

**Ministry of Planning and  
Ministry of National Economy  
Palestinian National Authority (PNA)  
Japan International Cooperation Agency (JICA)**

No.
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**Feasibility Study  
on  
Agro-industrial Park Development  
in  
the Jordan River Rift Valley**

**Final Report**

**Summary**

**May 2009**

**JAPAN INTERNATIONAL COOPERATION AGENCY**

**KRI INTERNATIONAL CORP.  
NIPPON KOEI CO., LTD.**

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## LIST OF VOLUMES

Volume I Main Report

Volume II Reference Data and Materials of Engineering Study

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**as of September 2008**

*(unless otherwise specified)*

## **PREFACE**

In response to the request from the Palestinian National Authority, the Government of Japan decided to conduct “the Study on Agro Industrial Park Development in the Jordan River Valley” and entrusted the study to Japan International Cooperation Agency (JICA).

JICA dispatched a study team led by Mr. Munenori TADA, KRI International Corp. and consisted of KRI International Corp. and Nippon Koei Co., LTD. several times since the commencement of the study in April 2008.

The team held discussions with the officials concerned of the Palestinian National Authority and other parties concerned, and conducted field surveys. Upon returning to Japan, the team made further study of the findings and compiled this final report.

I hope that this report will contribute and be fully utilized at the implementation stage of the development.

Finally, I wish to express my sincere appreciation to those who participated in and cooperated to the study.

May 2009

Seiichi NAGATSUKA  
Vice President  
Japan International Cooperation Agency

May 2009

Mr. NAGATSUKA Seiichi  
Deputy Vice President  
Japan International Cooperation Agency (JICA)

## **LETTER OF TRANSMITTAL**

Dear Sir,

We are pleased to submit to you the Final Report for “The Feasibility Study on Agro-industrial Park Development in the Jordan River Rift Valley (Phase II Study).

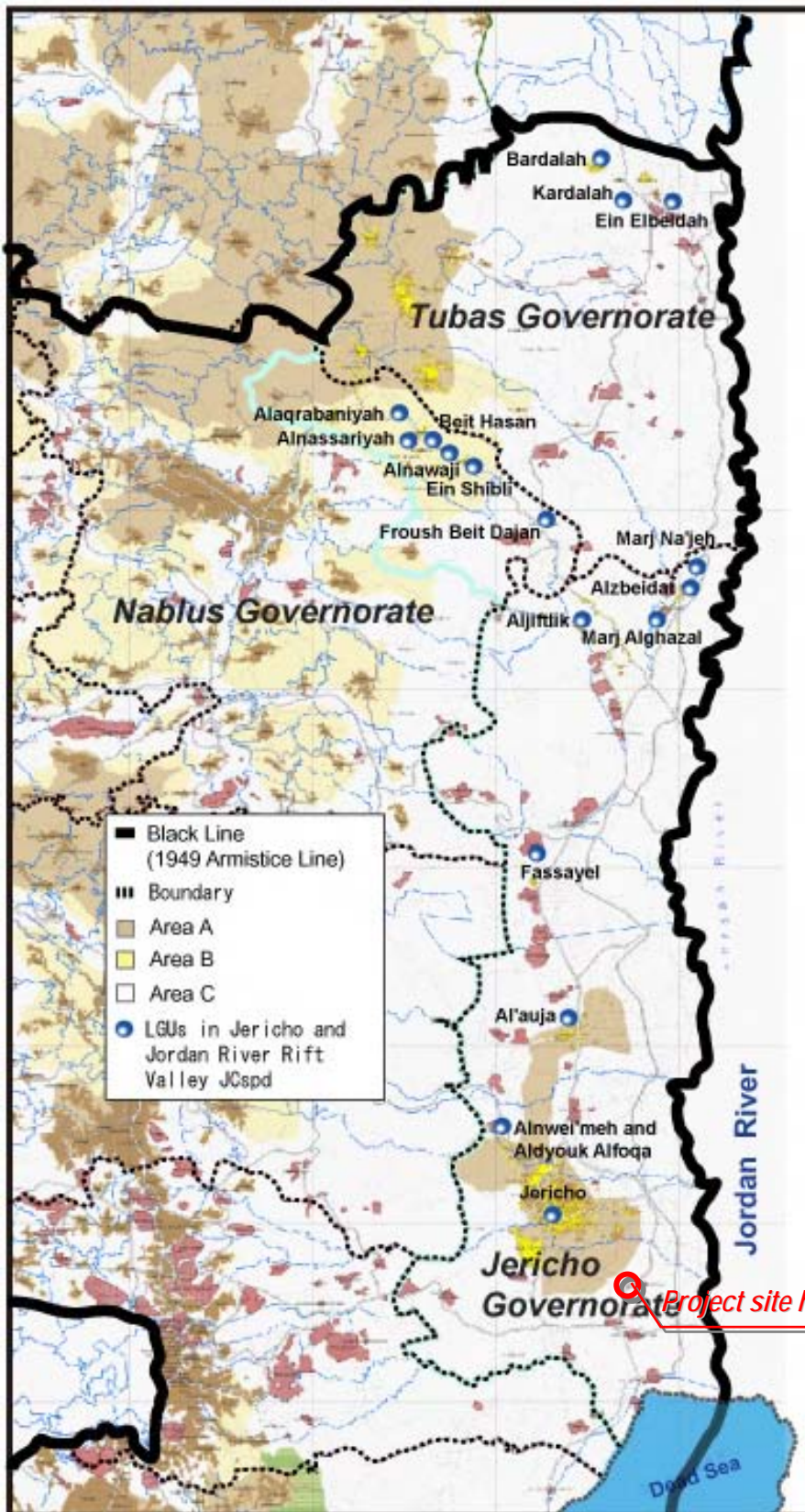
This Study has been conducted based on the results of the past study, i.e., Phase I, by the Study Team organized by KRI International Corp. and Nippon Koei Co., Ltd. during the period from April 2008 to November 2008, in collaboration with counterpart experts assigned by the Ministry of National Economy and Ministry of Planning of Palestine.

The objectives of the Study are to examine and elaborate the items required for full-scale feasibility study, covering such items as i) Agro-industrial Park development concept, ii) planning of land use and key facilities, iii) infrastructure development, iv) project cost estimate, v) economic and financial analysis, vi) social and environmental consideration, and vii) implementation and operation schemes. There were a series of discussions and exchange of views with the officials concerned of Palestinian National Authority and the private sector people of Palestine and its surrounding countries in the course of the Study, in order to provide down-to-earth options for planning and implementation of the Agro-industrial Park development.

The Study Team wishes to express its heartfelt gratitude for valuable assistance and cooperation received from the counterpart experts and public and private institutions during the execution of the field study in Palestine. The Final Report is the fruit of cooperation and collaboration of all the personnel that joined the Study.

Very truly yours,

TADA Munenori  
Study Team Leader



Note: JICA Study Team arranged the map based on that originally prepared by OCHA

## Study Area Map

**Feasibility Study on Agro-industrial Park Development  
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Study Area Map

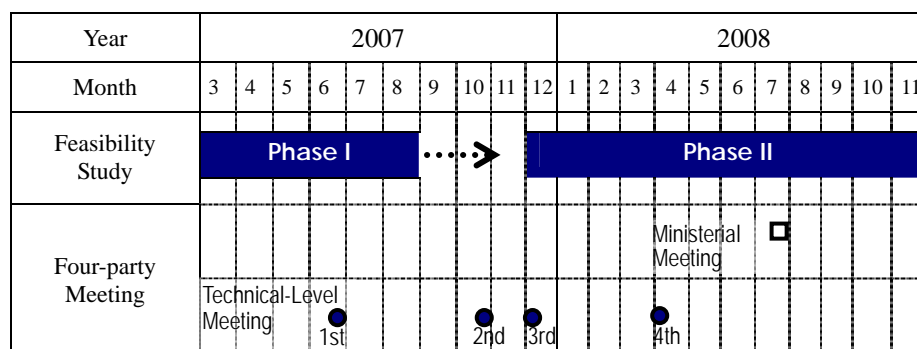
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## SUMMARY

### 1. Introduction

The “Feasibility Study on Agro-industrial Park Development in the Jordan River Rift Valley” (hereinafter referred to as “the Study”) consists of Phase I and Phase II Studies based on the time table as shown in Figure 1. Phase I Study was implemented as a pre-feasibility level study during the period from March 2007 to August 2007, and Phase II Study was implemented as a full-scale feasibility study from December 2007 to November 2008.



**Figure 1 Implementation Period of the Feasibility Study**

Phase I Study focused on the following works:

- Industrial sector study
- Investment environment
- Industrial development strategy
- Industrial park development

Phase I study concluded that the Agro-industrial Park development would be a significant project to fulfill its intended mission, in line with the Japanese initiative for the “Corridor for Peace and Prosperity”.

During the course of the Phase I study, an inter-regional consultation platform called the Four-Party Consultative Unit was formed with the participation of the Palestinian National Authority (PNA), Israel, Jordan and Japan for the purpose of promoting confidence-building through economic cooperation. The first technical level meeting was held on 27 June 2007, where regional cooperation issues were discussed.

The second technical level meeting was held on 25 October 2007, after the Phase I study. Concrete steps forward were marked, reaching an agreement regarding the site selection.

- The candidate site for the Agro-industrial Park covers 111.5 ha, and is next to an existing steel factory in the southern fringe of Jericho Municipality. The site consists of Areas A (61.5 ha) and C (50 ha). Construction of the Agro-industrial Park will start in Area A while further expansion in Area C would be subject to further discussion.

It was announced during the third technical level meeting held on 3 December 2007 that Phase II study, a



full-scale feasibility study, should be immediately carried out as shown in Figure 2.

Year	'07	2008											
Month	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Feasibility Study		Part 1			Part 2			Part 3					
Four-party Meeting	Ministerial Meeting							□					
	● 3rd				● 4th								

Figure 2 Time Table of the Phase II Study

Phase II study consisting of three parts was implemented from December 2007 to November 2008. The Study Part 1 concluded that “stage-wise development approach” is taken as development scenario for successful implementation of the Agro-industrial Park. The Study Part 2 presented the development planning of the Agro-industrial Park, engineering study and organizational arrangement for implementation with industrial and investment promotion. The Study Part 3, the last stage of the full scale of feasibility study, focused on business schemes of the Agro-industrial Park and its financial viability.

## 2. Development planning for the Agro-industrial Park

### 2.1 Basic Principles

It is expected that the Agro-industrial Park will be vital for the economic upgrading of the Jordan River Rift Valley (JRRV), which will contribute to challenging future goals, i.e. “improvement in agriculture”, “promotion of agro-industry” and “enhancement of export competitiveness of Palestinian export industries”.

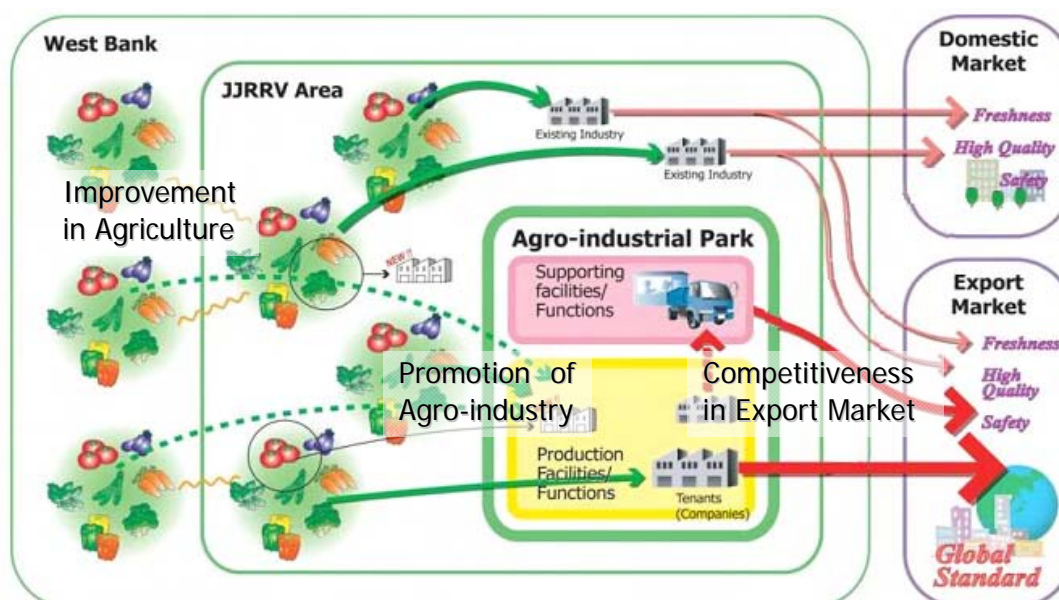


Figure 3 Schematic Image of the Future JRRV

The Agro-industrial Park will put its priority on business dealing with high value-added fresh fruits and vegetables, and food processing industry, which have comparative advantages in quality. Export promotion of priority industries will be the important mission of the Agro-industrial Park development. Both European

countries and the Gulf States would be the promising export markets for processed foods and fresh fruits and vegetables.

## 2.2 Development Plan

The candidate site is located at the southern fringe of Jericho Municipality and comprised three land parcels namely, Lot I (11.5 ha) and Lot II (50 ha) in Area A, and Lot III (50 ha) in Area C. Lot I is a state-owned land while Lots II and III are privately-owned.

The stage-wise development is scheduled to commence in 2009, starting from a relatively small scale development in Lot I (stage I), and subsequently in Lot II (stage II) on the condition that the PNA surely owns the land or secures the guarantee of land use. The simultaneous development of Lots I and II will be possible if investment demands for these seem sufficient, and if the PNA's land use for Lot II site is secured. The land use plans based on a stage-wise development, as well as the case of simultaneously developing these lots are illustrated below.



Stage-wise Development of Stages I, II and III



Source: JICA Study Team

**Figure 4 Land Use Plans**

The Agro-industrial Park is planned to provide land for factories, distribution/storage facilities, infrastructure facilities, office buildings and the Business Development Service (BDS) Center. The BDS Center would function as a business supporting facility to tenant enterprises. The type of industries and the land size allotted for factories are shown below.

**Table 1 Number of Tenants by the Type of Industries and the Land Size (recommended plan)**

Priority Industries		Area in the land use plan	Number of tenants according to development stage					Ratio of number of factories
			I	II	I+II	III	I+II+III	
a)	Business dealing with fresh vegetables and fruit		1	2	3	4	7	5%
b)	Food processing industries	Factory area	12	45	57	66	123	90%
c)	Supporting 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 planned infrastructure is largely divided into two categories; the off-site infrastructure and the on-site infrastructure. The on-site and off-site infrastructures shall be basically developed through the private developer's initiative and public initiative. On-site developer could be public entity depending on the decision by PNA, given the fact that financial viability of on-site development by a private developer seems low as analyzed in this report. The facilities which are public in nature such as the wastewater treatment facilities, solid waste treatment facilities and BDS Center shall be considered as off-site infrastructures even if these shall be located inside the Agro-industrial Park. The demarcation of these two infrastructure categories is shown below.

**Table 2 Demarcation of Required Infrastructure**

	Category	Off-site Infrastructure	On-site Infrastructure
1	Land reclamation	-	Excavation and embankment, and <i>Wadi</i> improvement
2	Road	Access road	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 tank 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 factories, office buildings
10	Logistics/Green/Open Space	-	Distribution area, storage area, parking area, green zone and park

Source: JICA Study Team

### **2.3 Values of the Agro-industrial Park**

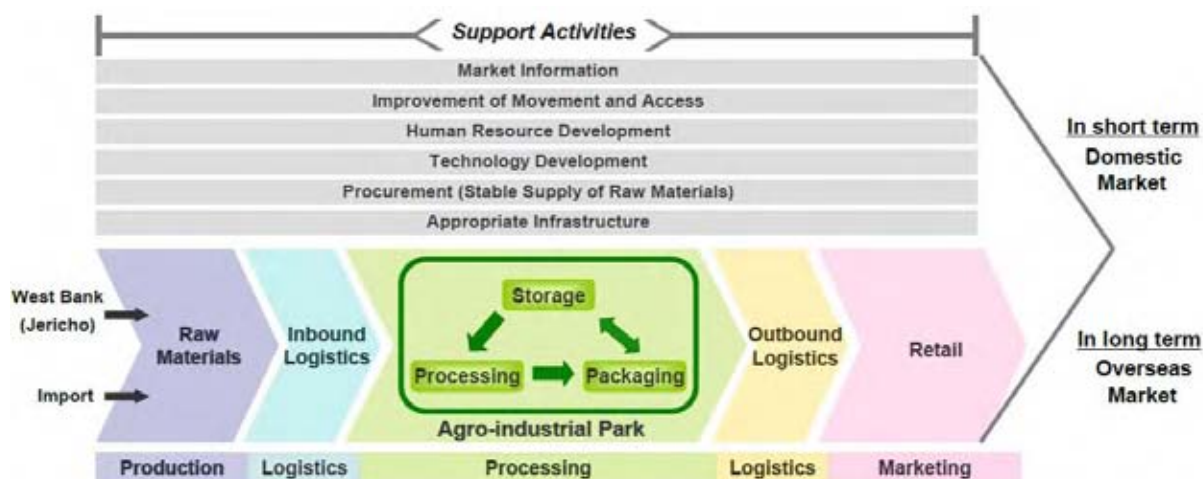
The planned Agro-industrial Park is expected to play the role as a "production base" in the JRRV as well as an export terminal to Jordan and other Gulf countries. However, in order to achieve the future goals in the JRRV, i.e., improvement in agriculture, promotion of agro-industry and enhancement of export competitiveness of Palestinian export industries, specific support activities should be included in the functions of the Agro-industrial Park.

The following support activities of the Agro-industrial Park would contribute to the enhancement of its values as a production base for the agro-industry as well as an export terminal to overseas market.

- a) Provision of appropriate infrastructure to tenant enterprises
- b) Joint procurement of raw materials to decrease the procurement cost
- c) Collective shipment of products from the Agro-industrial Park to allow for cost-efficient transport of tenant enterprises
- d) Implementation of technical assistance for upgrading technologies and developing products
- e) Completion of all production process, i.e. processing, packaging and storing inside the Agro-industrial Park

- f) Provision of common facilities such as warehouse and distribution center
- g) Provision of appropriate trainings on human resource development for tenant enterprises
- h) Facilitation of movement and access in the Agro-industrial Park such as those for commuting workers and cargo transportation.
- i) Provision of overseas market information considering seasonal advantage of agricultural products in JRRV

The following figure illustrates the necessary support activities for the Agro-industrial Park in terms of establishment of value chain for the agro-industry.



Source: JICA Study Team

**Figure 5 Value Chain for the Agro-industry with the Establishment of the Agro-industrial Park**

## **2.4 Implementation Method**

The Palestinian Industrial Estates and Free Zone Authority (PIEFZA) is responsible for industrial estate development in Palestine. The primal missions of PIEFZA are i) policy formulation for industrial estates and free zones development, ii) provision of administrative services called one-stop shop, iii) engage in contract administration such as selection of developer and tendering, and iv) monitoring of operation of industrial estates. The Palestinian Industrial Estates and Free Zones Law (PIEFZL) stipulates two methods of industrial estate development, i.e. public initiative and private initiative. Public initiative means that a public institution will act as a developer while a private initiative means that a private developer will be responsible for on-site development and management. The latter is deemed as the usual case where PIEFZA would invite a private developer in the form of development concession under its administrative control and supervision. The Gaza Industrial Estate (GIE), the only completed case under PIEFZA, was implemented on a concession scheme.

## **2.5 Economic Effects**

The planned Agro-industrial Park would bring about economic effects, i.e. incremental added value, contributing to Palestinian economy and employment creation. It is estimated that up to stage II, the added value to be generated inside the Agro-industrial Park would be about USD 18.7 million per year while

direct employment opportunities, i.e. hiring of factory workers, would benefit about 1,700 persons. The following table shows the estimated added values and employment creation inside the Agro-industrial Park.

**Table 3 Added Values and Employment Creation inside the Agro-industrial Park**

	Stage I	Stages I+ II	Stages I+II+ III
Added value (USD 1,000/year)	3,800	18,700	41,600
Employment (persons) <sup>1</sup>	340	1,700	3,790

Source: JICA Study Team

## **2.6 Social and Environmental Consideration**

During the execution of the Study Part 2 (Phase II), the first stakeholders' meeting was held on 10 June 2008 for the preparation of the EIA in accordance with the environmental assessment guidelines. The group discussions covered a wide range of subjects related to wastewater treatment, solid waste management, quantity and quality of water, and anticipated negative environmental impacts possibly caused by the project implementation. Consequently, the JICA Study Team (JST) started preparation of the EIA report. In the course of the Part 3 the second stakeholders meeting was held on 15 October 2008 in order to present the results of the EIA. The core components of the EIA are i) analysis of alternative plans, ii) potential environmental and social impacts and mitigation measures, and iii) environmental monitoring plans.

The analysis of alternative plans focuses on the development options of on-site and off-site infrastructures, including access roads, water supply, wastewater treatment and solid waste management. Then, the EIA encompasses mitigation measures for the pre-construction, construction and operation stages. Environmental monitoring plan was also prepared comprising of parameters, schedule, frequency to be monitored, and stakeholders' responsibilities in monitoring<sup>2</sup>.

## **2.7 Movement and Access**

The Agro-industrial Park will be a core production and business center, which would generate daily movement of 2,370 factory workers and 260 trucks<sup>3</sup> to and from the Agro-industrial Park in stage II. Smooth movement and access of goods and people will be vital for the efficient operation of tenant enterprises and industries.

As for the transportation of people working in the Agro-industrial Park, it is planned to provide transportation services for employees commuting from remote areas. Such services will require vehicles and drivers registered at security authority in order to avoid unnecessary disturbances at checkpoints. As for the cargoes of tenant enterprises in the Agro-industrial Park, appropriate facilitation should be considered and provided to the tenant enterprises. According to the interview survey of Palestinian companies conducted during the Part 1, the following risks were identified concerning transportation to the

<sup>1</sup> The number of employees inside the Agro-industrial Park as an additional direct employment (3,790) is calculated by multiplying the number of factories' employees by tenant occupancy ratio (90%) and incremental job creation ratio (80%). Direct employment in the Agro-industrial Park would include employees working in the tenant factories, but not includes workers and employees in distribution center, BDS Center, and office building.

<sup>2</sup> The outline of the EIA is presented in II-4 of the Chapter II.

<sup>3</sup> Inbound transportation for raw materials/equipment and outbound transportation for the products including export cargoes.

Agro-industrial Park:

- a) Delay in deliveries
- b) Unpredictability of deliveries
- c) High transportation costs
- d) Damaged raw materials and products due to the back to back checkpoint system

To alleviate the above risks, the following measures should be extended to the cargoes of the tenant enterprises:

- a) Advance notification of information to checkpoints (driver's ID, car number and date/time of arrival of cargoes)
- b) Joint procurement of fuel and equipment used by tenant enterprises and
- c) Use of known/trusted delivery service companies for cargo transportation

These measures would contribute to smooth passage of inbound goods through checkpoints. Outbound cargoes for export utilize the Allenby Bridge Terminal or other commercial terminals such as the Bardaleh Terminal (main products passing through this terminal are fresh vegetables and fruits) located in the northern Jordan Valley. The Allenby Bridge Terminal has already initiated facilitation of smooth passage and advance notification system (24 hours advance notice) for all commercial vehicles. However, if other commercial terminals are opted, use of Israel delivery service companies, sought by many Palestinian companies, is a commonly applied method to allow smooth passage of outbound cargoes under the existing situation.

The issue on movement and access concerning the nearby checkpoints was discussed at the headquarters of COGAT during the Study Part 1. The discussion focused on i) reduction of passage time of outbound cargoes through the Mousa Alami Gate to the Allenby Bridge, ii) security system in case of A-2 Access Road, and iii) security system inside the Agro-industrial Park.

There are two checkpoints in Jericho, i.e. Jericho DCL checkpoint and the Musa Alami Gate near the Agro-industrial Park. These are not commercial terminals, and hence, smooth passage of cargoes through both checkpoints will have to be taken into account as inbound and outbound traffic increase. The Jericho DCL checkpoint currently allows inbound transportation to enter Jericho City from outside, while commercial vehicles can not leave through the same checkpoint upon their return unless the drivers hold East Jerusalem and Jericho IDs. These would require i) facilitation of commercial vehicles for smooth passage and ii) permission for outbound commercial vehicles to cross the Jericho DCL checkpoint. Meanwhile, the Musa Alami Gate has currently two lanes for incoming and outgoing passages. A long queue of vehicles waiting to pass through the outbound lane has been observed especially during summer. It would be an incentive for the tenant enterprises if outbound cargo transportation from the Agro-industrial Park will be allowed to use the incoming lane flexibly (traffic counterflow system) during traffic congestion period in summer.

### 3. Engineering Study

#### 3.1 Conditions of Candidate Site

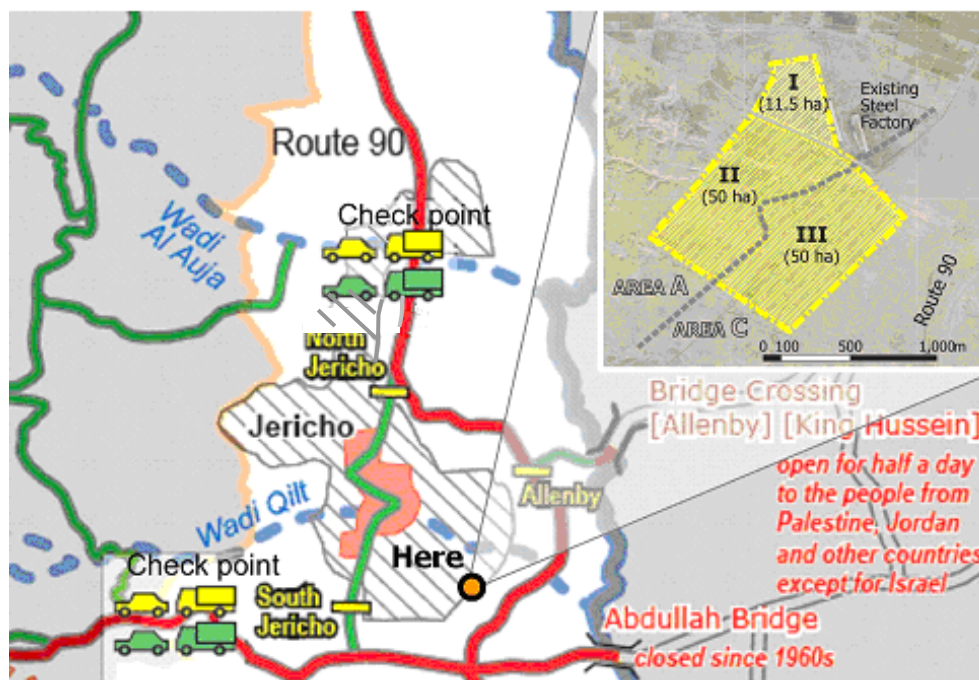
The candidate site located in the southern fringe of the Jericho Municipality, about 4.5 km from the city center, consists of a state-owned land (Lot I) and privately-owned lands (Lots II and III). The profile of the land parcels is shown in Table 4.

**Table 4 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 number designation of I, II and III is tentative.  
Source: JICA Study Team

The elevation of the candidate site ranges from -288 m to -313 m. In the privately-owned land, a *Wadi* (dried up river) flows from west to east.



Source: JICA Study Team

**Figure 6 Location of the Candidate Site**

The candidate site has a predominantly Mediterranean climate which prevails in and around the Jericho area. Annual rainfall at said area reaches lower than 200 mm. Rainfall occurs between October and May while it rarely rains in the summer season from June to September. The monthly rainfall in Jericho is less than the monthly evaporation throughout the year.

**Table 5 Annual Monthly Air Temperature, Rainfall and Evaporation in Jericho**

Item	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Air Temperature (°C)	13.2	14.6	17.4	21.7	25.6	28.5	29.9	30	28.6	25.1	19.6	14.7	22.4
Rainfall (mm)	36	31	25	10	2	0	0	0	0	7	22	33	166
Evaporation (mm)	78	76	128	189	261	289	298	267	227	135	94	59	2,101

Source: Meteorological Office, the Ministry of Transport



### 3.2 Expected Scale of the Agro-industrial Park

The land use plan of the Agro-industrial Park is prepared consistently with the basic concept on land use as mentioned in section 2.2, as well as the following assumptions:

- The building coverage of the factory is assumed to be 50% based on standard factory area in the Jericho Municipality.
- Factories and distribution facilities would be one-story buildings.
- Office buildings would be of three-story structure.
- Storage area is estimated based on the required storage volume, which is calculated on the basis of distribution and production volume.

The planned land use area is shown below.

**Table 6 Planned Land Use Area**

UNIT: m<sup>2</sup>

Item	Lot I	Lot II	Sub-total (I+II)	Lot 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 <i>Wadi</i> Improvement <sup>4</sup>	0	27,670	27,670	10,890	38,560
Sloped land due to land reclamation <sup>5</sup>	7,080	20,010	27,090	27,570	54,660
Unused area	0	42,050	42,050	0	0
<b>Total</b>	<b>115,000</b>	<b>500,000</b>	<b>615,000</b>	<b>500,000</b>	<b>1,115,000</b>

Source: JICA Study Team

The land use area planned for each development stage (I, II and III) and simultaneous development (I+II+III) is assumed to be the same. The number of employees in the Agro-industrial Park is estimated as shown below.

**Table 7 Estimated Number of Employees**

Unit: person

Facility	Stage I	Stage II	Sub-total (I+II)	Stage III	Total (I+II+III)
Factories	480	1,890	2,370	2,890	5,260
Distribution facilities	130	500	630	770	1,400
Office Building	80	100	180	100	280
BDS Center	10	20	30	0	30
Supporting Staff	10	10	20	10	30
<b>Total</b>	<b>710</b>	<b>2,520</b>	<b>3,230</b>	<b>3,770</b>	<b>7,000</b>

Note: Employees of the BDS center working in the office building in stage I would move to the exclusive BDS center building which is scheduled to be completed in stage II.

Source: JICA Study Team

<sup>4</sup> The existing alignment of *Wadi* would be modified into the artificial canal with a sufficient capacity of water flow.

<sup>5</sup> Due to land reclamation works, the sloped land would be created at the boundary of areas with each elevation.

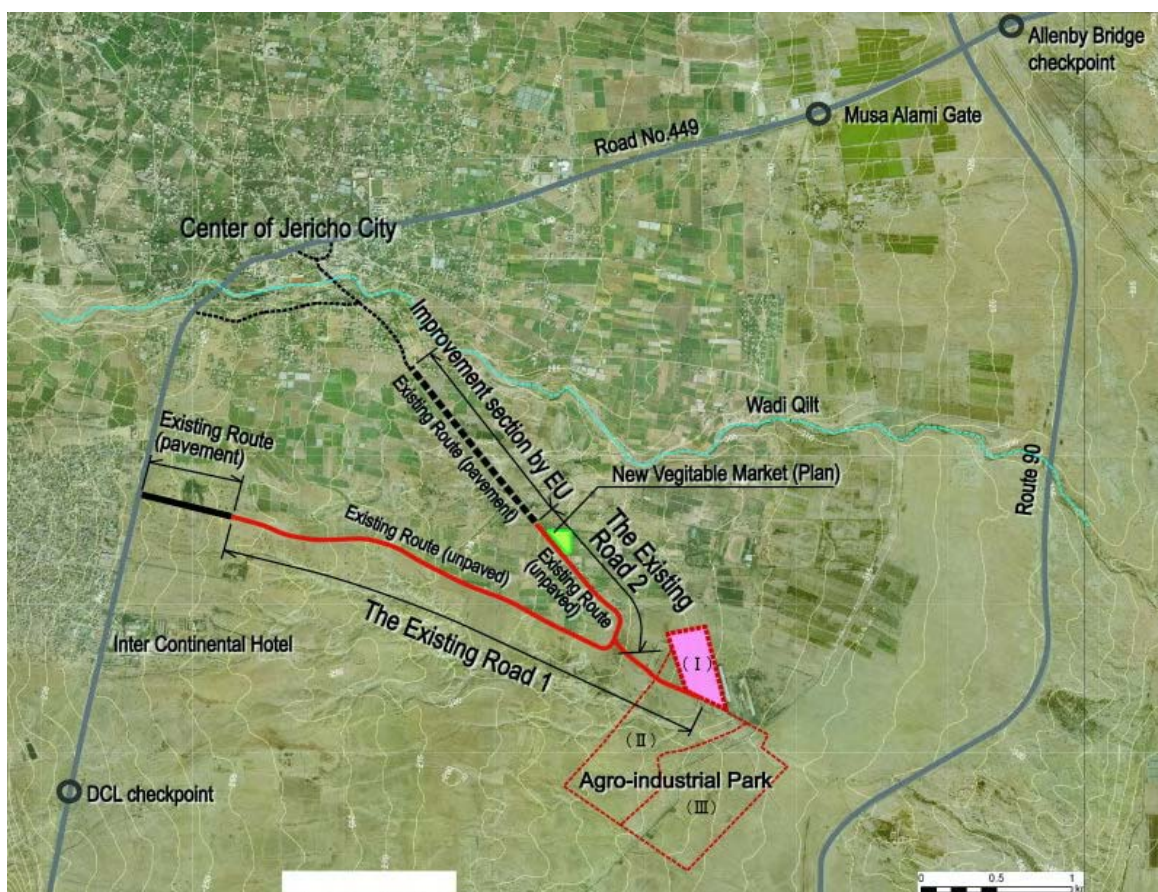
### 3.3 Off-site Infrastructure and Facility Planning

On the basis of function and facilities required for the Agro-industrial Park, off-site infrastructure is planned as described below.

#### Roads

The daily traffic volume to and from the Agro-industrial Park is estimated to be 575 vehicles in stage I and 2,730 vehicles in stage II.

The existing Road 1 leading to the Jericho Regional Hospital westward, and the existing Road 2 from its junction with Road 1 leading to the new vegetable and fruits market, are both unpaved as indicated in Figure 7. These roads need to be improved (paved) to facilitate transportation of inbound and outbound raw materials and products, and commuting of employees. The improvement of these existing roads are tentatively set for 10 m width for stage I and 20 m width for stage II, subject to different specifications and alignment, including the bridge over the *Wadi* for stage II.



Source: JICA Study Team

**Figure 7 Road Improvement for Stage I**

The following access road alternatives for stages II and III are shown in Figure 8.

- Access Road A-1 (a new road linking the north of the Agro-industrial Park to Route 449)
- Access Road A-2 (a new road merging with Route 90)

Both alternative roads would serve mainly the outbound transportation of the final products.

Access Road A-1 heading north to Route 449 would require land acquisition of the agricultural field and a part of the residential area. Access Road A-2 meanwhile is located in Area C where relocation of residents is not required for land acquisition. Access Road A-2 is considered to be more technically and financially feasible than Access Road A-1.

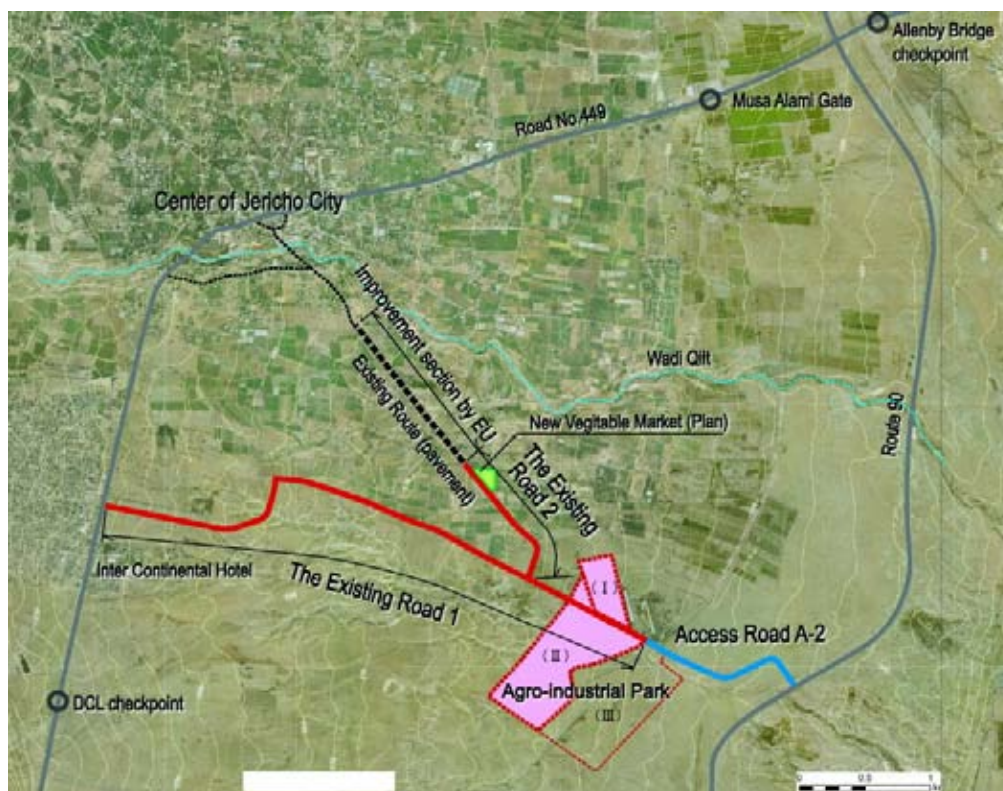


Source: JICA Study Team

**Figure 8** Alternative Routes of Access Road for the Agro-industrial Park

Improvement of the existing roads and the construction of Access Road A-2 are shown in Figure 9.<sup>6</sup>

<sup>6</sup> The proposed road specifications and alignment of improvement of the existing roads 1 and 2 for Stage II are different from those of Stage I. Required specifications and alignment are subject to further discussions with Jericho Municipality and the PNA in light of the Jericho Master Plan and the development plan of the Agro-industrial Park.



Source: JICA Study Team

**Figure 9 Improvement of the Existing Roads and Construction of Access Road A-2**

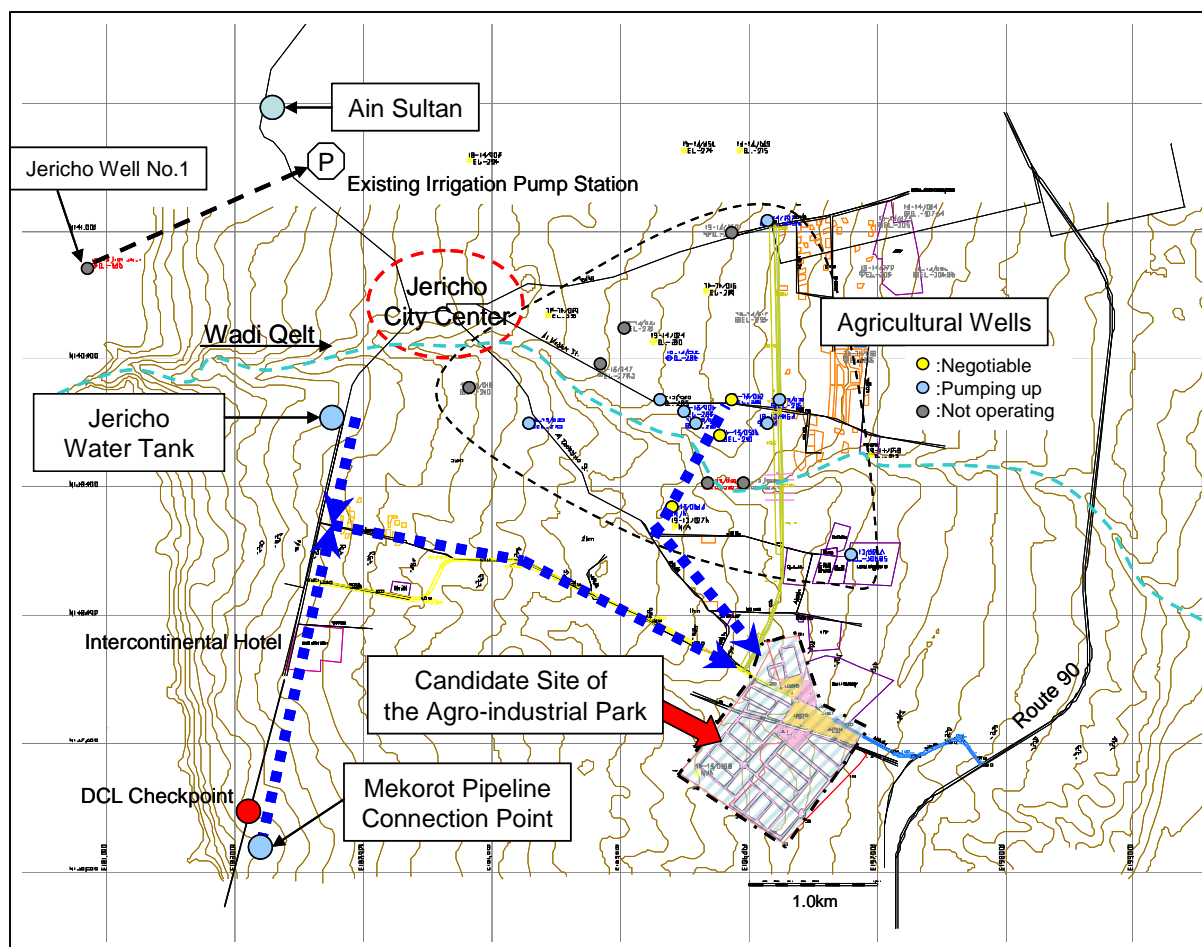
#### Power supply

The present power supply capacity in Jericho is 45 MW in total, which is sufficient for the power demand of the Agro-industrial Park (2.5 MW in stage I and 12.5 MW in stage II). Jerusalem District Electric Company (JDECO) has started the construction work of a new power station by the end of 2008, which is located approximately 4 km from the Agro-industrial Park. A new 33 kV line would be installed to supply power from the new station to the Agro-industrial Park.

#### Water supply

Water supply is one of the critical issues for the Agro-industrial Park development. Daily average water demand of the park is estimated to be 274 m<sup>3</sup>/day in stage I and 1,096 m<sup>3</sup>/day in stage II. Water quality required for food processing and production is equivalent to that for drinking water, as specified in “Second Modified Draft of Drinking Water Quality Guidelines” published by PSI in December 2004. Appropriate water sources for the Agro-industrial Park to meet corresponding demands for each development stage are as follows:

- Water supply system of the Jericho Municipality for stage I
- Existing agricultural wells surrounding the Agro-industrial Park (three wells) for stage II
- Water source from Mekorot of Israel for stage III and backup for stages I and II



Source: JICA Study Team

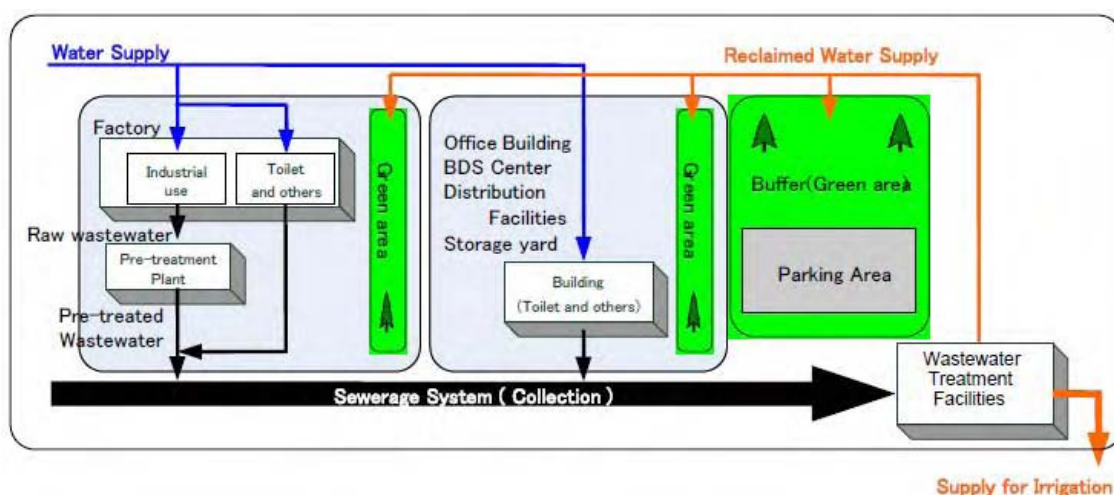
**Figure 10** Locations of Alternative Water Source for the Agro-industrial Park

Daily water supply volume from the existing Jericho water tank to the Agro-industrial Park is planned to be 320 m<sup>3</sup>/day for stage I, considering the water losses through the transmission pipelines. Meanwhile Palestinian Water Authority (PWA) intends to rehabilitate the existing Jericho Well No. 1. Brackish water from this well is planned to be mixed with pure water from Ain-Sultan at the existing irrigation pump station for irrigation use. Jericho Municipality confirmed that it would be possible to supply pure water from Ain-Sultan to the Agro-industrial Park during stage I, with a quantity of 280 m<sup>3</sup>/day, provided that rehabilitation of the Jericho Well No 1 and construction of pipeline to the existing irrigation pump station is implemented. This issue shall be discussed and coordinated further with Jericho Municipality.

Water quality and quantity survey for three agricultural wells and Jericho Well No 1 was conducted during the Part 2 of the Phase II study. Water quality in three agricultural wells was identified not suitable for drinking due to high concentration of potassium (K) and chloride (Cl). Desalination treatment will be required for the water sourced from these three wells. Daily water volume from these wells will supply about 1,545 m<sup>3</sup>/day to the Agro-industrial Park. Water quality of Jericho Well No 1 was also identified not suitable for drinking water because of high levels of bacteria. Hence, chlorine sterilization treatment will be required for the water sourced from said.

**Wastewater Treatment Facility**

Wastewater treatment is planned with two steps, i.e. pre-treatment by each tenant factory, then final treatment in wastewater treatment facilities. Wastewater is expected to contain high concentration of chlorine, BOD, SS, oil and acetic acid from factories processing food such as milk, meat and pickles. The following figure shows schematic the flow of wastewater treatment from pre-treatment to wastewater treatment facilities through sewerage collection system. Treated wastewater shall be reused as reclaimed water to sprinkle the greens and park areas, and to supply the dates plantation surrounding the Agro-industrial Park.



Source: JICA Study Team

**Figure 11 Schematic Flow of Wastewater Treatment in the Agro-industrial Park**

The following table shows the design parameters of influent quality to the wastewater treatment facilities (before treatment) and effluent quality from the wastewater treatment facilities (after treatment).

**Table 8 Design Parameters of Wastewater Treatment Facilities**

Major Parameter	Influent Quality (before treatment)	Effluent Quality (after treatment)
BOD <sub>5</sub>	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

The oxidation ditch process is recommendable to adopt for the wastewater treatment facilities of the Agro-industrial Park due to i) less odor emitted, ii) less influence caused by fluctuation of influent quantity, and iii) simple operation and maintenance. Wastewater treatment capacity is estimated to be 470 m<sup>3</sup>/day in stage I and 1,650 m<sup>3</sup>/day in stage II. Hence, simultaneous development of stages I and II would need wastewater treatment facilities with a combined capacity of about 2,120 m<sup>3</sup>/day.

**Solid Waste Treatment Facilities**

Solid waste generated in the Agro-industrial Park is likely divided into the four types: i) recyclables such as paper, glass, metal and plastics, ii) food processing waste, iii) wood from pallets for transport products, and

iv) dewatered sludge generated in the wastewater treatment facility. Inside the Agro-industrial Park, each type of waste shall be segregated and put in respective containers provided by tenant enterprises. Especially, food processing waste is diverted to compost through several processes. Outside the Agro-industrial Park, recyclables are sold, while sludge and other wastes are transported to a designated landfill site.

### **3.4 On-site Infrastructure and Facilities Planning**

On the basis of function and facilities required for the Agro-industrial Park, on-site infrastructure is planned as described below.

#### **Land reclamation**

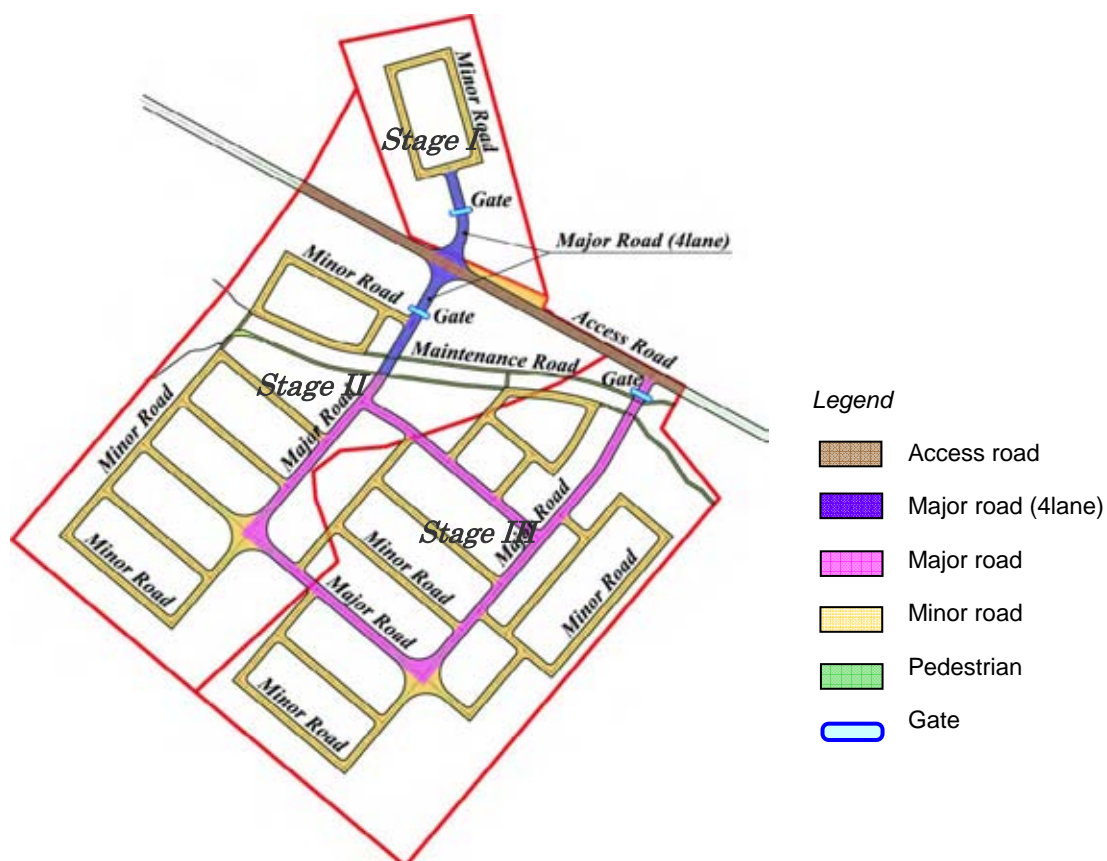
Soil condition in the candidate site varies and consists mainly of sandy soils with minimal moisture content. During the Part 2, soil sampling and core drilling tests were conducted, consequently confirming that the candidate site has a sufficient bearing capacity for foundations suitable to normal building structures. The preliminary planning for land reclamation was conducted using the available topographic data with 0.5 m interval contour lines. It was confirmed that excavation volume is sufficient for embankment in Lots I and II. The excavation volumes for stages I and II are 48,000 m<sup>3</sup> and 550,000 m<sup>3</sup>, respectively.

#### **Wadi improvement**

Improvement of *Wadi* crossing the central part of the candidate site from the west to east direction was planned with respect to its alignment, channel width, channel depth and protection works. Probable flood of 55 m<sup>3</sup>/s once in 50 years is adopted as design discharge for the *Wadi* improvement, in view of safety. Protection works are designed to prevent partial erosion at both river sides, downstream of bridges, and inlet and outlet portion of the area of each construction stage. The design considers the sandy clay condition of the area which is weak against erosion due to water flow.

#### **Internal roads**

In order to attain smooth daily traffic flow (2,730 vehicles/day) inside the Agro-industrial Park in stage II, internal road network was designed according to the classification of major and minor roads. Major roads are supposed to enhance mobility while minor roads maximize accessibility to each factory. Access road to the Agro-industrial Park is directly connected to major roads in order to ensure security control. At each stage, three gates are provided along the major roads. The following figure shows internal road network encompassing major roads (four and two lanes), minor roads (two lanes) and maintenance roads along the *Wadi*, for inspection purposes.



Source: JICA Study Team

**Figure 12 Planned Network of Internal Road**

#### Storm water drainage channel

Despite the relatively small rainfall in Jericho, storm water drainage channel is planned to discharge storm water into the *Wadi*. Storm water inside the Agro-industrial Park is planned to be collected into roadside ditch along the internal road, and then released into the *Wadi*. Pipe culverts are installed at sections where provision of road side ditch is difficult.

#### Power distribution lines

Overhead power distribution lines (33 kV) from the new Dead Sea power station would be extended to each tenant enterprise inside the Agro-industrial Park. Installation of step down transformers to convert 33 kV to 400 V will be planned for small and medium power consumers, while 33 kV line will be directly extended to big power consumers.

#### Water distribution lines

Water distribution facilities consist of water supply tank and distribution pipelines. Storage capacity of water tank was designed, taking into account the hourly water demand fluctuation, necessary water amount for fire fighting and emergency (cut-off of water supply) situations. Diameter of water distribution pipes was designed to accommodate the required hourly maximum water consumption.



#### Wastewater and solid waste collection system

The wastewater collection facilities are planned to collect pre-treated effluent from each factory, and sewage from other facility, in accordance with the following basic concepts:

- Separate system, which is a system for transporting wastewater and storm water separately, while storm water drainage is planned to utilize drain ditch beside the internal road network,
- Industrial wastewater and sewage from toilet are collected into the same pipe to avoid duplication of facilities, and
- Wastewater is transported as free flowing basically by gravity to avoid the possibility of choking in pipes as well as to reduce the cost of construction and maintenance of the pumping system.

#### Security facilities

The security system of the Agro-industrial Park has been studied considering a balance between the degree of risk controls and cost required. In order to consider the facilities for on-site security in the Agro-industrial Park, object persons, key procedures, and infrastructure are identified as follows:

Object persons: Employees, clients, routine transients, and visitors

Procedures: Admissions, inspection, packaging, shipping, receiving, and delivery

Infrastructure: Office building, factories, all infrastructures such as power supply and water supply

The required security system has been studied for each item mentioned above and efficient security system should be arranged considering security levels and potential risks. Nevertheless, it was clarified in the course of Study Part 3 that high security capital and recurrent costs will put the financial burden on a developer, leading to vulnerability of financial feasibility. In Stage I, it is expected that the total pedestrian, vehicle and cargo traffic will be low so that the minimum security requirements may be considered in conducting inspections. The security measures, at the minimum level, consist of fencing, cameras, patrolling cars and control monitoring system. As the Agro-industrial Park progresses and attracts more businesses, reduced processing time will become crucial; hence, the need for more advanced technologies such as high volume scanners will be needed. Provision of scanners and vehicle tracking system (GPS) would enhance security reliability of outbound vehicles, which would render cost-effective transportation to tenants. Further consideration of a cargo tracking system will be discussed in sub-committee on implementation (see page ES-27).

### **3.5 Cost Estimation**

The project cost of the Agro-industrial Park was estimated for off-site and on-site infrastructure and facilities. The cost estimation is based on the unit price as of 2008, which are collected from various price sources such as Jericho Municipality office and manufactures of equipment in Palestine. The project cost comprised of construction costs, land acquisition cost, administration costs, engineering services costs and the physical contingency. The project cost for the stage-wise implementation and the simultaneous

development of stages I and II is shown below.

**Table 9 Project Costs for Stage-wise Development of Stages I, II and III**

Description	Unit: Thousand USD		
	Stage I	Stage II	Stage III
Construction cost	25,361	64,623	51,045
Off-site	10,539	31,059	15,018
On-site	14,822	33,564	36,027
Land acquisition	258	5,166	4,141
Administration	384	1,047	828
Engineering services	3,121	8,500	6,722
Physical contingency	2,913	7,933	6,273
<b>Total</b>	<b>32,036</b>	<b>87,270</b>	<b>69,009</b>
<b>Grand total</b>			<b>188,313</b>

Source: JICA Study Team

**Table 10 Project Costs for Simultaneous Development of Stages (I+ II) and III**

Description	Unit: Thousand USD	
	Stage (I+II)	Stage III
Construction cost	78,564	51,045
Off-site	31,770	15,018
On-site	46,794	36,027
Land acquisition	5,315	4,141
Administration	1,258	828
Engineering services	10,206	6,722
Physical contingency	9,535	6,273
<b>Total</b>	<b>104,889</b>	<b>69,009</b>
<b>Grand total</b>		<b>173,897</b>

Note: USD 1.0 is equivalent to NIS 3.6, Euro 0.7 and JY 108 as of September 2008

Source: JICA Study Team

### 3.6 Implementation Plan

The implementation plan made for the Agro-industrial Park was intended for the stage-wise development and the simultaneous development of stages I and II. The commencement of stage III depends on further discussion with the PNA and Israel, and the progress of land security by the PNA.

	2009	2010	2011	2012	2013	2014	2015	2016
<b>Stage I, II and III</b>	Stage I				Stage II			
<b>1 Land Acquisition</b>	▨▨▨▨				▨▨▨▨			
<b>2 Basic and Detail Design</b>	▬▬▬▬				▬▬▬▬			
<b>3 Tendering</b>		▬▬▬				▬▬▬		
<b>4 Construction</b>			▬▬▬▬▬▬▬▬				▬▬▬▬▬▬▬▬	
<b>Stage I + II and III</b>	Stage I+II							
<b>1 Land Acquisition</b>	▨▨▨▨							
<b>2 Basic and Detail Design</b>	▬▬▬▬							
<b>3 Tendering</b>		▬▬▬						
<b>4 Construction</b>			▬▬▬▬▬▬▬▬					

Source: JICA Study Team

**Figure 13 Overall Implementation Plan**

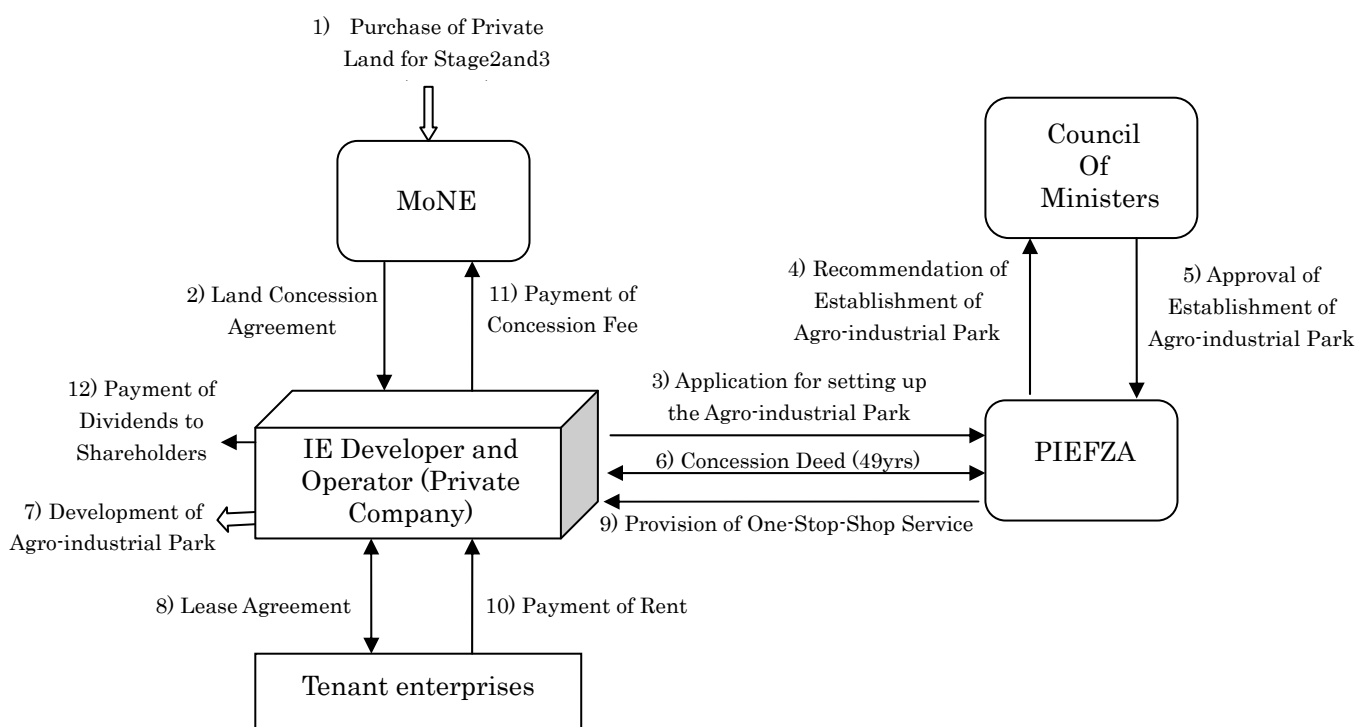
#### 4. Business Plan of the Agro-industrial Park

In order to reduce the financial burden on initial investment and contribute in sustaining the project viability, it is a prerequisite to assume that the lots for stages II and III shall be secured by the PNA and leased to a developer on a concession basis with minimal concession fee. Based on such condition, two business schemes for establishing the Agro-industrial Park may possibly be sought out, namely, by private sector initiative and public sector initiative.

##### 4.1 Business Scheme by Private Sector Initiative: Scheme A

The business scheme by private sector initiative (Scheme A) may be established by a developer as either a subsidiary or a division of an existing company, or a new private company set-up by shareholders with limited liabilities. The prospective developer shall raise capital from the private sector, develop the Agro-industrial Park, and operate and manage it for 49 years based on land concession contract to be concluded with PIEFZA. Meanwhile PIEFZA cooperates with the developer in marketing activities and functions as one-stop shop for providing the tenant enterprises with necessary administrative services at site. The developer shall make a lease agreement with tenant enterprises who are supposed to pay lease and service fees to the developer. Scheme A is a typical business frame by private sector initiative which may be adopted so that the developer will secure enough profit from the development and operation of the Agro-industrial Park for sustainable business and distribution of dividends.

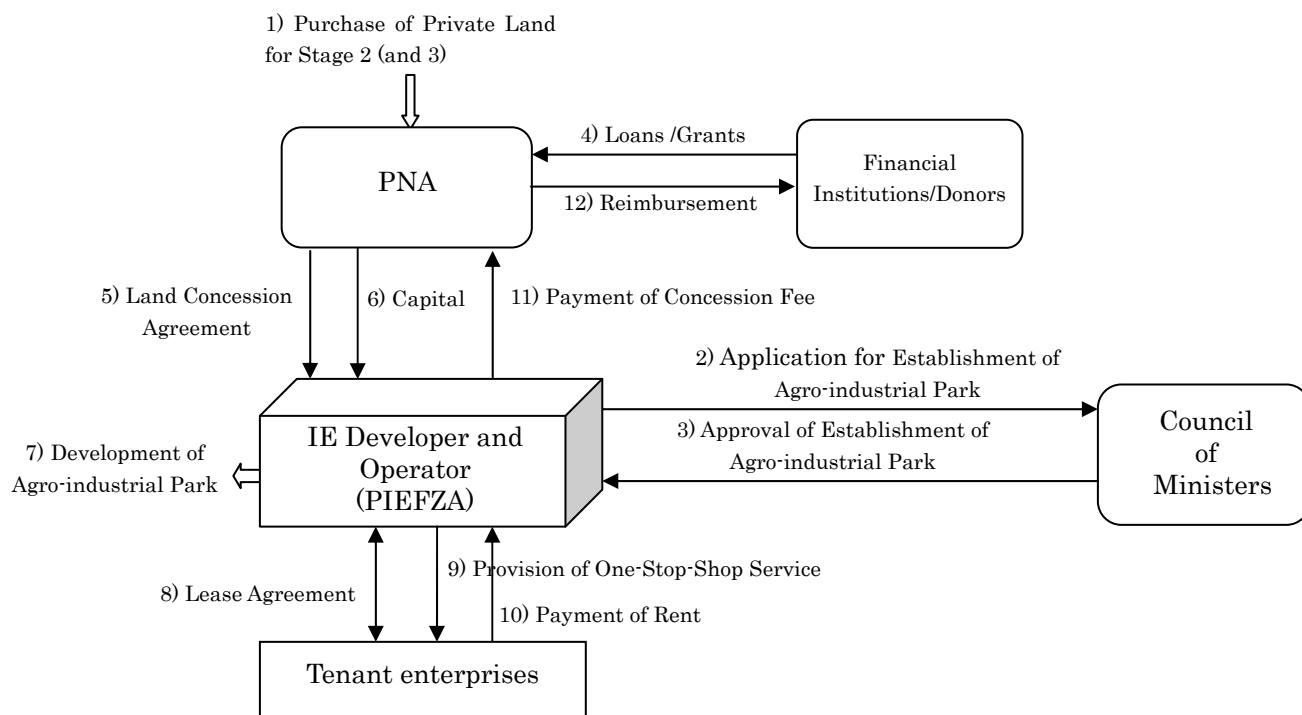
Such business scheme by private sector initiative is shown in the schematic diagram below.



**Figure 14 Business Scheme by Private Sector Initiative**

#### 4.2 Business Scheme by Public Sector Initiative: Scheme B

The business scheme by public sector initiative (Scheme B) needs a public institution who will act as a developer. PIEFZA could be the project executing organization acting as a developer and operator. Article (5).5 of “Law No.10/1998 regarding Industrial Estates and Industrial Free Zone” designates PIEFZA to conduct direct development of industrial estates and industrial free zones. The business scheme by public sector initiative is shown in the schematic diagram below.



**Figure 15 Business Scheme by Public Sector Initiative**

The above scheme is based on a prerequisite condition that capital with larger grant elements shall have to be secured by the PNA in the first place. Such capital shall be taken in by the PNA/Ministry of Finance (MoF) from donors and/or soft loan providers. The soft loans, which would carry much lower rate of interest than commercial loans, would be lent to PIEFZA who would be responsible for generating the profits in order to reimburse loans with interests. On the other hand, the grant fund could be used as part of the capital for development of the Agro-industrial Park without bearing any interest. By utilizing such grant funds and soft loans, the project cost would be reduced since the interest is smaller. Moreover, the executing institution need not seek for more profit, as compared to a private developer, in order to distribute dividends to shareholders. As a result, lease rates of open lots, SFBs or office buildings could be reduced.

Public sector played a major role in the development of various types of zone as noted in China and Thailand. In the Philippines as well, the first four export processing zones (EPZ) were developed by its government.

### 4.3 Lease Rates

Annual lease rates in other industrial estates in Palestine are US\$ 8 to US\$ 12 for open plot, US\$ 26 to US\$80 for plot with factory while those in the industrial estates in the neighboring (Jordan, Syria, UAE and Egypt) countries are far lower, in the range of US\$ 3 to US\$4 for open plot and around US\$ 20 for plot with factory.

On top of it, the manpower cost and utility charges are also lower in those countries than in Palestine. Considering these factors with the restriction on movement of goods and persons and social instability in Palestine, it may be difficult to expect the Foreign Direct Investment (FDI) to flow into the Agro-industrial Park.

**Table 11 Rate Setting in Neighboring Countries**

Country	Name of Industrial Estate	Selling Price (USD/sq meters)	Tenancy Rate (USD/sq meters/year)
Jordan	Abdullah II Ibn Al-Hussein	Open Lot: 75 SFB: 120 – 150	Open Lot: 3.5 SFB: 21.1
	Al Hassan	Open Lot: 42 SFB: 106 – 141	Open Lot: 3.5 SFB: 21.1
	Aqaba International	Open Lot: 40 SFB: 235	Open Lot: 4.0 SFB: 23.0
Syria	Lattakia, Aleppo		Open Lot: 3.0 SFB: 15.0
UAE			Open Lot: 0.46 – 1.8
Egypt	Six of October	Open Lot: 19.3 – 26.4	Open Lot: 1.75 – 3.5 SFB: 3.7 – 7.0
Israel	Erez	Open Lot: 160 – 200	SFB: 48.0
	Tel Aviv	Open Lot: 800	Open Lot: 8.0

Source: JICA Study Team

If the annual lease rates for open plot in the Agro-industrial Park are assumed to be US\$ 10 and an average company in Palestine leases standard open lot of 2,500 square meters in the Agro-industrial Park, the company would have to pay USD 25,000 per year or 16.5% of the average gross value-added in food and beverages manufacturing sector. This implies that the lease rate of USD10 could be beyond the bearable limit small scale private enterprises.

Accordingly, the initial investment cost of on-site infrastructure components would need public financial assistance in order to reduce annual lease rates for open plot and plot with factory in the Agro-industrial Park.

### 4.4 Priority Industries

In food and beverages manufacturing sector of Palestine, the companies with more than 10 employees remained at 135 in 2007.

**Table 12 Number of Operating Establishments in Food and Beverages Manufacturing Sector**

No. of Employee	+100	99-50	49-20	19-10	9-5
No. of Firm	4	7	19	105	386

Source: Table 6-1, Number of Establishments in Operation, PCBS 2007

In order to achieve 90% occupancy planned for stage I and II of the Agro-industrial Park with domestic firms, 42.2% of the existing large-scale firms with more than 10 employees have to move into the Agro-industrial Park within 4 years after its operation starts.

**Table 13 Occupancy Scenario and Number of Firms Required to Establish in Stages I and II**

Year	1	2	3	4
Occupancy Rate	30%	50%	79%	90%
No. of Firm Required	19	32	44	57

Source: JICA Study Team

To fill up the gap between the available number of industrial lots in the park and the number of firms in food and beverages manufacturing sector, the firms in other sectors may have to be taken into consideration the tenant enterprises in the Agro-industrial Park. Nevertheless, it has to be pointed out that, as far as local firms are concerned, there are only about 100 companies with more than 100 employees existing in Palestine. As shown in Table 1, the factory area is planned to accommodate agribusiness industries and supporting industries, whose occupancy rates are 90% and 5% respectively. If other industries are included, the occupancy rates shared by agribusiness industries would be lower than the planned rate (90 %)..

#### **4.5 Financial Analysis**

This section presents the financial viability of on-site development of the Agro-industrial Park based on two business schemes proposed (schemes A and B). The financial analysis of on-site development was made for the cases of “Simultaneous Development of Stages I and II”, “Stage-wise Development of Stages I and II” and “Independent Development of Stage I”. For the purpose of analysis, three options were defined based on the portion of public sector financial assistance regarding on-site development.

a) Option 1

This case implies that a developer finances all the on-site development costs.

b) Option 2

Public financial assistance shall be made to the development of land reclamation, *Wadi* improvement, internal roads, storm water drainage, water supply tank and solid waste collection facilities. The telecommunication distribution facilities are expected to be installed at the expense of the telecommunication company.

c) Option 3

Public financial assistance includes wastewater collection and reclaimed water redistribution facilities, and security facilities in addition to Option 2.

The distribution of initial investment cost in each option is presented in the following table. (“○” indicates that the item will be undertaken by the developer.)

**Table 14 Options and Initial Investment Costs for the Developer**

Item		Option 1	Option 2	Option 3
B01	General requirements	○	○ <sup>*1</sup>	○ <sup>*1</sup>
B02	Land reclamation	○	-	-
B03	Wadi improvement	○	-	-
B04	Internal Roads	○	-	-
B05	Storm water drainage channel	○	-	-
B06	Water distribution facilities	○	○ <sup>*2</sup>	○ <sup>*2</sup>
B07	Power distribution facilities	○	○	○
B08	Wastewater collection and reclaimed water redistribution facilities	○	○	-
B09	Solid waste collection facilities	○	-	-
B10	Telecommunication distribution facilities	○	- <sup>*3</sup>	- <sup>*3</sup>
B11	Security facility	○	○	-
B12	Parks	○	○	○
B13	Office building	○	○	○
B14	Model factory	○	○	○
B15	Car parking	○	○	○
<b>Initial Investment Cost (USD thousand)<sup>*4</sup></b>		<b>Option 1</b>	<b>Option 2</b>	<b>Option 3</b>
<b>a) Stage I Only</b>		<b>18,535</b>	<b>13,411</b>	<b>10,515</b>
<b>b) Stage I, II (Stage-wise development)</b>		<b>60,506</b>	<b>26,356</b>	<b>20,856</b>
<b>c) Stages I + II (Simultaneous development)</b>		<b>58,515</b>	<b>25,230</b>	<b>20,268</b>

\*1 General requirements include contractor's temporary buildings, warehouse and repair shops including removal of these facilities after completion of works. Pro rata allocation is applied for private developer share in Option 2 and 3 based on initial investment cost covered by public financial assistance.

\*2 Water supply tank is implemented by the PNA

\*3 Implemented by the telecommunication company

\*4 Includes administration (1.5%), engineering services (12%) and physical contingency (10%), excluding price contingency

Source: JICA Study Team

Business revenues will be generated from lease rates for open plots, SFBs and office buildings, and service fees/rates covering water supply, sewerage, security charge and other services.

Lot allocation according to development stage is as shown in the table below.

**Table 15 Lot Allocation of Stages I and II, and Stage I**

	Stages I and II	Stage I
Development Area	61.5 ha	11.5 ha
Lease Area	32.01 ha	7.46 ha
(Open Lot)	(26.45 ha)	(3.81 ha)
(SFB)	(2.38 ha)	(2.38 ha)
(Office)	(3.18 ha)	(1.27 ha)

Source: JICA Study Team

Four sets of lease rate package are assumed by referring to the lease rates being applied in the existing GIE and those of the other planned industrial estates in Palestine such as the Jenin and Nablus.

**Table 16 Annual Plot and Office Lease Rates**

	Open plot (USD/ land plot m <sup>2</sup> )	Plot with factory building (USD / land plot m <sup>2</sup> )	Office Space (USD / floor space m <sup>2</sup> )
Lease rate 1	8.00	35.00	70.00
Lease rate 2	9.00	40.00	80.00
Lease rate 3	10.00	45.00	90.00
Lease rate 4	12.00	45.00	90.00

Source: JICA Study Team based on various sources

**Scheme A**

Debt-equity ratio of 1.0 is applied to the initial fund requirement of a private sector developer. A 50 % of debt portion is assumed to be loaned from commercial banks subject to loan conditions (interest rate of 8%, 7 year repayment period after a 2-year grace period).

Financial viability of on-site development is assessed by the equity IRR based on cash flow comprising revenue and cost. Through interview survey of potential developers in Palestine, the expected equity IRR was reported to be 10.6 to 14.5% at constant price. Thus the target IRR was set at 10.5% and, according to the results of financial analysis, the target equity IRR is only achieved in Option 3 with high lease rate scenario in case of simultaneous development of stages I and II.

The results of the financial analysis of Scheme A are shown below.

**Table 17 Financial Analysis Results: Scheme A (Simultaneous Development of Stages I and II)**

Annual lease rate (per m <sup>2</sup> )	Option 1	Option 2	Option 3
Lease rate 1: Open Plot USD 8, SFB USD 35, Office USD 70	Below 0%	Below 0%	0.63%
Lease rate 2: Open Plot USD 9, SFB USD 40.0, Office USD 80	Below 0%	2.40%	4.20%
Lease rate 3: Open Plot USD 10, SFB USD 45.0, Office USD 90	Below 0%	5.00%	7.32%
Lease rate 4: Open Plot USD 12, SFB USD 45, Office USD 90	0.87%	7.76%	10.64%

Source: JICA Study Team Note: Financially feasible options (equity IRR more than 10.6%) are highlighted in yellow

**Table 18 Financial Analysis Results: Scheme A (Stage-wise Development of Stage I, II)**

Annual lease rate (per m <sup>2</sup> )	Option 1	Option 2	Option 3
Lease rate 1: Open Plot USD 8, SFB USD 35, Office USD 70	Below 0%	Below 0%	0.30%
Lease rate 2: Open Plot USD 9, SFB USD 40.0, Office USD 80	Below 0%	1.94%	3.76%
Lease rate 3: Open Plot USD 10, SFB USD 45.0, Office USD 90	Below 0%	4.45%	6.90%
Lease rate 4: Open Plot USD 12, SFB USD 45, Office USD 90	Below 0%	6.95%	9.85%

Source: JICA Study Team Note: Financially feasible options (equity IRR more than 10.6%) are highlighted in yellow

**Table 19 Financial Analysis Results: Scheme A (Independent Development of Stage I)**

Annual lease rate (per m <sup>2</sup> )	Option 1	Option 2	Option 3
Lease rate 1: Open Plot USD 8, SFB USD 35, Office USD 70	Below 0%	Below 0%	Below 0%
Lease rate 2: Open Plot USD 9, SFB USD 40.0, Office USD 80	Below 0%	Below 0%	Below 0%
Lease rate 3: Open Plot USD 10, SFB USD 45.0, Office USD 90	Below 0%	Below 0%	Below 0%
Lease rate 4: Open Plot USD 12, SFB USD 45, Office USD 90	Below 0%	Below 0%	0.30%

Source: JICA Study Team Note: Financially feasible options (equity IRR more than 10.6%) are highlighted in yellow

**Scheme B**

Debt-equity ratio of 4.0 is assumed for scheme B. A public sector developer finances 20 % of the initial investment cost while the remaining 80% is assumed to be loaned from international financial institution(s). Loan scheme assumes an interest rate of 0.75 % plus on-lending rate of 2.75%, with a 30-year repayment period including a 10 year grace period.

Financial viability of on-site development in Scheme B was assessed in comparison with the average cost of capital (4% per annum) in accordance with the Asian Development Bank. The target equity IRR (4.0%)



is achieved in the options of each case shaded in yellow.

The results of financial analysis are shown below.

**Table 20 Financial Analysis Results: Scheme B (Simultaneous Development of Stages I and II)**

Annual lease rate (per m <sup>2</sup> )	Option 1	Option 2	Option 3
Lease rate 1: Open Plot USD 8, SFB USD 35, Office USD 70	Below 0%	5.09%	12.06%
Lease rate 2: Open Plot USD 9, SFB USD 40.0, Office USD 80	Below 0%	15.29%	19.32%
Lease rate 3: Open Plot USD 10, SFB USD 45.0, Office USD 90	0.54%	20.11%	24.03%
Lease rate 4: Open Plot USD 12, SFB USD 45, Office USD 90	7.56%	24.44%	28.51%

Source: JICA Study Team Note: Financially feasible options (equity IRR more than 4.0%) are highlighted in yellow

**Table 21 Financial Analysis Results: Scheme B (Stage-wise Development of Stage I, II)**

Annual lease rate (per m <sup>2</sup> )	Option 1	Option 2	Option 3
Lease rate 1: Open Plot USD 8, SFB USD 35, Office USD 70	Below 0%	2.73%	10.38%
Lease rate 2: Open Plot USD 9, SFB USD 40.0, Office USD 80	Below 0%	14.05%	18.51%
Lease rate 3: Open Plot USD 10, SFB USD 45.0, Office USD 90	Below 0%	19.06%	23.40%
Lease rate 4: Open Plot USD 12, SFB USD 45, Office USD 90	6.65%	22.54%	26.90%

Source: JICA Study Team Note: Financially feasible options (equity IRR more than 4.0%) are highlighted in yellow

**Table 22 Financial Analysis Results: Scheme B (Independent Development of Stage I)**

Annual lease rate (per m <sup>2</sup> )	Option 1	Option 2	Option 3
Lease rate 1: Open Plot USD 8, SFB USD 35, Office USD 70	Below 0%	Below 0%	Below 0%
Lease rate 2: Open Plot USD 9, SFB USD 40.0, Office USD 80	Below 0%	Below 0%	Below 0%
Lease rate 3: Open Plot USD 10, SFB USD 45.0, Office USD 90	Below 0%	Below 0%	5.49%
Lease rate 4: Open Plot USD 12, SFB USD 45, Office USD 90	Below 0%	2.30%	13.75%

Source: JICA Study Team Note: Financially feasible options (equity IRR more than 4.0%) are highlighted in yellow

In order to estimate the possible lease rate reduction in scheme B, the lease rates meeting the target equity IRR of 4 % are calculated. The lease rates reduced are 1) USD 7.9 for open lots, ii) USD 35 for SFBs and iii) USD 70 for offices in Option 2. Meanwhile in Option 3 in the case of the simultaneous development of stages I and II the reduced leased rates are i) USD 7.3 for open lots, ii) USD 35 for SFBs and iii) USD 70 for offices.

### Conclusion

- 1) The financial viability of on-site development in scheme A seems to be low, implicating that it would be difficult to find a private sector developer in this scheme unless the PNA prepares a more attractive incentive package, including subsidies for a private developer.
- 2) The estimated equity IRR in scheme B turns out to be mostly more than the average cost of capital (4% per annum) in the case of Options 2 and 3, except for the “Independent Development of Stage I” case.<sup>7,8</sup>
- 3) In scheme B, the annual lease rates of open plot to meet the target equity IRR of 4% would be reduced to USD 7.9 in Option 2 and to be further reduced to USD 7.3 in Option 3 in the case of the simultaneous development of stage I and II. The estimated lease rates of open plot is competitive to that (USD 8) of the Gaza Industrial Estate (GIE) and lower than the planned rate (USD10) of the Jenin industrial estate.

<sup>7</sup> Scheme B is based on various assumptions such as PIEFZA as a public sector developer and financial affordability of the PNA for equity finance and favorable loan conditions.

<sup>8</sup> Even the lowest assumed lease rates seem to be unaffordable by many SMEs in the food and beverages sector in Palestine, taking into account the current annual average rents they are paying .

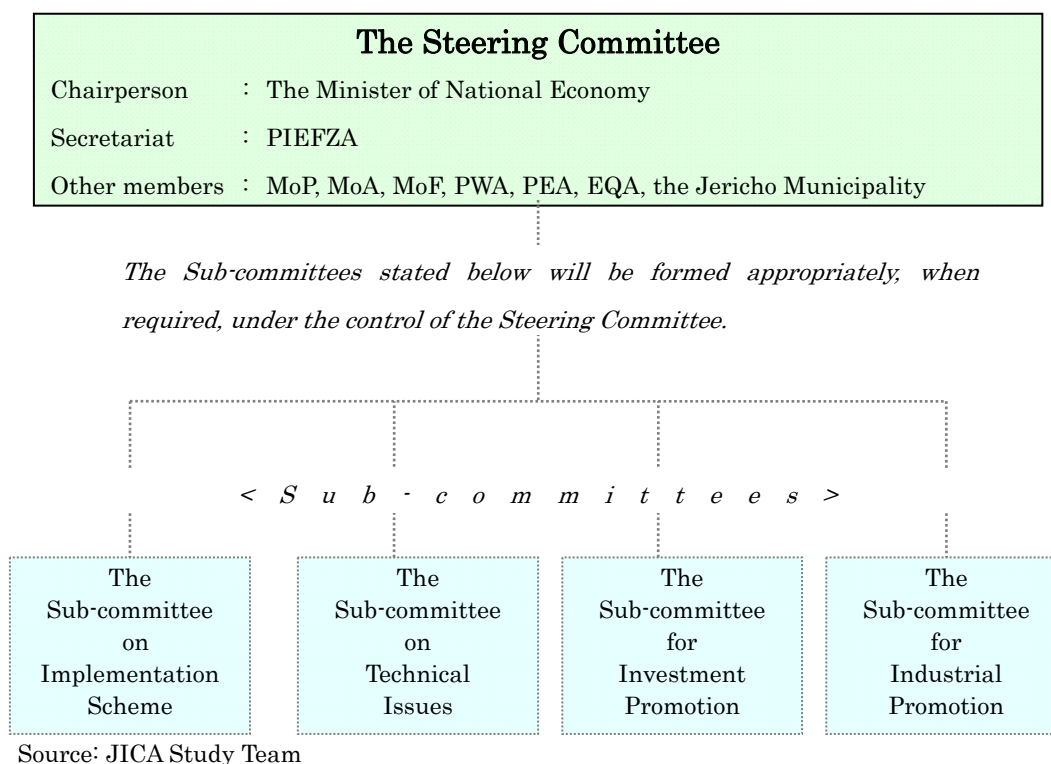
4) In scheme B, the annual lease rate of open plot to meet the target equity IRR of 4 % is estimated to be USD 9.9, which is still higher than the prevailing rates (i.e. USD 8 in GIE and those in the industrial estates in the neighboring countries). In order to further reduce lease rate for attracting investors, the further option with more grant elements will be required.

## 5. Administrative Arrangements and Business Support

### 5.1 Organizational Arrangement for Implementation and Management

For the organizational arrangement for implementation and management, it is recommended that the Minister of National Economy (MoNE), in association with the relevant administrative bodies inside the PNA, the local government and other relevant entities, should set up a steering committee in order to further discuss at the technical level the fields related to i) organizational and financial arrangements of project implementation, ii) technical issues on project implementation, iii) investment promotion and iv) industrial promotion.

The steering committee is proposed to be supported by in-depth, area-specific discussions of its sub-committees on implementation schemes, technical issues, investment promotion, and industrial promotion as shown in Figure 16. The discussions and the decisions of the committee and its sub-committees should be conveyed without delay to relevant stakeholders and the donor community, for the efficient implementation of the project.



**Figure 16 Proposed Organizational Structure of the Steering Committee**

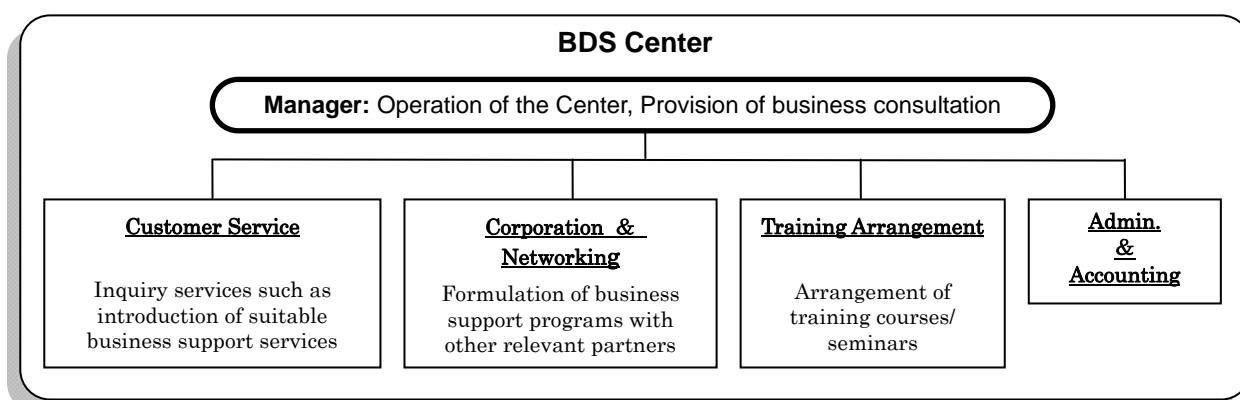
The institutional capacity strengthening of PIEFZA as implementing agency will be necessary in the aspects of human and financial resources. It is recommended to hire skilled experts and/or train existing staff with financial or technical assistance from the donor community. As a regulatory and supervisory administrative body, PIEFZA will need human resource capacity strengthening to fulfill internal control and supervision on the development and management of the Agro-industrial Park. This will also be relevant in monitoring the project performance and development, and in publishing reports. PIEFZA should promote investment in the Agro-industrial Park, while technical assistance will be significantly sought to support their capacity building. The one-stop shop service will require not only the capacity building of PIEFZA but that of all the relevant administrative bodies as a whole. As sole window for the investors of the Agro-industrial Park, PIEFZA should streamline all the necessary administrative procedures for industrial estates development in close cooperation with other relevant agencies.

The institutional arrangement of the off-site infrastructure operators will require further discussions among the concerned stakeholders at the steering committee. The on-site project facilities will principally be constructed and operated by PIEFZA. Some of the off-site facilities meanwhile may be constructed and operated by utility operators, while others by PIEFZA or other public entities.

## **5.2 Business Support Scheme for Industrial Promotion**

Since most of the agribusiness and food processing industries in Palestine belong to small and medium scale enterprise (SME), appropriate support schemes which would enhance their business activities should be developed to attract them in investing in the Agro-industrial Park.

Thus, the BDS<sup>9</sup> Center which aims to provide various kinds of business supports such as introduction/development of business support schemes, arrangement of trainings/seminars, and provision of market information/business consulting services, is proposed to be established in the Agro-industrial Park. This center would be managed by designated staff from MoNE. The following figure shows the expected organization structure of the BDS Center.



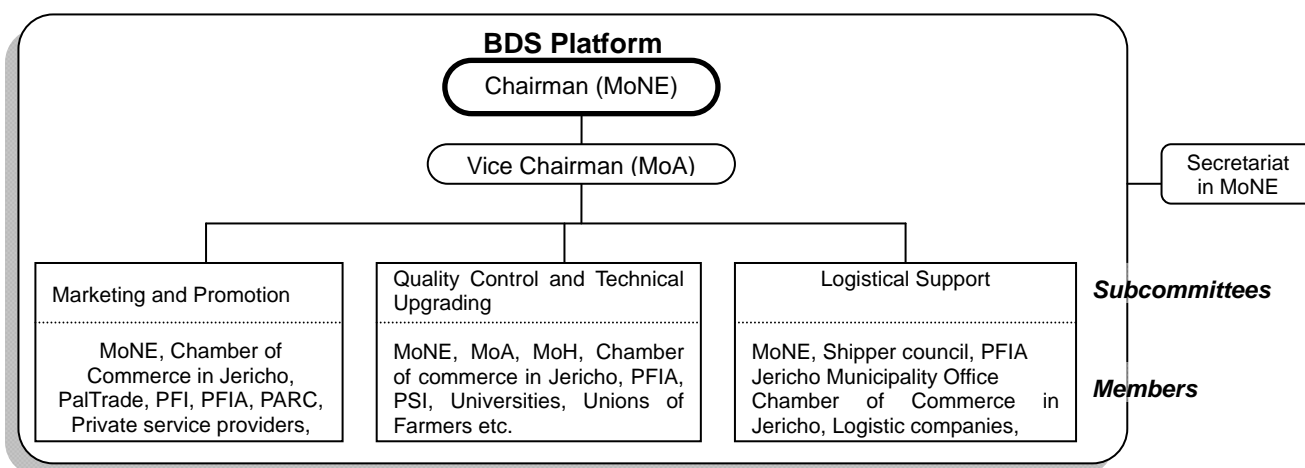
Source: JICA Study Team

**Figure 17 Expected Organization Structure of BDS Center**

<sup>9</sup> BDS (Business Development Service) is defined as “a variety of business services which shall improve the marketing performance of enterprises such as accessibility and competitiveness”. BDS include training, consultancy and advisory services, marketing assistance, information, technology development and transfer, and business linkage promotion.

The operational budget of the center must be fully supported by the public sector during at least the initial stage. However, from the viewpoint of long-term sustainability of the BDS Center, it would be considerable to adopt a self-income system by collecting membership fees or service fees from the tenant enterprises in the future. The amount shall be based on the increasing number of tenant enterprises as well as improvement of services provided by the BDS Center will be temporarily set up in an office building intended for the Agro-industrial Park. The BDS Center will move to its new permanent building once constructed, and should start providing more enhanced services.

In order to discuss a wide range of issues which may not be solved by the BDS Center alone, and to determine practical solutions with necessary assistance from the government, the BDS Platform chaired by MoNE is proposed to be established as an advisory committee to the BDS Center. The members of the BDS Platform would be comprised of relevant governmental agencies, business associations, NGOs (non-profit organizations), universities, and private service providers for business support.

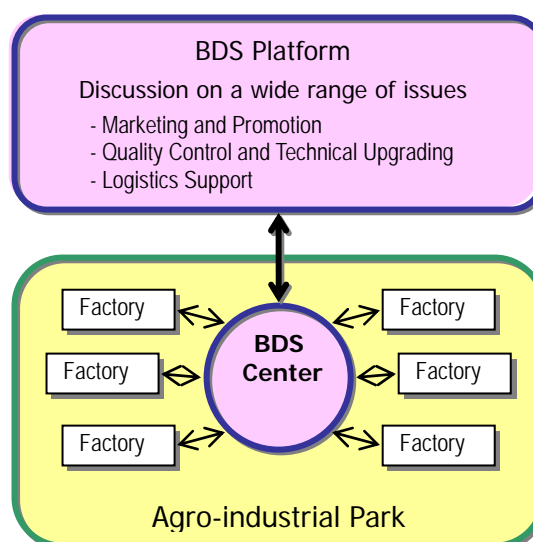


Source: JICA Study Team

**Figure 18 Schematic Image of BDS Platform**

As a first step towards mobilization of the BDS Platform and the BDS Center, three subcommittees corresponding to its possible primary services would be set up, i.e. i) marketing and promotion, ii) quality control and technical upgrading, and iii) logistical support.

Through the interaction between the BDS Center and the BDS Platform, a practical feedback system for solving problems of the tenant enterprises would be established under the cooperation between the public and private sectors. This feedback system would be a good model for industrial promotion in Palestine.



Source: JICA Study Team

**Figure 19 Schematic Image of BDS Platform and BDS Center**

## **6. Conclusions and Recommendations**

Phase II Study concludes that a business scheme by the private sector initiative would be difficult for the Agro-industrial Park development based on the results of financial viability of a developer. Therefore, a business scheme by the public sector initiative would be assumed for further discussion on the development of the Agro-industrial Park. In line with this, the conclusions and recommendations towards the implementation stage would be presented as a result of this feasibility study.

### **(1) Business Schemes of the Agro-industrial Park**

The Study presents two business schemes, i.e., .by a private developer and by a public developer. For both schemes the financial analysis is made based on public financial assistance options in which part of the on-site infrastructure would be financed through grant funds from donors since it was realized that financial viability of a developer is difficult to attain without public financial assistance.

The financial analysis is made for i) the simultaneous development of stages I and II, ii) stage-wise development of stages I and II and iii) independent development of stage I. This was initiated by setting options on the combinations of public financial assistance and annual lease rates. It is noted that the lease rates are found to be higher than the prevailing market rates in the neighboring countries such as Jordan.

In the case of the simultaneous development of stages I and II, only the option of combination of higher annual lease rates and higher public financial assistance sustains the financial viability of private sector's business scheme. No option satisfies the financial viability of a private developer in the cases of stage-wise development of stages I and II, and independent development of stage I.

This implicates the difficulty in finding a private developer and tenant enterprises for the Agro-industrial Park under a business scheme by private sector initiative.

Meanwhile, the results of financial analysis based on the business scheme by public sector initiative were found better than that of the private sector initiative.

In the case of the simultaneous development of stages I and II, financial viability of a public developer is sustainable considering combinations of public financial assistance and lower annual lease rates. These implicate that the business scheme by public sector initiative would be possible as indicated in tables 20, 21 and 22.

### **(2) Conditions for the Agro-industrial Park Development by Public Sector Initiative**

The conditions for the Agro-industrial Park development based on public sector initiative by a public developer are:

- a) Public financial assistance for part of the on-site infrastructure and facilities
- b) Equity funding from the PNA for 20 % of the initial investment cost
- c) Borrowing soft loans from international financial institutions for 80 % of the initial investment cost

- d) Institutional strengthening of PIEFZA as a public developer
- e) Investment promotion by a developer to fulfill occupancy scenario (30 % in 1<sup>st</sup> year, 50 % in 2<sup>nd</sup> year, 70 % in 3<sup>rd</sup> year and 90 % in 4<sup>th</sup> year) applied in the financial analysis
- f) SME development to increase the number of firms that would qualify for the operational requirements in the park, in terms of operation scale, product quality, profitability, exports orientation, etc.

The PNA must take necessary actions to satisfy the above conditions towards the implementation of the Agro-industrial Park. The requirement of PNA's equity for 20 % of the initial investment cost and soft loans for 80 % of it is just one scenario so that the concerned stakeholders are requested to discuss the appropriate portion of equity and soft loans.

### **(3) Recommendations on Important Issues**

Through all the chapters of this report, undertakings and important assumptions necessary to be seriously considered by the PNA are specified. Consequently, recommendations on some of the important issues from the preparatory stage of the Agro-industrial Park development are stated below.

#### **Steering Committee**

The steering committee, consisting of four sub-committees, for the Agro-industrial Park development was proposed in the course of the Phase II study. Provided that the business scheme by public sector initiative is accepted by the PNA, the steering committee shall convene immediately in order to discuss the i) implementation scheme, ii) technical issues, iii) investment promotion and iv) industrial promotion. The priority issues to be discussed are:

- a) Organizational and financial arrangement for the Agro-industrial Park development
- b) Investment promotion by public initiative
- c) Institutional arrangement for construction and management of the off-site infrastructure
- d) Establishment of the BDS Platform

The organizational and financial arrangement for implementation of the Agro-industrial Park development project will be the urgent subjects to be discussed among the principal members' organizations of the steering committee. MoNE and PIEFZA shall be responsible for implementation structure of the project while MoP and MoF shall be responsible for financial arrangement (grant or soft loan) from donors or international financial institutions.

The PIEFZA Board of Directors is responsible for promoting industrial estates locally and internationally. Investment promotion by public initiative implies institutional strengthening of the PIEFZA in the area of investment promotion. It shall be required to increase its marketing staff that will focus and facilitate the local target firms for the Agro-industrial Park. The PIEFZA will also be requested to facilitate FDI promotion in cooperation with the relevant organizations such as PIPA and PalTrade. These issues are to be discussed in the sub-committee on investment promotion.

Construction and management of the off-site infrastructure in the Agro-industrial Park development project require discussions on role-sharing and demarcation in construction, operation and maintenance, as well as cost-sharing in operation and maintenance. These issues are to be covered by the sub-committee on implementation scheme and technical issues.

The BDS Platform, designed as an advisory committee under a public-private partnership, will be the first step to realize the business support services to be implemented in the proposed BDS Center. The sub-committee on Industry Promotion should do the preparatory works for the establishment of the BDS Platform.

#### **Movement and Access**

In connection with the simultaneous development of stages I and II, there would be a need to initiate further coordination with Israel security authority concerning access road A-2, and smooth passage of goods and people to and from the Agro-industrial Park. The PNA is requested to hold a series of meetings to resolve the following issues:

- a) Conversion of Area C to B in lands where Access Road A-2 is planned.
- b) Facilitation of smooth passage of cargoes and people through the near-by checkpoint (Jericho DCL checkpoint), including inbound transportation for raw materials, and obtaining permission for outbound transportation from the Agro-industrial Park through the Jericho DCL checkpoint
- c) Special treatment for commuting employees, and inbound and outbound transportation vehicles to facilitate passage through other checkpoints

#### **Investment Promotion**

During the Study Part 3, the convention entitled “Investors and Business People Meeting to Promote the Agro-industrial Park in Jericho” was held in Ramallah-Palestine, Amman-Jordan and Dubai-UAE in November 2008 with the aim of inviting potential investors to the Agro-industrial Park. Throughout the course of the discussions at these seminars, The followings were identified as the urgent needs below:

- a) The Ramallah meeting covered various inquiries and comments related to the Agro-industrial Park, while the discussions held in Amman and Dubai concentrated on the investment environment in Palestine. The investment promotion strategy for foreign enterprises would need provision of a comprehensive set of investment-related information.
- b) The Ramallah meeting accommodated participants including those from 38 private enterprises. Successive investment promotion in Palestine should target these participants as potential investors.
- c) The Amman meeting accommodated participants including those from 33 private enterprises, where most of which were in agribusiness trading fresh vegetables and fruits. Successive investment promotion in Jordan should attract the agribusiness sector.
- d) The Dubai meeting was attended by seven participants from private business communities. Successive promotion in Dubai would require needs assessment of investment in Palestine.

Based on the results of the three meetings, the sub-committee on investment promotion should discuss strategy focusing on target potential investors based on their information and profile. Investment promotion would need various supports from the concerned stakeholders such as Paltrade, PFIA and MoNE. In the meantime, the staff of PIEFZA should be trained under the internal training programs and technical assistance extended by donors.

#### Amendment of PIEFZA Law

The current PIEFZA Law (PIEFZL) is legally ambiguous in the areas of industrial estates in terms of its objective, i.e. industrial promotion, ii) license and regulation applied to tenant industries, and iii) income tax incentives according to the size of investment. In particular, the current PIEFZA Law should make clear license, regulation and incentives for export industry in industrial estates. For instance, it is not clear whether they would be subject to the same regulations and incentives that are applied to export industries in industrial free zone. Further the Law does not clarify income tax incentives which are presented in PIPA Law. PIPA is requested to coordinate with PIEFZA for amendment of the PIEFZA Law.

The PIEFZL stipulates PIEFZA as the regulatory and supervisory body for the development and management of industrial estates. Since PIEFZL refers to direct development of industrial estates by PIEFZA, it is recommended that its mandate as a public developer shall be subject to careful review. If considered necessary, said law should be amended to realign its regulatory and supervisory functions, and its status as an implementing agency. Institutional strengthening of PIEFZA as a public developer would cover a wide range of issues such as its legislative status as a public developer, organizational arrangement for on-site management, investment promotion strategy and activities, and coordination with relevant agencies regarding the off-site operation and management.

#### **(4) Proposed Undertakings by the PNA for the Agro-industrial Park Development**

Based on the results of the feasibility study, the PNA is requested to satisfy the following conditions for the Agro-industrial Park development.

- (a) In order to secure occupancy scenario, alternative measures have to be prepared to sufficiently increase the local firms involved in food and beverages manufacturing sector. The firms in other sectors must also be encouraged to shift their operations in the park.
- (b) The PNA is requested to establish and implement the strategic policies for trade facilitation and investment climate improvement.
- (c) Investment promotion regulatory framework must be reassessed and improved to be more orderly and competitive.
- (d) Cooperative scheme must be established between PIPA and PIEFZA.
- (e) The measures to strengthen the capacities of PIEFZA have to be sought and implemented.
- (f) The PNA has to secure grants from donors for off-site infrastructure, and part of the on-site infrastructures for stage I and II in the cases of both stage-wise and simultaneous development. This



shall also be initiated for most part of on-site infrastructure for stage I in the case of independent development of stage I only.

- (g) In case of scheme B, the PNA has to allocate its own portion of fund as part of the initial investment cost for on-site construction.
- (h) In case of scheme B, the PNA has to secure enough soft loans from international financial institutions in order to cover the remaining investment cost for on-site construction.
- (i) The PNA needs to start discussing “movement and access” issues with the Israel security authority at the earliest possible stage, considering the timeframe of the Agro-industrial Park development.
- (j) The urgent policy decision by PNA on solid waste treatment in Jericho is a pressing issue, considering the construction of the Agro-industrial Park and rapid increase in the number of residents and visitors.
- (k) The measures to keep transparency in implementing and operating the Agro-industrial Park have to be established.
- (l) PNA needs to materialize SME development and support policies to enhance the capacity of small and medium scale of enterprises.
- (m) The current income tax incentive is given to investors whose investment amount is more than USD 100,000 according to the “ Law No. 10/1998 regarding Industrial Estates and Industrial Free Zones Law”. In the meantime, it is significant to attract SMEs which have not enjoyed current tax incentive in order to facilitate more investment in the Agro-industrial Park. Therefore the minimum investment ceiling currently provided to the enterprises with investment amount of USD 100,000 should be lowered.