated in area A. Both lands are not easy for an early development in a short term, same as Site No.3.

Site No.6 is superior in scalability and fairy good in other criteria, except for readiness of infrastructure. As the entire land area is in area A, there seems no difficulty or constraint for a quick start of the development, while enough attention should be paid to the environment aspect, *Wadi* related issue in particular, in designating land use demarcation. Since a part of this site has been delineated for an industrial development use when MoP prepared the latest spatial development plan of Palestine in 1997, this site has an official rationale for the industrial area development.

Site No.7 is poor in scalability among others. After setback from the Route 90, in accordance with the Israeli military and security code, only small land area would remain.

Site No.8 is almost similar to the case of Site No.5.

Based on the above result, Site No.4 turns out to be the most suitable, by Site No.2, Site No.3 and Site No.6. However, Site No.2, Site No.3 and Site No.4 are considered difficult in commencing early development since almost all the lands belong to area C, which is fully controlled by Israeli authority. Meanwhile Site No.6 could include a large area of Area A.

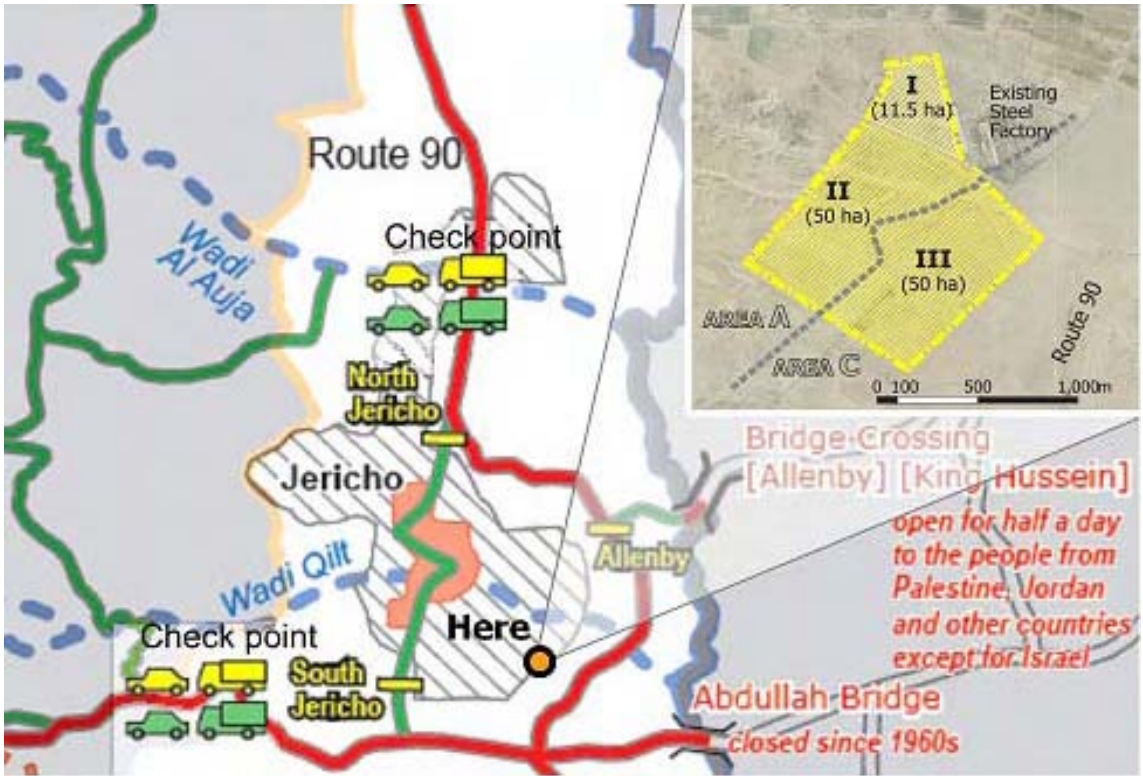
Therefore, as a tentative conclusion, it is recommended to designate a certain delineation of land (50 ~ 100 ha) in Site No.6 as the most feasible project site.

**Selected Site**

Two months after the completion of the Phase 1 Study, the most likely candidate site for the Agro-industrial Park Development in JRRV was identified and agreed among the stakeholders in the Second Technical Level Meeting in October 2007.

The selected candidate site partially belongs to the southern part of Site No. 7 and the eastern part of Site No. 6. The location of the site is right next to the existing steel factory in the southern fringe of Jericho City, which is part of area reserved for future development in the Jericho City Plan. The site is situated in the east, near Route 90, connecting to Route 1 in the south direction and to Allenby Bridge checkpoint in the north direction. The site for the Agro-industrial Park development consists of three land parcels with a total of 111.5 ha.

In terms of evaluating environmental aspect, the select site has less negative impact to the surrounding areas because it is relatively far form the residential and commercial areas as compared with other sites.




Source: JICA Study Team

**Figure B-4-3 Location of the Project Site for the Agro-industrial Park Development in JRRV**

**(3) Alternatives for Phased Development**

The selected candidate site is divided into three parcels. Lots I and II combined together makes a total area of 61.5 ha. A combined development of said lots would have no legal problem on the authorization of

development as it is under Palestinian jurisdiction. Meanwhile the remaining 50 ha in area (C) needs authorization from the Israeli authorities.

**Table B-4-2 Profile of Land Parcels**

| Lot No. | Area | Jurisdiction | Ownership |
|---|---|---|---|
| I | 11.5 ha | Area A | State-owned Land (PNA) |
| II | approx. 50.0 ha | Area A | Privately-owned Land (Al Hussein Family) |
| III | approx. 50.0 ha | Area C | Privately-owned Land (Al Hussein Family) |
| Total | 111.5 ha | | |

Note: Based on the information from Ministry of National Planning. Lot name I, II and III are tentative ones.

Lots I and II might be simultaneously developed when and if the sufficient investment demand is available. The simultaneous development of these lots would reduce the construction period and environmental and social impacts to surrounding areas rather than a stage-wise development.

**(4) Alternatives for Roads/Access Roads**

**Stage I**

Since Stage I is expected to generate a small number of inbound and outbound traffic to and from the Agro-industrial Park, the engineering study proposed improvement of the existing roads as shown in the Figure B-4-4.

**1) The Existing Road 1**

Road leading to the new residential area near the Jericho Regional Hospital in the westward direction, along the existing unpaved road beyond the boundary of the Agro-industrial Park.

**2) The Existing Road 2**

Road between road junction on the existing road 1 to the center of Jericho City in the northwest direction, and the new vegetable and fruit market.

According to the Jericho Municipality, both the existing Roads 1 and 2 have been approved in the master plan of the road improvement plan for the Jericho Municipality. The maximum road width is decided to be 20 m for all sections. The dimensions, such as the width of the existing road 1, would be studied with Jericho Municipality considering future road improvement of the access roads for the stages II and III.


Source: JICA Study Team

**Figure B-4-4 Road Improvement for Stage I**

The New Vegetable and Fruit Market

There exists an old vegetable market at the center of Jericho Municipality. Operation of this old market causes traffic problems as the farmers' vehicle queue on the main street while waiting for their turn to enter the market area. According to the master plan report for the New Vegetable and Fruit Market, a maximum of 45 farmers' vehicles lines up along the Jerusalem road from 7:30 A.M. to 9:15 A.M. Therefore, all functions of the old market will need to be shifted to the new one.

The Road Improvement Project

The width of the existing road between the center of the Jericho Municipality and the site of the New Vegetable and Fruit Market had been about 5 m. In order to have a smooth access to the new market, the improvement of the road section (1.8 km long and 14 m wide) from said market to the center of Jericho started from July 2008 and was completed in early 2009.

The New Residential Complex Development Project

There is a new residential complex development project near the Agro-industrial Park. The project area is adjacent to the existing road 1 and 2, and close to the new vegetable market in Jericho. Land for the project is owned by the Palestinian Agricultural Relief Committees (PARC) of Jericho. According to the PARC, the

land was sold to 70 private owners from outside of Jericho area. The expected total number of residential units is 70-100 with an average residential population of 470 for the whole complex. Types of resident units are cottage houses or vacation-style houses. This residential complex will be directly affected during improvement work for the existing roads 1 and 2. Anticipated impacts to the residential area along the existing roads 1 and 2 during the construction work period will be due to dust, fumes, noise and vibration from construction vehicles.

Alternative for road improvement during Stage 1 would be the choice between existing Road 1 and Existing Road 2. Anticipated environmental and social impacts by alternative are compared as shown below.

**Table B-4-3 Comparison of Environmental and Social Impacts by Alternative**

| Item | Possible impacts | | |
|---|---|---|---|
| | Existing Road 1 | Existing Road 2 | Existing Road 1 or 2 |
| Transportation efficiency | ・Possible heavy traffic congestion by the south Jericho checkpoint in busy seasons such as tourist peak season.<br>・Possible traffic congestion mixed the general traffic from the surrounding area.<br>・Contribution to improvement of inner city road network | ・Causing traffic congestion at the new market area.<br>・Possible traffic congestion mixed the general traffic from surrounding area.<br>・Smooth access from the city center to the new market and the agro-industrial park. | ・More heavy traffic congestions due to traffic concentration on either existing Road 1 or 2.<br>・Continuous traffic congestion mixed with the general traffic.<br>・Deteriorating the internal city road network. |
| Environmental Impact | ・Dust, fume, noise and vibration to the surrounding area, especially to Jericho Regional Hospital and JDECO residential complex and new residential complex induced by construction vehicle.<br>・Bridge construction on *Wadi.* | ・Dust, fume, noise and vibration to the surrounding area, especially to new residential complex induced by construction vehicle. | ・More serious negative impacts due to dust, fume, noise and vibration by construction vehicle. |
| Social Impact | ・Land acquisition from private farmers.<br>・Bedouin community settlement near the access road.<br>・Increasing land price along the load.<br>・Large construction and land acquisition cost. (Estimated total cost 38.9 million NIS) | ・Land acquisition from private landowners. | ・Increasing risk of traffic accident. |

Source: JICA Study Team

Based on the above comparison of impacts by alternative, a combination of the existing roads 1 and 2 would be environmentally recommendable than separate improvement work for said roads.

**Access Roads for Stage II and III**

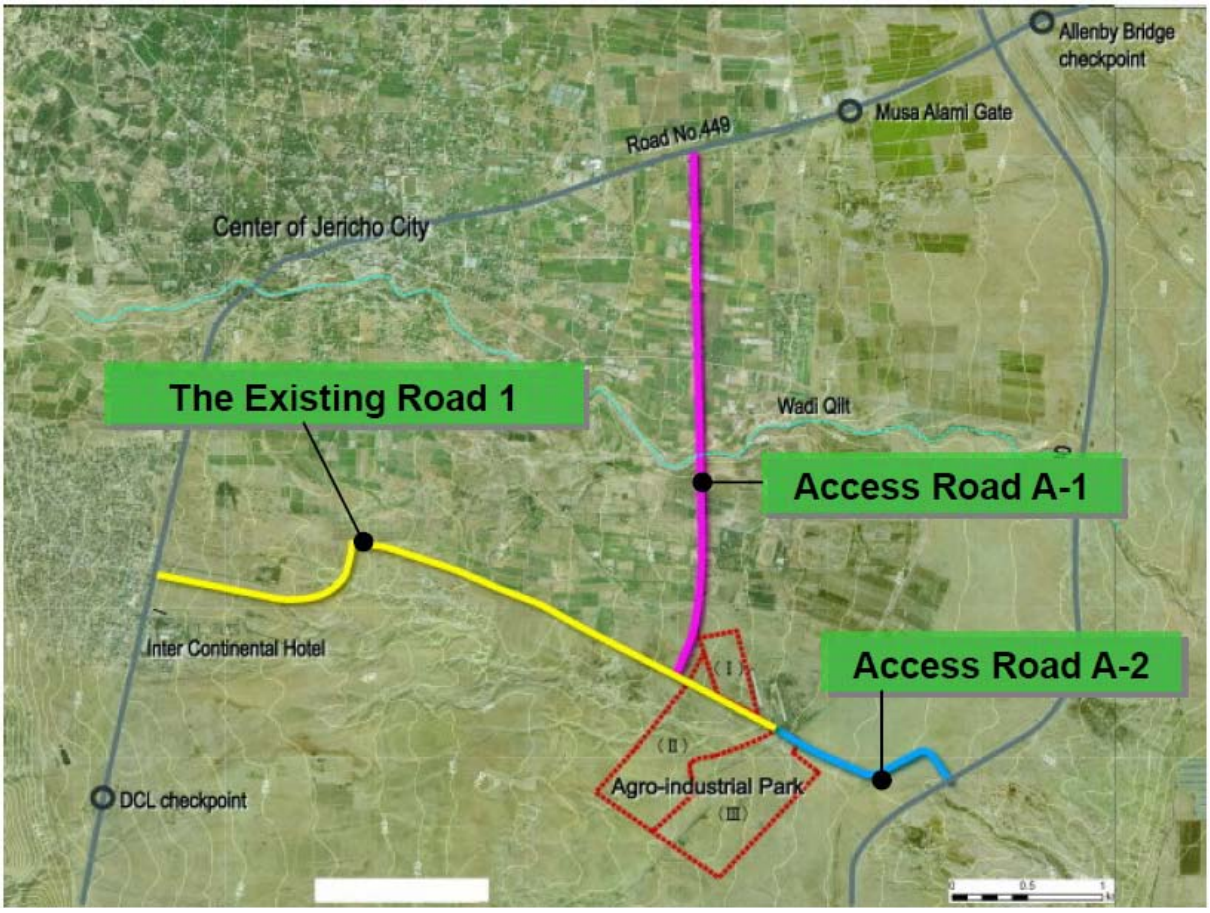
Two alternatives of access roads for outbound transportation during stages II and III were considered in the Study Part 1. Two alternatives consist of access roads A-1 and A-2, which are shown in Figure B-4-5.

1) Access Road A-1

   New road to be constructed heading north of the Agro-industrial Park to Route 449.

2) Access Road A-2

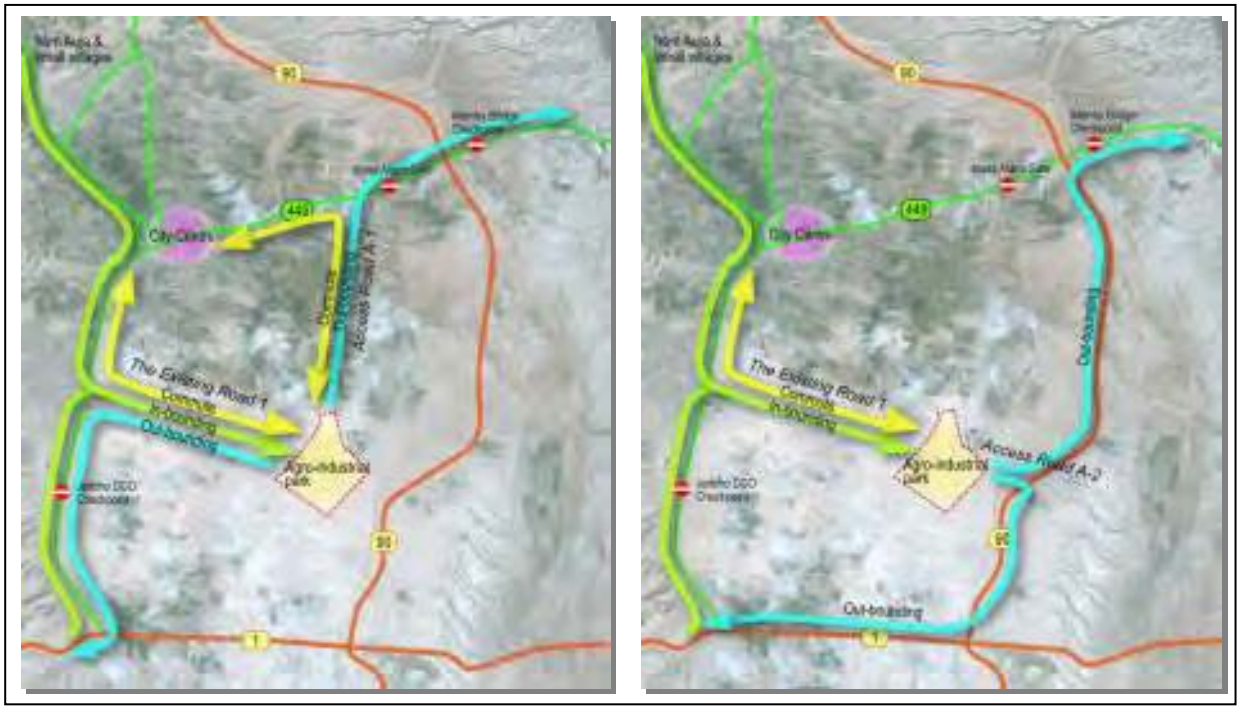
   New road to be constructed heading east of the Agro-industrial Park along the existing old road, connecting to the existing Route 90.




Source: JICA Study Team

**Figure B-4-5 Alternative Access Road to the Agro-industrial Park**

Prospective traffic movements surrounding the Agro-industrial Park are illustrated in Figure B-4-6. Access roads, A-1 and A-2 would be categorized as cargo access roads, intended mainly for the smooth outbound transportation of goods from the Agro-industrial Park to the Allenby Bridge. During stage II, the existing Road 1 would be further improved to a width of 20m.



Source: JICA Study Team

**Figure B-4-6 Traffic Movements surrounding the Agro-industrial Park**

Access roads A-1 and A-2 are compared in terms of transportation efficiency, environmental, social and financial concerns as shown in Table B-4-4.

**Table B-4-4 Comparison between Access Road A-1 and A-2**

| Item | Access Road A-1 | Access Road A-2 |
|---|---|---|
| Length | 3.5 km | 1.3 km |
| Status in Jericho Municipality Plans | It does not suit the existing urban development plan. | It had been approved in the master plan for road development. |
| Transportation Efficiency | It may cause traffic congestion with general traffic from the surrounding urban area. | It has an advantage in transportation time and smoothness of traffic. |
| Social Environmental Concern | It may traverse existing community, and cause serious negative impacts such as noise, vibration and risk of traffic accident to the surrounding area.<br>Bridge construction is required on *Wadi* Qilt River.<br>Potential problem of land acquisition from private farmers.<br>Agriculture and green areas exist along and near the existing route.<br>Recreational facilities exist such as sports club and horse riding located at a section between *Wadi* Qilt River and the site of the Agro-industrial Park.<br>It may require a long period for land acquisition and construction works to be completed. | It will not cause considerable negative impacts since it will be located in a vacant land.<br>Access road is located in area C under the control of the Israeli authority. Improvement of the existing road requires administrative procedure to obtain approval from the Israeli authority. |
| Financial Concern | Construction cost is approximately 9.2 million USD | Construction cost is approximately 2.7 million USD |

Source: JICA Study Team

Based on the result of above comparison, access road A-2 is considered to be more appropriate than access road A-1.

**(5) Alternatives for Water Supply**

**Water Demand**

Water would be consumed in factories, office buildings and distribution facilities inside the Agro-industrial Park. Water demand is estimated based on water consumption per employee.

**Table B -4-5 Water Demand for Agro-industrial Park**

Unit: MCM/year

| | Stage I | Stage II | Sub total | Stage III | Total |
|---|---|---|---|---|---|
| Factory | 0.08 | 0.30 | 0.38 | 0.46 | 0.84 |
| Office building and BDS center | 0.01 | 0.01 | 0.02 | 0.01 | 0.03 |
| Distribution facilities | 0.01 | 0.04 | 0.05 | 0.05 | 0.10 |
| Total | 0.10 | 0.35 | 0.45 | 0.52 | 0.97 |
| Value for plan | 0.1 | 0.4 | 0.5 | 0.5 | 1.0 |

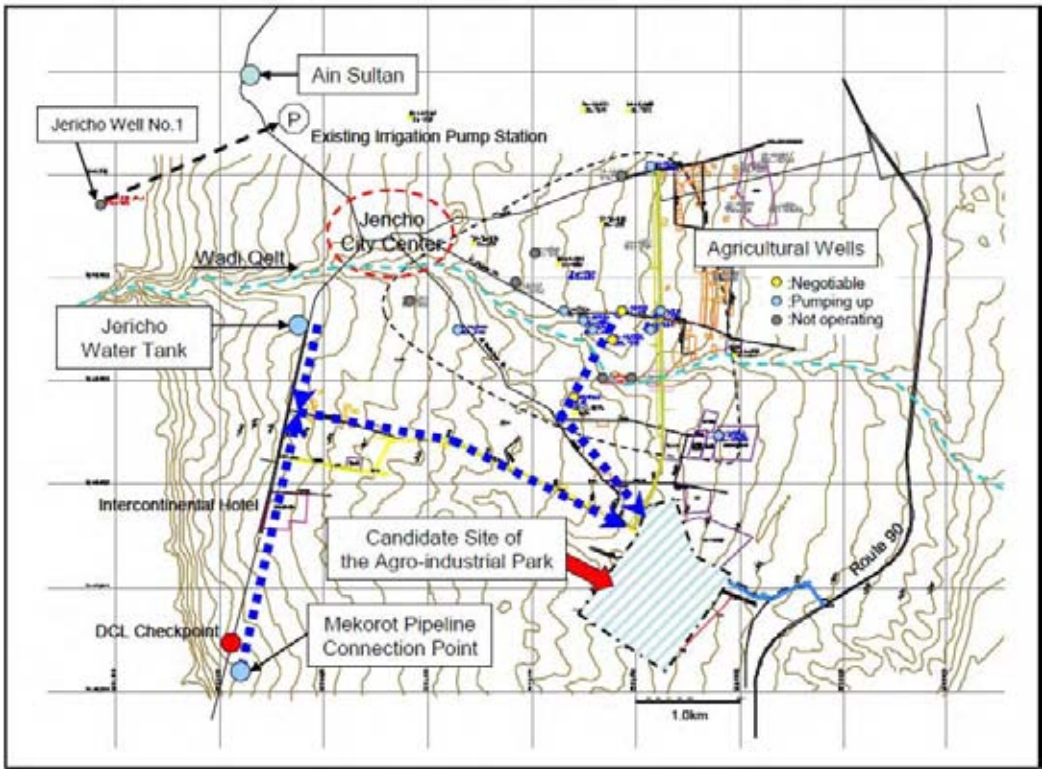
Source: JICA Study Team

Water quality required for food processing and production shall be equivalent to that of drinkable water, as specified in “Second Modified Draft of Drinking Water Quality Guidelines” which was published by PSI in December 2004 as the latest guideline for drinking water quality.

**Identified Alternatives for Water Supply**

Taking into account the water demand by stage and availability of water supply sources in a timeframe, the engineering study identified the following water sources as alternatives for water supply system for the Agro-industrial Park. These are shown in Figure B-4-7.

(1) Existing agricultural wells surrounding the Agro-industrial Park
(2) Water supply system of the Jericho Municipality
(3) Water supply system of Israel (Mekorot)




Source: JICA Study Team

**Figure B-4-7 Locations of Alternative Water Source for the Agro-industrial Park**

**Present Condition of Alternatives for Water Supply**

a) Alternative 1: Existing Agricultural Wells

Seventeen wells were located between Jericho city center and the candidate site. Six wells are identified to be dried up (not operational). Out of the eleven pumping wells, water quality of seven wells is brackish water, while the remaining four is utilized for drinkable water. Among these existing wells, three owners (well numbers 19-13/026A, 19-13/050A, and 19-13/052) have expressed willingness in negotiating the water supply to the park, from their wells. These wells are located between city center and the planned Agro-industrial Park, with distances of approximately 2.1 km, 3.0 km, and 3.3 km from the Agro-industrial Park, respectively.

Other well owners refused to share their water supply since quantity extracted from their wells decreases each year, and does not even meet their own demands, mainly for agriculture.

b) Alternative 2: Water Supply System of Jericho Municipality

At present, Jericho Municipality has two water supply systems for domestic and agricultural water use. Major water source for both systems is “Ain-Sultan Spring” which is located northwest of the city center. The spring water has a quantity of some 650 $m^3$/hour constantly, and of drinkable quality, and utilized to supply 42% for domestic use and 58% for agricultural use.

Another water source is Jericho Well No.1 located at the western side of Jericho City, which was constructed by Israel in 1973 and had been controlled by Mekorot. The license of this well was transferred from Israel to the PNA in 2000. Since then the well has no pumping facilities and is no longer operational.

**Photo: Jericho Well No.1 (as of June 2008)**

PWA intends to rehabilitate this well. It is seeking for financial assistance for the re-installation of its well pump as an urgent project. The brackish water from said well is planned to be mixed with pure water from Ain-Sultan at the existing irrigation pump station, which will be used for agriculture after achieving an acceptable salinity. Furthermore, preparation for the construction of pipeline from Jericho Well No.1 to the existing irrigation pumping station would be carried out under Jericho Municipality budget.

Through the rehabilitation work, it is expected that water quantity for domestic use from Ain-Sultan will increase, which will also sufficiently meet the required amount of water supply for the Agro-industrial Park in stage I.

Taking into account the above situation, Jericho Municipality confirmed that it is possible for them to supply water for the stage I of the park with a quantity of 280 $m^3$/day, priced at 3.0 NIS/$m^3$, provided that the water from concerned well becomes operational after being rehabilitated, and that construction of pipeline up to the existing irrigation pump station near Ain-Sultan Spring is implemented.

The water supply for the stages II and III seems to be difficult considering the forecasted water demand for the Agro-industrial Park and the increasing water demand in Jericho city.

c) Alternative 3: Water Supply System of Israel (Mekorot Water)

Water supply system of Israel is managed by Mekorot Water Company Ltd. which is a government-owned firm. It supplies drinkable water of approximately 50 million $m^3$/year for the West Bank in Palestine.

According to Israeli Water Authority (IWA), they are willing to supply drinkable water for stage I of the Agro-industrial Park, with a quantity of 280 $m^3$/day (15 $m^3$/hour: Max). Water unit price was not clarified. However domestic price was reported to be 3.8 NIS/$m^3$ in Israel.[11]

**Photo: Connection Point of Mekorot Pipeline (as of July 2008)**

[11] IWA strongly recommended to promote construction of wastewater treatment plant and recycle water use system, since a

The connection point of the Mekorot pipeline for water supply to the Agro-industrial Park is located near the DCL checkpoint, at the entrance of Jericho City. Distance between the connection point and the candidate site is approximately 5.8 km.

**Water Quality and Quantity of Water Supply Alternatives**

A water quantity and quality analysis was conducted for selected wells in Jericho area from July to August, 2008 during the Study, to identify water supply alternatives for the Agro-industrial Park. Surveyed four wells and the results of analysis are presented in the tables B-4-6 and B-4-7 respectively.

**Table B-4-6 Selected Water Wells in Jericho Area for Survey**

| No. | Alternative | Code | Point name | Aquifer |
|---|---|---|---|---|
| 1 | Alternative 1 | 19-13/026A | Ismail Deaq | Quaternary Deposits |
| 2 | Alternative 1 | 19-13/050A | Hassan Handoun | Quaternary Deposits |
| 3 | Alternative 1 | 19-13/052 | Zuhdi Hashwah | Quaternary Deposits |
| 4 | - | 19-14/101 | Jericho well no.1 | Lower Cenomanian |

Source: Water Quality and Quantity Survey for the Agro-industrial Park Development in the Jordan River Rift Valley, October 2008

lot of water is being wasted after once usage in Jordan Valley.

**Table B-4-7 Summary of Water Quantity and Quality Data for the Selected Wells in the Jericho area**

| No. | Code | Point Name | Pumping Data | Water Quality Data |
|---|---|---|---|---|
| 1 | 19-13/026A | Ismail Deaq | • The dynamic water level comes near the pump turbine with 76$m^3$/hr,<br>• It's recommended to reduce abstraction to 65$m^3$/hr to allow the dynamic water level over the pump turbine settings. | • TDS and EC are higher than the recommended values for drinking water.<br>• Well water is classified as very hard water.<br>• Acceptable concentrations of the analyzed trace metals.<br>• Water samples are contaminated by total Coliform but free from Feacal contamination. This indicated that the well water is not suitable for drinking unless treatment is applied.<br>• Organic matter considered to be very low. |
| 2 | 19-13/050A | Hassan Handoun | • The dynamic water level comes near the pump turbine with 42m3/hr.<br>• It's recommended to reduce the well abstraction to 35m3.hr. | • Water is classified as moderately hard water.<br>• Acceptable concentrations of the analyzed trace metals.<br>• Water samples are contaminated by total Coliform but free from Feacal contamination. This indicates that the well water is not suitable for drinking unless treatment is applied.<br>• Organic matter considered to be very low. |
| 3 | 19-13/052 | Zuhdi Hashwah | • There is a possibility for increasing the well pumping capacity up to 40 $m^3$/hr with increasing the pump setting to 100 mbgl. | • Water is classified as moderate hard water.<br>• Acceptable concentrations of the analyzed trace metals.<br>• Water samples are contaminated by total Coliform but free from Feacal contamination. This indicated that the well water is not suitable for drinking unless treatment is applied.<br>• Organic matter considered to be very low. |
| 4 | 19-14/101 | Jericho well no.1 | • The well specific capacity is acceptable (well yield by the draw down),<br>• The well pumping rate will increase to 100m3/hr with approximate dynamic water level of around 155 mbgl. | • Water is classified as moderate hard water where the calcium concentration is dominant.<br>• Acceptable concentrations of the analyzed trace metals, except for Iron and Manganese, thus requiring treatment.<br>• Water samples are contaminated by total Coliform bacteria.<br>• Organic matter considered to be very low. |

Source: Water Quality and Quantity Survey for the Agro-industrial Park Development in the Jordan River Rift Valley, October 2008

**Comparison of Water Supply Alternatives and Recommendation**

The data of water quality analysis shows that the selected wells cannot be used directly either for agro-industries or as drinking water without being subjected to treatment. The water hardness ranges from medium to high, which are not so suitable for drinking purposes and food processing. The traced metals are found to be in acceptable ranges except for well no.1 that has considerable high contents of iron and manganese. All wells are contaminated with total coliform bacteria, which need to be disinfected. The alternative 2 (Water Supply System of the Jericho City) is recommendable as water supply source for the Agro-industrial Park in stage I. However, domestic water demand will increase due to the residential development in Jericho. It is anticipated that the water supply for the Agro-industrial Park require consideration of all three alternatives in an efficient manner for the stages II and III.

**(6) Wastewater Treatment Facilities**

**On-site Wastewater Treatment Facility**

Each factory will be responsible for industrial wastewater (effluent) with necessary pretreatment. This pretreatment process is generally expected to be screened, and in some cases it might need some primary sedimentation treatment subject to the type of factory and production processes.

The collection system of wastewater will separate wastewater generated from the storm water. Industrial wastewater and sewage from toilet will be collected into the same system.

The wastewater is designed to be transported by gravity, which would not require significant maintenance costs. The wastewater collection facilities are suggested to meet the hourly maximum discharge which is expected to be different for each stage according to the following table:

**Table B-4-8 Hourly Maximum Discharge per Unit Area for Wastewater Treatment**

| Stage | $m^3$/hour/ha |
|---|---|
| I | 1.74 |
| II | 1.38 |
| III | 2.04 |

Source: JICA Study Team

After the collection of wastewater, the pretreated wastewater will be later pumped into the main treatment facility designed for each stage. Except for this system, there were no other alternatives considered in the Study. Based on the analysis of the proposed system for pretreatment and collection, said system is appropriate for on-site wastewater facilities in the Agro-industrial Park in terms of technical, environmental and economical aspects.

**Off-site Wastewater Treatment Facility**

Engineering study proposed the oxidation ditch process as the off-site wastewater treatment facility. This was proposed considering i) less order process, ii) less influence caused by fluctuation of influent quantity, and iii) simple operation and maintenance. The alternative for the oxidation ditch process would be a central public sewerage system in Jericho city, which is not constructed yet

a) Independent wastewater treatment facility in the Agro-industrial Park

In this alternative, each stage will have its own secondary wastewater treatment facility designed to hold and treat the expected amounts of generated wastewater as shown in the table below:

**Table B-4-9 Recommended Wastewater Treatment Facilities**

| | Area（ha） | Treatment Capacity ($m^3$/day) | Type of treatment |
|---|---|---|---|
| Stage I | 11.5 | 470 | Oxidation ditch process |
| Stage II | 50.0 | 1,650 | |
| Stage I+II | 61.5 | 2,120 | |
| Stage III | 50.0 | 2,450 | |

Source: JICA Study Team

This alternative requires the Agro-industrial Park to treat and control the generated wastewater independently. The operation and management remains the important issues in terms of who will be responsible for the off-site wastewater treatment facility.

According to the engineering design and study, three alternatives for wastewater treatment system are considered. The most recommended type in this option is the oxidation ditch process with de-nitrification, which was compared with the sequence batch reactor process, and the recycled nitrification /de-nitrification process.

b) Public sewerage system in the Jericho Municipality

If public sewerage system is constructed, the pre-treated effluent would be discharged into public sewerage system in the Jericho City. In this option, the operation and management is clear as it belongs to the public entity administered by Jericho Municipality. In this case, the public sewer should be extended to the Agro-industrial Park area so that the sewage can be collected and then treated in the central treatment facility.

There would be no alternative except for the proposed oxidation ditch process until public sewerage system is constructed. Therefore this process will be utilized as the second wastewater treatment facility until construction of public sewerage system is completed.

**(7) Solid Waste Treatment Facilities**

Solid waste generated in the Agro-industrial Park is divided into the following five types, excluding other wastes:

< Recyclables >

Recyclables, such as paper, glass, metals and plastics are mainly used for packaging of stuffs or products. These could be sold to recyclers. Broken wooden pallet for shipping of products, which will also be generated, could eventually be sold.

< Food Processing Waste >

Food processing waste would be mainly generated from the production lines. Depending on the type of food processing products, there are many types of food processing waste such as confectionery, meat, greenstuffs, etc.

< Wood >

Wood is mainly derived from wood pallets that are used to transport products or deliver stuffs for production. Used wood pallets are solid waste that can be used as resources.

< Dewatered Sludge>

Dewatered sludge is residuals after undergoing treatment from the wastewater treatment facilities. It also includes human wastes from each company's occupants and visitors of the Agro-industrial Park.

< Other Wastes >

Other wastes are materials that could not be sold due to unsuitability for recycling and composting. Bone is one of the unsuitable food processing wastes for composting due to difficulty in decomposing.

For each type mentioned above, amount of solid waste was estimated with reference to the results of the investment survey and sampling data, based on interview and observation.

a) Amount of recyclables (corrugated board, metals, etc.), food processing wastes and woods were estimated based on the unit generation by sampling 18 food industrial companies existing in Palestine.

b) Amount of dewatered sludge is estimated as Suspended Solids (SS) in consideration of water supply amount, effluent standard and type of wastewater treatment.

c) Amount of human wastes included in the dewatered sludge were estimated based on unit generation of human wastes from occupants.

d) Amount of other wastes was assumed to be 10% of the estimated amount of paper, plastic and food processing waste.

**Table B-4-10 Estimated Volume of Solid Wastes from the Agro-industrial Park**

Unit: ton/day

| | Stage I | Stage II | Stage I+II | Stage III | Stage I+II+III |
|---|---|---|---|---|---|
| **Recycling** | **1.0** | **5.1** | **6.1** | **5.1** | **11.2** |
| Paper& Cardbord | 0.6 | 3.1 | 3.7 | 3.1 | 6.8 |
| Plastic | 0.3 | 1.3 | 1.6 | 1.3 | 2.9 |
| Metal | 0.1 | 0.7 | 0.8 | 0.7 | 1.5 |
| Glass | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Feed** | **0.1** | **0.5** | **0.6** | **0.5** | **1.1** |
| Food Waste | 0.1 | 0.5 | 0.6 | 0.5 | 1.1 |
| **Composting** | **2.7** | **13.5** | **16.2** | **13.5** | **29.7** |
| Food Waste | 2.0 | 10.0 | 12.0 | 10.0 | 22.0 |
| Wood | 0.7 | 3.5 | 4.2 | 3.5 | 7.7 |
| **Disposal** | **1.1** | **4.5** | **5.6** | **5.8** | **11.4** |
| Dewatered Sludge | 0.8 | 2.9 | 3.7 | 4.2 | 7.9 |
| Other Wastes | 0.3 | 1.6 | 1.9 | 1.6 | 3.5 |
| **Total** | **4.9** | **23.6** | **28.5** | **24.9** | **53.4** |

Note: Amount of food waste for feed is estimated on the condition that five percent of total amount of food processing waste is going to composting.

Source: JICA Study Team

The above table does not include hazardous wastes, but in case these are identified, these shall be temporarily at a proper area and managed by a contracted solid waste management company specializing in hazardous wastes.

**On-site Methods**

On-site solid waste treatment methods involve sorting, storing, collecting and internal transportation. The plan of equipments, facilities for solid waste treatment is described below.

**Table B-4-11 Equipment and Facilities for On-site Solid Waste Treatment**

| Treatment method | Required Equipments and Facilities |
|---|---|
| Sorting and storage | Stock yard |
| Collection and internal transportation | Dump track to collect and transport recyclables and food processing waste to storage facility inside park |

Note: Quantity of the required equipments and facilities is depending on amount of waste for each stage.
Source: JCA Study Team

Solid waste management was the major environmental factor to be considered as negative and positive impacts identified in the scoping of EIA Study. Except for proposed on-site solid waste treatment method and required equipments and facilities, there were no other alternatives considered in the Study. The proposed on-site solid waste treatment methods and required equipments and facilities will be most appropriate and efficient in terms of reducing environmental impacts and mitigating negative impacts.

Collection system and methods of recycling as described below will require further discussion with JCspd, EQA and other related bodies.

Collection System

A collection system should be clarified through consultation with JCspd, EQA and other related bodies, taking into consideration that JCspd is currently the sole stakeholder that collects and transports generated solid wastes from Jericho City.

Recycler

Availability of recyclers that collect recyclables and its collection system should be clarified. In case that intermediate treatment is necessary before transportation of recyclables to recyclers, the following will be specifically taken into account.

- Metal: Press metals into a block of 80 x 80 cm with total weight of 70-80 kg
- Paper: Belt paper with diameters of 100 x 80cm with total weight of 300 kg
- Plastic: Shred plastics in granules form

**Off-site Methods**

The off-site treatment methods are related to composting facilities that are adjacent to the site but are classified as off-sites. The compost production will be mainly from the food processing waste generated at the site. Moreover, recyclables such as metal, paper, and plastic will be sent outside the park for potential recyclers. The steel factory adjacent to the Agro-industrial Park can be a potential recycler for metal.

The main facilities required for such treatment are summarized in the table below:

**Table B-4-12 Equipment and Facilities for Composting**

| Treatment Method | Required Equipment and Facilities |
|---|---|
| Production of feed | Shredder machine, drying facility |
| Composting | Composting plant, wheel loader, deodorization equipment, bag-filling machine |
| Solar drying beds for sludge treatments | Solar drying facility with the required equipment |
| External transportations | Dump truck to transport recyclables to recyclers<br>Dump track to transport compost<br>Tanker to collect and transport sludge to solar drying facility/landfill<br>Dump truck to transport other waste to a landfill |

Note: Quantity of the required equipment and facilities is depending on waste volume for each stage.
Source: JICA Study Team

According to the solid waste management study for the Agro-industrial Park, with the application of above treatment method, 90% of the solid waste from the Park will be recycled. This means that the remaining 10 % of the generated solid wastes will need to be land filled. The proposed method is considered to be the most efficient and systematic method for off-site solid waste treatment. The proposed treatment system will be mainly conducted by JCspd and private companies in terms of collecting solid wastes, solar dying and transporting to land fill site. It is necessary to improve and develop the capacity of JCspd and private companies for the operation and maintenance of the works.

## B.5 Existing Environmental and Socio-economic Conditions

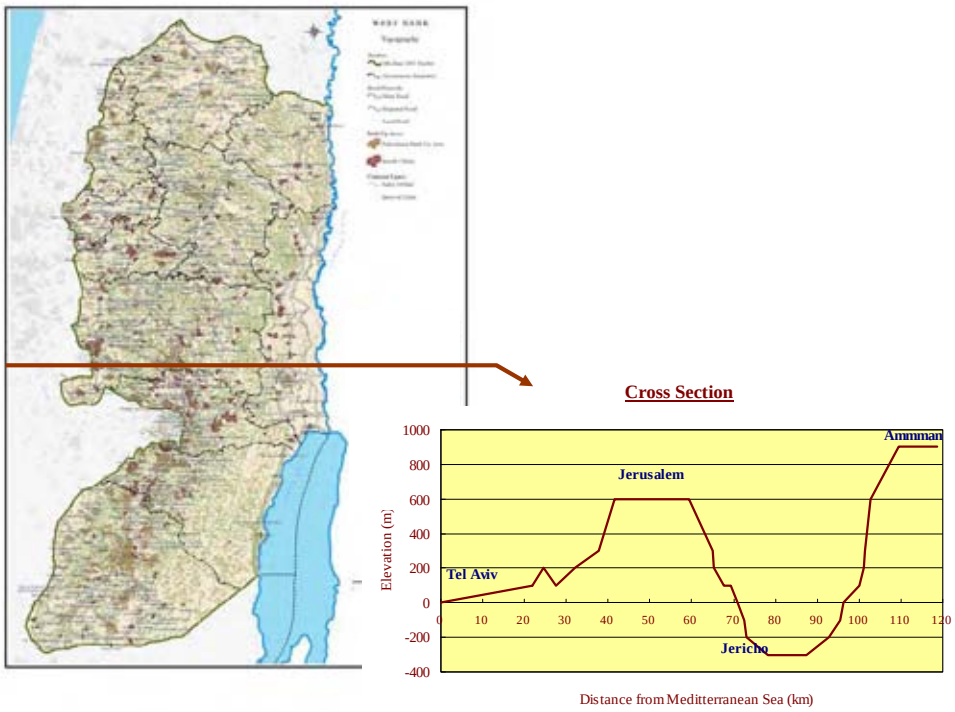
### (1) Biophysical, Resources and Land Use Components

**Location**

The Project site for the Agro-industrial Park Development is located in the south of Jericho City. Jericho City is located in the southern part of the JRRV and at the crossroads of the east-west and north-south corridors. It is at 35 km east of Jerusalem and 8 km northwest of the Dead Sea. Currently, people and products in the valley pass through the city for trade or visiting. The city has been and will continue to be developed as a regional center for trade, tourism, and agriculture. Being close to the international border with Jordan, the city could become an international gateway to/from the neighboring countries.

**Topography**

Jericho City is situated at approximately 300 m below sea level in the JRRV. Most of the lands in this area are dessert, eroded or saline. *WadiEl-Qelt* passes through the center of Jericho City and has no surface water except in the rainy season. Topographic survey for the project site has been undertaken by a local consultant. Details of topography at the project site are referred from the result of the topographic survey, conducted in the Study.




Source: Jericho Regional Development Study Project in Palestine, Final Report, August 2006, JICA

**Figure B-5-1 Topographic Features of the West Bank**

## Geology

*Jericho General Geology*

The geology of Jericho district characterized by the JRRV deposits is mainly composed of marl & pleistocene alluvial formations (ARIJ, 1995). The geologic formations in the eastern part of Jericho district are:

a) Alluvium Formation:

This formation covers the area adjacent to the JRRV starting with a width of 1 km in the north and 5 km in the south. It is of the pleistocene to recent in age. It is bounded structurally by the Jordan rift regional fault in the east and another fault of12 km long in the west.

b) Lisan and Samra Formation:

This formation covers the greatest part of the Jericho district. It is of the pleistocene to recent age, and includes three local faults of up to 3 km long. This area is bounded by the alluvium formation in the east and by a greater fault of about 13 km long in the west. It is mainly composed of marl, chalk and conglomerates.

*Site General Geology*

Considering the collected samples from the five drilled boreholes within the borders of the proposed site, and upon reviewing the visual analysis and description given in the borehole logs, it can be concluded that the entire studied area (within the explored depth of 20m from the existing ground) consists of un-cemented alluvium, loose to medium dense, fine grained silts to sandy silts with occasional cemented particles in the form of gravels.

The encountered materials in the drilled boreholes, as described above, can be referred to the soil description given above as soil type 1 (Alluvial Arid Brown Soils).

Geological cross sections illustrating the subsurface conditions encountered in the drilled boreholes are discussed below.

## Soil

The project site belongs to sandy soil land. The soil has very low water content. Soil sampling test was conducted for the project site in order to estimate the strength of foundation after the land grading. Nine soil associations can be distinguished in this system:

*Alluvial Arid Brown Soils*

This type of soil association is located mainly in Jericho City and Al-Auja areas. It covers an area of about 6,470 ha. It is composed of alluvial fans and plains, formed as a result of erosion of calcareous silt and clayey materials. This soil type supports herbaceous vegetation of desert and suits well to irrigation, producing various crops, mainly subtropical and tropical fruits, such as citrus, bananas, and dates, as well as winter vegetables.

*Loessial Arid Brown Soils*

This type of soil association is found on moderate slopes to the west and northwest of the Jericho district, covering an area of about 1,290 ha. The soil is formed originally from conglomerate and/or chalks and mainly found on gently sloping plateau as well as dissected plateau with hilly topography. The major vegetation type found in this region is Achillea santolina, and the main current land use consists of various field crops and some horticultural crops planted as irrigated crops. Wheat, barely, and sorghum also grow under rainfed conditions.

*Reg Soils and Coarse Desert Alluvium*

This type of soil association is located in the southern part of the Jericho district. It is found in plains and dissected low plateau and characterized as large valleys and alluvial fans. The soil covers an area of approximately 800 ha and its parent materials are mainly of unconsolidated mixed stone and deposits. The vegetation on this soil is restricted in a few areas to rivulets. In most areas, dwarf shrubs such as anabasis articulata and reaumuria are dominant. This soil has almost of no agricultural value and its native vegetation only serves as poor pastures for camels, goats and sheep.

*Brown Lithosols and Loessial Serozems*

This type of soil association is found on steep to moderate mountain slopes, in the areas southwest of Aqbat Jaber Camp and northwest of Nuwe'ma, covering an area of about 4,670 hectares. The soil is originally formed from limestone, chalk, dolomite and flint.

The major vegetation types found on this soil are anabasis articulata and zygophyllum. The current land use is restricted to winter crops grown by Bedouins in some *Wadi*.

*Calcareous Serozems*

This type of soil association is found southeast of Jericho city, northeast of Nuwe'ma and east of Al-Auja villages. It is formed mainly as a result of the flooding of the Jordan River. This soil covers an area of about 2,400 hectares and is originally formed from limestone, chalk and marl. The vegetation it hosts is restricted to Salsola vermiculata var vilosa and its current land use is limited to winter grazing.

*Solonchalks*

This type of soil association is found in the south eastern part of the district. It covers an area of approximately 3,460 ha. The soil occupies the drainage valleys and closed basins in the district, where the groundwater table is near the soil surface. The soil parent rocks are recent alluvial deposits ranging in texture form sand to clay. Its major vegetation is halophytic with species of tamarix, suaeda, and nitraria. Without proper drainage, this soil has almost no agricultural value. In the Jericho district, some dates are grown on the periphery of the depressions, where the ground water is still relatively fresh.

*Loessial Serozems*

This type of soil association dominates the areas of Nuwe'ma, north of Al-Auja and south of Aqbat Jaber camp covering an area of approximately 4,920 ha. This soil is typical at plateau and moderate slopes. The soil parent materials are loessial sediments, gravel and highly calcareous loamy sediments. Its major vegetation is an association with the Hammada scoparia. Most of the areas covered by this soil are used for grazing and only part of it is dry-farmed. There are also some irrigated orchards.

*Regosols*

This type of soil association characterizes the eastern border of the Jericho district. It is found as badlands along terrace escarpments in the JRRV, covering an area of approximately 8,880 ha. The soil parent materials are sand, clay and loess. The soil dominant vegetation is anabasis articulata, salsola vermiculata and salsola tetrandra, which are used primarily for grazing.

*Brown Lithosols and Loessial Arid Brown Soils*

This type of soil association characterizes the western part and covers an area of approximately 2,410 ha of the Jericho district. These types of soils are mainly found on steep rocky and eroded slopes. Brown lithosols are found in the pockets among rocks, while loessial arid brown soils are found on flat hilltops, plateau and foot-slopes.

The parent rocks of this soil association are chalk, marl, limestone and conglomerates. Its major vegetation cover is Artemisia herba-alba.

**Water Resources**

**(i) Groundwater sources**

*Groundwater wells*

In the Jericho governorate there are 63 irrigation wells consisting of 48 private wells owned by Palestinians, and 15 cooperative association wells owned by the Arab Development Society (ADS). Among these private wells 38 are located inside Jericho City and ten at AL-Auja community. Most of these wells are used for irrigation with an approximate discharge of 3.83 MCM/yr.

*Springs*

There are four main spring systems in the Jericho district with a total annual discharge of about 35.55 MCM. The springs are *Wadi* Qilt, Ein Al-Sultan, Dyouk Spring, and Al-Auja spring.

*Wadi* Al-Qilt is fed from three main springs namely, Ein Fara, Ein Fawwar, and Ein Al-Qilt (Scarpa, 1994). The total average annual discharge of this system is about 12.39 MCM.

Ein Al Sultan is located to the east of *Wadi* Qilt in Jericho City. The annual flow discharge of this spring is about 5.54 MCM. The spring water is used to serve the municipal and agricultural sectors in the Jericho district.

Dyouk Spring system is composed of the following springs: Dyouk, Nuwe'meh, and Shosah with the average annual discharge of 18.07 MCM.

Al-Auja spring system has a catchment area of 170 $km^2$ and has an average annual discharge of about 9.55 MCM. The Auja spring water is used mainly for irrigation.

**Photo: AL-Auja Spring**

Above date and information on groundwater sources are from PWA database, 2005.

**(ii) Groundwater Aquifer System**

Generally, Jericho Governorate in Jordan Valley Area is part of the Eastern Basin in the West Bank. The existing aquifer systems within Jericho area consist of the following three main aquifers where most of agricultural wells are tapped:

- The Quaternary Aquifer
- The Upper Aquifer System (Jerusalem, Bethlehem, and Hebron Formations)
- The Lower Aquifer System (Yatta, Upper Beit Kahil, and Lower Beit Kahil Formations)

These aquifer systems are described in detail below.

*Quaternary Deposits*

Quaternary Aquifer is the main ground water system in JRRV Area since most of the agricultural wells are tapping this aquifer at different depths. The Quaternary Aquifer is not a continuous system along the JRRV. It scattered over different and separated location in Jericho, Al-Uja, and Fasayel areas. These fan deposits were developed along the sides of major *Wadis* that flow through the JRRV. Moreover, the geometry of these fans is not determined in a precise way. They have a lens-shape with variable thickness and extension forming a good aquifer. The groundwater quality in these fans varies with location. Generally, good groundwater quality occurs, where fresh groundwater recharge is available. It is believed that this aquifer is overlaying the Lisan Formation, which is impermeable or has very low permeability layer. Groundwater recharge in this aquifer takes place through two mechanisms: lateral flow from the mountain aquifer that is replenished in the mountain area some 10 to 30 km to the west, and the infiltration of storm water from flooded *Wadis* that crossing the aquifer.

Water level in the Quaternary Aquifer can be found at variable depths ranging from 10 m to 70 m or more below ground level. Changes in groundwater levels reflect changes in recharge to, and discharge from an aquifer. In general, groundwater flow in this system is directed to the Jordan River and the Dead Sea.

*Upper Aquifer System*

The upper aquifer system occurs in the turonian and upper cenomanian formations. It spreads over the West Bank and is mainly utilized from the Eastern Basin. The Turonian section of the Upper Aquifer consists mostly of massive limestone and dolomite which varies in thickness. It extends well into the tulkarem area which produces a significant quantity of water.

The upper cenomanian section consists mainly of interbedded dolomites and chalky limestone formations (Bethlehem and Hebron formations according to Palestinian terminology). The formation's thickness ranges from 150 m to 400 m. Outcrops of this formation are located on the flanks of the Ramallah-Hebron Anticline where the rainfall is relatively high. Direct rainfall forms the main recharge source for this aquifer. The quality of the water from this aquifer is generally good.

*Lower Aquifer System*

The lower aquifer system is composed of the middle and lower Yatta Formations, the Upper and Lower Beit Kahil formations (Palestinian Terminology).

The Yatta Formation consists mainly of marl, clay, and marly limestone, and divided into three parts: upper, middle, and lower. The Upper Yatta is an aquitard and generally restricts vertical groundwater flow between the upper and lower aquifers. The middle and lower parts of the Yatta Formation form an aquifer which drains water to the lower layers.

The Upper Beit Kahil Formation is composed of regularly interbedded chalky limestone and dolomite. The formation becomes more massive and karstified upwards, while retaining the thin-bedded alternative.

The Lower Beit Kahil Formation is composed of dolomite and limestone interbedded with marl. Although the dolomitic limestone are well-fractured and have good aquifer potential, the chalky units contain clay which inhibits groundwater movement across the strata. The Lower Aquifer is a deep-seated

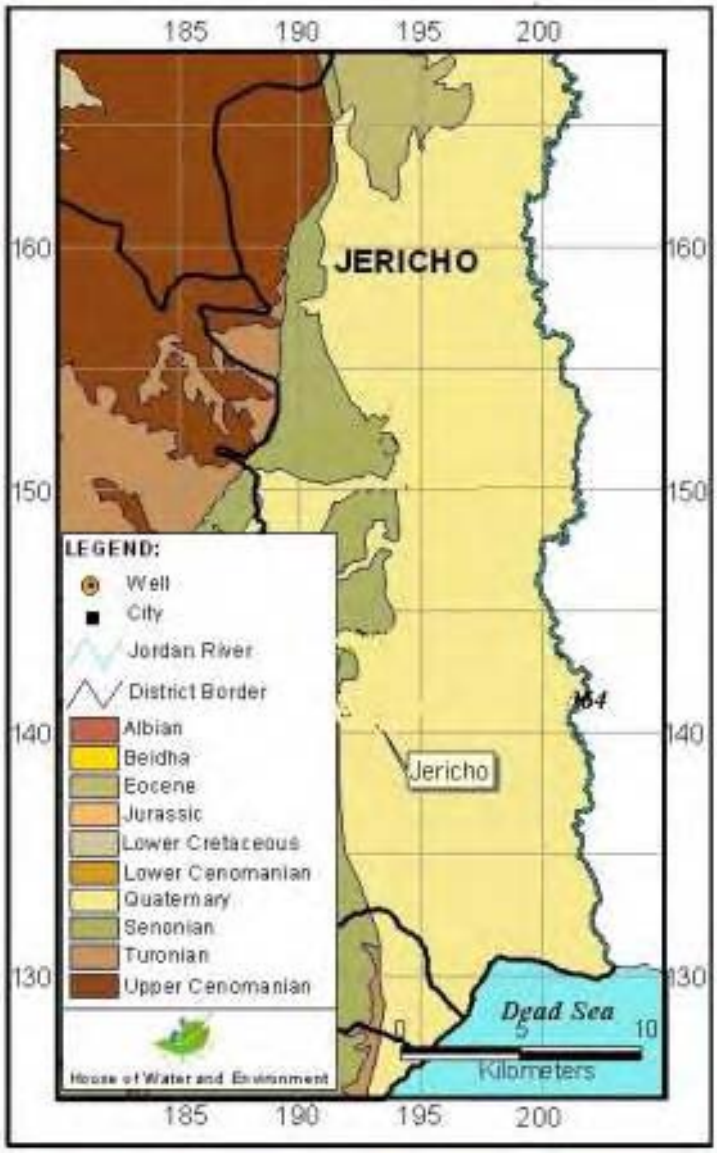



**Figure B-5-2 Geological Map of the Study Area**

aquifer and classified as having excellent water quantity and quality. The outcropping formations in the JRRV are shown in Figure B-5-2.

### (iii) Surface Water Resources

The surface water in the Jericho area can be divided into flood water, spring water and the Jordan River system.

*Flood water*

The flood water in the Jericho district comes mainly from outside the district mainly from the eastern Jerusalem and Ramallah areas. It is very hard to estimate the water quantities for the flood water since it mixes with the spring water in most *Wadis*.

***Spring Water***

There are four main spring systems in the Jericho district. The Wadi Al-Qilt system, which includes the springs Ein Fara, Ein Fawwar and Ein Al-Qilt, has an average annual discharge of about 5 MCM. The Ein Al-Sultan system has an annual discharge of around 4 MCM. The Dyouk system (Dyouk, Nuwe'ma, and Shosah springs) and the Al-Auja system have annual discharges of around 9 MCM and 10 MCM, respectively. (Environmental Profile for the West Bank: Jericho District." Volume 2. ARIJ, 1995. Pg. 28-31.)

*The Jordan River Basin*

The Jordan River is 360 km long from its source near Banias to the Dead Sea, with a catchment area of about 18,300 $km^2$. Syria, Israel, Lebanon, Jordan, and Palestine are all riparian of the River while 80% of the basin is located in Israel, Palestine, and Jordan. The flow at the mouth of the river (at the Dead Sea) used to be about 1,320 MCM but has fallen to less than 250 MCM, or roughly 15-18% of the original flow. Palestinians are forbidden of their share of the Jordan River due to military closures along the JRRV. ("Status of the Environment in the Occupied Palestinian Territory". ARIJ, 2007. p. 106.)

Today the lower Jordan River has more sewage as the budget for the river water was altered due to different projects by the riparian countries of the river. The following are the most important projects that altered the Jordan River flow:

*The King Abdullah Canal or the Eastern Jordan Valley Canal*

The Yarmouk River which is an important tributary to the Jordan River is diverted to this canal. Jordan uses 100-120 MCM/yr from this River.

*The Israel National Carrier*

Mekorot, the Israeli water company, is diverting the water from Lake Tiberias before it goes to the lower Jordan River basin. It conveys approximately 650 MCM of water per year from Lake Tiberias all the way to the Negev Desert in the south.

*The Gilgal Project*

This project was launched by the Israeli Authorities in order to pump water from the Jordan River to supply the Israeli settlers in the JRRV (ARIJ, 1995).

By the time the water reaches the Dead Sea its quality severely degraded since the salty springs are also diverted downstream. This is in addition to the non-point source pollution due to the heavy agricultural activity in the valley and the discharge of untreated sewage into the river by the JRRV Israeli settlers.

**Climate**

**(i) Climate**

The Mediterranean climate is prevalent in the West Bank, having four months of hot dry summer and a short winter with rain from November to March. As shown in Figure B-5-3, the characteristic of rainfall in the West Bank is extremely affected by its topographical uniqueness. The central highlands collect orographic rainfall and cast a rain shadow over their eastern slopes. The JRRV is warmer and much drier than other areas in the West Bank, and therefore said climatological uniqueness affects the characteristics of the soil and the water resources, and consequently, the agriculture in the valley. The climate of Jericho is classified as arid, which has hot summer and warm winter.


Source: Arcworld

**Figure B-5-3 Jordan River Basin**

**(ii) Temperature and Rainfall**

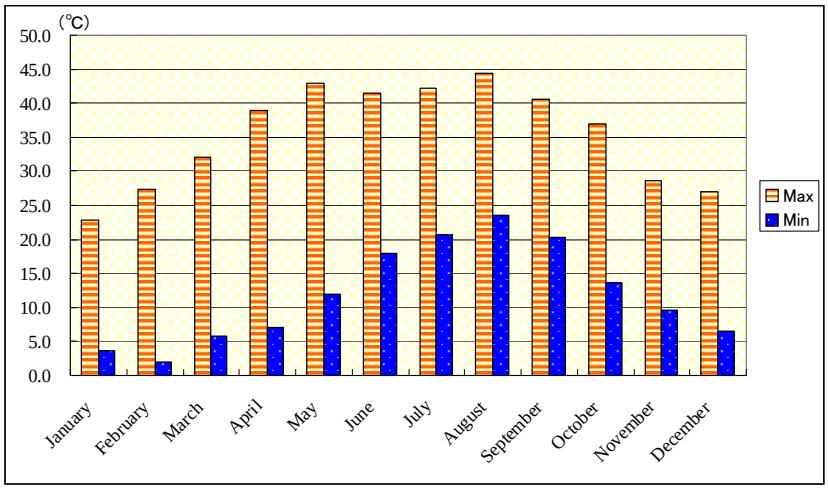
The average annual rainfall is 168 mm in Jericho, 240 mm in *Wadi* al Far'a, 429 mm in Tubas, 554 mm in Jerusalem, and 530 mm in Tel Aviv. The coolest month is January with a mean temperature of 13.3°C in Jericho, 14.4°C in *Wadi* al Far'a, 8.7°C in Jerusalem, and 13.6°C in Tel Aviv. Meanwhile the warmest month is July or August with a mean temperature of 30.0°C in Jericho, 31.4°C in *Wadi* al Far'a, 23.8°C in Jerusalem, and 24.2°C in Tel Aviv. Although the JRRV is an extremely dry area and surrounded by desert, some areas with groundwater or spring water were cultivated during rainfall from the central highlands in order to sustain agriculture in the valley. In addition, the warm climate even in the winter season seems to

improve the competitiveness in the agricultural industry, and serves as advantage for recreation and tourism.

**Table B-5-1 General Temperature in Jericho and Other Cities (2005)**

| | | Jericho | Ramallah | Nablus | Jenin | Gaza |
|---|---|---|---|---|---|---|
| Annual Mean of Air Temaperature | (℃) | 23.4 | 16.5 | 18.0 | 20.3 | 21.0 |
| Annual Mean of Max Air Temaperature | (℃) | 30.3 | 20.8 | 22.9 | 25.6 | 23.6 |
| Annual Mean of Min Air Temaperature | (℃) | 16.2 | 13.3 | 14.3 | 16.0 | 17.7 |

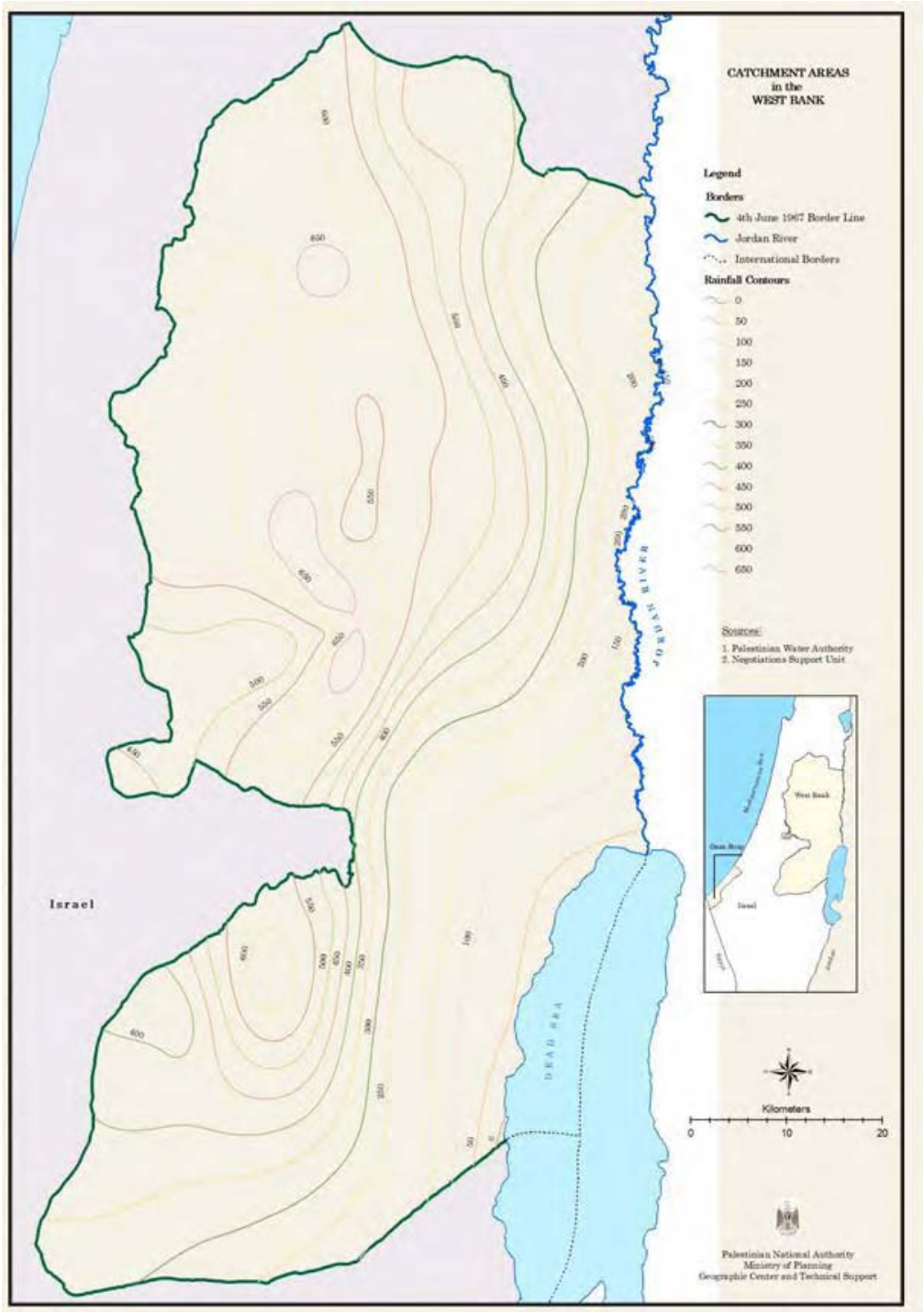
Source: Palestinian Central Bureau of Statistics




Source: Palestinian Central Bureau of Statistics

**Figure B-5-4 Monthly Max and Min Temperature in Jericho (2005)**

Figures B-5-4 and B-5-5 show annual rainfall and mean temperature, respectively, in Jericho, Tubas, Jerusalem, *Wadi* al Far'a, and Tel Aviv.




Source: Geographic Center and Technical Support, MoP, PNA

**Figure B-5-5 Annual Rainfall in the West Bank**

### iii) Relative Humidity

The mean annual relative humidity (RH) in the Jericho district is 50%. The highest percentage is observed during winter, ranging between 70% and 85% from day time to night time. In summer, the RH ranges between 45% and 65% and reaches as low as 5% at very high temperatures. During spring, the RH is around 30% on average but can reach up to 60%.

### iv) Sunshine Radiation

According to the data from the Jericho weather station in 1995, the solar radiation reaches its peak during the month of July. The total annual solar radiation measured for the period between June 1994 and May 1995 was 62,520 Watt/$m^2$ (Jericho Weather Station, 1995).

### v) Wind

The wind direction in the Jericho City changes from northwest at night, to south in the early morning, with an average speed of 3 m/sec (Kessler). During spring, the maximum wind speed ranges from 15 m/sec to 20 m/sec. During the rest of the year, the maximum wind speed reaches up to 12 m/sec. It is noted that the Jericho area is known for the Khamaseen or Khamaseeny wind which is a hot, dry, and sandy wind, blowing mainly from the Saudi Arabia (Kessler).

**Vegetation, Flora and Fauna**

The JRRV area supports the Mediterranean savanna and is classified as a land dominated by xeric steppe brush and spiny dwarf shrubs. There is a comparatively large number of endemic species in the flora.

In 2000, the MoP designated the rich biodiversity of the land to be conserved as Ecologically Significant Areas. Eight of these areas are located in JRRV. According to the study of Ecologically Significant Areas in the West Bank Governorates (2000), 28 floral species in Jericho and the eastern slope of the West Bank are reported to be endangered or rare as shown in the following table. There are no endangered and rare floral species found in and around the project site.

**Table B-5-2 Endangered and Rare Floral Species in the Jordan River Rift Valley**

| No | Name | District | Locality | Rare | End. |
|---|---|---|---|---|---|
| 1 | Agrostemma githago | S, JD. | Fields | * | |
| 2 | Herenaria glabra + hirsuta | S, JD. | Batha | * | |
| 3 | Iris vartanii | S, JD. | Rocky Batha | | * |
| 4 | Loranthus acaciae | S, JD. | Mountains | * | |
| 5 | Raphanus raphanistrum | S, JD. | Cultivated fields | * | |
| 6 | Abutilon pannasum + other spp. | ES, JD | Hot deserts | * | |
| 7 | Balanites aegyptiaca | ES, JD | Hot deserts | * | |
| 8 | Cistanche spp. | ES, JD | Deserts and Rd sides | * | |
| 9 | Commicarpus | ES, JD | Herbs, shady crops | * | |
| 10 | Crochorus tril culari s | ES, JD | Among irrigated crops | * | |
| 11 | Epipactis helleborim | ES, JD | Maquis | * | |
| 12 | Haloxylon persicum | ES, JD | *Wadis* in desert | * | |
| 13 | Hibiscus micranthus L. | ES, JD | Hot desert | * | |
| 14 | Nitaria retusa | ES, JD | Salin desert | * | |
| 15 | Seidlitzia rosmarinus | ES, JD | Hot desert | * | |
| 16 | T.systola | ES, JD | Batha | | * |
| 17 | Tamarix | ES, JD | River sides | * | |
| 18 | Zygophyllum dumosum | ES, JD | Desert, stony groung + Plateaus | * | |
| 19 | Acaia albida | JD | Hot zone = tropical | * | |
| 20 | Caesia (Senna) | JD | *Wadi* in hot regions | * | |
| 21 | Calotropos procera | JD | Desert | * | |
| 22 | Eclipta alba | JD | Fallow fields | * | |
| 23 | I.atrofusca | JD | Batha | | * |
| 24 | Indigofera articulata | JD | Oasios Tropical | * | |
| 25 | Moltkiopsis ciliata | JD | Sandy areas | * | |
| 26 | Oxystelma spp. | JD | Desert | * | |
| 27 | Psylliostachys Spicata | JD | Saline soil/desert | * | |
| 28 | Solenostemma spp. | JD | Desert | * | |

S: South Districts, JD: Jericho Districts, ES: Eastern Slope, End.: Endangered

Source: Jericho Regional Development Study Project in Palestine, Final Report, August 2006, JICA

Regarding fauna, millions of migratory birds pass through the JRRV area. This area is of particular importance for large soaring birds, such as storks and birds of prey. These birds avoid crossing the seas during their migration from Africa and Eurasia, as they depend on land-based thermals and are thus concentrated in the narrow corridor between the Mediterranean and the desert. Palestinian Wildlife Society (PWLS) is a local environmental NGO actively working on nature conservation, wildlife survey and research and eco-tourism, and public awareness programs in the area. PWLS established a bird monitoring station in Jericho for research and to monitor migratory birds as well as promote public awareness for the protection of the environment and biodiversity.

There are no data available related to fauna in the JRRV area. The following information is from the Jericho Regional Development Study. Mammals and bird species subject to international conservation concern have been identified in the West Bank and Gaza, as shown in the following table. These species either inhabit or pass through the JRRV.

Source: Jericho Regional Development Study Project in Palestine, Final Report, August 2006, JICA

**Figure B-5-6 Birds Flying above the Jordan River Rift Valley**

**Table B-5-3 Mammals and Bird Species of International Conservation Concern Identified in the West Bank and Gaza**

| Species | | Latin name | IUCN Category |
|---|---|---|---|
| Mammals | Bicoloured white-toothed and common white-toothed shrew | *Crocidura leucodon and C. russula* | |
| | Savi's dwarf shrew | *Suncus etruscus* | |
| | Greater mouse-eared bat | *Myotis myotis marcrocephalus* | En |
| | Indian crested porcupine | *Hystrix indica* | |
| | Badger | *Melis melis* | |
| | Ratel | *Melivora capensis* | |
| | Eurasian otter | *Lutra lutra* | Vu |
| | Wild cat | *Felis sylvestris tristrami* | |
| | Sand cat | *Felis margarita* | |
| | Hyrax | *Procavia capensis* | |
| | Mountain gazelle | *Gazella gazella* | |
| | Nubian ibex | *Capra nubiana* | En |
| Birds | Ferruginous duck | *Aythya nyroca* | |
| | Marbled teal | *Marmaronetta angustirostris* | Vu |
| | White-headed duck | *Oxyura leucocephala* | En |
| | Imperial eagle | *Aquila heliaca* | Vu |
| | Lesser kestrel | *Falco naumanni* | Vu |
| | Corncrake | *Crex crex* | Vu |

Source: UNEP (2003)

**Land Use and Landscape**

Existing land use plan for Jericho City was prepared in 1988, covering a total area of approximately 35 $km^2$ with two refugee camps. The planned development area has been fully developed without a strategic urban development plan. Urban sprawl is observed to be in progress.

The city mainly consists of flat agricultural land (40% of total land area) and unused land in the southern part of the city (35% of total land area). The agricultural land adjacent to the built-up area gives an idyllic setting, which is harmonized with the natural and the archeological sites.

In the northwest part of the city, there are many archeological sites, which are major tourism assets. These sites however are not maintained in good condition. They are also subject to deterioration because of the new development activities nearby that cause pollution, due to the induced vibration from cars passing alongside.

The built-up area is 7.0 $km^2$ , accounting for about 20% of the total land area, and spreads from the city center. The city center is extremely crowded due to concentration of most urban functions, including administrative and commercial facilities, wholesale markets, religious buildings, and recreational spaces. It is necessary to pay attention to the city center's reduction of the congestion to improve its function. It is noted that a large housing development project is on-going near the Jerusalem Street in the southwest of Jericho City.

Currently, the project site is an unused land. According to the land use plan proposed in the Jericho Regional Development Study Project, said site belongs to an industrial zone in the built-up area. It was also found that the area will be expanded near the existing factory, to accommodate lighting industries. A buffer zone is to be placed around the industrial area to segregate the zone from residential areas.

**Table B-5-4 Current Land Use (2004)**

| Categories | | Area ($km^2$) | Ratio |
|---|---|---|---|
| **Built-up area** | | ***7.0*** | ***20.7%*** |
| | Built up area | 5.4 | 16.1% |
| | Commercial area | 0.2 | 0.6% |
| | Industrial area | 0.05 | 0.1% |
| | Public area | 0.3 | 1.0% |
| | School | 0.1 | 0.3% |
| | Religious area | 0.4 | 1.1% |
| **Tourism** | | ***0.3*** | ***1.0%*** |
| | Hotel | 0.2 | 0.5% |
| | Archeological Sites | 0.2 | 0.5% |
| **Agriculture** | | ***13.4*** | ***39.9%*** |
| **Others** | | ***1.8*** | ***5.4%*** |
| | Cemetaries | 0.06 | 0.2% |
| | Rivers | 1.6 | 4.7% |
| **Unused land** | | ***11.6*** | ***34.5%*** |
| **Total** | | ***33.7*** | ***100.0%*** |

Note: The area indicated in the table has been extracted from the Current land use map prepared on the basis of a satellite image (2004).

Source: Jericho Regional Development Study Project

Location of the selected candidate site for the Agro-industrial Park development is next to an existing steel factory in the south of Jericho City, which is part of the reserved area for future development in the Jericho City Plan. The selected candidate site consists of three land parcels with a total of 111.5 ha as summarized in Table B-5-5.

**Table B-5-5 Profile of the Land Parcels**

| Lot | Area | Jurisdiction | Ownership |
|---|---|---|---|
| I | 11.5 ha | Area A | State-owned Land (PNA) |
| II | approx. 50.0 ha | Area A | Privately-owned Land (Al Hussein Family) |
| III | approx. 50.0 ha | Area C | Privately-owned Land (Al Hussein Family) |
| Total | 111.5 ha | | |

Source: JICA Study Team

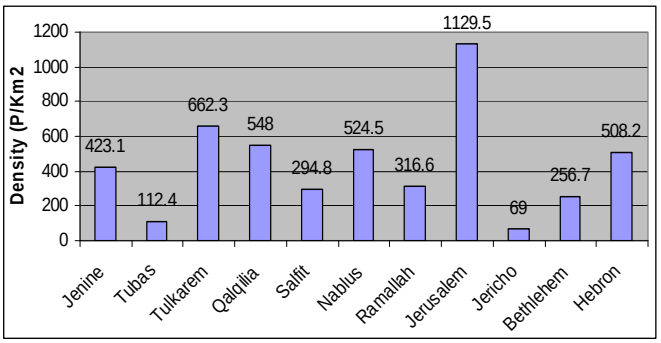
Lot I could be assessed as suitable for initial development in the first stage of implementation, considering its small scale, the jurisdiction of area A and state-owned status. Lot II meanwhile would be reserved for the second stage which shall be developed on a larger scale upon reaching agreement with its private land owner. Lot III needs special coordination/agreement with Israeli authorities since it is located in area C. It has been reported by the MoP that the state-owned land (Lot I) is secured for the Agro-industrial Park use as decided during the cabinet meeting on February 18, 2008.

### (2) Socio-economic Environment

**Social/demographic Profile**

#### (i) Population of Jericho Governorate and Jericho City

According to the Palestinian Central Bureau of Statistics (PCBS), the population of Jericho city was approximately 20,416 in 2006. Population census was conducted by the PCBS in 2007. Its result was announced in 2008. The city has the lowest population density among the major cities in the West Bank with 69 persons/km$^2$. This implies that it has a potential for future population expansion.




Source: PCBS

**Figure B-5-7 Population Density by Governorate in West Bank (2005)**

The population of Jericho Governorate for 2015 and 2025 were estimated in the Master Plan for the Jericho Regional Development, based on the population data in 2005, with an annual average population growth of 2.7%. Estimated population for Greater Jericho for 2010, 2015 and 2025 were 22,830, 25,860 and 37,870, respectively. For the purpose of land use planning, the Jericho population is assumed to reach around 40,000 in 2025.

Regarding households size, the average size in Jericho is 5.5 family members in 2007. This was increased by 0.5 when compared to household size in 1997, when the average family members used to be 6.0.

**(ii) Population of surrounding the Agro-industrial site**

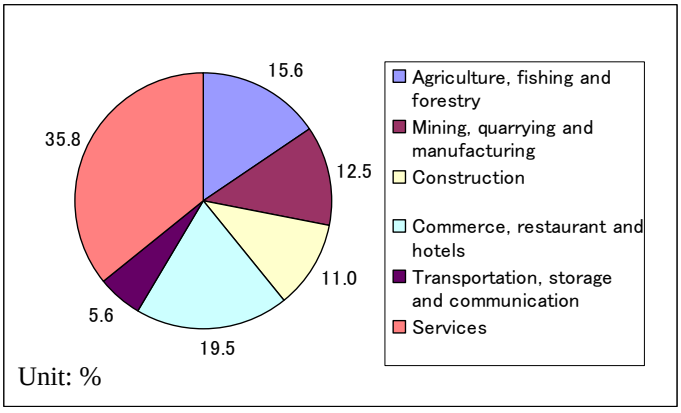
There is a new residential complex development project in Jericho area. Land for the development project is owned by the PARC of Jericho. Based on interviews with PARC, the land was sold to 70 private owners. The area is not developed yet, and most of the owners are from outside the Jericho City. The area is adjacent to the existing Roads 1 and 2, and close to the new vegetables market in Jericho. Thus, residential population in said area will be directly affected by the improvement of the existing roads during construction. The estimated total number of affected residential units is 70-100, with a total population of about 470 residents. Residents use their homes mainly as rest houses for vacation, which are not expected to be occupied for a full year.

The other two existing residential areas, JDECO Residential Complex and the Jericho City residential Complex, are not adjacent to the Agro-industrial Park site. These complexes are still under development. The total residential population of these complexes was estimated to be around 500 - 700, based on collected information from residents and the average household number for the Jericho area.

The estimated total indirect affected population during the full development of these residential areas is 5,000 residents. This information was based on estimated housing units multiplied by the average household number for the Jericho area.

**Economic Activity**

In terms of distribution of employed persons by economic activity in Jericho Governorate, the tertiary industries including commerce, restaurant, hotels and services contribute the largest share in economic activities with a total of 60.9 % in 2007. The large number employment is tourism business. Agriculture sector is also important in Jericho but its share of employment is only 15.6%. Although there are not enough statistical data available at the municipal level, Jericho Municipality appears to have a similar distribution pattern of employed persons as the Jericho Governorate.




Source: PCBS

**Figure B-5-8 Distribution of Employed Persons in Jericho Governorate by Economic Activity (2007)**

According to PCBS, unemployment rare in Jericho Governorate in 2007 was 16.0%. The highest unemployment rate was 26.2% in 2001, which was caused by the second Intifada that occurred in September 2000. Unemployment rates were over 20% from 2001 to 2003.

**(i) Agriculture**

*Farm Households*

Agriculture is the main economic activity in Jericho and JRRV areas. However, there is a constraint in the development potential for expansion due to limited land and water resources. According to Jericho Branch Office, Ministry of Agriculture, the number of farm households in Jericho Governorate is about 1,500. Farmers are engaged in three types of agriculture, namely, plant production, animal production and those mixed production. One-third of farm households in Jericho Governorate is concentrated in Jericho City, with a total of 582 households.

**Table B-5-6 Population and Farm Household Type (Jericho Governorate)**

| Locality Name | Holding Type | | | Total |
|---|---|---|---|---|
| | Plant Production | Animal Production | Mixed | |
| Marj Na'ja | 40 | 13 | 7 | 60 |
| Az Zubeidat | 51 | 20 | 25 | 96 |
| Marj al Ghazal | 30 | 3 | 3 | 36 |
| Al Jiftlik | 184 | 81 | 19 | 284 |
| Fasayil | 1 | 69 | 2 | 72 |
| Al 'Auja | 56 | 145 | 55 | 256 |
| An Nuwei'ma | 21 | 9 | 0 | 30 |
| 'Ein ad Duyuk al Fauqa | 26 | 9 | 2 | 37 |
| 'Ein ad Duyuk at Tahta | 18 | 21 | 15 | 54 |
| Jericho City | 380 | 112 | 90 | 582 |
| Total | 807 | 482 | 218 | 1,507 |

Source: Database, MoA

*Agricultural Land*

The agricultural land in Jericho Governorate is categorized into two units: the “Rainfed Land” and the “Irrigated Land”. In Jericho Governorate, the irrigated land covers 4,474 ha (44.7 $km^2$), which is over 99% of the total agricultural land use. The irrigated land in Jericho City is 1,828 ha, which is 40.9% of the total irrigated land in Jericho Governorate.

*Agricultural Production*

Agricultural productions are classified into three types, i) field crops and forages, ii) vegetables, and iii) fruits. According to Agricultural Statistics 2004/2005, PCBS, the total production in the field crops and forages in Jericho Governorate is 4,408 tons. The main field crops and forages currently cultivated in Jericho Governorate are wheat, barley, dry onion, potato, etc. The production of major vegetable in Jericho Governorate is squash (13,834 tons, 17.1%) eggplant (24,810 tons, 30.7%) and tomato (18,422 tons, 22.8%) and cucumber (7,011 tons, 8.7%). The total production of vegetables in Jericho Governorate is 80,915 tons, which contributes to 23.8% of the total production in the West Bank. The

production and planted area of fruits are 14,292 tons and 686 ha, respectively. Banana, date, grape and lemon are major fruits production in Jericho Governorate, which are over 90% of the total fruits production. Banana and date are planted only in Jericho because of its suitable climate conditions.

**Table B-5-7 Field Cropped Area, Yield and Production of Field Crops and Forages in Jericho Governorate (2004/05)**

| Crop | Production (ton) | Total Area (dunum) | Irrigated | | Rainfed | |
|---|---|---|---|---|---|---|
| | | | Yield | Area | Yield | Area |
| Wheat | 920 | 3,680 | 0.25 | 3,680 | - | - |
| Barley | 295 | 1,180 | 0.25 | 1,180 | - | - |
| Others Clover, Sern | 1,230 | 820 | 1.50 | 820 | - | - |
| Dry Onion | 1,420 | 355 | 4.00 | 355 | - | - |
| Potato | 452 | 113 | 4.00 | 113 | - | - |
| Clover | 71 | 89 | 0.80 | 89 | - | - |
| Thyme | 19 | 31 | 0.60 | 31 | - | - |
| Meramieh | 1 | 2 | 0.50 | 2 | - | - |
| Total | 4,408 | 6,270 | | 6,270 | | - |

Source: Agricultural Statistic 2004/2005, PCBS
Remark: 1 dunum = 0.1ha, Yield: ton/dunum

**Table B-5-8 Field Cropped Area, Yield and Production of Vegetables in Jericho Governorate (2004/05)**

| Crop | Production | Total Area | Plastic House | | Irrigated | |
|---|---|---|---|---|---|---|
| | | | Yield | Area | Yield | Area |
| Squash | 13,834 | 6,917 | - | - | 2.00 | 6,917 |
| Eggplant | 24,810 | 4,962 | - | - | 5.00 | 4,962 |
| Tomato | 18,422 | 4,008 | 18.00 | 303 | 3.50 | 3,705 |
| Maize | 3,779 | 3,779 | - | - | 1.00 | 3,779 |
| Cucumber | 7,011 | 2,364 | 9.00 | 462 | 1.50 | 1,902 |
| kidney bean (green) | 1,755 | 2,146 | 1.50 | 316 | 0.70 | 1,830 |
| Broad bean (green) | 742 | 1,484 | - | - | 0.50 | 1,484 |
| Cauliflower | 2,334 | 1,167 | - | - | 2.00 | 1,167 |
| Jew's mallow | 3,381 | 1,127 | - | - | 3.00 | 1,127 |
| white Cabbage | 1,558 | 779 | - | - | 2.00 | 779 |
| Snake cucumber | 873 | 582 | - | - | 1.50 | 582 |
| Paprika | 940 | 538 | 2.50 | 133 | 1.50 | 405 |
| Hot Pepper | 764 | 509 | - | - | 1.50 | 509 |
| Okra | 250 | 500 | - | - | 0.50 | 500 |
| Onion (green) | 279 | 398 | - | - | 0.70 | 398 |
| Pumpkin | 183 | 366 | - | - | 0.50 | 366 |
| Total | 80,915 | 31,626 | | 1,214 | | 30,412 |

Source: Agricultural Statistic 2004/2005, PCBS
Remark: 1 dunum = 0.1ha, Yield: ton/dunum

**Table B-5-9 Field Cropped Area, Yield and Production of Fruits in Jericho (2004/05)**

| Crop | Production | Total Area | Non-bearing | | Bearing | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Irrigated area | Rainfed area | Irrigated | | Rainfed | |
| | | | | | yield | area | yield | area |
| Banana | 9,800 | 3,305 | 855 | - | 4.00 | 2,450 | - | - |
| Date | 1,274 | 1,988 | 1,139 | - | 1.50 | 849 | - | - |
| Lemon | 942 | 473 | 159 | - | 3.00 | 314 | - | - |
| Grape | 1,251 | 428 | 11 | - | 3.00 | 417 | - | - |
| Shammoty Orange | 645 | 255 | 40 | - | 3.00 | 215 | - | - |
| Blady Orange | 100 | 102 | 62 | - | 2.50 | 40 | - | - |
| Olive | 24 | 80 | - | - | 0.30 | 80 | - | - |
| Clement | 48 | 66 | 34 | - | 1.50 | 32 | - | - |
| Mandarin | 33 | 42 | 20 | - | 1.50 | 22 | - | - |
| Fig | 53 | 35 | - | - | 1.50 | 35 | - | - |
| Bomaly | 30 | 25 | 15 | - | 3.00 | 10 | - | - |
| Poppy | 15 | 25 | 15 | - | 1.50 | 10 | - | - |
| Navel Orange | 45 | 15 | - | - | 3.00 | 15 | - | - |
| Grapefruit | 24 | 8 | - | - | 3.00 | 8 | - | - |
| Francawy Orange | 2 | 7 | - | - | 0.25 | 7 | - | - |
| Valencia Orange | 6 | 2 | - | - | 3.00 | 2 | - | - |
| Total | 14,292 | 6,856 | 2,350 | - | | 4,506 | - | - |

Source: Agricultural Statistic 2004/2005, PCBS
Remark: 1 dunum = 0.1ha, Yield: ton/dunum

*Livestock*

Livestock industry in Jericho Governorate comprised of milk production (goats, sheep and cattle), meat production (broiler, goats, sheep and cows), eggs and honey. The Bedouins living in Jericho Governorate are mostly engaged in the livestock sector. The livestock production rate in Jericho Governorate is relatively low in comparison with other areas.

**Table B-5-10 Livestock Production in Jericho (2004/05)**

Unit: ton

| Governorate | Milk | | | Meat | | | | Eggs (million) | Honey |
|---|---|---|---|---|---|---|---|---|---|
| | Goats | Sheep | Cattle | Broiler | Goats | Sheep | Cows | | |
| Jericho | 2,875 | 2,561 | 2,265 | 367 | 709 | 1,042 | 129 | 1 | 43 |
| West Bank | 30,344 | 51,975 | 78,022 | 41,863 | 7,485 | 21,154 | 4,211 | 434 | 441 |

Source: Agricultural Statistic 2004/2005, PCBS

### (ii) Manufacture Industry

The major economic activities in Jericho are tourism and agriculture. Due to the low level of investment capital in the West Bank area, manufacturing industries in Jericho are very small in scale. This includes food processing, textiles, and cement manufacturing. According to the Jericho Office of MoNE, most of the industries operate at a relatively low rate and are obliged to sell their products at higher prices, resulting in a loss of competitiveness.

**Table B-5-11 Top 10 Manufacturers in the Jericho District**

| Name of Company | Products | Sales 2004 ($ th) | Employees | Export | Op/Capa |
|---|---|---|---|---|---|
| COPSCO | Steel for building | 66,000 | 60 | ○ | 60% |
| West Bank Salt Co. | Salt | 4,000 | 32 | × | 85% |
| Jericho Natural Water Co. | Bottled water | 3,500 | 40 | ○ | 60% |
| Ghosheh Co. | Sausages | 2,100 | 12 | ○ | 50% |
| National Water Co. | Bottled water | 1,600 | 20 | × | 65% |
| Al Awdeh Co. | Concrete | 900 | 10 | × | 10% |
| Arab Development Soc. | Dairy products | 800 | 8 | × | 80% |
| Ashawa Establishment | Clothes | 250 | 20 | × | 20% |
| Brothers Establishment | Clothes | 250 | 18 | × | 60% |
| Jericho Brick Factory | Bricks | 230 | 8 | × | 23% |

Source: Jericho Office, MoNE, Jericho Regional Development Study Project in Palestine, August 2006

**(iii) Tourism**

Jericho has a great number of historical heritage sites located at the crossroads of the east-west tourist corridor, from Jerusalem to Amman, and the north-south tourist corridor from Tiberias to Eilat.

At present, it is a pilgrimage tourism destination for mainly foreign tourists from Europe and the United States. Most of the foreigners traveling to Jericho are group tourists visiting other pilgrimage sites such as, Jerusalem, Nazareth, Bethlehem, etc. Major religious heritage sites that attract visitors are Tell es-Sultan, Monastery of the Temptations (according to scriptures, this was the site where Christ was tempted by the devil), the Sycamore Tree of Zaccheus, Hisham's Palace, and Shahawan House (ancient synagogue). The total number of visitors to Jericho Governorate and the Jordan Valley in 2007 was 636,637, of which 52.5% are foreigners. Among said areas, major tourism resources and facilities are concentrated in Jericho, where most of visitors seemed to visit often.

Jericho is located 300 m below the sea level and the heat during summer is extremely high with over 40 $^{O}$C, and hence, is uncomfortable for tourists. On the other hand, the winter climate is mild which attracts many domestic tourists from Jerusalem, Bethlehem, Nablus and Ramallah. Jericho is known as the winter resort of Palestine.

There are two large hotel resorts in Jericho, namely, the Inter Continental Hotel (5-star, 181 rooms) and the Jericho Resort Village (4-star, 104 rooms). Other major tourism businesses are souvenir shops and restaurants located along Jerusalem Street, at the center of the city and near the Tell es-Sultan.

**Infrastructure Facilities**

### (i) Road Network

*Road Network in the JRRV*

The road network provides the only transportation mode in the West Bank. The existing roads fall into three categories: main, regional and local roads. According to Jericho Regional Development Study Project (August, 2006), the total length of the road network in the West Bank is about 4,456 km.

The West Bank is connected to outside world through a limited number of border crossings, which are controlled by the Israeli authorities. This control restricts the international movement of Palestinians and their goods.


Source MOTA and JICA Study Team

**Figure B-5-9 Road Network in JRRV**

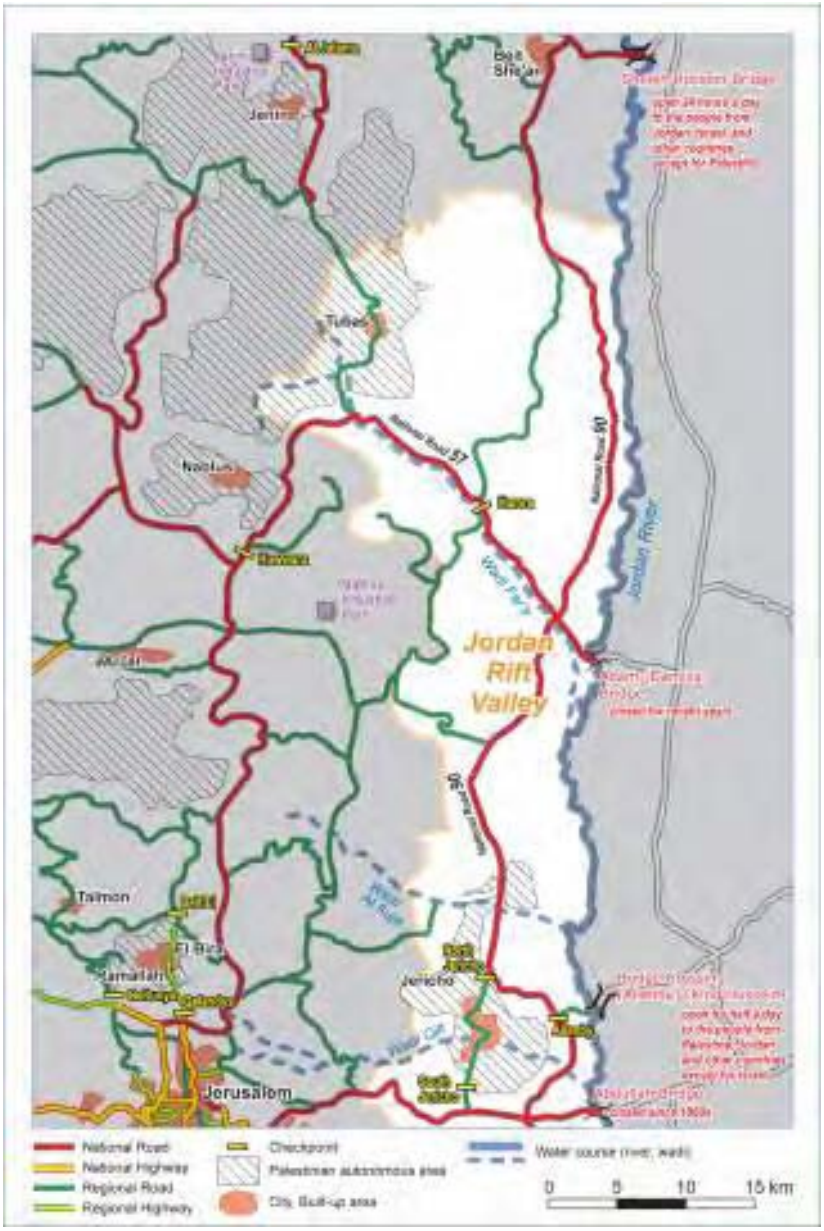
The existing main and regional road network in the JRRV is presented in Figure B-5-9. Route 90, a north-south Israeli artery in the eastern part of the West Bank, totally falls in Area C. In Tubas areas, Hamra

Checkpoint (along Route 57) is reportedly one of the problematic checkpoints hampering the smooth movement between Tubas City and the south-eastern part of the West Bank.

As Jericho City is located at about five km from Allenby Bridge, access from the city to Jordan is geographically easy.

*Road Conditions in the Southern Part of Jericho City*

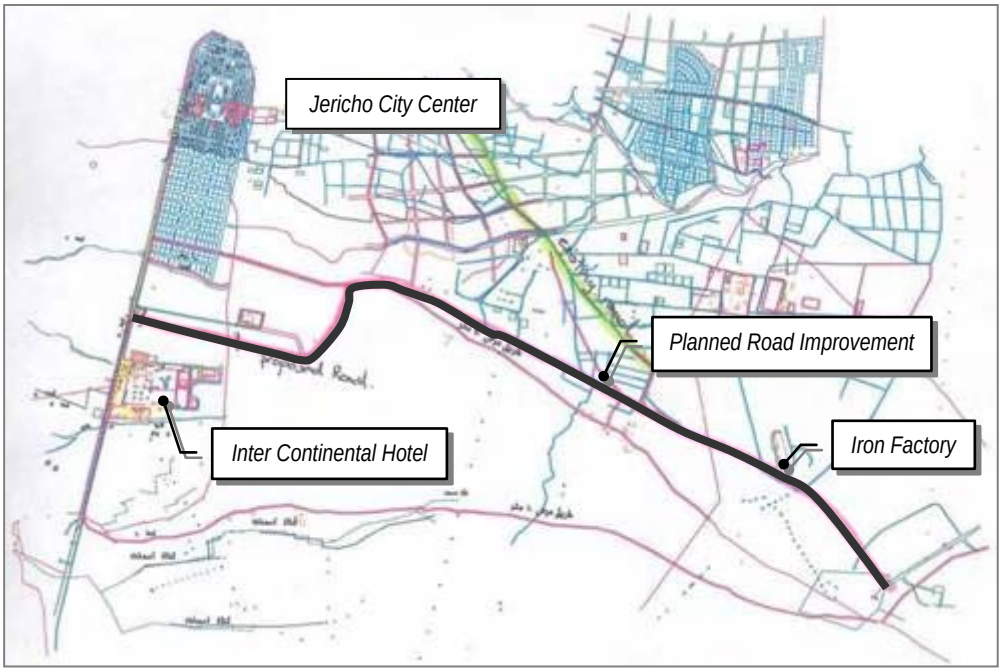
Currently, there are two access roads to Jericho City from outside, through checkpoints. These are Route 90 and Route 449. The other access roads are closed with roadblocks. The inner main roads in Jericho City are mostly paved, and accommodate either two or four lanes.




Source: Jericho Regional Development Study Project in Palestine, August 2006

**Figure B-5-10 Road Network in JRRV**

There is a new road construction plan in the southern part of Jericho City, which has been proposed to the central government and waiting for funding. This road will connect the southern entrance of Jericho City directly to the southern urban fringe (leading to the location of the existing steel factory), without passing through the city center. The total length of the planned section is 3.7 km.




Source: Jericho Regional Development Study Project in Palestine, August 2006

**Figure B-5-11 Planned Road Improvement in the Jericho City**

### (ii) Water Supply

*Water Supply in the JRRV*

The total domestic and industrial (except agriculture) water supply in the West Bank in 2002 was estimated to be 62.8 MCM[12]. In general, urban areas have access to Palestine water resources, while small villages depend on the Israeli wells managed by "Mekorot", an Israeli water supply company. Table B-4-7 shows the actual status of the water supply in the JRRV.

**Table B-5-12 Current Water Supply Conditions in Jericho Communities**

| Communities | | Resource | Network | Population | Consumption ($m^3$/yr) | per capita (lpcd) *1 |
|---|---|---|---|---|---|---|
| Jericho | 'Ein as Sultan Camp | Spring | O | 1,916 | | 207 |
| | Jericho | Spring | O | 19,213 | | |
| | Al Jiftlik | Mekorot | | 4,141 | 63,860 | 71 |
| | Fasayil | Mekorot | | 847 | 34,150 | 110 |
| | Al 'Auja | Mekorot | | 3,774 | 111,530 | 84 |
| | Al Nuwei'ma | Mekorot | | 1,096 | 32 | 0 |
| | Aqbat Jabar Camp | Mekorot | | 5,970 | 340,710 | 156 |
| | 'Ein ad Duyuk al Foqa | Spring | O | 766 | 50,000 | 82 |
| | 'Ein al Duyuk al Tahta | Spring | O | 910 | | |
| | Al Nabi Musa | Mekorot | | 54 | | 20 |
| | Total | | | 38,687 | | |

Source: Water Supply for Domestic and Industrial, PWA, 2003 *1: Including water losses.

[12] *West Bank and Gaza, Infrastructure Assessment*, World Bank, December 2004

*Water Supply in Jericho City*

According to Jericho Municipality and the JST for the Feasibility Study on Water Resources Development and Management in JRRV, the existing water network consists of main lines with a length of 45 km, and individual connection lines to the households with a length of 45 km. The main water resource is Ein–El Sultan spring has a capacity of 650 $m^3$/hr.

Based on the agreement between the farmers and Jericho Municipality, 42% of the water is currently used for the households (including other civil facilities) and 58% for irrigation. The water quality is good for drinking purpose, but is subjected to a potential risk of pollution by seepage of untreated wastewater. The current water balance between supply and demand in the urban area of Jericho City is summarized below.

**Table B-5-13 Current Water Balance in the Urban Area of Jericho City**

| Domestic Water Supply (Jericho Urban Area) | | | | | |
|---|---|---|---|---|---|
| Spring/ Well | | Water Rights | Supply/ hour | Supply/ day | Supply/ year |
| | | | m3 | m3 | MCM |
| Ein El Sultan | Total | | 650 | 15,600 | 5.69 |
| | 1) Agricultural | 58.0% | | 9,048 | 3.30 |
| | 2) Domestic | 42.0% | | 6,552 | 2.39 |
| Well No.1<br>*To be Rehabilitated | | | 70 | 1,680 | 0.61 |
| Total<br>* Including Well No.1 | 0 | | 70 | 8,232 | 3.00 |

| Domestic Water Demand (Jericho Urban Area) | | | | | |
|---|---|---|---|---|---|
| | population | Demand/ day/ capita | Demand/ day | Demand/ day | Demand/ year |
| | (2005) | liters | liters | m3 | MCM |
| Total | 42,268 | 350 | 13,170,000 | 13,170 | 4.81 |
| Urban | 19,783 | 350 | 6,924,050 | 6,924 | 2.53 |
| Rural | 14,366 | 350 | 5,028,100 | 5,028 | 1.84 |
| Camps | 8,119 | 150 | 1,217,850 | 1,218 | 0.44 |
| Urban + Camps | 27,902 | | | 8,142 | 2.97 |
| | | | | BALANCE = (SUPPLY) - (DEMAND) = | 0.03 |

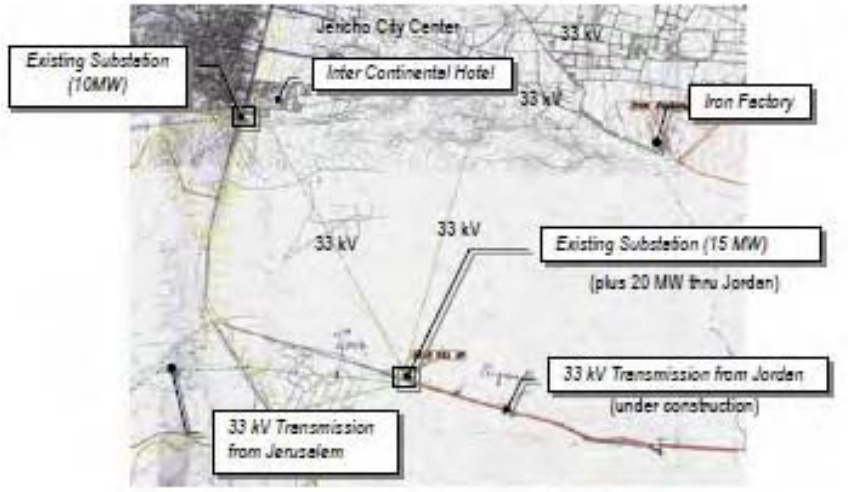
Calculation: JICA Study Team for the Feasibility Study on Agro-industrial Park Development in the Jordan River Rift Valley (Phase I)

Source: JICA Study Team for the Feasibility Study on Water Resources Development and Management in the Jordan River Rift Valley

### (iii) Electricity Supply

Palestinian Energy and Natural Resources Authority (PENRA) is responsible for policy, sector development, regulation and generation, and transmission. According to PENRA, the West Bank is entirely dependent on imported electricity supplies. The current maximum capacity of electricity supply to the West Bank is about 550 MVA. IEC directly and indirectly supplies 30% and 70%, respectively through JDECO.

Power supply in the JRRV is currently unstable due to the insufficient capacity of the facilities. In order to overcome this situation, the PNA is trying to increase the supply capacity.




Source: Jericho Regional Development Study Project in Palestine, August 2006

**Figure B-5-12 Power Transmission Grid in the South of Jericho City**

The current and future power supply in the West Bank is as shown below.

**Table B-5-14 Current and Future Power Supply in the West Bank**

| Year | Status | Capacity | Power Source |
|---|---|---|---|
| 2007 | Existing | 500 MW | IEC |
| 2008 | Decided | 20 MW | From Jordan |
| 2012 | Option (High Scenario) | 250 MW | New Israeli Power Plant or from Jordan |
| Total Supply in 2012 | | 770 MW | |

Source: Energy Sector Review Report, World Bank, May 2007

**(iv) Wastewater Collection/Treatment**

Wastewater is currently either untreated or partially treated almost everywhere in Palestine. According to the existing reports related to the wastewater sector in Palestine, most of the existing treatment plants are overloaded, poorly equipped and maintained. This poses a major threat to plant workers, farmers, and consumers. According to the PWA, approximately 60% of the houses in the urban communities are connected to sewerage systems. However, some large cities/towns have no treatment systems. In the rural areas, no sewerage systems exist and wastewater is collected in cesspits or septic tanks.

There is no wastewater collection system at present in Jericho City. All sewage from residential and public buildings in the area is drained to cesspits.

The project for wastewater collection and treatment was once proposed in 2005.The sewage network plan for Jericho City consists of the following components[13]:

- Sewerage collector pipelines (approximately 45 km)
- Irrigation pipeline network (approximately 15 km)
- Sewerage treatment plant, building structure
- Sewerage treatment plant, electro-mechanical components

The capacity of the planned sewage network is as shown below.

[13] This project was proposed as a grant-aid-project to Japanese government in 2005.

**Table B-5-15 Capacity of the Planned Sewage Network Plan for Jericho City**

| | Daily Average | Daily Maximum | Hourly Maximum |
|---|---|---|---|
| Sewerage Treatment Plant | 4,000 $m^3$/day | 5,000 $m^3$/day | 10,000 $m^3$/day |

Source: Jericho Municipality (Engineering Department)

**(v) Solid Waste Management**

JCspd is an official organization established in 2005 to provide solid waste management in the JRRV. It started its service in January 2007. Its service area covers 17 Local Authorities (LA) located in JRRV, as shown Table B-4-11. JCspd collects waste on a daily basis (except Fridays) and use four landfills such as Jericho, Al-Ojah, Tubas and Tovlan. JCspd made agreements with Jericho Municipality and Al-Ojah Council regarding common use of Jericho and Ojah dump sites.

**Table B-5-16 Local Councils of JCspd for SWM in JJRRV**

| Name of LA | Governorate | Name of LA | Governorate |
|---|---|---|---|
| 1. Jericho | Jericho | 9. Ein Al-Bidah | Tubas |
| 2. Al-New'meh & Edyuk Al-Foqa | Jericho | 10. Kardalah | Tubas |
| 3. Al-Ojah | Jericho | 11. Bardalah | Tubas |
| 4. Fasayel | Jericho | 12. Froosh Beit Dajan | Nablus |
| 5. Al-Jiftlik | Jericho | 13. Ein Shibli | Nablus |
| 6. Zbidat | Jericho | 14. Nawaji | Nablus |
| 7. Marj Al-Ghazal | Jericho | 15. Beit Hasan | Nablus |
| 8. Marj Na'jeh | Jericho | 16. Al-Nassaryyah | Nablus |
| | | 17. Al-Aqrabanyyah | Nablus |

Source: Basic Plan of JCspd prepared by Palestinian counterparts and JICA Expert Team

JCspd dealt with only domestic and commercial/institutional waste in 2007, as shown in Table B-4-12.

**Table B-5-17 Target Waste of JCspd for 2007**

| Category | Generation (ton) | Service area | Collection and transportation | Disposal |
|---|---|---|---|---|
| Domestic waste | 50/day | All target areas | JCspd | Dumping at landfill site |
| Commercial waste | 5/day | Jericho | JCspd | Dumping at landfill site |
| Agricultural waste | 1,200/year | To be studied | | |
| Hospital waste | 0.1 | Hospitals , Clinics | Ministry of Health | - |
| Night soil (sewerage) | 40-50/day | - | Private person, with charges for collection | Dumping at landfill site (tentative) |

Source: Basic Plan of JCspd prepared by Palestinian counterparts and JICA Expert Team

The Jericho dump site has been improved since the middle of January 2007, with the technical assistance provided by JICA. This is expected to prolong the life of the existing dump site. Extension of the existing dumping site is currently being planned by Jericho Municipality.

**Medical and Health Services**

Available medical and health facilities in Jericho City are listed as follows.

- Jericho New Hospital
- Jericho Center for the Disable
- Medical Care Center
- Medical Center Clinic
- Medical Relief Center
- Palestinian Red Crescent
- UNRWA Medical Center
- UNRWA Health Center

These are situated in the city center and outside the area.

Jericho New Hospital was constructed through a grant aid from Japan in 1998. Most of the medical and health facilities in Jericho City are operated by international agencies such as Red Crescent and UNRWA.

**Cultural and Recreational Facilities**

The following are the five cultural and recreational facilities in Jericho City, which are listed on Jericho Tourist Map published by Jericho Municipality.

- Palestinian Equestrian Club (Horse Riding Club)
- Papaya Park (Recreational facility including summing pool)
- Jericho Community Center
- Spanish Garden Park
- Jericho International Stadium (Soccer stadium)

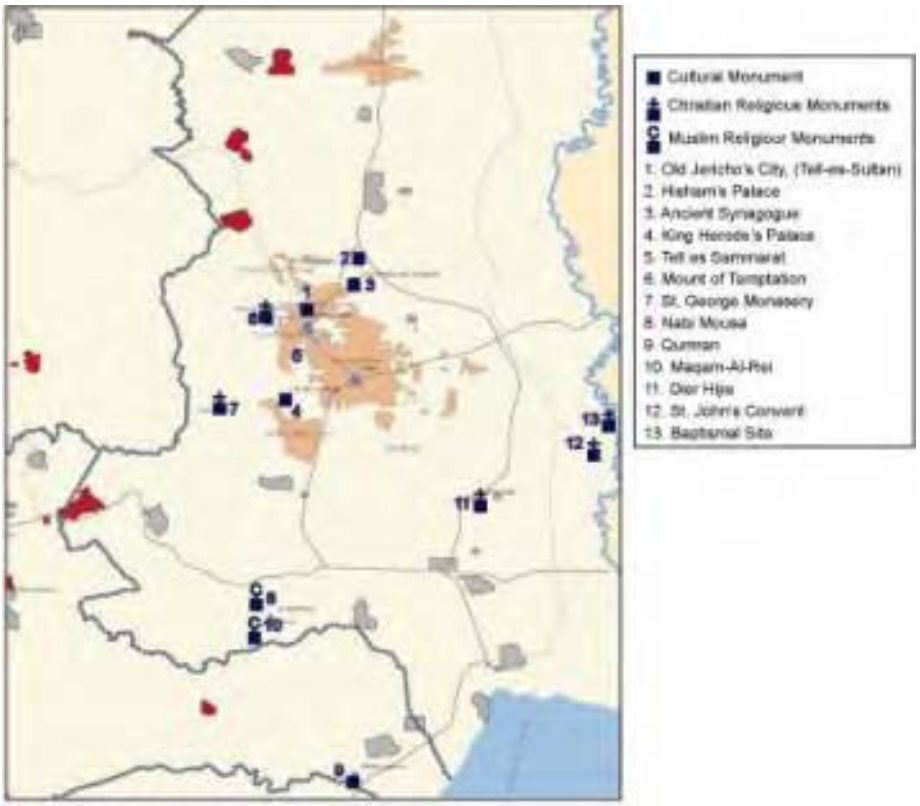
Detailed information and features of these facilities are also presented in the Jericho Tourist Map. These facilities are used by local residence and visitors from outside of Jericho.

**Photo: Soccer Stadium**

Three facilities, namely, Palestinian Equestrian Club, Papaya Park and Jericho Community Center are located about 1 km north of the project site.

**Historical and Religious Sites**

Since pre-historic times, the JRRV area has been the passageway for many civilizations and a cross-road with tracks of history. The various civilizations that lived in the area contributed towards the unique culture of residents the JRRV. Abundant historical and cultural remains were left behind during the passage of many different civilizations and the exchange of human activities. These remains are now recognized as valuable cultural and historical assets and are regional tourist attractions. The major assets in the Greater Jericho are introduced below. Jericho area has 532 archaeological sites, including 83 main archaeological sites and 449 archaeological features such as caves, churches, springs etc. Among these, only twenty have been excavated. As shown in the chronology, the Jericho and JRRV areas have had a unique impact on history, religions and cultures.




Source: Jericho Regional Development Study Project in Palestine, August 2006, JICA

**Figure B-5-13 Location of Historical and Cultural Sites in Jericho and its Surrounding Areas**

**Table B-5-18 Major Historical and Cultural Uniqueness of Jericho City**

| Uniqueness | Contents |
|---|---|
| Historically important sites | - Tell es-Sultan, "The oldest city in the world"<br>- Birth place of agriculture and civilization<br>- The center of Christianity in Roman times |
| Multi-religious sites | - Objects of Christian, Muslim, and Jewish religions can be observed throughout the city. |
| Multi-cultural sites | - Objects of Roman, Arabic, and Byzantine times can be observed throughout the city. |

Source: Jericho Regional Development Study Project in Palestine, August 2006, JICA

There are no historical and religious sites near the project site. The closest religious site is the Muslim cemetery located about 1 km north of the project site.

## B.6 Potential Environmental and Social Impacts and Mitigation Measures (Stages I and II)

This section deals with practical mitigation measures to minimize, reduce and eliminate identified negative impacts caused by project implementation phase such as pre-construction, construction and operation phases. This section focuses on potential environmental and social impacts and mitigation measures in the case of the simultaneous development of stages I and II. Anticipated impacts are referred to "Specific EIA Requirements" while scoping of impacts and mitigation measures are based on "Matrix of Scoping based on the Palestinian Environmental Components Standard", shown in Attachment 2.

### (1) Impacts and Mitigation Measures during Pre-construction Stage

**Economic Component**

#### (i) Land Use and Land Value

The geological condition of the site is featured by sandy soil with low water content, which is unsuitable for vegetation, flora and fauna. The present land use and landscape in the project location is described in (1) of B.5. The type of land is designated as desert and not suitable for agriculture use. Nevertheless, the planned land use for the Agro-industrial Park would induce impact on land values of areas surrounding the site. The impact of the Agro-industrial Park development on land value was raised during the first stakeholders meeting held 10 June 2008.

The planned land use for the project is summarized in the table below:

**Table B-6-1 Planned Land Use Area**

UNIT: $m^2$

| Item | Site I | Site II | Sub-total (I+II) | Site III | Total (I+II+III) |
|---|---|---|---|---|---|
| Factory area | 47,590 | 189,140 | 236,730 | 289,720 | 526,450 |
| Office building area | 12,760 | 10,000 | 22,760 | 9,940 | 32,700 |
| BDS Center | 0 | 8,990 | 8,990 | 0 | 8,990 |
| Distribution area | 14,330 | 24,070 | 38,400 | 22,150 | 60,550 |
| Storage area | | 13,220 | 13,220 | 17,170 | 30,390 |
| Park area | 1,880 | 18,750 | 20,630 | 25,440 | 46,070 |
| Common utility area | 12,890 | 29,500 | 42,390 | 21,260 | 63,650 |
| Parking area | 4,100 | 16,290 | 20,390 | 19,890 | 40,280 |
| Bus station/Security area | 0 | 12,890 | 12,890 | 0 | 12,890 |
| Internal road | 14,370 | 69,470 | 83,840 | 95,930 | 179,770 |
| Access road | 0 | 17,950 | 17,950 | 2,090 | 20,040 |
| Area required for *Wadi* Improvement[14] | 0 | 27,670 | 27,670 | 10,890 | 38,560 |
| Sloped land due to land reclamation[15] | 7,080 | 20,010 | 27,090 | 27,570 | 54,660 |
| Unused area | 0 | 42,050 | 42,050 | 0 | 0 |
| Total | 115,000 | 500,000 | 615,000 | 500,000 | 1,115,000 |

Source: JICA Study Team

[14] The existing alignment of *Wadi* would be modified into the artificial canal with a sufficient capacity of water flow.
[15] Due to land reclamation works, the sloped land would be created at the boundary of areas with each elevation.

*Impacts*

The simultaneous development of stages I and II encompasses improvement of the existing Road 1 and 2 (increase of road width to 20m), construction of Access Road A-2 and on-site development including Lots I and II. Because of the relatively large-scale of development, land price of the area surrounding the site at the pre-construction phase will appreciate considering that the project site will be classified as industrial area. The land adjacent to the site is a sloped landscape with an existing *Wadi* which will restrict future development. *Wadi* improvement plan would cause appreciation of land price of the site, which could affect the PNA, the purchaser of Lot II. Land prices along the existing roads to be improved are also expected to appreciate, particularly during the construction stage.

*Mitigation measures*

The PNA (Land Authority) would be responsible for the control of land price, at least, for any public projects which include planning to purchase land in the surrounding areas. The PNA should also regulate speculative investment on land in the surrounding areas; otherwise, this would trigger off increase in land price more than expected. As an option for mitigation measure, the Steering Committee could establish a working group to conduct surveillance of land price. It is recommended that Lot II should be secured by the PNA as early as possible, in order to avoid payment for the increased portion of land price.

**(ii) Indigenous Community**

*Impacts*

Construction of the existing Roads 1 and 2 will require relocation of some existing Bedouin communities located near the site or along part of the existing roads. At present, the number of Bedouin households is 15 in the said area. The affected Bedouin households will have to relocate before the commencement of construction works.

*Mitigation measures*

At the pre-construction stage, the issue of Bedouin communities' relocation has to be solved. It was found out that there are no legal procedures, laws or guidelines for relocating the Bedouin in Palestine. According to several consultations with local stakeholders and the Jericho Municipality, the land where Bedouin community has settled belongs to Al Hussein Family and not to the Bedoins. They have settled in this land for about 15 years. Seasonal movement of Bedouins has not been observed. It seems that they fix their present settlement while spreading during the day time. To mitigate the issue as stated by the Ministry of Local Government and the Jericho Governorate, the Jericho Municipality has to firstly discuss the issue with the Al Hussein Family. Secondary, in order to settle the issue, it needs to establish a committee which will include members from the Jericho Governorate. The Jericho Governorate is responsible in following up the tasks of the committee. An appropriate action for resettlement including explanation of the project to Bedouins and provision of alternative locations has to discussed and decided during the pre-construction stage.

### (2) Impacts and Mitigation Measures during Construction Stage

**Biophysical, Resources and Land Use Components**

#### (i) Air Quality

*Impacts*

Dust, odors, and fumes generated from the construction activities, particularly land grading and road construction, would cause deterioration of air quality. Exhaust gas emitted from the construction vehicles during the works may also cause air pollution. When Khamaseen wind (hot, dry, and sandy wind) blows from the Saudi Arabia, impact of dust will be very severe.

*Mitigation measures*

The corresponding mitigation measure is to install construction screen sheets around the construction site, in order to prevent dust propagation around the Jericho area. This measure will not totally prevent dust from spreading but will somehow reduce its propagation.

The contractors are required to use properly maintained or new vehicles and equipment with low emissions, which will not induce air pollution from exhaust gas. Most of the construction equipment in the West Bank use diesel as fuel, which could worsen air quality. For this reason it is recommended to check type and age of the vehicles and machines.

Sprinkling water by sprinkler trucks can prevent dispersion of dust when road and reclamation construction is conducted. Mobilization of sprinkler trucks has been often observed in road construction works in Palestine.

#### (ii) Flora and Fauna

*Impacts*

Millions of migratory birds pass through JRRV and the rest in Jericho area. During the construction work, noise, vibration and exhaust gas will cause negative impacts to the migratory birds. Hence, Palestine Wildlife Society (PWS) installed a bird monitoring station in Jericho.

Plants and vegetation will not be affected during the construction stage since the site is designated as a desert land with low vegetation density.

*Mitigation measures*

It is recommended to keep track and monitor the migratory birds especially through the bird watching facility in Jericho which is managed and operated by the PWS. The monitoring of birds should be conducted on the short and the long term by PWS in order to analyze the detailed impact.

**(iii) Water Resources**

*Impacts*

Contamination can be related to any oil spills or from dust and fumes that might accumulate on the surface of the ground. The *Wadi* does not have running waters all year round but mainly during the winter and spring seasons only. Thus, if construction takes place during the winter and spring seasons, then precautions should be taken regarding any kind of spill. Ground water resources might not be affected unless a huge contamination is taking place.

*Mitigation measure*

Appropriate safety operation and management of the construction is the main mitigation measure to prevent surface water from being contaminated In case any spills of hazardous chemical liquids and oils occurred while operating the machines during construction works, the machine should be stopped and removed from the site. Regular monitoring of the construction work and inspection of construction equipment are also required.

It is also required to flow the water utilized in the process of placing concrete into *Wadi*, after improving the water quality in turbid water treatment.

**Socio-economic Environment**

**(i) Employment and Local Economy**

*Impacts*

Construction work for the Agro-industrial Park development creates substantial employment opportunities, which surpass labor force available in Jericho. The simultaneous development of stages I and II would lead to sever labor shortage problems as compared to stage-wise development.

*Mitigation Measures*

To solve the labor shortage problem, contractors would have to mobilize construction workers outside the Jericho Governorate. These contractors usually construct temporary houses for construction workers commuting from remote areas or negotiate contract with local transportation service companies for transporting commuting workers.

**(ii) Land Use and Land Value**

*Impacts*

Land price along the existing roads will appreciate as a result of effective implementation.

*Mitigation measure*

During the construction stage, the Jericho Municipality would be responsible for control of land price in the area along the existing roads. Speculative investment on land will be strictly monitored and controlled in order to avoid speculation-led increase of land price.

**(iii) Traffic Movement**

*Impacts*

Construction vehicles may create traffic congestion at the security checkpoint of Jericho City (Jericho DCL checkpoint) during the peak time of construction. This will affect movement of tourist transportation (busses and taxis) coming and leaving Jericho City during tourist peak season (From March to April, from November to December).

*Mitigation measure*

In order to reduce the impacts of traffic congestion during the construction stage, the PNA (PIEFZA) is requested to coordinate with the Israel security authority to provide one special lane for incoming and outgoing trucks for construction. Contractors would have to inform the security authority in advance regarding the car registration number, name of drivers/passengers and consigned materials. The system for providing advance information on the transported equipment and the pre-registration will facilitate delivery to the Agro-industrial Park. During summer season, construction activities would be shifted to night time due to high temperature as mentioned in Figure B-5-4 in Chapter 5. Night shift works would need public consultation in order to acquire permission from local residents, and avoid misunderstanding.

**Health and Safety**

**(i) Air Quality**

*Impacts*

Dust, odors, and exhaust gas from the construction works induce negative impact to the surrounding area of the project sites. Local residents along the existing Roads 1 and 2 may be affected by dust and exhaust gas from construction vehicles. In special windy (Khamaseen) season, Jericho area may be affected with mixed dust and fumes which could have health impacts to some surrounding communities.

*Mitigation measures*

The corresponding mitigation measure is to install construction screen sheets around the site in order to prevent dust propagation around the Jericho area. This measure will not totally prevent dust from spreading but will somehow reduce its propagation.

Regulations shall be set for utilizing efficient construction vehicles with less exhaust gas emission and for controlling traffic volume and speed of those passing along the access roads.

Sprinkling water by sprinkler trucks can also prevent dispersal of dust when road and reclamation construction is executed.

**(ii) Noise and Vibrations**

*Impacts*

Construction vehicles and equipment will cause noise and vibration during the construction works. Particularly, heavy construction vehicles passing through the existing Roads 1 and 2 will create noise and

vibration and induce negative impacts to residents along the vicinity of said existing Roads.

*Mitigation measures*

Using sound-insulated equipment and setting up fence around the construction site will reduce the average noise level during the construction work. Work equipment should be well maintained to minimize noise level.

Construction workers must use hearing protection aids when the noise level exceeds 85dBA, in accordance with West Bank and Gaza Industrial Estate Environmental Manual.

Control of traffic volume and speed of construction vehicle will reduce noise and vibration and minimize impacts to residents along and near the existing roads.

**(iii) Health and Safety of Worker**

*Impacts*

Construction workers are subjected to potential risks of accident and injury if proper operation and management of the construction work is not initiated by the contractor. The health and safety of workers in the Jericho area are at risk due to high heat and very hot conditions.

*Mitigation measure*

By distributing safety gadgets such as helmets and boots, and requiring workers to wear them, risks on their physical safety will be reduced. Workers' health and safety can also be ensured by checking workers' physical conditions and conducting safety patrol everyday by contractors.

Construction works at night time will make construction activities much easier. The working condition would then be better than the day time especially during the spring and summer seasons.

In case of injury or accidents of a construction worker, Jericho Hospital is the main medical facility for accommodating patients. For smooth emergency transport of the patient, the existing Road 1 needs to be developed.

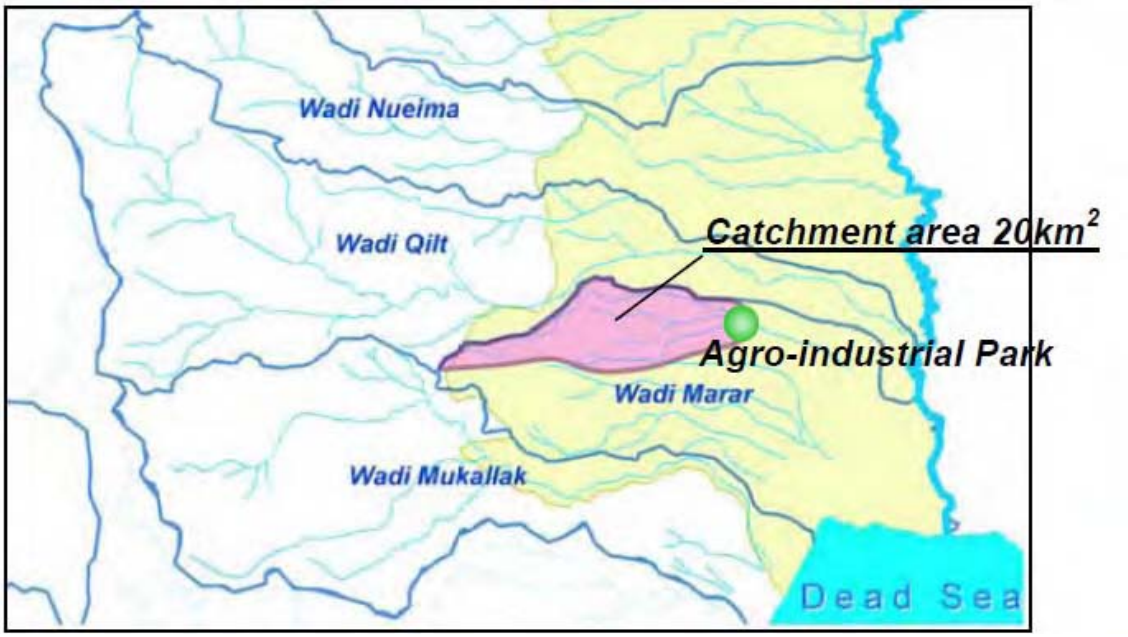
**(3) Impacts and Mitigation Measures during Operation Stage**

**On-site Infrastructure**

**(i) Water Resources**

Surface water

A *Wadi* is crossing at the center part of the candidate site from west to east direction, with a catchment area of about 20 $km^2$, located in the *Wadi* Marar basin. The development sites for Lots I and II can cause flooding and obstacles to the natural flow of water at the site. This basin does not cover the western highlands where rainfall is comparatively high as shown in Figure B-6-1. Therefore, influence of run-off due to rainfall in this catchment area is not critical. At the same time, it needs to be taken into consideration especially for intense rainfalls.




Source: JICA Study Team

**Figure B-6-1 Catchment Area of *Wadi* Marar**

Although the run-off due to rainfall is not significant, part of *Wadi* located in the candidate site shall be improved and protected against conceivable probable flood to avoid erosion due to water flow. However, hydrological data for this *Wadi* is hardly available. According to information from nearby residents, in recent years, run-off takes place with a depth of 20-30 cm when rainfall occurs for a few months during the winter season.

*Impacts*

The impact and the flooding of the *Wadi* was estimated from the analyzed data on the *Wadi* Kafrein Dam in the Jordan River East Bank in Jordan. These analyzed data were transposed to the Agro-industrial Park using the Creager's formula.

Fifty years probable flood of 55 $m^3/s$ is adopted as the design discharge of *Wadi* improvement.

**Table B-6-3 Estimated Probable Floods of *Wadi* in the Site**

Source: JICA Study Team

| Return Period | Kafrein Dam Site (CA=161 $km^2$) | | *Wadi* at Agro-industrial Park (CA=20 $km^2$) | |
|---|---|---|---|---|
| | Peak Discharge ($m^3/s$) | Creager's C Value ( - ) | Probable Flood ($m^3/s$) | Specific Discharge ($m^3/s/km^2$) |
| 2-year | 42 | 1.56 | 11 | 0.5 |
| 10- year | 106 | 3.94 | 27 | 1.3 |
| 25-year | 154 | 5.72 | 39 | 2.0 |
| 50- year | 218 | 8.10 | 55 | 2.8 |
| 100-year | 267 | 9.92 | 68 | 3.4 |

The *Wadi* area is sandy clay which is weak against erosion due to water flow. Partial erosion in *Wadi* will be anticipated at upstream and downstream of planned bridges, and inlet and outlet portions for the development site in Lot II.

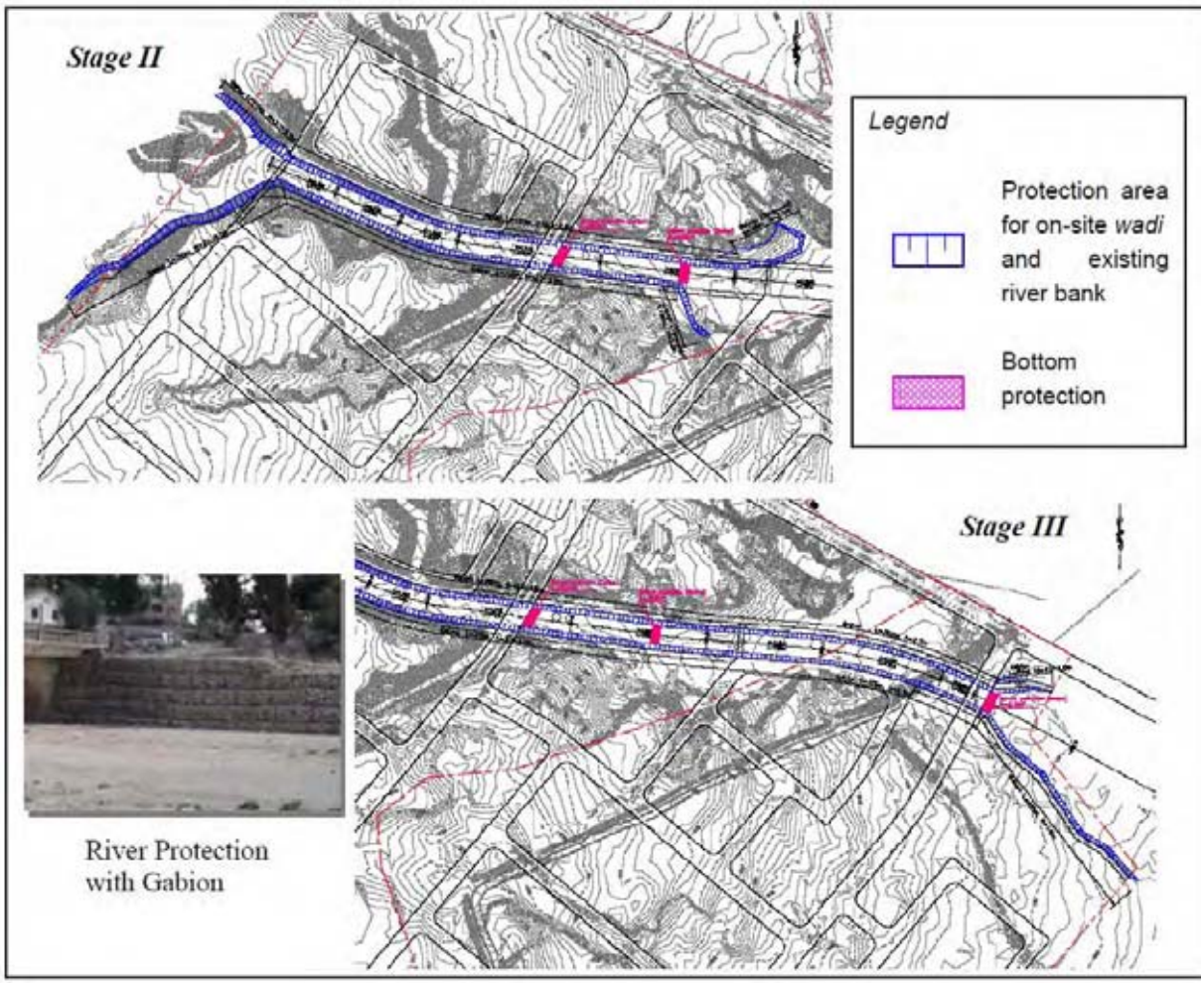
*Mitigation measure*

*Wadi* improvement is a mitigation measure for preventing its partial erosion. Detailed *Wadi* improvement plan and design is described in the section for on-site infrastructure and facility planning, Chapter 3 in Volume 1. The basic concept of *Wadi* improvement is as summarized below.

**Table B-6-4 Basic Concept of *Wadi* Improvement Work in the Stage II**

| Item | Outline |
|---|---|
| Alignment | *Wadi* alignment after improvement is designed as a gentle curve along the existing *Wadi* alignment. |
| Channel Width | In view of securing the available space for factory area and related facilities, the width of *Wadi* is expected to be as narrow as possible. On the other hand, extreme decrease of width of *Wadi* by artificial structure may cause scouring of riverbed and/or erosion of river bank due to fluctuation of flow velocity. Taking into consideration both issues, design width is considered to be 20 m at the bottom instead of the present average bottom width of 30 m. |
| Channel Depth | Design depth is planned to be 2.5 m in order to minimize the height of river protection. This will be further protected with gabions with an appropriate volume of backfill materials. |
| Protection Works | Protection works is required to prevent partial erosion at upstream and downstream of bridges and inlet and outlet portion of the area for each construction stage. This was required since the geological condition of this area is sandy clay which is weak against erosion due to water flow. |

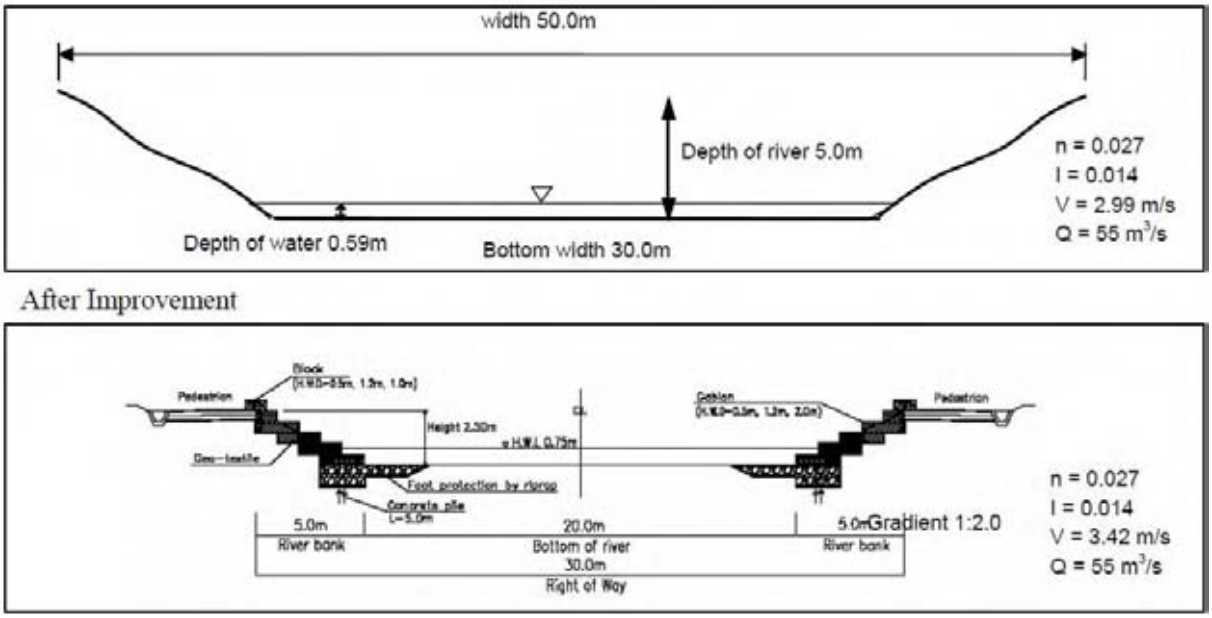
Source: JICA Study Team




Source: JICA Study Team

**Figure B-6-2 River Improvement and Protection Area**

Based on the calculation results, typical cross section of *Wadi* improvement was determined as shown in Figure B- 6-3. Flow depth changes from 0.59 m to 0.75 m, while flow velocity increases from 2.99 m/s to 3.42 m/s. Protection works will be studied considering flood probability, geological condition, and financial aspects.




Source: JICA Study Team

**Figure B-6-3 Typical Cross Section of *Wadi* Improvement**

Groundwater

*Impacts*

Surface and groundwater can both be contaminated if raw sewage is allowed to flow out of the site. It should be realized that the soil type at the site is highly permeable according to the geological surveys (borehole tests) conducted. Results of the tests are shown in the following Table B-6-5. The samples were taken at locations shown in Figure B-6-4.

**Table B-6-5 Soil Condition at Selected Site by Geological Survey**

| Sample No. | Visual Description |
|---|---|
| 1 | Light brown fine grained cohesive non- organic silt |
| 2 | Light brown fine grained cohesive non-organic silt |
| 3 | Grayish fine grained cohesive laminations of silty non-organic formation |
| 4 | Grayish fine grained cohesive laminations of silty non-organic formation |

Source: JICA Study Team


Source: JICA Study Team

**Figure B-6-4 Location of Site for Geological Survey**

The water level nearby the Agro-industrial Park was studied based on the data provided from the PWA, in order to estimate the groundwater elevation. The provided data indicated that there are no wells either for drinking or for agriculture that are in the direction of groundwater movement. The movement of ground water as shown in the figure below moves mainly eastward, towards the south of the Jordan River area and the Dead Sea. Hence, the impact on groundwater is considered to be very low and that there would be no contamination of any existing wells. According to the topographic survey done for the site, the ground level on average is about 300 m below sea level. The figure below shows that the ground water level at about 355 m below sea level near the site and reaches 375 m going eastward. This means that there is an average 60 m difference between the surface of the site and the ground water level. It thus imply that ground water contamination level is not very high but can be significant if high amounts of raw sewage are being discharged.

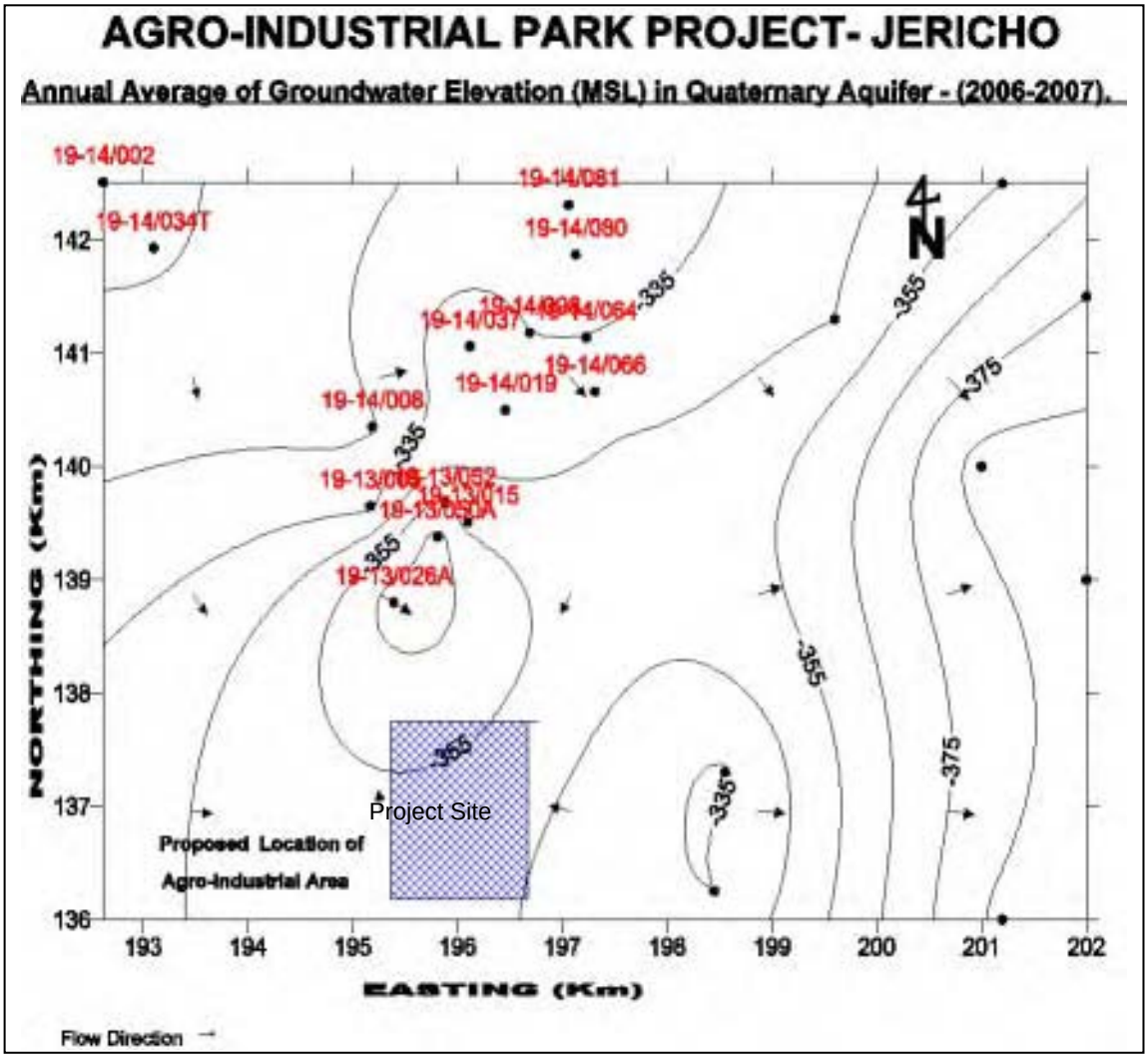



**Figure B-6-5 Annual Average of Ground Water Elevation in Qualitative Aquifer (2006-2007) in the Project Site and its Surrounding Area**

*Mitigation measure*

In order to mitigate impacts on the groundwater, it is planned to operate a wastewater treatment facility at each stage. In stage I, the wastewater treatment facility shall be located at the southern corner of the site right next to a composting or compost sorting facility. Stage II also includes a treatment facility at the south of the *Wadi*. In the case of the simultaneous development of stages I and II, wastewater treatment and solid waste treatment facilities would be combined as one facility in Lot 2.

As explained in the analysis of alternative plans in Chapter 4, it is recommended to apply the oxidation ditch process with de-nitrification, which will reduce the impacts of increased nutrients and pollutants flowing into the groundwater. Treated wastewater is also to be used to sprinkle green and park areas, and sold to dates farms located near the site.

**(ii)Wastewater**

*Impacts*

Generated wastewater from each factory will need to be collected into a separate collection system as explained in analysis of alternative plans in Section B.4. Discharging the industrial wastewater related to certain industries directly to the main wastewater treatment facility can either block the system or will not meet the effluent recommended standards.

Generally, wastewater generated from agro-industrial processes have less hazardous components but larger organic content.

Anticipated impacts caused by the waste water treatment plant are overflow of the collection system or any leakage of wastewater outside distribution pipelines. Contamination of soil, ground water can be direct impacts due to leakage of wastewater. Bad smell and health hazards are expected to be caused by such problems.

*Mitigation measure*

The wastewater treatment itself in this project is considered as a mitigation measure to prevent natural resources (ground water) from being contaminated by the nearby site.

Pre-treatment is a main mitigation measure that was included within the design, which increases the efficiency of the general treatment process due to removal of unwanted materials in the wastewater.

The wastewater collection facilities would be designed to meet hourly maximum discharge as follows in order to avoid any overflow that might lead to leakage in the collection system.

The hourly maximum discharge per unit area for the wastewater treatment facility is shown below.

**Table B-6-6 Hourly Maximum Discharge per Unit Area for Wastewater Treatment**

| Stage | $m^3$/hour/ha |
|---|---|
| I | 1.74 |
| II | 1.38 |
| III | 2.04 |

Source: JICA Study Team

Use of reclaimed water from the wastewater treatment facility is also one the mitigation measures suggested in order to utilize treated water for irrigation around the park. For this reason, a reclaimed water distribution system is proposed in the on-site facility.

**(iii) Solid Waste Disposal**

*Location and design of solid waste sorting and composting facilities*

Activities of the solid waste treatment systems such as recycling and composting in the Agro-industrial Park would be planned based on the concept of "Zero-Emission." This is intended to be a model activity which would contribute to the Palestinian environmental strategy for solid waste management. The location of solid waste facilities will be at the south side of stage I, and at the south side of the *Wadi* in stage II. In the case of simultaneous development of stages I and II, solid waste treatment facilities would be combined into one facility in Lot II.

*Treatment Methods*

The treatment methods are related to the waste type and can be summarized in the following table:

**Table B-6-7 Application Technology or Treatment Methods of Solid Waste**

| | Off-site | | On-site | | | | |
|---|---|---|---|---|---|---|---|
| Type of waste | Sorting and storage | Composting | Collection and internal transportation | External Transportation | Recycling | Feed | Landfill |
| Recyclables | ○ | - | ○ | ○ | ○ | - | - |
| Food Processing Waste | ○ | ○ | ○ | ○* | - | ○ | - |
| Wood | ○ | ○ | ○ | ○* | △ | - | - |
| Other Wastes | ○ | - | ○ | ○ | - | - | ○ |
| Dewatered Sludge | ○ | - | ○ | ○ | - | - | ○ |

(○): Application technologies or treatment methods
(△): In case that wood is not used for composting, alternatively, it could be recyclables.
*: Food processing waste and wood are transported as compost in case of on site.
Source: JICA Study Team

Treatment facilities for production of feeds or compost and solar drying beds are categorized as off-site processes.

*Impacts*

The on-site facilities for solid waste management are mainly for sorting of solid waste and then transferring them to the different treatment stations off-site. The negative impacts can be related to several factors but the most important one can be related to poor handling and storage management of the generated wastes. In such case, the negative impacts can be summarized as follows:

- Littering at the Agro-industrial Park especially during the Khamsaeeny wind periods and contamination of the nearby *Wadi* (surface water).
- Attraction of insects, rodents and birds.
- Deterioration of air quality around the site
- Bad smell
- Sludge accumulation from wastewater treatment

*Mitigation measures*

The developer should be responsible for the mitigation measures for solid waste management and facilities on-site. Proper management and operation of the system is the main concern of mitigation.

- Appropriate management and operation of solid waste facilities and handling and capacity building for solid waste management are needed.
- Concerning odor reduction, a deodorizing system shall be used in order to reduce the smell from the site. An appropriate order reduction system will be applied with a deodorizing substance such as "Rock wool" and "Zeolite".
- The attraction of birds, rodents, and mosquitoes can be mitigated by sealing the facility for the sorting stock yard.
- Sludge accumulated shall be dewatered on site. Dewatering can be done using suitable facilities.
- Recyclables accumulated at the site can be reused. Woods can be useful for the compost production using saw dust machines to make the fine pieces. This will make it easier for use with the composting production. Metals can be transferred directly to the steel factory nearby the site.

**Off-site Infrastructure**

**(i) Access Roads**

The following table shows the expected volume of traffic for the different stages development:

**Table B-6-8 Daily Traffic Volume to and from the Agro-industrial Park and Steel factory**

Unit: vehicles/day

| Vehicle Category | | Steel factory | Stage I | Stage II | Sub-total (I+II) *Inc. Steel factory | Stage III | Total (I+II+III) *Inc. Steel factory |
|---|---|---|---|---|---|---|---|
| Passenger car/ Van | | 17 | 423 | 1,500 | 1,940 | 2,250 | 4,190 |
| Bus | | 8 | 52 | 210 | 270 | 300 | 570 |
| Single unit truck | | - | 80 | 290 | 370 | 450 | 820 |
| | In-bound | - | 40 | 147 | 187 | 228 | |
| | Out-bound | - | 40 | 143 | 183 | 222 | |
| Heavy trailer | | 50 | 20 | 80 | 150 | 110 | 260 |
| | In-bound | 30 | 8 | 34 | 72 | 45 | |
| | Out-bound | 20 | 12 | 46 | 78 | 65 | |
| Total | | 75 | 575 | 2,080 | 2,730 | 3,110 | 5,840 |

Source: JICA Study Team

*Impacts*

- Traffic congestion in the center in Jericho City especially during commuting hours and tourist peak season.
- Noise and vibration to commercial and residential areas along the existing roads.
- Heavy trucks mixed with the main traffic.
- Deterioration of the city road network.

*Mitigation measures*

- Improvement of the existing roads 1 and 2 to increase road width to 20 m would sufficiently accommodate the traffic volume and alleviate traffic congestion of Jericho City in stages I and II.
- Noise and vibration to the communities will be reduced except for nearby communities along the existing roads

- Commercial traffic to and from the Agro-industrial Park should be separated from general traffic by limiting the existing Road 1 to commercial vehicles leading to the Agro-industrial Park.

**(ii) Water Supply**

*Impacts*

Engineering study proposed three water supply sources for the Agro-industrial Park, which are I) irrigation wells near the project site, ii) water from Mekorot and iii) water from Jericho City as shown in Analysis of Alternative Plans, B.4. Supplying water from irrigation wells without controlling well abstraction cause lowering of the groundwater level. In case of wells, if pumping of water is not controlled, the groundwater level could reduce.

Water demand for the Agro-industrial Park in the stages I and II was estimated to be low (0.5 MCM/yr) while stage III will have a relatively significant water demand compared to the available water from the sources in the Jericho area (1 MCM = 25% of the total discharge of Ein Al-Sultan; 20% of Wadi Qilt; 13.3% of available water from agricultural wells).

A water quantity and quality analysis was conducted by alternative source and summary of the result are as mentioned the analysis of alternative plans.

The result of analysis shows that the water cannot be used either for agro-industries or for drinking water without being treated prior to use. The water hardness ranging from medium to high is not suitable for drinking purposes and food processing. The traced metals are found to be in acceptable ranges except for Jericho Well No. 1 that has quite high contents of iron and manganese. All wells are contaminated with total coliform bacteria, which need to be disinfected.

*Mitigation measures*

Since the existing water supply system in Jericho area are limited in quantity and not all are suitable as drinking water unless treated, it might be conceivable to use the water supplied by the Mekorot Company in order to avoid supply of contaminated water from other sources.

In case any of the wells surveyed in the study is utilized, the JST suggested desalination of water in addition to disinfection in order to meet the quality standards.

A combination of the different sources is another mitigation measure that can be taken into consideration.

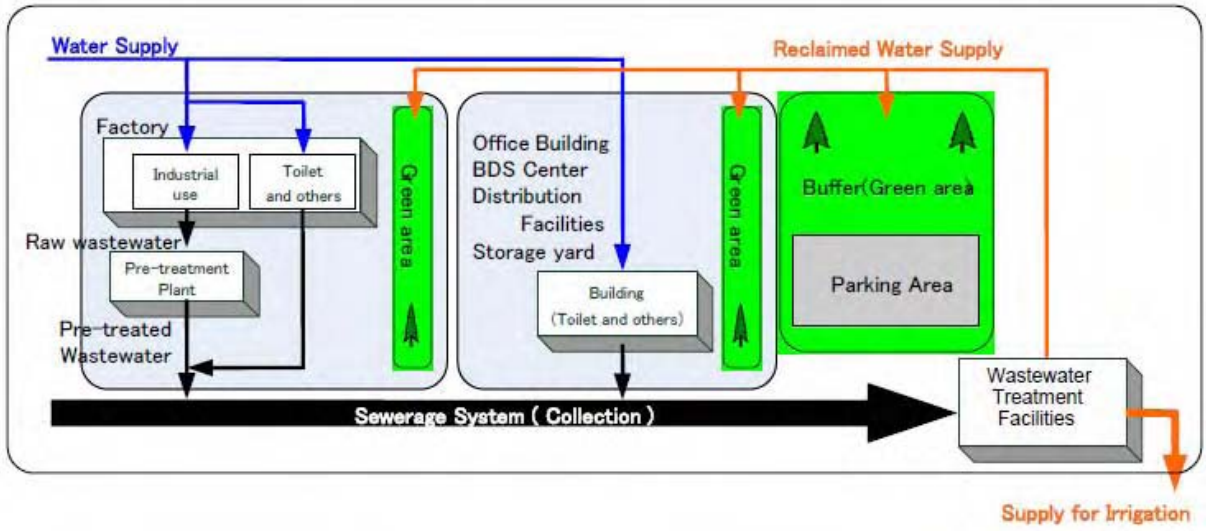
**(iii) Wastewater**

Location and design of wastewater treatment facility

Jericho City has no sewage network and central sewerage system. A domestic sewerage system in Jericho city was previously proposed in the master plan of Jericho Regional Development Study but was not implemented. In order to prevent any damages to the social or natural environments by waste water from the factories in the Agro-industrial Park, the wastewater treatment facility shall be installed as an off-site facility for each stage.

The location of the wastewater treatment facility in stage I will be at the south corner of the site. In stages II and III, its location will be at the south side of the *Wadi* (see map of land use).

Wastewater treatment is planned by two steps, i.e., pre-treatment (on-site) by each water user and final treatment in the wastewater treatment facility (off-site). The figure below shows the treatment scheme for the Agro-industrial Park.




Source: JICA Study Team

**Figure B-6-6 Proposed Wastewater Treatment System in the Agro-industrial Park**

Treatment Quality

The design parameters of treatment quality in the proposed facility are defined based on the available standard as follows:

a) Influent quality is specified based on the existing available standard in Palestine "Environmental Manual of the West Bank and Gaza" related to discharging to public sewers.

b) Effluent quality is specified based on the Palestine standard of treated wastewater. Moreover, the effluent should satisfy the criteria of "High quality treated wastewater (A)." which is the best parameter necessary for the effluent usage for the planted zone.

**Table B-6-9 Design Parameters of Wastewater Treatment Facility**

| Major Parameter | Influent Quality (before treatment) | Effluent Quality (after treatment) |
|---|---|---|
| $BOD_5$ | 650 mg/L | 20 mg/L |
| TSS | 650 mg/L | 30 mg/L |
| T-N | 80 mg/L | 25 mg/L |
| Fecal coli | — | 200MPN/100mL |

Source: JICA Study Team

**Table B-6-10 Design Quantities of Wastewater Treatment**

| | Unit | Stage I | Stage II | Sub-total (I+II) | Stage III | Total (I+II+III) |
|---|---|---|---|---|---|---|
| Design wastewater flow | $m^3$/day | 270 | 920 | 1,180 | 1,360 | 2,540 |
| Design maximum daily wastewater flow | $m^3$/day | 470 | 1,650 | 2,120 | 2,450 | 4,570 |
| Design maximum hourly wastewater flow | $m^3$/day | 620 | 2,150 | 2,760 | 3,180 | 5,940 |
| | $m^3$/hour | 25.8 | 89.6 | 115.0 | 132.5 | 247.5 |

Source: JICA Study Team

*Impacts*

In general, wastewater treatment will lead to positive as well as negative impacts. The anticipated positive impacts are related to the following facts:

- Prevention of groundwater pollution
- Recharge of aquifer
- Reuse for irrigation, agriculture and others uses

The negative impacts can appear in case of mismanagement in the operation and maintenance, breakdown of the system (internal), and/or external technical problems. In case of any problem that causes overflow of raw sewage into the nearby environment, following impacts are expected.

- Soil pollution and overloading with nutrients and micro-organisms
- Groundwater pollution
- Health hazards to the nearby workers or through water contamination

*Mitigation measures*

In general, mitigation measures related to the wastewater treatment facility depends on location and direction of the facility.

According to the analysis of soil in the project site, the proposed location has less possibility to induce groundwater contamination. Soil contamination is an issue but since the land use is suggested or not identified as agricultural, it will not have a significant impact. In case of any break down of system, the re-flushing can take place when the system is repaired. Subsequently, the reclaimed water can help in removing some of the high nutrients or polluting contents.

In general, the types of pollutants in the Agro-industrial Park are not expected to be of hazardous material, which will not complicate the processes of later mitigation. The possibility of using dried sludge as soil cover at landfill site is explored in the study as well to reduce contamination to the soil and groundwater.

**3) Solid Waste**

*Impacts*

There are positive and negative impacts related to off-site solid waste disposal can be summarized in the following points:

(Positive)

- Compost can be an important income generating source.
- On the long term compost can be used for the land reclamation in the Jericho area since there is high desertification

(Negative)

- Possibility of offensive odor during the transporting from the park to landfill site
- Polluted water could be caused when rain water is mixed with solid wastes
- Shredder machine for organic waste (fresh garbage) is included in the machine for composting, which induce vibration
- Emitting odor due to the process of composting
- Risk of flammable gases evaporation can lead to fire at the landfill site
- Solid waste accumulation in the case and spreading of pollutants.

*Mitigation measure*

The final solid waste will be transported to a landfill site in the West Bank. If an additional landfill site is developed for the Jericho City, then it can be used. It is recommended that the solid waste management and operation processes for stages I and II should be clarified through discussions with JCspd and other relevant agencies before the operation of the park commences.

Mitigating for polluting water mixed with rain water, installation of roof over the facilities.

Wastewater from the process of composting and washing container should be temporarily stored and send to wastewater treatment facility.

To mitigate vibration from the shredding machine, a low vibrating machine should be purchased to meet the local standards

Deodorizing equipment should be installed as a primary fermentation and a curtain around the fermentation tank should be provided for preventing the diffusion of offensive odor.

Risk of any flammable gases can be mitigated since it is only at the production of compost. The processes suggested by the JST are mainly sealed facilities and that can be controlled.

**Health and Safety of Workers**

*Impacts*

Negative impacts or contamination on natural resources can affect directly or indirectly the health of community or the workers. Any contamination of the water resources, air, or land will have an impact on the health of the surrounding community. As of any case of mismanagement for the solid waste disposal and/or wastewater treatment, an environmental health hazard can be expected.

As observed in the environmental setting, Jericho area is one of the hottest and driest areas in the West Bank since it is located in the JRRV. This implies that many mosquitoes and flies especially those transmitting diseases are omnipresent during the year, and thus they can find good medium of propagation in the valley. The existence of industrial wastes or raw sewage without adequate treatment will attract these unpleasant insects which will increase risks of spreading more diseases in the area.

The contamination of the underground water with wastewater in case of any breakdown of the treatment system can cause health problems to humans using water as a drinking source or in case of agricultural irrigation.

*Mitigation measures*

Using most of the mitigation measures in each section mentioned above of this report would render the benefits of not only protecting the environment but also preventing or reducing health hazards and diseases from propagation.

To mitigate any impacts on heath and safety for worker, corresponding plans and guidelines should be prepared for the Agro industrial Park as well as for each factory.

**Socio-economic Environment and Other Impacts**

**(i) Creation of Employment**

The Agro-industrial Park is designed to accommodate 137 factories and requires 7,000 employees as factory workers. According to design of factory plans for the park, the number of facilities and expected employment are shown in the table below. The park provides a large employment opportunity for Jericho and it has positive impacts to the local economy as well.

**Table B-6-11 Planned Number of Factory and Employee for the Agro-industrial Park**

| | Stage I | Stage II | Stage III | Total |
|---|---|---|---|---|
| No of factory | 14 | 49 | 74 | 137 |
| No of employee | 710 | 2,520 | 3,770 | 7,000 |

Source: JICA Study Team

**(ii) Population Growth and Increasing Housing Demand**

The Agro-industrial Park offers a large number of employments and will increase the population of Jericho. It is expected that housing and accommodation development will be accelerated due to increasing demand of housing and accommodation for workers.

**(iii) Air quality**

Air quality due to operation is expected to deteriorate. The existing industries are not highly polluted but still need to be checked to test air quality, then a modeling system can be used for the park in order to estimate the gas emissions and expected pollution.

Air pollution during the operation process is related to the traffic fumes, and factories' fumes. Air pollution can also be caused by mismanagement in the waste disposal on-site as mentioned earlier concerning solid waste disposal. The nearby communities and mainly the nearby Bedouin communities might be the first to be affected.

Indoor air quality can also be affected in case of any technical problems and can be a source of hazard to occupational health and workers safety.

**(iv) Trans-boundary Impacts**

Trans-boundary impacts can be at the level of groundwater contamination or due to gas emissions. As observed in the groundwater analysis, the water contamination reaches trans-boundary water systems in the

Jordan River and the Dead Sea. The expected impacts on both systems are expected not to be of very high level. Also the lower Jordan River is highly deteriorated and the Agro-industrial Park mitigations prevent further deterioration. Gas emissions can be an impact mainly when the wind direction is at the southern direction, which takes place in the early morning where this direction is closer to south Israel and Jordan. This impact is assumed to be minimal since most of the work takes place during the day time where the wind starts blowing at a north western direction during the night time.

**(v) Noise and Vibrations**

Noise and vibrations can be a source of altering the wildlife and bird migrations in the JRRV. Monitoring of migrant birds will be necessary during the operation of the park. The highest impact can be expected at full scale of operation at the stage II of the project. Stage I is estimated to have a relatively low impact regarding this issue.

## B. 7 Potential Environmental and Social Impacts and Mitigation Measures (Stage III)

### (1) Introduction

Stage III development is a real challenge for the Agro-industrial Park in the Jericho area. This stage involves a restricted requiring an Israeli approval for the development in area C. At this stage, the expected impacts seem to be related to water supply, wastewater, and solid wastes. At the same time, the local economy of the area is expected to grow due to the large development and job creation consequently generated.

### (2) Impacts and Mitigation Measures at Operation Stage

**On-site Infrastructure**

#### (i) Surface Water

*Wadi* Marar crosses Lot 1 through Lot 3. The flood probability for this *Wadi* was estimated in the previous Chapter 6. Although the *Wadi* is suggested not to have a high discharge, it can cause flash floods at certain extreme events. In order to avoid this problem, the *Wadi* channels will be improved at the same criteria described in Chapter 6.

#### (ii) Wastewater

The volume of wastewater generated at this stage is estimated to be higher than those at stages I and II, but its design flow per area is 2.04 $m^3$/hour/ ha, which is less than 1.38 $m^3$/hour/ha in stage II.

In the previous stages, the main mitigation for this issue is to have a separate collection system for sewage than for the storm water. Furthermore, pre-treatment of wastewater at each factory will be an important measure to maintain effluent quality in accordance with the Palestinian standards for treated wastewater.

#### (iii) Solid Waste

The volume of solid wastes generated at stage III is expected to be 53.4 tons/day. For the on-site facility to handle such amount of sorting is quite a challenge. In case of mismanagement, this volume level would have extreme impacts to the surrounding environment and the health of workers.

The mitigation for such issue is to conduct capacity building and implement high level of monitoring and management.

If proper management is taken towards on-site composting, this will make a smooth transfer of organic waste into feed production process without high accumulation.

Moreover, it is highly recommended to make agreements with trash collectors in order to transfer wastes.

**Off-site Infrastructure**

**(i) Water supply**

Water demand in the Agro-industrial Park at full stage development will be about 1 MCM/yr. At stage III, water sources should be made clear. Because both agricultural wells and Jericho Well No 1 are contaminated, a desalination system will have to be seriously taken into account.

In order to mitigate this problem, a desalination system with significant design capacity should be considered. The other solution would be to utilize the Mekorot Water Company as main source especially at stage III.

**(iii) Wastewater**

The design for the wastewater treatment in the stage III is similar to the previous stages. Yet the volumes of wastewater are expected to be much higher, from 2,120 $m^3$/day in stages I and II to 4,570 $m^3$/day in stage III. The latter stage will require provision of a separate treatment unit plant on the eastern side of the site and is considered as a mitigation measure to lower the groundwater contamination according to previous analysis.

For the stage 3, if the site can be connected to a public sewerage system, operation and management will be further facilitated. In any case, the designed plants for this purpose are suggested to be fully adequate to handle the generated amounts including the fact that the operation and management criteria should be well defined.

**iv) Solid Waste**

The solid waste issue will have to be seriously taken into consideration in stage III. Out of the 53.4 tons/day generated, only 10% can be treated at the near-by landfill site.

The mitigation measure is to identify another landfill site in the West Bank. The opening of a new landfill for the Jericho area can be a solution. The transfer of the wastes completely out of the Jericho City is another solution.

**(3) Local Economy**

The number of employees is expected to increase from 3,230 in stage II to 7,000 in stage III. This indicates that there would be a need for a sizable residential complex to accommodate employees. The residents of Jericho will clearly benefit from it. Yet the water demand and sanitation issue would be highlighted in proportion to population increase. For this reason, it should be emphasized that water supply from Mekorot Company should be the main alternative water source to be highly considered as part of the mitigation measures needed to avoid high impacts.

## B.8 Environmental Monitoring and Management Plan

The EMMP is a detailed plan describing the system of environmental monitoring and the execution of mitigation measures to reduce the environmental and social impacts caused by the implementation of the Agro-industrial Park development. The EMMP consists of environmental management and monitoring framework, monitoring procedure, monitoring program, and training. It is prepared and carried out according to the implementation stages of the Agro-industrial Park development, i.e. pre-construction, construction, and operation. The required activities identified in the EMMP will be executed under the responsibility of PIEFZA, EQA and the tenant enterprises.

### (1) Demarcation of Responsibility

PIEFZA is the implementing agency for the development of the Agro-industrial Park, and is responsible for the EIA study. Therefore, PIEFZA would be the leading organization in conducting related activities for the EMMP.

In general, the private developer has an obligation to comply with the environmental guideline and standards for the operation and management of on-site infrastructure and facilities. Meanwhile, PIEFZA and the relevant ministries/agencies such as MoNE are responsible for the monitoring of ambient air, water quality, effluent quality, solid waste and noise. However, there seems to be unclear demarcation of the responsibility in terms of on-site monitoring (Who monitors what?). The demarcation of responsibility in the operation and management of off-site infrastructure is also vague and appears different for each industrial estate.

As part of its mandate, PIEFZA is responsible for the execution of one-stop-shop services. Hence, it has the authority to issue industry licenses including handling documentation of environmental permission. PIEFZA will assist each tenant factory inside the industrial estate in preparation of documentation regarding pre-treated wastewater, air emission, and hazardous materials.

Environmental Monitoring and Inspection Department under the General Directorate of Environmental Protection in EQA is responsible for management of environmental monitoring activities of the Agro-industrial Park. EQA will assign its experts who can provide technical assistance on environmental permission and monitoring activities to the environmental officer of PIEFZA.

### (2) Environmental Manual

It is required to prepare an environmental manual for the Agro-industrial Park which presents explanation on the relevant conditions and environmental monitoring procedure to the tenant enterprises. Environmental Manual for Gaza Industrial Estate (GIE) which was prepared as part of the EIA Study for GIE to establish a system of environmental permits and monitoring, is a good reference for the preparation of the environmental manual of the Agro-industrial Park. The GIE environmental manual describes necessary procedures for obtaining an environmental permit and provides a set of guidelines and environmental standards which its tenant enterprises need to comply in order to obtain environmental permits. It also provides general requirements for emission monitoring at site, which should be carried out under the responsibility of the tenant enterprises.

Since this GIE manual is commonly used as reference and applied for other EIA studies of industrial estates in Palestine, it would also be beneficial in the preparation of the EMMP for the Agro-industrial Park in JRRV. In particular, it renders information on applicable environmental standard, parameters and emission monitoring procedures for environmental management.

### (3) Environmental Monitoring Components

The following environmental components are to be monitored during pre-construction, construction and operation stages.

1) Pre-Construction

- Land use
- Indigenous community

2) Construction stage

- Air quality monitoring
- Site and worker's safety
- Noise and vibration monitoring
- Construction waste management

3) Operation stage

- Wastewater treatment effluents monitoring
- Groundwater monitoring
- Air emission monitoring
- Ambient air quality
- Solid waste and hazardous waste monitoring
- Noise and vibration monitoring
- Water resources
- Operational health and safety plan

### (4) Environmental Monitoring Program

The environmental monitoring program covers (i) the parameters to be monitored, (ii) standards to be followed, (iii) location of sampling and/or observation, (iv) duration and/or frequency of monitoring, and (v) supervision responsibility. The proposed environmental monitoring program for the Agro-industrial Park is shown below. These should be further discussed with PIEFZA, EQA and other relevant agencies before the implementation of the Agro-industrial Park development.

1) Pre-construction stage

| Environmental component | Location | Parameter | Time/ Frequency | Responsibility | |
|---|---|---|---|---|---|
| | | | | Implementation | Supervision |
| Land use | Surrounding areas and route of access roads | Development activity and land use | Periodically | PIEFZA | Jericho Municipality |
| Indigenous community | Near the park and along the existing road 1 | Bedouin community (Relocation) | Before the construction | Jericho Municipality | Jericho Municipality |

Source: JICA Study Team

2) Construction stage (on-site and off-site infrastructure)

| Environmental component | Location | Parameter | Time/ Frequency | Responsibility | |
|---|---|---|---|---|---|
| | | | | Implementation | Supervision |
| Air quality (Dust, fume) | Construction site, along access roads | TSP, $PM_{10}$ | Periodically during Site preparation work | Contractor | Jericho Municipality |
| Noise and vibration | Construction site, along access roads | Noise level (dB(A)) | Excessive noise occurred | Contacted Research lab | Developer and PIEFZA |
| Site and worker's safety | Construction site | Visual inspection, Safety plan and data | Daily | Contractor | Developer |
| Construction waste management | Construction site and its surrounding | Visual inspection, records of waste collection | Weekly | Contractor | Developer |

Source: JICA Study Team

3) Operation stage (On-site)

| Environmental component | Location | Parameter | Time/ Frequency | Responsibility | |
|---|---|---|---|---|---|
| | | | | Implementation | Supervision |
| Air emissions quality (Stack emission) | Factory site, its surrounding areas | SOx, NOx, TSP, $PM_{10}$ | Monthly | Tenant or Contracted research lab | Developer and PIEFZA |
| Noise and vibration | Inside the park and outside area | Noise level (dB(A)) | Excessive noise occurred | Developer or Contracted research lab) | PIEFZA |
| Solid waste (sorting, storage) | Solid waste collection facilities (stock yard) | Visible inspection, disposal methods | Periodically | Tenant | Developer |
| Effluent wastewater (pre-treatment) | Primary Wastewater treatment facility | BOD, SS, COD, T-N | Monthly | Tenant or contracted research lab (Occasional monitoring by PIEFZA & EQA) | Developer, PIEFZA and EQA |
| Operational health and safety | Inside the factory and other related facilities in the site | Workplace air quality, noise, safety measure, injury record | Periodically | Tenant | Developer, PIEFZA |
| Discharge water from storm water drainage | Drainage, *Wadi* | Visible inspection | When rained | Developer | PIEFZA |

Source: JICA Study Team

4) Operation stage (Off-site)

| Environmental component | Location | Parameter | Time/ Frequency | Responsibility | |
|---|---|---|---|---|---|
| | | | | Implementation | Supervision |
| Air quality | Along the access roads and near the factory site | SOx, NOx, TSP, $PM_{10}$ | Periodically | PIEFZA (Contracted research lab) | PIEFZA and EQA |
| Noise and vibration | Inside the park and outside area and along the access roads | Noise level (dB(A)) | Excessive noise occurred or received any local complaints | PIEFZA (Contracted research lab) | PIEFZA and EQA |
| Solid waste management | Composting site, transporting route, landfill site | Visible inspection, disposal methods | Periodically | PIEFZA | JCspd in Jericho |
| Effluent quality of wastewater | Secondly Wastewater treatment facilities | BOD, SS, COD, T-N | Monthly | PIEFZA (Laboratory test) | PWA |
| Ground water | | pH, BOD, COD, SS, TDS, EC, NO3, salinity | Twice a year | PIEFZA (Laboratory test) | PWA |
| Safety on traffic | Areas along the access roads | Visible inspection, traffic volume, accident record | Periodically | PIEFZA | Jericho municipality |

Source: JICA Study Team

**(5) Training**

- Compliance with environmental standards,
- Pollution prevention and clear technologies,
- Emergency and safety measures, and
- Management of environmental data collected

For the industrial park as a whole, effluent emission, solid waste management and wastewater treatment would be the most important environmental factors to be managed and monitored. However, since the capacity of PIEFZA is still limited for conducting environmental management and monitoring, capacity building as well as increase in its number of environmental officers are indispensable. The technical assistance from EQA, PWA, JCspd, research laboratories and specialized private companies are valuable in enhancing the capacity of PIEFZA.

In addition, the capacity of EQA for monitoring ambient air quality and atmospheric emissions is relatively low compared to other environmental factors such as effluent and ground water quality. Enhancement of these capabilities would be the essential requirement for effective environmental monitoring and management. It would be worthy to consider the capacity building of EQA and other environmental-related institutions in West Bank in the future.

The environmental officer in the Agro-industrial Park should be selected from PIEFZA and shall be tasked to prepare an environmental monitoring guideline including the required conditions and monitoring procedure. He shall be expected to cooperate with experts from EQA. Meanwhile, EQA shall be requested to provide trainings for PIEFZA officers regarding monitoring methods in compliance with the environmental monitoring program.

EQA and the concerned agencies are also requested to provide training for employees of tenant enterprises, on matters concerning basic knowledge on environmental, health and safety and potential hazards. The primary subjects of such trainings are as follows:

## B.9 Public Consultation

### (1) The First Stakeholder Meeting

The first stakeholders' meeting was held on 10 June 2008 at Jericho Resort Village in Jericho City. The meeting was prepared and held by the project proponent, PIEFZA, in cooperation with the JICA Study Team and EQA. A wide range of stakeholders from project related ministries, departments, local governments, NGOs, universities, community-based organizations, private sectors, and donors participated in the meeting. The programs in the meeting include presentations of the project outline and EIA process and scoping discussion with stakeholders.

**Objectives**

The objectives of the first stakeholders meeting are as follows:

- To impart necessary information to the stakeholders about the project through JICA Study Team's explanation on the background project and outline of the project;
- To explain to the stakeholders the objective of implementing the EIA Study, environmental assessment procedure and scope of work for EIA, through the efforts of the EQA;
- To identify any environmental and social impacts caused by the Agro-industrial Park Development Project in JRRV by group discussion among stakeholders;
- To determine the scoping of EIA and its implementation.

**Participants**

There were 66 participants at the first stakeholders meeting including members of the JICA Study Team. The participants from various institutions are shown in the list below. About half of these participants were from the central and local governments. Detailed list of participants in the meeting is presented in Attachment 4.

**Table 9-1 Number of Participants to the 1st Stakeholder Meeting**

| Category | Ministry/Agency | Number |
|---|---|---|
| Central Government | MoP, MoA, MoL, MoLA, MoPWH, PWA, PEA, EQA, PCBS, PIEFZA, Jericho Governorate, Tubas Governorate, | 27 |
| Local Government | Jericho Municipality, JCspd in JRRV | 5 |
| Community based Organization | Peasants Union, Palestinian Workers Syndicates Union, Union of Agriculture Work Center, JRRV Cooperative Society for Bees, Food Industry Union, Marketing Society, Union of Agricultural Work Committee | 8 |
| University | Bir Zeit University Labs, Al Najah University | 2 |
| NGOs | Palestine Wildlife Society, PARC (Jericho Branch) | 2 |
| Donors | FAO, Spanish Cooperation | 2 |
| Private Sector | Jericho Chamber of Commerce, Industry and Agriculture, Telfeeq Project, Al Mays Company for Plastic | 4 |
| JICA Palestine Office/Other JICA Study Teams | JICA Palestine Office, JICA Ramallah Office, Solid Waste Management (JICA Study Team), Agriculture (JICA Study Team) | 4 |
| JICA Study Team | Agro-industrial Park Development | 12 |
| Total | | 66 |

Source: JICA Study Team

**Program**

The program for the first stakeholders meeting is as follows:

**Table 9-2 Program of the First Stakeholder Meeting**

| | |
|---|---|
| 9:00-9:30 | 1. Registration |
| 9:30-10:00 | 2. Opening speech<br>1) Dr. Saeb Erikat, Head of Negotiation Dept., PLO, Palestinian Legislative Council from Jericho District<br>2) Governor of Jericho Governorate, Mr. Areef Ja'bari<br>3) Director General of PIEFZA, Mr. Ahmad Hasasneh<br>4) Vice President of Environmental Quality Authority, Mr. Jameel Mtour<br>5) Deputy Resident Representative of JICA Palestine Office, Mr. Kazuhiko SAKAMOTO |
| 10:00-10:20 | 3. Presentation on the Outline of the Projects<br>by JICA Study Team |
| 10:20-10:40 | 4. Presentation on the EIA Process<br>(Objective, procedure, and scope of work of EIA)<br>by Mr. Mahmoud Abu-Shanab, EQA |
| 10:40-10:55 | 5. Questions and comments |
| 10:55-11:10 | 6. Orientation for the scoping discussion<br>by JICA Study Team |
| 11:10-11:30 | - Coffee Break - |
| 11:30-13:50 | 7. Scoping discussion with stakeholders<br>1) Group discussion<br>2) Presentation by group (10 min each)<br>3) Summary of the discussion<br>by JICA Study Team |
| 13:50-14:00 | 8. Closing speech<br>by PIEFZA |
| 14:00- | - Lunch - |

Source: JICA Study Team

**Group Discussion**

The objective of the scoping discussion is to grasp opinions and issues concerning anticipated environmental and socio-economic impacts caused by the Agro-industrial Park development. The JICA Study Team considered three environmental components such as natural (Biophysical) resources, health and sanitation as well as socio-economic environment as issues for discussion. Participants were separated into four groups to discuss each environmental component. Two members from the JICA Study Team facilitated the group discussion. Each group was expected to discuss both the positive and negative impacts of the three project implementation stages (pre-construction, construction and operation). Many participants eagerly participated in the group discussion. It was recognized that many stakeholders reveal various awareness and concerns on of the project's environmental and socio-economic impacts. Subsequently, each group presented the results of their discussion.

**Table 9-3 Environmental Components for the Scoping Discussion for the first Stakeholders Meeting**

| Environmental component | Detailed environmental component |
|---|---|
| Natural (Biophysical) resources:<br>(Direct impact to nature) | - Surface and ground water<br>- Soils and vegetation<br>- Climate and air quality<br>- Agricultural resources<br>- Land and water use<br>- Wildlife and eco-tourism resource |
| Health and Sanitation:<br>(Direct and indirect impacts to human) | - Wastewater treatment and discharge<br>- Community water supply<br>- Public health risks<br>- Health and safety for workers (Occupational safety)<br>- Access to health services<br>- Noise and vibration |
| Socio-economic environment:<br>(Direct and indirect impacts to regional and local economy) | - Employment and income<br>- Local business and industries<br>- Sources of supplies, materials and services<br>- Infrastructure requirements<br>- Residential area and indigenous population<br>- Transportation and traffic<br>- Government budget and revenue<br>- Recreational/tourist resources and activities |

Source: JICA Study Team

Results of group discussion by group are summarized below.

Group 1

| | Pre-Construction | Construction | Operation |
|---|---|---|---|
| Surface and underground water | - Enhancement of awareness among factory owners regarding the effective regulations for water use in case any environmental malfunctions take place<br>- Recommend compliance to standards and regulation for water use as required by Palestinian Standard Institute and general safety conditions | - Detecting the validity of waste water treatment process | - Wastewater treatment must follow the Palestinian standards. |
| Public Health | - Establishing a landfill site especially for industrial waste | - Wastes generated from construction, or reuse if possible | - Organic wastes from the park needs to be managed and reused for other purposes<br>- Providing health services with ambulance |
| Income and labor | | - Creating job opportunities for construction work | - Creating job opportunities and developing the skills of workers and the staff<br>- Ensuring monitoring and inspection function as part of environmental and health regulations |

Group 2

| | Pre-Construction | Construction | Operation |
|---|---|---|---|
| Water Resources | Not affect | Affected | Affected by chemicals |
| Soil | Not affected | Affected | Affected |
| Air and climate | Not affected | Affected by dust, acid rain, fume | Affected by acid rain, fume |
| Agricultural Resources | Affected | Affected | Affected |
| Wastewater treatment | | | Generated wastewater includes harmful substance |
| Land Use | Affected | Appreciation of land price | Appreciation of land price |
| Wild Life | Not affected | Not affected | Negative impacts induced to migratory birds and wild plants |

Group 3

| | Pre-Construction | Construction | Operation |
|---|---|---|---|
| Natural resources and Agricultural resources | Positive<br>- Land reclamation<br>- Necessity of technical support for farmers<br>- Utilization of new water resources<br>Negative<br>- Will cause delay in implementing projects | Positive<br>- Extending agricultural programs support<br>Negative<br>- Decreasing agricultural land area<br>- Pollutes air due to construction works | Positive<br>- Increase and diversify agriculture production<br>- Motivate agricultural productivity<br>- Increase farmers' income<br>Negative<br>- Increase in water consumption<br>- Increase in generation of waste water |
| Health | Positive<br>Not affected<br>Negative<br>Not affected | Negative<br>- Air pollution and noise caused by construction activities | Positive<br>- Organized and systematic transfer of agricultural products<br>Negative<br>- Use of preservatives<br>- Increase use of plastics<br>- Increase use of fertilizers and pesticides |
| Income and labor | | Positive<br>- Increase in number of labor opportunities for construction<br>- Improve economic situation | Positive<br>- Increase opportunities for factory workers<br>- Increase and diversify agricultural production<br>- Increase in exported goods<br>- Increase in national income<br>Negative<br>- Decrease in the number of small-scale farmers |

Group 4

| | Pre-Construction | Construction | Operation |
|---|---|---|---|
| Surface and underground water | - A preliminary study on existing water quality and quantity is required | | - Water resources by decreasing the water level<br>- Increasing salt concentration<br>- Raising water cost |
| Waste water and wastewater treatment | | - Waste generated from construction work which should be managed appropriately | - Decreasing waste quantities by separation, recycling and composting<br>- Establishing disposal site especially for the generated waste |

From the presentation of the group discussion, waste water, solid waste management and quantity and quality of water were anticipated as factors for negative environmental impacts during the project implementation. Based on the discussions, in spite of the negative impacts to physical environment, the project also provides positive impacts to socio-economic environment such as income generation, creation of employment opportunity, reuse and recycle of resources and improvement of the agriculture sector in terms of technology, production and human resources. The recommendations and issues raised during the discussions will be reflected in the EIA study. The minutes, including results of group discussion during the first stakeholders meeting are attached in Attachment 3 and 4.

*Scenes of the First Stakeholders Meeting*

**Opening Speech by Dr. Saeb Erikat**

**Presentation of the Project Outline by JICA Study Team**

**Presentation of EIA Process by EOA**

**Raised Questions from Participants**

**Group Discussion**

**Presentation by Group**

### (2) The Second Stakeholders Meeting

The second stakeholders' meeting was held on 15 October 2008 at Jericho Resort Village in Jericho City. The meeting was organized and initiated by the project proponent, PIEFZA in cooperation with the JICA Study Team and EQA. A wide range of stakeholders from project-related ministries, departments, local governments, NGOs, university, community based organizations, private sectors, and donors participated in the meeting. The agenda includes presentations of the project outline, EIA process, review of the first stakeholders meeting (June 10 2008), results of the EIA Study and discussion with stakeholders regarding said study results.

**Objectives**

The objectives of the second stakeholders meeting are as follows:

- To impart to the stakeholders the necessary information about the project, through JICA Study Team's explanation of the background and outline of the project;
- To explain the objectives of implementing EIA Study, environmental assessment procedure and scope of work for EIA, through the efforts of the EQA;
- To review the results of the first stakeholders meeting by presenting the summary of the group discussions;
- To collect comments and suggestions from stakeholders related to the presented result of the EIA Study and discuss any related issues;
- To reflect stakeholders feedbacks for the completion of the EIA Study Report.

**Participants**

There were 74 participants in the second stakeholders meeting, including members of the JICA Study Team. Participants from various institutions are shown in the list below. More than half of the participants were from the central and local governments. Detailed list of participants for the meeting is attached in Attachment 4.

**Table 9-4 Number of Participants to the second Stakeholder Meeting**

| Category | Ministry/Agency | Number |
|---|---|---|
| Central Government | MoNE, MoA, MoLA, MoPWH, MoTA, MoH, PWA, PLA, PLO, PEA, EQA, PCBS, PIEFZA, PFI, National Agriculture Research Center | 34 |
| Local Government | Jericho Governorate, Tubas Governorate, Jericho Municipality, JCspd for SWM, Jericho Hospital | 9 |
| Community based Organization | Jericho Association for Presented Growing | 2 |
| University | Al Najah University | 1 |
| NGOs | Palestine Wildlife Society, Center for Engineering and Planning, House of Water and Environment, WEDO | 6 |
| Donors | FAO, Oxfam, Spanish Cooperation, Italian Cooperation | 4 |
| Private Sector | Palestinian Food Industrial Association, Palestine TV, Voice of Palestine, WAFA Journal, etc | 8 |
| JICA Palestine Office/ Other JICA Study Teams | JICA Palestine Office, JICA Ramallah Office, Solid Waste Management (JICA Study Team) | 3 |
| JICA Study Team | Agro-industrial Park Development | 7 |
| Total | | 74 |

Source: JICA Study Team

**Program**

The program of the second stakeholders meeting is as follows.

**Table 9-5 Program of the Second Stakeholders Meeting**

| | |
|---|---|
| 9:00-9:30 | 1. Registration |
| 9:30-10:15 | 2. Opening speech<br>1) Speech by Governor of Jericho Governorate, Mr. Kamel Hmeid<br>2) Speech by Mayor of Jericho, Mr. Hasan Saleh<br>3) Speech by Director General of PIEFZA, Eng. Ahmad Hasasneh<br>4) Speech by Vice President of Environmental Quality Authority, Dr. Jameel Mtour<br>5) Speech by Deputy Resident Representative of JICA Palestine Office, Mr. Kazuhiko SAKAMOTO |
| 10:15-10:30 | 3. Presentation on the Outline of the Projects<br>by JICA Study Team |
| 10:30-10:40 | 4. Outline of the EIA Process<br>by Mr. Mahmoud Abu-Shanab, EQA |
| 10:40-11:00 | - Coffee Break - |
| 11:00-11:15 | 5. Review of the first Stakeholder Meeting<br>By JICA Study Team |
| 11:15-13:00 | 6. Presentation and discussion of the results of the EIA Study<br>1) Environmental and Social Impacts<br>2) Alternative plans<br>3) Mitigation measures<br>4) Environmental monitoring plan<br>by JICA Study Team |
| 13:00-13:15 | 7. Closing remark<br>by PIEFZA |
| 13:15- | - Lunch - |

Source: JICA Study Team

**(3) Presentation and Discussion**

There were four presentations in the stakeholders meeting, prepared by EQA and the JICA Study Team, in cooperation with PIEFZA as shown above table.

The first presentation was the outline of the project explained by JICA Study Team, including 1) Outline of the development plan, 2) Infrastructure and facility, 3) Implementation and O&M.

The second presentation was the outline of EIA Process explained by EQA, including procedure for environmental evaluation, evaluation of environmental effects, policies and laws.

The third presentation was the review of the first stakeholders meeting held on 10 June 2008, explained by the JICA Study Team. Results of the group discussions on environmental and socio-economic impacts were the most important part of this presentation.

The final presentation which includes discussion of the result of the EIA Study was the main part of the stakeholders meeting. The JICA Study Team explained the following: 1) Environmental and social Impacts, 2) Alternative plans, 3) Mitigation measures and 4) Environmental monitoring plan. After presenting the mitigation measures, discussion with all participants was carried out. More than ten questions and comments were received from the central government officials, universities and NGOs. Major questions and comments were as follows:

- Impact on migratory birds flying over or near the park,
- Effects of solid waste facility (Stock yard) on birds,
- Effects of the existing steel factory on food processing and production in the park,
- Effects on groundwater under the park development area.
- Water quality on Jericho well no.1 which is not suitable for drinking due to the salinity of water.
- Use of alternative water supply sources,
- Consideration of applying solar energy as alternative energy source for the park,
- Demand for medical facility (hospital) or expansion of existing Jericho Hospital to serve the increasing number of residents and employees in the park,
- Management of large volume of solid wastes generated by the park, and
- Agreement with Israeli government for the use of Road no. 90

Some questions and comments were raised either due to limited information obtained from the presentation materials and unclear explanation. The JICA Study Team answered most of the questions and comments from the participants. Some questions and comments required to be further considered in the EIA Study. Hence, these were reflected in the EIA Study Report.

Through the stakeholders meeting, many participants expressed high concern on environmental and social impacts due to the project. Due to limited time for discussion, the JICA Study Team recognized the necessity of holding another stakeholders meeting with local community in Jericho City.

Detailed questions and answers in the minutes of the second stakeholders meeting are attached in Attachment 3.

*Scenes of the second Stakeholder Meeting*

**Participants in the stakeholder meeting**

**Opening speech by Mr. Hasan Saleh, Mayor of Jericho Municipality**

**Presentation of the Project Outline by JICA Study Team**

**Presentation of EIA Process by EQA**

**Presentation of the Result of EIA Study by JICA Study Team**

**Raised questions and comments from Participants**

### (3) The Third Stakeholder Meeting

On 26 October 2008, the JICA Study Team held a third stakeholders meeting at the conference room of the Jericho Municipal Hall, in cooperation with the Department of Public Relations in Jericho Municipality. The meeting was mainly targeting residential communities in Jericho City.

**Objectives**

The objectives of the third stakeholder meeting are as follows:

- To impart to the stakeholders all necessary information about the project by explaining related background and outline;
- To explain to the stakeholders the objective of implementing EIA Study, environmental assessment procedure and scope of work for EIA;
- To receive from the stakeholders comments and suggestions on the presented result of the EIA Study and discuss related issues;
- To reflect stakeholders feedbacks for the completion of the EIA Study Report.

**Participants**

There were 12 participants at the third stakeholders meeting, including members of the JICA Study Team. Participants were from the steel factory, residential complex of Jericho Municipality, JDECO Residential Complex in New Jericho Area, PARC and representatives from the Jericho Municipality. List of participants for the meeting is attached in Attachment 4.

**Program**

The program of the third stakeholders meeting is as follows.

1) Presentation by JICA Study Team
   - EIA Process and requirement
   - Outline of the Project
   - Result of the EIA Study
2) Discussion with stakeholders

**Summary of Discussion including Comments and Recommendations**

(i) Questions and comments

- The steel factory adjacent to the site of Agro-industrial Park will not be in a competitive position with tenant enterprises inside the park since priority industries are agribusiness and food processing sectors.
- The steel factory expects to benefit from the improvement of off-site infrastructures, particularly improvement of the existing roads
- The steel factory requests the Agro-industrial Park to take into consideration, in particular, the treatment of wastewater and solid waste which cause foul smell and mosquito emergence in the area. Mismanagement of these issues must be avoided.

- The steel factory is not so much concerned on noise and vibration since the factory also operates as a manufacturer, and the site area is not a residential area.
- JDECO Residential Complex requested for the necessity in the increase of electric energy, distributed from Jordan, to avoid the shortage of supply to the residential area due to the establishment of the Agro-industrial Park, which could utilize half of Jordan's consumption. The necessity of coordination with Jordan in this regard was also raised by the representative from the residential complex.
- JDECO Residential Complex requested not to expand the Agro-industrial Park to the west area of the planned site in the future, since it is close to the residential area.
- JDECO Residential Complex asked about the possibility of obtaining more water from the *Wadi* Qilt or other *Wadis* through the project implementation of the Agro-industrial Park.
- JDECO Residential Complex requested that the treatment of wastewater in the Agro-industrial Park and sewerage network in Jericho city including the residential area be included in the study of wastewater.
- A participant asked about the impacts of water supply on the city's drinking water.
- A participant pointed out the necessity of special wastewater treatment for factories since the effluent including polluting chemicals causes negative impacts to the ground water.

(ii) Recommendations

- Connect the proposed access road and Road no. 90.
- Coordinate with the Jericho Municipality concerning the additional necessary facilities in anticipation of the increase in the city's population due to the establishment of the Agro-industrial park.
- Maintain a high level of monitoring in the Agro-industrial park especially the operation of the tenant on the polluting industries.
- Carry out detailed analysis on water and electricity supply to ensure that the city will not be affected.
- Clarify the issues of compost in terms of quality and specification of the compost producer.
- Consider the safety of access roads such as its width and road shoulders.

The JICA Study Team replied to most of the questions raised by the participants. Answers to the questions were summarized in the minutes of the third stakeholders meeting, attached in Attachment 3. Questions, comments, and recommendations raised by participants will be reconsidered and reflected in the EIA Study Report.

**(4) Information Dissemination through Public Media**

Aside from the stakeholders meetings held, a press release was initiated to inform a wider range of stakeholders and public about the project and the results of the EIA stakeholders meetings.

Results of the first and second EIA stakeholder meetings were reported in local newspapers, Al-Quds and Al-Ayyam newspapers. The second stakeholders' meeting was broadcasted on Palestine TV.

**Attachment 1**

# Terms of Reference (TOR) for Environmental Impact Assessment (May 2008)

## Agro-Industrial Park Development In Jordan River Rift Valley (JRRV)

| | |
|---|---|
| Project: | Agro-Industrial Park Development in Jordan River Rift Valley (JRRV) |
| Proponent: | Palestine Industrial Estates and Free Zones Authority (PIEFZA) |
| Contact: | |
| Project No: | |
| Application Date: | |
| Terms of Reference Date: | |

CONTENTS:

## 1. General Requirements

### (1) Environmental Assessment (EA)

These terms of reference (TOR) for an Environmental Impact Assessment (EIA) apply to the captioned project (Agro-Industrial Park Development in Jordan River Rift Valley) as described in the Proponent's Application for Environmental Approval. Any significant changes to the Project as described in the said application may require that new TOR be prepared and approved by Environment Quality Authority (EQA) before the application can be considered further.

The EIA shall be carried out in conformity with requirements of the Palestinian Environmental Assessment Policy, and with the General Guidelines for Environmental Assessment (the Guidelines) published by EQA.

The EIA shall be a comprehensive evaluation of environmental impacts of the Project, and should be undertaken during pre-feasibility and/or detailed feasibility studies (Phase II). Its main purposes are (1) to assist the Proponent in planning the Project and (2) to provide EQA with information it needs to consider granting Environmental Approval. The EIA provides an environmental plan in which features to be incorporated to mitigate adverse impact and potential benefits to be captured shall be described. It shall include a sever analysis and significance of impacts and benefits, especially for individuals and communities directly influenced by the project. It shall also provide an environmental management plan.

The EIA Report shall be of excellent quality to provide the EQA with sufficient information to:

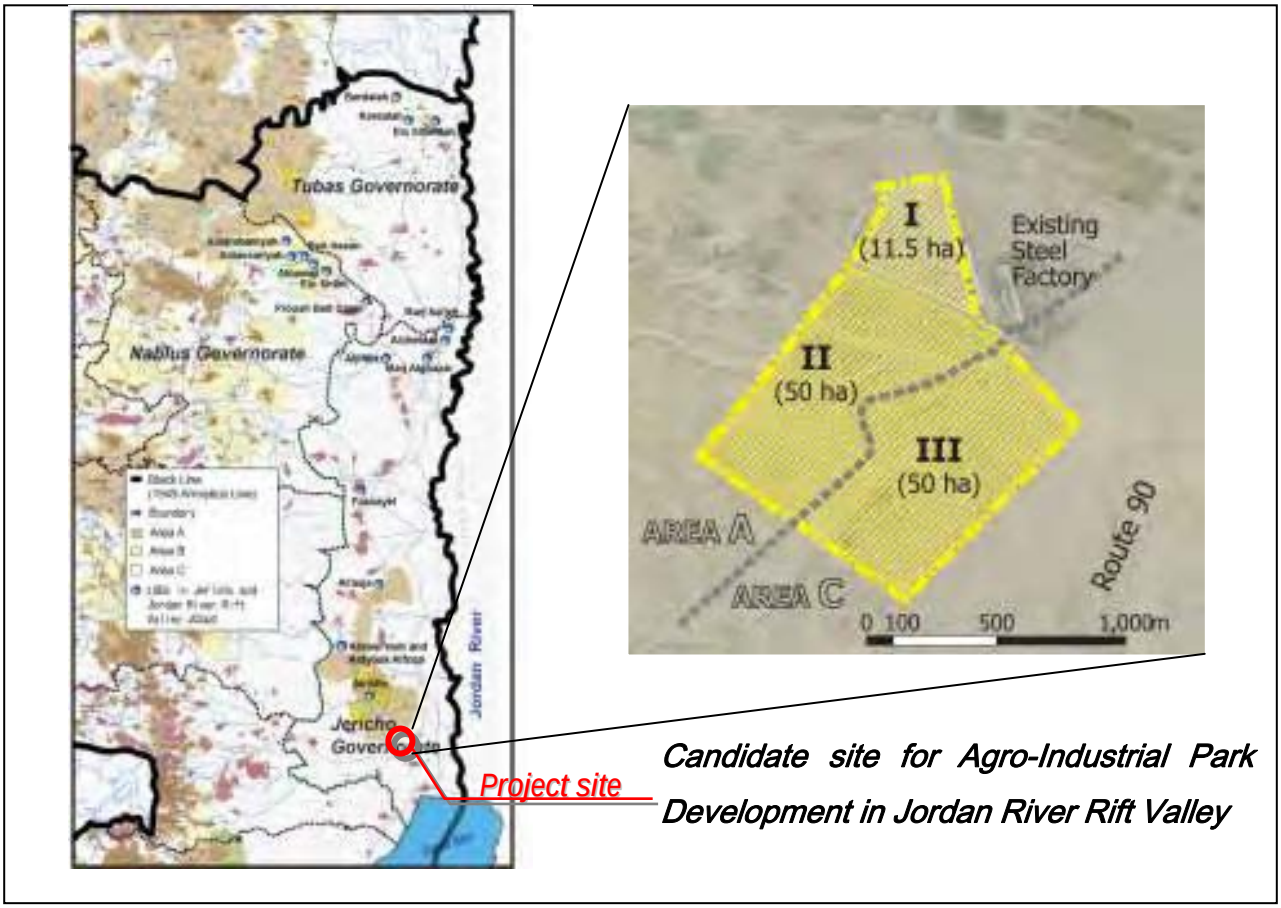
a) Grant Environmental Approval, with or without conditions; *OR*
b) Withhold Environmental Approval since the project has unacceptable environmental impacts.

### (2) Background of the Project

On the occasion of the visit of His Excellency Former Prime Minister Koizumi to Palestine in July 2006, the Japanese Government proposed the concept "Corridor for Peace and Prosperity" to promote regional development. Under the Japanese initiative, a governmental consultation platform has been set up involving Palestine, Jordan, Israel and Japan for the purpose of promoting economic cooperation in the region. This concept aims to create stability in the region surrounding Palestine.

In August 2006, the Japan International Cooperation Agency (JICA) decided to implement "The Jericho Regional Development Program" composed of three sub-programs: (1) Government Administration and Social Service; (2) Agriculture, Agro-industry and Distribution; and (3) Tourism and Urban Environment. Subsequently in November 2006 JICA dispatched a Project Formulation Mission to discuss the scope of works for the second sub-program.

Then followed the "Feasibility Study on Agro-industrial Park Development in the Jordan River Rift Valley", which is one of major core inputs under this initiative. The Study consists of two phases, the Pre-Feasibility Study (Phase I) (April-August 2007) and the Feasibility Study (Phase II) (Part 1: December 2007- February 2008, Part 2: April-November 2008).




Study Area Map

## 2. Scope of the Evaluation

The EIA shall focus on addressing key issues important to:

a) Planning and design of the project;

b) the local community;

c) the EQA in considering Environmental Approval; and

d) The related authorities in considering the issue of permission required for the Project to proceed.

Valued environmental components (VECs) which must be considered during the EIA are indicated with a check mark (√) in Table 1. As required for clarification, the VECs and related issues discussed shall be the items specified in List 1.

The EIA shall assess project in compliance with relevant local, district, regional and national land use and development policies, plans and programs, and with relevant regulatory standards.

The spatial boundaries and timeframe of the EIA shall be established to adequately address all direct, indirect, cumulative, and trans-boundary impacts on the VECs.

## 3. Environmental Planning

The EQA expects the EIA to contribute positively and significantly to the planning and design of the Project. The EIA Report shall document how environmental factors are incorporated into Project planning and design, and what the results are. EIA's study and reporting requirements on environmental planning are described in the Guidelines. The Proponent shall pay particular attention to the need to:

a) Consider alternatives in planning and designing the Project; and
b) Develop an environmental management plan.

## 4. Stakeholder Consultation

Prior to EIA, the Proponent shall consult with relevant local, district and national government agencies to ensure that their concerns, interests and regulatory requirements are adequately reflected in the EIA strategy and report.

General guidance on public consultation is given in the Guidelines. Specific consultation requirements for this Project are discussed (3) of List 1.

## 5. Minimum EIA Report Requirements

Detailed guidance on the conduct of an EIA and the preparation of EIA Reports is given in the Guidelines.

The EIA Report must contain at least:

a) Non-technical executive summary;
b) An introduction to the project, the proponent, and the EIA strategy;
c) A summary of stakeholders and public consultations about the project;
d) Baseline conditions (natural and social environmental conditions)
e) A description of the environmental planning for the project, and particularly of the alternatives to be considered;
f) A description of the project, including design and strategies for environmental protection;
g) Suitable maps showing the location of the project site(s), route(s) and alternatives, and the arrangement of project facilities within the preferred site or route;
h) An assessment of significant, potential impacts and their mitigation measures during and after construction;
i) An environmental monitoring and management plan and;
j) Identification of the names and responsibilities in charge of the EIA.

The EIA Report, and/or the letter of submission which accompanies it, must clearly indicate to which the Proponent:

a) Is in agreement with the contents of the Report; and
b) Is committed to implementing the environmental planning, design, mitigation, compensation and management measures it contains.

The Proponent shall note that the EIA Report will be reviewed by EQA and other Palestinian National Authority (PNA) agencies using standard procedures (see the guidelines). The comprehensive evaluation criteria used in these procedures represent quality standards which EQA expects the Proponent to meet in his EIA Report.

The Proponent shall also note that if the draft EIA Report fails to meet the minimum requirements specified above, it will not be accepted for review by the Authority.

## 6. Submission and Review of the EIA Report

The Proponent shall submit three (3) copies of the draft EIA Report to the Director of the environmental assessment department at EQA Office in Ramallah.

When the EQA is satisfied that the draft EIA Report meets the minimum reporting requirements, the Proponent shall submit twelve (12) copies of the final Report for detailed technical review under the provisions of the EA Policy.

## Table 1 : Valued Environmental Components

| Category | √ | Environmental Component |
|---|---|---|
| **Biophysical, Resource and Land Use Components** | √ | Climate and air quality |
| | √ | Surface water hydrology and quality |
| | √ | Groundwater hydrology and quality |
| | √ | Terrain and natural hazards |
| | √ | Soils and vegetation |
| | √ | Wildlife resources and use |
| | √ | Aquatic resources and use |
| | √ | Recreation and tourism resources and use |
| | √ | Forest resources and use |
| | √ | Agricultural resources and use |
| | √ | Mineral resources and use |
| | | |
| **Economic Components** | √ | Direct employment and income |
| | √ | Indirect/induced employment and income |
| | √ | Labor market conditions |
| | √ | Sources of supplies, materials and services |
| | √ | Transportation requirements |
| | √ | Infrastructure development requirements and costs |
| | √ | Government revenues/costs |
| | √ | Indirect/induced economic development opportunities |
| | | |
| **Cultural and Heritage Components** | √ | Archaeological sites |
| | √ | Traditional use sites |
| | √ | Historic sites and landscape features |
| | | |
| **Social Components** | √ | Social/demographic profile |
| | √ | Population |
| | √ | Housing and accommodation |
| | √ | Land and water use |
| | √ | Transportation and traffic |
| | √ | Community service delivery |
| | √ | Local government revenues/costs |
| | √ | Social support services |
| | √ | Community stability, cohesion and well being |
| | √ | Gender equity |
| | | |
| **Health Components** | √ | Supply of health facilities and services |
| | √ | Community water supply and watersheds |
| | √ | Waste treatment and discharge |
| | √ | Ambient air and water quality |
| | √ | Public health risks |
| | √ | Worker health and safety |
| | √ | Noise |
| | √ | Local community health |

## List 1 : Specific EIA Requirements

### (1) VECs and Related Issues/Concerns

The EIA Report shall study issues and concerns related to the following VECs as follows:

- **Air Quality**

1. Possible release of air pollutants as a result of construction and operation of the Agro-Industrial Park.
2. The expected level of such air pollutants and their cumulative effects;
3. the wind directions and the boundaries of their negative impacts;
4. Source reduction and other mitigation measures; and
5. The monitoring system to be adopted.

- **Groundwater hydrology and quality**

1. The geology and hydrology of the area.
2. The possible sources of pollution to groundwater;
3. Negative impacts onto the groundwater and their mitigation measures; and
4. The monitoring system that will be established.

- **Surface water hydrology and quality**

1. The maximum annual rainfall;
2. The natural drainage system in the area;
3. The runoff collection system and drainage that will be established;
4. Possible sources of pollution.
5. The mitigation measures to be adopted; and
6. The monitoring plan.

- **Soil and vegetation**

1. The presence of endangered species in the area and measures to conserve them;
2. Possible negative impacts on the surrounding biodiversity, sensitive areas, forests and the procedures to conserve and enhance them;
3. Soil erosion especially during construction and mitigation measures required for conserving soils for other uses such as greening of the area; and
4. Vegetation and habitat conserving and replanting plan.

- **Water resources and uses**

1. The available water resources and uses scheme;
2. The safe yield of such resources;
3. The expected project's water consumption and its impacts on the resources and other users; and
4. Measures to mitigate such impacts.

- **Wildlife**

1. The native Fauna;
2. The endangered wildlife in the area;
3. The impact of Agro-Industrial Park Project on the wild life presence;
4. Mitigation measures required to reduce or avoid wildlife and habitant disturbance or fragmentation; and
5. Plans to enhance the surrounding wildlife habitat.

- **Recreation and tourism**

1. The impacts of the project on the recreational and tourism sites and activities in the area;
2. The role of the project to conserve the resources of such activities and measures to enhance them.

- **Agriculture**

1. The valuable agricultural activities in the area;
2. The project impact on the agricultural land uses and activities;
3. Possible mitigation measures; and
4. Plan for agricultural enhancement in the area as part of the compensation for the loss or any negative impacts on the agricultural land.

- **Direct employment and income and labor market conditions**

1. The project's impact on employment and income;
2. Measures to enhance the employment and income rates;
3. The impacts on local communities; and
4. Possible mitigation measures of any negative impacts on local communities.

- **Sources of supplies, materials and services.**

1. The nature of such sources;
2. The impact of such sources on the project, local communities, and the Palestinian economy;
3. Measures to mitigate such impacts and benefits to local communities; and
4. Plans and policies to insure sustainable Palestinian sources.

- **Land Value**

1. The impact of the project on land value;
2. The compensation scheme and possible mitigation measures.

- **Transportation**

1. Map of the transportation system inside and outside the Agro-Industrial Park during the different project phases;
2. The impact of the movement of people, agricultural equipment’s and trucks across and along the project for the surrounding communities needs.
3. The expected traffic increase and routes to accommodate such increase;
4. The parking policy in the project area; and
5. Measures to mitigate congestion, air pollution, accidents and to ease transportation and prevent traffic interruption.

- **Infrastructure**

1. The capacity of the infrastructure to handle the project activities; and
2. The possible impacts of the development activities on the infrastructure and their mitigation measures.

- **Historic and Archeological sites and landscape features**

1. Full investigation of these sites in the area to avoid any damage or disturbance.
2. In case of the presence of any archeological and historical site and landscape features in the area, a plan for conservation of such sites should be suggested; and
3. The plan should suggest also the coherence of the project landscaping with these sites and possible social and economic impact.

- **Demographic profile, population and housing.**

1. The demographic map of the area;
2. The expected demographic changes in the map as a result of the project;
3. Risks of fragmentation of build-up areas and communities;
4. Compensation and other mitigation measure.

- **Public health, health facilities and services**

1. The possible health impacts of the project activities on workers, beneficiaries and the surrounding communities;
2. Accidents and health risks assessment;
3. Health facilities and services to serve both the industrial Park and the neighboring communities;
4. The health monitoring plan; and
5. Other mitigation measures to avoid health risks and accidents.

- **Waste water**

1. Industrial and waste water collection and treatment systems and technologies that will be established;
2. Who will be served by the proposed systems;
3. Measures for source reduction;
4. Treated waste water reuse; and
5. The possible impacts of wastewater collection, treatment and reuse or disposal and their mitigation measures.
6. Testing of treated wastewater and compare it with the Palestinian standards that EQA recommends.

- **Solid and hazardous wastes.**

1. The solid and hazardous wastes management systems that will be suggested for the project;
2. Assessment of needs for equipment and facilities;
3. Measures for prevention and source reduction; and
4. Possible environmental impacts of handling and disposal of such wastes and the mitigation measures.

- **Noise and safety**

1. Assessment of sources of risk and hazards that may endanger workers, visitors and the neighborhoods' safety;
2. Measures to mitigate such risks and to improve safety;
3. Sources and levels of noise and compare it with the allowed EQA recommended standards.
4. Measures to reduce noise levels.

**(2) Spatial Boundaries and Timeframe for the Study**

As appropriate to encompass anticipated effects on each VECs or group of VECs

1. Mapped definition of study area, including any alternatives to be considered.
2. Study time frame for construction phase and operation phase for up to 20 years.
3. The possible trans-boundary impacts.

- **Alternatives to be Considered**

Alternatives regarding phasing:

1. The locations of different phases of the project based on clear criteria; and
2. The types of priority industries.

Alternatives regarding social and environmental aspects:

1. Choice of technologies and processes;
2. Supply of materials, goods and services, especially where local suppliers exist;
3. Labor supply and scheduling for construction;
4. Handling of hazardous materials;
5. Waste management; and
6. Water supply.

- **Minimum Requirements for an Environmental Monitoring and Management Plan**

For monitoring each phase of the project:

1. Environmental variables to be monitored, and frequency; and
2. Reporting to appropriate authorities and local community.

Issues/concerns that are to be the subject of the environmental management plan, and reporting requirements to government and the public,

Environmental standards and guidelines will be adopted or required.

- **Stakeholder Consultation Requirements**

Stakeholder consultation will be carried out during the early stages of report preparation. The purposes of consultation are:

1. To inform the public of all issues and concerns related to the project;
2. To determine public concerns.
3. To specify project performance standards to be met;
4. To collect data, information or local knowledge;
5. To avoid future conflicts with affected or concerned stakeholders; and
6. To mitigate public environmental concerns.

The consultant has to examine suitable means to reach and get feedback from the public.

Consultations and feedback should be included in the report.

**(3) Stakeholders that will be consulted are the following**

1. The site and neighborhood land owners.
2. The surrounding municipalities. (Joint Service Council JSC in the area)
3. Public institutions in the area.
4. The Palestinian ministries of:
    - Agriculture
    - Transportation
    - Labor
    - Health
    - Local Government
    - Public Works & Housing
    - Water Authority
    - National Economy
    - Energy Authority
    - Tourism and Antiquities.
5. Universities and NGOs in the region.
6. Other stakeholders that the consultant fined that they are affected by the project.

Continuous consultation should be held with EQA during the preparation process.

During public consultations, page 5 of this TOR has to be examined and any additional concerns should be mitigated.

The significance of all issues and concerns mentioned in this TOR or presented during public consultations should be examined based on clear environmental criteria.

Finally the report should provide the industrial park management with clear and easy to apply criteria for sitting of new industries in each phase and each location.

Industries should be categorized in to the following categories:

1. Industries that do not require any kind of environmental assessment.
2. Industries that require environmental approval because of their well known direct or accumulative environmental impacts.
3. Industries that will not be accepted in the Industrial Park.

**Attachment 2**

## Matrix of Scoping based on the Palestinian Environmental Components Standard (1/2)

| Environmental Components | | Environmental Impact factors | Pre-construction | | Construction | | | | Operation | | | | | | | Brief Description |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Infrastructure components | | | | | | | |
| | | | Land acquisition | Land use plan | Site preparation work | Pavement work | Infrastructure components | Operation of construction equipment and vehicles | Cargo road access | Water supply | Power supply | Waste water treatment | Solid waste management | Common facilities | Operation of factories | |
| Biophysical Resources and Land-Use Components | 1 | Climate and Air Quality | D | D | B | B | C | B | B | D | D | C | C | C | C | Scale of the Industrial Park is relatively small. But some negative impact on air quality might be expected due to increase of traffic volume of cargo and construction vehicles. |
| | 2 | Surface Water Hydrology and Quality | D | D | D | D | D | D | D | D | D | D | D | D | D | No surface water exists. |
| | 3 | Groundwater Hydrology and Quality | D | D | D | D | D | D | D | B | D | C | C | D | C | There is some possibility that existing wells or ground water should be affected. Further information on ground water needs to be collected and analyzed through water quality survey.Existing water use and water right in Jericho related to supply of water is checked. |
| | 4 | Terrain and Natural Hazards | D | B | B | C | C | D | D | D | D | C | D | D | D | There is some possibility that the existing *wadi* should be dangerous in case of torrential downpours. |
| | 5 | Soils and Vegetation | D | D | C | D | C | D | D | D | D | D | D | D | D | No remarkable vegetation exists. But, possibility of soil erosion should be checked by the soil sampling test and geology survey. |
| | 6 | Wildlife Resources and Use | D | D | D | D | D | D | D | D | D | D | D | D | D | No valuable species exist. |
| | 7 | Aquatic Resources and Use | D | D | D | D | D | D | D | D | D | D | D | D | D | No aquatic species exist. |
| | 8 | Recreation and Tourism Resources and Use | D | D | D | D | D | B | B | D | D | D | D | D | D | No recreation and tourism resources exist at the site and its surrounding area. Construction and cargo vehicles might cause some traffic congestion on Route 90 and border checking point during tourist peak season. Carge access routes and carge traffic volume need to be checked. |
| | 9 | Forest Resources and Use | D | D | D | D | D | D | D | D | D | D | D | D | D | No forest resources exist. |
| | 10 | Agricultural Resources and Use | D | C | C | C | C | C | C | C | D | C | C | D | C | No agricultural land is included in the site for an industrial park. Field survey for agricultural land and activities is required around the site. |
| | 11 | Mineral Resources and Use | D | D | D | D | D | D | D | D | D | D | D | D | D | No mineral resource exists. |
| Economic Components | 12 | Direct Employment and Income | D | D | B+ | B+ | B+ | A+ | D | D | D | D | D | B+ | B+ | Positive impact is expected during the construction and operation of factories. |
| | 13 | Indirect/ Induced Employment and Income | D | D | D | D | D | D | B+ | D | D | D | B+ | B+ | B+ | Positive impact is expected after the operation of the park. |
| | 14 | Labor Market Conditions | D | D | B+ | B+ | B+ | A+ | D | D | D | D | D | B+ | A+ | Positive impact is expected through the operation of factories and common facilities. |
| | 15 | Sources of supplies, materials, and services | D | D | C | B+ | B+ | B+ | D | D | D | D | D | B+ | B+ | Positive impact is expected during the construction and operation of factories. |
| | 16 | Transportation Requirements | D | D | D | D | D | D | B+ | D | D | D | D | B+ | B+ | Transportation facilities such as bus and taxi should be required for the commuting of factory workers and staff to the park. |
| | 17 | Infrastructure Development Requirements and Costs | D | D | D | D | B+ | B+ | B+ | B+ | B+ | B+ | B+ | D | D | Infrastructures such as road and water supply in and around Jericho will be improved gradually as the Agro-industrial Park is developed. |
| | 18 | Government Revenues and Costs | A | C | B | B | B | B | B | B | B | B | B | C | C | PIEFZA (or other organization(s) in charge of O&M) shall allocate budget for the construction of the Industrial Park, including land acquisition. It is estimated that 17 years to recover the initial investment cost for the park development (Phase 1) |
| | 19 | Indirect/ Induced Economic Development Opportunities | C | D | D | D | D | D | B+ | D | D | D | D | B+ | B+ | Usually positive impact is expected. |
| Cultural and Heritage Components | 20 | Archeological Sites | D | D | D | D | D | D | D | D | D | D | D | D | D | No cultural property is reported in and surrounding area of the industrial park. |
| | 21 | Sites for Traditional Use | D | D | D | D | D | D | D | D | D | D | D | D | D | No site for traditional use is reported in and surrounding area of the industrial park .No historic property is reported in and surrounding area of the industrial park, but the industrial park might give negative impact to the existing local landscape. |
| | 22 | Historic Sites and Landscape Features | D | C | B | B | B | B | B | D | B | D | D | C | C | No historic property is reported in and surrounding area of the industrial park, but the industrial park might give negative impact to the existing local landscape. |
| Social Components | 23 | Social/ Demographic Profile | D | D | B+ | B+ | B+ | B+ | B+ | D | D | D | C+ | C+ | B+ | Creating employment opportunity at factories in the park may give some impact to this item.Cargo Road access will expects to encourage the social and economic activities along the road. |
| | 24 | Population | D | D | D | D | D | D | D | D | D | D | D | B+ | A+ | Population of Jericho city is expected to increase due to an additional inflow of population from other areas by the agro-industrial park development. |
| | 25 | Housing and Accommodations | B | D | B | B | B | B | D | D | D | D | D | B+ | B+ | Housing and accommodation for workers and visitor to the park may be developed near the park after the operation of the park. Housing development area is included in the plan of the 2nd phase of the agro-industrial park. |

## Matrix of Scoping based on the Palestinian Environmental Components Standard (2/2)

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Social Components | 26 | Land and Water Use | B | B | C | C | C | D | D | B | D | D | D | C | B | Selected site (Lot 1, 11.5ha) for the 1st stage development of the park is a state-owned land. Other sites (Lot 2, Lot 3) are privately-owned land and are required permission to develop for the park. It is reported Bedouins and local community are settled near the selected site. Detailed field survey is necessary in and around the sites. Available water volume at the site and its surroundings shall be also examined by conducting the water quality and water use survey. |
| | 27 | Transportation and Traffic | D | C | D | D | D | B | B | D | D | D | B | B | B | An estimated cargo access volume for the 1st stage development (11.5ha), about 10-20 tracks/day is acceptable to use existing road. Construction and cargo vehicles might create traffic congestion and interfere private and tour buses during tourist peak season on Route 90 and border checking point during tourist peak season. Further information on expected traffic volume is required to consider. |
| | 28 | Community Services Delivery | D | D | D | D | D | D | D | D | D | D | D | D | D | No impact. No local community service facility is included in the project. |
| | 29 | Local Government Revenues/ Costs | B | D | B | B | B | B | B | B | B | B | B | B+/- | B+/- | It is possible that the Jericho Municipality shall allocate some budget for the improvement and development of infrastructures around the Industrial Park (off-site). |
| | 30 | Social Support Services | D | D | D | D | D | D | D | D | D | D | D | D | D | It is necessary to investigate an overall influence of the Industrial Park on the adjacent areas or the whole Jericho City from the social point of view. |
| | 31 | Community Stability, Cohesion, and Well-Being | D | D | D | D | D | D | D | D | D | B+ | B+ | C+ | B+ | There is little possibility that the Industrial Park affect the local community-related matters.Proposed an overall concept for the park development is to have a variety of productive activities related to “Human Well-Being”. This concept could bring about some merits to not only investor to the park, but also to local community. |
| | 32 | Gender Equity | D | D | D | D | D | D | D | D | D | D | D | D | D | No impact. |
| Health Components | 33 | Supply of Health Facilities and Services | D | D | D | D | D | D | D | D | D | D | D | D | D | No impact. No health facilities and service is included in the project. |
| | 34 | Community Water Supply and Watersheds | D | D | D | D | C | D | D | C | D | C | C | D | C | There is some possibility that the wastewater from the industrial park affect the water resource in the long run, if the wastewater is not properly treated and discharged. |
| | 35 | Waste Treatment and Discharge | D | D | D | D | C | D | D | D | D | C | C | D | C | There is some possibility that the waste from the industrial park affect the neighbors’ comfortable life in the long run, if the waste is not properly treated and managed. |
| | 36 | Ambient Air and Water Quality | D | D | B | C | D | B | C | D | D | C | C | D | C | Extent of impact is unknown. Any emission from the factory and existing water quality need to be checked. |
| | 37 | Public Health Risks | D | D | D | D | D | D | C | D | D | C | C | D | C | Extent of impact is unknown. Appropriate methods and operation for waste water treament and solid waste management by factory are required. |
| | 38 | Worker Health and Safety | D | D | B | B | C | B | C | D | D | C | C | D | C | Extent of impact is unknown. Proper operation and management of the construction work for the industrial development is indispensable by the contractor/developer. |
| | 39 | Noise | D | D | B | B | B | B | B | D | D | D | D | D | C | Noise from the construction work, construction and cargo vehicle will affect the local society especially during the construction stage. |
| | 40 | Local Community Health | D | D | D | D | D | D | D | D | D | B | B | D | B | There is some possibility that without proper management of waste water and solid waste will affect heath of local community. |

*Evaluation Categories:*

*A: Serious impact is expected.*
*B: Some impact is expected.*
*C: Extent of impact is unknown. (Examination is needed. Impacts may become clear as study progress.)*
*D: No impact is expected. IEE/ EIA is not necessary.*
*+: Positive impact*

Source: JICA Study Team

**Attachment 3**

## Minutes of Meeting

### 1st Stakeholder Meeting for Environmental Impact Assessment for the Feasibility Study on Agro-industrial Park Development in the Jordan River Rift Valley

Date: June 10th 2008
Place: Jericho Resort Village, Jericho
Attendance: List of participants attached

### 1. Opening Speech

**Dr. Saeb Erikat, Head of Negotiations Department and PLC member, Palestinian Legislative Council from Jericho District** started by welcoming the participants and expressing thanks to JICA, JICA project teams, and JICA Study Team for their efforts in conducting the feasibility study. He also expressed thanks to PIEFZA, addressed the importance of EIA in large scale projects such as establishing the agro-industrial park, and called all heads of local councils to cooperate with JICA project teams.

Dr. Erikat stated that he was confident that the project will benefit the different parts of the West Bank, but the ordinary person needs to see real steps on the ground. However, people are not used to the idea of paying their financial commitments; the Japanese side is asked to work on the mentality of people throughout the project.

Dr. Erikat expressed his wish that the Israeli side would facilitate work related issues, so that we would have a completely coordinated process.

**Mr. Areef Ja'bari, Governor of Jericho and JRRV Governorate** welcomed the participants and conveyed gratitude to JICA for their efforts and added that this meeting holds great importance for the environmental aspect; he encouraged the specialization in environmental issues since it goes hand in hand with sustainable development. He called the stakeholders to come up with recommendations, and expressed his concern for the pollution of the environment which can results in an imbalance in nature.

The Israeli policy since 1967 was to uproot trees and to control environmental resources where 65% of water resources are controlled by Israel; in addition, the continuous incursions aimed at demolishing agricultural lands. If Israel takes part in any project, the Palestinian jurisdiction will be eliminated; the idea of Israeli participation is not desirable however, they impose restrictions on the project. It is not possible to have three countries in one project with an airport and an export passage. The real obstacle is the land of the project where part of the designated area falls under area C which is a few meter away from area A. Previously in other meetings, it was explained that restrictions and checkpoints imposed by Israel must be removed if this project is to succeed, and the passage must be under Palestinian jurisdiction otherwise, the expected benefit from this project will not be achieved. Palestinians will not give up any if the above mentioned demands since according to International Law, Israelis are occupiers and their existence is temporary. Palestinians face a problem in water resources especially in Jericho since water resources are used for the surrounding Israeli settlements; this issue was discussed with Tony Blair who on his part stated that he discussed this with Israelis. He further explained that Palestinians must have hope and must not give up.

**Mr. Ahmad Hasasneh, Director General of PIEFZA** started his speech by expressing gratitude for JICA and the Japanese people. He explained that the aim of the project is to develop the economy, to create job opportunities, and to use advanced technology. He addressed the efforts of the JICA Study Team in preserving the environment, and he called for joint efforts for the purpose of completing the project.

**Dr. Jameel Mtour, Vice President of EQA** welcomed the attendees on the land of Jericho city which is the eastern gate of Palestine and a historical city. He expressed thanks to JICA and to the Japanese government. The studies and surveys conducted by JICA especially for EIA have great significance especially in a large scale project where environment will be affected. Preserving environment is extremely important for social and economic development, and the project will have several benefits to the Palestinian economy in spite of

the difficulties faced such as the accessibility to the location of the industrial park and the Israeli control. However, Palestinians have determination to develop their society until they achieve their goal of having an independent state of their own. The complete Palestinian jurisdiction on the area of the project is the most important factor.

**Mr. Kazuhiko Sakamoto, Deputy Resident Representative, JICA Palestine Office** welcomed the attendees and his colleagues and addressed the importance of this meeting saying that environment is easy to lose and hard to get. The agro-industrial park project is an environment friendly project and several studies are being conducted such as solid waste management and waste water treatment. Future projects will be implemented, and hopefully cooperation will continue in the coming years.

**2. Presentations**

- **The Outline of the Project (Background and Outline)** was presented by Mr. Takuya Okada, JICA Study Team. The presentation included background, feasibility study, project location, development concept and issues on infrastructure.

- **EIA Process** was presented by Mr. Mahmoud Abu Shanab, Deputy Director, Environmental Protection Dept, EQA. The presentation included objective of EIA, procedure of environmental evaluation, evaluation of environmental effects, policies and laws.

**3. Questions and Comments**

**Q1: Mr. Bassam Sha'lan (Deputy Director of Cooperative, Housing and Real Estates, Ministry of Public Works and Housing)** questioned concerning the criteria of selecting the Agro Industrial Park location and the sensitivity of the area regarding ground water and surface water.

**Answer: Mr. Kazuhiko Sakamoto (JICA Palestine Office)** answered that JICA did not select the location for the agro-industrial park development proposed by the Palestinian National Authority. JICA cannot choose any location and left the task for PNA. As for JICA's role, it is to conduct technical studies on the selected location such as the environmental impact assessment. The results of the conducted studies show that the soil in the site is firm enough to prevent contamination of underground water.

**Q2: Mr. Bilal Amous (Bir Zeit University Labs)** commented on the fact that the project is a joint cooperation with Israel, Jordan, and PNA; he questioned the role of Israel in this project, and asked whether the Israeli policy or Palestinian policy will be applied. In addition, he posed a question concerning the Palestinian right in Jordan River and why wasn't it considered as a water resource in addition to the three mentioned resources?

**Answer: Mr. Kazuhiko Sakamoto (JICA Palestine Office)** said that EIA is a responsibility of Palestinian government since the project will be established on Palestinian land, therefore; the criteria of PNA were adopted and will be implemented. We cannot deny what Israelis will have to say and we have to pay attention to Israeli law especially in area C; there should be cooperation for crucial issues like water. The answer to the second question is that in Nablus people pay 10 NIS for cubic meter, and some areas are refused to buy from Mekorot. Water resources in Jericho area are scarce and we have to find every possibility since it is a pre requisite for the project, therefore; we are conducting a feasibility study on water resources, and a pilot project on water so that leakage of water will be prevented and more water will be provided for agriculture uses. We have to launch awareness campaigns among farmers to save water. Such small efforts will sum up to good results. We should not depend on water from Mekorot and it should remain as an option for water resources. In Jericho one cubic meter costs 2 NIS which is a very good price which makes Jericho a good place in water resources comparable to other places.

**Q3: Mr. Hasan Shbeeb (Palestinian Workers from Syndicate Union)** stated with commenting that we will buy Mekorot water which is originally Palestinian owned water. He wondered about the reason of not proposing the Agro Industrial park project on the private sector which would have provided a wider area; he commented further that what type of agro industries and what kind of products factories located in the ago-industrial park will be produced, which are not clarified. It is better to start with surveying the types of agricultural products that can be produced. Also, diseases might occur among workers in factories which

were not presented. As for water resources, he commented that water is available in Jericho and JRRV; however, license for well drilling in area C has to get permission from the Israeli side for well drilling. PNA has 6 deep wells licenses.

**Answer: Mr. Kazuhiko Sakamoto (JICA Palestine Office)** commented that this project is dealing with complicated issues; the Agro-industrial Park will not be implemented easily. Similar projects proposed by other donor agencies and international organizations were stopped somewhere because of political issues. JICA Study Team is technical people and tries not to be involved in political issues and politics in choosing the land or water resources; we have been conducted studies for several locations which were selected by PNA. We understand the legitimacy of water resources for Palestinians. But again we are technical people and JICA teams deal with only technical matters. We improved a number of wells in West Bank and we got permission from COGAT really quick which has never happened with others because we have good relations with them. Since 1967 Israel has never permitted to dig new wells. This is a feasibility study and afterwards we will face more difficulties. We try our best to implement this project.

**4. Orientation for the Scoping Discussion**

Mr. Go Kimura, JICA Study Team explained issues of discuss in the group discussion for participants. Participates are divided into four groups. Each group was discussed expected positive and negative impacts concerning following three environmental evaluation components by the implementation of the Agro-industrial Park Development.

- Natural (Biophysical) resources
- Health and sanitation
- Socio-economic environment

For considering the expected impacts, there are three stages (pre-construction, construction, operation) in accordance with time frame.

**5. Result of Scoping Discussion**

**Group 1:**

- Surface water: PNA must spread awareness among factories owners about the special criteria of water use. There should be an establishment for water treatment included in the project.
- Public health: There should be a sanitary disposal site on the site of the park since the Jericho solid waste disposal site cannot absorb the generated waste from the agro- industrial park. In addition, organic waste should be managed and reused for other purposes.
- Income and labor: The project will create job opportunities for people working in the field of construction. Also, the skills and experience of the local staff will be improved. There should be a monitoring and inspection body in the Agro Industrial park to ensure environmental and health regulations are not violated.

**Group 2:**

- The agro-industrial park should be comprehensive in nature with supportive industries, and each factory must obtain a license.
- The park might affect the ground water and soil by dust, chemicals, fumes, and acid rain. It was recommended that the project should include agro industries according to the crops planted in the area.
- Land prices might rise before and during construction process.
- Wild life might be negatively affected by birds' immigration and wild plants demolishing.
- Waste Water: An estimation of waste water generation should be made with the harmful substances included. The water used in the agro- industrial park and water used in agriculture should be separated.

**Group 3:**

- Agricultural institutions should be contacted, and land reclamation programs should be designated, technical support should be provided and water resources should be developed.
- Agro Industries included in the project should absorb the agricultural products. The agricultural sector will flourish, employment rate will increase, and income will improve.
- Waste Water: Waste water generation will increase as well as the use of chemicals.
- Health: The agro industrial park might cause air pollution. Plastic should be recycled.

- Income and employment: income and employment are the most important sides of the project.
- Construction and agricultural sectors will benefit, and the economy will improve as a result raising national income.

**Group 4:**

- A preliminary study on quality and quantity of existing water should be conducted and based on this, the types of industries should be determined.
- Waste Water: The Agro Industrial Park should include a water treatment station
- Solid Waste: solid waste will be generated and should be managed appropriately such as Compost and recycling. In addition, the method of waste generation reduction should be followed. The remaining types of waste should be disposed in sanitary landfills.

**6. Summary of the Group Discussion**

**Mr. Go Kimura, JICA Study Team** thanked the groups for their cooperation and recommendations which will be reflected to the EIA report. The discussion did not cover all issues; however, each group discussed mostly waste water, solid waste and their quantity and quality, income generating and creating job opportunities. In this meeting, we only provided limited information regarding the project. We plan to hold another EIA stakeholder meeting in mid-October. At the next meeting, we will provide more detailed information on the project. The meeting will be present result of EIA study including anticipated environmental and social impacts, alternative plans, mitigation measures, monitoring plan.

**7. Closing Speech**

**Mr. Ahmad Hasasneh, Director General of PIEFZA** made the closing speech by thanking all attendance and those who participated in the group discussion. Received recommendations will be taken into consideration the EIA study.

**Minutes of Meeting**

**2nd Stakeholder Meeting for Environmental Impact Assessment for the Feasibility Study on Agro-industrial Park Development in the Jordan River Rift Valley**

Date: October 15th 2008
Venue: Jericho Resort Village, Jericho
Attendance: List of participants attached

## 1. Opening Speech

**Mr. Kamel Hmeid, Governor of Jericho and JRRV Governorate** thanked JICA on behalf of Palestinian Authority and Palestinian people especially in Jericho Governorate for the support and effort to develop Jericho Governorate that will have positive effect on the socio-economy of Palestine. He thanked EQA for their efforts especially in the technical field, and appreciated their struggle against the occupation.

Mr. Hmeid also talked about the historical status and tourism in Jericho district, in addition that Jericho is considered as the food basket for Palestine, that is the reason why there is a need for economy development.400,000 people were visited Jericho to spend their vacation there. Jericho Municipality is looking forward to the development of Jericho district and support in the implementation of the project (Agro-industrial Park).

Mr. Hmeid mentioned Jericho before the occupation in the year of 1967 was a big district, but it is now reduced due to Israel's military action. The population exceeded 200,000 and they are still living without any facilities, it is necessary to call for the Israelis to stop those actions against the Palestinians.
Even though Jericho is the oldest city in the world, people in Jericho Governorate is facing a lot of problems such as water shortage (like in Aqbat Jaber) housing problems and sewerage problems

Mr. Hmeid insisted that Jericho Governorate supports and facilitates their mission to invite all the investors and donors to develop and invest in Jericho. He stated that this meeting will help to establish a concrete base in developing the district and take action in implementing the project.

**Mr. Hasan Saleh, Mayor of Jericho Municipality,** stated the environmental study (EIA) that has been done for the agro-industrial park will help and accelerate the project and make it more successful. Mr. Saleh mentioned Jericho is considered as the food basket for Palestine; also Jericho has an advantage of location as a gate of Palestine. This area starts from Jordan River and Al-Karamah crossing.

Mr. Saleh explained current situation of tourism sector in Jericho. A half million of tourists visited to Jericho, so that investment in tourism is a very important issue for Palestinians and other nations. Japan is one of the examples we try to adapt for the development of our district, Jericho as location from the river not like the occupation drew the border of the city, was considered as basket food for the neighboring countries like Jordan, Syria and Lebanon.

Mr. Saleh stated Jericho needs to welcome investors and donors for development of Jericho city and invite them. Additionally Jericho Municipality will try to help preparing good condition for investing. Mr. Saleh also mentioned about protection of the environment in the city and coordinate with all parties to protect the environment.

Regarding the environment, EQA should follow-up the region's conditions, and the leakage of sewerage into the groundwater. Mr. Saleh said an importance of water share in Jordan River. The share of water needs to increase with seeking support from Japanese and other countries.

Mr. Saleh expressed appreciation for Japan and the Japanese people who are paying taxes for the sake of the development of our country.

Mr. Saleh stated that “Peace Corridor project without peace means nothing, we shall emphasize on projects like this one, and get benefit from the location of Jericho as a gate of Palestine.”

**Eng. Ahmad Hasasneh, Director General of PIEFZA,** thanked JICA for their successful and comprehensive study that has been going on for 2 years with PIEFZA. The feasibility study of the Agro-industrial Park has nearly finished the preparation stage and PIEFZA will start soon in implementing the

ago-industrial Park. EIA study has been conducted by JICA Team with taking into consideration of all the environmental issues.

Mr. Hasasneh mentioned EQA is playing a good role in reducing the negative impacts and the Agro-industrial Park has positive impact for the district in social-economic wise, because of increases employment, and attracts many regional and international investments. PIEFZA instigated the work with all parties to establish a company for the development and management of the work in the Agro-industrial Park. This park will be developed in 3 stages, starting from 2009 and there will be other stakeholder meetings.

Mr. Hasasneh expressed appreciation to JICA for all their efforts and experience to developing and implementing the project.

**Dr. Jameel Mtour, Vice President of EQA**, stated EQA is coordinating with all parties to succeed the EIA study in this project for Jericho Municipality which considered the gate for Palestinian people.

JICA Study Team cooperates with EQA for EIA study and both help each other to conduct the EIA study with following the Palestinian and other international environmental standard.

EQA hopes to see the implementation of the ago-industrial park project as soon as possible, and it will help to develop Jericho as well as local resources.
EQA has to take into account how to insure environmental resources, municipality measures, possible harms, and support any real studied developmental effort under the supervision of JICA, PIEFZA, Jericho Municipality that will contribute in reaching the results of establishing the park and put a halt to the Israeli policies.

Dr. Mtour mentioned that without conducting the EIA study for the project is no sustainability of the project. Conducting EIA study is not a wasting time but it draws the sustainability and durability for the project.

Dr. Mtour insisted that there is big aquifer under Jericho city that can't get benefit from our rights of water and Palestinians are requesting our share and rights in the aquifer, in addition that Israeli depleted our resources and deteriorated our environment due to their settlement and their occupation. Dr. Mtour also mentioned methods for disposing hazardous wastes in the Palestinian lands in the West Bank and Israel's unrecognizing the Palestinian rights.

Dr. Mtour finally added that "we are ready for peace but Israel refuse to give us our rights but we still believe and work for peace**.**"

**Mr. Kazuhiko Sakamoto, Deputy Resident Representative, JICA Palestine Office**, explained about JICA's various cooperative activities and feasibility studies since 2005, JICA Team conducted the feasibility study for the project in addition to the Environmental Impact Assessment (EIA), gathering all information to be successful in the study.

Mr. Sakamoto mentioned PIEFZA's efforts and facilitating for the Agro-industrial Park in JRRV and other industrial estates like Bethlehem Industrial Estate funded by French Government, Jenin Industrial Estate funded German Government.

Mr. Sakamoto mentioned about constraints of water resources in Jericho. In the study, there are 4 options for water supply to the Agro-industrial Park. One of them is the deserted wells.

Mr. Sakamoto said that if we do not plan and design properly for this park, there will be a negative effect on the people. He also stated an importance of proper management of waste water and solid waste in this project in order to reduce negative impacts.

Mr. Sakamoto also added necessity of issues on capacity building and institutional strengthening for the operation and management of the park.

Mr. Sakamoto finally said he look forward to hear your comments and exchange opinions about this park in order to achieve the project without any future problems.

**2. Presentation**

**The Outline of the Project** was presented by Mr. Munenori Tada, Team Leader of JICA Study Team. The

presentation included outline of the development plan, infrastructure and facility, and implementation and O&M.

**The Outline of the EIA Process** was presented by Mr. Mahmoud Abu-Shanab, Deputy Director, Environmental Protection Dept., EQA. The presentation included procedure of environmental evaluation, evaluation of environmental effects, policies and laws.

**Review of the 1st EIA Stakeholder Meeting (June 10, 2008)** was presented by Mr. Go Kimura, JICA Study Team. Mr. Kimura explained about programs, presentations and results of group scoping discussion with stakeholders in the 1st EIA Stakeholder Meeting.

**Results of the EIA Study** was presented by Mr. Iyad Abu Erdeni, Mr. Go Kimura, JICA Study Team. Mr. Iyad Abu Erdeni explained about Environmental and Social Impacts, Alternation Plans, Mitigation Measures. Mr. Go Kimura explained Environmental Monitoring Plan.

**3. Questions and Comments**

After the presentation of the EIA Study, following questions and comments were raised from participants.

**Q1: Mr. Imad Al-Atrash (Wildlife Society)**

- What about migratory birds from out side of west bank and flying over the Industrial Park? Does this project take into consideration of the birds?
- Any effects of solid waste facility (Stock yard) on birds, and causing the sickness?
- What are the total effects on ground water under the Park, especially near the Jordanian Palestinian border?

**Answer: JICA Study Team**

- The birds might be affected. So, these mitigation measures are taking into consideration the emissions rate reduction in order to minimize this effect. A monitoring of the bird migrations in the Jericho area is suggested in order to reduce to any negative impacts and to modify the mitigation measures if needed.
- Solid waste can be a problem in case of no efficient management for the solid waste processing, treatment and transfer.
- JICA Study Team suggested required water supply from different water sources in order not to affect the ground water quality, especially if additional quota is supplied by Mekorot.

**Q2: Mr. Ibrahim Qteeshat (Head of Jericho Branch, Ministry of Agriculture (MOA))**

- Seeka well (Jericho Well no.1) is not suitable for drinking due to the salinity of the well which reaches 1500mg/l. Wells in Jericho are very having few (limited) water resource. An estimated number of laborers in the Industrial Park are 6000. Ein-Sultan spring provides the domestic and agriculture water supply covering a large area in Jericho and it is not enough to supply for the park. Do you recommend getting water from Mekorot.

**Comment: Eng. Deeb Abdelghafour (Palestinian Water Authority (PWA))**

- JICA is in the process of negotiating the different water supply options with the PWA. To answer the previous question, water from Jericho Well no.1 can be used for agro-processing and other uses in the agro-industrial park. In case of not covering the water from Ein-Sultan, then Mekorot is also an option.
- I don't know about the Wadi Marar design and catchment rehabilitation and JICA Study Teams didn't have any coordination with PWA in this regard.
- What do you mean by that there is no effect or no pollutions on ground water? That's not clear, please explain more? And the effects on ground water?

**Answer: JICA Study Team**

- No impact on the drinking water wells, but low impact for the groundwater which goes to Dead Sea.

**Q4: Mr. Atef Abu Jesh (Alnajah University)**

- Do JICA and Palestinians coordinate and discuss issues regarding water, roads and other necessary points with the Israeli side? What about the Jordanian side?

**Answer: JICA Study Team**

- I leave this question for the other members of JICA Study Team or JICA Palestine Office.

**Q5: Mr. Maan Salhab (Palestinian Census Bureau of Statistic (PCBS))**

- Is there any effect on food processing and production in the Agro- industrial park by the Iron factory near the park?
- What kind of action do you take into consideration to reduce or stop the effects?

**Answer: JICA Study Team**

- We don't know if this really has a direct impact, but we will take it more into consideration.

**Q6: Mr. Basil Yaseen (Energy Research Center)**

- Is their any suggestion to use solar energy? Solar Energy is not included as an alternative energy in you plan.

**Answer: JICA Study Team**

- Some processes for the compost treatment includes solar drying beds, but for operation process there wasn't any suggestion on applying solar system by the engineering team for this regard.

**Comment: Mr. Nader Al khateeb (WEDO)**

- JICA and Jericho Municipality should take into consideration a promotion plan of selling compost to the farmers and making them aware about it before its production at the agro-industrial park

**Q7: Mr. Samih Hussein/(General Manager of Jericho Hospital)**

- Do JICA consider expanding the Jericho Hospital in order to meet needs of the agro-industrial park, especially with a large number of population and employees being created?
- Not only to develop first aid services at the site, but needs development of special medical service (hospital) in Jericho to mitigate worker's safety and disease.

**Answer: JICA Study Team**

- I don't know if there is a plan to expand the Jericho Hospital from any founders. Maybe other members in JICA Study Team can reply in this regard.

**Q8: Mr. Majdi Shomali (PR consultant, JICA Expert Team)**

- Can the solid waste facility (Stock yard) be used not only for Industrial park but also for solid waste of Jericho?

**Answer: JST**

- It might be. Need to be coordinated.

**Q9: Ms. Ghadah Abed Rabbo (Jericho Work Manager, Ministry of Public Works)**

- What procedure does it take to consider for the residential areas near the Agro-Industrial Park?
- How flexible and possible to expand the area of Agro-industrial Park?

**Answer: JICA Study Team**

- Population around the site is taken into consideration. The Bedouin population will be relocated. Other residents in the New Jericho Area and others will be consulted in separate public hearings in Jericho.
- Expansion of the Agro-industrial Park is not outside the park boundaries (Expansion is within the designated boundaries of the park development.).

**Q10: Mr. Maan Salhab (Palestinian Census Bureau of Statistic (PCBS))**

- Solid waste is estimated to generate 185tons/day without recycle; it will be 4 times of solid waste generated in Jericho Municipality. The final solid waste estimated to be if minimized to 1% of solid waste, which means for example 2 tons/day. Where this quantity will be transferred or dumped?

**Answer: JICA Study Team**

- This issue will be adapted with the operation of the Agro-industrial Park but there are alternatives. Using the Jericho Solid Waste Dumping site is an option and sending the solid waste out of Jericho is another option that will be considered and to deal with the Jericho Dumping site is as a transfer station.

**Q11: Mr. Ibrahim Qteeshat (Head of Jericho Branch, Ministry of Agriculture (MOA))**

- This park area seems very conventional. Is there any advanced or updated technology or system applying in the Agro-industrial Park?

**Answer: JICA Study Team**

- Advanced technology is adapted in supporting infrastructure for the park and mitigation measures.

**Q12: Mr. Othman Hatab (Palestinian Land Authority)**

- Is there any condition or requirements for the owners of lands near the park? Is their any criteria you follow about this issue?
- What about the land ownership surrounding the site

**Answer: JICA Study Team**

- Regarding regulations and zoning of the city, this is a responsibility of the Jericho Municipality.
- Land ownership of the site is mainly for the Husseiny family and the Moslem Trustee Fund as well as some public land.

**Q13: Mr. Nader Khateeb (WEDO)**

- Does Israeli government agree to use Road no.90 and what about the other regional arrangements and export to Jordan?

**Answer: Mr. Kazuhiko Sakamoto (JICA Palestine Office)**

- We put pressures on the Israeli government and the Jordanian and the Palestinian in order to coordinate this issue. As explained before, this study is still working on the park area and we can't jump directly to Road no. 90 issue until we go with the phased development of the project.
- When we get into the 3rd stage development we should put more pressure on the Israeli side.
- We have to admit facts on the ground that some sides did not participate in the negotiations and the Israeli presence in this area is a de facto, and the Israelis objected to the use of Road no. 90. The IDF's answer is that there is no way to make a short cut to Road no. 90 for that reasons. Each phase will have different requirements.
- Concerning the export to Jordan, we invited ministers and decision makers for meetings to discuss these issues with the Jordanians.
- We are happy about the feasibility study. During the study, the Foreign Minister of Japan and met with the Palestinian Minister of International Cooperation and the Jordanian side concerning the Palestinian-Jordanian trade cooperation. Now we are about to finalize on these issues.

**4. Closing Speech**

**Eng. Ahmad Hasasneh, Director General of PIEFZA,** made closing speech by thanking all stakeholders participated in the meeting. He mentioned following points in the speech.

- Succeeding the EIA study for the Agro-industrial Park Development is a first priority of PIEFZA for the implementation of the project.
- Through the discussion and the speeches we found the importance of studying the EIA such as zero-emission from the agro-industrial park and priority of the project sustainability.
- The success of the project will expect positive effect on socio-economic aspect for Jericho as well as Palestine.
- Regarding to all studies of industrial estates in Palestine, major issues on implementation of the projects are how to attract and promote local and international investor to the industrial estate.

**Minutes of Meeting**

**The 3rd Stakeholder Meeting for Environmental Impact Assessment for the Feasibility Study on Agro-industrial Park Development in the Jordan River Rift Valley**

Date: October 26, 2008
Time: 10:30 - 13:30
Place: Conference Room, Jericho Municipality

**1. Objective of the Meeting**

The meeting aims to explain the outline of the project (Feasibility study on the Agro-industrial Park Development in JRRV) and the preliminary result of EIA study conducted by JICA Study Team for local stakeholder in Jericho, and to discuss any issues related to the EIA study. Any received comments from stakeholders will be are feedback to the EIA Report. The meeting was targeted to mainly residential communities and stakeholders that might have concerns regarding the development of the park.

**2. Opening speech**

**Mr. Iyad Abu Erdeni, JICA Study Team** gave opening speech for welcoming the meeting on behalf of JICA Study Team

**3. Presentation**

- **EIA Process and Requirement** was presented by Mr. Iyad Abu Erdeni. He explained the importance of stakeholder meetings for local residents in the process of EIA study.

- **Outline of the Project** was presented by Mr. Majdi Abu Awwad, JICA Study Team. The presentation included development plan, infrastructure and facilities , implementation (operation and maintenance).

- **Result of the EIA Study** was presented by Mr. Iyad Abu Erdeni. The presentation included environmental and social impacts**,** alternative plans and mitigation measures.

**4. Summary of Discussion**

**Q1: Eng. Asaad Hassouneh (Industrial Engineer and Deputy Manager, Steel Factory)**

- The steel factory will not be affected environmentally or socially because the project is the agro-industrial park development. There Road improvement and water supply are main supporting infrastructure for the steel factory which are not implemented for 13 years (Since the steel factory was constructed.)
- The factory might be affected in case of mismanagement of solid waste and/or the wastewater for the fact that the factory is very close to the park. The most important part for us (the steel factory) is to take into consideration the wastewater and solid waste which can be causing bad smell and mosquitoes in the area. Noise and vibration are not great concern since we are an industrial factory and not a residential area.
- Will the special exporting arrangements be exclusive to the Agro-industrial Park?
- Is there intention to support the local industries by JICA, in other ways, will any raw material be produced inside Palestine?

Some questions are still remained for regarding the industrial and economic promotion. (**JICA Study Team)**

**Comment: Mr. Mahmoud Abu Ghazaleh, Mr.Husein Osta, Mr. Saleh Sweidi (JDECO Residential Complex in Jericho)**

- We would like to thank JICA on the clear presentation on the Agro-industrial park development. The feasibility study is an important step and we are waiting for this project to be implemented as it is a

comprehensive development plan for the Jericho area and an important factor for developing the Palestinian economy in general.

**Q2: JDECO Residential Complex in Jericho**

- Will JDECO be requested to increase its electric energy that is bought from Jordan, especially that the Agro-industrial park will be consuming half of the energy bought from Jordan (12 Megawatt)? Will there be coordination with Jordan in this regard?

**Answer: JICA Study Team**

- This might be possible to negotiate with Jordan and if energy in the future is provided by independent Palestinian companies then it's a main source.

**Q3: JDECO Residential Complex in Jericho**

- It is very important that in the future their will be no expansion to the west of the agro-industrial park, which makes the park closer to the residential areas.

**Answer**: **JICA Study Team**

- That's clear in the master plan of the park that there is no expansion to the west.

**Q4: JDECO Residential Complex in Jericho**

- We hope that the study for the wastewater will take into consideration. The treatment processes needed for the park but also to emphasis on making a sewage network for Jericho city and the residential areas near the park.

**Answer: JICA Study Team**

- If a sewage network and treatment plants provided for Jericho then this is an important move for the city, but the agro-industrial park is having the necessary treatment for the park itself. In case of central wastewater treatment, the park can be connected to it.

**Q5: JDECO Residential Complex in Jericho**

- In case of success of the agro-industrial park, will there be a possibility of getting more water from the *wadi* Qilt or other *wadis* ?

**Answer: JICA Study Team**

- This was one of the water alternatives but not at this stage.

**Recommendations: Ms. Wiam Erekat, Mr. Muhamed Abu Muhsen, Mr. Maisa Hijazi (Jericho Municipality Residential Complex)**

- Concerning the proposed access road, access road should be connected to road no. 90.
- Coordination with the Jericho municipality concerning the different requested facilities since the agro-industrial park will increase the population number in the city.
- To maintain a high level of monitoring in the Agro-industrial park especially on the polluting industries if existed.
- To make detailed analysis regarding the water and electricity supply so as to make sure that the city will not be affected in this regard.

**Recommendations and comments: Mr. Ikremah Adas, Mr. Amal Qweider (PARC and the new residential area near the Agro-industrial Park)**

- The compost issue should be clarified in terms of quality and production specification should be clarified by the compost producer.
- Impacts of water supply on drinking water in the city.

**Answer: JICA Study Team**

- We have already taken into consideration and different alternatives are suggested such as water desalination or water from Mekorot in order to have high water quality.

**Q6: PARC and the new residential area near the Agro-industrial Park**

- Take into consideration the safety of access roads, width and sides of the road.

**Answer: JICA Study Team**

- This is taken into consideration in the design.

**Q7: PARC and the new residential area near the Agro-industrial Park**

- Will there be special wastewater treatment for factories that will use hard polluting chemicals and that have impact on the ground water?

**Answer: JICA Study Team**

- Those kinds of factories are not recommended to be in the Agro-industrial Park but in case of any factory using such material, a special EIA will be requested by the EQA. Also, each factory will have a pre-treatment unit (facility) before wastewater is mixed with the rest of the wastewater network of the park.

**Attachment 4**

## List of Participants for the 1st Stakeholder Meeting for Environmental Impact Assessment

Date: June 10th, 2008
Place: Jericho Resort Village

| | Name | Ministry/ Agency/Institution | Position | Telephone/ Mobile | e-mail |
|---|---|---|---|---|---|
| **Government** | Dr. Saeb Erikat | PLO, Palestinian Legislative Council | Head of Negotiation Dept. | | |
| | Mr. Mohammad Al Masri | Ministry of Agriculture | Director of Post Harvest Dep. | 0598931059 | almasrix@yahoo.com |
| | Mr. Isam Nofal | Ministry of Agriculture | | 0598931076 | Issam-nofal@hotmail.com |
| | Eng. Mohammad Namoora | Ministry of Labor | Director of Inspection and Labor Protection | 05998016931 | m_namara2003@yahoo.com |
| | Eng. Yousef Zaghloul | Ministry of Labor | Director of Safety and Occupational Health Department | 0599 788514 | Yousef_zaghloul@yahoo.com |
| | Mr. Tahseen Barakat | Ministry of Agriculture | Director | 0598931073 | Tahseenbarakat@yahoo.com |
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| | Mr. Deeb Abdel Gafoor | Palestinian Water Authority | JICA Project Coordinator in PWA | 0599778793 | Deeb_saleh2003@yahoo.com |
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| | Mr. Hani Kasem | Palestinian Water Authority | Water Planning Director | 0599225587 | hqasem@yahoo.com |
| | Mr. Emad Safi | Palestinian Water Authority | Director | 0598183115 | Emad_saifi@yahoo.com |
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| | Mr. Jameel Mtour | Environmental Quality Authority | Vice President | 240 3495 | Jameel_mtoor@hotmail.com |
| | Eng. Mahmoud Abu Shanab | Environmental Quality Authority | Deputy Director of Environment Protection Department | 240 3495 | Ma_shanab@yahoo.com |
| | Mr. Nidal Katbeh | Environmental Quality Authority | Deputy Director of Resources Department | 240 3495 | n72065@hotmail.com |
| | Mr. Amjad Kharraz | Environmental Quality Authority | Environmental Assessment Department | 240 3495 | engkharraz@yahoo.com |
| | Mr. Ma'en Salhab | Palestinian Central Bureau of Statistics | Head of Solid Waste Statistics Section | 240 6340 | maen@pcbs.gov.ps |
| | Eng. Bassam Sha'lan | Ministry of Public Works and Housing | Deputy Director of cooperative Housing and real estates | 2966006 | |

| | Name | Ministry/ Agency/Institution | Position | Telephone/ Mobile | e-mail |
|---|---|---|---|---|---|
| | Mr. Issa Kheir | West Bank Water Department | Deputy Director | 0599814073 | |
| **Local Government** | Mr. Areef Ja'bari | Jericho and JRRV Governorate | Governor | | |
| | Mr. Khaled Hamad | Jericho and JRRV Governorate | Planning Director | 232 1515 | |
| | Mr. Mohammad Salahat | Tubas Governorate | General Director Planning and Development | 09 2571077 | |
| | Mr. Abdel Jabbar Abu Halaweh | JCspd in JRRV | Director | 232 018 | manager@jcspd-jericho.org |
| | Mr. Marwan Samarat | JCspd in JRRV | Public Relations | 232 0118 | Samarat_11@hotmail.com |
| | Eng. Ghazi Ayyad | Municipality of Jericho | Head of Water Section | 232 2417 | |
| | Mr. Zahi Barahmeh | Municipality of Jericho | Public Services Deputy Services | 232 2417 | Zahi_barahme20@yahoo.com |
| **Community based Organizations** | Mr. Judeh S'eed | Peasants Union | Director | 2324704 | |
| | Hasan Shbeeb | Palestinian Workers Syndicates Union | Director | 232 1328 | |
| | | Union of Agricultural Work Center | Project Supervisor in Jericho | 2980316 | |
| | Mr. Mona Jaber | JRRV Cooperative Society for Bees | Public Relations | 232 7205 | Jersoc2007@yahoo.com |
| | Mr. Foad Al Akra | Food Industry Union | Executive Director | 295 0290 | pfia@palnet.com |
| | Mr. Wael Nazeef | General Union of Palestinian Workers Syndicates | General Director | 232 1328 | Pgftu_jer@yahoo.com |
| | Mr. Abdel Kader Salah | Marketing Society | Member in the Marketing Society | 2325674 | |
| | Eng. Mohammad Njoum | Union of Agricultural Work Committees | Project Supervisor in Jericho | 0598919659 | njoum@uawc-pal.org |
| **Private Sector** | Mr. Silmi Hamad | Jericho Chamber of Commerce, Industry and Agriculture | Secretary General | 232 3313 | |
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| | Mr. Azzam S'eed | Al Mays Company for Plastic | | 232 5674 | |
| | Mr. Marwan Sonokrot | Telfreeq Project | Director | 2321590 | kamel@sinokrot.com |
| **Universities** | Eng. Bilal Amous | Bir Zeit University Labs | Director Assistant | 298 2010 | bamous@Birzeit.edu |
| | Mr. Atef Abu Jeish | Al Najah University/Water Institute for Aquatic and Environmental Studies | Environmental Researcher | 0598 930680 | |

| | Name | Ministry/ Agency/Institution | Position | Telephone/ Mobile | e-mail |
|---|---|---|---|---|---|
| **NGOs** | Mr. Imad Atrash | Wildlife Society | Executive Director | 2774373 | wildlife@palnet.com |
| | Mr. Ekrima Adas | PARC/ Jericho Branch | | 232 7296 | aadas@pal_arc.org |
| **Donors** | Dr. Azzam Saleh | FAO | Senior Agricultural Advisor | 0599 727797 | Azzam.saleh@fao.org |
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Date: October 15th, 2008
Place: Jericho Resort, Jericho

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# Annex C

# Economic Effects of the Agro-industrial Park

C.1 Methodology of the Analysis

C.2 Results of the Economic Effects Analysis

C.3 Comparison of Economic Effects by Type of Industries

## C.1 Methodology of the Analysis

### (1) Target of the Analysis

The Agro-industrial Park would generate demand for the labor force as well as goods and services in the form of production inputs and consumer goods. The demand for transportation and storage services would also increase. The effects of this growth could lead to significant multiplying effects throughout the local, regional, and national economies.

This section estimates the economic effects of the Agro-industrial Park development on Palestinian economy. The economic effects are estimated as i) the incremental added value contributing to the Palestinian economy in monetary value, and ii) the employment generation. Added value refers to the additional value created at a particular stage of production of goods and is calculated as the remaining value after intermediate consumption is subtracted from annual output. Since the added value is further divided into capital cost, labor cost and taxes, this section estimates the increase in the added value first and then the increase in labor cost and taxes in more detail.

### (2) Methodology of the Analysis

Figure C-1 illustrates the schematic image of the abovementioned direct and indirect economic effects of the Agro-industrial Park. Economic effects consist of direct and indirect effects, where the latter can be further divided into forward and backward linkage effects. The term “forward linkage” is used to indicate interconnection of a sector to the sectors to which it sells output. The term “backward linkage” is used to indicate the interconnection of a sector to the sectors from which it purchases input.

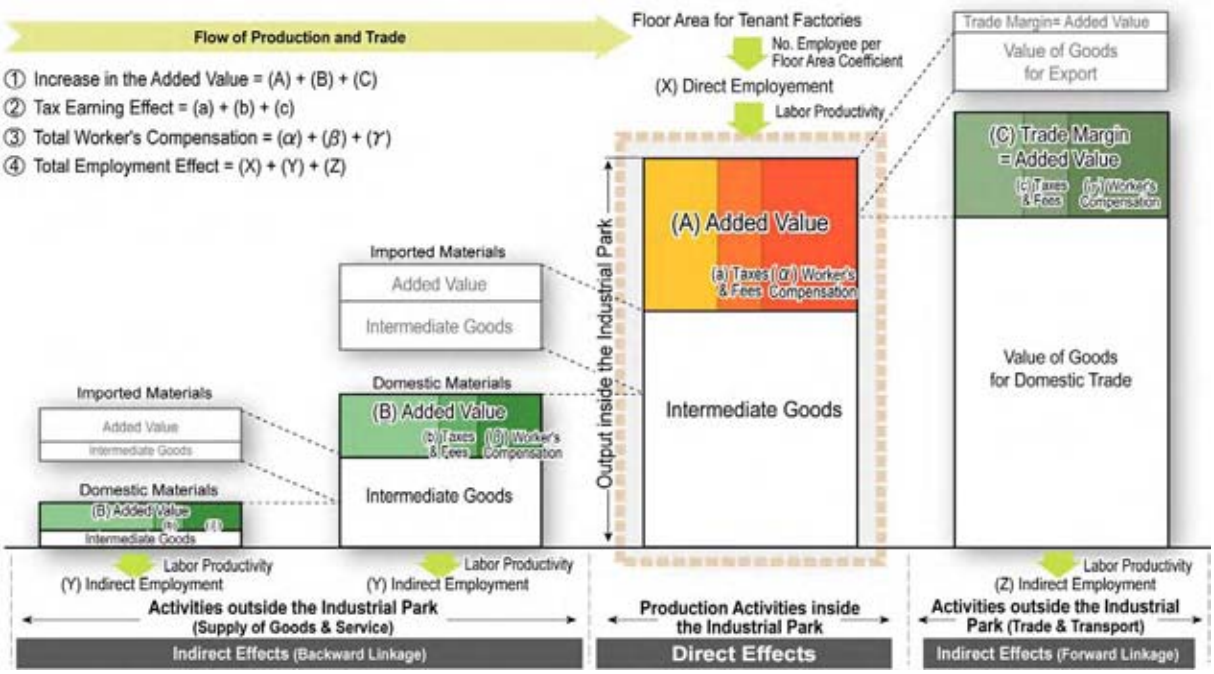



**Figure C-1 Direct and Indirect Effects of the Agro-industrial Park**

Employment creation effect (X) inside the Agro-industrial Park is calculated based on the total floor area available for tenant companies, tenant occupancy ratio, and the number of employees per floor area coefficient. The annual output inside the Agro-industrial Park is estimated based on the number of employees and the labor productivity.

Value of output produced inside the Agro-industrial Park is divided into “added value” and “intermediate consumption”. Increase in added value created inside the Agro-industrial Park is determined as the sum of all the added values (A, B and C). It is further divided into operating surplus, payment of taxes (a), worker’s compensation (α), and depreciation of fixed assets. These effects generated inside the Agro-industrial Park are counted as the direct effects.

Indirect effects are generated in the course of supply of goods/service to the Agro-industrial Park, as well as transportation and wholesale/retail activities of the goods produced inside the park. Added value (B, C), employment creation (Y, Z), payment of taxes (b, c) and worker’s compensation (β, γ) are counted as indirect benefits. Figure C-2 illustrates a more detailed flow of the calculation of economic effects of the Agro-industrial Park, as considered in the analysis.

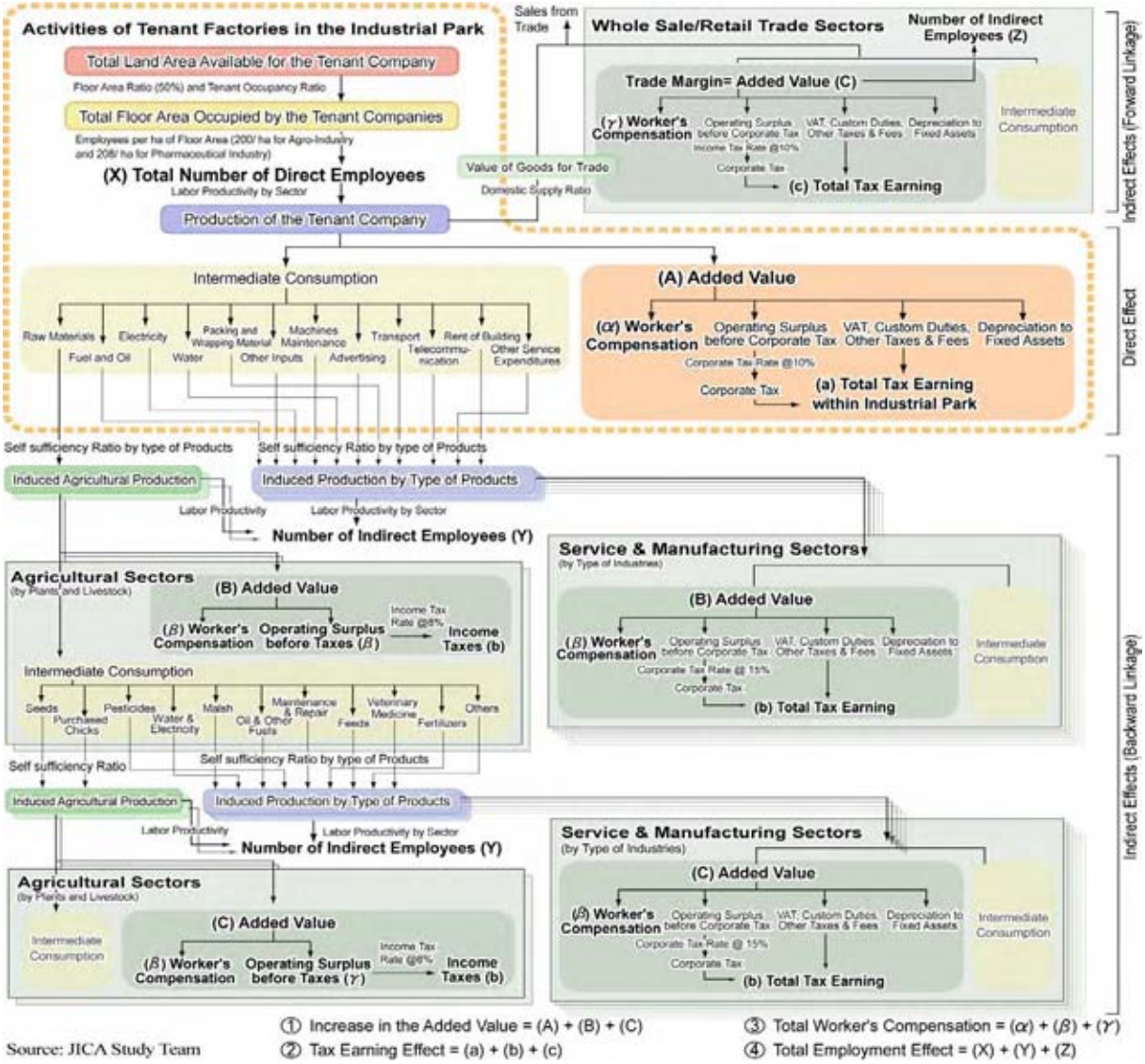



**Figure C-2 Flow Chart for Computing Economic Effects of the Agro-industrial Park**

**Direct Effects**

Annual output of the tenant companies are estimated for every promising industry based on total floor area available for tenant companies, tenant occupancy ratio, number of employees per floor area and labor productivity. The total floor area for tenant companies are estimated to be 26.3 ha (Stage I: 2.4 ha, Stage II: 9.5 ha, and Stage III: 14.5 ha) based on the land use plan (see Chapter III for detail).

The number and type of companies entering into the Agro-industrial Park are estimated as shown in Table C-1. This was based on the investment survey and interview conducted as part of this study. The same assumption is adopted for the demand forecast in the engineering plan. As shown in said table, the manufacturing of food/beverages, processing/preserving of fruit/vegetables, and packaging industries are selected as the promising industries in the Agro-industrial Park.

Tenant occupancy ratio is tentatively assumed to be 90% for stages I to III. Floor area occupied according to type of industries is computed based on the weighted average of total occupied floor area and the number of companies. Number of employees per hectare of floor is assumed to be 200 employees/ha[*1]. The total value of output (amount of sales) of each industry is computed based on the labor productivity index of each industry, which is calculated based on the PCBS' economic survey 2006.

**Table C-1 Number of Tenant Companies, Total Floor Area, and Tenant Occupancy Ratio**

| | ISIC-Code | Stage I | Stage II | Stage III | Total |
|---|---|---|---|---|---|
| Total Floor Area Available for the Tenant Factories | - | 2.14 ha | 9.46 ha | 14.49 ha | 26.33 ha |
| Tenant Occupancy Ratio | - | 90% | 90% | 90% | 90% |
| Number of Companies and Floor Area | - | 10 (1.88ha) | 40 (8.72ha) | 60 (11.45ha) | 110 (22.05ha) |
| - Food Processing Industries | 15 | 8 (1.69ha) | 36 (7.85ha) | 54 (10.30ha) | 98 (19.84ha) |
| - Agribusiness dealing with Fresh Fruit and Veg. | 1511 | 1 (0.09ha) | 2 (0.44ha) | 3 (0.57ha) | 6 (1.10ha) |
| - Packaging Industry* | 25 | 1 (0.09ha) | 2 (0.44ha) | 3 (0.57ha) | 6 (1.10ha) |

*Note: Various assumptions used for computing economic effects of "packaging industries" are the same as the manufacture of plastic and rubber industries (ISIC code 25)

Source: JICA Study Team

Total output of each industry is divided into "added value" and "intermediate consumption"[*2]. Added value is further divided into compensation of employees, fees/taxes, depreciation, and operating surplus, in proportion to the actual data of every industrial type (see Figure C-3), which was collected through the sampling survey of the PCBS' economic survey 2006. Added value, compensation of employees, number of employees and fees/taxes calculated herewith are regarded as the direct effects of the Agro-industrial Park.

It is assumed that while 80% of industrial activities in the Agro-industrial Park are newly generated as a result of the development project, the remaining 20% is made up for the industrial activities of the existing

[1] Number of employees per ha of floor area of food processing related industries is assumed to be 200 per ha based on the results of the investment survey conducted in this study.

[2] Added value refers to the additional value created at a particular stage of production, and consists of compensation of employees, fees and taxes, depreciation, and operating surplus. On the other hand, intermediate consumption refers to value of production inputs, and consists of value of raw material, value of input goods and value of input service.

industries that relocated into the park from other areas of Palestine. The latter cannot be regarded as additional economic effects because these originated from the Agro-industrial Park project. Results of the analysis are shown in section C-2.

**Indirect Effects**

Intermediate consumption by the tenant companies in the Agro-industrial Park which was calculated in the previous discussion (Direct Effects) is not regarded as the direct economic effects. However, added value, additional employment, compensation of employees, and fees and taxes of domestic materials/goods and service providers outside the Agro-industrial Park are regarded as the indirect economic benefits resulting from the operation of tenant factories in the Agro-industrial Park.

**Table C-2 Inter-relation of Industries**

| Intermediate Consumption and Final Products Demand in the Industrial Estate | Affected Sectors | |
|---|---|---|
| | ISIC-Code | Name of Sectors |
| Finished Products | 51, 52 | Wholesale trade and commission trade, Retail trade, repair of personal goods |
| Intermediate Consumption (Manufacturing Sectors) | | |
| Raw materials | 01 | Agriculture, hunting and related service activities (Food and Beverage Industries) |
| Fuel and Oil | 51 (5141) | Wholesale of Solid, Liquid and Gaseous Fuels and Related Products |
| Electricity | 40 | Electricity |
| Water | 41 | Collection and Distribution of Water |
| Packing and Wrapping Material | 21, 22, 25 | Manufacture of Paper and its Products, Publishing, Printing and Reproduction, and Manufacture of Rubber and Plastic |
| Other Inputs | 14-41 | Industrial Sector Average |
| Machines Maintenance | 52 | Repair of personal and household goods |
| Advertising | 55, 70-90 | Service Activities Average |
| Transportation | 60, 63 | Land transportation, Supporting and Auxiliary Transportation |
| Telecommunication | 64 | Postal and Telecommunications |
| Rent of Building | 70 | Real Estate Activities |
| Other Service Expenditures | 55, 70-90 | Service Sector Average |
| Intermediate Consumption (Agricultural Sectors) | | |
| Seeds | 011 | Agricultural Sector (Growing of Crops; Market Gardening; Horticulture) |
| Fertilizers | 24 (2412) | Manufacture of fertilizers and nitrogen compounds |
| Pesticides | 24 | Manufacture of Chemicals and its Products |
| Electricity | 40 | Electricity |
| Water | 41 | Production and Distribution of Water |
| Malsh (Plastic Cover) | 25 | Manufacture of Rubber and Plastic |
| Oil, Lubricant and Other Fuel | 51 (5141) | Wholesale of Solid, Liquid and Gaseous Fuels and Related Products |
| Maintenance and Repair | 52 | Repair of Personal Goods |
| Feeds | 1533 | Manufacture of Animal Feed |
| Veterinary Medicine | 33 | Manufacture of medical, optical equipment |
| Purchased Chicks | 012 | Farming of cattle, sheep, goats, horses, asses, mules and hinnies; dairy farming |
| Others | 55, 70-90 | Service Sector Average |

Source: JICA Study Team

Induced productions for the Palestinian industries on final products manufactured inside the Agro-industrial Park are calculated as the sum of the breakdown of the intermediate consumption and the self-sufficiency ratio[*3], by type of products.

[3] A ratio of total food produced to the total food requirements measured in percentage terms. A measure of the ability of food produced to meet the demand for food and other food related requirements. In this analysis, self-sufficiency ratio is calculated based on production volume of the manufacturing sector, and import and export amount (manufacturing sector) quoted from PCBS data, and production and consumption volume of agricultural products quoted from FAO database for Palestine during 2001-03.

Categories of intermediate consumption and their concerned industrial sectors (provider of intermediate goods and service) were assumed as shown in Table C-2. Induced productions (outputs) are also divided into added value and intermediate consumption. The former is regarded as indirect effects. Indirect employment effects are computed based on the induced output by products and labor productivities of concerned economic activities.

Likewise, the final products procured inside the Agro-industrial Park will generate additional economic effect on the wholesale/retail trade sector. These are also regarded as indirect effects of the Agro-industrial Park.

### (3) Data Used for Analysis

Data used for estimating economic effects of the Agro-industrial Park is mainly obtained from the industrial survey 2006. The economic survey is conducted annually by the Palestinian Central Bureau of Statistics (PCBS) in order to obtain a detailed operational data of companies belonging to the manufacturing industry, internal trade, construction, and transportation/storage sectors. The effective sample size of the economic survey in 2006 was 7,320 which are 8.2 % of the total number of enterprises in Palestine (89,389)[*4].

The data is compiled by type of industries using International Standard Industrial Classification (ISIC) Code, Revision 3. Some of the data required for the analysis is processed using the raw data from the survey, in accordance with the intended use. Similarly, other statistical data, such as labor survey data, import and export data, are also re-compiled in accordance with ISIC Code. For example, the import and export data in Palestine are originally compiled in accordance with the Standard International Trade Classification Revision 3 (SITC-3), and thus import and export data of major commodities are re-compiled using ISIC Code with technical assistance from PCBS staff.

The major financial data of the economic survey used for this analysis is as follows (see also attached Tables C-9 and C-10);

**Table C-3 Major Input and Output Data of Industries Used for the Analysis (1/2)**

| | | |
|---|---|---|
| **Output** | | |
| Exports Sales | Change in Stocks | Revenue from Transport Activities |
| Local Sales | Revenue from Main Service Activities | Other Revenue from Service |
| **Added Value** | | |
| Trade Margin | Operating Surplus | Entity Licensing Fees |
| Gross Value Added | Operating Surplus before Income Taxes | Vehicle Licensing Fees |
| Compensation of Employees | Value Added Tax | Stamp FeesBuilding Taxes |
| Depreciation of Fixed Assets | Corporate Tax | Other Taxes |
| **Intermediate Consumption (Industrial and Service Sectors)** | | |
| Raw materials | Other Inputs | Telecommunication |
| Fuel and Oil | Machines Maintenance | Rent of Building |
| Electricity | Subcontract | Other Service Expenditures |
| Water | Advertising | |
| Packing and Wrapping Material | Transport | |

[4] Total number of enterprises belongs to manufacturing industry, internal trade, construction, and, transportation and storage sectors (2006 data).

**Table C-4 Major Input and Output Data of Industries Used for the Analysis (2/2)**

| Intermediate Consumption (Agricultural Sector) | | |
|---|---|---|
| Seeds | Plastic Cover | Veterinary Medicine |
| Fertilizers | Oil, Lubricant and Other Fuel | Purchased Chicks |
| Pesticides | Maintenance and Repair | Others |
| Water and Electricity | Feeds | |

Source: JICA Study Team

In the case of the agricultural sector, similar data shown above are obtained from the agricultural statistics 2005/06.

Palestinian industries can be divided into micro industry (1 - 4 employees), small industry (5 - 19 employees), medium industry (20 - 49 employees), large industry (50-99 employees), and very large industry (more than 100 employees). In the case of food and beverage processing industry, about 80% are classified as micro industry. It is however assumed that micro industries will not enter into the Agro-industrial Park, and thus data used for the companies in said park are recalculated using only the raw data of companies with five or more employees. Sample sizes of food processing industries are as follows.

**Table C-5 Sample Size of the Data Used for Analysis by Industrial Activities**

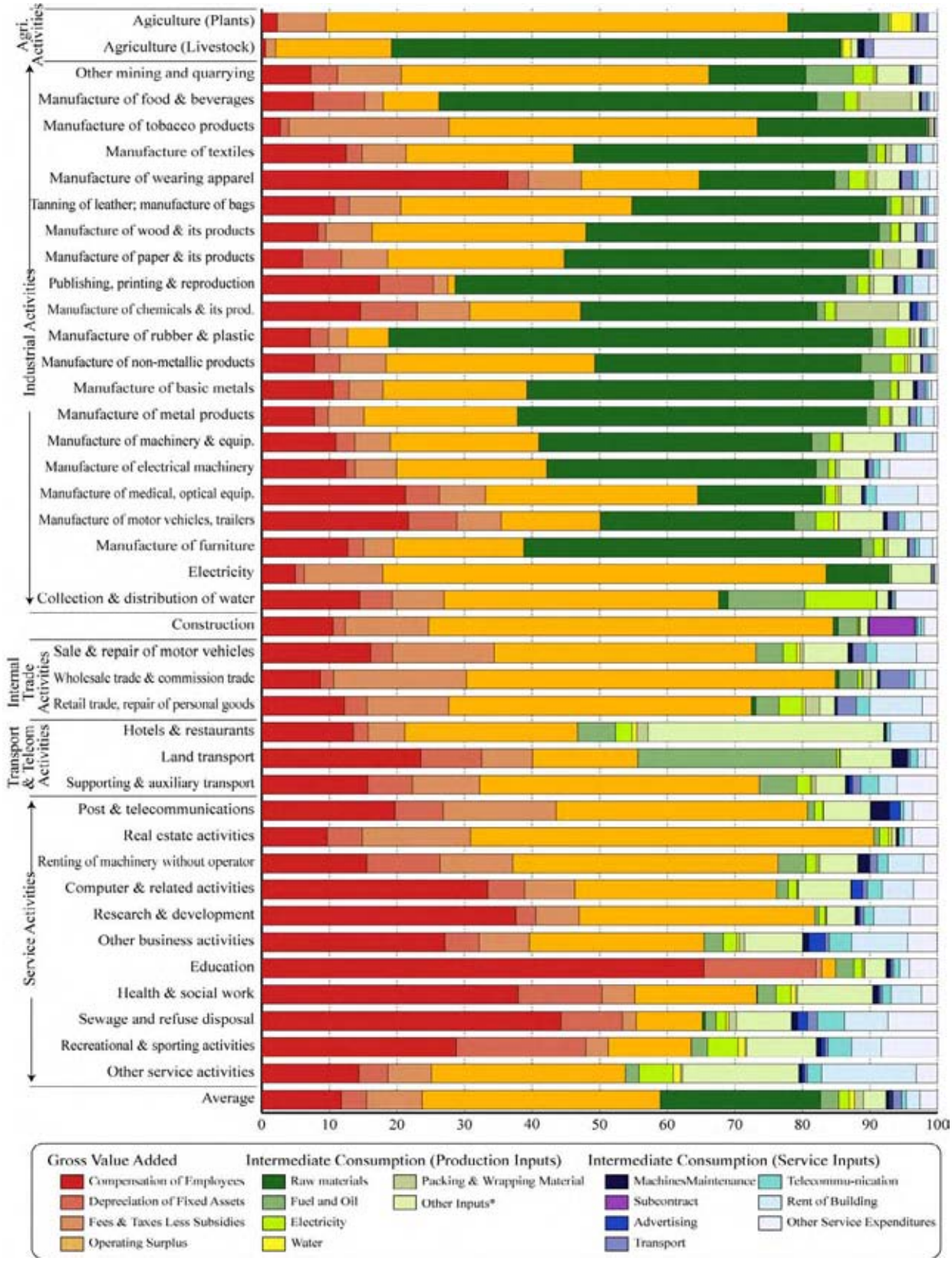
| ISIC-Code | Type of Activities | Number of Entities | Sample Size used |
|---|---|---|---|
| 15 | Manufacture of food and beverages | 7,746 | 360 |
| 1511 | Production, processing and preserving of meat and meat products | 115 | 10 |
| 1513 | Processing and preserving of fruit and vegetables | 325 | 20 |
| 1520 | Manufacture of dairy products | 903 | 24 |
| 1531 | Manufacture of grain mill products | 384 | 61 |
| 1533 | Manufacture of prepared animal feeds | 228 | 15 |
| 1541 | Manufacture of bakery products | 2,062 | 119 |
| 1543 | Manufacture of cocoa, chocolate and sugar confectionery | 71 | 18 |
| 1544 | Manufacture of Macaroni, Noodles, and similar farinaceous products | 46 | 5 |
| 1549 | Manufacture of other food products etc. | 433 | 74 |
| 1551 | Distilling, Rectifying and Blending of Spirits | 36 | 4 |
| 1554 | Manufacture of soft drinks and mineral water | 408 | 14 |

Source: JICA Study Team

The amount of tax paid by the companies is also calculated based on the survey result of PCBS' economic survey. Corporate tax and income tax are calculated separately by the JST because the questionnaires on economic and agriculture surveys do not include queries on corporate tax payment as well as farmers' income tax payment. Thus, corporate tax and income tax levied on companies and farmers, respectively, are calculated using the following formula:

Corporate Income Tax= (Sales from production + Sales from service activities - Compensation of employees - Expenditure for intermediate goods - Depreciation of fixed assets - Fees and other taxes) × Income tax rate of 15% or 10%

Income Tax = (Sales from production + Sales from service activities - Compensation of employees - Expenditure for intermediate goods - Depreciation of fixed assets - Fees and other taxes) × Income tax rate of 8%




Source: Economic Survey 2006, Agricultural Survey 2005/06, Foreign Trade Statistics 2005, Labor Force Statistics 2006, PCBS

**Figure C-3 Input Structure to Output of the Industries in Palestine**

Corporate income tax rate levied on corporate profit of the companies in the Palestinian territory is 15% for domestic companies and 16% for foreign capitalized companies. The Law No. 1/1998 (related to the

encouragement of investment in Palestine) and No.10/1998 (related to investment inside the industrial estates/free zones) provide 7-year exemptions for companies inside the industrial estates/free zones and 5-year exemptions for companies in other areas. In addition, 10 % of the corporate tax rate is adopted succeeding 8 - 20 years for the companies inside the industrial estates/free zones. Period of reduction of the corporate tax rate depends upon the amount of investment.

In order to simplify the model, 10% of the corporate tax is adopted for companies inside the Agro-industrial Park and 15 % for those outside. Income tax levied on farmers is decided based on the amount of taxable income. In this analysis, 8% of the farmers' income tax (applicable for yearly taxable income below USD 10,000) is adopted.

Income tax is also levied on employees in the industrial sector. However, it should be noted that this is not calculated due to lack of adequate data.

## C.2 Results of the Economic Effects Analysis

### (1) Increase in the Added Value

The total amount of output (sales) inside the Agro-industrial Park is estimated to be USD 161.2 million per year. The USD 41.6 million per year, which is 25.8% of the total output, is added direct effect inside the Agro-industrial Park. In addition USD 66.0 million of added value is estimated to be generated outside the Agro-industrial Park, in the course of the provision of raw materials and other input goods/services as well as the trading of products in the market.

The total economic effects of the Agro-industrial Park (total added value inside and outside) to the Palestinian economy is estimated to be USD 107.3 million, which is equivalent to 1.8% of the gross domestic product (GDP) of Palestine in 2007 (USD 6,009 million).

**Table C-6 Output and Added Value inside/ outside of the Agro-industrial Park**

(Unit: USD 1,000/year)

| | Stage I | Stage II | Stage III | Total |
|---|---|---|---|---|
| Value of Output within the Agro-industrial Park | 14,600 | 57,900 | 88,700 | 161,200 |
| Added Value (Economic Effect) | 9,700 | 38,500 | 59,100 | 107,300 |
| Added Value inside the Agro-industrial Park (Direct Effect) | 3,800 | 14,900 | 22,900 | 41,600 |
| Added Value outside the Agro-industrial Park (Indirect Effect) | 5,900 | 23,600 | 36,200 | 65,700 |

Note: Above values are rounded to the nearest 100,000, and thus the total values are not necessarily the same with the sum of each value.

Source: JICA Study Team

Currently, 35% share of the estimated raw materials procured in Palestine is for food and beverages industries. The domestic procurement ratio of raw materials is expected to increase, contributing to the generation of additional employment and the added value outside the Agro-industrial Park. Accordingly, in order to obtain significant effects on Palestinian economy, the utilization of domestic raw materials will be more important in the future.

### (2) Employment Effect

The Agro-industrial Park (stage I - III) is expected to create about 7,900 additional jobs in Palestine, of which about 3,800 are from direct employment[5]. Indirect employment in the agricultural sector outside the Agro-industrial Park is estimated to be about 3,000. For internal trade and transportation sector outside the Agro-industrial Park indirect employment is about 500, which is almost equal to that of the other sectors.

**Table C-7 Employment Effects and Total Worker's Compensation**

(Unit: No. and USD 1,000)

| | Stage I | Stage II | Stage III | Total |
|---|---|---|---|---|
| Employment (no. of employees) | 710 | 2,820 | 4,320 | 7,850 |
| Inside the Agro-industrial Park (direct employment) | 340 | 1,360 | 2,090 | 3,790 |
| Outside the Agro-industrial Park (indirect employment) | 370 | 1,460 | 2,240 | 4,060 |
| Agricultural Sector | 280 | 1,090 | 1,670 | 3,040 |
| Internal Trade and Transportation Sector | 40 | 180 | 270 | 490 |
| Other Sectors | 50 | 190 | 290 | 530 |
| Total Workers Compensation per Annum | 1,390 | 5,540 | 8,490 | 15,420 |
| Workers Compensation inside the Agro-industrial Park | 1,130 | 4,480 | 6,870 | 12,480 |
| Workers Compensation outside the Agro-industrial Park | 270 | 1,050 | 1,620 | 2,930 |

Note: The above values are rounded to the nearest 10 or USD 10,000, and thus the total values are not necessarily the same as the sum of each value.

Source: JICA Study Team

The PCBS estimated the labor force[*6] of Palestine in the year 2006 as 872,000. Out of which, 206,000 or 23.6% are unemployed. Direct and indirect employment in the Agro-industrial Park is expected to reduce the number of the currently unemployed by about 3.8%, and unemployment ratio by 0.9% (from the current level of 23.6% to 22.7%).

The total worker's compensation inside and outside the Agro-industrial Park is estimated to be USD 12.5 million and USD 2.9 million[7] per annum, respectively.

### (3) Increase in the Tax Revenue

The PNA's annual tax revenue from the operations inside the Agro-industrial Park is estimated to be USD 3.78 million per annum, which consists of USD 1.78 million value added tax, USD 1.53 million corporate tax, USD 0.20 million customs duties on imported materials/products, and other taxes, and fees (e.g.

[5] Direct employment in the Agro-industrial Park includes employees in the tenant factories, but not includes workers and employees in the distribution center, the business development support (BDS) center, and the office building.

[6] The economically active population (Labor Force) consists of people of ages 15 years and above of 2,111,000 minus outside labor force 15 years and above of 1,239,000 (includes housewives, students/trainees, old/ill, and neither working nor looking for work).

[7] Worker's compensation of the agricultural sector outside the Agro-industrial Park is considerably underestimated. It is because the compensation of employees of the agricultural sector is based only on the compensation from agricultural labor (payment as a compensation for seasonal labors for such as harvesting and planting works) but excludes the compensation aside from agriculture. However, agriculture is the basic source of income of families, and their other incomes are not included in the total worker's compensation.

vehicle license fees, building taxes, official stamp fees, and entity license fees) of USD 0.26 million. In addition, USD 1 million per annum of the tax revenue will be collected outside the Agro-industrial Park.

As mentioned, the income tax of the employee is not computed although the salary data is available. This is because the amount of exemption and deduction from the respective income is not yet available. Likewise, the land tax imposed on the farmers is not computed due to non-availability of appropriate data. Accordingly, actual tax revenue could be more than the estimated amount.

**Table C-8 Annual Tax Revenue Inducement Inside and Outside of the Agro-industrial Park**

(Unit: USD 1,000)

| Stage | Stage I | Stage II | Stage III | Total |
|---|---|---|---|---|
| Tax Revenue form Inside the Agro-industrial Park | 340 | 1,360 | 2,080 | 3,780 |
| Customs Duties | 20 | 70 | 110 | 200 |
| Value Added Taxes | 160 | 640 | 980 | 1,780 |
| Corporate Taxes | 140 | 550 | 840 | 1,530 |
| Other Taxes and Fees | 20 | 90 | 150 | 260 |
| Tax Revenue from Outside the Agro-industrial Park | 90 | 360 | 550 | 1,000 |
| Total Tax Revenue of PNA | 430 | 1,720 | 2,630 | 4,780 |

Note: The above values are rounded to the nearest 10,000, and thus the total values are not necessarily the same with the sum of each value.

Source: JICA Study Team

## C.3 Comparison of Economic Effects by Type of Industries

This section compares the economic effects of food and beverage industries as well as pharmaceutical industry for every USD 1 million of product sales. The same economic model as mentioned in section C.1 is also adopted for the analysis.

Figure C-4 illustrates the percentage of various input values to produce the output. Red bars represent the value added sector, green for the raw materials and other intermediate goods, and blue for service inputs.

Animal feed industry (ISIC Code 1533) and flour milling industry (ISIC Code 1531) are raw materials intensive industries, its raw materials cost is made up of about 80% of the total outputs. On the other hand, the raw materials cost of alcohol industry[*8] (ISIC Code 1551) and pharmaceutical industry (ISIC Code 2423), occupied smaller percentages such as 16% and 24%, respectively.

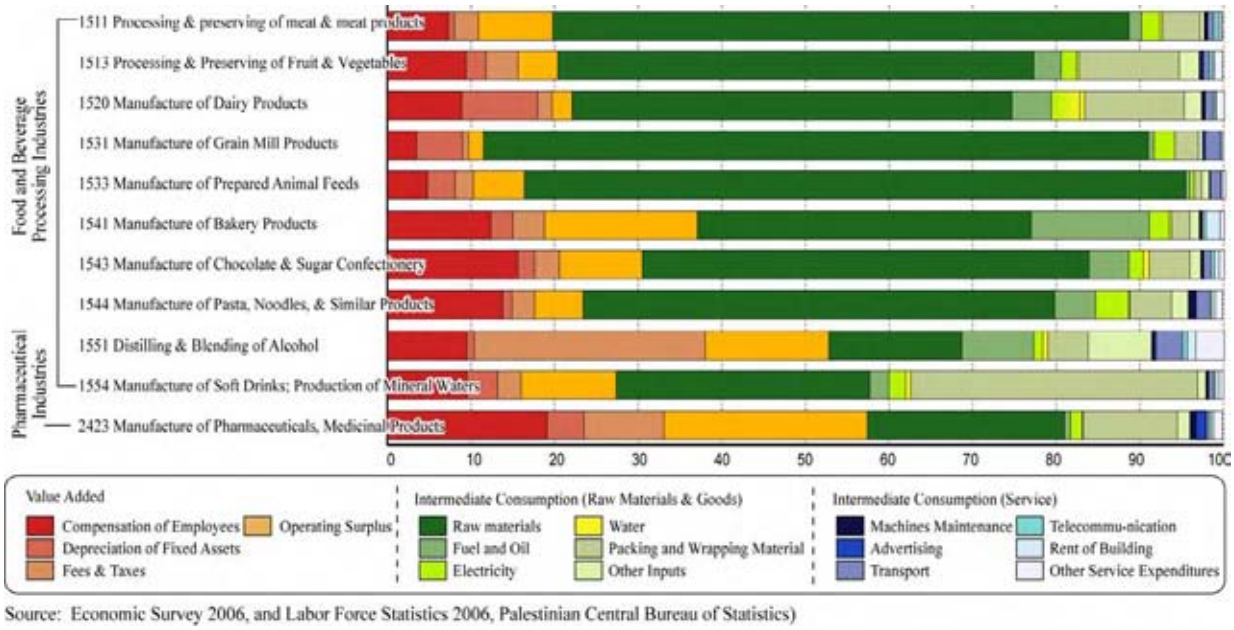
In the case of pharmaceutical industry (ISIC Code 2423), confectionary industry (ISIC Code 1543), pasta/noodle industry (ISIC Code 1544) and baking industry (ISIC code 1541), the compensation of the employees are relatively higher than others, accounting for 12 - 19% of the outputs. These are considered to be labor intensive industries.

Cost of packaging/wrapping materials of beverage industry (ISIC Code 1554) occupied 34% of total output value. Cost of fuel and oil occupied a relatively big percentage (14%) in the baking industry. Thus, this

[8] Beer (including Taybeh beer), wine, and *Arak* (distilled alcoholic drinks made from a variety of products such as grape, grain, and plums) are produced in Palestine.

industry is considered to be vulnerable to the recent hike of international fuel prices. The payment of taxes and fees of alcohol industry made up to about 25% of total output value.

These characteristics of the industries are reflected in the results of the economic effects analysis (see Table C-13 attached at the end of this annex).

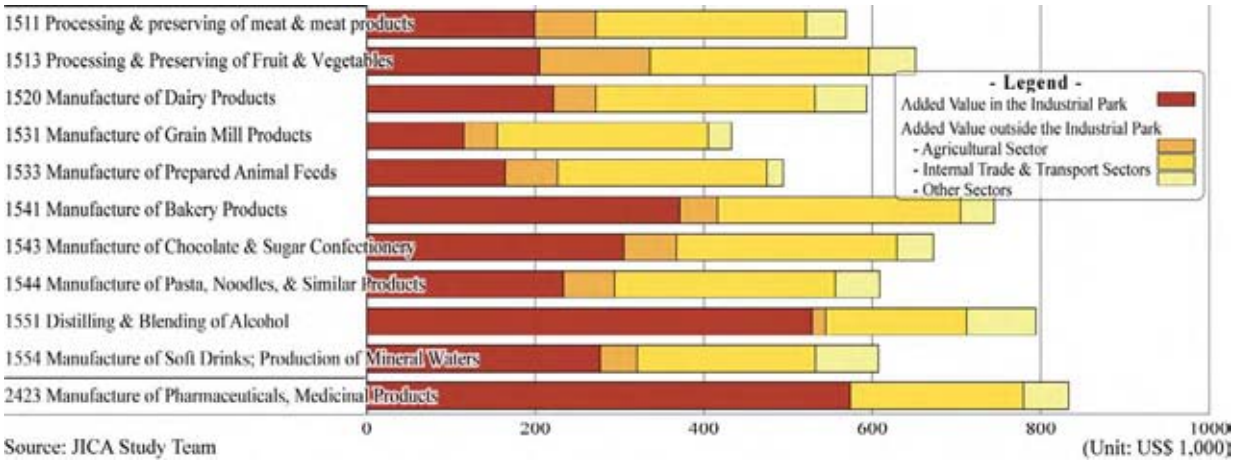



Source: Economic Survey 2006, and Labor Force Statistics 2006, Palestinian Central Bureau of Statistics)

**Figure C-4 The Proportion of Various Inputs to Total Output by Type of Industries**

### (1) Economic Effect (Added Value Increase Effect)

Figure C-5 illustrates direct and indirect economic effects (added value increase effects) of promising industries every USD 1 million of sales from their products. Economic effects are calculated for direct effects (generated inside the Agro-industrial Park), and indirect effects (generated outside the Agro-industrial Park). Indirect effects are separately calculated for the agricultural sector, internal trade/transportation sector and other sectors.




Source: JICA Study Team

(Unit: US$ 1,000)

**Figure C-5 Economic Effects of Industries per USD 1million of Sales by Type of Industries**

Shares of added value to total output of pharmaceutical industry, alcohol industry and baking industry are higher at 57%, 53% and 37%, respectively. Thus, direct economic effects of these industries are considerably higher than others. Despite the smaller indirect economic effects of these industries resulted from the lower demand for domestically produced raw materials, the total economic effects (direct and indirect) are still higher than the others.

On the other hand, since the share of added value to the total output of flour milling industry and animal feed industry are smaller by 12% and 16% respectively, direct economic effects are quite small.

As to indirect economic effects on the agricultural sector, fruit and vegetable processing industry (ISIC Code 1513) has the highest influence, and followed by meat processing industry (ISIC Code 1511).

**(2) Employment Effects and Compensation of Employees Increase Effect**

As shown in Figure C-6, confectionery industry (ISIC Code 1543) absorbs the largest number of direct employment in the industries. Similarly, baking industry creates the large number of employment inside the Agro-industrial Park.

Meat processing industry, fruit/vegetables processing industry, and manufacture of dairy products (ISIC Code 1520) show strong employment inducement in the agricultural sector, being among the most labor intensive sectors. These industries contribute to absorbing relatively bigger indirect employment outside the Agro-industrial Park. Such a high indirect employment effect on agricultural sector is caused by two components such as a relatively high share of cost of raw materials to total output (57% - 79%), and a higher domestic procurement ratio of raw materials (30 - 33%).

In the case of flour milling industry and manufacture of prepared animal feeds, direct employment effects are quite small. In addition, these industries as well as the alcohol industry have less influence on employment of agricultural workers outside the Agro-industrial Park because most of their raw materials (e.g. wheat, barley, corn, grape, and soybean) are imported from abroad.

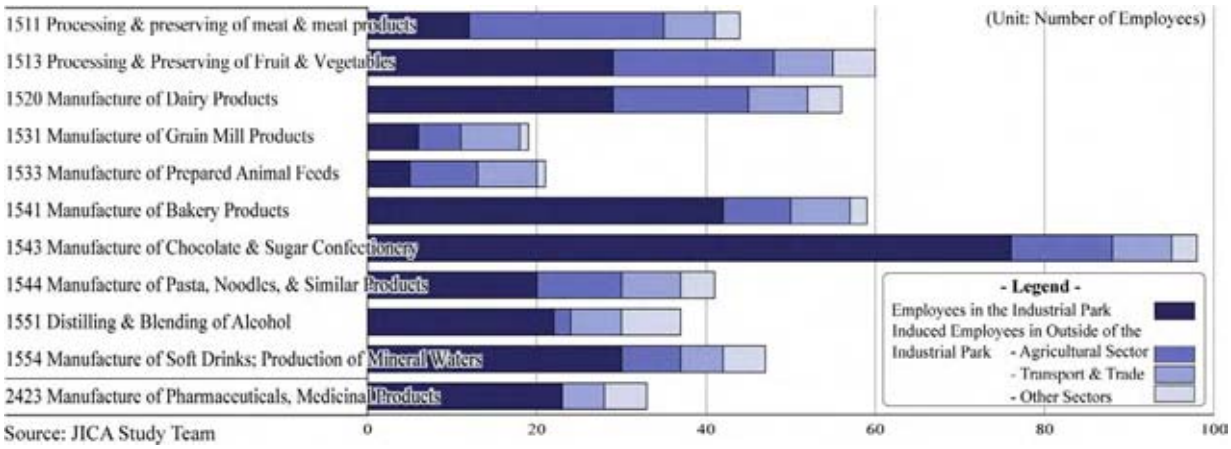



**Figure C-6 Employment Effects of Industries per USD 1million of Sales by Type of Industries**

### (3) Tax Revenue Increase Effect

With regards to the effects of PNA's tax revenue increase, as Figure C-7 shows, alcohol industry has an outstanding effect among others. Pharmaceutical industry has also relatively high tax revenue increase effects.

As mentioned previously, industries located inside the Agro-industrial Park benefit from corporate income tax exemption/reduction. The amount of corporate tax as shown below is calculated based on the tax exemption/reduction considerations. Since alcohol industry, meat processing industry, confectionery industry, baking industry, and beverage industry usually pay relatively big amount of corporate tax, these industries can fully exploit the advantages of corporate tax exemption/reduction adopted in the Agro-industrial Park.

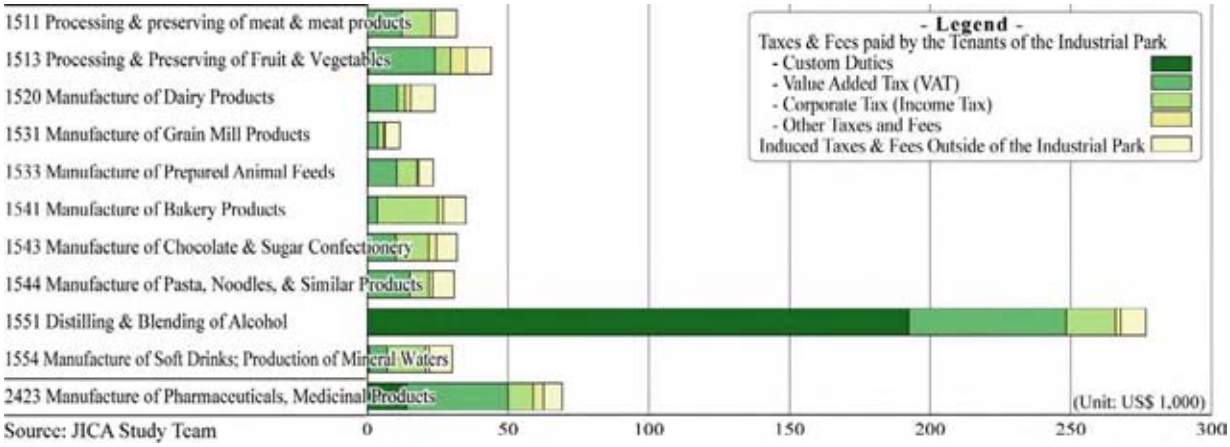



**Figure C-7 Amount of Tax Payment per USD 1 million of Sales by Type of Industries**

**Table C-9 Input Structure of Major Industries in Palestine (1/2)**

(Unit: US$ 1,000)

| ISIC Code | Index / Sector Name | Number of Persons Engaged | Number of Entities | Output | Production of Industry | Exports Sales | Local sales | Change in stocks | Service Activities | Main Service Activities | Transport Activities | Other Revenue from Service | Trade Margin | Output | Gross Value Added | Compensation of Employees | Depreciation of Fixed Assets | Fee & Tax less subsidies** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | Agiculture (Plants) | 107,226 | | 600,554.0 | | | | | 0.0 | | | | 0.0 | 600,554.0 | 467,751.0 | 13,720.0 | 0.0 | 7,583.9 |
| 01' | Agriculture (Livestock) | | | 464,054.0 | | | | | 0.0 | | | | 0.0 | 464,054.0 | 89,194.0 | 2,616.2 | 0.0 | 44.5 |
| 14 | Other mining and quarrying | 1,127 | 173 | 48,615.8 | 48,233.0 | 30,140.8 | 17,648.1 | 444.1 | 382.8 | 0.0 | 0.0 | 382.8 | 0.0 | 48,615.7 | 32,179.4 | 3,531.6 | 1,900.4 | 698.1 |
| 15 | Manufacture of food and beverages | 7,746 | 1,558 | 332,149.0 | 328,590.2 | 2,873.0 | 324,009.6 | 1,707.6 | 2,075.1 | 0.0 | 0.0 | 2,075.1 | 1,483.7 | 332,148.8 | 87,116.9 | 25,295.9 | 25,233.7 | 4,247.4 |
| 1511 | Production & preserving of meat produc | 115 | 10 | 9,400.7 | 9,360.3 | 0.0 | 9,280.9 | 79.4 | 40.4 | 13.5 | 13.5 | 13.5 | 0.0 | 9,400.7 | 1,864.3 | 687.6 | 70.3 | 125.2 |
| 1513 | Processing & preserving of fruit and vegetat | 325 | 13 | 11,278.0 | 11,253.4 | 37.3 | 11,354.6 | -138.5 | 24.6 | 8.2 | 8.2 | 8.2 | 0.0 | 11,278.0 | 2,307.8 | 1,065.5 | 276.0 | 334.0 |
| 1514 | Manufacture of vegetable & animal oil*a | 931 | 194 | 4,689.1 | | 0.0 | 0.0 | | 4,623.8 | 4,520.1 | | 38.4 | 65.3 | 4,623.8 | 3,021.2 | 430.4 | 1,595.8 | 23.3 |
| 1520 | Manufacture of diary products | 903 | 21 | 31,264.1 | 31,091.2 | 0.0 | 30,957.1 | 134.1 | 172.9 | 57.6 | 57.6 | 57.6 | 0.0 | 31,264.1 | 6,889.9 | 2,777.2 | 2,856.5 | 391.7 |
| 1531 | Manufacture of grain mill products | 384 | 19 | 65,748.0 | 65,670.1 | 67.4 | 66,121.4 | -518.7 | 77.9 | 26.0 | 26.0 | 26.0 | 0.0 | 65,748.0 | 7,558.2 | 2,273.6 | 3,618.5 | 268.2 |
| 1533 | Manufacture of prepared animal feeds | 228 | 17 | 48,791.6 | 48,712.8 | 0.0 | 48,703.1 | 9.7 | 78.8 | 26.3 | 26.3 | 26.3 | 0.0 | 48,791.6 | 8,006.6 | 2,341.7 | 1,612.3 | 537.8 |
| 1541 | Manufacture of bakery products | 2,062 | 242 | 48,661.2 | 48,552.5 | 0.0 | 48,222.3 | 330.2 | 108.7 | 36.2 | 36.2 | 36.2 | 0.0 | 48,661.2 | 18,039.3 | 6,053.0 | 1,249.3 | 261.0 |
| 1543 | Manufacture of chocolate & sugar product | 71 | 8 | 938.2 | 938.2 | 0.0 | 938.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 938.2 | 286.2 | 145.9 | 19.1 | 12.1 |
| 1544 | Manufacture of macaroni, & similar products | 46 | 4 | 2,355.9 | 2,355.9 | 0.0 | 2,356.1 | -0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2,355.9 | 549.9 | 325.1 | 26.4 | 38.6 |
| 1549 | Manufacture of other food products n.e.c | 433 | 40 | 19,512.9 | 18,639.8 | 1,530.7 | 16,979.2 | 129.9 | 873.1 | 291.0 | 291.0 | 291.0 | 0.0 | 19,512.9 | 9,611.4 | 1,377.9 | 379.0 | 553.8 |
| 1551 | Distilling & blending of alcohol | 36 | 4 | 1,662.9 | 1,662.9 | 679.0 | 950.6 | 33.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1,662.9 | 878.9 | 157.9 | 14.3 | 416.2 |
| 1554 | Manufacture of soft drinks & mineral water | 408 | 17 | 13,514.1 | 13,388.1 | 128.0 | 11,093.0 | 2,167.1 | 126.0 | 42.0 | 42.0 | 42.0 | 0.0 | 13,514.1 | 3,709.2 | 1,289.2 | 494.4 | 112.2 |
| 16 | Manufacture of tobacco products | 277 | 14 | 77,604.6 | 77,485.4 | 0.0 | 77,481.0 | 4.4 | 4.5 | 0.0 | 0.0 | 4.5 | 114.7 | 77,604.6 | 56,910.7 | 2,109.0 | 1,018.2 | 12,139.9 |
| 17 | Manufacture of textiles | 1,202 | 209 | 17,293.2 | 13,944.5 | 802.8 | 13,131.6 | 10.1 | 2,750.2 | 0.0 | 0.0 | 2,750.2 | 598.5 | 17,293.3 | 7,980.9 | 2,159.5 | 404.8 | 372.3 |
| 18 | Manufacture of wearing apparel | 8,820 | 1,022 | 55,254.9 | 19,478.2 | 5,608.3 | 14,115.3 | -245.4 | 35,505.4 | 0.0 | 0.0 | 35,505.4 | 271.3 | 55,254.8 | 35,785.0 | 20,118.0 | 1,676.2 | 2,623.5 |
| 19 | Tanning of leather; manufacture of bags | 1,634 | 279 | 33,509.5 | 31,923.8 | 5,603.9 | 25,956.3 | 363.6 | 1,564.9 | 0.0 | 0.0 | 1,564.9 | 20.8 | 33,509.5 | 18,356.6 | 3,594.5 | 744.7 | 528.4 |
| 20 | Manufacture of wood and its products | 1,301 | 511 | 24,773.5 | 24,425.5 | 6,199.6 | 18,194.0 | 31.9 | 244.6 | 0.0 | 0.0 | 244.6 | 103.4 | 24,773.4 | 11,887.0 | 2,056.3 | 297.8 | 306.3 |
| 21 | Manufacture of paper and its products | 408 | 45 | 20,298.1 | 20,247.2 | 3,006.6 | 17,240.8 | -0.2 | 48.7 | 0.0 | 0.0 | 48.7 | 2.2 | 20,298.2 | 9,092.0 | 1,214.3 | 1,183.8 | 446.6 |
| 22 | Publishing, printing and reproduction | 1,017 | 204 | 18,654.9 | 17,898.3 | 208.2 | 17,626.4 | 63.7 | 434.7 | 0.0 | 0.0 | 434.7 | 321.9 | 18,655.0 | 5,340.8 | 3,244.3 | 1,492.2 | 363.3 |
| 24 | Manufacture of chemicals & its prod. | 1,717 | 140 | 68,157.1 | 67,954.0 | 10,775.5 | 55,898.7 | 1,279.8 | 24.4 | 0.0 | 0.0 | 24.4 | 178.7 | 68,157.2 | 32,171.1 | 9,946.0 | 5,748.8 | 3,307.2 |
| 2423 | Manufacture of Pharmaceuticals, Medicinal | 881 | 0 | 37,961.1 | 37,960.4 | 5,464.5 | 31,288.0 | 1,208.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 | 37,961.1 | 21,784.2 | 7,235.2 | 1,664.8 | 2,035.9 |
| 25 | Manufacture of rubber and plastic | 894 | 111 | 47,358.6 | 46,643.6 | 11,047.3 | 35,233.6 | 362.7 | 712.4 | 0.0 | 0.0 | 712.4 | 2.6 | 47,358.6 | 8,911.9 | 3,393.3 | 1,275.0 | 835.3 |
| 26 | Manufacture of non-metallic products | 9,615 | 1,629 | 431,830.8 | 424,943.8 | 46,741.9 | 376,595.8 | 1,606.1 | 4,043.0 | 0.0 | 0.0 | 4,043.0 | 2,844.0 | 431,830.7 | 212,890.0 | 33,783.5 | 16,154.0 | 6,007.2 |
| 27 | Manufacture of basic metals | 122 | 22 | 3,923.8 | 3,314.0 | 53.9 | 3,350.0 | -89.9 | 553.2 | 0.0 | 0.0 | 553.2 | 56.6 | 3,923.7 | 1,539.9 | 415.1 | 92.6 | 47.4 |
| 28 | Manufacture of metal products | 5,881 | 2,795 | 100,021.5 | 94,736.5 | 7,235.6 | 87,876.5 | -375.6 | 4,345.3 | 0.0 | 0.0 | 4,345.3 | 939.7 | 100,021.4 | 37,837.8 | 7,801.1 | 2,051.2 | 1,273.8 |
| 29 | Manufacture of machinery and equip. | 530 | 187 | 5,750.5 | 4,216.0 | 574.2 | 3,217.1 | 424.7 | 1,449.0 | 0.0 | 0.0 | 1,449.0 | 85.5 | 5,750.5 | 2,359.3 | 630.4 | 161.7 | 79.5 |
| 31 | Manufacture of electrical machinery | 246 | 43 | 4,493.9 | 4,041.3 | 860.7 | 3,180.1 | 0.5 | 333.7 | 0.0 | 0.0 | 333.7 | 118.9 | 4,494.0 | 1,896.4 | 559.9 | 61.7 | 98.7 |
| 32 | Manufacture of radio, TV equip. | 8 | 6 | 11.1 | 0.0 | 0.0 | 0.0 | 0.0 | 10.5 | 0.0 | 0.0 | 10.5 | 0.6 | 11.2 | 4.7 | 0.0 | 1.6 | 0.2 |
| 33 | Manufacture of medical, optical equip. | 100 | 44 | 899.3 | 709.9 | 53.7 | 626.8 | 29.4 | 169.6 | 0.0 | 0.0 | 169.6 | 19.8 | 899.3 | 580.2 | 191.3 | 44.8 | 11.6 |
| 34 | Manufacture of motor vehicles, trailers | 65 | 13 | 426.8 | 370.4 | 0.0 | 369.3 | 1.1 | 56.4 | 0.0 | 0.0 | 56.4 | 0.0 | 426.8 | 213.7 | 92.6 | 30.6 | 16.9 |
| 36 | Manufacture of furniture | 5,455 | 1,891 | 86,467.3 | 83,340.4 | 18,902.7 | 63,995.8 | 441.9 | 2,107.0 | 0.0 | 0.0 | 2,107.0 | 1,019.9 | 86,467.4 | 33,539.5 | 11,010.4 | 2,011.7 | 897.4 |
| 37 | Recycling | 39 | 9 | 9,743.3 | 9,706.9 | 9,014.0 | 686.4 | 6.5 | 36.4 | 0.0 | 0.0 | 36.4 | 0.0 | 9,743.4 | 1,717.0 | 135.1 | 43.7 | 16.2 |
| 40 | Electricity | 638 | 9 | 58,968.2 | 58,749.6 | 0.0 | 58,749.6 | 0.0 | 218.6 | 0.0 | 0.0 | 218.6 | 0.0 | 58,968.2 | 49,245.6 | 2,922.2 | 782.0 | 19.1 |
| 41 | Collection & distribution of water | 1,148 | 437 | 28,158.9 | 24,234.4 | 0.0 | 24,234.4 | 0.0 | 1,608.4 | 0.0 | 0.0 | 1,608.4 | 2,316.1 | 28,158.9 | 19,044.6 | 4,077.8 | 1,354.3 | 138.4 |
| 45 | Construction | 3,908 | 460 | 160,475.0 | 156,561.1 | 252.6 | 156,308.5 | 0.0 | 2,351.1 | 0.0 | 0.0 | 2,351.1 | 1,562.8 | 160,475.1 | 135,730.5 | 16,934.5 | 2,838.8 | 2,902.5 |
| 50 | Sale & repair of motor vehicles | 12,211 | 5,411 | 108,433.5 | 0.0 | 0.0 | 0.0 | 0.0 | 41,061.1 | 0.0 | 0.0 | 41,061.1 | 67,372.4 | 108,433.5 | 79,307.2 | 17,492.7 | 3,522.8 | 8,843.6 |
| 51 | Wholesale trade & commission trade | 6,056 | 1,458 | 201,452.5 | 627.7 | 0.0 | 1,138.8 | -511.1 | 1,245.3 | 0.0 | 0.0 | 1,245.3 | 199,579.5 | 201,452.5 | 171,039.9 | 17,446.6 | 3,951.4 | 20,151.3 |
| 52 | Retail trade, repair of personal goods | 65,045 | 37,043 | 451,684.5 | 3,310.2 | 0.0 | 4,870.9 | -1,560.7 | 21,334.3 | 0.0 | 0.0 | 21,334.3 | 427,040.0 | 451,684.6 | 327,273.5 | 55,179.0 | 15,198.0 | 18,948.1 |
| 55 | Hotels & restaurants | 9,494 | 3,464 | 103,992.9 | 0.0 | 0.0 | 0.0 | 0.0 | 99,249.8 | 98,992.3 | 0.0 | 257.5 | 4,743.1 | 103,992.8 | 48,632.7 | 14,100.9 | 2,278.4 | 934.6 |
| 60 | Land transport | 2,301 | 271 | 31,820.6 | 0.0 | 0.0 | 0.0 | 0.0 | 30,394.0 | 0.0 | 28,991.6 | 1,402.4 | 1,426.6 | 31,820.6 | 17,708.4 | 7,485.9 | 2,864.1 | 1,517.2 |
| 63 | Supporting & auxiliary transport | 880 | 245 | 12,313.1 | 0.0 | 0.0 | 0.0 | 0.0 | 12,057.8 | 0.0 | 11,915.8 | 142.0 | 255.3 | 12,313.0 | 9,067.5 | 1,929.3 | 816.5 | 325.0 |
| 64 | Post & telecommunications | 3,058 | 82 | 270,370.6 | 0.7 | 0.0 | 0.7 | 0.0 | 264,219.6 | 0.0 | 263,521.8 | 697.8 | 6,150.3 | 270,370.5 | 218,376.7 | 53,374.6 | 19,187.1 | 27,342.0 |
| 70 | Real estate activities | 216 | 90 | 8,985.5 | 0.0 | 0.0 | 0.0 | 0.0 | 8,962.8 | 8,888.3 | 0.0 | 74.5 | 22.7 | 8,985.4 | 8,141.1 | 870.8 | 467.4 | 490.2 |
| 71 | Renting of machinery without operator | 699 | 274 | 5,281.9 | 0.0 | 0.0 | 0.0 | 0.0 | 5,191.5 | 5,179.7 | 0.0 | 11.8 | 90.4 | 5,281.9 | 4,037.4 | 821.0 | 571.1 | 203.2 |
| 72 | Computer & related activities | 545 | 207 | 6,352.5 | 0.0 | 0.0 | 0.0 | 0.0 | 5,924.6 | 5,371.6 | 0.0 | 553.0 | 427.9 | 6,352.4 | 4,840.9 | 2,123.7 | 347.7 | 135.2 |
| 73 | Research & development | 241 | 29 | 4,127.2 | 0.0 | 0.0 | 0.0 | 0.0 | 4,127.0 | 3,987.9 | 0.0 | 139.1 | 0.2 | 5,133.7 | 4,203.2 | 1,930.8 | 151.8 | 12.6 |
| 74 | Other business activities | 6,063 | 2,308 | 46,792.2 | 18.0 | 0.0 | 18.0 | 0.0 | 45,593.5 | 45,283.8 | 0.0 | 309.7 | 1,180.7 | 47,511.8 | 31,108.4 | 12,872.8 | 2,415.7 | 1,374.4 |
| 80 | Education | 12,866 | 1,442 | 104,018.5 | 6.1 | 0.0 | 6.1 | 0.0 | 103,733.8 | 103,200.3 | 0.0 | 533.5 | 278.6 | 118,124.9 | 100,314.8 | 77,262.1 | 19,625.4 | 578.7 |
| 85 | Health & social work | 10,448 | 2,874 | 87,655.2 | 199.2 | 9.0 | 188.6 | 1.6 | 87,040.1 | 86,158.4 | 0.0 | 881.7 | 415.9 | 110,755.3 | 81,149.7 | 42,021.3 | 13,758.8 | 1,848.9 |
| 90 | Sewage and refuse disposal | 5,023 | 740 | 20,397.2 | 1,066.5 | 0.0 | 1,066.5 | 0.0 | 19,300.8 | 17,991.5 | 0.0 | 1,309.3 | 29.9 | 36,642.0 | 23,890.4 | 16,224.2 | 3,331.3 | 111.2 |
| 92 | Recreational, culture & sporting activities | 2,701 | 831 | 19,099.5 | 2.5 | 0.0 | 0.0 | 2.5 | 18,790.2 | 18,229.4 | 0.0 | 560.8 | 306.8 | 19,927.2 | 12,664.2 | 5,735.5 | 3,826.0 | 229.7 |
| 93 | Other service activities | 5,458 | 3,386 | 23,970.7 | 0.0 | 0.0 | 0.0 | 0.0 | 23,683.9 | 23,671.9 | 0.0 | 12.0 | 286.8 | 23,970.7 | 12,901.7 | 3,447.4 | 1,029.1 | 324.3 |
| 01 | Agricultural Activities | 107,226 | | 1,064,608 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,064,608 | 556,945 | 16,336 | 0 | 7,628 |
| 14~41 | Industrial Activities | 56,813 | 11,940 | 1,770,142 | 1,694,773 | 167,610 | 1,517,662 | 9,501 | 64,805 | 5,021 | 501 | 59,218 | 10,565 | 1,770,077 | 751,108 | 164,442 | 77,642 | 39,585 |
| 51,52 | Internal Trade Activities (Retail +Whole S | 71,101 | 38,501 | 653,137 | 3,938 | 0 | 6,010 | -2,072 | 22,580 | 0 | 0 | 22,580 | 626,620 | 653,137 | 498,313 | 72,626 | 19,149 | 39,099 |
| 55~93 | Service Activities | 143,305 | 60,155 | 1,506,748 | 5,231 | 9 | 7,290 | -2,068 | 791,910 | 416,955 | 304,429 | 70,526 | 709,607 | 1,562,753 | 1,154,658 | 330,319 | 93,343 | 83,370 |
| 60, 63 | Transport Activities | 3,181 | 516 | 44,134 | 0 | 0 | 0 | 0 | 42,452 | 0 | 40,907 | 1,544 | 1,682 | 44,134 | 26,776 | 9,415 | 3,681 | 1,842 |
| 21~25 | Packing and Wrapping Material Related | 2,319 | 360 | 86,312 | 84,789 | 14,262 | 70,101 | 426 | 1,196 | 0 | 0 | 1,196 | 327 | 86,312 | 23,345 | 7,852 | 3,951 | 1,645 |
| | Grand Total | 304,429 | 71,966 | 4,206,196 | 1,566,979 | 159,964 | 1,403,015 | 3,999 | 852,940 | 416,955 | 304,429 | 131,556 | 721,669 | 4,262,201 | 2,513,934 | 501,871 | 159,947 | 128,376 |

Source: Economic Survey 2006, Labor Force Survey 2006 and Agriultural Survey 2005/06, * Export and Domestice Sales of Medican and Optical Sector was revisised based on the data from Phermaceutical Industrie *a: Data of Manufacture of Vegetable & Animal Oil was quoted from Olive ** Customs Duties, Ent. Licensing Fees, Vehicle Licensing Fees, Stamp Fe

**Table C-9 Input Structure of Major Industries in Palestine (2/2)**

(Unit: US$ 1,000)

| ISIC Code | Index / Sector Name | Operating Surplus | Corporate Tax (@8%, 15%) | Operating Surplus After Taxes | Intermediate Consumption | Raw materials | Fuel and Oil | Electricity | Water | Packing and Wrapping Material | Other Inputs* | Machines Maintenance | Subcontract | Advertising | Transport | Telecommu-nication | Rent of Building | Other Service Expenditures |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | Agiculture (Plants) | 446,447.2 | 35,715.8 | 410,731.4 | 132,803.0 | 80,663.0 | 8,892.0 | 2,008.1 | 18,072.9 | 3,079.0 | 1,549.5 | 1,549.5 | | | 8,494.5 | | | 8,494.5 |
| 01' | Agriculture (Livestock) | 86,533.3 | 6,922.7 | 79,610.6 | 374,860.0 | 308,206.0 | 307.0 | 1,401.4 | 5,605.6 | 0.0 | 4,417.5 | 4,417.5 | | | 6,701.5 | | | 43,803.5 |
| 14 | Other mining and quarrying | 26,049.3 | 3,907.4 | 22,141.9 | 16,436.3 | 6,949.8 | 3,432.8 | 1,451.6 | 149.9 | 104.5 | 2,318.1 | 278.2 | 0.0 | 40.9 | 261.9 | 184.2 | 91.2 | 1,173.2 |
| 15 | Manufacture of food and beverages | 32,339.9 | 4,851.0 | 27,488.9 | 245,031.9 | 185,712.1 | 13,427.4 | 6,501.3 | 917.7 | 25,668.0 | 3,743.4 | 742.9 | 0.0 | 353.6 | 2,845.5 | 902.2 | 2,555.5 | 1,662.3 |
| 1511 | Production & preserving of meat produc | 981.2 | 147.2 | 834.0 | 7,536.4 | 6,476.0 | 140.6 | 209.9 | 25.2 | 425.4 | 49.2 | 30.1 | 0.0 | 8.1 | 67.4 | 55.8 | 26.9 | 21.8 |
| 1513 | Processing & preserving of fruit and vegetal | 632.3 | 94.8 | 537.5 | 8,970.2 | 6,420.3 | 369.9 | 199.8 | 32.0 | 1,351.1 | 266.2 | 23.3 | 0.0 | 31.2 | 81.5 | 50.5 | 26.2 | 118.2 |
| 1514 | Manufacture of vegetable & animal oil*a | 971.7 | 145.8 | 825.9 | 1,602.6 | 457.1 | 310.6 | 230.9 | 230.9 | 186.6 | 186.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1520 | Manufacture of diary products | 864.5 | 129.7 | 734.8 | 24,374.3 | 16,435.5 | 1,465.1 | 1,050.9 | 201.0 | 3,711.0 | 670.2 | 82.9 | 0.0 | 43.0 | 287.0 | 98.1 | 32.0 | 297.6 |
| 1531 | Manufacture of grain mill products | 1,397.9 | 209.7 | 1,188.2 | 58,189.8 | 52,294.8 | 440.1 | 1,659.5 | 10.3 | 1,856.4 | 328.0 | 13.4 | 0.0 | 180.8 | 1,151.6 | 104.2 | 5.1 | 145.6 |
| 1533 | Manufacture of prepared animal feeds | 3,514.8 | 527.2 | 2,987.6 | 40,785.1 | 38,571.8 | 227.2 | 222.6 | 13.9 | 420.8 | 421.4 | 48.1 | 0.0 | 3.6 | 630.7 | 27.9 | 10.0 | 187.1 |
| 1541 | Manufacture of bakery products | 10,476.0 | 1,571.4 | 8,904.6 | 30,621.9 | 19,399.9 | 6,882.9 | 1,182.9 | 142.4 | 1,046.8 | 543.1 | 92.5 | 0.0 | 36.2 | 52.2 | 175.5 | 826.3 | 241.2 |
| 1543 | Manufacture of chocolate & sugar product | 109.1 | 16.4 | 92.7 | 652.1 | 501.1 | 44.8 | 16.1 | 6.3 | 45.7 | 12.4 | 2.2 | 0.0 | 0.7 | 8.2 | 3.7 | 5.4 | 5.5 |
| 1544 | Manufacture of macaroni, & similar products | 159.8 | 24.0 | 135.8 | 1,806.0 | 1,329.1 | 115.5 | 94.4 | 2.9 | 118.6 | 46.8 | 21.6 | 0.0 | 0.8 | 41.2 | 4.4 | 9.9 | 20.8 |
| 1549 | Manufacture of other food products n.e.c | 7,300.7 | 1,095.1 | 6,205.6 | 9,901.5 | 7,082.7 | 532.9 | 457.8 | 50.0 | 801.2 | 385.1 | 61.8 | 0.0 | 11.3 | 247.5 | 56.4 | 43.8 | 171.0 |
| 1551 | Distilling & blending of alcohol | 290.5 | 43.6 | 246.9 | 784.1 | 264.7 | 142.7 | 18.0 | 9.5 | 80.0 | 126.7 | 2.8 | 0.0 | 4.8 | 53.2 | 9.3 | 16.1 | 56.3 |
| 1554 | Manufacture of soft drinks & mineral water | 1,813.4 | 272.0 | 1,541.4 | 9,805.0 | 4,098.6 | 309.0 | 268.1 | 81.6 | 4,628.6 | 139.5 | 33.2 | 0.0 | 11.3 | 85.3 | 22.5 | 65.4 | 61.9 |
| 16 | Manufacture of tobacco products | 41,643.6 | 6,246.5 | 35,397.1 | 20,693.8 | 19,408.4 | 207.6 | 63.8 | 9.3 | 221.0 | 342.9 | 0.1 | 0.0 | 12.6 | 132.8 | 40.4 | 1.9 | 253.0 |
| 17 | Manufacture of textiles | 5,044.3 | 756.6 | 4,287.7 | 9,312.4 | 7,512.1 | 239.3 | 221.6 | 19.7 | 138.2 | 377.8 | 28.2 | 0.0 | 2.4 | 238.0 | 114.4 | 318.0 | 102.7 |
| 18 | Manufacture of wearing apparel | 11,367.3 | 1,705.1 | 9,662.2 | 19,469.8 | 11,075.3 | 1,151.7 | 1,373.4 | 196.3 | 646.3 | 1,913.0 | 154.8 | 0.0 | 8.2 | 917.6 | 413.2 | 948.0 | 672.0 |
| 19 | Tanning of leather; manufacture of bags | 13,489.0 | 2,023.4 | 11,465.7 | 15,152.9 | 12,598.7 | 227.2 | 546.2 | 53.1 | 537.2 | 374.8 | 30.2 | 0.0 | 3.5 | 177.1 | 138.9 | 325.1 | 140.9 |
| 20 | Manufacture of wood and its products | 9,226.6 | 1,384.0 | 7,842.6 | 12,886.5 | 10,749.6 | 426.9 | 302.3 | 30.9 | 33.4 | 529.4 | 36.2 | 0.0 | 4.2 | 265.7 | 113.6 | 298.2 | 96.1 |
| 21 | Manufacture of paper and its products | 6,247.3 | 937.1 | 5,310.2 | 11,206.1 | 9,140.8 | 161.2 | 262.8 | 6.4 | 507.3 | 529.6 | 131.0 | 0.0 | 9.4 | 245.3 | 74.6 | 46.3 | 91.4 |
| 22 | Publishing, printing and reproduction | 241.0 | 36.2 | 204.9 | 13,314.2 | 10,779.0 | 319.9 | 320.4 | 29.2 | 105.5 | 549.2 | 78.6 | 0.0 | 23.0 | 208.5 | 202.8 | 459.4 | 238.7 |
| 24 | Manufacture of chemicals & its prod. | 13,169.1 | 1,975.4 | 11,193.7 | 35,986.1 | 23,808.2 | 834.9 | 1,003.9 | 146.0 | 6,261.0 | 1,144.0 | 228.6 | 0.0 | 529.1 | 770.6 | 235.3 | 237.0 | 787.5 |
| 2423 | Manufacture of Pharmaceuticals, Medicinal | 10,848.3 | 1,627.2 | 9,221.1 | 16,176.9 | 8,959.4 | 282.0 | 526.2 | 53.4 | 4,307.0 | 582.2 | 247.7 | 0.0 | 456.8 | 113.4 | 112.5 | 102.7 | 433.6 |
| 25 | Manufacture of rubber and plastic | 3,408.3 | 511.2 | 2,897.1 | 38,446.7 | 33,861.8 | 906.6 | 1,715.7 | 38.7 | 306.6 | 382.7 | 82.2 | 0.0 | 3.7 | 259.6 | 175.5 | 458.9 | 254.7 |
| 26 | Manufacture of non-metallic products | 156,945.3 | 23,541.8 | 133,403.5 | 218,940.7 | 170,147.5 | 18,913.8 | 9,055.9 | 1,644.8 | 2,037.5 | 6,411.2 | 1,063.8 | 0.0 | 56.9 | 4,460.2 | 1,613.7 | 1,902.6 | 1,632.8 |
| 27 | Manufacture of basic metals | 984.8 | 147.7 | 837.1 | 2,383.7 | 2,012.1 | 99.7 | 39.5 | 6.4 | 2.4 | 82.5 | 23.7 | 0.0 | 0.2 | 44.7 | 15.3 | 22.3 | 34.9 |
| 28 | Manufacture of metal products | 26,711.7 | 4,006.8 | 22,704.9 | 62,183.6 | 51,626.7 | 1,903.8 | 1,568.8 | 177.1 | 177.9 | 2,439.4 | 180.2 | 0.0 | 43.0 | 945.6 | 686.0 | 1,889.8 | 545.3 |
| 29 | Manufacture of machinery and equip. | 1,487.7 | 223.2 | 1,264.5 | 3,391.2 | 2,320.9 | 150.3 | 96.9 | 14.2 | 6.5 | 437.7 | 13.0 | 0.0 | 1.4 | 30.1 | 49.0 | 231.0 | 40.2 |
| 31 | Manufacture of electrical machinery | 1,176.1 | 176.4 | 999.7 | 2,597.6 | 1,789.4 | 82.7 | 46.9 | 3.1 | 22.0 | 172.3 | 20.2 | 0.0 | 1.2 | 33.1 | 41.7 | 65.2 | 319.8 |
| 32 | Manufacture of radio, TV equip. | 2.9 | 0.4 | 2.5 | 6.5 | 0.0 | 0.2 | 0.7 | 0.2 | 0.0 | 2.4 | 0.1 | 0.0 | 0.0 | 0.0 | 1.5 | 1.1 | 0.3 |
| 33 | Manufacture of medical, optical equip. | 332.5 | 49.9 | 282.6 | 319.1 | 165.3 | 4.3 | 14.1 | 3.6 | 3.4 | 27.3 | 1.6 | 0.0 | 2.5 | 1.7 | 13.7 | 55.4 | 26.2 |
| 34 | Manufacture of motor vehicles, trailers | 73.6 | 11.0 | 62.6 | 213.1 | 122.5 | 13.6 | 11.6 | 2.8 | 0.3 | 28.0 | 2.1 | 0.0 | 0.4 | 7.0 | 4.0 | 10.6 | 10.2 |
| 36 | Manufacture of furniture | 19,620.0 | 2,943.0 | 16,677.0 | 52,927.8 | 43,168.9 | 1,573.2 | 1,253.1 | 123.3 | 457.6 | 2,511.1 | 141.8 | 0.0 | 26.3 | 788.3 | 542.1 | 1,709.6 | 632.5 |
| 37 | Recycling | 1,522.0 | 228.3 | 1,293.7 | 8,026.4 | 7,862.6 | 59.7 | 7.4 | 3.2 | 0.0 | 11.4 | 1.7 | 0.0 | 0.0 | 10.1 | 4.4 | 0.0 | 65.9 |
| 40 | Electricity | 45,522.3 | 6,828.3 | 38,694.0 | 9,722.5 | 5,473.0 | 217.1 | 10.7 | 4.0 | 0.0 | 3,440.0 | 4.4 | 0.0 | 26.9 | 187.7 | 36.4 | 85.0 | 237.3 |
| 41 | Collection & distribution of water | 13,474.1 | 2,021.1 | 11,453.0 | 9,114.2 | 379.4 | 3,212.3 | 2,968.6 | 25.9 | 1.6 | 472.8 | 118.4 | 0.0 | 9.1 | 33.1 | 111.2 | 35.3 | 1,746.5 |
| 45 | Construction | 113,054.7 | 16,958.2 | 96,096.5 | 24,744.5 | 1,152.6 | 4,532.6 | 360.1 | 239.1 | 57.5 | 1,900.8 | 244.6 | 10,809.3 | 108.7 | 568.3 | 939.5 | 665.0 | 3,166.4 |
| 50 | Sale & repair of motor vehicles | 49,448.1 | 7,417.2 | 42,030.9 | 29,126.3 | 0.0 | 4,324.7 | 2,202.8 | 549.3 | 526.8 | 7,136.8 | 627.3 | 0.0 | 135.4 | 2,098.7 | 1,763.3 | 6,374.7 | 3,386.5 |
| 51 | Wholesale trade & commission trade | 129,490.6 | 19,423.6 | 110,067.0 | 30,412.6 | 1,033.1 | 5,720.6 | 1,190.6 | 189.0 | 2,500.5 | 1,877.8 | 325.0 | 0.0 | 499.6 | 8,719.1 | 1,567.9 | 3,153.2 | 3,636.2 |
| 52 | Retail trade, repair of personal goods | 237,948.4 | 35,692.3 | 202,256.1 | 124,411.1 | 2,924.1 | 15,543.4 | 15,493.9 | 2,098.4 | 9,684.7 | 9,989.1 | 863.5 | 0.0 | 932.7 | 12,599.2 | 8,996.8 | 35,121.5 | 10,163.8 |
| 55 | Hotels & restaurants | 31,318.8 | 4,697.8 | 26,621.0 | 55,360.1 | 0.0 | 5,807.5 | 2,548.3 | 713.7 | 1,736.1 | 36,283.5 | 173.0 | 0.0 | 119.8 | 166.2 | 548.8 | 6,189.8 | 1,073.4 |
| 60 | Land transport | 5,841.2 | 876.2 | 4,965.0 | 14,112.2 | 0.4 | 9,355.2 | 134.9 | 45.8 | 7.2 | 2,419.3 | 697.9 | 0.0 | 51.8 | 112.6 | 362.4 | 380.6 | 544.1 |
| 63 | Supporting & auxiliary transport | 5,996.7 | 899.5 | 5,097.2 | 3,245.5 | 0.0 | 678.4 | 254.0 | 23.1 | 70.1 | 542.0 | 65.6 | 0.0 | 64.0 | 149.6 | 325.3 | 334.7 | 738.7 |
| 64 | Post & telecommunications | 118,473.0 | 17,771.0 | 100,702.1 | 51,993.8 | 0.2 | 2,751.3 | 3,310.2 | 278.0 | 9.0 | 18,750.9 | 7,550.6 | 0.0 | 4,461.6 | 23.7 | 1,333.7 | 3,570.7 | 9,953.9 |
| 70 | Real estate activities | 6,312.7 | 946.9 | 5,365.8 | 844.4 | 0.0 | 73.6 | 120.1 | 42.3 | 3.3 | 53.7 | 25.5 | 0.0 | 5.2 | 7.9 | 64.9 | 104.1 | 343.8 |
| 71 | Renting of machinery without operator | 2,442.1 | 366.3 | 2,075.8 | 1,244.5 | 0.0 | 217.5 | 77.2 | 17.0 | 12.2 | 297.5 | 87.0 | 0.0 | 7.7 | 59.8 | 83.1 | 275.5 | 110.0 |
| 72 | Computer & related activities | 2,234.3 | 335.1 | 1,899.2 | 1,511.5 | 0.0 | 108.3 | 81.8 | 8.8 | 4.7 | 493.7 | 7.1 | 0.0 | 102.9 | 46.0 | 137.9 | 293.9 | 226.4 |
| 73 | Research & development | 2,108.0 | 316.2 | 1,791.8 | 930.5 | 0.0 | 27.5 | 49.7 | 8.4 | 2.6 | 216.1 | 22.4 | 0.0 | 14.0 | 30.6 | 74.5 | 274.1 | 210.6 |
| 74 | Other business activities | 14,445.5 | 2,166.8 | 12,278.7 | 16,403.3 | 6.7 | 1,345.9 | 955.2 | 166.9 | 369.3 | 4,083.5 | 415.4 | 0.0 | 1,169.8 | 289.3 | 1,572.3 | 3,947.4 | 2,081.6 |
| 80 | Education | 2,848.6 | 427.3 | 2,421.3 | 17,810.1 | 6.0 | 3,185.9 | 1,431.2 | 321.6 | 100.2 | 3,789.4 | 542.2 | 0.0 | 271.9 | 462.6 | 1,069.4 | 1,734.4 | 4,895.3 |
| 85 | Health & social work | 23,520.7 | 3,528.1 | 19,992.6 | 29,605.6 | 99.3 | 3,058.9 | 2,438.9 | 771.0 | 265.9 | 12,359.9 | 800.1 | 0.0 | 274.2 | 458.4 | 1,497.9 | 4,959.3 | 2,621.8 |
| 90 | Sewage and refuse disposal | 4,223.7 | 633.6 | 3,590.1 | 12,751.5 | 145.6 | 598.3 | 528.4 | 155.0 | 424.3 | 2,980.6 | 313.5 | 0.0 | 550.4 | 533.4 | 1,476.7 | 2,354.6 | 2,690.7 |
| 92 | Recreational, culture & sporting activities | 2,873.0 | 431.0 | 2,442.1 | 7,263.1 | 1.7 | 473.4 | 912.9 | 196.3 | 49.2 | 2,054.3 | 132.3 | 0.0 | 115.1 | 95.8 | 695.5 | 876.0 | 1,660.6 |
| 93 | Other service activities | 8,100.9 | 1,215.1 | 6,885.8 | 11,068.9 | 0.0 | 485.1 | 1,209.2 | 268.8 | 67.5 | 4,124.4 | 121.6 | 0.0 | 86.0 | 86.3 | 513.3 | 3,353.9 | 752.8 |
| 01 | Agricultural Activities | 532,980 | 42,638 | 490,342 | 507,663 | 388,869 | 9,199 | 3,410 | 23,679 | 3,079 | 5,967 | 5,967 | 0 | 0 | 15,196 | 0 | 0 | 52,298 |
| 14~41 | Industrial Activities | 469,439 | 70,416 | 399,023 | 1,018,969 | 778,955 | 58,829 | 34,974 | 4,465 | 56,217 | 31,998 | 4,022 | 0 | 1,947 | 15,683 | 6,435 | 12,917 | 12,525 |
| 51,52 | Internal Trade Activities (Retail +Whole S | 367,439 | 55,116 | 312,323 | 154,824 | 3,957 | 21,264 | 16,685 | 2,287 | 12,185 | 11,867 | 1,189 | 0 | 1,432 | 21,318 | 10,565 | 38,275 | 13,800 |
| 55~93 | Service Activities | 647,626 | 97,144 | 550,482 | 408,095 | 4,217 | 53,756 | 32,939 | 5,853 | 15,834 | 107,453 | 12,770 | 0 | 8,862 | 25,939 | 22,084 | 73,298 | 45,090 |
| 60, 63 | Transport Activities | 11,838 | 1,776 | 10,062 | 17,358 | 0 | 10,034 | 389 | 69 | 77 | 2,961 | 764 | 0 | 116 | 262 | 688 | 715 | 1,283 |
| 21~25 | Packing and Wrapping Material Related | 9,897 | 1,484 | 8,412 | 62,967 | 53,782 | 1,388 | 2,299 | 74 | 919 | 1,462 | 292 | 0 | 36 | 713 | 453 | 965 | 585 |
| | Grand Total | 1,723,740 | 221,252 | 1,502,488 | 1,748,266 | 1,010,903 | 115,053 | 65,546 | 33,377 | 56,208 | 143,561 | 22,344 | 10,809 | 10,129 | 54,568 | 28,737 | 85,711 | 111,319 |

Source: Economic Survey 2006, Labor Force Survey 20... s, Building Taxes, Value Added Tax, and Other

*Others including, stationary, disposables, and spare parts

**Table C-10 Share of Various Input to Total Output and Other Indicators (1/2)**

| ISIC Code | Index / Sector Name | Compensation per Employee (US$ / year) | Output per Employee (US$ /employee) | Output | Production of Industry | Exports Sales | Local sales | Change in stocks | Service Activities | Main Service Activities | Transport Activities | Other Revenue from Service | Trade Margin | Output | Gross Value Added | Compensation of Employees | Depreciation of Fixed Assets | Fee & Tax less subsidies** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Agiculture (Plants) | | 9,928.6 | | 100.00% | 3.40% | 96.60% | | | | | | | 100.00% | 77.89% | 2.28% | 0.00% | 1.26% |
| 3 | Agriculture (Livestock) | | | | | | | | | | | | | 100.00% | 19.22% | 0.56% | 0.00% | 0.01% |
| 14 | Other mining and quarrying | 3,133.6 | 43,137.3 | 100.00% | 99.21% | 62.00% | 36.30% | 0.91% | 0.79% | 0.00% | 0.00% | 0.79% | 0.00% | 100.00% | 66.19% | 7.26% | 3.91% | 1.44% |
| 15 | Manufacture of food and beverages | 3,265.7 | 42,880.0 | 100.00% | 98.93% | 0.86% | 97.55% | 0.51% | 0.62% | 0.00% | 0.00% | 0.62% | 0.45% | 100.00% | 26.23% | 7.62% | 7.60% | 1.28% |
| 1511 | Production & preserving of meat produc | 5,979.1 | 81,745.2 | 100.00% | 99.57% | 0.00% | 98.73% | 0.84% | 0.43% | 0.14% | 0.14% | 0.14% | 0.00% | 100.00% | 19.83% | 7.31% | 0.75% | 1.33% |
| 1513 | Processing & preserving of fruit and vegetab | 3,278.5 | 34,701.5 | 100.00% | 99.78% | 0.33% | 100.68% | -1.23% | 0.22% | 0.07% | 0.07% | 0.07% | 0.00% | 100.00% | 20.46% | 9.45% | 2.45% | 2.96% |
| 1514 | Manufacture of vegetable & animal oil | 462.3 | 4,966.5 | 101.41% | 0.00% | 0.00% | 0.00% | 0.00% | 100.00% | 97.76% | 0.00% | 0.83% | 1.41% | 100.00% | 65.34% | 9.31% | 34.51% | 0.50% |
| 1520 | Manufacture of dairy products | 3,075.5 | 34,622.5 | 100.00% | 99.45% | 0.00% | 99.02% | 0.43% | 0.55% | 0.18% | 0.18% | 0.18% | 0.00% | 100.00% | 22.04% | 8.88% | 9.14% | 1.25% |
| 1531 | Manufacture of grain mill products | 5,920.8 | 171,218.8 | 100.00% | 99.88% | 0.10% | 100.57% | -0.79% | 0.12% | 0.04% | 0.04% | 0.04% | 0.00% | 100.00% | 11.50% | 3.46% | 5.50% | 0.41% |
| 1533 | Manufacture of prepared animal feeds | 10,270.6 | 213,998.2 | 100.00% | 99.84% | 0.00% | 99.82% | 0.02% | 0.16% | 0.05% | 0.05% | 0.05% | 0.00% | 100.00% | 16.41% | 4.80% | 3.30% | 1.10% |
| 1541 | Manufacture of bakery products | 2,935.5 | 23,599.0 | 100.00% | 99.78% | 0.00% | 99.10% | 0.68% | 0.22% | 0.07% | 0.07% | 0.07% | 0.00% | 100.00% | 37.07% | 12.44% | 2.57% | 0.54% |
| 1543 | Manufacture of chocolate & sugar product | 2,054.9 | 13,214.1 | 100.00% | 100.00% | 0.00% | 100.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 100.00% | 30.51% | 15.55% | 2.04% | 1.29% |
| 1544 | Manufacture of macaroni, & similar products | 7,067.4 | 51,215.2 | 100.00% | 100.00% | 0.00% | 100.01% | -0.01% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 100.00% | 23.34% | 13.80% | 1.12% | 1.64% |
| 1549 | Manufacture of other food products n.e.c | 3,182.2 | 45,064.4 | 100.00% | 95.53% | 7.84% | 87.02% | 0.67% | 4.47% | 1.49% | 1.49% | 1.49% | 0.00% | 100.00% | 49.26% | 7.06% | 1.94% | 2.84% |
| 1551 | Distilling & blending of alcohol | 4,386.1 | 46,191.7 | 100.00% | 100.00% | 40.83% | 57.17% | 2.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 100.00% | 52.85% | 9.50% | 0.86% | 25.03% |
| 1554 | Manufacture of soft drinks & mineral water | 3,159.8 | 33,122.8 | 100.00% | 99.07% | 0.95% | 82.08% | 16.04% | 0.93% | 0.31% | 0.31% | 0.31% | 0.00% | 100.00% | 27.45% | 9.54% | 3.66% | 0.83% |
| 16 | Manufacture of tobacco products | 7,613.7 | 280,161.0 | 100.00% | 99.85% | 0.00% | 99.84% | 0.01% | 0.01% | 0.00% | 0.00% | 0.01% | 0.15% | 100.00% | 73.33% | 2.72% | 1.31% | 15.64% |
| 17 | Manufacture of textiles | 1,796.6 | 14,387.1 | 100.00% | 80.64% | 4.64% | 75.93% | 0.06% | 15.90% | 0.00% | 0.00% | 15.90% | 3.46% | 100.00% | 46.15% | 12.49% | 2.34% | 2.15% |
| 18 | Manufacture of wearing apparel | 2,281.0 | 6,264.7 | 100.00% | 35.25% | 10.15% | 25.55% | -0.44% | 64.26% | 0.00% | 0.00% | 64.26% | 0.49% | 100.00% | 64.76% | 36.41% | 3.03% | 4.75% |
| 19 | Tanning of leather; manufacture of bags | 2,199.8 | 20,507.6 | 100.00% | 95.27% | 16.72% | 77.46% | 1.09% | 4.67% | 0.00% | 0.00% | 4.67% | 0.06% | 100.00% | 54.78% | 10.73% | 2.22% | 1.58% |
| 20 | Manufacture of wood and its products | 1,580.6 | 19,041.8 | 100.00% | 98.60% | 25.03% | 73.44% | 0.13% | 0.99% | 0.00% | 0.00% | 0.99% | 0.42% | 100.00% | 47.98% | 8.30% | 1.20% | 1.24% |
| 21 | Manufacture of paper and its products | 2,976.2 | 49,750.5 | 100.00% | 99.75% | 14.81% | 84.94% | 0.00% | 0.24% | 0.00% | 0.00% | 0.24% | 0.01% | 100.00% | 44.79% | 5.98% | 5.83% | 2.20% |
| 22 | Publishing, printing and reproduction | 3,190.1 | 18,343.2 | 100.00% | 95.94% | 1.12% | 94.49% | 0.34% | 2.33% | 0.00% | 0.00% | 2.33% | 1.73% | 100.00% | 28.63% | 17.39% | 8.00% | 1.95% |
| 24 | Manufacture of chemicals & its prod. | 5,792.7 | 39,695.5 | 100.00% | 99.70% | 15.81% | 82.01% | 1.88% | 0.04% | 0.00% | 0.00% | 0.04% | 0.26% | 100.00% | 47.20% | 14.59% | 8.43% | 4.85% |
| 2423 | Manufacture of Pharmaceuticals, Medicinal | 8,212.5 | 43,088.6 | 100.00% | 100.00% | 14.39% | 82.42% | 3.18% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 100.00% | 57.39% | 19.06% | 4.39% | 5.36% |
| 25 | Manufacture of rubber and plastic | 3,795.6 | 52,973.8 | 100.00% | 98.49% | 23.33% | 74.40% | 0.77% | 1.50% | 0.00% | 0.00% | 1.50% | 0.01% | 100.00% | 18.82% | 7.17% | 2.69% | 1.76% |
| 26 | Manufacture of non-metallic products | 3,513.6 | 44,912.2 | 100.00% | 98.41% | 10.82% | 87.21% | 0.37% | 0.94% | 0.00% | 0.00% | 0.94% | 0.66% | 100.00% | 49.30% | 7.82% | 3.74% | 1.39% |
| 27 | Manufacture of basic metals | 3,402.5 | 32,161.5 | 100.00% | 84.46% | 1.37% | 85.38% | -2.29% | 14.10% | 0.00% | 0.00% | 14.10% | 1.44% | 100.00% | 39.25% | 10.58% | 2.36% | 1.21% |
| 28 | Manufacture of metal products | 1,326.5 | 17,007.5 | 100.00% | 94.72% | 7.23% | 87.86% | -0.38% | 4.34% | 0.00% | 0.00% | 4.34% | 0.94% | 100.00% | 37.83% | 7.80% | 2.05% | 1.27% |
| 29 | Manufacture of machinery and equip. | 1,189.4 | 10,850.0 | 100.00% | 73.32% | 9.99% | 55.94% | 7.39% | 25.20% | 0.00% | 0.00% | 25.20% | 1.49% | 100.00% | 41.03% | 10.96% | 2.81% | 1.38% |
| 31 | Manufacture of electrical machinery | 2,276.0 | 18,268.3 | 100.00% | 89.93% | 19.15% | 70.76% | 0.01% | 7.43% | 0.00% | 0.00% | 7.43% | 2.65% | 100.00% | 42.20% | 12.46% | 1.37% | 2.20% |
| 32 | Manufacture of radio, TV equip. | 0.0 | 1,400.0 | 99.11% | 0.00% | 0.00% | 0.00% | 0.00% | 93.75% | 0.00% | 0.00% | 93.75% | 5.36% | 100.00% | 41.96% | 0.00% | 14.29% | 1.79% |
| 33 | Manufacture of medical, optical equip. | 1,913.0 | 8,993.0 | 100.00% | 78.94% | 5.97% | 69.70% | 3.27% | 18.86% | 0.00% | 0.00% | 18.86% | 2.20% | 100.00% | 64.52% | 21.27% | 4.98% | 1.29% |
| 34 | Manufacture of motor vehicles, trailers | 1,424.6 | 6,566.2 | 100.00% | 86.79% | 0.00% | 86.53% | 0.26% | 13.21% | 0.00% | 0.00% | 13.21% | 0.00% | 100.00% | 50.07% | 21.70% | 7.17% | 3.96% |
| 36 | Manufacture of furniture | 2,018.4 | 15,851.0 | 100.00% | 96.38% | 21.86% | 74.01% | 0.51% | 2.44% | 0.00% | 0.00% | 2.44% | 1.18% | 100.00% | 38.79% | 12.73% | 2.33% | 1.04% |
| 37 | Recycling | 3,464.1 | 249,830.8 | 100.00% | 99.63% | 92.51% | 7.04% | 0.07% | 0.37% | 0.00% | 0.00% | 0.37% | 0.00% | 100.00% | 17.62% | 1.39% | 0.45% | 0.17% |
| 40 | Electricity | 4,580.3 | 92,426.6 | 100.00% | 99.63% | 0.00% | 99.63% | 0.00% | 0.37% | 0.00% | 0.00% | 0.37% | 0.00% | 100.00% | 83.51% | 4.96% | 1.33% | 0.03% |
| 41 | Collection & distribution of water | 3,552.1 | 24,528.7 | 100.00% | 86.06% | 0.00% | 86.06% | 0.00% | 5.71% | 0.00% | 0.00% | 5.71% | 8.23% | 100.00% | 67.63% | 14.48% | 4.81% | 0.49% |
| 45 | Construction | 4,333.3 | 41,063.2 | 100.00% | 97.56% | 0.16% | 97.40% | 0.00% | 1.47% | 0.00% | 0.00% | 1.47% | 0.97% | 100.00% | 84.58% | 10.55% | 1.77% | 1.81% |
| 50 | Sale & repair of motor vehicles | 1,432.5 | 8,880.0 | 100.00% | 0.00% | 0.00% | 0.00% | 0.00% | 37.87% | 0.00% | 0.00% | 37.87% | 62.13% | 100.00% | 73.14% | 16.13% | 3.25% | 8.16% |
| 51 | Wholesale trade & commission trade | 2,880.9 | 33,264.9 | 100.00% | 0.31% | 0.00% | 0.57% | -0.25% | 0.62% | 0.00% | 0.00% | 0.62% | 99.07% | 100.00% | 84.90% | 8.66% | 1.96% | 10.00% |
| 52 | Retail trade, repair of personal goods | 848.3 | 6,944.2 | 100.00% | 0.73% | 0.00% | 1.08% | -0.35% | 4.72% | 0.00% | 0.00% | 4.72% | 94.54% | 100.00% | 72.46% | 12.22% | 3.36% | 4.19% |
| 55 | Hotels & restaurants | 1,485.2 | 10,953.5 | 100.00% | 0.00% | 0.00% | 0.00% | 0.00% | 95.44% | 95.19% | 0.00% | 0.25% | 4.56% | 100.00% | 46.77% | 13.56% | 2.19% | 0.90% |
| 60 | Land transport | 3,253.3 | 13,829.0 | 100.00% | 0.00% | 0.00% | 0.00% | 0.00% | 95.52% | 0.00% | 91.11% | 4.41% | 4.48% | 100.00% | 55.65% | 23.53% | 9.00% | 4.77% |
| 63 | Supporting & auxiliary transport | 2,192.4 | 13,992.0 | 100.00% | 0.00% | 0.00% | 0.00% | 0.00% | 97.93% | 0.00% | 96.77% | 1.15% | 2.07% | 100.00% | 73.64% | 15.67% | 6.63% | 2.64% |
| 64 | Post & telecommunications | 17,454.1 | 88,414.2 | 100.00% | 0.00% | 0.00% | 0.00% | 0.00% | 97.73% | 0.00% | 97.47% | 0.26% | 2.27% | 100.00% | 80.77% | 19.74% | 7.10% | 10.11% |
| 70 | Real estate activities | 4,031.5 | 41,599.1 | 100.00% | 0.00% | 0.00% | 0.00% | 0.00% | 99.75% | 98.92% | 0.00% | 0.83% | 0.25% | 100.00% | 90.60% | 9.69% | 5.20% | 5.46% |
| 71 | Renting of machinery without operator | 1,174.5 | 7,556.4 | 100.00% | 0.00% | 0.00% | 0.00% | 0.00% | 98.29% | 98.07% | 0.00% | 0.22% | 1.71% | 100.00% | 76.44% | 15.54% | 10.81% | 3.85% |
| 72 | Computer & related activities | 3,896.7 | 11,655.8 | 100.00% | 0.00% | 0.00% | 0.00% | 0.00% | 93.27% | 84.56% | 0.00% | 8.71% | 6.74% | 100.00% | 76.21% | 33.43% | 5.47% | 2.13% |
| 73 | Research & development | 8,011.6 | 21,301.7 | 80.39% | 0.00% | 0.00% | 0.00% | 0.00% | 80.39% | 77.68% | 0.00% | 2.71% | 0.00% | 100.00% | 81.87% | 37.61% | 2.96% | 0.25% |
| 74 | Other business activities | 2,123.2 | 7,836.4 | 98.49% | 0.04% | 0.00% | 0.04% | 0.00% | 95.96% | 95.31% | 0.00% | 0.65% | 2.49% | 100.00% | 65.48% | 27.09% | 5.08% | 2.89% |
| 80 | Education | 6,005.1 | 9,181.2 | 88.06% | 0.01% | 0.00% | 0.01% | 0.00% | 87.82% | 87.37% | 0.00% | 0.45% | 0.24% | 100.00% | 84.92% | 65.41% | 16.61% | 0.49% |
| 85 | Health & social work | 4,021.9 | 10,600.6 | 79.14% | 0.18% | 0.01% | 0.17% | 0.00% | 78.59% | 77.79% | 0.00% | 0.80% | 0.38% | 100.00% | 73.27% | 37.94% | 12.42% | 1.67% |
| 90 | Sewage and refuse disposal | 3,230.0 | 7,294.8 | 55.67% | 2.91% | 0.00% | 2.91% | 0.00% | 52.67% | 49.10% | 0.00% | 3.57% | 0.08% | 100.00% | 65.20% | 44.28% | 9.09% | 0.30% |
| 92 | Recreational, culture & sporting activities | 2,123.5 | 7,377.7 | 95.85% | 0.01% | 0.00% | 0.00% | 0.01% | 94.29% | 91.48% | 0.00% | 2.81% | 1.54% | 100.00% | 63.55% | 28.78% | 19.20% | 1.15% |
| 93 | Other service activities | 631.6 | 4,391.8 | 100.00% | 0.00% | 0.00% | 0.00% | 0.00% | 98.80% | 98.75% | 0.00% | 0.05% | 1.20% | 100.00% | 53.82% | 14.38% | 4.29% | 1.35% |
| 01 | Agricultural Activities | 152.4 | 9,928.6 | 100.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 100.00% | 52.31% | 1.53% | 0.00% | 0.72% |
| 14~41 | Industrial Activities | 2,894.4 | 31,156.2 | 100.00% | 95.75% | 9.47% | 85.74% | 0.54% | 3.66% | 0.28% | 0.03% | 3.35% | 0.60% | 100.00% | 42.43% | 9.29% | 4.39% | 2.24% |
| 51,52 | Internal Trade Activities (Retail +Whole S | 1,021.4 | 9,186.0 | 100.00% | 0.60% | 0.00% | 0.92% | -0.32% | 3.46% | 0.00% | 0.00% | 3.46% | 95.94% | 100.00% | 76.30% | 11.12% | 2.93% | 5.99% |
| 50~90 | Service Activities | 2,305.0 | 10,905.1 | 96.42% | 0.33% | 0.00% | 0.47% | -0.13% | 50.67% | 26.68% | 19.48% | 4.51% | 45.41% | 100.00% | 73.89% | 21.14% | 5.97% | 5.33% |
| 60, 63 | Transport Activities | 2,959.8 | 13,874.1 | 100.00% | 0.00% | 0.00% | 0.00% | 0.00% | 96.19% | 0.00% | 92.69% | 3.50% | 3.81% | 100.00% | 60.67% | 21.33% | 8.34% | 4.17% |
| 21~25 | Packing and Wrapping Material Related | 3,385.9 | 37,219.4 | 100.00% | 98.24% | 16.52% | 81.22% | 0.49% | 1.39% | 0.00% | 0.00% | 1.39% | 0.38% | 100.00% | 27.05% | 9.10% | 4.58% | 1.91% |
| | Grand Total | 1,648.6 | 14,000.6 | 98.69% | 36.76% | 3.75% | 32.92% | 0.09% | 20.01% | 9.78% | 7.14% | 3.09% | 16.93% | 100.00% | 58.98% | 11.77% | 3.75% | 3.01% |

Source: Economic Survey 2006, Labor Force Survey 2006 and Agriultural Survey 2005/06, PCBS

** Customs Duties, Ent. Licensing Fees, Vehicle Licensing Fees, Stamp Fe

**Table C-10 Share of Various Industries to Total Output and Other Indicators (2/2)**

| ISIC Code | Index / Sector Name | Corporate Tax (@8%, 15%) | Net Profit After Tax | Intermediate Consumption | Raw materials | Fuel and Oil | Electricity | Water | Packing and Wrapping Material | Other Inputs* | Machines Maintenance | Subcontract | Advertising | Transport | Telecommu-nication | Rent of Building | Other Service Expenditures | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Agiculture (Plants) | 5.95% | 68.39% | 22.11% | 13.43% | 1.48% | 0.33% | 3.01% | 0.51% | 0.26% | 0.26% | 0.00% | 0.00% | 1.41% | 0.00% | 0.00% | 1.41% | |
| 3 | Agriculture (Livestock) | 1.49% | 17.16% | 80.78% | 66.42% | 0.07% | 0.30% | 1.21% | 0.00% | 0.95% | 0.95% | 0.00% | 0.00% | 1.44% | 0.00% | 0.00% | 9.44% | |
| 14 | Other mining and quarrying | 8.04% | 45.54% | 33.81% | 14.30% | 7.06% | 2.99% | 0.31% | 0.21% | 4.77% | 0.57% | 0.00% | 0.08% | 0.54% | 0.38% | 0.19% | 2.41% | |
| 15 | Manufacture of food and beverages | 1.46% | 8.28% | 73.77% | 55.91% | 4.04% | 1.96% | 0.28% | 7.73% | 1.13% | 0.22% | 0.00% | 0.11% | 0.86% | 0.27% | 0.77% | 0.50% | |
| 1511 | Production & preserving of meat produc | 1.57% | 8.87% | 80.17% | 68.89% | 1.50% | 2.23% | 0.27% | 4.53% | 0.52% | 0.32% | 0.00% | 0.09% | 0.72% | 0.59% | 0.29% | 0.23% | |
| 1513 | Processing & preserving of fruit and vegetal | 0.84% | 4.77% | 79.54% | 56.93% | 3.28% | 1.77% | 0.28% | 11.98% | 2.36% | 0.21% | 0.00% | 0.28% | 0.72% | 0.45% | 0.23% | 1.05% | |
| 1514 | Manufacture of vegetable & animal oil | 3.15% | 17.86% | 34.66% | 9.89% | 6.72% | 4.99% | 4.99% | 4.04% | 4.04% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | |
| 1520 | Manufacture of dairy products | 0.41% | 2.35% | 77.96% | 52.57% | 4.69% | 3.36% | 0.64% | 11.87% | 2.14% | 0.27% | 0.00% | 0.14% | 0.92% | 0.31% | 0.10% | 0.95% | |
| 1531 | Manufacture of grain mill products | 0.32% | 1.81% | 88.50% | 79.54% | 0.67% | 2.52% | 0.02% | 2.82% | 0.50% | 0.02% | 0.00% | 0.27% | 1.75% | 0.16% | 0.01% | 0.22% | |
| 1533 | Manufacture of prepared animal feeds | 1.08% | 6.12% | 83.59% | 79.05% | 0.47% | 0.46% | 0.03% | 0.86% | 0.86% | 0.10% | 0.00% | 0.01% | 1.29% | 0.06% | 0.02% | 0.38% | |
| 1541 | Manufacture of bakery products | 3.23% | 18.30% | 62.93% | 39.87% | 14.14% | 2.43% | 0.29% | 2.15% | 1.12% | 0.19% | 0.00% | 0.07% | 0.11% | 0.36% | 1.70% | 0.50% | |
| 1543 | Manufacture of chocolate & sugar product | 1.74% | 9.88% | 69.51% | 53.41% | 4.78% | 1.72% | 0.67% | 4.87% | 1.32% | 0.23% | 0.00% | 0.07% | 0.87% | 0.39% | 0.58% | 0.59% | |
| 1544 | Manufacture of macaroni, & similar products | 1.02% | 5.77% | 76.66% | 56.42% | 4.90% | 4.01% | 0.12% | 5.03% | 1.99% | 0.92% | 0.00% | 0.03% | 1.75% | 0.19% | 0.42% | 0.88% | |
| 1549 | Manufacture of other food products n.e.c | 5.61% | 31.80% | 50.74% | 36.30% | 2.73% | 2.35% | 0.26% | 4.11% | 1.97% | 0.32% | 0.00% | 0.06% | 1.27% | 0.29% | 0.22% | 0.88% | |
| 1551 | Distilling & blending of alcohol | 2.62% | 14.85% | 47.15% | 15.92% | 8.58% | 1.08% | 0.57% | 4.81% | 7.62% | 0.17% | 0.00% | 0.29% | 3.20% | 0.56% | 0.97% | 3.38% | |
| 1554 | Manufacture of soft drinks & mineral water | 2.01% | 11.41% | 72.55% | 30.33% | 2.29% | 1.98% | 0.60% | 34.25% | 1.03% | 0.25% | 0.00% | 0.08% | 0.63% | 0.17% | 0.48% | 0.46% | |
| 16 | Manufacture of tobacco products | 8.05% | 45.61% | 26.67% | 25.01% | 0.27% | 0.08% | 0.01% | 0.28% | 0.44% | 0.00% | 0.00% | 0.02% | 0.17% | 0.05% | 0.00% | 0.33% | |
| 17 | Manufacture of textiles | 4.38% | 24.79% | 53.85% | 43.44% | 1.38% | 1.28% | 0.11% | 0.80% | 2.18% | 0.16% | 0.00% | 0.01% | 1.38% | 0.66% | 1.84% | 0.59% | |
| 18 | Manufacture of wearing apparel | 3.09% | 17.49% | 35.24% | 20.04% | 2.08% | 2.49% | 0.36% | 1.17% | 3.46% | 0.28% | 0.00% | 0.01% | 1.66% | 0.75% | 1.72% | 1.22% | |
| 19 | Tanning of leather; manufacture of bags | 6.04% | 34.22% | 45.22% | 37.60% | 0.68% | 1.63% | 0.16% | 1.60% | 1.12% | 0.09% | 0.00% | 0.01% | 0.53% | 0.41% | 0.97% | 0.42% | |
| 20 | Manufacture of wood and its products | 5.59% | 31.66% | 52.02% | 43.39% | 1.72% | 1.22% | 0.12% | 0.13% | 2.14% | 0.15% | 0.00% | 0.02% | 1.07% | 0.46% | 1.20% | 0.39% | |
| 21 | Manufacture of paper and its products | 4.62% | 26.16% | 55.21% | 45.03% | 0.79% | 1.29% | 0.03% | 2.50% | 2.61% | 0.65% | 0.00% | 0.05% | 1.21% | 0.37% | 0.23% | 0.45% | |
| 22 | Publishing, printing and reproduction | 0.19% | 1.10% | 71.37% | 57.78% | 1.71% | 1.72% | 0.16% | 0.57% | 2.94% | 0.42% | 0.00% | 0.12% | 1.12% | 1.09% | 2.46% | 1.28% | |
| 24 | Manufacture of chemicals & its prod. | 2.90% | 16.42% | 52.80% | 34.93% | 1.22% | 1.47% | 0.21% | 9.19% | 1.68% | 0.34% | 0.00% | 0.78% | 1.13% | 0.35% | 0.35% | 1.16% | |
| 2423 | Manufacture of Pharmaceuticals, Medicinal | 4.29% | 24.29% | 42.61% | 23.60% | 0.74% | 1.39% | 0.14% | 11.35% | 1.53% | 0.65% | 0.00% | 1.20% | 0.30% | 0.30% | 0.27% | 1.14% | |
| 25 | Manufacture of rubber and plastic | 1.08% | 6.12% | 81.18% | 71.50% | 1.91% | 3.62% | 0.08% | 0.65% | 0.81% | 0.17% | 0.00% | 0.01% | 0.55% | 0.37% | 0.97% | 0.54% | |
| 26 | Manufacture of non-metallic products | 5.45% | 30.89% | 50.70% | 39.40% | 4.38% | 2.10% | 0.38% | 0.47% | 1.48% | 0.25% | 0.00% | 0.01% | 1.03% | 0.37% | 0.44% | 0.38% | |
| 27 | Manufacture of basic metals | 3.76% | 21.33% | 60.75% | 51.28% | 2.54% | 1.01% | 0.16% | 0.06% | 2.10% | 0.60% | 0.00% | 0.01% | 1.14% | 0.39% | 0.57% | 0.89% | |
| 28 | Manufacture of metal products | 4.01% | 22.70% | 62.17% | 51.62% | 1.90% | 1.57% | 0.18% | 0.18% | 2.44% | 0.18% | 0.00% | 0.04% | 0.95% | 0.69% | 1.89% | 0.55% | |
| 29 | Manufacture of machinery and equip. | 3.88% | 21.99% | 58.97% | 40.36% | 2.61% | 1.69% | 0.25% | 0.11% | 7.61% | 0.23% | 0.00% | 0.02% | 0.52% | 0.85% | 4.02% | 0.70% | |
| 31 | Manufacture of electrical machinery | 3.93% | 22.24% | 57.80% | 39.82% | 1.84% | 1.04% | 0.07% | 0.49% | 3.83% | 0.45% | 0.00% | 0.03% | 0.74% | 0.93% | 1.45% | 7.12% | |
| 32 | Manufacture of radio, TV equip. | 3.88% | 22.01% | 58.04% | 0.00% | 1.79% | 6.25% | 1.79% | 0.00% | 21.43% | 0.89% | 0.00% | 0.00% | 0.00% | 13.39% | 9.82% | 2.68% | |
| 33 | Manufacture of medical, optical equip. | 5.55% | 31.43% | 35.48% | 18.38% | 0.48% | 1.57% | 0.40% | 0.38% | 3.04% | 0.18% | 0.00% | 0.28% | 0.19% | 1.52% | 6.16% | 2.91% | |
| 34 | Manufacture of motor vehicles, trailers | 2.59% | 14.66% | 49.93% | 28.70% | 3.19% | 2.72% | 0.66% | 0.07% | 6.56% | 0.49% | 0.00% | 0.09% | 1.64% | 0.94% | 2.48% | 2.39% | |
| 36 | Manufacture of furniture | 3.40% | 19.29% | 61.21% | 49.93% | 1.82% | 1.45% | 0.14% | 0.53% | 2.90% | 0.16% | 0.00% | 0.03% | 0.91% | 0.63% | 1.98% | 0.73% | |
| 37 | Recycling | 2.34% | 13.28% | 82.38% | 80.70% | 0.61% | 0.08% | 0.03% | 0.00% | 0.12% | 0.02% | 0.00% | 0.00% | 0.10% | 0.05% | 0.00% | 0.68% | |
| 40 | Electricity | 11.58% | 65.62% | 16.49% | 9.28% | 0.37% | 0.02% | 0.01% | 0.00% | 5.83% | 0.01% | 0.00% | 0.05% | 0.32% | 0.06% | 0.14% | 0.40% | |
| 41 | Collection & distribution of water | 7.18% | 40.67% | 32.37% | 1.35% | 11.41% | 10.54% | 0.09% | 0.01% | 1.68% | 0.42% | 0.00% | 0.03% | 0.12% | 0.39% | 0.13% | 6.20% | Trade Margin Ratio |
| 45 | Construction | 10.57% | 59.88% | 15.42% | 0.72% | 2.82% | 0.22% | 0.15% | 0.04% | 1.18% | 0.15% | 6.74% | 0.07% | 0.35% | 0.59% | 0.41% | 1.97% | |
| 50 | Sale & repair of motor vehicles | 6.84% | 38.76% | 26.86% | 0.00% | 3.99% | 2.03% | 0.51% | 0.49% | 6.58% | 0.58% | 0.00% | 0.12% | 1.94% | 1.63% | 5.88% | 3.12% | 19.24% |
| 51 | Wholesale trade & commission trade | 9.64% | 54.64% | 15.10% | 0.51% | 2.84% | 0.59% | 0.09% | 1.24% | 0.93% | 0.16% | 0.00% | 0.25% | 4.33% | 0.78% | 1.57% | 1.80% | 35.99% |
| 52 | Retail trade, repair of personal goods | 7.90% | 44.78% | 27.54% | 0.65% | 3.44% | 3.43% | 0.46% | 2.14% | 2.21% | 0.19% | 0.00% | 0.21% | 2.79% | 1.99% | 7.78% | 2.25% | 30.87% |
| 55 | Hotels & restaurants | 4.52% | 25.60% | 53.23% | 0.00% | 5.58% | 2.45% | 0.69% | 1.67% | 34.89% | 0.17% | 0.00% | 0.12% | 0.16% | 0.53% | 5.95% | 1.03% | |
| 60 | Land transport | 2.75% | 15.60% | 44.35% | 0.00% | 29.40% | 0.42% | 0.14% | 0.02% | 7.60% | 2.19% | 0.00% | 0.16% | 0.35% | 1.14% | 1.20% | 1.71% | |
| 63 | Supporting & auxiliary transport | 7.31% | 41.40% | 26.36% | 0.00% | 5.51% | 2.06% | 0.19% | 0.57% | 4.40% | 0.53% | 0.00% | 0.52% | 1.21% | 2.64% | 2.72% | 6.00% | |
| 64 | Post & telecommunications | 6.57% | 37.25% | 19.23% | 0.00% | 1.02% | 1.22% | 0.10% | 0.00% | 6.94% | 2.79% | 0.00% | 1.65% | 0.01% | 0.49% | 1.32% | 3.68% | |
| 70 | Real estate activities | 10.54% | 59.72% | 9.40% | 0.00% | 0.82% | 1.34% | 0.47% | 0.04% | 0.60% | 0.28% | 0.00% | 0.06% | 0.09% | 0.72% | 1.16% | 3.83% | |
| 71 | Renting of machinery without operator | 6.94% | 39.30% | 23.56% | 0.00% | 4.12% | 1.46% | 0.32% | 0.23% | 5.63% | 1.65% | 0.00% | 0.15% | 1.13% | 1.57% | 5.22% | 2.08% | |
| 72 | Computer & related activities | 5.28% | 29.90% | 23.79% | 0.00% | 1.70% | 1.29% | 0.14% | 0.07% | 7.77% | 0.11% | 0.00% | 1.62% | 0.72% | 2.17% | 4.63% | 3.56% | |
| 73 | Research & development | 6.16% | 34.90% | 18.13% | 0.00% | 0.54% | 0.97% | 0.16% | 0.05% | 4.21% | 0.44% | 0.00% | 0.27% | 0.60% | 1.45% | 5.34% | 4.10% | |
| 74 | Other business activities | 4.56% | 25.84% | 34.52% | 0.01% | 2.83% | 2.01% | 0.35% | 0.78% | 8.59% | 0.87% | 0.00% | 2.46% | 0.61% | 3.31% | 8.31% | 4.38% | |
| 80 | Education | 0.36% | 2.05% | 15.08% | 0.01% | 2.70% | 1.21% | 0.27% | 0.08% | 3.21% | 0.46% | 0.00% | 0.23% | 0.39% | 0.91% | 1.47% | 4.14% | |
| 85 | Health & social work | 3.19% | 18.05% | 26.73% | 0.09% | 2.76% | 2.20% | 0.70% | 0.24% | 11.16% | 0.72% | 0.00% | 0.25% | 0.41% | 1.35% | 4.48% | 2.37% | |
| 90 | Sewage and refuse disposal | 1.73% | 9.80% | 34.80% | 0.40% | 1.63% | 1.44% | 0.42% | 1.16% | 8.13% | 0.86% | 0.00% | 1.50% | 1.46% | 4.03% | 6.43% | 7.34% | |
| 92 | Recreational, culture & sporting activities | 2.16% | 12.25% | 36.45% | 0.01% | 2.38% | 4.58% | 0.99% | 0.25% | 10.31% | 0.66% | 0.00% | 0.58% | 0.48% | 3.49% | 4.40% | 8.33% | |
| 93 | Other service activities | 5.07% | 28.73% | 46.18% | 0.00% | 2.02% | 5.04% | 1.12% | 0.28% | 17.21% | 0.51% | 0.00% | 0.36% | 0.36% | 2.14% | 13.99% | 3.14% | |
| 01 | Agricultural Activities | 4.01% | 46.06% | 47.69% | 36.53% | 0.86% | 0.32% | 2.22% | 0.29% | 0.56% | 0.56% | 0.00% | 0.00% | 1.43% | 0.00% | 0.00% | 4.91% | Trade Margin Ratio |
| 14~41 | Industrial Activities | 3.98% | 22.54% | 57.57% | 44.01% | 3.32% | 1.98% | 0.25% | 3.18% | 1.81% | 0.23% | 0.00% | 0.11% | 0.89% | 0.36% | 0.73% | 0.71% | |
| 51,52 | Internal Trade Activities (Retail +Whole S | 8.44% | 47.82% | 23.70% | 0.61% | 3.26% | 2.55% | 0.35% | 1.87% | 1.82% | 0.18% | 0.00% | 0.22% | 3.26% | 1.62% | 5.86% | 2.11% | 32.33% |
| 50~90 | Service Activities | 6.22% | 35.23% | 26.11% | 0.27% | 3.44% | 2.11% | 0.37% | 1.01% | 6.88% | 0.82% | 0.00% | 0.57% | 1.66% | 1.41% | 4.69% | 2.89% | |
| 60, 63 | Transport Activities | 4.02% | 22.80% | 39.33% | 0.00% | 22.73% | 0.88% | 0.16% | 0.18% | 6.71% | 1.73% | 0.00% | 0.26% | 0.59% | 1.56% | 1.62% | 2.91% | |
| 21~25 | Packing and Wrapping Material Related | 1.72% | 9.75% | 72.95% | 62.31% | 1.61% | 2.66% | 0.09% | 1.07% | 1.69% | 0.34% | 0.00% | 0.04% | 0.83% | 0.52% | 1.12% | 0.68% | |
| | Grand Total | 5.19% | 35.25% | 41.02% | 23.72% | 2.70% | 1.54% | 0.78% | 1.32% | 3.37% | 0.52% | 0.25% | 0.24% | 1.28% | 0.67% | 2.01% | 2.61% | |

Source: Economic Survey 2006, Labor Force Survey 2e s, Building Taxes, Value Added Tax, and Othe r *Others including, stationary, disposables, and spare parts

# Table C-11 Self-Sufficiency Ratio of Major Products and Export and Import of Major Commodities

## Estimation of Self-sufficiency Ratio by ISIC Code

Value in 1000US$

| | | Imports | Exports | Production | Domestic Demand | Self Sufficiency Ratio |
|---|---|---|---|---|---|---|
| 011 | Growing of crops; market gardening; horticult | 106,734.7 | 22,790.2 | 600,554.0 | 684,498.5 | |
| 012 | Farming of animals | 43,571.3 | 110.3 | 464,054.0 | 507,515.0 | |
| 14 | Other mining and quarrying | 5,554.1 | 331.5 | 37,489.4 | 42,712.0 | 87.77% |
| 15 | Manufacture of food and beverages | 238,852.4 | 28,497.3 | 286,770.9 | 497,126.0 | 57.69% |
| 16 | Manufacture of tobacco products | 42,925.3 | 9,535.4 | 62,612.6 | 96,002.5 | 65.22% |
| 17 | Manufacture of textiles | 44,974.3 | 10,229.5 | 18,154.6 | 52,899.5 | 34.32% |
| 18 | Manufacture of wearing apparel | 31,583.3 | 6,259.1 | 17,049.4 | 42,373.6 | 40.24% |
| 19 | Tanning of leather; manufacture of bags | 17,787.6 | 17,522.7 | 36,186.8 | 36,451.7 | 99.27% |
| 20 | Manufacture of wood and its products | 53,624.2 | 13,693.2 | 20,752.7 | 60,683.7 | 34.20% |
| 21 | Manufacture of paper and its products | 55,334.8 | 2,847.4 | 16,114.3 | 68,601.7 | 23.49% |
| 22 | Publishing, printing and reproduction | 9,161.3 | 997.0 | 42,178.5 | 50,342.9 | 83.78% |
| 24 | Manufacture of chemicals & its prod. | 208,427.6 | 20,940.4 | 62,034.3 | 249,521.5 | 24.86% |
| 25 | Manufacture of rubber and plastic | 41,857.4 | 18,880.7 | 145,594.6 | 168,571.4 | 86.37% |
| 26 | Manufacture of non-metallic products | 164,753.4 | 77,309.3 | 335,370.6 | 422,814.7 | 79.32% |
| 27 | Manufacture of basic metals | 158,829.9 | 15,449.6 | 1,921.0 | 145,301.3 | 1.32% |
| 28 | Manufacture of metal products | 37,617.1 | 9,824.3 | 99,567.0 | 127,359.8 | 78.18% |
| 29 | Manufacture of machinery and equip. | 105,329.2 | 7,134.6 | 4,953.0 | 103,147.6 | 4.80% |
| 31 | Manufacture of electrical machinery | 30,520.5 | 3,835.0 | 3,367.9 | 30,053.4 | 11.21% |
| 32 | Manufacture of radio, TV equip. | 50,118.1 | 651.6 | 829.0 | 50,295.5 | 1.65% |
| 33 | Manufacture of medical, optical equip. | 31,217.3 | 1,046.6 | 843.1 | 31,013.8 | 2.72% |
| 34 | Manufacture of motor vehicles, trailers | 157,633.4 | 3,608.8 | 254.0 | 154,278.6 | 0.16% |
| 36 | Manufacture of furniture | 28,207.5 | 28,055.4 | 109,203.0 | 109,355.1 | 99.86% |
| 37 | Recycling | | | 424.7 | 424.7 | 100.00% |
| 40 | Electricity | 191,955.5 | 0.0 | 59,736.1 | 251691.55 | 23.73% |
| 41 | Collection & distribution of water | | | 20,640.5 | 20,640.5 | 100.00% |
| 45 | Construction | | | 166,871.5 | 166,871.5 | 100.00% |
| 50 | Sale & repair of motor vehicles | | | 1,201.9 | 1,201.9 | 100.00% |
| 51 | Wholesale trade & commission trade | | | 414.8 | 414.8 | 100.00% |
| 52 | Retail trade, repair of personal goods | | | 4,263.5 | 4,263.5 | 100.00% |
| 55 | Hotels & restaurants | | | 462.8 | 462.8 | 100.00% |
| 85 | Health & social work | | | 91.7 | 91.7 | 100.00% |
| 90 | Sewage and refuse disposal | | | | 0.0 | |
| 92 | Recreational, culture & sporting activities | 5.8 | 0.0 | 3.6 | 9.4 | 38.14% |
| 93 | Other service activities | | | | 0.0 | |
| 14~41 | Industrial Activities | 1,706,264.1 | 276,649.2 | 1,382,048.0 | 2,811,662.9 | 49.15% |
| 51,52 | Internal Trade Activities (Retail +Whole Sale) | 0.0 | 0.0 | 4,678.3 | 4,678.3 | 100.00% |
| 55,70~93 | Service Activities | 5.8 | 0.0 | 558.1 | 563.9 | 98.96% |
| 60, 63 | Transport Activities | | | | | 100.00% |
| 21~25 | Packing and Wrapping Material Related | 314,781.2 | 43,665.5 | 265,921.7 | 537,037.4 | 49.52% |
| | Total (exc. Agricultural activities) | 1,706,269.9 | 276,649.2 | 1,555,357.8 | 2,984,978.5 | 52.11% |

Source: Compiled by JICA Study Team using the data from Palestinian Central Bureau of Statistics 2008, (Unpublished data).

## Food Consumption and Production in Palestine

| Group Code | Food groups | Consumption (g/person/day) | Production (g/person/day) | Self-sufficiency Ratio |
|---|---|---|---|---|
| 2924 | Alcohol (incl beer&wine) | 1 | | |
| 2946 | Animal fats & products | 2 | 0 | 0.0% |
| 2922 | Beverage crops | 4 | | 0.0% |
| 2905 | Cereals &prod. excl beer | 390 | 18 | 4.6% |
| 2949 | Eggs & products | 26 | 11 | 42.3% |
| 2960 | Fish, seafood & prod. | 1 | 1 | 100.0% |
| 2919 | Fruits &prod. (excl. wine) | 255 | 64 | 25.1% |
| 2943 | Meat (slaughtered) & prod. | 81 | 28 | 34.6% |
| 2948 | Milk & products | 150 | 49 | 32.7% |
| 2945 | Offals edible | 1 | 1 | 100.0% |
| 2913 | Oilcrops (excl. prod.) | 5 | 31 | 620.0% |
| 2911 | Pulses & products | 6 | 2 | 33.3% |
| 2923 | Spices | 106 | 1 | 0.9% |
| 2907 | Starchy roots & products | 45 | 19 | 42.2% |
| 2909 | Sugar & Sweeteners | 91 | 0 | 0.0% |
| 2912 | Treenuts & products | 4 | 1 | 25.0% |
| 2914 | Vegetable oils & prod. | 29 | 7 | 24.1% |
| 2918 | Vegetables & products | 403 | 167 | 41.4% |
| | Livestock Total | 260 | 89 | 34.2% |
| | Plants Total | 1340 | 311 | 23.2% |
| | Grand Total | 1600 | 400 | 25.0% |

Data source: FAO Statistics Division,(2001 - 2003 Data

Consumption: The food consumption refers to the amount of food available for human consumption as estimated by the FAO Food Balance Sheet However food consumption may be lower than the quantity shown as food availability depending on the magnitude of wastage and losses of food the household, e.g. during storage, in preparation and cooking, as plate-waste or quantities fed to domestic animals and pets, thrown or given awa

Food group consumption: Food consumption per person is the amount of food, in terms of quantity, for each individual in the total populatio

## Export and Import by ISIC Code in 2005

Value in 1000US$

| ISIC -R3 | | Imports | Exports |
|---|---|---|---|
| 111 | Growing of cereals and other crops n.e.c. | 64,310.14 | 2,864.79 |
| 112 | Growing of vegetables, horticultural specialties and nursery products | 7,064.46 | 13,073.66 |
| 113 | Growing of fruit, nuts, beverage and spice crops | 35,360.12 | 6,851.73 |
| 121 | Farming of cattle, sheep, goats, horses, asses, mules and hinnies; dairy farming | 33,742.02 | 3.69 |
| 122 | Other animal farming; production of animal products n.e.c. | 9,829.28 | 106.65 |
| 200 | Forestry, logging and related service activities | 5,524.77 | 113.78 |
| 500 | Fishing, operation of fish hatcheries and fish farms; service activities incidental to fishing | 1,464.19 | 1,907.07 |
| 1010 | Mining and agglomeration of hard coal | 12.08 | |
| 1020 | Mining and agglomeration of lignite | 22.24 | |
| 1030 | Extraction and agglomeration of peat | 40.4 | |
| 1110 | Extraction of crude petroleum and natural gas | 58,818.22 | |
| 1310 | Mining of iron ores | 6.04 | |
| 1320 | Mining of non-ferrous metal ores, except uranium and thorium ores | 138.89 | |
| 1410 | Quarrying of stone, sand and clay | 5,259.81 | 314.88 |
| 1421 | Mining of chemical and fertilizer minerals | 19.92 | |
| 1422 | Extraction of salt | 103.65 | |
| 1429 | Other mining and quarrying n.e.c. | 170.73 | 16.63 |
| 1511 | Production, processing and preserving of meat and meat products | 27,421.79 | 3,322.19 |
| 1512 | Processing and preserving of fish and fish products | 8,042.42 | 137.36 |
| 1513 | Processing and preserving of fruit and vegetables | 13,943.49 | 2,639.84 |
| 1514 | Manufacture of vegetable and animal oils and fats | 17,659.50 | 8,942.59 |
| 1520 | Manufacture of dairy products | 28,141.79 | 4,047.11 |
| 1531 | Manufacture of grain mill products | 31,703.33 | 1,507.76 |
| 1532 | Manufacture of starches and starch products | 7,450.68 | 668.1 |
| 1533 | Manufacture of prepared animal feeds | 30.9 | 1.76 |
| 1541 | Manufacture of bakery products | 10,055.91 | 630.36 |
| 1542 | Manufacture of sugar | 25,870.77 | 95.77 |
| 1543 | Manufacture of cocoa, chocolate and sugar confectionery | 24,639.47 | 3,425.98 |
| 1544 | Manufacture of macaroni, noodles, couscous and similar farinaceous products | 728.91 | 99.42 |
| 1549 | Manufacture of other food products n.e.c. | 35,695.62 | 338.5 |
| 1551 | Distilling, rectifying and blending of spirits; ethyl alcohol production from fermented materials | 3,350.85 | 1,606.21 |
| 1552 | Manufacture of wines | 22.04 | 136.28 |
| 1553 | Manufacture of malt liquors and malt | 1,375.92 | 630.31 |
| 1554 | Manufacture of soft drinks; production of mineral waters | 2,719.01 | 267.79 |
| 1600 | Manufacture of tobacco products | 42,925.34 | 9,535.44 |
| 1711 | Preparation and spinning of textile fibres; weaving of textiles | 22,558.60 | 7,462.45 |
| 1721 | Manufacture of made-up textile articles, except apparel | 6,414.71 | 1,576.03 |
| 1722 | Manufacture of carpets and rugs | 6,245.97 | 256.5 |
| 1723 | Manufacture of cordage, rope, twine and netting | 196.33 | 20.33 |
| 1729 | Manufacture of other textiles n.e.c. | 6,870.03 | 414.2 |
| 1730 | Manufacture of knitted and crocheted fabrics and articles | 2,688.70 | 499.94 |
| 1810 | Manufacture of wearing apparel, except fur apparel | 31,578.81 | 6,259.08 |
| 1820 | Dressing and dyeing of fur; manufacture of articles of fur | 4.5 | |
| 1911 | Tanning and dressing of leather | 2,085.60 | 3,145.06 |
| 1912 | Manufacture of luggage, handbags and the like, saddlery and harness | 4,518.57 | 364.38 |
| 1920 | Manufacture of footwear | 11,183.41 | 14,013.28 |
| 2010 | Sawmilling and planing of wood | 17,085.55 | 477.15 |
| 2021 | Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board and other | 33,233.80 | 4,804.50 |
| 2022 | Manufacture of builders' carpentry and joinery | 1,448.13 | 473.07 |
| 2023 | Manufacture of wooden containers | 159.02 | 7,264.35 |
| 2029 | Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting ma | 1,697.70 | 674.1 |
| 2101 | Manufacture of pulp, paper and paperboard | 26,790.00 | 221.86 |
| 2102 | Manufacture of corrugated paper and paperboard and of containers of paper and paperboard | 5,935.21 | 675.92 |
| 2109 | Manufacture of other articles of paper and paperboard | 22,609.60 | 1,949.64 |
| 2211 | Publishing of books, brochures, musical books and other publications | 1,565.12 | 88.81 |
| 2212 | Publishing of newspapers, journals and periodicals | 3,147.71 | 11.47 |
| 2213 | Publishing of recorded media | 366.35 | 135.68 |
| 2219 | Other publishing | 1,395.25 | 146.61 |
| 2221 | Printing | 1,982.12 | 535.68 |
| 2222 | Service activities related to printing | 704.78 | 78.72 |
| 2310 | Manufacture of coke oven products | 11.16 | |
| 2320 | Manufacture of refined petroleum products | 463,577.17 | 11,065.88 |
| 2411 | Manufacture of basic chemicals, except fertilizers and nitrogen compounds | 24,770.91 | 820.14 |
| 2412 | Manufacture of fertilizers and nitrogen compounds | 6,614.72 | 274.37 |
| 2413 | Manufacture of plastics in primary forms and of synthetic rubber | 37,964.91 | 166.06 |
| 2421 | Manufacture of pesticides and other agro-chemical products | 3,494.76 | 283.6 |
| 2422 | Manufacture of paints, varnishes and similar coatings, printing ink and mastics | 15,835.71 | 1,114.01 |
| 2423 | Manufacture of pharmaceuticals, medicinal chemicals and botanical products | 56,614.57 | 12,350.75 |
| 2424 | Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toile | 44,311.34 | 5,501.14 |
| 2429 | Manufacture of other chemical products n.e.c. | 17,647.31 | 419.17 |
| 2430 | Manufacture of man-made fibres | 1,173.36 | 11.19 |

Value in 1000US$

| ISIC -R3 | | Imports | Exports |
|---|---|---|---|
| 2511 | Manufacture of rubber tyres and tubes; retreading and rebuilding of rubber tyres | 2,982.83 | 1,396.05 |
| 2519 | Manufacture of other rubber products | 2,401.97 | 146.82 |
| 2520 | Manufacture of plastics products | 36,472.62 | 17,337.78 |
| 2610 | Manufacture of glass and glass products | 12,758.86 | 2,899.33 |
| 2691 | Manufacture of non-structural non-refractory ceramic ware | 11,860.41 | 3,110.23 |
| 2692 | Manufacture of refractory ceramic products | 82.45 | 3,501.34 |
| 2693 | Manufacture of structural non-refractory clay and ceramic products | 26,853.34 | |
| 2694 | Manufacture of cement, lime and plaster | 98,649.14 | 336.29 |
| 2695 | Manufacture of articles of concrete, cement and plaster | 2,290.37 | 1,868.87 |
| 2696 | Cutting, shaping and finishing of stone | 9,440.77 | 64,175.78 |
| 2699 | Manufacture of other non-metallic mineral products n.e.c. | 2,818.03 | 1,417.43 |
| 2710 | Manufacture of basic iron and steel | 110,013.27 | 6,381.75 |
| 2720 | Manufacture of basic precious and non-ferrous metals | 48,816.62 | 9,067.88 |
| 2811 | Manufacture of structural metal products | 3,123.10 | 5,263.00 |
| 2812 | Manufacture of tanks, reservoirs and containers of metal | 1,459.63 | 41.56 |
| 2813 | Manufacture of steam generators, except central heating hot water boilers | 64.74 | |
| 2893 | Manufacture of cutlery, hand tools and general hardware | 10,417.53 | 765.94 |
| 2899 | Manufacture of other fabricated metal products n.e.c. | 22,552.07 | 3,753.77 |
| 2911 | Manufacture of engines and turbines, except aircraft, vehicle and cycle engines | 375.25 | 36.44 |
| 2912 | Manufacture of pumps, compressors, taps and valves | 8,161.87 | 823.93 |
| 2913 | Manufacture of bearings, gears, gearing and driving elements | 640.74 | 3.5 |
| 2914 | Manufacture of ovens, furnaces and furnace burners | 1,166.49 | 6.57 |
| 2915 | Manufacture of lifting and handling equipment | 5,030.69 | 198.9 |
| 2919 | Manufacture of other general purpose machinery | 17,234.15 | 2,250.03 |
| 2921 | Manufacture of agricultural and forestry machinery | 2,323.68 | 56.05 |
| 2922 | Manufacture of machine-tools | 12,151.75 | 273.02 |
| 2923 | Manufacture of machinery for metallurgy | 475.99 | 4.46 |
| 2924 | Manufacture of machinery for mining, quarrying and construction | 8,158.99 | 1,197.06 |
| 2925 | Manufacture of machinery for food, beverage and tobacco processing | 3,230.02 | 48.45 |
| 2926 | Manufacture of machinery for textile, apparel and leather production | 1,711.52 | 229.52 |
| 2927 | Manufacture of weapons and ammunition | 0.48 | |
| 2929 | Manufacture of other special purpose machinery | 6,735.76 | 348.63 |
| 2930 | Manufacture of domestic appliances n.e.c. | 37,931.80 | 1,658.01 |
| 3000 | Manufacture of office, accounting and computing machinery | 42,778.41 | 1,272.74 |
| 3110 | Manufacture of electric motors, generators and transformers | 4,510.94 | 175.96 |
| 3120 | Manufacture of electricity distribution and control apparatus | 7,833.71 | 1,794.61 |
| 3130 | Manufacture of insulated wire and cable | 7,266.36 | 644.74 |
| 3140 | Manufacture of accumulators, primary cells and primary batteries | 1,771.39 | 484.36 |
| 3150 | Manufacture of electric lamps and lighting equipment | 4,193.55 | 371.63 |
| 3190 | Manufacture of other electrical equipment n.e.c. | 4,944.55 | 363.73 |
| 32 | Manufacture of radio, television and communication equipment and apparatus | 2,274.80 | 23.18 |
| 3210 | Manufacture of electronic valves and tubes and other electronic components | 1,230.63 | |
| 3220 | Manufacture of television and radio transmitters and apparatus for line telephony and line tele | 35,851.08 | 287.15 |
| 3230 | Manufacture of television and radio receivers, sound or video recording or reproducing appara | 10,761.55 | 341.22 |
| 3311 | Manufacture of medical and surgical equipment and orthopaedic appliances | 19,216.13 | 811.19 |
| 3312 | Manufacture of instruments and appliances for measuring, checking, and testing, except indus | 3,317.22 | 89.88 |
| 3313 | Manufacture of industrial process control equipment | 3,706.46 | 31.45 |
| 3320 | Manufacture of optical instruments and photographic equipment | 3,535.89 | 87.65 |
| 3330 | Manufacture of watches and clocks | 1,441.59 | 26.42 |
| 3410 | Manufacture of motor vehicles | 96,870.44 | 109.35 |
| 3420 | Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailer | 530.31 | 437.7 |
| 3430 | Manufacture of parts and accessories for motor vehicles and their engines | 60,232.60 | 3,061.72 |
| 3520 | Manufacture of railway and tramway locomotives and rolling stock | 1.99 | |
| 3591 | Manufacture of motorcycles | 350.04 | 17.36 |
| 3592 | Manufacture of bicycles and invalid carriages | 746.07 | 2.61 |
| 3599 | Manufacture of other transport equipment n.e.c. | 28.97 | |
| 3610 | Manufacture of furniture | 14,773.70 | 24,340.71 |
| 3691 | Manufacture of jewellery and related articles | 389.6 | 2,168.86 |
| 3692 | Manufacture of musical instruments | 626.92 | 27.07 |
| 3693 | Manufacture of sports goods | 1,550.68 | 409.33 |
| 3694 | Manufacture of games and toys | 3,030.58 | 406.02 |
| 3699 | Other manufacturing n.e.c. | 7,836.01 | 703.37 |
| 4010 | Production, collection and distribution of electricity | 191,955.45 | |
| 9214 | Dramatic arts, music and other arts activities | 5.84 | |
| Total | | 2,430,096.60 | 313,929.17 |

Source: Palestinian Central Bureau of Statistics 2008, (Unpublished data).

Note: PCBS advises to use the numbers cautiously as they are based on various statistical data sources and the different mechanism adopted by each data source.

## Table C-12 Sample of Calculation Sheet of Economic Effects (ISIC Code: 15 Manufacture of Food and Beverages)

### Direct Effects

| | RAW Data*a (US$ 1,000) | RAW Data (% to Output) | Direct Effect (US$) | |
|---|---|---|---|---|
| Output | 332,148.8 | 100.00% | 8,576,008.3 | |
| Intermediate Consumption | 245,031.9 | 73.77% | 6,326,669.2 | |
| Raw materials | 185,712.1 | 55.91% | 4,795,045.2 | ---> |
| Fuel and Oil | 13,427.4 | 4.04% | 346,692.5 | ---> |
| Electricity | 6,501.3 | 1.96% | 167,862.1 | ---> |
| Water | 917.7 | 0.28% | 23,694.8 | ---> |
| Packing and Wrapping Material | 25,668.0 | 7.73% | 662,742.1 | ---> |
| Other Inputs* | 3,743.4 | 1.13% | 96,653.8 | ---> |
| Machines Maintenance | 742.9 | 0.22% | 19,181.5 | ---> |
| Advertising | 353.6 | 0.11% | 9,129.9 | ---> |
| Transport | 2,845.5 | 0.86% | 73,470.2 | ---> |
| Telecommunication | 902.2 | 0.27% | 23,294.6 | ---> |
| Rent of Building | 2,555.5 | 0.77% | 65,982.4 | ---> |
| Other Service Expenditures | 1,662.3 | 0.50% | 42,920.2 | ---> |
| Gross Value Added | 87,116.9 | 26.23% | 2,249,339.0 | |
| Compensation of Employees | 25,295.9 | 7.62% | 653,134.5 | |
| Depreciation of Fixed Assets | 25,233.7 | 7.60% | 651,528.5 | |
| Taxes and Fees | 9,098.4 | 2.74% | 193,209.6 | |
| Customs Duties | 434.7 | 0.13% | 11,223.9 | |
| Value Added Tax | 3,323.8 | 1.00% | 85,819.8 | |
| Corporate Tax | 4,851.0 | 1.46% | 83,542.7 | |
| Ent. Licensing Fees | 144.8 | 0.04% | 3,738.7 | |
| Vehicle Licensing Fees | 232.6 | 0.07% | 6,005.7 | |
| Stamp Fees | 1.0 | 0.00% | 25.8 | |
| Building Taxes | 93.4 | 0.03% | 2,411.6 | |
| Other Taxes and Fees | 17.1 | 0.01% | 441.5 | |
| Operating Surplus | 27,488.9 | 8.28% | 709,757.7 | |
| Output | 332,149.0 | 100.00% | 8,576,013.4 | |
| Production of Industry | 328,590.2 | 98.93% | 8,484,126.0 | |
| Exports Sales | 2,873.0 | 0.86% | 74,180.2 | |
| Local sales | 324,009.6 | 97.55% | 8,365,855.9 | |
| Change in stocks | 1,707.6 | 0.51% | 44,089.9 | |
| Service Activities | 2,075.1 | 0.62% | 53,578.6 | |
| Trade Margin | 1,483.7 | 0.45% | 38,308.8 | |
| Number of Persons Engaged | 7,746.0 | | 200 | |

| | Total Floor Area (ha) | No. of Employees per Floor Area*1 |
|---|---|---|
| | 1.0 | 200.0 |

*1: Quoted from: F/S JIE, Sep 1998

*2: Palestinial Food Processing Industries Sector Survey 2005, Table 69

### Primarly Inducement Effects

| Affected Sector | Self Sufficiency Ratio | Induced Production | Induecd Per-chase for Trade | Trade Margin Ratio | Induced Trade Margin | Added Value Ratio | Induced Added Value | Labor Productivity*a | Induced Employment | Compensation to Output Ratio*a | Worker's Compensation | Taxes to Output Ratio*a | Fees and Taxes less Subsidies |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primarly Inducement Effects Total | | | | | | | 3,422,138.7 | | 211 | | 126,033.2 | | 45,625.1 |
| Internal Trade Sector Average | 100.00% | | 8,365,855.9 | 32.33% | 2,704,803.0 | 76.30% | 2,063,639.6 | 54,517.1 | 17 | 1.25% | 16,892.6 | 0.67% | 9,094.4 |
| 01 Agricultural | 34.85% | 1,671,200.4 | | | | 55.59% | 929,079.0 | 9,928.6 | 168 | 1.53% | 25,644.2 | 0.72% | 11,974.9 |
| 51 Wholesale trade & commission tra | 100.00% | | 346,692.5 | 35.99% | 124,770.6 | 84.90% | 105,934.4 | 91,571.9 | 1 | 3.15% | 3,925.3 | 3.63% | 4,533.8 |
| 40 Electricity | 23.73% | 39,840.1 | | | | 83.51% | 33,271.4 | 92,426.6 | 0 | 4.96% | 1,974.3 | 0.03% | 12.9 |
| 41 Collection & Distribution of Water | 100.00% | 23,694.8 | | | | 67.63% | 16,025.4 | 24,528.7 | 1 | 14.48% | 3,431.3 | 0.49% | 116.5 |
| 21~25 Pakking and Wrapping Sector | 49.52% | 328,166.2 | | | | 27.05% | 88,758.9 | 52,973.8 | 6 | 9.10% | 29,853.7 | 1.91% | 6,255.2 |
| 14~41 Industrial Sector Average | 49.15% | 47,509.3 | | | | 42.43% | 20,159.9 | 18,343.2 | 3 | 9.29% | 4,413.7 | 2.24% | 1,062.5 |
| 52 Repair of Personal Goods | 100.00% | 19,181.5 | | | | 72.46% | 13,898.2 | 6,944.2 | 3 | 12.22% | 2,343.3 | 4.19% | 804.7 |
| 55~93 Service Activities Ave. | 98.96% | 9,035.3 | | | | 73.89% | 6,675.9 | 10,905.1 | 1 | 21.14% | 1,909.8 | 5.33% | 482.0 |
| 60, 63 Transport Sector Average | 100.00% | 73,470.2 | | | | 60.67% | 44,574.4 | 13,874.1 | 5 | 21.33% | 15,673.7 | 4.17% | 3,066.8 |
| 64 Telecomunication | 100.00% | 23,294.6 | | | | 80.77% | 18,814.9 | 88,414.2 | 0 | 19.74% | 4,598.7 | 10.11% | 2,355.7 |
| 70 Real Esatte | 100.00% | 65,982.4 | | | | 90.60% | 59,782.5 | 41,599.1 | 2 | 9.69% | 6,394.5 | 5.46% | 3,599.7 |
| 55, 70~90 Service Sector Avearge | 98.96% | 42,475.7 | | | | 50.67% | 21,524.2 | 10,905.1 | 4 | 21.14% | 8,978.1 | 5.33% | 2,266.0 |

*a These value for Wholesale Trade Sectors are ratio to not "output" but to "purchase for trade"

### Economic Effect

| Items | Direct Effect | Primary Ripple Effect | Secondary Ripple Effect | Total Effect |
|---|---|---|---|---|
| a) Induced Output | 8,576,008 | 2,343,851 | 374,037 | 11,293,896 |
| b) Induced Added Value | 2,249,339 | 3,422,139 | 118,484 | 5,789,962 |
| c) Tax Earning of Govt. | 193,210 | 45,625 | 5,975 | 244,809 |
| d) Total Workers Compensation | 653,135 | 126,033 | 27,365 | 806,532 |
| e) Foreign Currency Earn/Saving | 2,071,870 | 0 | 0 | 2,071,870 |
| f) Employment | 200 | 211 | 11 | 422 |

Note: Assumed all the tenant companies are not relocation

### Composition of Raw Materials and their Self-sufficiency Ratio by Major Commodity

| | Consumption (g/person/day) | Production (g/person/day) | Self Sufficiency Ratio*1 | Composition of Raw Materials | Weighted Value |
|---|---|---|---|---|---|
| Eggs & Products | 26 | 11 | 42.3% | 5.0% | 2.12% |
| Meat (slaughtered) & Production | 81 | 28 | 34.6% | 28.0% | 9.68% |
| Milk & Products | 150 | 49 | 32.7% | 5.0% | 1.63% |
| Offals Edible | 1 | 1 | 100.0% | | 0.00% |
| Livestocks Total | 258 | 89 | 34.5% | 38.0% | 35.3% |
| Cereals & Production excl beer | 390 | 18 | 4.6% | 8.0% | 0.37% |
| Fruits & Production (excl. wine) | 255 | 64 | 25.1% | 10.0% | 2.51% |
| Oilcrops (excl. Production) | 5 | 31 | 100.0% | 5.0% | 5.00% |
| Pulses & Products | 6 | 2 | 33.3% | | 0.00% |
| Spices | 106 | 1 | 0.9% | 3.0% | 0.03% |
| Starchy Roots & Products | 45 | 19 | 42.2% | 2.0% | 0.84% |
| Sugar & Sweeteners | 91 | 0 | 0.0% | 3.0% | 0.00% |
| Treenuts & Products | 4 | 1 | 25.0% | | 0.00% |
| Vegetable Oils & Production | 29 | 7 | 24.1% | 1.0% | 0.24% |
| Vegetables & Products | 403 | 167 | 41.4% | 30.0% | 12.43% |
| Plants Total | 1334 | 310 | 23.2% | 62.0% | 34.6% |
| Agricultural Products Total | 1592 | 399 | 25.1% | 100.0% | 34.9% |

*1 Source: Calculated by the JICA Study Team using the data of FAO Statistics Division Food Consumption and Food Production in Palestine during 2001 a

### Secondary Inducement Effects

*a: Source: Economic Survey 2006, PCBS, Unpublished Data

| | RAW Data | | Ratio to Output | | | Related Sector | 2nd Induced Production | Self Sufficiency | Induced Prod. in Palestine | Added Value Ratio | Trade Margine Ratio | Added Value | Labor Productivity | Induced Employment | Taxes to Output Ratio | Fees and Taxes | Compensation to Output Rat. | Worker's Compensation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Plants | Livestock | Plants | Livestock | Weighted Avearge | | | | | | | | | | | | | |
| Secondary Inducement Effect Total | | | | | | | 684,656.8 | | 374,037.3 | | | 118,484.3 | | 11 | | 5,974.5 | | 27,364.5 |
| Indued Output | 600,554.0 | 464,054.0 | 100.00% | 100.00% | 100.00% | | 1,671,200.4 | | | | | | | | | | | |
| Intermediate Consumption | 132,803.0 | 374,860.0 | 22.11% | 80.78% | 40.97% | | 684,656.8 | | | | | | | | | | | |
| Seeds | 17,245.0 | 0.0 | 2.87% | 0.00% | 1.95% | 01 Agriculture (Plants) | 32,565.8 | 41.44% | 13,495.0 | 77.89% | | 10,510.8 | 9,928.64 | 1 | 0.72% | 96.7 | 1.53% | 207.1 |
| Fertilizers | 36,595.0 | 0.0 | 6.09% | 0.00% | 4.14% | 15 Manufacture of Food and Beverag | 69,106.6 | 57.69% | 39,864.7 | 26.23% | | 10,455.8 | 42,880.0 | 1 | 1.28% | 509.8 | 7.62% | 3,036.0 |
| Pesticides | 26,823.0 | 0.0 | 4.47% | 0.00% | 3.03% | 24 Manufacture of Chemicals & its Pr | 50,653.0 | 24.86% | 12,593.0 | 47.20% | | 5,944.1 | 39,695.5 | 0 | 4.85% | 611.1 | 14.59% | 1,837.7 |
| Electricity | 2,008.1 | 700.7 | 0.33% | 0.15% | 0.28% | 40 Electricity | 4,603.1 | 23.73% | 1,092.5 | 83.51% | | 912.4 | 92,426.6 | 0 | 0.03% | 0.4 | 4.96% | 54.1 |
| Water | 18,072.9 | 6,306.3 | 3.01% | 1.36% | 2.48% | 41 Water | 41,428.2 | 100.00% | 41,428.2 | 67.63% | | 28,019.0 | 24,528.7 | 2 | 0.49% | 203.6 | 14.48% | 5,999.4 |
| Malsh | 3,079.0 | 0.0 | 0.51% | 0.00% | 0.35% | 25 Manufacture of Rubber and Plastic | 5,814.4 | 86.37% | 5,021.9 | 18.82% | | 945.0 | 52,973.8 | 0 | 1.76% | 88.6 | 7.17% | 359.8 |
| Oil, Lubricant & Other Fuel | 8,892.0 | 307.0 | 1.48% | 0.07% | 1.03% | Internal Trade Sector Average | 17,147.1 | 100.00% | 17,147.1 | 76.30% | 32.33% | 5,543.9 | 9,186.0 | 2 | 5.99% | 1,026.5 | 11.12% | 1,906.7 |
| Maintenance & Repair | 3,099.0 | 8,835.0 | 0.52% | 1.90% | 0.96% | 52 Repair of Personal Goods | 16,078.0 | 100.00% | 16,078.0 | 72.46% | | 11,649.5 | 6,944.2 | 2 | 4.19% | 674.5 | 12.22% | 1,964.1 |
| Feeds | 0.0 | 291,654.0 | 0.00% | 62.85% | 20.20% | 1533 Manufacture of Animal Feed | 337,565.3 | 57.69% | 194,727.1 | 16.41% | | 31,954.3 | 213,998.2 | 1 | 1.10% | 2,146.4 | 4.80% | 9,345.7 |
| Veterinary Medicine | 0.0 | 37,102.0 | 0.00% | 8.00% | 2.57% | 33 Manufacture of medical, optical eq | 42,942.5 | 2.72% | 1,167.4 | 64.52% | | 753.2 | 8,993.0 | 0 | 1.29% | 15.1 | 21.27% | 248.3 |
| Purchased Chicks | 0.0 | 16,552.0 | 0.00% | 3.57% | 1.15% | 01 Agricultural (Live Stocks) | 19,157.6 | 34.57% | 6,622.4 | 19.22% | | 1,272.9 | 9,928.6 | 1 | 0.72% | 47.5 | 1.53% | 101.6 |
| Others | 16,989.0 | 13,403.0 | 2.83% | 2.89% | 2.85% | Industrial Sector Average | 47,595.2 | 52.11% | 24,800.0 | 42.43% | | 10,523.6 | 31,156.2 | 1 | 2.24% | 554.6 | 9.29% | 2,304.0 |

*Assumed as Water : Electricity= 9 : 1

**Table C-13 Comparison of Economic Ripple Effects by Candidate Incoming Tenant Industries (per US$ 1 million of Value of Output)**

| | 15 | 1511 | 1513 | 1520 | 1531 | 1533 | 1541 | 1543 | 1544 | 1551 | 1554 | 2423 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Manufacture of Food Products & Beverages | Processing & preserving of meat & meat products | Processing & Preserving of Fruit & Vegetables | Manufacture of Dairy Products | Manufacture of Grain Mill Products | Manufacture of Prepared Animal Feeds | Manufacture of Bakery Products | Manufacture of Chocolate & Sugar Confectionery | Manufacture of Pasta, Noodles, & Similar Products | Distilling & Blending of Alcohol | Manufacture of Soft Drinks; Production of Mineral Waters | Manufacture of Pharmaceuticals, Medicinal Products | Manufacture of Chemicals & its Products |
| Value of Production (US$) | 1,000,000.0 | 1,000,000.0 | 1,000,000.0 | 1,000,000.0 | 1,000,000.0 | 1,000,000.0 | 1,000,000.0 | 1,000,000.0 | 1,000,000.0 | 1,000,000.0 | 1,000,000.0 | 1,000,000.0 | 1,000,000.0 |
| Added Value (US$) | 682,446.5 | 568,722.7 | 651,339.2 | 593,271.0 | 432,818.3 | 494,220.3 | 744,632.0 | 672,535.7 | 608,924.2 | 794,225.8 | 607,285.3 | 833,026.9 | 735,371.9 |
| In Industrial Park | 265,123.2 | 199,171.0 | 205,075.8 | 221,602.9 | 115,093.5 | 164,363.4 | 371,542.1 | 305,052.2 | 233,414.0 | 528,534.5 | 277,052.0 | 573,866.9 | 473,424.7 |
| Induced Added Value | 417,323.2 | 369,551.7 | 446,263.4 | 371,668.1 | 317,724.8 | 329,857.0 | 373,089.9 | 367,483.4 | 375,510.2 | 265,691.3 | 330,233.3 | 259,160.0 | 261,947.2 |
| Agriculturural Sector (incl. | 110,896.8 | 72,676.2 | 131,166.0 | 50,281.2 | 39,472.0 | 62,228.8 | 44,727.2 | 62,531.2 | 60,589.6 | 16,068.8 | 43,793.4 | 0.0 | 0.0 |
| Internal Trade & Transportation Sector | 256,375.0 | 249,486.2 | 259,730.2 | 260,222.3 | 250,656.8 | 248,428.1 | 288,579.4 | 261,629.6 | 262,035.7 | 167,330.4 | 211,702.9 | 205,584.9 | 206,667.3 |
| Other Sectors | 50,051.4 | 47,389.3 | 55,367.1 | 61,164.5 | 27,596.0 | 19,200.1 | 39,783.3 | 43,322.7 | 52,884.9 | 82,292.1 | 74,737.0 | 53,575.1 | 55,279.9 |
| Employment (no. of employees) | 50 | 45 | 60 | 57 | 20 | 21 | 59 | 97 | 41 | 36 | 48 | 33 | 35 |
| In Industrial Park | 24 | 12 | 29 | 29 | 6 | 5 | 42 | 76 | 20 | 22 | 30 | 23 | 25 |
| Induced Employment | 26 | 33 | 31 | 27 | 14 | 17 | 16 | 21 | 22 | 15 | 18 | 10 | 10 |
| Agriculturural Sector (incl. | 20 | 23 | 19 | 16 | 5 | 8 | 8 | 12 | 10 | 2 | 7 | 0 | 0 |
| Internal Trade & Transportation Sector | 3 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 5 | 5 | 6 |
| Other Sectors | 3 | 3 | 5 | 4 | 1 | 1 | 2 | 3 | 4 | 7 | 5 | 5 | 4 |
| Total Workers Compensation (US$) | 95,063.7 | 94,900.5 | 119,626.9 | 114,744.4 | 49,186.5 | 61,242.2 | 140,829.2 | 174,677.1 | 159,166.8 | 123,321.1 | 124,436.4 | 210,764.6 | 167,350.8 |
| Workers Compensation within Industrial Park | 76,983.1 | 73,459.2 | 94,682.5 | 89,324.3 | 34,621.5 | 48,071.6 | 124,669.2 | 155,510.6 | 137,994.0 | 94,954.6 | 96,294.5 | 190,599.5 | 146,363.7 |
| Induced Workers Compensation outside Ind.P | 18,080.6 | 21,441.3 | 24,944.4 | 25,420.0 | 14,564.9 | 13,170.7 | 16,160.1 | 19,166.5 | 21,172.9 | 28,366.5 | 28,141.9 | 20,165.2 | 20,987.0 |
| Agricultural Workers (incl. Operating Surplus) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other Sectors Workers | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Contribution for Reducing Trade Deficit (US$) | 244,205.4 | 132,666.2 | 200,167.9 | 173,068.2 | 113,267.0 | 257,974.9 | 17,208.7 | 325,816.0 | 166,858.1 | 718,104.4 | 315,366.0 | 440,233.3 | 387,257.6 |
| Forex Earning fromExport of Products | 8,743.4 | 0.0 | 3,314.6 | 0.0 | 1,026.3 | 0.0 | 0.0 | 0.0 | 0.0 | 408,322.8 | 9,560.7 | 143,951.5 | 158,570.5 |
| Forex Saving by Import Substitute | 603,660.8 | 597,084.3 | 576,575.9 | 541,352.0 | 857,719.8 | 967,757.0 | 342,050.0 | 743,966.7 | 628,778.4 | 448,572.8 | 543,521.6 | 520,500.2 | 561,526.8 |
| Forex Losing by Importt of Raw Material | -368,198.8 | -464,418.2 | -379,722.6 | -368,283.8 | -745,479.1 | -709,782.1 | -324,841.2 | -418,150.8 | -461,920.3 | -138,791.3 | -237,716.4 | -224,218.5 | -332,839.7 |
| Tax Earning of Govt (US$) | 28,855.0 | 31,853.9 | 44,058.2 | 23,997.1 | 11,582.5 | 23,437.3 | 34,911.0 | 31,838.5 | 30,878.4 | 276,711.7 | 30,154.5 | 69,303.5 | 71,578.0 |
| Tax Earning within Industrial Park | 22,773.1 | 23,863.5 | 35,301.5 | 15,380.3 | 6,213.8 | 18,259.2 | 26,963.1 | 24,531.5 | 23,170.8 | 267,763.9 | 21,932.2 | 62,614.2 | 64,640.4 |
| Custom Duties | 1,322.9 | 0.0 | 479.9 | 578.9 | 123.3 | 221.7 | 166.8 | 0.0 | 0.0 | 192,374.8 | 552.7 | 13,846.1 | 8,569.0 |
| Value Added Taxes | 10,115.3 | 12,179.1 | 23,495.1 | 9,996.4 | 3,540.4 | 10,212.9 | 3,353.1 | 10,125.8 | 15,026.1 | 56,046.7 | 6,453.5 | 36,114.5 | 37,282.6 |
| Corporate Taxes | 9,846.9 | 10,487.8 | 5,621.6 | 2,781.9 | 2,129.7 | 7,219.0 | 21,587.4 | 11,634.5 | 6,786.4 | 17,478.2 | 13,551.6 | 8,983.1 | 15,972.2 |
| Other Taxes and Fees | 1,487.9 | 1,196.5 | 5,704.9 | 2,023.1 | 420.3 | 605.6 | 1,855.7 | 2,771.3 | 1,358.3 | 1,864.2 | 1,374.4 | 3,670.6 | 2,816.6 |
| Induced Tax Earning from Outside of Ind.Park | 6,081.9 | 7,990.5 | 8,756.8 | 8,616.7 | 5,368.8 | 5,178.1 | 7,948.0 | 7,307.0 | 7,707.7 | 8,947.9 | 8,222.3 | 6,689.3 | 6,937.6 |
| Vulnerability to Fractuation of Exchange Rate | | | | | | | | | | | | | |
| ref. Self-Sufficiency Ratio of Raw Material | 34.85% | 32.87% | 33.44% | 30.33% | 6.39% | 10.36% | 18.70% | 21.71% | 18.12% | 12.81% | 22.35% | 5.00% | 5.00% |
| ref. Share of Import Products | 39.00% | 26.00% | 31.00% | 28.00% | 42.00% | 89.00% | 3.00% | 56.00% | 31.00% | 75.00% | 55.00% | 52.50% | 52.50% |

Source: JICA Study Team

# Annex D

# Brief Information on Investment to Palestine

D.1 Basic Information

D.2 Economic Overview

D.3 Business Operating Environment

D.4 Investment

D.5 Industrial Estates (IE) and Industrial Free Zones (FZ) Agro-industrial Park

D.6 Private Sector

D.7 Other Information Expatriates

# BRIEF INFORMATION ON INVESTMENT TO PALESTINE

OCTOBER 2008

THE PALESTINIAN INVESTMENT PROMOTION AGENCY

Note:

1. English translation of the provisions of laws and regulations quoted herein is unofficial and any provision of the laws and regulations quoted herein shall be finally interpreted based on the official Arabic versions.
2. Although the Palestinian Investment Promotion Agency is responsible for all the contents and descriptions contained herein, no decision shall be made basing only on the information provided in this publication alone. The Palestinian Investment Promotion Agency does not accept any responsibility for any such decision.

# *Map of Palestine*

# *Table of Contents*

# *Abbreviation*

| | |
|---|---|
| ASTAP | Administrative Services for Tourism Agencies in Palestine |
| BAP | Banks Association of Palestine |
| EFTA | European Free Trade Association |
| EQA | The Environment Quality Authority |
| FPCCIA | Federation of Palestine Chambers of Commerce, Industry and Agriculture |
| FZ | Industrial Free Zones |
| GDP | Gross Domestic Product |
| GIZ | Gaza Industrial Estate |
| GS | The GAZA Strip |
| IAS | International Accounting Standards |
| IE | Industrial Estates |
| IEC | Israeli Electricity Company |
| IFRS | International Financial Reporting Standards |
| IPR | Intellectual Property Rights |
| ITL | Income Tax Law |
| JDEC | Jerusalem District Electric Company |
| Mcm | million cubic meters |
| MoNE | Ministry of National Economy |
| NIS | New Israeli Shekel |
| PalTrade | Palestine Trade Center |
| PBA | Palestine Businessmen Association |
| PCBS | The Palestinian Central Bureau of Statistics |
| PCU | Palestine Contractors Union |
| PENRA | The Palestine Energy and Natural Resources Authority |
| PFI | Palestine Federation of Industries |
| PIEDCO | Palestine Industrial and Management Company |
| PIEFZA | Palestinian Industrial Estates and Free Zones Authority |
| PIF | Palestine Insurance Federation |
| PIPA | The Palestine Investment Promotion Agency |
| PITA | Palestine Information Technology Association |
| PLC | The Palestinian Legislative Council |
| PMA | The Palestinian Monetary Authority |
| PNA | The Palestine National Authority |
| PPSCC | Palestine Private Sector Coordinating Council |
| PSC | Palestine Shippers Council |
| PSI | Palestinian Standard Institute |
| R&D | Research and Development |
| VAT | Value Added Tax |
| WBGS | The West Bank and the GAZA Strip |
| WB | The West Bank |

# 1. BASIC INFORMATION

## 1.1 Geography and Climate

### 1.1.1 Geography

- Palestine lies on the western edge of the Asian continent and on the eastern edge of the Mediterranean Sea. It is comprised of two land areas, namely, the West Bank and the Gaza Strip (WBGS).
- Total space: 6,020 ㎢ (West Bank: 5,655 ㎢, Gaza Strip: 365 ㎢)
- Agricultural Land: 24.6% (2006), Forest and Wooded: 1.5% (2005), Palestine Build-up Land: 9.7% (2000)
- Jordan River Valley: Fertile plain
- Eastern Slopes: Rocky and semi-arid
- Central Highlands: From Elevation +1,000 m highland to the semi-coastal zone
- Gaza Strip: Coastal plain and sand dunes

### 1.1.2 Climate

- Mediterranean climate with hot and dry summers and wet and mild winters

## 1.2 Political Climate

- Government: Republic
- The Israelis and Palestinians signed the *Oslo Accords* in 1993. In essence, the Accords affirm the Palestinian right to self-government within the West Bank (WB) and the Gaza Strip (GS) through the creation of the Palestinian Authority (PA).
- In the *Paris Protocol* signed in 1994, the PA was defined as a separate customs territory.
- According to the Palestinian "Basic Law", which was signed by Yasser Arafat in 2002, the current structure of the PA is based on three separate branches of power: executive, legislative, and judiciary.
- The president of the PA is directly elected by the people. In an amendment to the Basic Law approved in 2003, the president appoints a "prime minister" who is also the chief of the National Security Services. The prime minister chooses a cabinet of ministers and runs the government, reporting directly to the president.
- The Palestinian Legislative Council (PLC) is an elected body of 132 representatives and acts as a parliament. The PLC must approve all government cabinet positions proposed by the prime minister, and must also confirm the prime minister himself upon nomination by the president.
- Mahmoud Abbas won the presidency on 9 January 2005 with 62% of the vote.
- Salam Fayad took office as prime minister on 15 June 2007.

## 1.3 Legal and Judicial System

### 1.3.1 Legal System

- There still exists a patchwork of Ottoman, British, Jordanian and Egyptian laws in operation.
- The first decree of the President of the PA, issued on 20 May 1994, declared that the legislation and laws that were effective prior to 5 June 1967 in the WBGS should continue to be valid.
- In the past 14 years, the PA has made continuous efforts to unify the system, particularly the laws pertaining to economy and judicial system.

### 1.3.2 Judicial System

- The PLC issued a package of laws on the Palestine judicial system, of which the most important were the Judicial Authority Act and the Penal Procedures Law.
- The Constitutional Court was established under the Constitutional Court Law which was issued in 2006. The Court judges the constitutionality of laws, regulations and the interpretation of the Basic Law provisions and other laws in the event of conflict on the rights, duties and functions of the three authorities (legislative, executive and judicial).
- In 2006, there were 37 courts in the WBGS, which consist of the following:
  - 20 Magistrate's Courts (14 in the WB and six in the GS)
  - 11 Courts of First Instance (eight in the WB and three in the GS)
  - 3 Courts of Appeal (one each in Jerusalem, Ramallah and Gaza)
- There are higher courts such as the High Court of Justice and the Courts of Appeals and Cassation. In addition, there are two Courts of Appeal for Income Tax, one each in the WB and GS.
- In 2006, there were 140 judges at the regular courts, 93 in the WB and 47 in the GS.

## 1.4 Social Climate

### 1.4.1 Population

(The following data are sourced from the PCBS statistics)

- Total population (Projection at December 1, 2007): 3,761,646
- Population by area: WB: 2,345,107; GS: 1,416,539
- Population by sex: Male: 1,908,432; Female: 1,853,214
- Population increase rate: 3.3% (2006)
- Population Structure by Age

**Population Structure by Age**

| Age Range | 2006 | 2003 |
|---|---|---|
| 0-14 years old | 45.5% | 46.1% |
| 16-65 years old | 51.5% | 50.8% |
| Over 65 years old: | 3.0% | 3.1% |

- Life Expectancy at Birth

**Life Expectancy at Birth**

| Gender | 2006 | 2003 |
|---|---|---|
| Male | 71.7 years old | 70.7 years old |
| Female | 73.2 years old | 73.8 years old |

### 1.4.2 Language and Literacy

- Arabic is the official language in Palestine but English is also spoken by many people, especially by those who are educated.
- Illiteracy Rate

**Illiteracy Rate by Age Group**

| Age Range | 2007 | 2003 |
|---|---|---|
| 15 years old and over | 7.6% | 8.1% |
| Between 15-29 years old | 6.5% (2006) | n.a. |

Source: PCBS

### 1.4.3 Living Standard

**Indicators showing Living Standards**

Unit: % of household

| Indicator | 2006 | 2003 |
|---|---|---|
| Telephone Line | 47.2 | 44.72 |
| Washing Machine | 89.9 | 87.5 |
| Refrigerator | 92.3 | 91.6 |
| Car | 18.2 | 22.7 |
| Household below Poverty Line | 49.3 | 59.8. |
| Individuals below Poverty Line (Persons) | 2,208,550 | N.A |
| Cesspit | 54.0 | 55.2 |
| Sewage Network | 45.3 | 43.6 |

Source: PCBS

### 1.4.4 Education

**Indicators on Education**

| Indicator | 2006 | 2003 |
|---|---|---|
| Students of Basic Stage (Enrolment Ratio) | 954,877 (85.4%) | 916,837 (91.3%) |
| Students of Secondary Stage (ditto) | 130,397 (64.0%) | 100,606 (54.5%) |
| Repetition Rates | 1.5% | 1.4% |
| Drop-Out Rates | 0.8% | 0.9% |
| Students at Community Colleges | 11,135 (2005) | 8,511 |
| Students at Universities | 139,138 (2005) | 113,417 |
| % of Graduates of High Education & Vocational Training among 15 yrs old and over (end 2005) | 14.5% | N.A |

Source: PCBS

### 1.4.5 Labor Force

**Labor Situation**

| Indicator | 2006 | 2003 |
|---|---|---|
| Percentage of Employment | 68.5% | 68.2% |
| Unemployment Rate | 23.6% | 25.6% |
| Average Weekly Working Hours | 41.7 hours | 42.1 hours |
| Average Monthly Working Days | 23.1 days | 23.0 days |
| Average Daily Wage | NIS 83.3 | NIS 74.0 |
| Mean Daily Wage | NIS 73.1 | NIS 60.0 |

Source: PCBS

### 1.4.6 Currency

- Palestine does not have its own currency. It uses the Israeli currency (New Israeli Shekel: NIS) for daily exchanges.
- Exchange rate: Around NIS 3.5 /USD 1(as of October 2008)
- USD, Jordanian Dinars (JD) and Euros are also widely used for savings and commercial exchanges.
- Salaries (especially in private sectors) are often quoted in USD.

# 2. ECONOMIC OVERVIEW

## 2.1 Economic Situation

### 2.1.1 GDP

| Indicator | 2007 | 2003 |
|---|---|---|
| GDP (million USD) | 4,133.4 | 4,165.3 |
| GDP per capita (USD) at constant prices | 1,177.4 | 1,272.3 |

Source: PCBS

- GDP decreased by 2.1% in the 1st quarter of 2008 while GDP per capita by 7.4% over the last quarter of 2007

### 2.1.2 GDP by Economic Activities

Million USD

| Economic Activity | 2006 | 2003 |
|---|---|---|
| Financial Intermediaries | 186.7 | 139.6 |
| Industrial Activities | 531.1 | 489.7 |
| Services Activities | 940.2 | 975.5 |
| Internal Trade | 382.7 | 378.6 |
| Construction | 104.0 | 145.2 |
| Transport, Storage and Communications | 466.0 | 378.5 |
| Agriculture and Fishing | 334.0 | 422.1 |
| Public Administration and Defense | 552.7 | 647.6 |
| Household with Employed Persons | 8.7 | 8.7 |

Source: PCBS

### 2.1.3 Prices

| Indicator | 2006 | 2003 |
|---|---|---|
| Consumer Price Index (CPI) | 152.31 | 137.7 |
| Inflation Rate of Consumer Price | 3.76% | 4.4% |

Source: PCBS

### 2.1.4 Doing Business

- The World Bank's Report "*Doing Business"* presents quantitative indicators on business regulations and the protection of property rights that can be compared across 178 economies. A high ranking on the ease of doing business index means the regulatory environment is conducive to the operation of business.
- In "*Doing Business 2008*", Palestine (WBGS) was placed at 117th among 178 countries in the "*rankings on the ease of doing business*".

- Although Palestine's rank is lower than that of the United Arab Emirates (67th), Jordan (80th) and Lebanon (85th), it ranked higher than India (120th), Brazil (122nd), Indonesia (123rd), Egypt (126th) and Syria (137th).
- Among the ten criteria of "Doing Business Indicators", Palestine got higher rank in the field of "Paying taxes (22nd)" and "Protecting investors (33rd )", while it was pointed out that the cost for starting business and minimum capital are relatively high in comparison with the "income per capita". "Dealing with license (132nd)" is another obstacle for local businesses, in terms of the cost required to obtain licenses (the cost versus income per capita).

## 2.2 Situation of Major Economic Sectors in 2005

### 2.2.1 Industrial Sector

(*Palestine in Figures 2005*, PCBS, May 2006)

1) Manufacturing and mining

- General: Contributing to 12% of GDP and 12.4% of total employment with 14,000 firms and 60,000 employees
- Quarrying and stones
  - Concentrated near Hebron
  - Exporting to Israel, Jordan, Arab countries, international markets
  - Reaching 40% of industrial exports
  - More than USD300 million output
  - More than 11,000 employees
- Textiles and garments
  - Contributing 15% of manufacturing outputs
  - 70% sold to local market and 20% to Israel
  - More than 12,000 employees
- Food processing and beverage
  - Increased rapidly in the latter half of 1990s
  - Occupying 30% of local market
  - More than USD250 million output
  - More than 8,000 employees
- Metal products and engineering
  - Satisfying 60 – 70% of local demands
  - More than USD 100 million output (including rubber, plastic and furniture)
  - More than 6,000 employees (including rubber, plastic and furniture)
- Ten major paint companies, Nablus soap, and six major pharmaceutical companies

### 2.2.2 Agriculture, Livestock and Fishing Sector

**Major Indicators in Agriculture**

Unit: 1,000 hectare

| Indicator | 2006 | 2003 |
|---|---|---|
| Area of Cultivated Land | 183.3 (2005) | 181.5 |
| Permanent Crops | 114.8 | 115.8 |
| Temporary Crops | 68.6 | 65.7 |

Source: PCBS

- Agriculture and fishing produced 7% of the GDP
- Output: More than USD 900 million
- Value added: More than USD 400 million
- Employment: 16% of the total employment in 2006 (including hunting and fishing)
- Exports include fruits, olives, olive oil, vegetables, cut flowers
- Olive cultivation is a backbone of the WB agriculture (50% of cultivated land)
- Olive production: 15% of agricultural outputs, 20% of exports
- Major shifts to cultivation of vegetables in last two decades
- Livestock and fishing: Accounting for half of the agricultural outputs in the WB and one third in the GS

### 2.2.3 Construction

- Contributing around 9% to GDP, and 10.1% employment in the WB and 8.8% in the GS

### 2.2.4 Services

- Contributing 60% to GDP

### 2.2.5 Banking Sector

- Twenty two banks in the WBGS with more than 160 branches and USD 5.1 billion in deposits (as of December 2007)
- Low credit penetration rate of 35% (Regional average: 65%)
- High cost for trade finance due to the terms and conditions requested by international corresponding banks

## 2.3 Investment Trend

- Following the enactment of the Law No. 1/1998 on the Encouragement of Investment in Palestine, the Palestine Investment Promotion Agency (PIPA) was established in 1998. It is

an autonomous agency with the mission of creating and maintaining a competitive investment climate by providing high-quality services and incentives to foreign and domestic investors.

- In 2006, projects worth USD15 million were realized under the Law.
- The investments that materialized in the WB during the period between 1998 and 2006 are shown below.

**Investment in the West Bank: 1998-2006**

| Sector | Investment Results |
|---|---|
| Industrial Sector | USD 63 million<br>(Hebron: USD 20 million)<br>(Jericho: USD 13 million) |
| | Stone and marble quarries: 20 factories in Hebron and 10 factories in Bethlehem |
| Tourism Sector | USD 54 million<br>(Bethlehem: USD 32.5 million)<br>(Jericho: USD 7 million) |
| Service Sector | USD 55 million<br>(Ramallah: USD 43 million) |
| Total | ➢ USD 175 million<br>➢ 203 projects |

## 2.4 Trade Performance

- Export of goods such as "Manufactured Goods classified chiefly by material", namely marbles and stone, has been outstanding as exporting goods for the last five years, followed by "Miscellaneous Manufactured goods" and "Food and Live animals".
- Among the imports, "Mineral Fuels, Lubricants and Related Materials", "Manufactured Materials", "Food and Live Animals" and "Machinery and Transport Equipments" are major commodities in recent years.

**Value of Exports and Imports, and Trade Balance**

Million USD

| Trade Indicator | 2006 | 2003 |
|---|---|---|
| Value of Export of Goods | 366.7 | 279.7 |
| Value of Import of Goods | 2,758.7 | 1,800.3 |
| Net Balance of Trade of Goods | -2,392.0 | -1,520.6 |

Source: PCBS

# 3. BUSINESS OPERATING ENVIRONMENT

## 3.1 Company

### 3.1.1 Regulatory Framework for the Company

- "Law 12/1964 on the Companies" applicable in the WB
- "Companies Law of 1929" applicable in the GS

### 3.1.2 Regulatory Body for the Company Registration

- All business entities in Palestine have to be duly registered with the Companies Registrar, which is currently under the Ministry of National Economy (MoNE).

### 3.1.3 Company (Type of Companies)

- Public shareholding company or private shareholding company with limited liability
- Partnership
  - General Partnership: The liability of each partner is limited. All partners are personally responsible for the liabilities of the partnership. The name of at least one of the partners must be indicated in the title of the General Partnership.
  - Limited Partnership: A limited partnership must have at least one general partner who is personally responsible for the liabilities of the company. There must also be at least one limited partner whose liability is limited to the amount of capital invested. The limited partner may not participate in the management of the company.
- Sole proprietorship
- Branch of foreign corporation

## 3.2 Trade

### 3.2.1 Regulatory Framework for Trade

- "Foreign Trade Act" has been drafted and is awaiting for the outcome of the Palestinian - Israeli trade negotiation

### 3.2.2 Import Procedures

- Imported goods shall comply with the health and environment standards set by the Palestinian Standard Institute (PSI).
- It usually takes up to 15 days to obtain the necessary documents for imports in this regards.
- The license will be valid for a period of six months to a year depending on the product.
- The documents required for obtaining import license are as follows:

- Certificate of Incorporation
- Certificate of Foreign Trade Dealings (Obtainable from MoNE)
- Pro-forma Invoice
- Import License for the items on the specified list

### 3.2.3 Export Procedures

- There is no application or license needed for company exporting from Palestine, except for certain categories of goods that need to meet specific standards.
- Exporters must submit a certificate of origin to the MoNE for final approval.
- The MoNE will pre-approve and issue multiple certificates of origin to enterprises that export the same product on regular basis.

### 3.2.4 Current Situation of Trade

- The World Bank's "Doing Business 2008" ranked Palestine as 77$^{th}$ among 178 countries and regions in the world. The trade related indicators in the Report are as follows.

| | | |
|---|---|---|
| Trading across borders (77$^{th}$) | Documents to export (number) | 6 |
| | Time to export (days) | 25 |
| | Cost to export (USD per container) | 830 |
| | Documents to import (number) | 6 |
| | Time to import (days) | 40 |
| | Cost to import (USD per container) | 995 |

### 3.2.5 Taxes on Trade

(a) Customs Duties

- Base: On the cost, insurance and freight (CIF) value of imports
- Rates: From 0 to 340% for food, animal and agriculture products, and from 0 to 22% for all other products

(b) Purchase tax

- Base: CIF value of imports + customs duties + TAMA (a calculation procedure that reflects domestic wholesale price as the basis of valuation)
- Rates: 5-200%

(c) Value added tax

- Base: All imported goods
- Rates: 16%

### 3.2.6 Trade Agreements and Privileges Granted

- Free trade agreement with the USA: The preferential status was given to the WBGS by the US President in April 1995 and, under this arrangement, the duty free treatment is granted to all the Palestinian products entering the USA. The goods must meet the American Rule of Origin for them to be entitled to this privilege.
- The "Interim Agreement on Trade and Cooperation" with the European Union (EU) was signed in 1997. The Agreement grants the reciprocal duty-free treatment to industrial products complying with the EU Rule of Origin. For agricultural items, the EU grants duty-free or reduced tariff treatment on products exported to the EU within specific quotas.
- Four member countries, namely Iceland, Liechtenstein, Norway and Switzerland, of the European Free Trade Association (EFTA) concluded an "Interim Agreement" with the PLO in 1998. The agreement provided duty-free treatment for most of Palestinian and EFTA industrial products, fish and other marine products. The majority of Palestinian and EFTA processed agricultural products are granted reduced tariffs and some benefits from full duty-free treatment.
- Canada signed an "Interim Free Trade Agreement" with the PLO in 1999. The agreement grants tariff elimination on industrial products and tariff reduction or elimination on agricultural products and processed foods, in accordance with established quotas.
- The PNA has also concluded the free trade agreement with Turkey in 2004. The agreements regulating trade relations and cooperation have also been signed with Russia, Saudi Arabia, the United Arab Emirates, Yemen, Morocco, Tunisia, Israel and other Arab states.

### 3.2.7 Incentives, Limitations and Taxation on Exports

- "Rules of Origin": In order to be entitled for the preferential trade treatment under the trade agreements, generally not less than 35-40% of the ex-factory values of products have to be processed in Palestine.

## 3.3 Taxation and Accounting

### 3.3.1 Tax Year

- The tax year is generally the calendar year.

### 3.3.2 Income Tax

#### 1) Income Tax Law

- A unified "Income Tax Act No. 17/2004" came into effect as of January 1, 2005, which is applicable to the income of individuals, companies and some institutions.
- In 2008, some amendments for the simplifications and tax cuts were made into the law under the "Decree Law No. 1/2008".

**Palestinian Income Tax Schedule***

| Yearly Taxable Income (USD) | Rate (%) |
|---|---|
| Individuals | |
| 1-10,000 | 5 |
| 10,001-16,000 | 10 |
| More than 16,000 | 15 |
| Companies | |
| Resident | 15 |
| Non-resident | 16 |

*ITL No.17/2004 and Decree-Law No.1/2008 for amending the ITL No.17/2004

**2) Personal Income Tax**

- Base: Tax is levied on residents and non-residents on a universal basis (including income from work, craft, business, profession or vocation, and accruing as salaries or wages, profits, dividends, rent, and interest) but only on income sourced in Palestine.
- Deductions: The taxable income is calculated after allowing the following deductions:
  - USD 3,000 for the resident tax payer
  - USD 500 for each parent, spouse, and dependent child
  - USD 2,500 for each dependent enrolled in higher education institute, except those with scholarship
  - Maximum of USD 2,000 annually for the rent paid by the tax payer
  - Once-in-a-lifetime deduction of USD 5,000 for buying or building a house.
  - Medical expenses paid by the tax payer or his/her dependents provided that the total does not exceed the income subject to tax.
- Tax exemptions:
  - Capital gains derived from the sale of property are tax exempt provided they are not derived from the principal business activity of the individual.
  - Capital gains derived from the sale of investments in securities are tax exempt provided they are not derived from the active trading and such investments are not the principal business activity of the individual.
- Tax on employment income must be withheld by employer and remitted to the tax authority.

**3) Corporate Income Tax**

- Residence: A corporation is a resident if it is incorporated, managed or controlled in Palestine.
- Base: Local taxable incomes (corporate net profit)

- Income tax deductibles:
  - Expenses for searching new markets: Maximum of USD 100,000 or 1% of total income, whichever is lower
  - R&D expenses: Maximum of USD 100,000 or 1% of total income, whichever is lower
  - Staff training expenditures: Maximum of USD 100,000 or 1% of total income, whichever is lower
  - Costs for adopting Palestinian specifications and standards and applying the best practices of corporate governance including the adoption of international accounting standards: Maximum of USD 100,000 or 1% of total income, whichever is lower
  - Hospitality expenses: Maximum USD 50,000
  - Head Office expenses: Maximum USD 100,000 or 5% of taxable income, whichever is lower
- Tax exemptions:
  - Capital gains derived from the sale of property are tax exempt provided they are not derived from the normal business activity of the company.
  - Capital gains derived from the sale of investments in securities are tax exempt provided they are not derived from the active trading and not derived from the normal business activities of the companies.
- The Decree allows carrying forward the losses for five years but does not permit carrying back the losses.

### 3.3.3 Withholding Tax

- No withholding tax is levied on dividends, interests paid to nonresidents. Regarding the royalties, it is not certain whether it is taxable or not, according to the provisions of the law.

### 3.3.4 Real Property Tax

(a) Buildings and Non-farmed Land

- Base: Buildings and land within municipalities
- Rates: 17% of the net annual value (net value= gross value-20% depreciation)
- Base: Buildings and land outside municipalities
- Rates: 10% of the net annual value

(b) Farm land tax

- Base: All land planted with fruits and vegetables
- Rates*:* Varies from year to year and according to crop

### 3.3.5 Taxes on Domestic Goods and Services

(a) Value Added Tax

- Base: All domestically-produced goods and services (after deductions of purchases of intermediate goods)
- Rates: 16% except for zero-rate on exported goods, tourist services and fruits and vegetables

(b) Purchase Tax

- Base: All wholesale prices of consumer goods, and several raw materials and processed goods
- Exemptions: Conditional exemptions apply to certain products in education, health, industry and agriculture sectors

**Purchase Tax for Selected Goods**

| Item | Rate (%) |
|---|---|
| Cigarettes | 62% of the consumer price before adding VAT+ NIS 66.20 for every 1000 cigarettes |
| Alcohol | 32%, 66%, 72%, 127.2% or 192% (according to alcohol content) |
| Cars | 75% |
| Electrical Equipment | 10%, 15% and 45% |

(c) Fuel Tax

- Base: A specific rate for 1,000 liters updated every three months, according to the rise in consumer prices
- Rates: USD 489.73 for gasoline, USD 223.23 for diesel oil, USD 223.23 for kerosene

(d) Stamp Duty

- 0.8% duty is levied on the contracts with the government institutions and on credit contracts with banks.

### 3.3.6 Tax Treaty

- There is no tax treaty concluded so far.

### 3.3.7 Accounting Principles

- IAS/IFRS is required for all financial service companies and firms listed in the Palestine stock exchange.
- Financial statements must be prepared annually.
- Semi-annual financial statements must be prepared by the financial institutions and listed companies.

## 3.4 Financial and Monetary System

### 3.4.1 Regulatory Framework for Banks

- "Law No. 2/2002"

### 3.4.2 Regulatory Framework for Insurance

- "Jordanian Law No. 5/1965" on the supervision of insurance in the WBGS
- "Law No. 76/1965" on insurance companies in the WB
- "Law No. 2/1966" and "Law No. 1/1967" also regulate the insurance sub-sector.
-

### 3.4.3 Regulatory Body of Monetary Policies

- Palestinian Monetary Authority (PMA) was established in 1994 to implement and regulate monetary policies in Palestine.

### 3.4.4 Banking System

- Banks in Palestine are defined as "any institution authorized to conduct banking transactions in Palestine in accordance with the provisions of "Law No. 2/2002".
- The bank must be incorporated in form of Joint Stock Company unless it is a foreign bank
- A foreign bank must be registered as a foreign company in accordance with the "Company Law".
- The PMA must approve the Memorandum of Articles of Association and all other management agreements and/or contracts signed by the manager of the bank.
- The PMA shall decide on the licensing of banking activities within three months.
- The banks in Palestine provide the corporate services such as opening and closing an account, current accounts, overdrafts, commercial loans, money transfers and other services (letters of credit, letters of warranty, syndicated loans, bonds, etc.).
- Current Accounts: Interest rates tend to range 12 - 16% per annum on the dollar.
- Overdrafts: Fixed interest rate is around 11% annually. Interest may be charged LIBOR + 2-3% per annum.
- Commercial Loans: The banks request for collateral guarantees, either money or real estate. Interest rate usually ranges between 7-9% on the USD, 8-10% on JD, and 8.5-14.5 on the NIS. It may be calculated based on the LIBOR + 3.5% (usually).
- The "2007 Money Laundering Law" emphasizes transparency, management control and verification of the identity of parties to any transfer.
- Both residents and non-residents can hold bank accounts in any preferred currency.

### 3.4.5 Insurance

- The types of insurance available in Palestine include the insurance for air, land and sea transportation, and for movable and immovable properties.
- Personal insurance is also widely covered and it includes life, theft, health, employees and vehicles.

## 3.5 Foreign Exchange

### 3.5.1 Restriction on the Foreign Exchange

- Free movement of currencies is admitted.
- There is no restriction imposed on the export and import of capital from/into the Palestine.

### 3.5.2 Remittance

- No limitation on profit and capital repatriation.
- Remittance can be made in any currency.

## 3.6 Labor

### 3.6.1 Regulatory Framework for the Labor Issues

- Settlement on labor issues shall be in accordance with "Labor Law No. 7/2000" (Articles indicated below are based on the provisions of this labor law).

### 3.6.2 Principal Institutional Framework on Labor Issues

- The Council of Ministers shall form the Committee of Labor Policies, which is a tripartite (the Government, employers and workers) advisory committee under the presidency of the Minister of Labor, will be tasked to propose public policies relating to the employment, training and occupational guidance. (Article 7)
- The Ministry of Labor shall establish Labor Offices which are easily accessible to employers and workers. Such offices shall render their services free of charge. (Article 8)
- Discrimination in the circumstances and conditions of work between workers in Palestine shall be prohibited. (Article 16)

### 3.6.3 Major Provisions on Employment and Labor

➢ ***GENERAL:***

- Work is a right for each citizen who is capable of working. The PNA shall provide it on the basis of equal opportunities and without any kind of discrimination whatsoever. (Article 2)

- ***EMPLOYMENT:***

- Each person who is capable of and wishing to work must register his or her name at the Labor Office. Said office must register the work applications and give applicants a corresponding certificate. (Article 10)
- Each employer must submit to the Labor Office a monthly statement of the names of workers as well as their number, functions, age, gender, qualifications, salaries, the date on which they joined the firm and the vacant functions available. (Article 12)
- The Ministry of Labor shall be entitled to award a licence to work in Palestine for non-Palestinians. The employer shall be prohibited from employing, in a direct manner or by means of a third party, any non-Palestinian worker prior to the confirmation of obtaining the licence mentioned above. (Article 14)

- ***EMPOYMENT CONTRACT***:

- The individual work contract shall be an explicit or implicit written or verbal agreement that is concluded between an employer and a worker for a limited or unlimited period of time or for the accomplishment of a specified work. (Article 24)
- The maximum duration of a work contract of limited period at the selfsame employer must not exceed two consecutive years, including the cases of renewal. (Article 25)
- In case the parties to the work contract of the limited period continue to implement it following the expiration of its duration, the contract shall be deemed to be of an unlimited period. (Article 26)
- The work contract shall be drawn up in the Arabic language which shall include the basic terms and conditions of work such as salary, type of work, its place and its duration. It shall be signed by the two parties concerned. (Article 28)
- The work contract may commence with a probationary period, the duration of which is three months, and it may not be repeated for more than once with the same employer. (Article 29)
- "Expiration and termination of individual work contract" are stipulated in Articles 35 to 48.

- ***WAGES***:

- The salary shall be disbursed to the worker in the circulated currency, provided that the payment is conducted as follows: (Article 82.1)
  a. On the working days and in the workplace;
  b. At the end of each month for workers with a monthly salary; and
  c. At the end of each week for workers on the basis of the production unit or on hourly, daily or weekly basis.
- The employer shall not take any disciplinary measure or impose a fine against a worker except due to a contravention provided under the Bylaw of Penalties, which is approved by the Ministry of Labor. (Article 84.1)

- The salary of a worker shall not be less than the minimum limit which is legally approved. (Article 89)

➢ ***WORKING HOURS***:

- The actual working hours per week shall be 45 hours. (Article 68)
- Daily working hours must include one or more period(s), the total of which shall not exceed one hour, for the repose of the worker taking into consideration that the worker does not work for five consecutive hours. (Article 70)
- The parties to production may agree to extra working hours that do not exceed twelve hours a week. A remuneration of an hour and a half shall be paid to the worker for each extra working hour. (Article 71)
- The worker shall have the right to a paid weekly holiday that is not less than 24 consecutive hours. Based upon an agreement between parties to production, these may be accumulated once per month. (Article 72.1)
- Friday is a weekly holiday unless the interest of the work requires the allocation of another day on a regular basis. (Article 73)

➢ ***LEAVE***:

✓ The worker shall be entitled to a paid annual leave, the duration of which is two weeks per year of work. (Article 74.1)

✓ Other leaves are stipulated in Articles 75 to 78.

➢ ***UNION:***

✓ In accordance with the provisions of the law, the workers and employers shall have the right to organize unions organisations on a professional basis with the aim to sponsor their interests and defend their rights. (Article 5)

## 3.7 Land and Zoning

### 3.7.1 Regulatory Body of Land Issue

- Land Authority was established by "Presidential Decree No. 10/2002", by gathering various departments from the Ministries of Justice, Public Works and Housing.

### 3.7.2 Zoning System in Palestine and Limitations on Land Use

- The WB is divided into three zones according to the role of the authority.
  - Zone A: All the urban Palestinian areas within the WB where the PNA has full civil and security control (17.2%).
  - Zone B: All the rural areas within the WB where the PNA has civilian jurisdiction but no security control (23.8%).
  - Zone C: Areas within the WB that is under full Israeli security and civil control (59%).

- Construction in Area C requires permits from the Israeli Civil Administration.
- Investments in Area A and B:
  - Local municipalities set the land-usage regulations.
  - Most of the lands within these zones are mapped and designated for different usages such as industrial, agricultural, residential, etc.
  - Any land that is not within the jurisdiction of a municipality is under the regulation of the Palestine Ministry of Local Government.
  - Investing in a non-designated area is possible through the consent of the local authority and Palestine Ministry of Local Government, subject to obtaining necessary permits and licenses.

### 3.7.3 Land Ownership

- The "Land Transfer Law of 1920" allows any registered company within Palestine to own the land necessary for its projects and activities.
- As only about 40% of land in the WBGS is officially registered, it is essential to consult the Land Authority for checking the status of the land being purchased.

### 3.7.4 Foreign Ownership of Land

- "Law No.40/1953 on Immovable Property: Lease and Sale by Foreigners" allows foreign ownership or rental in Palestine of the necessary area of land for living, construction and agricultural purposes**.**
- The sale or transfer of land by foreigners must be approved by the Palestinian Cabinet, which in return publishes a list of the names and nationalities of investors (land owners), the area of the land they own, and the location.

## 3.8 Environment

### 3.8.1 Regulatory Organization

- In December 1996, the Palestinian Environmental Authority (PEnA) was established by Presidential Decree and merged the Environmental Planning Department in the Ministry of Planning and International Cooperation in 1997.
- PEnA agreed with various ministries such as Ministry of Health and Ministry of Agriculture regarding the transfer of responsibilities over environmental issues.
- In 1998, the State Minister for Environment was appointed and the PEnA was merged with the Ministry of Environment Affairs (MEnA).
- In 2002, the Environment Quality Authority (EQA) was established having the same authorization and duties as the MEnA.

### 3.8.2 Regulatory Framework for the Environmental Protection

- The environmental activities and practices in the WB are mostly regulated by a legislation existing before 1967, which is mainly the Jordan regulations.
- The most important related regulations are “Law No. 43/1966 on Public Health” and “Law No. 79/1966 on the Planning and Zoning”.
- After 1967, some activities were regulated through ad hoc instructions and regulations issued by the Israeli Civil Administration.
- “Environmental Law No. 7/1999” was enacted and became effective at the end of 1999. The law contains 82 articles covering a wide range of environmental issues.

### 3.8.3 Basic Policy for Environment Protection

- The PNA has developed a ten-year environmental strategy called “Palestinian Environmental Strategy (PES)”, which has to be updated every three to five years.
- The PNA has adopted a National Environmental Action Plan (NEAP) in August 2000 as an instrument to translate the general themes and priorities set out in PES into concrete and prioritized actions, plans and projects for the three-year period 2000-2002, with subsequent annual updates.
- In the Palestinian Environmental Assessment Policy, which was approved by the Council of Ministers in 2000, the necessity of Environmental Assessment (EA) is clearly spelled out. According to the policy, the Initial Environmental Evaluation (IEE) and/or Environmental Impact Assessment (EIA) shall be required according to the type of project.

## 3.9 Intellectual Property Rights (IPR)

### 3.9.1 Regulatory Framework for the Protection of IPR

- Intellectual property is currently governed by the “Civil Claim Law of 1933” in the GS and the “Commercial Law No. 19/1953” in the WB.

### 3.9.2 Trademarks and Names

- Trade names should be registered in accordance with “Law No. 30/1953” in the WB.
- Trademarks should be registered in accordance with “Law No. 33/1952” in the WB and “Trademark Law No. 35/1938” in the GS.
- The initial protection period of trademarks is seven years.
- The law prescribes the imprisonment for a maximum period of one year or a fine of not exceeding 100 JD for infringement of a registered trademark.

### 3.9.3 Patent

- Regarding the patent and design, “Law No. 22/1953 on Patent and Design” is applicable in the WB while “Law No. 64/1947 on the Patent and Design” in the GS.
- A foreign company is also entitled to have a patent registered.

### 3.9.4 Copyrights

- The protection by “Copyrights Laws of 1911 and 1924” lasts for a period of 50 years after the death of author of the work.

## 3.10 Quality and Standards

### 3.10.1 Regulatory Body for Standards

- The Palestine Standards Institute (PSI) is the sole body in Palestine for developing and issuing Palestine standards.

### 3.10.2 Current Situation of Palestine Standards

- The PSI adopts about 80 standards each year. There are now about 1,000 standards on food, environment, chemicals, plastics, petroleum products, construction and cosmetics.
- Most standards adopted by the PSI are internationally harmonized.
- All standards-type documents are classified into fields, groups and sub-groups according to the International Classification of Standards (ICS).
- The PSI quality mark is granted for products that meet the requirements stated below. So far, more than 50 manufacturers received the quality mark certificate.
  - The product complies with all requirements of applicable Palestine standards.
  - The quality management system of the producer meets the requirements of the PS/ISO 9001.
  - The manufacturing facility meets requirements of local codes on environment, health and safety.
  - The quality mark is granted following ISO guide number 65.

## 3.11 Dispute Settlement

### 3.11.1 Regulatory Framework for the Commercial Arbitration

- Under the “Civil and Commercial Procedures Law”, courts hear civil proceedings pertaining to both Palestinians and foreigners.
- The “Law No. 5/2000” sets out the basis for court recognition and enforcement of arbitral awards.

- Every dispute may be referred to arbitration as a general rule, but certain disputes may not if they are related to marital status, public order issues or the cases where no conciliation is permitted.
- The law devotes a special chapter to address urgent cases, which gives greater flexibility for the judiciary to consider. It also acts on a large number of exceptional issues that are considered particularly pressing. This is intended to limit any ongoing damages that may be caused to the parties involved in dispute.

### 3.11.2 Efficiency of Commercial Contract Enforcement

- Palestinian courts adjudicated 101,926 cases in 2006, which represents 88.3% of the total cases submitted.
- "Doing Business" survey ranked Palestine 125 out of 176 economies on the enforcement of contracts. (Slightly behind Israel but ahead of Jordan, Syria and the UAE)
- The survey indicated that the average length of time between the filing of a lawsuit in court until the payment of claim is700 days. (689 days in Jordan, 872 days in Syria and 890 days in Israel)
- The cost of litigation in Palestine is 21.1% of the claim. (25.3% in Israel, 29.3% in Syria and 31.2% in Jordan)

### 3.11.3 Labor Dispute Settlement

- The collective labor disputes shall be those which arise between one or more employer(s) and workers or a group thereof over a collective interest. (Labor Law Article 60)
- Each of the two parties in a collective labor dispute shall have the right to resort to the Reconciliation Officer at the Ministry (of Labor) in the event that such dispute has not been solved by negotiation means in the installation. (Article 61)
- In case the Reconciliation Officer fails to solve the dispute within ten days, the Minister must refer the dispute to a Reconciliation Committee to be composed of a functionary at the Ministry of Labor acting as chairperson and an equal number of members to be nominated by the employer and workers. (Article 62)
- In case the Reconciliation Committee fails to solve the dispute within two weeks, any of the two parties thereto shall have the right to resort to the competent court. (Article 63.1)
- If none of the parties resort to the judiciary whereas the labor dispute jeopardizes the public interest, the Minister shall be entitled to oblige both parties to appear before an Arbitration Committee established by the Minister. (Article 63.2)

## 3.12 Infrastructure

### 3.12.1 Electricity

- The Palestine Energy and Natural Resources Authority (PENRA) is responsible for policy making, sector development, regulation, generation and transmission of electricity.
- The current maximum supply of electricity to the WB is 550 MVA, of which 30% is supplied directly by Israeli Electricity Company (IEC) and 70% indirectly by IEC through Jerusalem District Electric Company (JDEC).
- JDEC (a private company) supplies electricity to East Jerusalem, Jericho, Bethlehem, Ramallah and El Bireh.

### 3.12.2 Telecommunications

- The Palestinian Telecommunication Company (PALTEL), established in 1995, is the main provider of telecommunication services in the region, especially by the fixed telephone line.
- Pal-Cell (Jawwal) was also established to provide mobile phone services.

**(1) Telephone**

**Fixed and Mobile Phone**

| Indicator | 2006 | 2003 |
|---|---|---|
| Number of Main Telephone Lines | 321,999 | 243,494 |
| Number of Cellular Phones | 821,800 | 264,091 |
| Percent of household available for Cellular | 81.0% | 66.1% |

Source: PCBS

**(2) ITC**

**Internet Facilities** (of households)

| Indicator | 2006 | 2003 |
|---|---|---|
| Computer | 32.8% | 21.3% |
| Internet at Home | 15.9% | 6.0% |
| Persons who have access to the internet | 18.4% | |

Source: PCBS

### 3.12.3 Water Resource

- Primarily, groundwater is extracted from wells or springs. Mountain aquifer system has an annual recharge of 679 million cubic meters (83% are in occupied territory).
- 85% of groundwater resources are for use in Israeli settlements and in Israeli proper.

- Available quantities of water (2007): 335.4 Mcm
- In general, urban areas have access to the Palestine water resources while small villages depend on the Israeli wells managed by “Mekorot”, an Israeli water supply company.

### 3.12.4 Aviation

- Ben Gurion Airport (Tel Aviv, Israel) is currently the main gateway airport to Palestine.

### 3.12.5 Roads and Transport

- Road networks provide the only transportation mode in the WB. The existing roads fall into three categories: main, regional and local roads.

**Road Network and Vehicles in Palestine**

| Indicator | 2006 | 2003 |
|---|---|---|
| Road Network | 5,146.9 (km) | 4,943.6 (km) |
| Road Vehicles Licensed | 116,646 | 105,774 |

Source: PCBS

### 3.12.6 Railway

- Railway service is not available in Palestine.

### 3.12.7 Sea Port

- Haifa Port (Israel) is currently being used as a major exports gateway from Palestine.

### 3.12.8 Inland Water Transportation

- No inland water transportation is available for industrial or commercial use.

# 4. INVESTMENT

## 4.1 Investment Policies

- Any investor may invest in any sector of the Palestine economy unless it contravenes other laws. (Law Article 3)

## 4.2 Regulatory Framework for the Investment

- Regulations on investment are based on "Law No. 1/1998 on the Encouragement of Investment in Palestine" (Articles stated in the succeeding sections below are based on the provisions of this law).

## 4.3 Responsible Organization

- The PIPA was founded in 1998 as an autonomous agency of the PNA, in order to promote and regulate investments in Palestine.

## 4.4 Investment Licensing Scheme

- Enterprises in all sectors shall benefit from the exemptions and incentives, except for investments in the fields where prior approval of the Council of Ministers must be required to obtain incentives.(Article 4)
- To be eligible under the Law, all investments in Palestine must be registered. (Article 5)
- The criteria for granting the incentives and exemptions shall be decided by the Council of Ministers according to the recommendation of PIPA. (Article 15)
- For confirming the provision of the Incentives, the Confirmations of Investment shall be issued by the PIPA. (Article 15)

## 4.5 Investment Licensing Procedures

- Upon submission of the investor regarding information requested in the regulations related to the project, the PIPA shall act to access the information. If within 30 days from the date of filing application, the PIPA does not decide for the entitlement of the incentives provided in the law, the project shall be deemed entitled to such Incentives. (Article 25.A)
- The regulations shall specify the methods by which the PIPA's incentive may require the information for the Confirmation of Investment. (Article 26)

## 4.6 Investment Incentive

### 4.6.1 General

- All incentives are applicable to investors regardless of nationality or the form of business. (Article 6)
- "Law No. 1/1998 on the Encouragement of Investment in Palestine" grants the following incentives to the approved investment.

### 4.6.2 Fixed Assets Exemptions

- (Article 22)
- The fixed assets of the enterprise shall be exempted from customs duties provided that they are brought in or imported within the period set by the PIPA when it approved the list of fixed assets.
- Spare parts imported by the enterprise shall be exempted from customs duties provided that their value does not exceed 15% of the fixed assets and they are brought in or used by the enterprise within the period set by the PIPA, commencing from the date of production or investment start-up.
- The fixed assets of the enterprise required for enlarging, developing or upgrading the investment shall be exempted from customs duties if the PIPA determines that they increase the productive capacity.
- A price increase in the value of fixed assets shall be exempted from customs duties if the increase in value was caused by a price increase at the country of origin.

### 4.6.3 Income Tax Exemptions

**Tax Exemption on Investment**

| Investment Size | Investment outside IE/FZ |
|---|---|
| USD100,000-USD1 million | - 5-year tax holiday<br>- 10% income tax on net profits for an additional 8-year period |
| USD 1-5 million | - 5-year tax holiday<br>- 10% income tax on net profits for an additional 12-year period |
| Over USD 5 million | - 5-year tax holiday<br>- 10% income tax on net profits for an additional 16-year period |
| Special Investment approved by the Council of Ministers | - 5-year tax holiday<br>- 10% income tax on net profits for an additional 20-year period |

- The Council of Ministers may decide to extend the exemption period up to five additional years depending on the nature and location of the enterprise, increase in exports, job creation opportunities and advancement of development. (Article 24.A)

- The exemption period may be increased for two additional years if the local input in equipment, machines and fixtures exceeds 60%. (Article 24.C)
- The PIPA may grant additional exemption to enterprises engaged in the export activity provided that the input is not less than 30% of the total value of its output. The additional exemption period shall not exceed three years. (Article 31)

#### 4.6.4 Free Movement of Capital and Profits

- Thus shall generally be in accordance with Article 10.
- Full capital repatriation including capital, profits, dividends and capital gains, wages and salaries, interest and principal payments on debts, royalty, etc., is guaranteed, except in the cases provided in Article 11 of the law.
- Unrestricted movement of foreign exchange is also guaranteed.

#### 4.6.5 Export Exemptions

- Goods produced and sold outside of Palestine shall be exempted from export taxes and any other taxes.

#### 4.6.6 Local Market Sales

- Goods produced and sold within Palestine shall be regarded as regular imports.
- An export-oriented company may sell a maximum of 20% of the annual value of its production to the local market, provided that;
  - All raw materials used in the goods sold to the local market shall be subject to the fees and customs duties imposed on any similar product available in the local market
  - If a similar product is not available in the local market, only 80% of the fees and customs duties imposed on these products shall be paid.

#### 4.6.7 Incentives for Specific Sub-sectors

- Related provisions shall generally be in accordance with Article 35.
- The following commodities to be used in specified sub-sectors shall be imported free from customs duties:
  - Furniture, electrical appliances and electronics for hotels and hospitals
  - Electrical appliances and electronics for tourism enterprises
- Hotel and hospital enterprises shall be granted additional exemptions from customs duties at least every five years on above-mentioned goods for modernization and renovation purposes.

#### 4.6.8 Investment Project not Eligible for the Incentives

- The following investment enterprises shall not be eligible for the incentive under the Investment Law. (Article 43)e
  - Commercial enterprises
  - Insurance
  - Real property (except development companies)
  - Banks, money changers and any other financial institutions (except housing mortgage companies)

### 4.7 Investment Guarantee

- The PNA prohibits the nationalization of any investment in Palestine and may not expropriate any investment except by operation of the law. (Article 7).
- There shall be no expropriation of an investment or part thereof, save and except in exceptional cases for a public purpose, with due process of law accorded to the investor subject to an expropriation, who shall be compensated the fair market value and for losses suffered because of such expropriation. (Article 8)
- Even in case the PIPA cancels the Confirmation of Investment, no other administration may cancel the permits issued in relation to real property, as licensed. The permits may not be canceled unless for legal reasons or public purpose on the basis of non-discrimination.(Article 9)
- Long-term Political Risk Insurance for foreign direct investors is available with coverage of up to USD 3 - 5 million per project during a 15-year period. Co-insurance is also available to increase coverage capacity.
- The Investment Guarantee Fund is administered by the Multilateral Investment Guarantee Agency (MIGA) and is funded by the World Bank.

### 4.8 Transfer of the Investment Project Approved for the Incentives

- Provisions below are in accordance with Article 29.
- An enterprise benefiting from the incentives may be transferred freely to a new owner in its entirety.
- The new owner of a transferred enterprise can benefit from the incentives as long as he continues to operate the enterprise as a going concern.

### 4.9 Merger, Division or Alteration of Enterprise Approved for Incentives

- Regulations below are based on Article 30.

- Companies merged or companies that have been split or whose legal structure is altered shall benefit from the (tax) exemption granted prior to the merger, splitting or alteration of legal structure until the expiration of the period of exemption.
- No new tax incentives shall be granted to such merger, splitting or alteration of legal structure.

## 4.10 Cancellation of a Confirmation of Incentive

- The PIPA may cancel a Confirmation of Incentive in the event that it finds that the investor supplied the PIPA with false information at the time of submission or, if the investor withheld from the PIPA any information on the proposed investment, which was deemed a relevant material for the PIPA's decision to confirm the eligibility for the incentives. (Article 32)

## 4.11 Restrictions on Investment by Foreign Citizenship

### 4.11.1 Limitation on Incentives for Foreign Investment

- No investor will be discriminated against on any basis whatsoever in the application of the incentives provided under the Article 6.A.
- The PNA may grant preferential treatment to investors on the basis of nationality under bilateral or multilateral trade and/or investment agreements with other states. (Article 6.B)

### 4.11.2 Ownership and Use of Land

- Foreign investors have the right to own or rent immovable property, in accordance with "Law No.40/1953 on Immovable Property: Lease and Sale by Foreigners", and its amendments of 1960 and 1962.
- The sale or transfer of land must be approved by the Palestinian Cabinet, which in return publishes a list of the names and nationalities of investors (land owners), the area of the land they own, and the location. On February 13, 2008, the Palestinian Cabinet published a list of foreign investors and the lands they purchased.
- The whole process involves ten procedures and takes an average of 72 days. The average cost of registering land and property is 2.2% of its cost. (7.5% in Israel and 10.0% in Jordan)

# 5. Industrial Estates (IE) and Industrial Free Zones (FZ)

## 5.1 Regulatory Frame for IE and FZ Scheme

- Regulations on IE and FZ scheme shall be generally in accordance with "Law No. 10/ 1998 regarding Industrial Estates and Industrial Free Zones Law" (Discussions on subsequent articles below are based on this law).

## 5.2 Regulatory Body for IE and FZ Scheme

- The IE and FZ schemes are regulated, supervised and promoted by the Palestinian Industrial Estates and Free Zones Authority (PIEFZA).

## 5.3 Basic Nature of IE and FZ

- IE: Geographically defined areas designated to serve a number of businesses that carry out industrial activities and services
- FZ: Extraterritorial customs and duty free areas established with the aim of attracting direct foreign investments and joint ventures in export-oriented manufacturing activities

## 5.4 Existing and Planned IEs and FZs

### 5.4.1 Existing IEs and FZs

- Gaza Industrial Estate (GIZ):
  - Total area is 480,000 sq. meters, developed with USD85.4 million and opened in 1999.
  - Managed and operated by privately-owned Palestine Industrial and Management Company (PIEDCO).

### 5.4.2 Planned IEs and FZs

- Jenin Industrial Estate (JIE): Jenin
  - JIE is to be located on the North of Jenin City, about 1.6 km west of Road No. 60, with an area of 93 hectares. The area is 40 km away from Haifa Port and 22 km away from Sheikh Hussein Bridge.
  - JIE will be developed and managed by Northern International and Industrial Co.
- Nablus Industrial Estate (NIE): Nablus
- Tarqumia Industrial Estate (TIE): Hebron
- Agro-industrial Park: Jericho

- In Agro-industrial Park project, 61.5 hectares are being planned to be developed in Jericho area and additional 50 hectares are now under the discussion. The project is being planned with assistance from Japan.
- The project objectives are to enhance Palestine economy and industries based on agriculture and agro-business sectors and to promote investment in Palestine.
- The Agro-industrial Park is scheduled for a stage-by-stage development.
- It is planned to have a central facility with essential business development service functions in an efficient and effective business environment. Fundamental infrastructures, such as industrial water, power supply and access roads, will also be planned.
- For the export of goods produced in the Agro-industrial Park, the transport route from Jericho through Jordan, via Allenby Bridge, to the Gulf countries are being considered.

### 5.5 Establishment of IE and FZ

- PIEFZA may recommend to the Council of Ministers to declare any suitable place in Palestine as IE or FZ. (Article 18)
- If IE or FZ is established on leased land, the lease period shall not exceed 49 years. (Article 18)
- The application for setting up the IE or FZ must be submitted to the Director General of PIEFZA. He, in turn, shall submit it within three weeks to the Board of Directors who shall then submit its recommendation to the Council of Ministers within 60 days from the date of submission of the application. The Council of Ministers shall issue a decision for allocation of the IE or FZ within one month after receiving the recommendation of PIEFZA's Board of Directors.(Articles 19 and 20)
- The Council of Minister's decision shall decide the location, area and borders of the IE or FZ. It shall also determine its activities and the means to regulate and monitor its operation. (Article 21)
- The PIEFZA's Board may grant a concession for development of an IE or FZ to any developer pursuant to a concession deed. The developer may be a public, private or a mixed corporation or company registered in Palestine. (Article 22)
- The PIEFZA shall determine the conditions of the concession deed, term, master layout, general specifications of buildings and infrastructure, operations and maintenance plan, and type of activities and services to be carried out, in accordance with the regulations and instructions of the concession deed. (Article 25)

- The IE or FZ shall be subject to control and supervision of PIEFZA, in order to verify the implementation of the conditions of the concession deed. (Article 26)

### 5.6 Responsibilities of IE or FZ Developer

- The developer shall promote the IE or FZ with the purpose of attracting the investors and businessmen. It shall also maintain the infrastructures and other facilities required for operation of the IE or FZ in good operating condition. (Articles 28 and 29)

### 5.7 Application Procedures to Locate in the FZ

- To locate and operate in the FZ, the investor has to obtain the FZ Certificate. (Article 30)
- The application for FZ Certificate has to be submitted to the Director General of PIEFZA and the Director General submits it to the Board of Directors within one month for decision. The Board shall make its decision within two weeks after the submission by the Director General. (Article 31)
- The FZ Certificate may not be granted, except to the persons or the legal entities registered in Palestine whose purpose is to work in the FZ. (Article 34)

### 5.8 One-Stop-Shop Services Provided by PIEFZA at the IE and FZ

- PIEFZA provides the investors with one-stop-shop services. Once application forms are submitted, PIEFZA will coordinate all permits, licenses and official registrations, needed to start operation, with all relevant government ministries and institutions within six weeks. (Article 3)
- The one-stop-shop consists of a series of agreements signed between PIEFZA and relevant government ministries and public institutions to offer streamlined business procedures to companies planning to establish operations at IE and FZ.

### 5.9 Movement of Goods In and Out of the FZ

- Local goods and products supplied to the FZ from any Palestinian territories shall not be subject to any established procedures, duties or taxes. (Law Article 39)
- Assets originating from any FZ and entering into Palestinian markets shall be treated as imports on the date of exit from the FZ. All the customs duties, taxes and government allowances on them shall be collected. (Law Article 41)

## 5.10 Incentives

### 5.10.1 Income Tax

| Investment Size | Investment inside of IE & FZ |
|---|---|
| USD100,000 – 1 million | - 7 years tax holiday<br>- 10% income tax on net profit for additional 8 years |
| USD1 – 5 million | - 7 years tax holiday<br>- 10% income tax on net profit for additional 12 years |
| Over USD5 million | - 7 years tax holiday<br>- 10% income tax on net profit for additional 16 years |

### 5.10.2 Fixed Assets Exemptions in the FZ

- All goods, materials, implements, machinery and vehicles, imported from abroad into the FZ with the purpose of using them inside the FZ boundaries or in any industrial project in it, shall be exempted from customs duties and other duties attached and import licenses. (Article 38)

### 5.10.3 Local Market Sales from the FZ

- The owner of a licensed project (at the FZ) may sell up to 20% of its production to the local market, provided that all the production input of the product sold to the local market shall be subject to the customs duties and taxes. If no similar local product exists, 80% of customs and taxes imposed on those materials shall be paid. (Article 36)

### 5.10.4 Exported Goods from the FZ

- All goods and products manufactured in the FZ exported abroad shall not be subject to the rules and legal procedures established for export, export taxes and any other tax. (Article 40)

# 6. PRIVATE SECTOR

## 6.1 Summary Information of Private Sector (2006)

| Sub-sectors | NO. of Establishments in Operation |
|---|---|
| Mining and Quarrying | 204 |
| Manufacturing | 12,907 |
| Electricity and Water Supply | 498 |
| Construction | 570 |
| Commerce | 54,861 |
| Transportation, Storage and Communication | 821 |
| Hotels and Restaurants | 4,185 |
| Financial Intermediation | 727 |
| Real Estate, Rental and Business Activities | 3,833 |
| Education | 1,929 |
| Health and Social Work | 3,654 |
| Other Community, Social and Personal Services | 6,351 |

Source: PCBS

- The number of newly registered companies decreased by 5% in the first quarter of 2008, totaling to 247. All of which were in WB.
- About 33.7% of newly registered companies are in trading industry and 31.3% in services.

## 6.2 Private Sector Establishments

- **Palestine Private Sector Coordinating Council (PPSCC)** plays the roles such as representation, coordination, advocacy and policy-making for the private sector. PPSCC consists of the Palestine Federation of Industries (PFI), the Federation of Palestine Chambers of Commerce, Industry and Agriculture (FPCCIA), the Palestine Businessmen Association (PBA), the Palestine Trade Center (PalTrade), the Palestine Contractors Union (PCU), the Palestine Information Technology Association (PITA), the Palestine Shippers Council (PSC), the Administrative Services for Tourism Agencies in Palestine (ASTAP), the Palestine Insurance Federation (PIF), and the Banks Association of Palestine (BAP).
- **Palestine Federation of Industries (PFI)**: Founded in 1999 as private sector organization, it represents the Palestinian industrial sector. It represents such industrial sectors as food and beverage, construction, stone and marble, pharmaceuticals, chemicals, metal and engineering, textiles, garments and leather, paper, printing and packaging, handicrafts, plastic and rubber and furniture.

- **Palestine Trade Center (PalTrade)**: With more than 300 leading business members, it formulates trade development strategies of key economic sectors, makes a yearly plan for its export capacity-building services, provides business development services program (such as marketing plans, promotional campaigns, marketing collaterals, web portals, specialized training programs, etc.), implements trade promotion programs for Palestinian products, sponsors local trade exhibition such as **EXPOTECH** (ICT exhibition), **ZADNA** (processed food exhibition), **BUILDEX** (construction materials exhibition) and **NATIONAL FURNITURE SHOW**.
- **Palestine Businessmen Association (PBA)**: An independent and non-government organization of 350 members, this was founded in December 1997. It aims to activate Palestine private sector and expand the business cooperation with Arab and foreign countries.

# 7. OHTHER INFORMATION FOR EXPATRIATES

## 7.1 Hotels (2008)

**Hotels in Palestine**

| | |
|---|---|
| No. of Hotels (First quarter of 2008) | 82 |
| No. of Available Beds | 8,429 |
| Room Occupancy (Second Quarter 2008) | 42.5% |
| Bed Occupancy (Second Quarter 2008) | 38.5% |
| No. of Guests | 151,801 |
| No. of Guest Nights | 2.5 nights |

Source: PCBS

## 7.2 Medical Services (2007)

- Number of Hospitals: 77
- Doctors per 1,000 population: 1.7
- Nurses per 1,000 population: 2.1
- Beds per 1,000 population: 1.3

Source: PCBS

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# *Annex: How to Start a Business in Palestine*

**Step 1: Obtain a temporary copy of the certificate of registration from the MoNE**

The purpose of this temporary registration certificate is to enable the entrepreneur to open a bank account prior to depositing the initial capital in the bank. No charge is levied.

**Step 2: Deposit the initial capital in the bank**

This normally has to be 25% of initial capital plus official bank fees (1/1000 of stated capital). Upon payment, a receipt is obtained and supplied back to the MoNE.

**Step 3: Select a company name and reserve proposed name.**

Once a name is selected the MoNE will check whether the name has been already used by others, and if not, MoNE will consequently approve it. Fee is USD 22.

**Step 4: Hire a local lawyer to sign the company documents.**

Although it is recommended to hire a lawyer for drafting the articles, this is not mandatory. The documents must, however, be signed by a lawyer once drafted. Fees charged range between USD 200- 300. For example, a company starting up with USD 11,000 of capital would be charged around USD 500-700.

**Step 5: Register with the Commercial Registry**

Documents required include:

1) Articles of Association
2) By-laws
3) Copies of shareholder identification cards
4) Verified company name

The fee to be paid is broken down as follows:

1) Name verification: USD 22
2) Application fee: USD 81
3) Signature verification fee (Signing before the Company Register: USD 24 per signature; minimum two signatures required to form a “Ltd” firm or seven to form a “Plc” firm)
4) 1/0000 of the stated capital

### Step 6: Payment of registration fees

The fees noted in Step 5 have to be paid at a local bank upon submission of the registration documents. The MoNE will not review the application until the fees are paid.

### Step 7: Register for income tax and VAT

The registration number for income tax and VAT is the same. In most cases, accountants register the company for tax (over 90% of cases). There is a fee for accountants, which starts at USD 400 per annum. However, there are no official fees.

### Step 8: Register with Chamber of Commerce

Cost of registration depends on the company's capital and varies from chamber to chamber. As a guide, the fees for the Ramallah Chamber of Commerce are as follows:

- Grade Excellence: Companies whose registered capital is over JD 50,000 pay an initial fee of USD 140 plus an annual fee of USD 140
- Grade A: Companies whose registered capital is over 15,000 to JD 50,000 pay an initial fee of USD 106 plus an annual fee of USD 106
- Grade B: Companies whose registered capital is over 6,000 to JD 15,000 pay an initial fee of USD 70 plus an annual fee of USD 70
- Grade C: Companies whose registered capital is below JD 6,000 pay an initial fee of USD 35 plus an annual fee of USD 35

### Step 9: Obtain business license from municipality

Normally costs between USD 120-700

### Step 10: Obtain and legalize special company books

All corporate and financial records must be legalized by the companies' controller and auditors. While this applies to all forms of companies, supervision is more stringent with respect to public shareholding companies compared to others.

### Step 11: Obtain approval from fire department

The cost of this varies according to the area of the business to be registered, but is in the range of USD 0.20 per square meter per year. For example, registering 100 $m^2$ in Ramallah costs NIS 80 annually, while 1,000 $m^2$ costs NIS 650.

The cost of registering a company depends on both the company's capital and type, but is likely to range between USD 1,000 to 5,000. The whole process usually takes less than a month.

***Source: Hands-out materials of "Palestine Investment Conference", May 2008**



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