MINISTRY OF AGRICULTURE
PALESTINIAN WATER AUTHORITY
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THE FEASIBILITY STUDY
ON
WATER RESOURCES DEVELOPMENT AND MANAGEMENT
IN
THE JORDAN RIVER RIFT VALLEY

FINAL REPORT

VOLUME-IV
ANNEXES-C

DECEMBER 2008

JAPAN INTERNATIONAL COOPERATION AGENCY

NIPPON KOEI CO., LTD.

THE FEASIBILITY STUDY
ON
WATER RESOURCES DEVELOPMENT AND MANAGEMENT
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LIST OF VOLUMES

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DESIGN REPORT

Detailed Design Study for Pilot Project for Improvement of Nwai'mah Spring Water Conveyance System

December 2007

2. EXISTING SITUATION AND CHARACTERISTICS OF NWAI'MAH VILLAGE

The main current constraints on the efficient use of the Nwai'mah Spring water are the poor conditions of irrigation canals.

It is important to understand the existing and future proposed method of irrigation water supply for the whole Service Area, as this will form the design for those areas under consideration. This is especially true with regard to the locations of future possible development.

2.1 General Description of the Project Area

2.1.1 Project Site

The project area is located in the Jordan Valley about 4.5 km to the north of Jericho City. A general location map of the project region is presented in the package of drawings. The Nwai'mah village has an elevation of about 75 meters below the mean sea level. The project area presents a very favorable environment for irrigated agricultural production. In general, the project site has a variable topography(steep slope, flat, green areas and park area. Nwai'mah lands are formed of Nwai'mah AL Fuqa and Nwai'mah Al Tahta, which is adjacent to the abandoned Nwai'mah Refugee Camp to the east. Tall As-Sultan Camp is located to the south of the village. Wadi Al Nwai'mah passes near the village. The Nwai'mah village is one of the small villages in the Western Ghor.

2.1.2 Area and Irrigated Land

Currently, the irrigated area is about 41% of the potential irrigated land area in Nwai'mah village that is about 5,240 dunums. This is attributed to the limited resources of water available in the area, the poor conditions of the canal, the great losses of spring water, and other financial problems.

It is reported by the Agricultural Department in the City of Jericho that the total agricultural lands of the Nwai'mah village is about 2,182 dunums. 1,097 dunums (50.3% of irrigated land) are planted with banana, 1,018 dunums (46.7% of irrigated land) are planted with different types of vegetables. The remaining area (3%) is planted with other field crops.

2.2 Existing Irrigation System

The Nwai'mah Spring is located in the eastern slopes of the West Bank. Nwai'mah irrigation system is located in and around the village of Nwai'mah. The lack of maintenance and rehabilitation of the existing canal reduce significantly the canal conveyance efficiency. The people are the owners of the land and they have rights to the water of the Nwai'mah Spring feeding the existing irrigation system. The source of the spring is located about 2 km to the north of the Village and is accessible through a pathway that is around 300 meters away from the paved road. The spring has an average flow of around 316m^3/hr.

The existing irrigation system consists of the main canal, which flows through the land of the upper and lower Nwai'mah, branches from the main canal; the sluice branches convey the water from the main canal to the irrigated farms. Each branch serves many farms through intake canals constructed on the branch canal by the farmers themselves using the sluice gates

system. Most of the time, the water from intake canals is stored in storage ponds to be used later for irrigation.

2.2.1 Existing Main Canal

Main Canal: The existing irrigation system can be best described as follows: water form the spring flows through an earth canal for the first sixty-seven meters and then flows through a concrete canal. The concrete canal has a rectangular cross section of about 40x50 cm. The dimensions are not fixed along the canal and they vary from part to part due to the irregular maintenance carried out through the years and due also to scouring activities in the canal itself. After running for 289 meters from the source, the canal has then to cross a wide deep valley. The water crosses a wadi via a 16" diameter steel pipe over a length of 68.2 meter. The pipe has been constructed after the damage of the ancient bridge over which the canal used to pass. After crossing the wadi, the canal then goes before and through Banana Park where the canal is used for tourist activities. After the park, the canal starts to cross the land of the Duyuk village. The canal crosses the main street, which connects Jericho with Ramallah, near the Village Council building to go through the upper Nwai'mah land. In this section of the canal, two branches carry the water to the farmers there. The total length of the main canal is about 5,528 meter; the portion of this project has a concrete canal length about 1293 m, which has nine connections along this canal from the source to the firs branch after 1428 m, but it not used since 1970.

The water of the spring used to flow through natural path to join the Wadi of Nwai'mah. By the end of the 1930's, a cemented canal had been built to convey water from the source of the spring through an ancient bridge over the wadi to the center of the recent village. In the 1940's, the rest of the recent main canal had been constructed to supply water to the rest of the lands of Nwai'mah. The last part had been implemented after one of the families agreed to fund the construction of the canal. Since that time, many rehabilitation activities have been done on the canal, the major and final rehabilitation was in the 1970's, when the ancient bridge was damaged by the flooded Wadi of Nwai'mah. The open canal over the bridge was replaced by a hanged pipe crossing the wadi instead of the damaged bridge

2.2.2 Existing Branches

Branches of the Canal: The existing irrigation system used in the Nwai'mah village is a very old one. The branches have the same cross section as the main canal, which ensures proper distribution of the water in accordance to the prevailing rotation system of irrigation. There are nine branches along the main canal, and each branch supply water to several farmers through their own private canals.

2.2.3 Existing Resources (Nwai'mah Spring)

Water resources in the Western Ghor area are very limited. Springs in the area are the outlets of the aquifers and are considered as the major source of water. The existing public resources, which supply the village irrigated service area, include only one spring, which is, Nwai'mah Spring.

In the surrounding area of the Nwai'mah village, there are three springs, which are Duyuk, Nwai'mah and Shoseh springs. The source of the three springs are few meters separated from each other and they yield from the same aquifer i.e., Lower Cenomanian. Table 2.1 gives

basic information about the springs. The information includes the Palestinian local grid reference, altitude and the aquifer that the springs yield from.

Table 2.1
Basic Information of the Springs in the Project Area

Spring	Grid Reference (E/N) Km	Altitude MSL	Aquifer
Duyuk	190.050/144.660	-115	Lower Cenomanian
Nwai'mah	190.040/144.720	-110	Lower Cenomanian
Shoseh	190.000/144.800	-110	Lower Cenomanian

Source: West Bank Water Department / Hydrology Division.

2.2.4 Major Problems of the Existing Canal

(A) Losses: losses in the canal are due to the following reasons:

1) Leakage from the canal is remarkably high; the canal is very old and no maintenance has been done since the 1970's, many parts of the canal have cracks, this is clearly observed in different places. No measurements have been carried out to estimate the water quantities lost through cracks. Also, there is high rate of vegetation growth around the canal, which occurs due to the cracks, and high rate of evapotranspiration.
2) Evaporation: The monthly evaporation ranges from 59 mm in December to 298 mm in July. If the evaporation of the running water in the canal is considered to be the same as settled water, the rate of evaporation along the canal of length 5,528 meter will range from 4.1 m^3 to 26.2 m^3 per day. This amount of losses due to evaporation contributes a percentage from 0.05% to 0.32% of the annual discharge of the spring.

(B) Damages: Along the irrigation main canal and branches, two types of damages have been observed:

1) Damages caused by boulders and sediments due to natural and human activities. This type of damage disturbs the free flow of water and decreases its efficiency of conveying water, and causes flooding of water at the sides of the canal.
2) Damages due to the cracks in the canal which is remarkably observed in many parts of the canal e.g., near the source of the spring and the area before the Banana Park. The occurrence of the crack causes a high rate of loss in the water quantity.

(C) Pollution: The water of the canal can be easily polluted by human beings who are using the canal for washing activities and by the livestock grazing around the area.

(D) Operational Problem: Steel gates are used to direct and separate the flow of the water in the canal. The used gates are not working efficiently because they are very old and rusty.

2.2.5 In-Farm Irrigation System

The development of the in-farm irrigation system is beyond the objectives of this project. The in-farm irrigation system depends mainly on the ponds for storage. In most of the farms, the water from the intake is being stored in ponds. From the pond, the water is pumped and

distributed to the irrigated land through plastic pipes. The distribution of water is either by using pumps or by gravity, depending on the elevation of the land compared to the elevation of the pond. If the elevation of the pond supplies the required head for the trickles no pumps are needed, but this is not the case most of the time in the Nwai'mah village. Most of the village farmers are using ponds for storage. It has been noticed that some farms have more than one pond depending on the amount of water to be stored, and many farmers are sharing in one pond.

According to the Agriculture Department of Jericho, the average surface area of the pond is three dunums, with average volume of 1,500 m^3. The ponds used for irrigation are mainly earth ponds lined by plastic sheets to prevent percolation. In Nwai'mah village, most of the ponds are earth ponds while a few are concrete ones.

2.3 Feasibility Study for Nwai'mah Irrigation Project

In this study, the problem of the Nwai'mah existing irrigation system has been analyzed in order to Rehabilitate and design a new transmission line instead of the existing open canal.

This study summarized the proposed solution for the existing open canal problems, these problems are water losses, water pollution, canal blockage by sediments, canal corrosion, and disability of developing the irrigation system inside farms.

2.4 Quality of the Spring Water

Availability of Data: Continuous and periodical testing program of the water quality of Nwai'mah Spring is implemented. Physical, chemical and bacteriological tests are carried out. The tests are carried out by the Hydrology Department of the West Bank Water Department (WBWD) which belongs to the Palestinian Water Authority (PWA). The physical, chemical and biological properties of the spring water are tested twice per year in April and October.

The Palestinian Fresh Water Springs Description, flow and water quality data 1970-1994, M. Nuseibeh & T. N. Eddin, 1995 considered Nwai'mah Spring as a fresh water spring and they present only two measurements: the Chloride (Cl) which was 32 mg/l and the Nitrate (NO_3) which was 18 mg/l. These values represent the quality up to 1994.

The location of connection points from the canal to the irrigated lands has been provided from the head of the village council (Mr.Galeb), as the consultant CEP asked the council to show the CEP surveyor the exact locations of the connection points and on which side of the canal. Also, the characteristics of the canal and the project area conditions.

3. DESIGN CONSIDERATION

3.1 Summary of Design Criteria

This section summarizes the criteria and basis for the design purpose. Design is based upon fulfilling the objectives of the TOR of the Project and the results of meetings.

3.1.1 Design Area

Project Site: The project area is located in the Jordan Valley about 4.5 km to the north of Jericho City. The Nuweimeh village has an elevation of about 75 meters below the mean sea level and the project elevations between 150 to130 meter below sea level. The Nuweimeh village local grid reference is between 190,000 and 194,700 East and between 142,810 and 144,715 North.

Area and Irrigated Land: Currently, the irrigated area is about 2,200 dunums, which is equivalent to 41% of the potential irrigated land area in Nuweimeh village that is about 5,240 dunums.

The Design Area: It is defined hydraulically as the source, which is Nuweimeh Spring and the main canal and connection gates ,the existing canal transmit the water from the source extending to the first branch, so the total length of this project will be 1428m.

3.1.2 Water Source

The existing public resources, which supply the village irrigated service area, include only one spring, which is, Nuweimeh Spring and its characteristics are presented in Table 3.1.

Table 3.1
Basic Information of the Spring

Spring	Grid Reference (E/N) Km	Altitude MSL	Aquifer
Nuweimeh	190.040/144.720	-110	Lower Cenomanian

Source: West Bank Water Department / Hydrology Division.

The available resource for the design horizon has been assumed fixed and it is only the existing spring of Nuweimeh. The resultant estimated flow would then remain fixed for the purposes of these designs.

3.1.2.1 Average Flow of the Spring

According to the discharge presented in the conceptual report, the average flow of the spring has been calculated and the values are presented Table 3.2.

Table 3.2
Flow Rates of Nuweimeh Spring

Flow State	Measured Monthly Flow in Last 30 Years												Average Flow Rates		
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	l/sec	$10^3 m^3$ /yr.	m^3/hr
Max. (last 30yrs)	104	110	118	113	112	106	103	100	99	109	100	97	102.2	3224.3	368.1
Min. (last 30yrs)	53	64	67	49	70	61	58	56	55	53	49	58	65.8	2074.4	236.8
Ave.(last 30yrs)	84.3	89	92.3	89.1	88.9	87	85.3	79.5	77.8	76.2	75.6	77.2	85.9	2709.4	309.3
Max. (last 10yrs)	104	110	113	113	111	106	102	86	87	86	86	87	102.2	2747.7	368.1
Min.(last 10yrs)	78	87	89	84	82	83	86	68	67	65	60	60	81.2	2736.3	292.4
Ave. (last 10yrs)	91	96	100	99	95	95	93	79	78	75	75	77	87.9	2770.9	316.3

3.1.3 Pipe Hydraulics

The design criteria adopted for the different parameters are:

- **Pipe Material:** HDPE, Steel, and UPVC pipes have been compared and the use of each type has been investigated in the conceptual phase. It is recommended to use High-Density Polyethylene (HDPE) pipes in the Nuweimeh Irrigation Project. The characteristics and local experience show that using HDPE pipes is recommended compared to using UPVC or steel pipes for sustainability, chemical resistance, flexibility, durability, etc.
- **Minimum Velocities:** 1.0 m/s for distribution network, and to be met at the average demand level.
- **Maximum Velocities:** According to Table 3.3 below.

Table 3.3
Maximum Velocities

Pipe Diameter (D) (mm)	Maximum Velocity (m/s)
$50 \leq D < 100$	1.25
$100 \leq D < 300$	1.50
$300 \leq D < 500$	2.00

- **Roughness Coefficient:** Pipes material will be HDPE treated for irrigation water, C is taken to be 100.
- **Maximum and Minimum Peaking Factors:**
  - As discussed earlier in section 6.1.2.3, the maximum peaking factors are calculated as follows:
    - ✓ Monthly Peak Factor = 1.14
    - ✓ Yearly Peak Factor = 1.16
    - ✓ The Global Peak Factor (1.14*1.16) = 1.33
  - The minimum factors are as follows:
    - ✓ Minimum Monthly Factor = 0.85
    - ✓ Minimum Yearly Factor = 0.92

✓ The Global Minimum Factor (0.92*0.85) = 0.78

- **Average Supply (Flow) and Demand**
  - Source will include existing spring of Nuweimeh.
  - Demands will be a function of the water rights shares.
  - Maximum demand will be on one node and approximate 420 m^3/hr.

3.1.4 Demand of Irrigation Water

The transmission system is designed on the basis that it can deliver the available resources during the design horizon. It is important to realize that the instantaneous flow rate, delivered to farms may be in excess of the average daily demand or less than this demand. But as long as this project aims to distribute the irrigation water according to the existing historical water rights, the demand will not be the major criterion for designing the system.

3.1.5 Facility Capacity Requirements

The facility capacities defined below are those which used in the development of the design for the project area and which must be fulfilled for the hydraulic requirements.

- Settling Basin - Capacity = 16 m^3,(4m*2m*2m)
- Transmission Mains - Maximum velocity 2.0m/s
- Flow Control System - manual gate valves.
- Pipe Diameter - HDPE100 DN 350 mm.

3.2 Development of the Design

3.2.1 Topographical Survey

The Consultant signed an agreement with a professional surveyor to provide professional survey services for the Project of Nuweimeh Irrigation System.

The survey has been conducted and it covered the main canal, connection points and branches. Coordinates and level points have been taken on the center line, sides and around the canal and branches.

A plan of a scale 1:1000 of the existing canal and all connection points has been prepared. Highest and lowest points of every farm have been taken into consideration. The coordinates (x,y,z) of these points were identified and the stations from the source to the end of project (the first branch). The survey included all features in the survey works. Digital copy of the survey works prepared by using AutoCAD 2005 program, and has been presented on layers.

The survey drawings also includes: outlets on the canal, crossing with streets, valleys, property lines and names of farm owners, right of way of the canal, any obstacles, buildings, trees, culverts, pipes, manholes, contour lines, reference points (bench marks), natural ground level points, walls, curb stones, roads, pedestrian paths, bridges, Parks and other features in the Project area.

Profile lines have been prepared for the natural ground level and were shown on drawings (scale: horizontal 1:1000 vertical 1:100).
Cross section for the canal every 50 m where shown on drawings (scale: horizontal 1:200 vertical 1:200).

There are nine connection points along the main canal within the Pilot project limits and each point supplies water to farmers through their own private intakes and canals. Table 3.4 presents the names of each connection point on the main canal

Table 3.4
Main Canal and Connection Points

Number of Branch	Name of the Owner	Location (stations from the Source in Meters)
1	Mahmoud Abu Gheath	1+415
2	Mahmoud Abu Gheath	1+359.5
3	Zayed Al-Burshi	1+211
4	Al-Heno (Dajani)	1+185
5	Al-Rewaq (Dajani)	1+100
6	Al-Falater (Dajani)	0+870.5
7	Kour Al-Amarah(Dajani)	0+716.2
8	Al-Heno Al Marakh (Dj)	421.4
9	Al-Heno Al Marakh (Dj)	343.5

(1) Source: Nwai'mah Council.

3.2.2 Distribution Equipment (Main Line, Flow Meter, Valves, etc...)

Within the concept of the project development, CEP staff contacted some factories in Israel in order to estimate fittings and equipment that might be used in this project.

3.2.2.1 Selection of Material

According to specification of pipes materials and coast of material the main line will be HDPE100 DN 350 mm

3.2.2.2 Identify Location of Outlets

The exact locations will be determined exactly at site as shown on the drawings of the tender documents. The number of outlets is about 9 outlets, each outlet need two gate valves 350 mm PN10.

3.2.3 Valves

1) **Washouts:** These valves are used to drain water and to clean the irrigation networks. They are located either at the end of the pipelines or at the lowest point of the pipeline.
2) **Gate Valves:** These valves are used to close the pipe at one point to make the flow direction going to another, in this project the gate valves on the outlet will be one on the main line and the second one on the branch.

3.2.4 Water Meters

A main water meter is to be installed after the settling basin to measure the quantities of water entering the network.. The accuracy of this water meters should be within the allowable maximum limits in order to decrease water losses related to meter under registration.

3.2.5 Identify the Right of Way (ROW) of the New Alignment

The existing main canal has 8 m-width right of way, 4m from centerline of the canal in each side. The new pipe system will be installed within the same right of way.

The choice of the routes is based on following: the ground conditions and slopes the right of way of the existing canal in order to avoid land acquisition, conflicts, disruption and political problems. In addition, attention has been given to environmental concerns. Pedestrian safety and traffic disruption have also been taken into consideration.

3.3 Selection of Optimal Economic and Technical Design Option

The selection of the optimal design alternative has been made using the following criteria:

- Engineering Integrity.
- Cost.
- Ease of Construction.
- Disruption due to Construction.
- Ease of Maintenance.

Hydraulic design requirements are necessarily more complex than those utilized for the selection of the optimum design solution at feasibility stage as they form the basis for detailed design. Hydraulic design accounts for the possible variation of hydraulic conditions within the system and the context of the proposed transmission systems identified in the Scope of Work.

3.3.1 Method of Supply (Flow Methodology)

One cases of supply method have been discussed, it is in two parts as follow:

(I) Rehabilitate Part of the Existing Canal: the first thirty meters of the concrete canal will be rehabilitated by using type (A), (refer to drawing and details).Then Construct a settling basin with a capacity of $16m^3$.

Table 3.5
Cost Estimate for Rehabilitation and Settling Basin

Item	Description	Unit	Quantity	Total (US$)
1.	Rehabilitation Type A and cover	m	30	2400
2.	Settling basin 16 m^3	No.	1	4816
	Total			**7,216**

(II) Flow by Gravity: According to this system, the flow will be transmitted naturally from the settling basin at station 0+100 from the source(the spring) through the pipe system. A comprehensive analysis has been conducted by using the EPANET software. Inputs, outputs, and figures of the model are shown in Appendix B of this report. Cost estimate for this solution is presented below in Table 3.6.

Table 3.6
Cost Estimates of the Piping System

Item	Description	Total US$
1.	By-Bass System	5,630
2.	Transmission Line	126,460
3.	Gate Valve Chambers	82,800
4.	Washout Chambers and Flow Meters	7,200
5.	Concrete Box Chambers	5,251
6.	Connection	1,500
Total		**228,841**

The Consultant performed a hydraulic analysis by using EPANET software to make sure that the "by gravity flow" principle is valid for this project. Appendix 1 shows the input and output of this model and the analysis.

It has been decided to convey water from spring site to the settling basin through the existing canal and over the bridge area, then to convey the flow from the settling basin to the proposed network by HDPE 100 DN350 pipes. Pipe starts from the settling basin to the first branch at station 1428 meter from the spring (0+00 station).

3.3.2 Pipe Materials for Transmission Mains

The Consultant studied the available pipe materials in the local market and carried out the required comparison with respect to the costs and the technical specifications.

The available types of pipes are:

(A) UPVC Pipes: This type of pipes has the following characteristics:

1. Light weight.
2. UPVC piping is not susceptible to internal and to external corrosion, chemical resistant and hence suitable to adverse environmental conditions, consequently UPVC pipes serve long life.

3. UPVC pipes have a smooth internal surface (Hazen Williams Coefficient, C = 150), which remains constant providing a hydraulic advantage over steel pipes, and thus preventing scale accumulation.
4. The pipes can be supplied in 5-6 meter lengths with internal BELL SOCKET (diameters 75mm – 630mm) for push-fit connection, or in 5-8 meter lengths with integral socket for solvent cement (diameters 20mm – 110mm) connection.
5. They are available for operating pressure of 6, 8, 10, 12.5 and 16 bar.
6. Relatively low cost.

(B) Polyethylene Pipes (P.E): P.E pipes have the following characteristics:

1. Light weight.
2. Long life (minimum of 50 years).
3. Long-lasting internal smoothness gives these pipes a significant hydraulic advantage over other pipes (steel, UPVC...).
4. Rigid enough to withstand soil and vehicle load, the pipes are also high flexible and provide the optimum answer for harsh topographical conditions and narrow winding routes, thus minimizing the elbows and other fittings.
5. P.E pipes can be supplied on large reels, as they are relatively lightweight and highly flexible leading to cost-efficient transport, storage and fittings.
6. P.E pipes are highly resistant to both internal and external corrosion and therefor appropriate for harsh field conditions.
7. P.E pipes are not attacked by microorganisms.
8. P.E pipes withstand solar radiation for extensive periods.
9. Wide range of connectors and fittings allows for maximum flexibility in the design of the water networks.
10. The pipes are supplied in:
    a. Straight segments (5.9 m or 12 m length)
    b. Coils, for hundreds of meters.
    c. Metal reels, for thousands of meters.
11. Networks can be changed or expanded with minimal effort by cutting or punching the P.E pipes with simple hand tools.
12. P.E pipes are resistant to saline water, acid and alkaline solutions and most of the substances used in fertilization or any other agricultural applications.

(C) Steel Pipes: Steel pipes have the following characteristics:

1. Strong and durable, which can withstand high pressure.
2. Reasonable chemical resistance. (Less than UPVC or P.E pipes).
3. Easy to maintain and construct by local contractors.

The steel pipes are not considered in cost estimates as long as the other two types proved to be more reliable and economic as well as they proved to be more efficient.

3.4 Design of Project Components

The Consultant prepared the design taking into consideration the comments raised by the Client according to previous meetings. The results of the final design is discussed in this section.

It was decided to modify the design of the system according to the new inputs after the preliminary studies and meetings. From the results of hydraulic analysis of the flow scenarios during the design horizon it was noted that the friction head losses within the system must be minimized to ensure sufficient head at outlets. This dictated the chosen diameter of transmission mains.

3.4.1 The Park

There was a problem in the project that the Banana Park is obstacle for the project, so the client decided to keep the canal inside the park open canal, but the rest of the canal will be closed pipe as per design.

3.4.2 Bridge Area (Crossing Nuweimeh Valley)

The Consultant found that the existing steel pipeline over the bridge is in a good condition and its support has been improved before. Therefore, the feasible solution is to keep the existing pipeline over the bridge as long as it is the only available route for the conveying system over the valley, please refer to the detailed design drawings.

3.4.3 Settling Basin and Filtration

This basin shall be constructed to convert the water from the open canal flow case to the closed conduits flow case and to filter the water before entering the pipe network. The optimal solution is to construct the settling basin directly after the fence around the spring area. The pipe system will start after the settling basin. The overflow can be easily discharged to the proposed pipe, which will serve as emergency alternative system.

Two-filtration process will be considered, the first one is the screening inside the settling basin and within the inlet of the settling basin. The other filtration will be done by a set of strainers, which will be fixed at the irrigation pipe system according to the design requirements in compliance with the other fittings of the project such as the flow meter.

Reinforced concrete settling basin will be constructed, the internal dimensions of this basin will be of 4 m length x 2 m width x 2 m height.

This reception tank which will also act as a sedimentation basin will be required at the beginning of the pipeline and it will reduce the number of filters required in the farms, because the quality of water flowing through the pipes will not harm the trickles.

3.4.4 Existing Canal

The lack of maintenance and rehabilitation of the existing canal reduce significantly the canal conveyance efficiency.

3.4.4.1 Types of Maintenance of the Canal

The Consultant studied the possible maintenance measures for the canal and concluded the following maintenance operations according to the type of deterioration in the canal section. The main expected types of maintenance of the existing canal of Nuweimeh are as follow:

Type A: Comprehensive rehabilitation of the deteriorated canal by construction of a new reinforced layer of concrete inside the existing canal for the sides and the floor. This type of rehabilitation is recommended but its cost is relatively high.

Type B: Partially rehabilitation of the canal by raising and plastering of the sides and repairing the floor of the existing canal.

Types C and D: Construction of a new reinforced layer of concrete and raising the sides of the existing canal in areas where water flows over the canal and losses are high due to the shallow dimension of the canal.

The recommended type was type A.

This type for rehabilitation is shown in the submitted drawings.

3.4.5 Pipe Network System

This stage conveys flow from the settling basin and delivers it through the main pipe, to all branches and users. The new pipe system follows the existing right of way of the canal, which is only 6 meters wide. The existing canal requires maintenance in order to be used in emergency. The alignment will be chosen along one of the sides of the existing canal according to which side will be easier for construction; the selected alignment is shown on the drawings.

4.4.5.1 Hydraulic Analysis (EPANET)

Hydraulic systems design and analysis, using the design criteria in this Section and EPANET software were used to analyze and size each system components and to develop transmission requirements throughout the design horizon.

Annex 6.1.2

Bill of Quantities

BILL OF QUANTITIES

Item	Description	Unit	Quantity	Unit Price US Dollar	Total US $
	General:				
(a)	The unit price for the items listed below are to include the work described in the Agreement, the Drawings and the Technical Specifications and shall cover the cost of all labor, materials, equipment, specified testing of materials, specified testing of works, temporary work for diverting the canal water and other temporary works, excavation and backfilling.				
(b)	It is the contractor responsibility to coordinate with the village council representative and private land owners during the construction period (i.e diversion of water, construction in private lands,etc...).				
1	**Rehabilitation of Existing Canal:**				
	Rehabilitate the existing canal and other structures relevant to it according to the following requirements. Rate includes all works related to the construction and rehabilitation of canal such as diverting of water during construction, cleaning the canal base floor and side walls and making ready to receive concrete works, excavation, backfilling, concrete works and any other required works.				
1.1	Rehabilitate the existing canal as per typical details STD 06 Type A rate includes formworks, reinforced concrete, and any excavation to rise the canal walls. All works shall comply with tender specifications and drawings, and to be approved by the Engineer.	L-M	30		
1.2	**Provision Item:** Supply and install precast concrete covers of different widths for the existing canal all as specified and shown on drawings. Rate includes excavation over side walls to provide adequate space to install covers, reinforced concrete B250, clamps, all as directed by the Engineer.	L-M	30		
2	**By-Pass System:**				
2.1	Supply and install DN350mm PN6 HDPE100 pipes and related fittings according to drawings and specifications. Rate includes installation of all types of fittings (tees, elbows, adaptors, reducers, etc...), excavation in any materials, trimming, bedding material, supply of pipes and fittings, pipe laying, pipe welding, testing, flushing, disinfection, backfilling, compaction, reinstatement and commissioning complete. Rate shall also include supply and installation of box screens, sluice gates construction of bell mouth, connection between concrete canal and by-pass pipe line. All works shall be constructed as per drawings and specifications, and direction of the Engineering. Refere to STD 03.	L-M	41		
2.2	Supply and cost reinforced concrete for canal diversion as per drawings No. STD 03. Rate includes supply and erect 2 No. of sluice gate, as per drawings, specifications and direction of the Engineer.	L.S	1		

Item	Description	Unit	Quantity	Unit Price US Dollar	Total US $
3	**Settling Basin:**				
3.1	Excavation in any kind of earth or rock for settling basin including trimming, preparation of the surfaces to receive reinforced concrete, removal and disposal of the excavated material. To the approved dumpsite.	C.M	38		
3.2	Supply 150 mm thick granular base course under the basin foundations, well spread, leveled and compacted, including preparation of subgrade, all as specified and shown on drawings.	M^2	20		
3.3	Supply and cast plain concrete with compresive strength 150 kg/cm^2 in blinding beds complete including necessary formwork. The rate should allow for each and every expense to construct the blinding beds as specified and shown on the drawings.	M^2	24		
3.4	Supply and cast reinforced concrete with compresive strength 250 kg/cm^2 in foundations and base slab of basin and inlet and outlet aprons with reinforcement steel complete including necessary formwork and two coats of hot asphalt isolation. The rate should allow for each and every expense to cast reinforced concrete for foundations as per specificatins and shown on the drawings. Refere to STD 03.	M^3	6		
3.5	Supply and cast reinforced concrete with compresive strength 250 kg/cm^2 for the side walls and top slab complete including but not limited to: reinforcement steel, supplying and installation of PVC sleeves at inlet and outlet walls, joint fillers, contraction/construction joints, two coats of hot asphalt isolation and protective membrane on exterior surfaces, 2 No. galvanized steel doors opening. The rate should allow for each and every expense to cast reinforced concrete for walls as specified and shown on the drawings and per the Engineering direction.	M^3	10		
3.6	Lay backfill material around the settling basin walls on layers in accordance with tender documents. Rate includes spreading of backfill material including watering and compacting as specified and shown on drawings.	M^3	8		
3.7	Supply and install stainless steel screen to the settling basin bell mouth, installed complete and including all supports to the concrete base and skeleton of the basin, accessories, all as specified and shown on drawings, and upon Engineering direction and approvall.	No	1		
3.8	Ditto, but for the internal stainless steel ladders.	No	1		
3.9	Supply and install water stops for the settling basin.	L.M	14		
3.10	Supply and execute 3 coats of plaster for the interior sides of walls for the settling basin as per tender drawings, spesifications, and direction of the Engineer.	M^2	42		
3.11	Testing, disinfection and commissioning of basin.	LS	1		

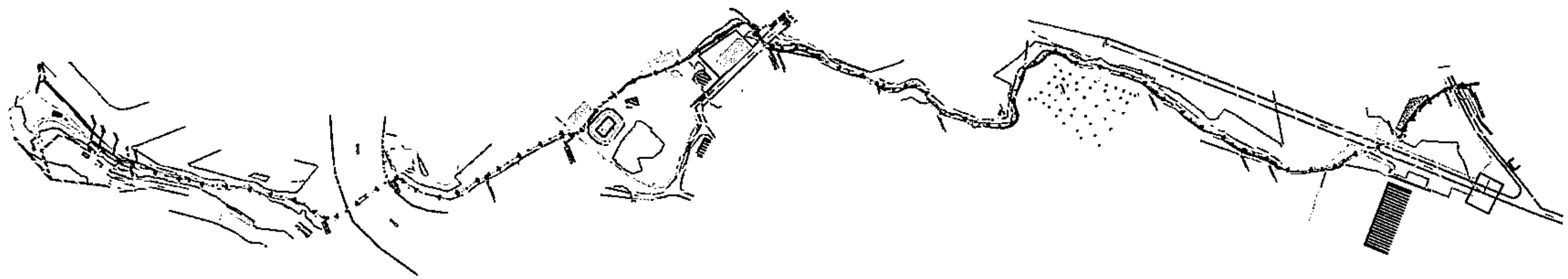
Item	Description	Unit	Quantity	Unit Price US Dollar	Total US $
4	**Transmission Line:**				
	General:				
	Unit prices of all items shall include for cleaning the site from all surplus and backfill materials, or results of excavation, and repairing all damages of concrete, or stone walls, or asphalted yards, edge of asphalted roads, sidewalks, existing water pipelines, sewerage lines, cables, cesspools, etc..., that may occur in the course of executing the works, testing, flushing, disinfections and commissioning of all piping work components.				
4.1	**Buried Pipe Excavation by Machine:** Supply and install DN350mm PN10 HDPE100 pipes and related fittings according to drawings and specifications. Rate includes installation of all types of fittings (tees, elbows, adaptors, reducers, etc...), excavation in any materials, trimming, bedding material, supply of pipes and fittings, pipe laying, testing, flushing, disinfection, backfilling, compaction, reinstatement and commissioning complete,as per tender drawings, specifications and directions of the engineer.	L.M	646		
4.2	**Buried Pipe Excavation by Hand:** Supply and install DN350mm PN10 HDPE100 pipes and related fittings according to drawings and specifications. Rate includes installation of all types of fittings (tees, elbows, adaptors, reducers, etc...), excavation in any materials, trimming, bedding material, supply of pipes and fittings, pipe laying, testing, flushing, disinfection, backfilling, compaction, reinstatement and commissioning complete, as per tender drawings, specifications and directions of the Engineer.	L.M	310		
4.3	**Non-Buried Pipes:** Supply and install DN350mm PN10 HDPE100 pipes and related fittings according to drawings and specifications. Rate includes installation of all types of fittings (tees, elbows, adaptors, reducers, etc...), trimming, bedding material, supply of pipes and fittings, pipe laying, concrete supports, testing, flushing, disinfection, reinstatement and commissioning complete, as per tender drawings, specifications and directions of the Engineer.	L.M	30		
4.4	**Pipes Through Sleeves:** Supply and install DN350mm PN10 HDPE100 pipes and related fittings inside theexisting concrete culvert(D=600mm) and steel pipe (D=500mm) according to drawings and specifications. Rate includes installation of all types of fittings (tees, elbows, adaptors, reducers, etc...), supply of pipes and fittings, pipe laying, testing, flushing, disinfection, reinstatement and commissioning complete. as per tender drawings, specifications and directions of the Engineer.	L.M	50		

Item	Description	Unit	Quantity	Unit Price US Dollar	Total US $
5	**Gate Valve Chambers:**				
5.1	**Gate Valve on Main Line:** Supply, install and construct PN10, 350mm nominal diameter gate valve chamber according to drawings and specifications. Rate includes excavation in any material, trimming, reinforced concrete structure complete, cast iron heavy duty frame and cover, reinforced concrete cover with compresive strength 250 kg/cm^2, rungs, gate valve, flanges, tee, all steel and HDPE100 DN 350 mm piping, including flange adapters connection (steel/HDPE100), laying, jointing, building in, bedding, testing, backfilling, reinstatement and commissioning complete.	No.	9		
5.2	**Gate Valve on Branch:** Supply, install and construct PN10 DN 350mm nominal diameter Gate valve chamber according to drawings and specifications. Rate includes excavation in any material, trimming, Reinforced concrete structure complete, cast iron heavy duty frame and cover, reinforced concrete with compresive strength 250 kg/cm^2, rungs, ladder, gate valve with one spindle for each chamber, PE flange adapters 2 No. per chamber associated with the galvanized steel flanges, bolts and nuts and any other fitting necessary for proper installation of the valves, tee, all steel and HDPE100, DN350 mm piping, flap valve, including flange adapters connection (Steel/HDPE100), laying, jointing, building in, bedding, testing, backfilling, reinstatement and commissioning complete.	No.	9		
6	**Washout Chambers and Flow Meter:**				
6.1	Supply, install and construct washout chamber according to drawings and specifications. Rate includes excavation in any material, trimming, cast iron heavy duty frame and cover,Reinforced concrete structure complete, ladder, rungs, gate valve PN10 DN100, steel flanges, tee, all steel and HDPE DN350mm and DN 100mm, steel piping , flap valve, reinforced concrete support base, laying, jointing, building in, bedding, testing, backfilling, reinstatement and commissioning complete. Refere to drawing STD 04.	No.	1		
6.2	Supply, install and construct Flow Meter chamber according to drawings and specifications. Rate includes excavation in any material, trimming, cast iron heavy duty frame and cover,Reinforced concrete structure complete, ladder, rungs, Flow Meter PN10 300 mm Dia, steel flanges bolts and nuts, tee, dressers, all steel and HDPE DN350mm and DN 300mm, steel piping, reinforced concrete support base, including flange adapters connection (Steel/HDPE100), laying, jointing, building in, bedding, testing, backfilling, reinstatement and commissioning complete. Refere to drawing STD 08.	No.	1		

Item	Description	Unit	Quantity	Unit Price US Dollar	Total US $
7	**Concrete Box Chambers:**				
	General:				
	Construct new chamber to distribute water between the existing canal and the steel pipe DN350mm. Rate includes excavation in any kind of soil for floor and walls, plain concrete in blinding beds, reinforced concrete in foundations and walls with reinforcement steel complete including necessary formwork and two coats of hot asphalt isolation, cast iron heavy duty frame and cover,construction joints, joints fillers, lay backfill material around the walls on layers all as per drawings and as directed by the Engineer. Refere to STD				
7.1	Excavate in any kind of earth or rock for reinforced concrete chamber including trimming, preparation of the surfaces to receive chambers, removal and disposal of the excavated material.	M^3	25		
7.2	Supply and cast plain concrete with compresive strength 150 kg/cm^2 for blinding beds complete including necessary formwork. The rate should allow for each and every expense to construct the blinding beds as specified and shown on the drawings.	M^2	15		
7.3	Supply and cast reinforced concrete compresive strength 250 kg/cm^2 for foundations and base slab of reinforced concrete chamber and inlet and outlet aprons with reinforcement steel complete including necessary formwork and two coats of hot asphalt isolation. The rate should allow for each and every expense to cast reinforced concrete for foundations as specified and shown on the drawings.	M^3	4		
7.4	Supply and cast reinforced concrete compresive strength 250 kg/cm^2 for side walls complete including but not limited to: reinforcement steel, supplying and installation of PVC sleeves at inlet and outlet walls, joint fillers, contraction/construction joints, two coats of hot asphalt isolation and protective membrane on exterior surfaces. The rate should allow for each and every expense to cast reinforced concrete for walls and include water stops as per specifications and drawings.	M^3	7		
7.5	Supply and cast reinforced concrete for chambers cover with compresive strength 250 kg/cm^2, as per specifications and drawings.	M^2	12		
7.6	Lay backfill material around the RC concrete chamber walls on layers in accordance with tender documents. Rate includes spreading of backfill material including watering and compacting as specified and shown on drawings.	M^3	10		
7.7	Supply and install stainless steel screen box for the concrete chamber inlet,and on the HDPE100 (DN=350mm)pipe on the exit of the chamber,rate including any fittings welding to complete the works.as per specifications and drawings. Refere to STD 05.	No.	1		
7.8	Ditto, but for the internal stainless steel ladders.	No	1		
7.9	Supply and install water stops for the concrete box chambers.	L.M	28		
8	**Connecting HDPE Pipe with Existing Steel Pipe:**				
8.1	Connect the HDPE100 pipe of DN350mm to the existing steel pipeline of D 400 mm. Rate includes supply of HDPE100 pipes, required fittings, flages, adapters, connection, pipe laying, reinstatement, testing, disinfection and commissioning to the satisfaction of the Engineer. The rate shall also includes removal of existing concrete chamber as per specifications and drawings. Refere to STD 02.	No.	2		
	Sum				

Annex 6.1.3

As-built Drawing



Legend:

(symbol)	Concrete Canal
(symbol)	HDPE DN 350MM
	Existing steel pipeline
(symbol)	Shoes Canal
(symbol)	Contour Line
(symbol)	Gate Valve Chamber
0+250	Stations for Existing Canal
0+160	Station's for Pipeline Alignment

Notes:

1. Exact route for polyethylene pipeline and connection points should be identified on si te. The Contractor should submit shop drawings for Engineer approval prior to start work.

2. Contractor shall construct thrust blocks for all tees and elbows. Refer to drawing No. STD 06 for thrust blocks details.

3. Contractor should refer to related drawings for by-pass system connections details HDPE DN 350mm with existing steel pipeline (drawing No. STD 02) and HDPE DN 350 mm inlet and outlet details at concrete chambers (drawing No. STD 05).

4. Exact location of valves should be determined on site upon Engineer approval.

REVISIONS

Client:

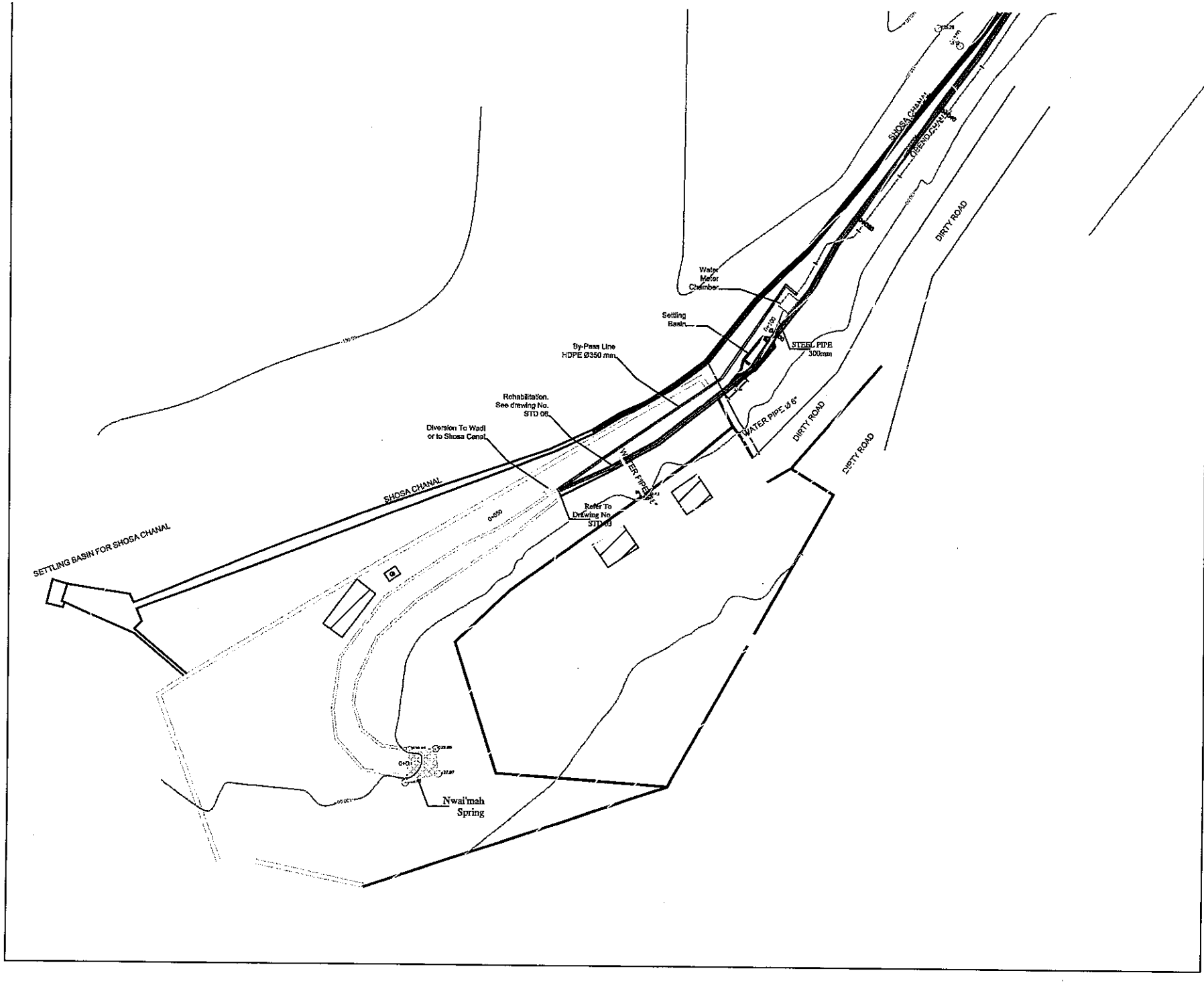
JICA

center for engineering and planning

Project Name: Pilot Project for Improvement of Nwaimah Spring Conveyance System

Drawing Title: Main Pipeline Horizontal Alignment

Scale: [illegible]	Design: [illegible]
Date: [illegible]	Drawing: [illegible]
Drawing No.: [illegible]	Checking: [illegible]


SETTLING BASIN FOR SHOSA CHANAL
SHOSA CHANAL
Diversion To Wadi or to Shosa Canal
Rehabilitation. See drawing No. STD 05
By-Pass Line HDPE Ø350 mm
Water Meter Chamber
Settling Basin
STEEL PIPE 300mm
WATER PIPE Ø 6"
DIRTY ROAD
DIRTY ROAD
DIRTY ROAD
Refer To Drawing No. STD 03
Nwai'mah Spring
Legend:
Concrete Canal
HDPE DN 350MM
Existing steel pipeline
Shosa Canal
Contour Line
Gate Valve Chamber
0+250 Stations for Existing Canal
0+160 Station's for Pipeline Alignment
Notes:
1. Exact route for polyethylene pipeline and connection points should be identified on site. The Contractor should submit shop drawings for Engineer approval prior to start work.
2. Contractor shall construct thrust blocks for all tees and elbows. Refer to drawing No. STD 06 for thrust blocks details.
3. Contractor should refer to related drawings for by-pass system connections details HDPE DN 350mm with existing steel pipeline (drawing No. STD 02) and HDPE DN 350 mm inlet and outlet details at concrete chambers (drawing No. STD 03).
4. Exact location of valves should be determined on site upon Engineer approval.
REVISIONS
JICA
center for engineering and planning
Pilot Project for Improvement of Nwaimah Spring Conveyance System
Main Pipeline Horizontal Alignment

Legend:

- Concrete Canal
- HDPE DN 350MM
- Existing steel pipeline
- Shosa Canal
- Contour Line
- Gate Valve Chamber
- 0+250 Stations for Existing Canal
- 0+160 Station's for Pipeline Alignment

Notes:

1. Exact route for polyethylene pipeline and connection points should be identified on site. The Contractor should submit shop drawings for Engineer approval prior to start work.

2. Contractor shall construct thrust blocks for all tees and elbows. Refer to drawing No. STD 06 for thrust blocks details.

3. Contractor should refer to related drawings for by-pass system connections details HDPE DN 350mm with existing steel pipeline (drawing No. STD 02) and HDPE DN 350 mm inlet and outlet details at concrete chambers (drawing No. STD 05).

4. Exact location of valves should be determined on site upon Engineer approval.

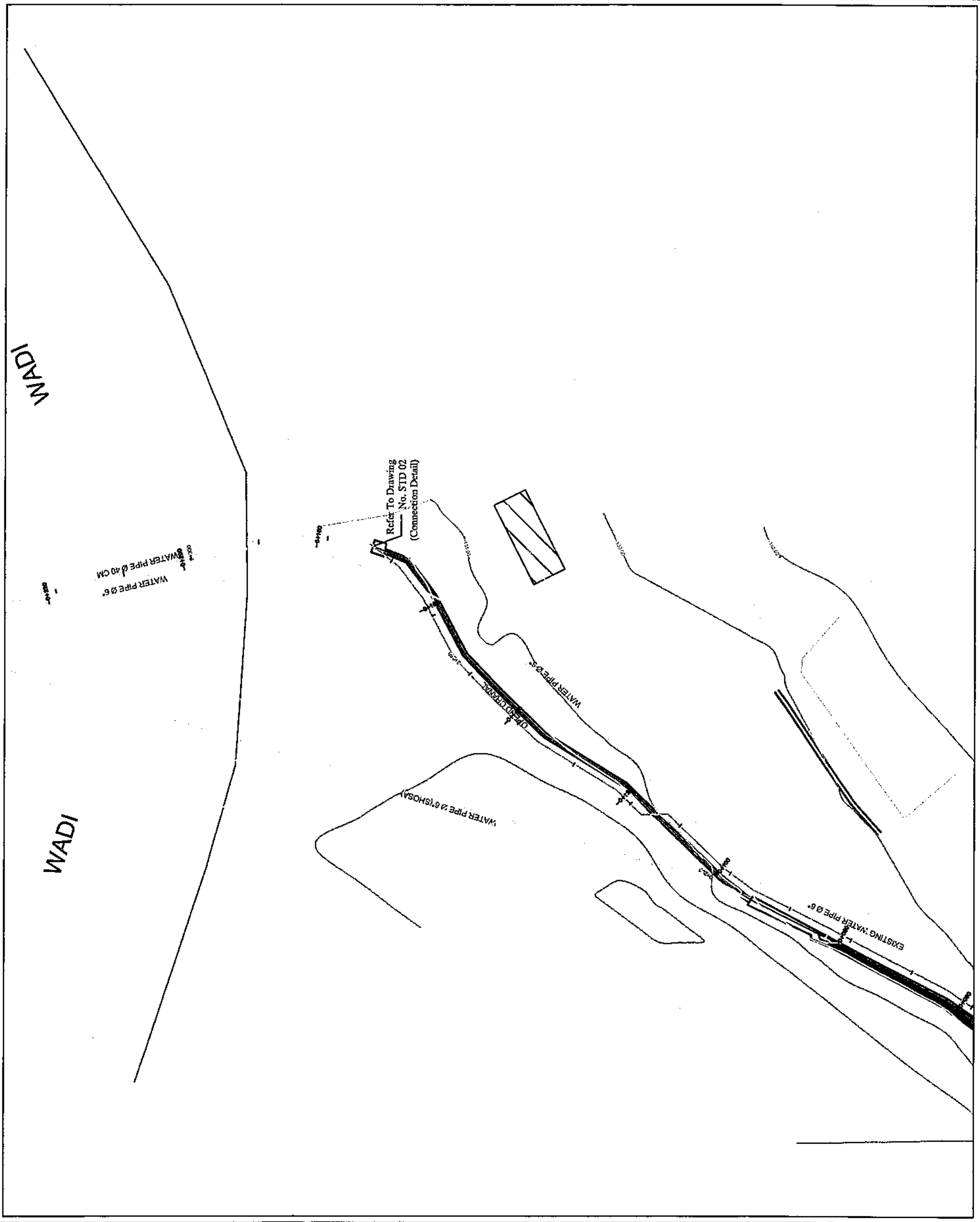
REVISIONS

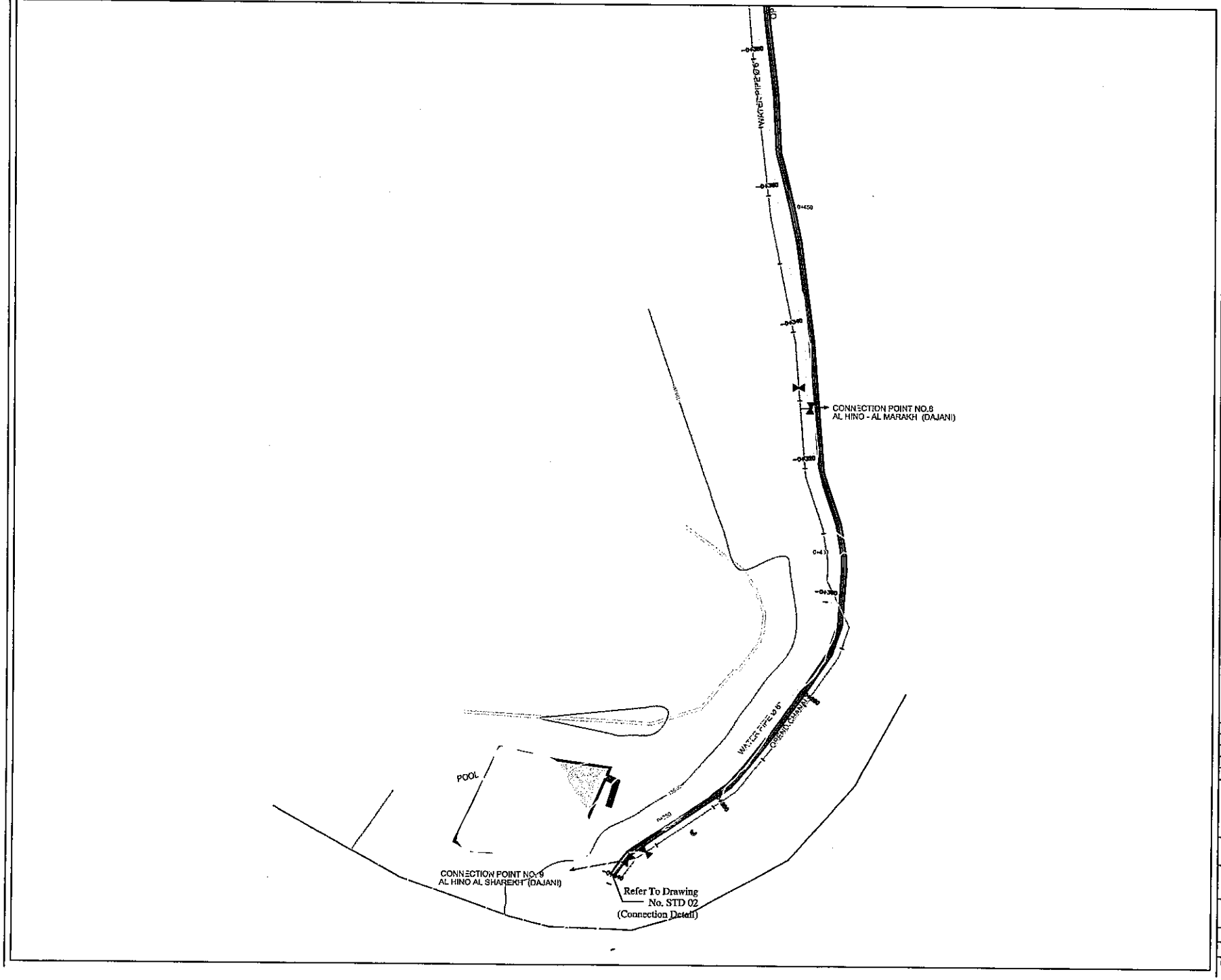
Client: JICA

center for engineering and planning

Project Name: Pilot Project for Improvement of Nwaimah Spring Conveyance System

Drawing Title: Main Pipeline Horizontal Alignment





Legend:

- Concrete Canal
- HDPE DN 350MM
- Existing steel pipeline
- Shoaa Canal
- Contour Line
- Gate Valve Chamber
- 0+250 Stations for Existing Canal
- 0+160 Station's for Pipeline Alignment

Notes:

1. Exact route for polyethylene pipeline and connection points should be identified on si te. The Contractor should submit shop drawings for Engineer approval prior to start work.
2. Contractor shall construct thrust blocks for all tees and elbows. Refer to drawing No. STD 06 for thrust blocks details.
3. Contractor should refer to related drawings for by-pass system connections details HDPE DN 350mm with existing steel pipeline (drawing No. STD 02) and HDPE DN 350 mm inlet and outlet details at concrete chambers (drawing No. STD 05).
4. Exact location of valves should be determined on site upon Engineer approval.

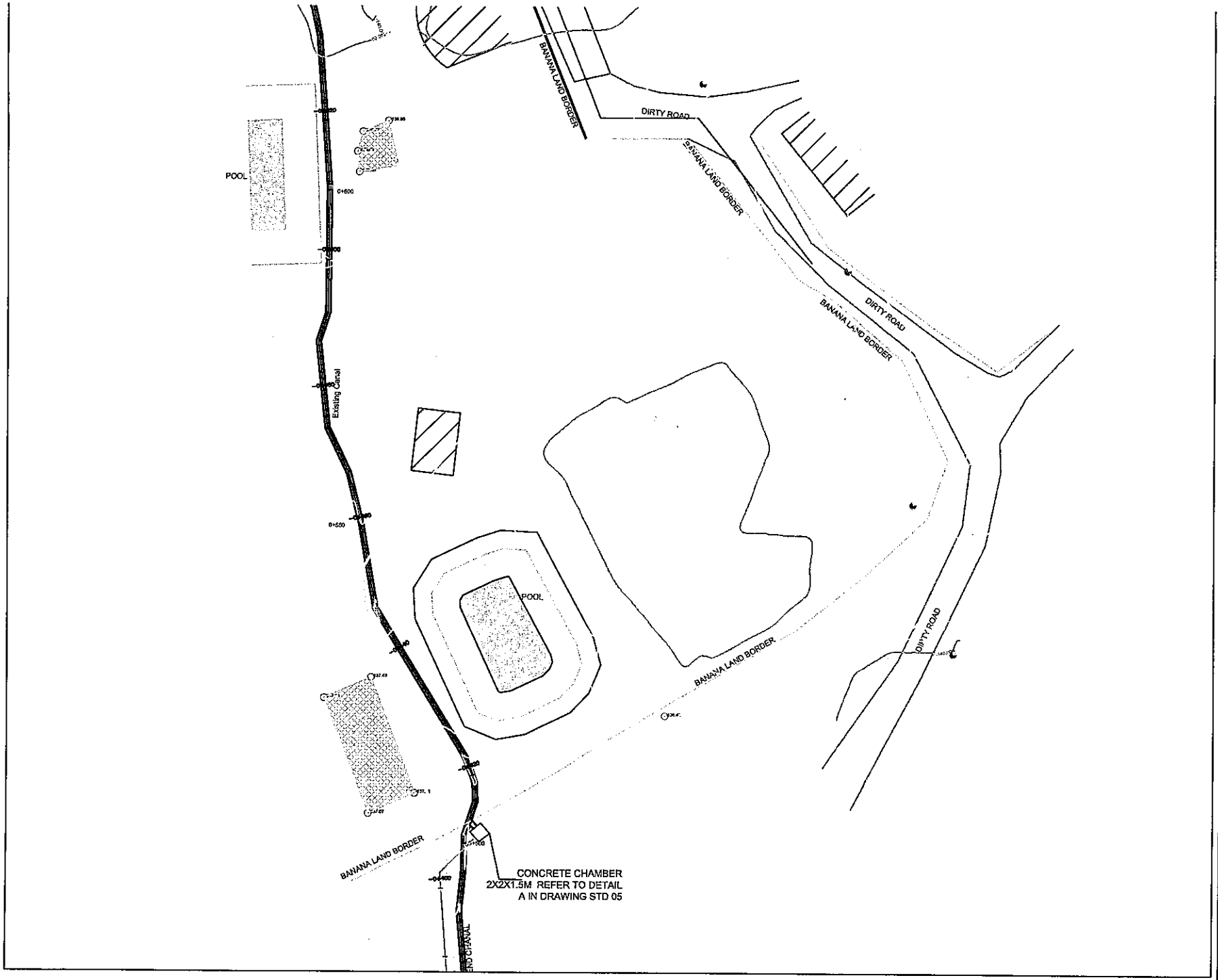
REVISIONS

Client: JICA

center for engineering and planning

Project Name: Pilot Project for Improvement of Nwaimah Spring Conveyance System

Drawing Title: Main Pipeline Horizontal Alignment



Legend:

- Concrete Canal
- HDPE DN 350MM
- Existing steel pipeline
- Stone Canal
- Contour Line
- Gate Valve Chamber
- 0+250 Stations for Existing Canal
- 0+160 Station's for Pipeline Alignment

Notes:

1. Exact route for polyethylene pipeline and connection points should be identified on site. The Contractor should submit shop drawings for Engineer approval prior to start work.

2. Contractor shall construct thrust blocks for all tees and elbows. Refer to drawing No. STD 06 for thrust blocks details.

3. Contractor should refer to related drawings for by-pass system connections details HDPE DN 350mm with existing steel pipeline (drawing No. STD 02) and HDPE DN 350 mm inlet and outlet details at concrete chambers (drawing No. STD 05).

4. Exact location of valves should be determined on site upon Engineer approval.

REVISIONS

Client: JICA

center for engineering and planning

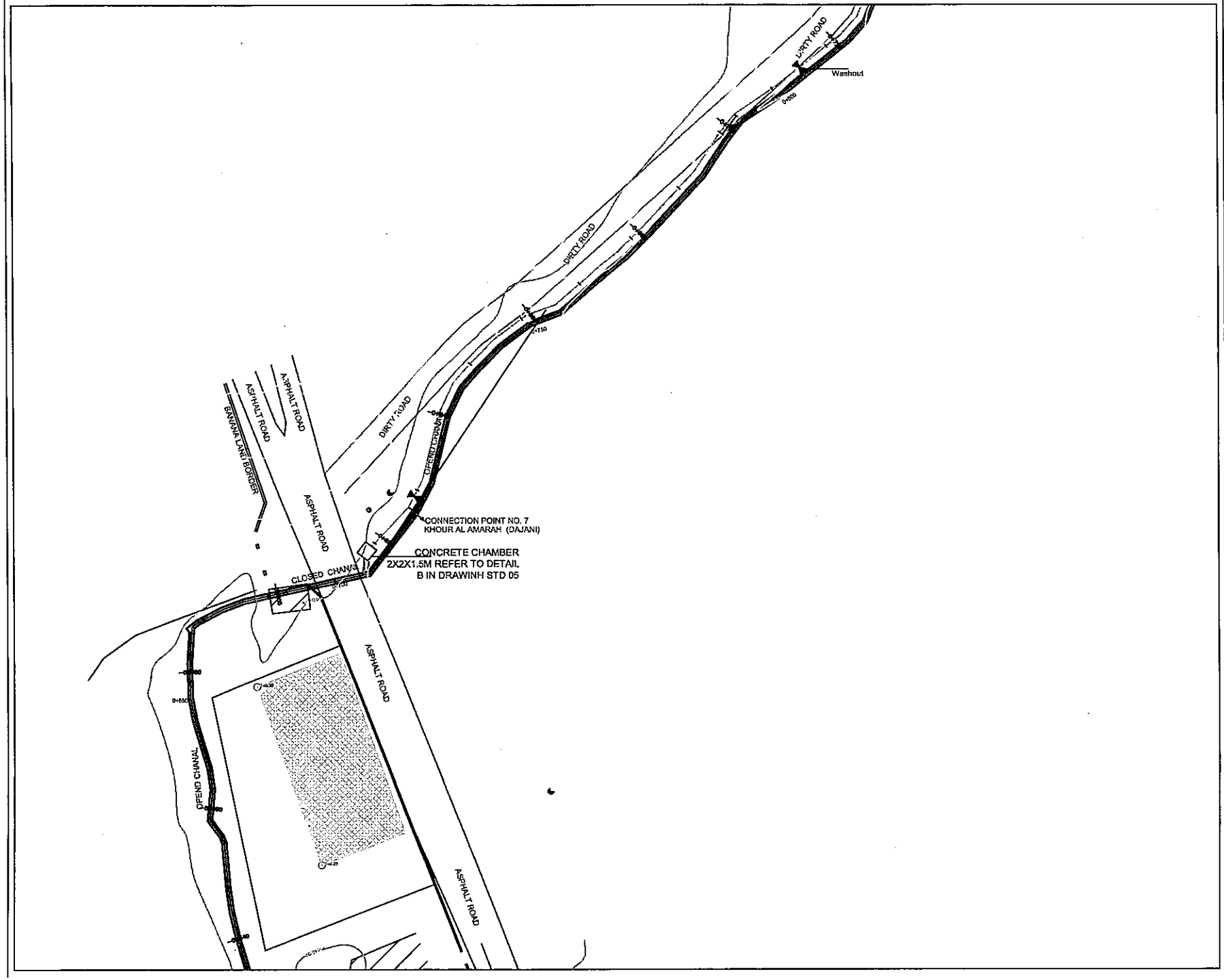
Project Name: Pilot Project for Improvement of Nwahmah Spring Conveyance System

Drawing Title: Main Pipeline Horizontal Alignment

Scale: 1:2000@A1 | Design: M. K.

Date: Dec. 2007 | Drawn: K. K.

Drawing No.: 004 | Checked: T. M.



Legend:

- Concrete Canal
- HDPE DN 350MM
- Existing steel pipeline
- Shoas Canal
- Contour Line
- Gate Valve Chamber
- 0+250 Stations for Existing Canal
- 0+160 Station's for Pipeline Alignment

Notes:

1. Exact route for polyethylene pipeline and connection points should be identified on site. The Contractor should submit shop drawings for Engineer approval prior to start work.

2. Contractor shall construct thrust blocks for all tees and elbows. Refer to drawing No. STD 06 for thrust blocks details.

3. Contractor should refer to related drawings for by-pass system connections details HDPE DN 350mm with existing steel pipeline (drawing No. STD 02) and HDPE DN 350 mm inlet and outlet details at concrete chambers (drawing No. STD 05).

4. Exact location of valves should be determined on site upon Engineer approval.

No.	DATE	DESCRIPTION
		REVISION

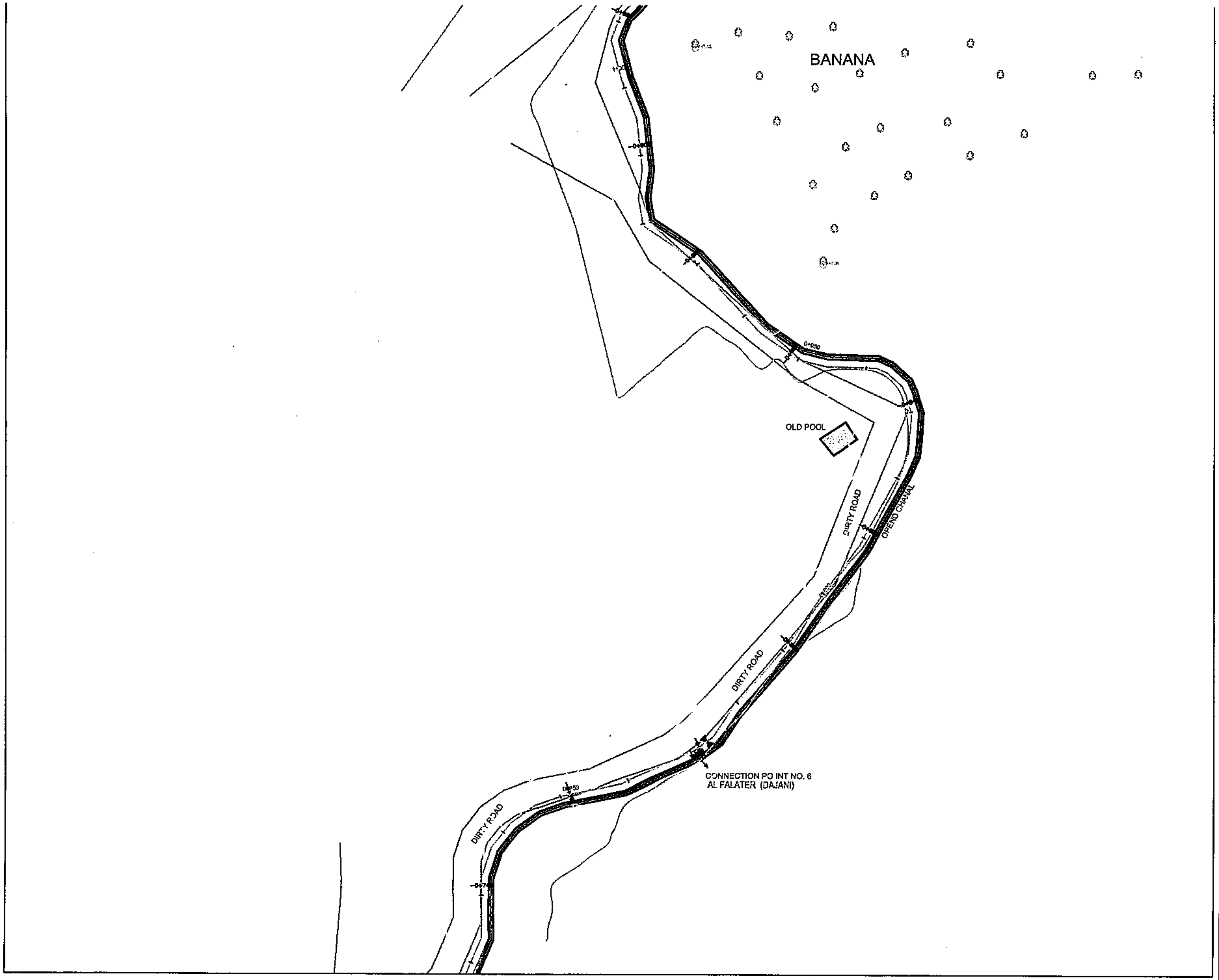
Client: JICA

center for engineering and planning

Project Name: Pilot Project for Improvement of Nwaimah Spring Conveyance System

Drawing Title: Main Pipeline Horizontal Alignment

Scale: 1:5000M	Design: M. H.
Date: Nov. 2007	Drawing: H. H.
Drawing No.: 005	Checking: E. SH.



Legend:

- Concrete Canal
- HDPE DN 350MM
- Existing steel pipeline
- Shoss Canal
- Contour Line
- Gate Valve Chamber
- 0+250 Stations for Existing Canal
- 0+160 Station's for Pipeline Alignment

Notes:

1. Exact route for polyethylene pipeline and connection points should be identified on site. The Contractor should submit shop drawings for Engineer approval prior to start work.

2. Contractor shall construct thrust blocks for all tees and elbows. Refer to drawing No. STD 06 for thrust blocks details.

3. Contractor should refer to related drawings for by-pass system connections details HDPE DN 350mm with existing steel pipeline (drawing No. STD 02) and HDPE DN 350 mm inlet and outlet details at concrete chambers (drawing No. STD 05).

4. Exact location of valves should be determined on site upon Engineer approval.

REVISIONS

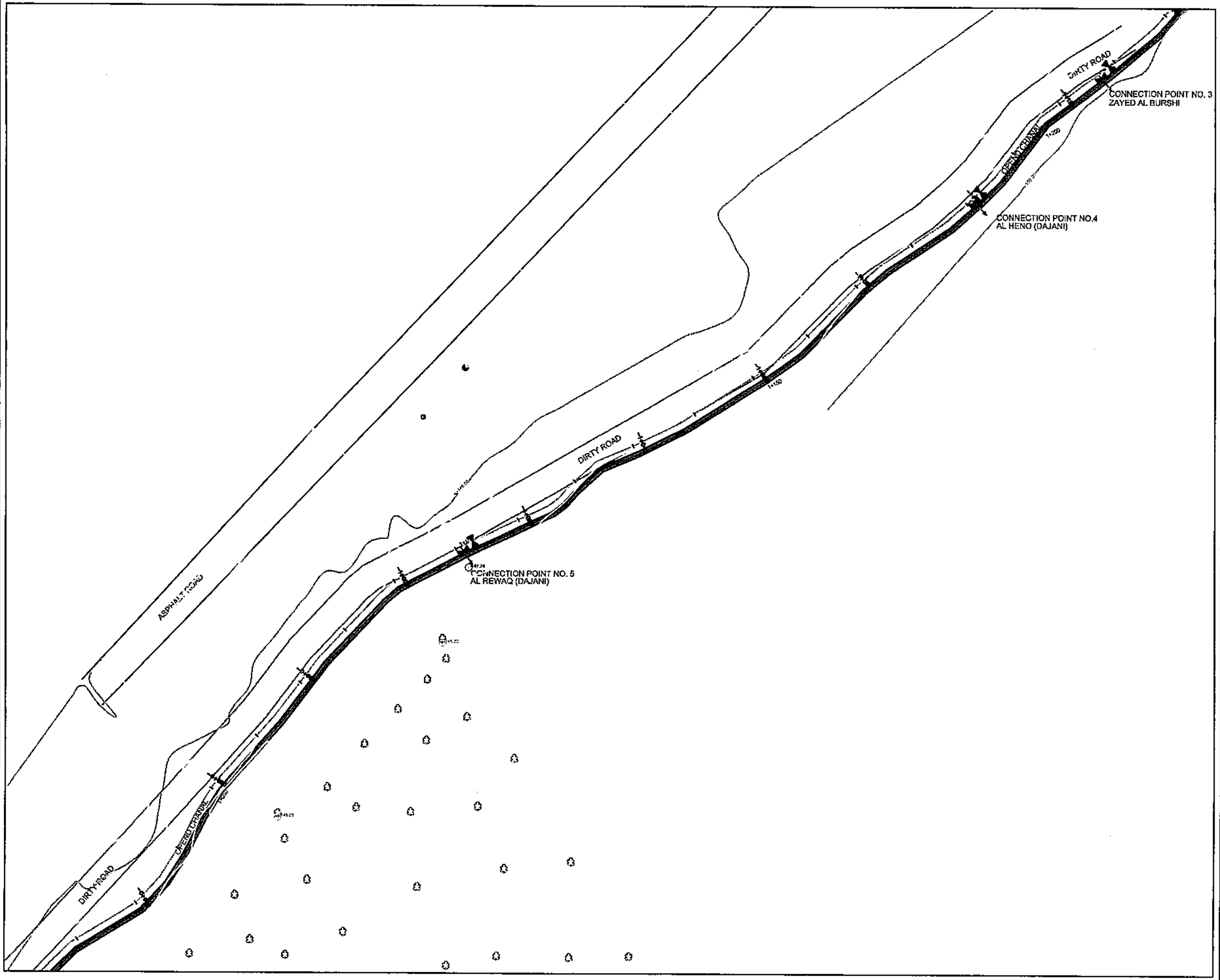
Client

JICA

center for engineering and planning

Project Name: Pilot Project for Improvement of Nwaimah Spring Conveyance System

Drawing Title: Main Pipeline Horizontal Alignment



Legend:

- Concrete Canal
- HDPE DN 350MM
- Existing steel pipeline
- Shoes Canal
- Contour Line
- Gate Valve Chamber
- 0+250 Stations for Existing Canal
- 0+160 Station's for Pipeline Alignment

Notes:

1. Exact route for polyethylene pipeline and connection points should be identified on si te. The Contractor should submit shop drawings for Engineer approval prior to start work.

2. Contractor shall construct thrust blocks for all tees and elbows. Refer to drawing No. STD 06 for thrust blocks details.

3. Contractor should refer to related drawings for by-pass system connections details HDPE DN 350mm with existing steel pipeline (drawing No. STD 02) and HDPE DN 350 mm inlet and outlet details at concrete chambers (drawing No. STD 05).

4. Exact location of valves should be determined on site upon Engineer approval.

REVISIONS

Client: JICA

center for engineering and planning

Project Name: Pilot Project for Improvement of Nwaimah Spring Conveyance System

Drawing Title: Main Pipeline Horizontal Alignment

Legend:

- Concrete Canal
- HDPE DN 350MM
- Existing steel pipeline
- Shoes Canal
- Contour Line
- Gate Valve Chamber
- 0+250 Stations for Existing Canal
- 0+160 Station's for Pipeline Alignment

Notes:

1. Exact route for polyethylene pipeline and connection points should be identified on si te. The Contractor should submit shop drawings for Engineer approval prior to start work.

2. Contractor shall construct thrust blocks for all tees and elbows. Refer to drawing No. STD 06 for thrust blocks details.

3. Contractor should refer to related drawings for by-pass system connections details HDPE DN 350mm with existing steel pipeline (drawing No. STD 02) and HDPE DN 350 mm inlet and outlet details at concrete chambers (drawing No. STD 05).

4. Exact location of valves should be determined on site upon Engineer approval.

No.	Date	Description

REVISIONS

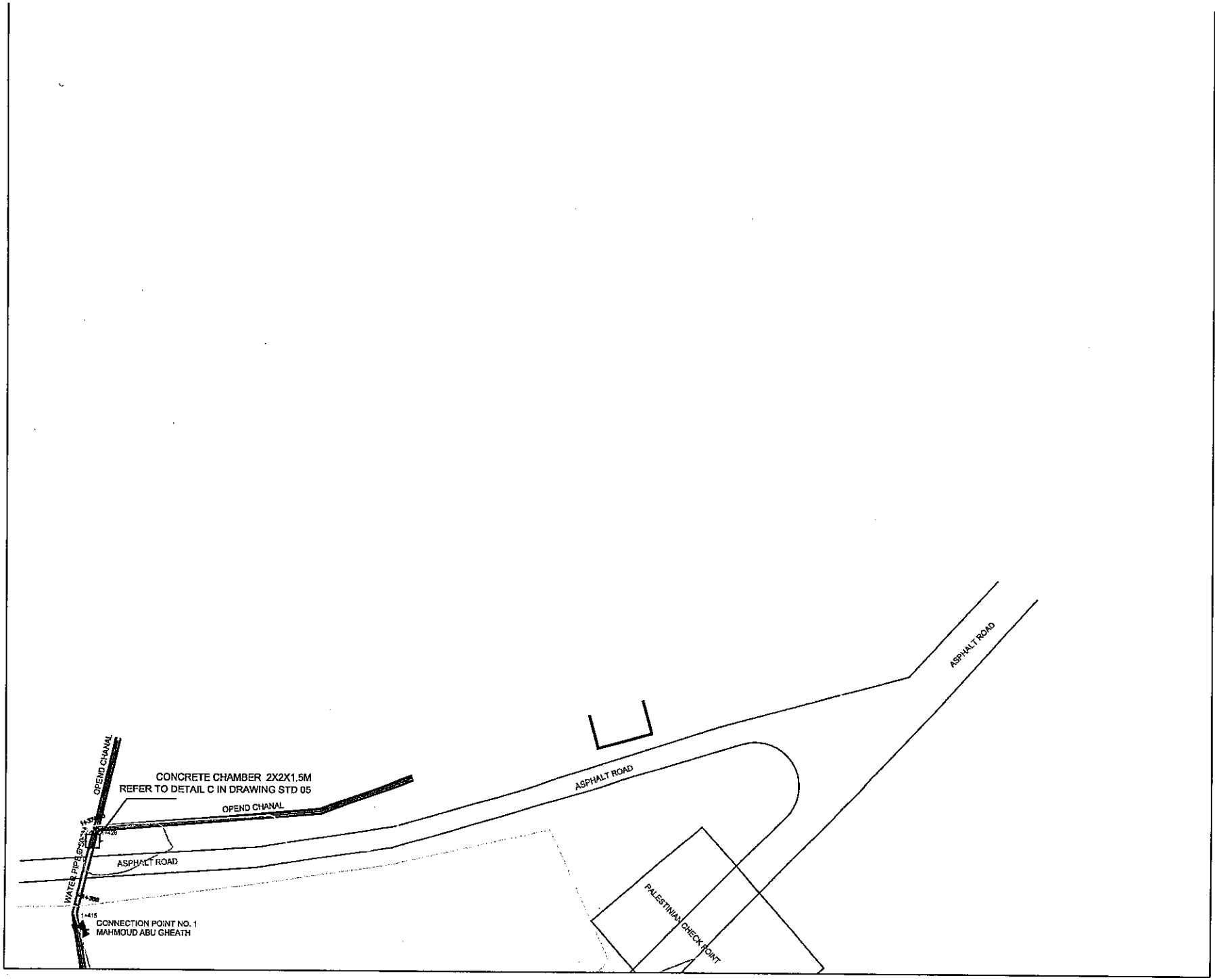
Client: JICA

center for engineering and planning

Project Name: Pilot Project for Improvement of Nwaimah Spring Conveyance System

Drawing Title: Main Pipeline Horizontal Alignment

Scale: 1:2000	Design: SH. H.
Date: Dec. 2007	Drawing: H. H.
Drawing No.: 005	Checking: F. SH.



Legend:

- Concrete Canal
- HDPE ON 350MM
- Existing steel pipeline
- Stone Canal
- Contour Line
- Gate Valve Chamber
- 0+250 Stations for Existing Canal
- 0+160 Station's for Pipeline Alignment

Notes:

1. Exact route for polyethylene pipeline and connection points should be identified on site. The Contractor should submit shop drawings for Engineer approval prior to start work.

2. Contractor shall construct thrust blocks for all tees and elbows. Refer to drawing No. STD 06 for thrust blocks details.

3. Contractor should refer to related drawings for by-pass system connections details HDPE DN 350mm with existing steel pipeline (drawing No. STD 02) and HDPE DN 350 mm inlet and outlet details at concrete chambers (drawing No. STD 05).

4. Exact location of valves should be determined on site upon Engineer approval.

REVISIONS

Client: JICA

center for engineering and planning

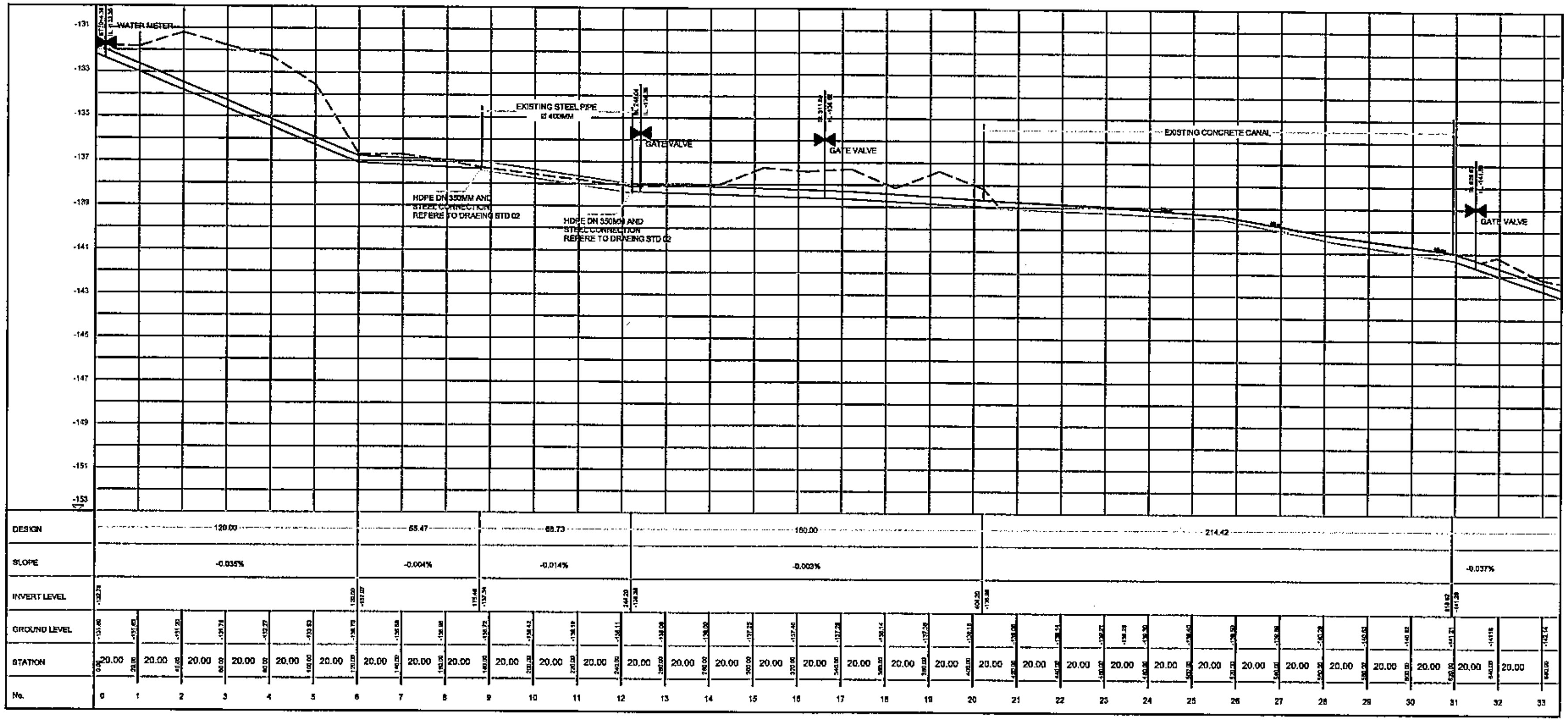
Project Name: Pilot Project for Improvement of Nwaimah Spring Conveyance System

Drawing Title: Main Pipeline Horizontal Alignment

Scale: 1:20000 | Design:

Date: Dec. 2007 | Drawing:

Drawing No.: 000 | Checking:



Legend:

Proposed Pipeline

Ground Level

Notes:

1. The Contractor should submit shop drawing (connection, ground and invert levels, etc...) for the connection of HDPE 350mm and the discharge mouth of settling basin, inlet and outlet of concrete chambers for Engineer approval prior to start work.

2. The Contractor should supply and cast concrete suppotr and casing parts of HDPE 350mm and should submit shop drawings for Engineer approval prior to start work.

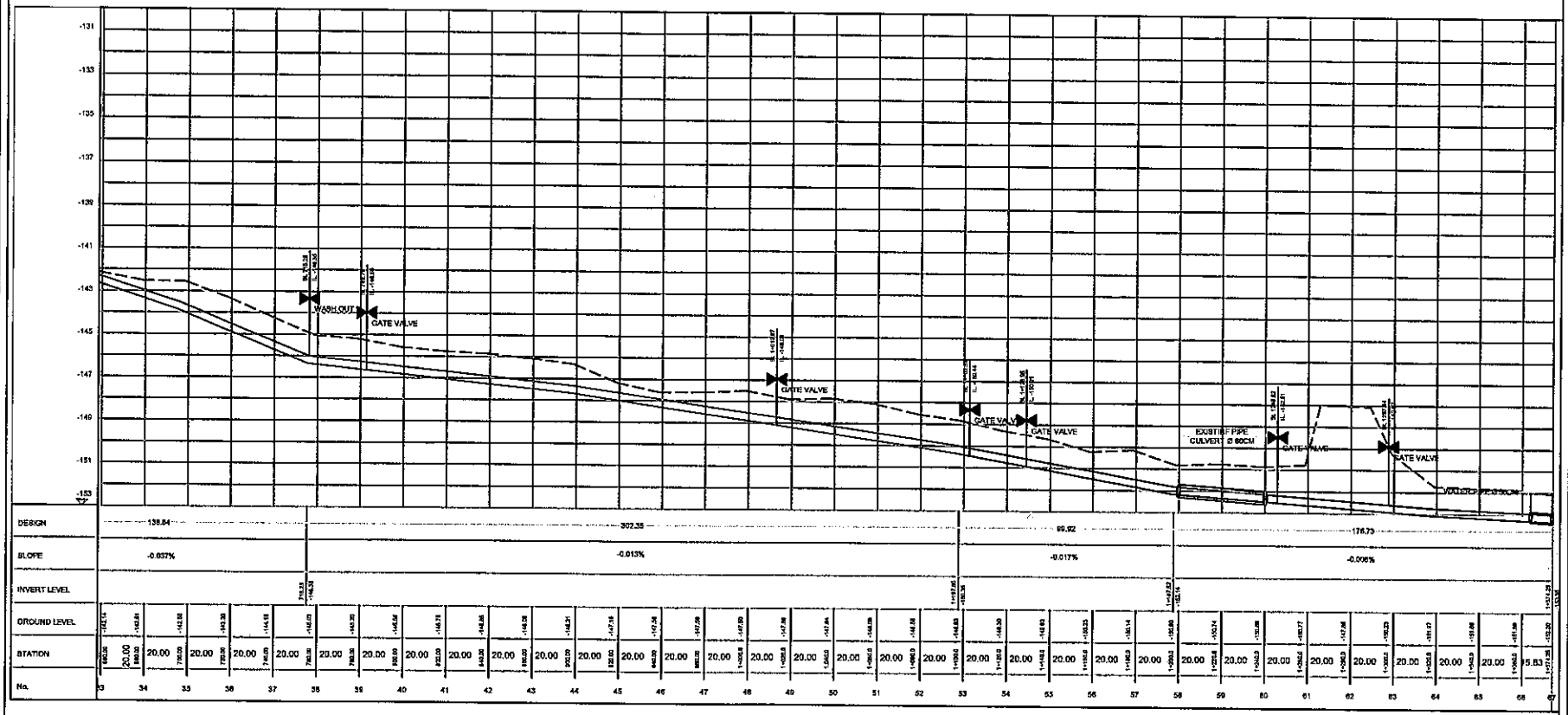
REVISIONS

Client: JICA

center for engineering and planning

Project Name: Pilot Project for Improvement of Nwaimah Spring Conveyance System

Drawing Title: Canal Profile FROM St. 0.00 TO St. 660.00



Legend:

Proposed Pipeline

Ground Level

Notes:

1.The Contractor should submit shop drawing (connection, ground and invert levels, etc...) for the connection of HDPE 350mm and the discharge mouth of settling basin, inlet and outlet of concrete chambers for Engineer approval prior to start work.

2. The Contractor should supply and cast concrete suppotr and casing parts of HDPE 350mm and should submit shop drawings for Engineer approval prior to start work.

REVISIONS

Client: JICA

center for engineering and planning

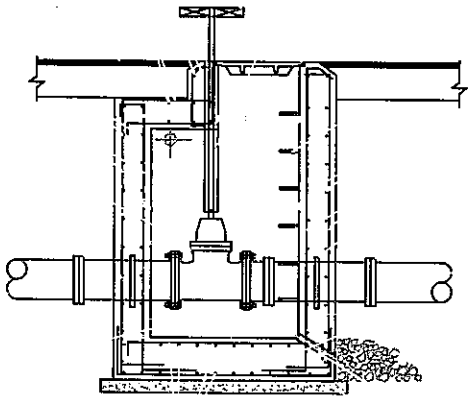
Project Name: Pilot Project for Improvement of Nwaimah Spring Conveyance System

Drawing Title: Canal Profile FROM SL 660.00 TO SL 1+374.25

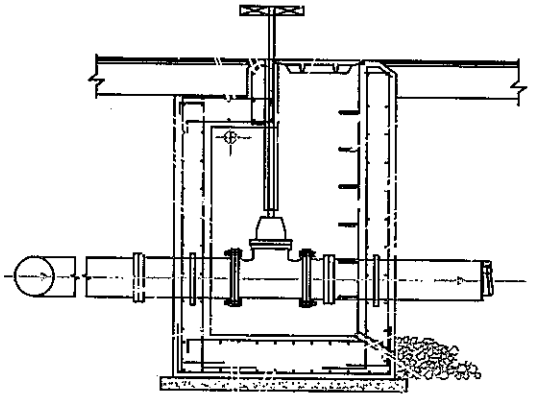
Scale: 1:2500/40 | Design: SH. M.

Date: Dec. 2007 | Drawing: H. M.

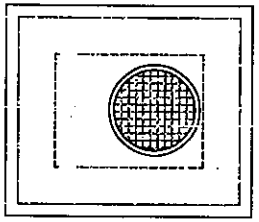
Drawing No.: 702 | Checking: E. SH.



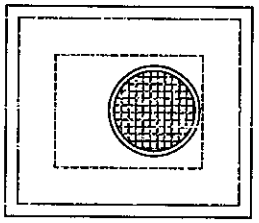
GATE VALVE INSTALLATION INSIDE CONCRETE CHAMBER
(AT MAIN PIPELINE)
SECTION



GATE VALVE INSTALLATION INSIDE CONCRETE CHAMBER (AT BRANCH CONNECTION LINE)
SECTION



GATE VALVE INSTALLATION INSIDE CONCRETE CHAMBER
PLAN



GATE VALVE INSTALLATION INSIDE CONCRETE CHAMBER
PLAN

Notes:

1. All Dimensions are in millimeter unless otherwise indicated.

2. Design compressive strength of concrete used in all reinforced concrete (f'c) shall be 25N/mm^2 at 28 days. Strength tests for concrete shall be made in accordance with "method of test for compressive strength of molded concrete cylinders" ASTM C39.

3. Design compressive strength of lean concrete blinding shall be 15N/mm^2.

4. All reinforcing steel bars used (fy) shall be deformed with a minimum yield point strength of 420N/mm^2, and shall conform to ASTM specifications A615 or to BS4449 or BS4461.

5. Minimum gross bearing capacity of soil (qall) shall not be less than 35N/cm^2. If otherwise, revision shall be made.

7. Exact location of chambers should be subjected to Engineer aproval

No.	DATE	DESCRIPTION

REVISIONS

Client: JICA

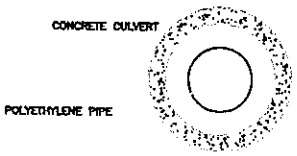
center for engineering and planning

Project Name: Pilot Project for Improvement of Nwaimah Spring Conveyance System

Drawing Title: Standard Details
Gate Valve Details

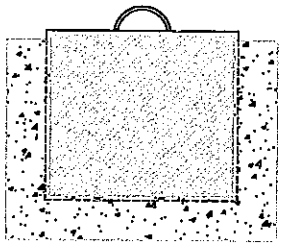
Scale: NTS	Design: SH. M.
Date: Dec. 2007	Drawing: H. H.
Drawing No.: SD 07	Checking: E. Sh.

DETAIL OF EXISTING STEEL PIPE SLEEVE



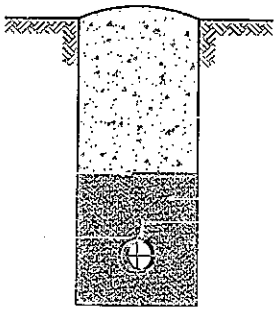
DETAIL OF EXISTING CONCRETE CULVERT SLEEVE

PLAN



SECTION

TYPICAL DETAIL FOR SLUICE GATE
REFER TO DETAIL 2



TYPICAL PIPE TRENCH
USING MATERIAL AROUND IN DRY SOIL
(Sheetpiling)

NOTES:

1. ALL DIMENSIONS AND SIZES ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED

2. THE CONTRACTOR SHOULD SUBMIT SHOP DRAWINGS FOR SLUICE GATE FOR ENGINEER APPROVAL PRIOR TO START WORK .

No.	DESC.	DATE	DRWN

REVISIONS

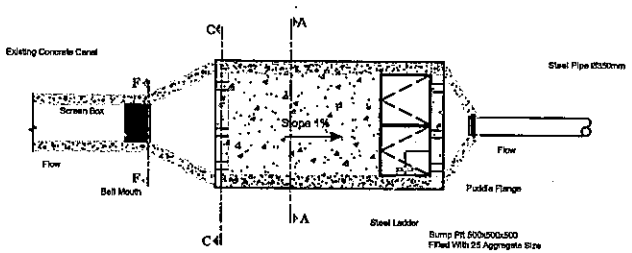
Client: JICA

center for engineering and planning

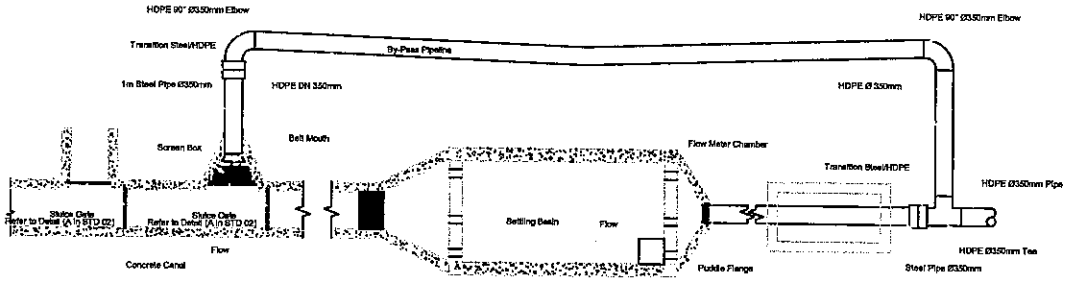
Project Name: Pilot Project for Improvement of Nwaimah Spring Conveyance System

Drawing Title: Standard Details

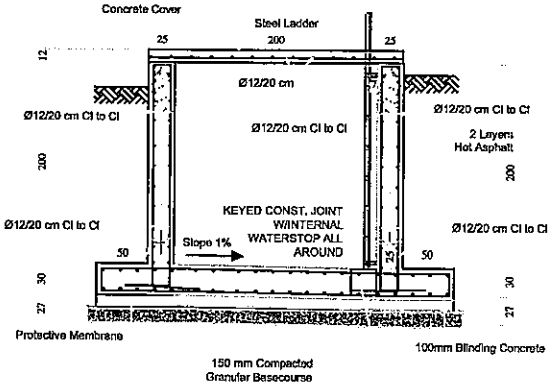
Scale: NTS	Design: SH. M.
Date: Dec. 2007	Drawing: M. M.
Drawing No.: SW 02	Checking: E. Sh.



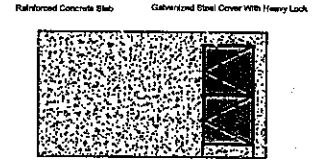
PLan
Scale 1:50



Details for By Pass with Settling Basin
Scale 1:50



Section A-A
Scale 1:25

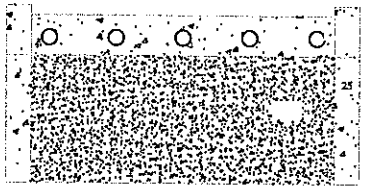


Plan

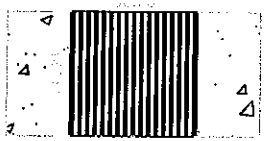
Section

Details for Settling Basin
Concrete Cover

Ø150mm PVC pipe
300 mm c/c



Section C-C
1:25



Section F-F
1:10

Notes:

1. All Dimensions are in centimeter unless otherwise indicated.

2. Design compressive strength of concrete used in all reinforced concrete (f'_c) shall be 25N/mm² at 28 days. Strength tests for concrete shall be made in accordance with "method of test for compressive strength of molded concrete cylinders" ASTM C39.

3. Design compressive strength of lean concrete blinding shall be 15N/mm².

4. All reinforcing steel bars used (f_y) shall be deformed with a minimum yield point strength of 420N/mm², and shall conform to ASTM specifications A615 or to BS4449 or BS4461.

5. Minimum gross bearing capacity of soil (q_{all}) shall not be less than 35N/cm². If otherwise, revision shall be made.

6. All footings walls shall be isolated with 2 hot asphalt coats.

7. Based on the settling basin surveyed level, The Contractor should submit shop drawing for the settling basin levels (inlet, outlet, connections to the down stream and up stream complete with all concrete details for Engineer approval.

No.	Date	Remarks

REVISIONS

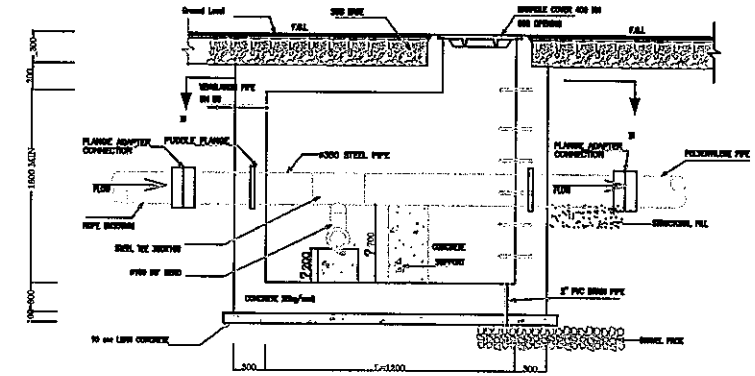
JICA

center for engineering and planning

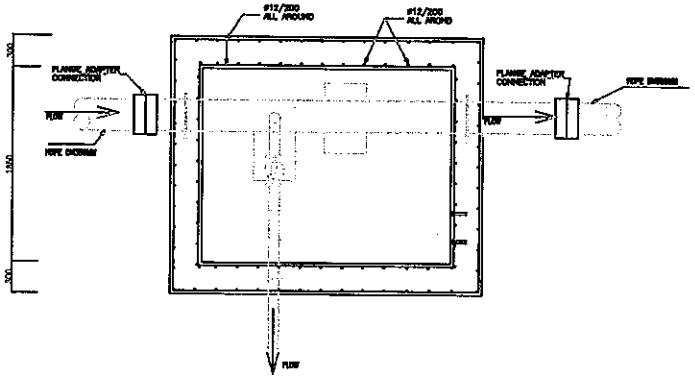
Pilot Project for Improvement of Nwalmah Spring Conveyance System

Settling Basin Details

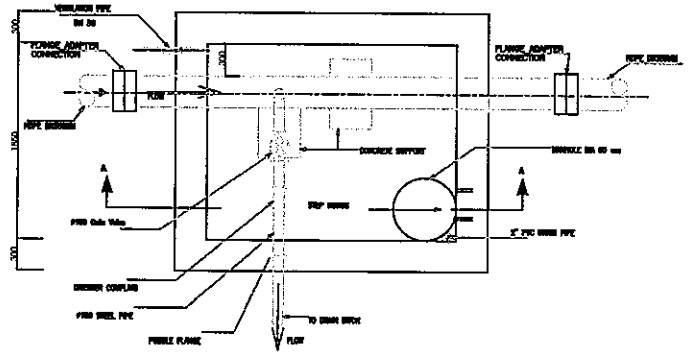
Scale: 1:50/100	Designed:
Date: Dec, 2007	Drawn:
Drawing No.:	Checked:



SECTION A–A



STRUCTURAL DETAIL (PLAN)



SECTION B–B
WASHOUT
WITH CONCRETE CHAMBER

Notes:

1. All Dimensions are in millimeter unless otherwise indicated.

2. Design compressive strength of concrete used in all reinforced concrete ($f'c$) shall be 25N/mm^2 at 28 days. Strength tests for concrete shall be made in accordance with "method of test for compressive strength of molded concrete cylinders" ASTM C39.

3. Design compressive strength of lean concrete blinding shall be 15N/mm^2.

4. All reinforcing steel bars used (fy) shall be deformed with a minimum yield point strength of 420N/mm^2, and shall conform to ASTM specifications A615 or to BS4449 or BS4461.

5. Minimum gross bearing capacity of soil (qall) shall not be less than 35N/cm^2. If otherwise, revision shall be made.

6. The washout direction and length will be determined on site upon the Engineer approval.

No.	DATE	DESCRIPTION

REVISIONS

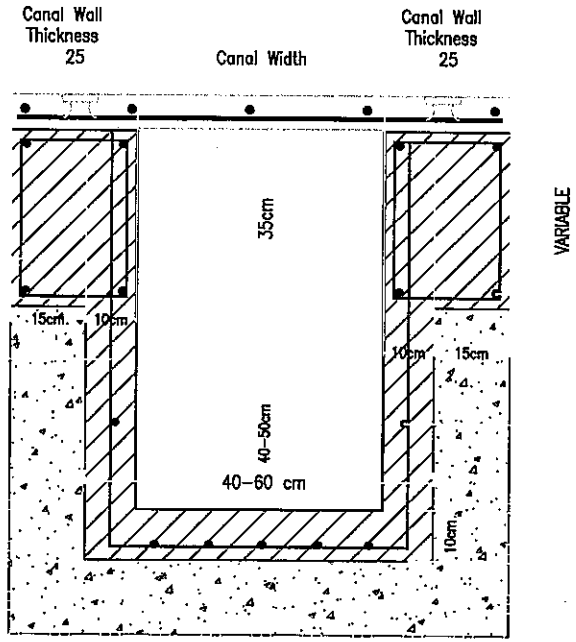
Client: JICA

center for engineering and planning

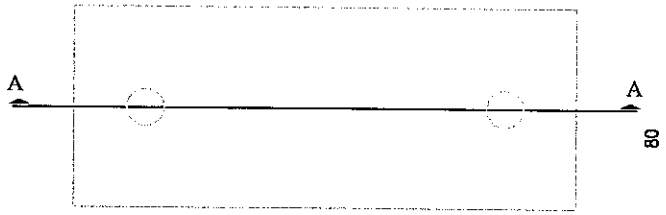
Project Name: Pilot Project for Improvement of Nwoimah Spring Conveyance System

Drawing Title: Standard Details
Washout Details

Scale: NTS	Design:
Date: Dec. 2007	Drawing: M. M.
Drawing No.: STD 04	Checking: E. Sh.



Proposed cross section for type "A"
Scale : As shown



Varies 80~140

SECTION A-A
TYPICAL PRECAST REINFORCED CONCRETE COVER DETAIL

Legend :

Existing Canal

New Work

REVISIONS

Client JICA

center for engineering and planning

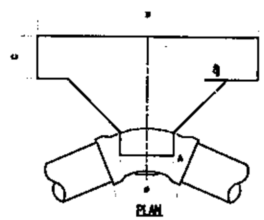
Project Name
Pilot Project for Improvement of Nwaimah Spring Conveyance System

Drawing Title
Typical Cross Sections For Types (A, B,)

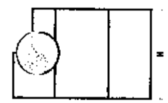
Scale: NTS | Design:

Date: Dec. 2007 | Drawing: K. K.

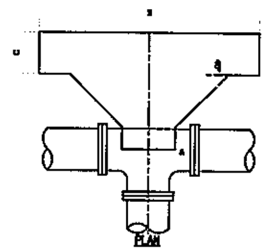
Drawing No.: STR 08 | Checking: T. Sh.



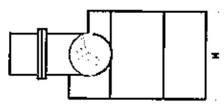
PLAN



SECTION



PLAN



SECTION

DIMENSION / DIA	ROCK				GRAVEL-SILT MIXTURE				GRAVEL-SAND MIXTURE			
	H	A	B	C	H	A	B	C	H	A	B	C
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

ϕ=11.25° BEND

DIMENSION / DIA	ROCK				GRAVEL-SILT MIXTURE				GRAVEL-SAND MIXTURE			
	H	A	B	C	H	A	B	C	H	A	B	C
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

ϕ=22.5° BEND

DIMENSION / DIA	ROCK				GRAVEL-SILT MIXTURE				GRAVEL-SAND MIXTURE			
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

ϕ=45° BEND

DIMENSION / DIA	ROCK				GRAVEL-SILT MIXTURE				GRAVEL-SAND MIXTURE			
	H	A	B	C	H	A	B	C	H	A	B	C
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

ϕ=90° BEND

DIAMETER OF		ROCK				GRAVEL-SILT MIXTURE				GRAVEL-SAND MIXTURE			
[illegible]	[illegible]	H	A	B	C	H	A	B	C	H	A	B	C
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TEE

REVISIONS

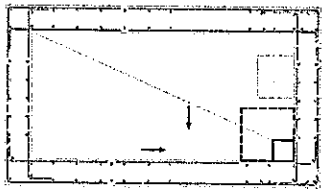
Client: JICA

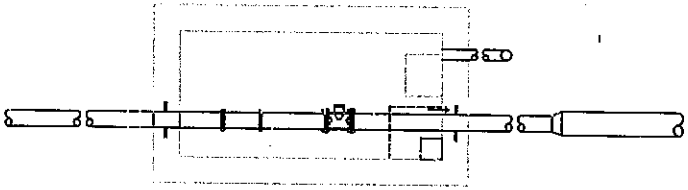
center for engineering and planning

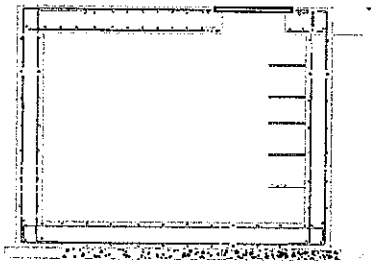
Project Name: Pilot Project for Improvement of Nwaimah Spring Conveyance System

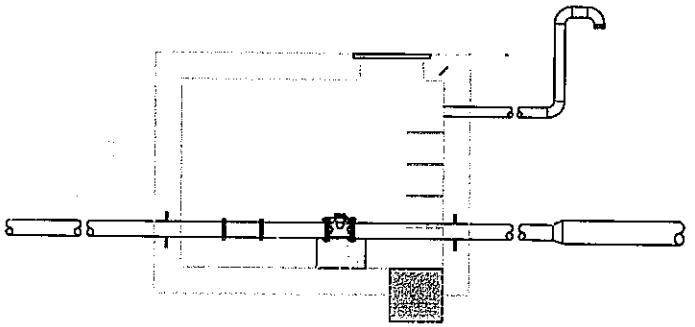
Drawing Title: Standard Details Thrust Blocks Details

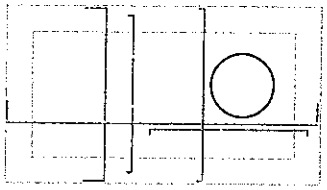
Scale: NTS | Design: [illegible]
Date: Dec. 2007 | Drawing: [illegible]
Drawing No.: STD 07 | Checking: [illegible]

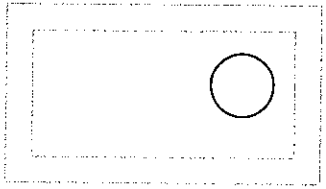












Notes:

1. All Dimensions are in millimeter unless otherwise indicated.

2. Design compressive strength of concrete used in all reinforced concrete (f'c) shall be 25N/mm² at 28 days. Strength tests for concrete shall be made in accordance with "method of test for compressive strength of molded concrete cylinders" ASTM C39.

3. Design compressive strength of lean concrete blinding shall be 15N/mm².

4. All reinforcing steel bars used (fy) shall be deformed with a minimum yield point strength of 420N/mm², and shall conform to ASTM specifications A615 or to BS4449 or BS4461.

5. Minimum gross bearing capacity of soil (qall) shall not be less than 35N/cm². If otherwise, revision shall be made.

7. Exact location of chambers should be subjected to Engineer apruval

No.	DATE	REMARKS

REVISIONS

Client: JICA

center for engineering and planning

Project Name: Nwa'imah Spring Conveyance System

Drawing Title: Standard Details
Watermeter Chamber Details

Scale: NTS	Design: SH. H.
Date: Nov. 2007	Drawing: H. H.
Drawing No.: SWD 08	Checking: E. Sh.

Annex 6.2

Rehabilitation of Seven Agricultural Wells

BILL OF QUANTITIES

1		Jifftlik (ID: 19-17/054)			
No.	**Description**	**Unit**	**Quantity**	**Unit Rate (US$)**	**Total (US$)**
1	Disjoin and extraction of the old pump, and the riser pipes	Lump sum			
2	Supply and assemble new submersible pump of the following parameters: Q=30 m3/hr,Total Head= 70 m , pump efficiency not less than 70% Pump should be supplied with the electric cable and necessary wire	Pump	1		
3	Supply and install new Lifting Pipes of high density polyethylene (HDPE) , 4", 50m with the necessary fitting for connection to pump discharge manifold and irrigation networks. HDPE must have the following specifications: Working pressure: 16 bar Standard wall thickness	M	50		
4	Supply and install new Electric Control Panel with specification mentioned in technical specification section and matching the required pump	Lump sum	1		
5	Supply and assemble a non return valve, 4" complete, type, 16 bar. Price includes: excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area	Valve	1		
6	Supply and assemble gate valve, 4"complete, 16 bar. Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area	Valve	1		
7	Supply and install water meter 4" complete 16 bar, flow rate 50 m3/hr. Price includes excavation, cutting,	Flow meter	1		

	welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area				
8	Supply and assemble compound air valve 2" complete, origin, 16 bar Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area. Prices also include supplying and installing 2" coupling, nipple and 2" gate valve	Valve	1		
9	Supply Water Meters (for convey system), flow meter of 3 inches, 16 bar and flow rate of 100 m3/hr . Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area.	Flow meter	4		
10	Supply and install 1” galvanized steel pipe for water level measurements.	M	48		
11	Supply and assemble pressure gauge, 25 bar with oil liquid Rotal ASME, B40. Price includes excavation, cutting, welding, adding coupling, and accessories that are needed to assemble the gauge.	Lump sum	1		
12	All works related to assemble and lower down all pumping equipments, which include: discharge head, pumping pipes, columns, and pump. Price involves checking, testing and operating the pump after finishing all project works.	Lump sum	1		
	Sub-Total				

2		Al Jeftlik (ID: 19-17/027)			
No.	**Description**	**Unit**	**Quantity**	**Unit Rate (US$)**	**Total (US$)**
1	Disjoin and extraction of the old pump, and the existed riser pipes	L.S			
2	Supply and assemble new vertical turbine pump of the following parameters: - Capacity:65m3/hr, - 1800 rpm - Total Discharge Head: 80 m - Efficiency not less than 70%	L.S.	1		
3.	Supply and install new rising Pipes,(6", 52m), complete with drive shaft with standard diameter at least 35 mm, lager and coupling	M	52		
4.	Supply and assemble a new steel discharge head class F complete. The intake and outlet dimensions are 6"*6" the price includes supplying and installing wick and box, and suitable stainless steel column for the last riser pipe and connect with the existed discharge manifold.. The basic dimensions for the discharge head are 65*65 cm. The price includes supplying and installing A suitable stainless steel column for the last riser pipe and connect with gear box up to the control nut	L.S.	1		
5.	Supply and install Right Angle Gear Head Gear rate 5/6 , 50HP ,Johnson	L.S.	1		
6.	Disjoin the old motor, supply and install new diesel motor with dual clutch, 50 HP, 1500 rpm, One year warranty starting from the date of handing over. Price include: Supply and assemble an automatic control panel and all accessories: battery of 110 ampere, protection mesh for radiator and all moving parts Construction of reinforce concrete foundations with 2 layer of steel	Lump sum	1		

	bar: diameter 12mm 20 cm X 20cm to fix the motor Executing and fixing the exhaust silencer, flexible pipes. Connections and valves to the fuel tanks. Filters for oil and fuel for the first 100 running hours Documents showing: specifications, catalogues and declaration from contractor of these specifications				
7.	Supply and assemble a non return valve, 6" complete, type, 16 bar. Price includes: excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area	Valve			
8.	Supply and assemble gate valve, 6"complete, 16 bar. Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area	Valve			
9	Supply and assemble compound air valve 2" complete, origin, 16 bar Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area. Prices also include supplying and installing 2" coupling, nipple and 2" gate valve	Valve			
10	Supply Water Meters (for convey system) -2 flow mete of 4 inches, - 2flow meter of 3 inches 16 bar and flow rate of 100 m3/hr . Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area.	Num	4		
11.	Supply and install 1” galvanized	M	55		

	steel pipe for water level measurements.				
12	Supply and assemble pressure gauge, 25 bar with oil liquid Rotal ASME, B40. Price includes excavation, cutting, welding, adding coupling, and accessories that are needed to assemble the gauge.	Lump sum	1		
13	All works related to assemble and lower down all pumping equipments, which include: discharge head, pumping pipes, columns, and pump. Price involves checking, testing and operating the pump after finishing all project works.	L.S.	1		
	Sub-Total				

3		Al Jeftlik (ID: 19-17/055)			
No.	**Description**	**Unit**	**Quantity**	**Unit Rate (US$)**	**Total (US$)**
1	Disjoin and extraction of the old pump, and the riser pipes of meter total length	L.S			
2	Supply and assemble new vertical pump of the following parameters: - Capacity= 90m3/hr, - Turbine Speed=1800 rpm - Total Head: 120 m - efficiency not less than 70%	L.S.	1		
3	Supply and install new rising Pipes,(6", 85 m), complete with drive shaft with standard diameter at least 35 mm, lager and coupling	M	85		
4.	Supply and assemble a new steel discharge head class F complete. The intake and outlet dimensions are 6"*6" the price includes supplying and installing wick and box, and suitable stainless steel column for the last riser pipe and connect with the existed discharge manifold. The basic dimensions for the discharge head are 65*65 cm. The price includes supplying and installing A suitable stainless steel column for the last riser pipe and connects with gear box up to the control nut.	L.S.	1		
5.	Supply and install new Diesel Generator 75 HP, 1500pm, continuous running. One year warranty starting from the date of handing over. Price include: Supply and assemble an automatic control panel and all accessories: battery of 110 ampere, protection mesh for radiator and all moving parts Construction of reinforce concrete foundations with 2 layer of steel bar: diameter 12mm 20 cm X 20cm to fix the generator Executing and fixing the exhaust	Lump sum	1		

	silencer, flexible pipes. Connections and valves to the fuel tanks. Filters for oil and fuel for the first 100 running hours Documents showing: specifications, catalogues and declaration from contractor of these specifications				
6	Supply and install new Electric Control Panel with specification mentioned in technical specification sections and matching the required pump	Lump sum	1		
7.	Supply and install 3-phase electric motor (Vertical), squirrel cage heavy duty, water proof, 10 m of cable with enough capacity, 55HP. This motor should be equipped with all accessories needed to connect motor and to the gear box and run the vertical pump	Lump sum	1		
8.	Supply and assemble a non return valve, 6" complete, type, 16 bar. Price includes: excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area	Valve			
9.	Supply and assemble gate valve, 6"complete, 16 bar. Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area	Valve			
10	Supply and assemble compound air valve 2" complete, origin, 16 bar Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area. Prices also include supplying and installing 2" coupling, nipple and 2" gate valve	Valve			
11	Supply Water Meters (for convey system)	Flow meter	4		

	-2 flow mete of 4 inches, - 2flow meter of 3 inches 16 bar and flow rate of 100 m3/hr . Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area.				
12.	Supply and install 1" galvanized steel pipe for water level measurements.	M	85		
13	Supply and assemble pressure gauge, 25 bar with oil liquid Rotal ASME, B40. Price includes excavation, cutting, welding, adding coupling, and accessories that are needed to assemble the gauge.	Lump sum	1		
14.	All works related to assemble and lower down all pumping equipments, which include: discharge head, pumping pipes, columns, and pump. Price involves checking, testing and operating the pump after finishing all project works.	L.S.	1		
	Sub-Total				

4		Frush Biet Dajan (ID: 19-17/034)			
No.	**Description**	**Unit**	**Quantity**	**Unit Rate (US$)**	**Total (US$)**
1	Disjoin and extraction of the old pump, and the riser pipes of meter total length	Lump sum			
2	Supply and assemble new vertical pump of the following parameters: - Capacity: 50 m3/hr, - Turbine Speed: 1800 rpm - Total Discharge Head: 180 m - Efficiency not less than 70%	L.S.	1		
3.	Supply and install new rising Pipes,(6", 142m), complete with drive shaft with standard diameter at least 35 mm, lager and coupling	M	142		
4.	Supply and assemble a new steel discharge head class F complete. The intake and outlet dimensions are 6"*6" the price includes supplying and installing wick and box, and suitable stainless steel column for the last riser pipe and connect with the existed discharge manifold. The basic dimensions for the discharge head are 65*65 cm. The price includes supplying and installing A suitable stainless steel column for the last riser pipe and connects with gear box up to the control nut.	Lump sum			
5.	Supply and install Right Angle Gear Head Gear rate 5/6 , 45 HP, Johnson	Lump sum	1		
6.	Disjoin the old motor, supply and install new diesel motor with dual clutch, 45 HP,1500 rpm, One year warranty starting from the date of handing over. Price include: Supply and assemble an automatic control panel and all accessories: battery of 110 ampere, protection mesh for radiator and all moving parts Construction of reinforce concrete	Motor			

	foundations with 2 layer of steel bar: diameter 12mm 20 cm X 20cm to fix the motor Executing and fixing the exhaust silencer, flexible pipes. Connections and valves to the fuel tanks. Filters for oil and fuel for the first 100 running hours Documents showing: specifications, catalogues and declaration from contractor of these specifications				
7.	Supply and assemble a non return valve, 6" complete, type, 16 bar. Price includes: excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area	Valve	1		
8.	Supply and assemble gate valve, 6"complete, 16 bar. Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area	Valve	1		
9.	Supply and assemble compound air valve 2" complete, origin, 16 bar Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area. Prices also include supplying and installing 2" coupling, nipple and 2" gate valve	Valve	1		
10.	Supply Water Meters (for convey system) -2 flow mete of 4 inches, - 2flow meter of 3 inches 16 bar and flow rate of 100 m3/hr . Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area.	Flow meter	4		

11.	Supply and install 1" galvanized steel pipe for water level measurements.	M	142		
12	Supply and assemble pressure gauge, 25 bar with oil liquid Rotal ASME, B40. Price includes excavation, cutting, welding, adding coupling, and accessories that are needed to assemble the gauge.	Lump sum	1		
13.	All works related to assemble and lower down all pumping equipments, which include: discharge head, pumping pipes, columns, and pump. Price involves checking, testing and operating the pump after finishing all project works.	L.S.			
	Sub-Total				

5		Frush Biet Dajan (ID: 19-17/047)			
No.	**Description**	**Unit**	**Quantity**	**Unit Rate (US$)**	**Total (US$)**
1.	Disjoin and extraction of the old pump, and the riser pipes of meter total length	L.S			
2.	Supply and assemble new vertical pump of the following parameters: - Capacity= 80m3/hr, - Turbine Speed=1800 rpm - Total Discharge Head: 200 m - Efficiency not less than 70%	Lump sum	1		
3.	Supply and install new rising Pipes,(6", 152 m), complete with drive shaft with standard diameter at least 35 mm, lager and coupling	M	152		
4.	Supply and assemble a new steel discharge head class F complete. The intake and outlet dimensions are 6"*6" the price includes supplying and installing wick and box, and suitable stainless steel column for the last riser pipe and connect with the existed discharge manifold.. The basic dimensions for the discharge head are 65*65 cm. The price includes supplying and installing A suitable stainless steel column for the last riser pipe and connect with gear box up to the control nut.				
5.	Supply and install Right Angle Gear Head Gear rate 5/6 , 125 HP, Johnson	Lump sum	1		
6.	Disjoin the old motor, supply and install new diesel motor with dual clutch, 125 HP,1500 rpm, One year warranty starting from the date of handing over. Price include: Supply and assemble an automatic control panel and all accessories: battery of 110 ampere, protection mesh for radiator and all moving parts	Motor	1		

	Construction of reinforce concrete foundations with 2 layer of steel bar: diameter 12mm 20 cm X 20cm to fix the motor Executing and fixing the exhaust silencer, flexible pipes. Connections and valves to the fuel tanks. Filters for oil and fuel for the first 100 running hours Documents showing: specifications, catalogues and declaration from contractor of these specifications				
7.	Supply and assemble a non return valve, 6" complete, type, 16 bar. Price includes: excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area	Valve	1		
8.	Supply and assemble gate valve, 6"complete, 16 bar. Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area	Valve	1		
9.	Supply and assemble compound air valve 2" complete, origin, 16 bar Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area. Prices also include supplying and installing 2" coupling, nipple and 2" gate valve	Valve	1		
10.	Supply and install water meter 6" complete 16 bar. Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area.	Num	1		
11.	Supply Water Meters (for convey system) -2 flow mete of 4 inches,	Flow meter	4		

	- 2flow meter of 3 inches 16 bar and flow rate of 100 m3/hr . Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area.				
12	Supply and install 1" galvanized steel pipe for water level measurements.	M	152		
13	Supply and assemble pressure gauge, 25 bar with oil liquid Rotal ASME, B40. Price includes excavation, cutting, welding, adding coupling, and accessories that are needed to assemble the gauge.	Lump sum	1		
14.	All works related to assemble and lower down all pumping equipments, which include: discharge head, pumping pipes, columns, and pump. Price involves checking, testing and operating the pump after finishing all project works.	L.S.	1		
	Sub-Total				

6		Fara'a (ID: 18-18/036)			
No.	**Description**	**Unit**	**Quantity**	**Unit Rate (US$)**	**Total (US$)**
1	Disjoin and extraction of the old pump and the riser pipes.	Lump sum			Disjoin and
2	Supply and assemble new vertical pump of the following parameters: - Capacity:90m3/hr, HP - Turbine Speed:1800 rpm - Total Discharge Head: 60 m - Efficiency not less than 70%	L.S.	1		
3	Supply and install new rising Pipes,(6", 15 m), complete with drive shaft with standard diameter at least 35 mm, lager and coupling	M	15		
4	Supply and assemble a new steel discharge head class F complete. The intake and outlet dimensions are 6"*6" the price includes supplying and installing wick and box, and suitable stainless steel column for the last riser pipe and connect with the existed discharge manifold. The basic dimensions for the discharge head are 65*65 cm. The price includes supplying and installing A suitable stainless steel column for the last riser pipe and connects with gear box up to the control nut.	Lump sum	1		
5.	Supply and install Right Angle Gear Head Gear rate 5/6 , 50 HP, Johnson	Lump sum	1		
6.	Disjoin the old motor, supply and install new diesel motor with dual clutch, 50 HP,1500 rpm, One year warranty starting from the date of handing over. Price include: Supply and assemble an automatic control panel and all accessories: battery of 110 ampere, protection mesh for radiator and all moving parts Construction of reinforce concrete foundations with 2 layer of steel bar: diameter 12mm 20 cm X	L.S.	1		

	20cm to fix the motor Executing and fixing the exhaust silencer, flexible pipes. Connections and valves to the fuel tanks. Filters for oil and fuel for the first 100 running hours Documents showing: specifications, catalogues and declaration from contractor of these specifications				
7.	Supply and assemble a non return valve, 6" complete, type, 16 bar. Price includes: excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area	valve	1		
8.	Supply and assemble gate valve, 6"complete, 16 bar. Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area	Valve			
9.	Supply and assemble compound air valve 2" complete, origin, 16 bar Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area. Prices also include supplying and installing 2" coupling, nipple and 2" gate valve	Valve			
10	Supply and install water meter 6" complete 16 bar. Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area.	L.S.	1		
11	Supply Water Meters (for convey system) -2 flow mete of 4 inches, - 2flow meter of 3 inches 16 bar and flow rate of 100 m3/hr .	Flow meter	4		

	Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area.				
12	Supply and install 1" galvanized steel pipe for water level measurements.	M	152		
13	Supply and assemble pressure gauge, 25 bar with oil liquid Rotal ASME, B40. Price includes excavation, cutting, welding, adding coupling, and accessories that are needed to assemble the gauge.	Lump sum	1		
14	All works related to assemble and lower down all pumping equipments, which include: discharge head, pumping pipes, columns, and pump. Price involves checking, testing and operating the pump after finishing all project works.	L.S.	1		
	Sub-Total				

7		Ein Al-Bida (ID: 19-19/005A)			
No.	**Description**	**Unit**	**Quantity**	**Unit Rate (US$)**	**Total (US$)**
1	Disjoin and extraction of the old pump and the riser pipes.	L.S			
2	Supply and assemble new vertical pump of the following parameters: - Capacity:120 m3/hr, - Turbine Speed:1800 rpm - Total Discharge Head: 50 m - Efficiency not less than 70%	Lump sum	1		
3.	Supply and install new rising Pipes,(6", 42 m), complete with drive shaft with standard diameter at least 35 mm, lager and coupling	M	42		
4.	Supply and assemble a new steel discharge head class F complete. The intake and outlet dimensions are 6"*6" the price includes supplying and installing wick and box, and suitable stainless steel column for the last riser pipe and connect with the existed discharge manifold. The basic dimensions for the discharge head are 65*65 cm. The price includes supplying and installing A suitable stainless steel column for the last riser pipe and connects with gear box up to the control nut.				
5.	Supply and install Right Angle Gear Head Gear rate 5/6 ,75 HP, Johnson	Lump sum			
6.	Supply and install new Diesel Generator 75 HP, 1500pm, continuous running. One year warranty starting from the date of handing over. Price include: Supply and assemble an automatic control panel and all accessories: battery of 110 ampere, protection mesh for radiator and all moving parts Construction of reinforce concrete foundations with 2 layer of steel bar: diameter 12mm 20 cm X	Lump sum	1		

	20cm to fix the generator. Executing and fixing the exhaust silencer, flexible pipes. Connections and valves to the fuel tanks. Filters for oil and fuel for the first 100 running hours Documents showing: specifications, catalogues and declaration from contractor of these specifications				
7.	Supply and install new Electric Control Panel with specification mentioned in technical specification sections and matching the required pump	Lump sum	1		
8.	Supply and assemble a non return valve, 6" complete, type, 16 bar. Price includes: excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area	Valve			
9.	Supply and assemble gate valve, 6"complete, 16 bar. Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area	Valve			
10.	Supply and assemble compound air valve 2" complete, origin, 16 bar Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area. Prices also include supplying and installing 2" coupling, nipple and 2" gate valve	Valve			
11	Supply and install water meter 6” nominal capacity 60 m3/h complete 16 bar. Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area.	Valve	1		

12	Supply Water Meters (for convey system) -2 flow mete of 4 inches, - 2flow meter of 3 inches 16 bar and flow rate of 100 m3/hr . Price includes excavation, cutting, welding, adding screws, bolts and accessories that are needed to assemble the valve. The valves could be installed any where within the project area.	Flow meter	4		
13	Supply and install 1" galvanized steel pipe for water level measurements.	M	152		
14	Supply and assemble pressure gauge, 25 bar with oil liquid Rotal ASME, B40. Price includes excavation, cutting, welding, adding coupling, and accessories that are needed to assemble the gauge.	Lump sum	1		
15	All works related to assemble and lower down all pumping equipments, which include: discharge head, pumping pipes, columns, and pump. Price involves checking and operating the pump after finishing all project works.	Lump sum	1		
	Sub-Total				

Annex 6.3

Software Component for Pilot Project

SOFTWARE COMPONENT FOR PILOT PROJECT

Establishment of Water Users' Association for the Target Wells in the Pilot Project

Since full-scale operation will be started from September, a result of monitoring of actual O&M cannot be clarified in this report. This report mentions only monitoring of process of WUA formation and capacity building of WUA for the target wells and staff of concerned village council in target spring.

(1) Rehabilitation of agricultural well

Area and number of farmers

Cultivated area and number of farmer in each target well are shown table below. Cultivated area and number of farmer vary from156 dunoms to 639 dunoms, and 2 farmers to 26 farmers respectively. Total of each figure are 2580.5 dunoms and 93 farmers. According to the pumping test, quality of water from well 19-15/008 in Auja was not applicable for agriculture. The well was not rehabilitated in the pilot project.

Table Cultivated Area and Number of Farmer in Target Wells

No.	Well code	Total cultivated area (dnm)	No. of farmer	Locations
1	19-17/005A	561	11	Ein Al Beida
2	18-18/036	156	12	Fara
3	19-17/034	396	26	Frush Beit Dajan
4	19-17/047	157	8	Frush Beit Dajan
5	19-17/055	639	19	Jiftlik
6	19-17/054	310	10	Jiftlik
7	19-17/027	361.5	13	Jiftlik
8	19-15/008	(200)	-	Auja
	Total	2780.5	93	19-15/008 is not included

Following steps were taken to establish WUA.

(1) Orientation

(2) Profile survey

(3) Problem analysis and objective analysis

(4) Organization set up

(5) Board member selection

(6) Regulation

(7) Registration

(8) Training on O&M

(1) Orientation

An intervention started with orientation of the pilot project. Following items were explained to stakeholders.

- The purpose of the pilot project
- Components of the pilot project
- Contents of each component (hardware and software)
- Schedule of the pilot project

(2) Detailed profile survey

Detailed profile survey was conducted, and the purposes of the survey are:

To grasp the conditions of stakeholders well,

To communicating with stakeholders, and;

To collect baseline data for evaluation.

The result was summarized in the "Profile Survey for 8 Wells in the Jordan Rift Valley". Following data and information were collected in the survey.

Profile of a well and land

Data and information includes; Names of owner, usage, irrigated area, water cost, owner's profit, fee collection, water quality and volume, maintenance, a kind of equipment, management system, operation system, contract, adjacent water sources, and problems and needs.

Profile of each farmer

Collected data and information includes;

Water source for domestic and agriculture, cultivated area, irrigated area, irrigation method, quantity of water use, frequency of water supply, water fee, cropping pattern, ownership of irrigation facility, availability of pond, produce selling channel, and problems in technology and management.

Well owners and farmers expectation on WUA

Reactions from beneficiaries of target wells are varied from positive to negative on impact of WUA establishment. According to the profile survey of target wells in pilot project, most beneficiaries expect positive impact on water management and

other activities in WUA.

- Reliable water supply
- Equitable water distribution
- Quick dispute solution
- Less water loss and water theft
- Appropriate water supply depending on crop water requirement
- Decision making on water management
- Water tariff setting
- Services other than water supply, such as crop planning, collective buying and selling, marketing, fund-raising

(3) Problem analysis and object analysis

Problem analysis workshop was conducted in each well. The purposes of the workshop is to identify problems,, which well owners and water users are facing, and to share these problems among stakeholders, Common problems were identified as follows:

- Israeli Restrictions
- Deterioration of the infrastructure and well conditions
- Lack of capacity and organization to manage water supply properly
- Decreasing water level (water quantity)
- Bad economic conditions of farmers and high cost of fuel
- Pollution of water (water quality)

After the discussion on the problems, possible actions to overcome above problems were discussed. Propose strategies and actions by stakeholders summarized as follows. these actions includes actions taken by all stakeholders, such as government organizations.

- Reduce leakage from main pipeline
- Rehabilitate infrastructure such as a canal
- Rehabilitate groundwater wells
- Eliminate pollution
- Law enforcement
- Organize farmers / users and build their capacity
- Convert the wells to operate by electricity
- Improve marketing - Improve farmer income
- Provide extension and supervision by government Institutions

Following actions were prioritized and shared among well owners and water users. This process could help the consolidation of stakeholders towards formation of WUA.

- Rehabilitate wells and infrastructure
- Organize farmers group and build their capacity
- Improve coordination and communication among users and with other institutions

(4) Organization set up

Well owners and water users still wondered what is WUA and how actually it can work with problems they face. They had following anxiousness on WUA.

- Confusion of farmers - water users
- Ownership vs collective work
- Concept
- Positioning within water governance structure
- Roles and responsibilities
- Mandates
- Financial resources to run WUA
- Sustainability of WUA
- Access to various support from outside
- Technical and administrative competence of members

Process of clarifying the misunderstanding and the confusions

Through a series of discussions and advices from the NGO staff, well owners and water users made clear the misunderstanding and the confusions. Main points, which stakeholders focused on, are clarified as follows.

<u>Concept of WUA</u>

"A Water User Association (WUA) is a voluntary based association of individual water users who wish to undertake water-related activities for their mutual benefit. The specific nature of the service that WUA provides will differ from case to case: as the name suggests, a water user association is an institution that serves its members".

<u>Membership</u>

Membership can be granted to well owners, farmers (water users), and others approved by UWA.

Well ownership

By all means, farmers (water users) will not take over the ownership of the existing wells.

Possible role of WUA

Finally, well owners and water users, reached following scope

- Distribution of water based on agreed schedule
- Operation and maintenance of water related infrastructure
- Collection of required fees and charges to run WUA
- To monitor quality and quantity
- To resolve disputes among members, or between members and non-members
- Acting as an interface between farmers and other Institutions (government, NGO, etc.)
- Form WUA alliances
- To own infrastructure and other means to serve its members.
- Secure credit to members
- Organize post harvest practices (marketing, processing, etc.)

(5) Board member selection

Each WUA elected 7 members to act as management committee consisting of well owners, farmers and members of the local councils. The agreed scope of the management committee is to ensure a better and coordinated management of local water resources and improve the status of farmers.

(6) Regulation

The temporary regulation, which consists of four chapters with thirty nine articles, was developed. Since the temporary regulation was not Each WUA shall modify its contents upon the requests of stakeholders.

Contents of WUA Regulation

CHAPTER ONE (Basic Information)

Article (1) The name, address, command area, and type of WUA

Article (2) Characteristic of the association

Article (3) Association goals

Article (33) Signing power

Article (34) Vice chairman

Article (35) Branch

Article (36) Loans for members

Article (38) Wage for members

Article (39) Contradiction to Water Law

(7) Registration

Since WUA has not been established in Palestine, there was not available any application form in PNA. In the pilot project, PWA supported by NGO, which undertook software component, made application form. The NGO helped WUA to fill the application form. Each WUA submitted the application form and finally registered to PWA. Valid abstraction license has to be attached in the application form. Abstraction license in three of seven wells had not been renewed, and it took time for registration. It tends to not renew abstraction license in absentee-owned well.

(8) Training on O&M

Technical Training

1) Operation

- Establishment of water distribution time table

Based on needs of water users, WUA develop a water distribution time table with improved volume.

- Record keeping of water distribution (a format of record)

Based on the time table, the operator distributes water to each user, and keep the record using a format.

2) Maintenance

Maintenance of pump, gearbox, diesel motor, electric motor, electric panel, and other equipment installed.

Check list of periodical maintenance (a format)

Management Training

- Tariff setting

Temporary tariff was decided based on the result of pumping test after rehabilitation.

The result showed pumping capacity and fuel efficiency. Temporary tariff was set using abstraction license volume.

- Water fee calculation for each user and its record

Based on the record of distribution, water fee for each user has to be calculated. Then, a bill for users has to be issued.

- Water fee collection

Based on the bill, water users pay their water fee, and receipt is issued and payment is recorded.

- Accounting book keeping (revenues and expenses)

Revenue, mainly, water fee and expenses for O&M have to be recorded in the accounting book.

Attachment

1. Summary of Well Profile Survey
2. Application form
3. Regulation (Arabic)
4. Draft Guideline of Water Users' Association (WUA)

(Translated)

General Administration for Water Control

Application form for water users association

1. Association Name:
2. Name and number of Water Resource:
3. Address (location):
4. Telephone No.:
5. Working area:
6. City or town:
7. Governorate or district:
8. Type of association:
9. Name and ID No. of board members

Name	ID No.	Address and Tel.	Signature

I. Main purposes of the association:

a) …….
b) ……
c) ……
d) ……
e) ……

II. Required attachments

a. A copy for the latest extracting license from the water resource.
b. A copy of ownership certificate (if available) or information for the total cultivation area covered by the resource.
c. Copies for ID card of the board members of the association
d. Name/s of authorized person/s who can sign for the requisite evidence of the association
e. Meeting record or the association establishment decision singed by the board.
f. Draft of suggested internal regulation of the association.

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1. Name of applicant:
2. Tele No.:
3. Signature:

(For PWA Use)

Comments of General Administration for Water control:

1) ……..
2) ……..
3) ……

Decision of General Director of Water Control

.....
.....

Procedures:

.....
.....
.....

النظام الداخلي

لجمعية مستخدمي مياه الري من مصدر المياه

اسم المصدر (.....)

رقم (.....)

منطقة (.....)

محافظة (.....)

النظام الداخلي
لجمعية مستخدمي مياه الري من مصدر المياه
اسم المصدر (.....)
رقم (.....)
منطقة (.....)
محافظة (.....)

الفصل الأول

المادة (1) يسمى هذا النظام الداخلي للجمعية.

1. اسم الجمعية:
2. عنوانها:
3. مركزها:
4. نوعها: جمعية مستخدمي مياه الري

المادة(2) صفة الجمعية:

الجمعية هي مؤسسة تعاونية تطوعية غير ربحية لها صفتها الاعتبارية والقانونية، يربط أعضاؤها طوعاً بصفتهم الإنسانية الاعتبارية والقانونية بهدف القيام بنشاطات مشتركة فيما بينهم وبين المجتمع تتعلق بإدارة مصادر المياه الزراعية والبنية التحتية المتعلقة بهما.

هذه الجمعية تمول وتدار وتراقب من قبل أعضائها بطريقة ديمقراطية لتلبية احتياجاتهم الإنتاجية المشتركة المنقولة وغير المنقولة، وان تبرم العقود والاتفاقيات وتوقع الرهون وان تكون طرفا في الدعاوي التي تقيمها أو تقام عليها، ولها أن تمارس كافة الأعمال التي تمكنها من تحقيق أهدافها وفقاً لقانون المياه والأنظمة الصادرة بمقتضاه، وهذا النظام والقوانين المرعية الأخرى السائدة على الأراضي الفلسطينية، وتؤمن بمبادئ المساواة بين الجنسين.

المادة (3) أهداف الجمعية:

تهدف هذه الجمعية إلى إدارة مصادر مياه الري والبنية التحتية لنظام الري الخاص بالمصدر بصورة مستدامة لتلبية احتياجات الأعضاء من مياه الري للزراعات المروية لتحسين أحوالهم الاقتصادية والاجتماعية والثقافية والبيئية وتنظيمهم وفقاً للمبادئ والقيم والأخلاق التعاونية القائمة على المساعدة الذاتية والاعتماد على الذات وترسيخ مبادئ الديمقراطية والمساواة والعدالة والتضامن وفقاً لأحكام القانون وهذا النظام .

المادة (4) نشاطات الجمعية:

أنشأت هذه الجمعية لممارسة النشاطات التالية:

(1) تشغيل وصيانة وتأهيل وتطوير وتوسيع البنية التحتية للمياه الزراعية المستفيدة من مصدر (مصادر) المياه المذكور/ة سابقا
(2) العمل على إقامة مشاريع مائية متطورة لتحسين طرق الري المستخدمة واتباع التكنولوجيا الحديثة في عمليات الري من اجل النهوض بمصالح أعضائها الاقتصادية والاجتماعية.
(3) زيادة مساحة الأراضي المروية.
(4) تقليل تكلفة إنتاج وتخزين وتوزيع المتر المكعب من المياه الزراعية.
(5) خلق تفاهم مشترك بين مستخدمي المياه ومالكي الآبار الزراعية.
(6) إرشاد المزارعين لأنماط زراعة اقتصادية تحقق دخلاً أفضل للمزارعين وتستهلك كميات أقل من المياه وذلك بالتنسيق مع الدوائر والمؤسسات الفنية المختصة.
(7) المساهمة والمشاركة مع الجهات الرسمية وغير الرسمية في إعداد وتنفيذ البرامج التدريبية الخاصة بإدارة مصادر المياه والمحافظ عليها وكذلك البرامج الخاصة بإدارة الإنتاج الزراعي والحيواني وفقا للمفاهيم العالمية لتحقيق الأمن الغذائي والتنمية المستدامة.
(8) إمكانية استخدام المياه العادمة المعالجة لري بعض المزروعات وفقا للمعايير والأسس المعتمدة لدى الجهات الرسمية.
(9) تمكين الأعضاء من الحصول على الخدمات التي تقدمها الجمعية والعمل على زيادة أعضاء الجمعية.
(10) تشجيع وتعميق الوعي البيئي لدى الاعضاء والمواطنين المستهدفين والعمل على تطوير مفهوم التنمية المستدامة بالتعاون والتنسيق مع الجهات الرسمية وغير الرسمية
(11) تطوير الشراكة والتعاون بين اعضاء الجمعية والجمعيات الاخرى ذات الاهداف المشابهة
(12) العمل على الحصول على التمويل والقروض والهبات من المصادر المتاحة لتحقيق اهدافها

الفصل الثاني

المادة (5) العضوية:

أ. العضوية في الجمعية اختيارية وطوعية، وباب الانتساب مفتوح أمام كل الذين يرغبون بالاستفادة من خدماتها، ولديهم الرغبة وإمكانية تحمل المسؤوليات والالتزامات والمخاطر المترتبة على هذه العضوية دون تمييز سياسي أو ديني أو عنصري أو بين جنس وآخر ضمن الشروط المحددة في هذا النظام ويتألف الأعضاء من:

1. الأشخاص الذين اشتركوا في طلب التسجيل بصفتهم الأعضاء المؤسسين.
2. الأشخاص الذين يقبلون في الجمعية من حين لآخر وفقاً لأحكام هذا النظام.

ب. الشروط المؤهلة للعضوية:

1. أن يكون مالكا أو متصرفاً أو مستأجرا لأرض زراعية مروية في المنطقة الجغرافية المحيطة بالمصدر المائي ومنتفعاً من المصدر المائي.
2. أن يكون قد أتم الثامنة عشرة من عمره ويستثنى من ذلك الورثة القاصرون لأحد الأعضاء المتوفين.
3. أن تكون لديه الرغبة والاستعداد للتعاون مع لجنة الإدارة والأعضاء في تعامله واستخدامه لمرافق ونشاطات الجمعية.

ت. . شروط اخرى خاصة:

- أن يكون قد وقع على التعهد الخطي المحدد بصيغة طلب الانتساب للجمعية.

المادة (6) طلب الانتساب:

يجب على جميع الأعضاء طالبي الانتساب إلى الجمعية أن يقدموا لها التعهد الخطي التالي:

أنا ..... الموقع أدناه المقيم في .....

واعمل

..... والمولود في ..... بتاريخ / / 19م

وبعد أن اطلعت على النظام الداخلي للجمعية أتقدم بطلبي هذا راغبا قبولي عضواً في الجمعية، وأتعهد بان اعمل بمقتضى القوانين والأنظمة النافذة والنظام الداخلي للجمعية وقرارات الهيئة العمومية ولجنة الإدارة والمفوضين الذي يتمتعون بصلاحيات مخولة إليهم من الجمعية حسب الأصول، وأتعهد بان اخضع لجميع الالتزامات والمخاطر والعقوبات والشروط المبينة في النظام المذكور، وأتعهد بالالتزام بجميع العقود والقيود المدونه في دفاتر الجمعية حسب الأصول فيما يتعلق بديونها علي وبما لي في ذمتها وان لا أتصرف بما يتعارض ومصلحة الجمعية.

التاريخ / / 20م **توقيع**

طالب الانتساب

المادة (7) قبول الاعضاء الجدد:

يحق للجمعية اضافة اعضاء جدد كما يلي:

أ. تقديم طلب للعضوية.
ب. تعرض طلبات الانتساب على لجنة الإدارة في اقرب جلسة لها وتقرر هذه اللجنة بأكثرية أصوات الحاضرين قبول الطلب أو رفضه، مع ذكر الأسباب الموجبة للرفض.
ت. يجوز للطالب الذي رفضت لجنة الإدارة طلبه ان يستأنف قراراها إلى الهيئة العمومية في اجتماعها التالي وإذا صوت أكثرية الأعضاء الحاضرين لصالحه يصبح عضوا في الجمعية.
ث. يترتب على من أصبح عضوا في الجمعية أن يوقع اسمه في سجل الأعضاء ومن يسمونهم.
ج. ينظر في طلبت الانتساب للجمعية حسب أولوية الطلبات المقدمة.

المادة (8) التمتع بحقوق العضوية:

لا يحق لأي عضو أن يتمتع بحقوق العضوية ما لم يكن قد سدد ما هو مستحق عليه للجمعية من مال، كرسم الانتساب وأية التزامات مالية مستحقة أخرى تقررها الهيئة العمومية ولجنة الإدارة والنظام الداخلي للجمعية.

المادة (9) الحلول القانوني محل الاعضاء

أ. مع مراعاة أحكام قانون الأحوال الشخصية المتعلق بالمواريث، فان للعضو أن يسمي شخصا آخر يقوم مقامه ويتمتع بكافة حقوق الديمقراطية ويلتزم بجميع التزاماته بعد وفاته أو أن تترك التسمية للورثة لاختيار من ينوب عنهم ويمثلهم بدل العضو المتوفى.
ب. للعضو المتواجد خارج البلاد أن ينيب عنه خطياً عضوا آخر يمارس حقوقه، ويفي بالالتزامات المستحقة عليه أثناء غيابه، على انه لا يجوز للنائب أن يكون نائباً عن أكثر من عضو واحد وان يتم إقرار هذه النيابة من لجنة الإدارة.

المادة (10) زوال العضوية:

تزول عضوية العضو بقرار مسبب من لجنة الإدارة في الأحوال التالية

1. فقدان العضو أحد مؤهلات العضوية بمقتضى هذا النظام.
2. الانسحاب بعد تبليغ أمين السر خطياً قبل ثلاثة أشهر، ولا يعتبر هذا الانسحاب نافذاً طيلة المدة التي يكون فيها العضو مدينا لجمعية، أو كفيلاً على قرض لم يسدد بعد أو لم يسدد ما عليه من التزامات أخرى للجمعية.
3. الفصل من عضوية الجمعية وفقاً للشروط والإجراءات المحددة بالمادة (10) من هذا النظام.
4. فقدان الأهلية القانونية أو الوفاة على انه في هاتين الحالتين إذا لم يكن ثمة مسمى فانه للجنة الإدارة ان تقبل بان يحل محل العضو الذي زالت عنه العضوية بسبب إحدى الحالتين وصي أو وكيل ورثة العضو المتوفى وان يتمتع هذا الوصي أو الوكيل بجميع حقوق العضو الأصلية ويخضع لجميع التزاماته، وتطبق عليه النظم المعمول بها بهذا الخصوص فيما يتعلق بالعضو.
5. عند زوال العضوية عن العضو وفقا لهذا النظام تدفع له مساهماته أو حقوقه المالية خلال سنتين من تاريخ زوال عضويته بعد حسم أي دين مستحق عليه للجمعية أو نصيبه في صافي خسارة الجمعية عند زوال عضويته.

المادة (11) فصل الاعضاء:

يفصل العضو من الجمعية بقرار يتخذه 3/2 (ثلثا) أعضاء لجنة الإدارة لأحد الأسباب التالية:

1. إذا أدين بارتكابه جرما جزئيا يشتمل على سوء الأمانة أو الشرف.
2. إذا لم يؤد ما عليه من التزامات للجمعية أو أهمل أو رفض التقيد بهذا النظام أو أي نظام عام أو عدم الرضوخ لقرارات الهيئة العمومية ولجنة الإدارة بعد إعطائه إشعاراً خطياً بذلك.
3. إذا خالف نص سند التعهد الخطي المحدد بصيغة طلب الانتساب للجمعية أو عقد تأسيس أو اتفاق الالتزام المنظم أو المبرم أو المعقود بينه وبين الجمعية، ويشترط في ذلك أن تكون لجنة الإدارة قد أخطرته أو أنذرته بالمخالفة ولم يعمل على تلافيها خلال المدة المحددة في الإخطار. ما لم يقدم عذراً تقتنع به لجنة الإدارة خلال فترة الإخطار.
4. إذا تغيب خارج البلاد دون أن ينتدب عنه رسمياً عضواً آخر لينوب عنه في تسديد الالتزامات المالية لمدة ستة اشهر على الأقل أو عدم حضوره اجتماع الهيئة العمومية لمرتين متتاليتين.

يبلغ العضو قرار فصله من الجمعية بكتاب مسجل (مضمون) ترسله إليه لجنة الإدارة آو بأية وسيلة قانونية أخرى.

المادة (12) استئناف قرارات الفصل:

للعضو الذي قررت لجنة الإدارة فصله من عضوية الجمعية أن يستأنف قرار فصله (بنفسه أو بواسطة من أنابه رسمياً) للهيئة العمومية خلال ثلاثين يوماً من تبليغه القرار، وعلى لجنة الإدارة أن تعرض الاستئناف المقدم على أول اجتماع للهيئة العمومية لبحثه، واتخاذ القرار المناسب القطعي بشأنه.

الفصل الثالث

المادة (13) رسم الانتساب:

يجب على كل عضو في الجمعية أن يدفع لها رسم انتساب عند قبوله مقداره (عشرة دنانير أردنية) ولا يحق له استرداده عند زوال عضويته من الجمعية مهما كانت أسباب هذا الزوال.

المادة (14) تمويل نشاطات الجمعية:

يجوز للجمعية أن تستحدث صندوقاً أو أكثر لتمويل نشاطاتها وذلك بقرار من الهيئة العمومية على أن يحدد له نظام خاص يبين فيه أهداف الصندوق وطريقة تمويله من الأعضاء وأوجه الصرف منه.

المادة (15) القروض والهبات:

يجوز للجمعية أن تحصل على القروض أو الهبات لتنفيذ غاياتها بقرار من الهيئة العمومية على أن يتم إعلام سلطة المياه بهذا.

المادة (16) الغايات التي تستثمر بها أموال الجمعية:

لا يجوز استثمار أموال الجمعية من رأسمال أسهمي ومال احتياطي أو هبات أو مساعدات أو قروض أو فائض إلا في الغايات التي تحقق أهدافها.

المادة (17) السنة المالية:

تبدأ السنة المالية للجمعية في 1/1 وتنتهي في 31 كانون أول (المدة 12 شهر) من كل سنة ميلادية وتعتبر المدة الواقعة بين تاريخ تسجيل الجمعية ونهاية السنة المالية جزءاً من السنة المالية اللاحقة.

المادة (18) الميزانية العمومية وحساب الدخل والمصروف

يجب على لجنة الإدارة أن تحضر الميزانية العمومية وحساب الدخل والمصروف وكافة البيانات والجداول المالية والإحصائية التي تبين أوجه نشاطها وتسلم لسلطة المياه مباشرة بعد انتهاء السنة المالية.

المادة (19) تدقيق الحسابات:

يجري تدقيق الدفاتر والسجلات الحسابية للجمعية في نهاية كل سنة مالية من قبل مدقق حسابات قانوني مرخص ومعتمد وفقا لما تقرره الهيئة العمومية على أن تراعي في ذلك نصوص القانون والأنظمة الصادرة بمقتضاه.

الفصل الرابع
الاحكام الادارية

المادة (20) الهيئة العمومية:

أ. تتألف الهيئة العمومية من كافة الأعضاء المسددين التزاماتهم المالية المستحقة والذين انطبقت عليهم شروط العضوية وتخول لها الصلاحية العليا في الجمعية.

ب. الأعضاء الذين ينتسبون للجمعية بعد التسجيل لا يتمتعوا بحقوق الترشيح والانتخاب إلا بعد مضي سنة على تاريخ تقديم طلب الانتساب للجمعية.

ت. تعقد الهيئة العمومية اجتماعها السنوي العادي خلال شهرين بعد الانتهاء من تدقيق الحسابات السنوي واستخراج الميزانية العمومية وحساب الدخل المصروف والبيانات المالية والإحصائية الملحقة بها وتصديقها حسب الأصول.

ث. تمتع الهيئة العمومية في اجتماعها الأول بالصلاحيات ذاتها التي تتمتع بها في اجتماعها السنوي العادي وذلك إلى المدى الذي تطبق فيه هذه الصلاحيات.

ج. يجوز للجنة إدارة الجمعية إن تدعو الهيئة العمومية إلى اجتماع غير عادي (طارئ) في أي وقت تشاء أو خلال شهر واحد من تاريخ استلامها طلباً خطياً بذلك من 5/2 (خمسي) الأعضاء أو بطلب من سلطة المياه.

وإذا لم تقم لجنة الإدارة بدعوة الهيئة العمومية إلى مثل هذا الاجتماع فيحق لسلطة المياه أن يدعوها بالطريقة التي تراها مناسبة.

ح. يبلغ الأعضاء بموعد اجتماع الهيئة العمومية قبل انعقاده بعشرة أيام على الأقل ويجب أن يتضمن التبليغ جدول الأعمال ومكان وزمان الاجتماع ومرفقا بها نسخة من التقرير الاداري والحسابات السنوية وترسل الى سلطة المياه نسخة من الدعوة مرفقا بها جدول أعمال الاجتماع.

خ. لا يجوز اتخاذ قرار بأي أمر لم يرد ذكره في جدول أعمال الاجتماع ويجوز مناقشة المواضيع التي يعرضها الأعضاء (خارج حدود الأعمال) دون اتخاذ قرار بشأنها وتعتبر كتوصية للجنة الإدارة.

د. يتألف النصاب القانوني في اجتماعات الهيئة العمومية من (50%+1) (الأغلبية النسبية) وإذا لم يكتمل النصاب القانوني في الاجتماع الأول يؤجل الاجتماع دون إدخال تعديل على جدول الأعمال إلى عشرة أيام على الأقل وثلاثين يوما على الأكثر من تاريخ الاجتماع الأول ويعتبر الاجتماع الثاني قانونياً إذا حضر (25%) من عدد الأعضاء على الأقل شريطة أن لا يقل عددهم عن عدد أعضاء لجنة الإدارة وإذا لم يحضر العدد المطلوب في المرة الثانية يحق لسلطة المياه إما الدعوة لاجتماع آخر وإما التحقيق في شؤون الجمعية.

ذ. يرأس اجتماعات الهيئة العمومية رئيس لجنة الإدارة ويتولى كتابة وقائع الجلسة أمين سر الجمعية.

ر. يكون التصويت في اجتماعات الهيئة العمومية عدا الانتخابات وما نص عليه في هذا النظام برفع الأيدي ويمكن أن يجري بالاقتراع السري إذا أراد ذلك عشر الأعضاء الحاضرين على الأقل وتكفي أكثرية الأصوات لاتخاذ أي قرار عدا ما نص عليه صراحة في قانون المياه والنظام الداخلي لجمعيات مستخدمي المياه وهذا النظام ويعتبر نافذاً وملزماً لجميع أعضاء الجمعية سواء حضروا أو لم يحضروا أو صوتوا مع القرار أو ضده.

ز. لكل عضو من الأعضاء صوتا واحدا فقط وللرئيس صوت مرجح إذا تساوت الأصوات ويحق للعضو المتغيب خارج البلاد أن ينيب عنه خطياً عضوا آخر بموافقة لجنة الإدارة غير انه يجوز للعضو أن ينوب عن أكثر من عضو واحد.

س. تدير لجنة الإدارة اجتماعات الهيئة العمومية، ويترأس الاجتماع لجنة الإدارة ويقوم أمين سر لجنة الإدارة بمهام كاتب وقائع الجلسة لتدوين وقائع الاجتماع، أما في اجتماع الهيئة العمومية الأول فيدير الجلسة أعضاء الهيئة التأسيسية (اللجنة التحضيرية).

ش. تدون في سجل محاضر الاجتماعات جميع الأعمال التي بحثت فيها الهيئة العمومية ويوقع عليها رئيس وأمين سر الاجتماع الذي جرت فيه الوقائع ويجب أن تضمن هذه الوقائع أسماء الأعضاء الذين حضروا الاجتماع، يطلع عليه الأعضاء (توزع نسخة).

ص. ترسل نسخة من وقائع كل اجتماع تعقده الهيئة العمومية مع نسخة من التقارير التي بحثت في الاجتماع والموازنة التقديرية خلال خمسة عشر يوما من تاريخ عقد الاجتماع إلى سلطة المياه الفلسطينية.

ض. بعد إعلان رئيس الاجتماع عن اكتمال النصاب القانوني وإقرار جدول أعمال الاجتماع تقوم الهيئة بالأعمال التالية:-

1. استعراض وقائع اجتماع الهيئة العمومية السابق.
2. النظر في تقرير لجنة الإدارة عن أعمالها خلال العام المنصرم والمشاريع التي تنوي تنفيذها.

3. النظر في تقارير لجنة المراقبة واللجان الأخرى إن وجدت.
4. النظر في الميزانية العمومية التي جرى تدقيقها وتقرير مدقق الحسابات وملاحظات سلطة المياه والمصادقة عليها.
5. كيفية التصرف بالفائض الصافي طبقا لقانون التعاون وهذا النظام.
6. النظر في الموازنة التقديرية للسنة المالية المقبلة والمشاريع والنشاطات المرفقة بها وإقرارها.
7. تعيين مدقق قانوني لحسابات الجمعية ولا يجوز للهيئة العمومية تفويض لجنة الإدارة بتعيين ملحق الحسابات.
8. تحديد البنك أو البنوك التي تتعامل معها الجمعية.
9. تحديد الحد الأعلى للالتزامات المالية التي تتحملها الجمعية بالنسبة للقروض والودائع والصناديق والفوائد عليها خلال السنة المقبلة على أن يقترن ذلك بموافقة سلطة المياه.
10. تحديد الحد الأعلى لقروض وخدمات للأعضاء والعمولة عليها (رسم الخدمة).
11. إقرار المواد من مستلزمات ووسائل الإنتاج التي توفرها في مخازنها.
12. إقرار نوع الإنتاج الذي ستقوم الجمعية بتسويقه أو تصنيعه.
13. إقرار المشاريع المشتركة مع الجمعيات أو المؤسسات الأخرى.
14. انتخاب أعضاء لجنة الإدارة وأعضاء الاحتياط للجان الأخرى.
15. الانتساب إلى الهيئات غير التعاونية وانتخاب ممثلي الجمعية لدى تلك الهيئات.
16. تغريم الأعضاء المخالفين.

المادة (21) لجنة الإدارة:

أ. تتألف لجنة الإدارة من ثلاثة إلى سبعة أعضاء على الأكثر.
ب. تنتخب الهيئة العمومية في اجتماعها السنوي بالاقتراع السري أعضاء لجنة الإدارة لمدة سنة واحدة مع حق أعضاء لجنة الإدارة في إعادة ترشيح أنفسهم لفترة تحددها الجمعية العمومية.
ت. عندما يخلو منصب عضو في لجنة الإدارة خلال الدورة يصبح الشخص الذي نال عدداً اكبر من الأصوات بعد الأعضاء المنتخبين عضواً في اللجنة بدلاً من العضو الذي خلا منصبه فإذا لم يكن هناك شخصاً من هذا القبيل تعقد الهيئة العمومية اجتماعاً طارئاً لانتخاب من يشغل العضوية الشاغرة.
ث. تزول العضوية عن عضو لجنة الإدارة في الأحوال المبينة في المادة (9) من هذا النظام أو إذا تغيب عن حضور ثلاث جلسات متتالية من جلساتها دون عذر مقبول.
ج. ينتخب أعضاء لجنة الإدارة من بينهم رئيساً ونائباً للرئيس وأميناً للسر وأميناً للصندوق وأعضاء مفوضين للتوقيع على المستندات المالية.
ح. تعقد لجنة الإدارة اجتماعا دوريا كل شهر على الأقل أو عند اقتضاء الضرورة أو إذا قدم 3/2 (ثلثي) أعضائها طلباً للرئيس.
خ. يتألف النصاب القانوني في اجتماعات لجنة الإدارة من أكثرية الأعضاء ويكون للرئيس صوتاً مرجحاً إذا تساوت الأصوات
د. تخول لجنة الإدارة الصلاحيات التي لم تحتفظ بها الهيئة العمومية تحقيق أهداف الجمعية على أن تكون خاضعة لأية تعليمات أو قيود تضعها الهيئة العمومية حسب الأصول أو ينص عليها نظام الجمعية الداخلي، وتدير هذه اللجنة أعمال الجمعية وهي مسؤولة أمام الهيئة العمومية عن إدارة كافة نشاطات ومشاريع الجمعية والموظفين العاملين بها وتتحمل مسؤولية الخسائر التي تنشأ عن عدم مراعاة قانون المياه والأنظمة الصادرة بمقتضاه وهذا النظام.
ذ. تتمتع لجنة الإدارة بوجه خاص بالصلاحيات والواجبات التالية:
1. أن تقتني السجلات والدفاتر الضرورية للقيام بأعمالها وان تحتفظ بحسابات صحيحة لجميع معاملات الجمعية وأعضاءها وان توفر السجلات والدفاتر على الأقل:
   أ. سجل الأعضاء وحساباتهم.
   ب. سجل اليومية.
   ت. سجل محاضر اجتماعات الهيئة العمومية ومحاضر جلسات لجنة الإدارة ولجنة المراقبة.
   ث. المستندات المالية الضرورية.
2. أن تقبل الأعضاء الجدد ضمن شروط العضوية المحددة.
3. إقرار كافة النفقات.
4. أن تعد الميزانية العمومية وحساب الدخل والمصروف والجداول المالية والإحصائية وتقرير لجنة الإدارة والموازنة التقديرية والمشاريع والنشاطات ذات الجدوى وخطة العمل لسنة قادمة تعرضها

على الهيئة العمومية في اجتماعها السنوي وخلال المدة المحددة في نظام جمعيات مستخدمي المياه بهدف إقرارها.

5. أن تسهل لموظفي سلطة المياه القيام بوظيفتهم وتزودهم بالمعلومات الوافية المطلوبة.
6. أن تسهل لمدقق الحسابات القيام بواجبه وتزوده بالمعلومات والأرقام والبيانات الوافية المطلوبة.
7. أن تتخذ التدابير لاستيفاء المبالغ المستحقة للجمعية كرسم الانتساب والذمم والغرامات.
8. ان تبرم العقود والاتفاقيات نيابة عن الجمعية وتراقب تنفيذها وتوقع الرهون.
9. أن ترصد المخططات اللازمة لمواجهة تعويض نهاية الخدمة للموظفين إن وجدوا والعجز في الميزانية أو الاستثمار في المشاريع .....الخ.
10. أن تؤمن الخدمات الفنية من الأجهزة الرسمية المختصة لأعضائها.
11. أن تعين الموظفين والمستخدمين، وتحصل منهم على الكفالات اللازمة وتحدد أجورهم وذلك في حدود الموازنة السنوية وتوفقهم وتفصلهم عن العمل.
12. الانتساب إلى الهيئات التعاونية واختيار ممثلي الجمعية لديها.
13. أن تساهم باسم الجمعية في الجمعيات المركزية أو الاتحادات التعاونية أو الهيئات المعنوية.
14. المساهمة والمشاركة في الندوات والدورات الفنية التي تتعلق بأعمال الجمعية.
15. التواصل مع الأعضاء وتزويدهم بالنشرات والمعلومات الفنية عن نشاطات جمعيتهم.
16. أن تنتدب عند نشوء أي خلاف (يتعلق بأعمال الجمعية أو لجنة الإدارة أو أية لجنة منتخبة من الجمعية) أي عضو أو شخص آخر.
    أ. لرفع الأمر للقضاء.
    ب. للدفاع عن الجمعية في قضية رفعت عليها.
    ت. تعيين المحكم / المحكمين لحل الخلافات.
17. أن تصدر القرارات والتعليمات التي تراها مناسبة لحسن إدارة مرافقها ومشاريع الأعضاء.
18. اتخاذ القرارات المناسبة بحق الأعضاء المخالفين لتغريمهم وفق قرارات الهيئة العمومية.
19. دعوة الهيئة العمومية لعقد اجتماعاتها السنوية العادية أو الطارئة وإعداد جدول الأعمال لها.
20. اختيار المفوضين للتوقيع نيابة عن الجمعية على أن يكون أمين الصندوق أحدهم.
21. تشكيل اللجان المختصة لتحقيق غايات الجمعية وأهدافها.
22. يجوز للجنة الإدارة أن تنقل بعض صلاحيات أمين الصندوق أو أمين السر إلى رئيس الجمعية أو موظفي الجمعية لضمان حسن سير عمله.

المادة (22) رئيس لجنة الإدارة:

يكون رئيس لجنة الإدارة مسؤولاً عن القيام بمهام هذا المنصب وخاصة:

أ. أن يرأس جلسات لجنة الإدارة واجتماعات الهيئة العمومية.
ب. أن يوقع على المعاملات المتعلقة بأعمال الجمعية وعلى محاضر جلسات لجنة الإدارة.
ت. أن يمثل الجمعية في الحالات والمجالات التي تقتضي ذلك.

ويقوم نائب الرئيس مقام الرئيس في حالة غيابه.

المادة (23) أمين السر:

يقوم بوجه عام بالعمل الذي تتطلبه واجبات أمانة السر في الجمعيات ويؤدي الواجبات التي تحددها له لجنة الإدارة وبوجه خاص يكون مسؤولا عن:

أ. دعوة أعضاء لجنة الإدارة لحضور جلستها العادية والدورية، أو بطلب من رئيس لجنة الإدارة لحضور جلستها الطارئة.
ب. يعد ويحضر جدول أعمال جلسات لجنة الإدارة.
ت. يدون وقائع الجلسات والاجتماعات والقرارات في دفتر محاضر الجلسات والاجتماعات ويوقع عليها.
ث. الاحتفاظ تحت طائلة المسؤولية بجميع سجلات الجمعية ومستنداتها ووثائقها وختمها على أن يتقيد بالمكان الذي تعينه لذلك لجنة الإدارة.
ج. إعداد التقرير السنوي عن أعمال الجمعية وتلاوته أمام الهيئة العمومية بعد إقراراه من لجنة الإدارة.
ح. القيام بإعداد مراسلات الجمعية وتنظيمها وإطلاع لجنة الإدارة عليها وحفظها حسب الأصول.

المادة (24) أمين الصندوق:

1. تنتخب لجنة الإدارة احد أعضائها أميناً للصندوق ويكون مسؤولا عن قبض وتنظيم وحفظ أموال الجمعية في حرز أمين وعن صرفها في الوجوه التي تقررها لجنة الإدارة، وعليه أن يثبت من صحة القيود في دفاتر وسجلات الجمعية المالية وان يبرز الرصيد النقدي عندما تطلب إليه ذلك لجنة الإدارة أو لجنة المراقبة أو مدقق الحسابات أو سلطة المياه.
2. لا يحق لأمين الصندوق أن يحتفظ لديه مبلغ يزيد عما تقرره الهيئة العمومية.
3. يكون أمين الصندوق أحد المفوضين للتوقيع على معاملات الجمعية المالية.
4. يحتفظ أمين الصندوق بسندات القبض والصرف المعدة للاستعمال اليومي وتلك التي تم استعمالها بصورة كاملة.
5. يكون أمين الصندوق مسؤولا عن نقص أي مبلغ من الصندوق أو فقدانه.
6. يحق للجنة الإدارة أن تطلب من أمين الصندوق تقديم كفالة مالية تقررها وان يلتزم بحفظ أموال الجمعية في البنك المعتمد من الهيئة العمومية.

المادة (25) الجهاز الوظيفي:

يتم تعيين مدير ومحاسب وعدد الموظفين في ضوء حجم عمل الجمعية وإمكانياتها المالية سواء كان متفرغاً للعمل أو يعمل بصورة جزئية أو مقابل مكافأة مقطوعة. وتحدد لجنة الإدارة مؤهل ومهام وظيفة ومسؤولية كل واحد منهم ووصف الأعمال المطلوبة لكل وظيفة ومقدار الرواتب المناسبة للوظائف المختلفة .

المادة (26) لجنة المراقبة:

يمكن تشكيل لجنة للمراقبة اذا ارتأت الجمعية العمومية ضرورة لذلك وفقا للبنود التالية

1. تتألف لجنة المراقبة من ثلاثة أعضاء على الأقل تنتخبهم الهيئة العمومية في اجتماعها السنوي العادي لمدة سنتين وتنتخب مقرراً أو رئيساً لها.
2. تتولى لجنة المراقبة مراقبة إدارة نشاطات الجمعية ومشاريعها وفقا للتشريعات التعاونية وهذا النظام ومتابعة تنفيذ قرارات الهيئة العمومية.
3. تعقد لجنة المراقبة اجتماعاتها الدورية بصورة منفردة أو جلسة مشتركة مع لجنة الإدارة وتدون وقائع جلساتها في سجل خاص يوقع عليه رئيس اللجنة المنتخب.

الفصل الخامسحكام عامة

المادة (27) ختم الجمعية:

يجب أن يكون للجمعية ختم رسمي حسب النموذج الذي تقرره لجنة الإدارة، ويستعمل لختم الوثائق الصادرة عن الجمعية، وتحدد لجنة الإدارة كيفية استعماله.

المادة (28) فض الخلافات:

أ. تحال جميع الخلافات التي تتعلق بأعمال الجمعية إلى سلطة المياه للفصل فيها إما بالتراضي أو بإحالتها إلى التحكيم حسب نصوص قانون المياه والأنظمة الصادرة بمقتضاه بعد أن يكون قد استعصى حلها لجنة الإدارة.

ب. جميع الخلافات التي تنشأ بين الأعضاء أو أفراد أسرهم تحال إلى لجنة الإدارة للفصل فيها وديا.

المادة (29) تعديل النظام الداخلي:

لا يجوز تعديل النظام أو أية مادة منه إلا وفقاً للنصوص المحددة في قانون المياه والأنظمة الصادرة بمقتضاه أو وفقاً للنصوص الواردة في هذا النظام.

المادة (30) اندماج الجمعية مع جمعية أخرى:

يجوز أن تندمج الجمعية مع غيرها وفقاً للنصوص المحددة في قانون المياه والأنظمة الصادرة بمقتضاه.

المادة (31) تصفية الجمعية:

يجوز تصفية الجمعية:

بقرار من سلطة المياه إذا انخفض عدد أعضائها إلى ما دون الحد الأدنى بموجب القانون، أو بعد إجراء تحقيق في شؤونها.

1. بطلب موقع من ثلاثة أرباع أعضائها.
2. يمارس المصفى الصلاحيات المنصوص عليها في قانون المياه والأنظمة الصادرة بمقتضاه.
3. يجري التصرف بأموال الجمعية عند التصفية بعد تسديد الالتزامات على النحو الذي تقرره الهيئة العمومية أمام المصفى وموافقة سلطة المياه.

المادة (32):

يجوز للهيئة العمومية إذا زاد عدد أعضائها عن مائة عضو وتعذر حضورهم للاجتماعات أن يتم انتداب ممثلين عنهم ممن يتمتعون بحقوق العضوية حسب مناطق إنتاجهم أو تواجدهم لحضور اجتماعات الهيئة العمومية وذلك بتنسيب من لجنة الإدارة ويكون لكل ممثل صوت واحد ولا تجوز الإنابة في مثل هذه الحالات.

المادة (33):

يجوز للجنة الإدارة أن توقع عقداً أو تعد نموذجاً للتعهد يوقع من الأعضاء فيما يتعلق بتعاملهم مع الجمعية في عمليات التوريد والتسويق والتصنيع.

المادة (34):

يجوز للجنة الإدارة أن تنتخب نائباً للرئيس إذا كانت طبيعة عملها تحتاج ذلك ويتولى مهام الرئيس في حالة غيابه.

المادة (35):

يجوز للهيئة العمومية للجمعية أن تفتح فروعا لها في منطقة عملها لتحقيق أهدافها بتنسيب من لجنة الإدارة.

المادة (36):

يجب على لجنة الإدارة حصر غايات القروض التي تقدم لأعضائها لتحقيق أهدافها.

المادة (37):

يجب على لجنة الإدارة إعلام سلطة المياه عند تغيير عنوانها أو فتح فروع لها.

المادة (38):

العضوية في لجنتي الإدارة والمراقبة واللجان الأخرى تطوعية ولا يجوز أن يتقاضى عليها العضو أي راتب فيما عدا النفقات التي تقررها لجنة الإدارة. والمكافأة التي تحددها الهيئة العمومية.

المادة: (39):

يقع باطلا كل ارتباط أو اتفاق أو عقد أو تصرف يجريه عضو الجمعية أو لجنة الإدارة أو أية لجنة أخرى في الجمعية خلافاً لأحكام قانون المياه والنظام الخاص بجمعيات مستخدمي المياه وهذا النظام.

(Draft)

Guideline of Water Users' Association for the management of wells in Palestine

Palestinian Water Authority

August 2008

Overall Goal of Establishment of WUA

1. Encourage wider participation in and fair distribution of benefits from, the development and rehabilitation of the infrastructure in water sector.
2. Encourage application of the government policies, such as efficient agriculture water use and diversification of cropping pattern, for the benefit of farmers.
3. Ensure sustainable operation and maintenance activity through user's participation in planning, implementation, monitoring and evaluation.
4. Encourage cooperation among users to solve common problems

Constitutional framework

In chapter VII of the Water Law No. 3 / 2002 states the following:

The Article (25)

> By virtue of this law, Regional Water Utilities will be established based on the desire of local committees and water users associations, to provide water and wastewater services and it will set the tasks and responsibilities and their composition, and management, and financial resources, and dismantling, and all matters pertaining to their work in accordance with regulations that will be issued for this purpose.

Article (26) as follows:

> Regional utilities and water users associations shall set the prices of water for different usage, in accordance with the approved tariff system

Article (28) as follows:

1. The Authority shall have the right to supervise an control regional utilities and water users associations, in cooperation and coordination with the relevant parties, and to take all the procedures necessary regarding them for violating the provisions of this Law or the regulations or directives issued thereunder.

2. The Council, based on the recommendation of the relevant parties, to decide by means of a reasoned decision to suspend or dismantle the services board of directors for of any regional utilities or water user associations and this decision shall be subject to appeal before the relevant court.

1. Name of Organization

Water Users' Association (WUA)

2. Purpose

Sustainable water management through joint management by well owners and users for better national and regional water management

3. Legal Status and Capacity

Special legal status is not granted to WUA so far, but authorized by PWA as a voluntary group for O&M of water supply facility.

4. Establishment

WUA is established by interested well owners and water users, and authorized by PWA.

5. Membership

Membership is voluntary and open to all well owners and water users who have an interest on water management of a well.

5.1. Eligibility Criteria

All well owners and all water users, who receive the benefit from the well.

5.2. Rights and Duties of Members

WUA members have following rights:

A right to participate in decision making of activities related to O&M of water supply system,

A right to access records and documents issued by WUA; and

A right to receive water according to water distribution plan

WUA members have following duties:

A duty to comply the regulation set by WUA, and;

A duty to pay water fee according to the tariff set by WUA.

6. Internal Structure

WUA members elect board members, who directly manage the water supply system.

7. Functions, Powers and Rights

7.1. Functions

WUA has following functions:

- Setting a regulation,
- Setting a tariff,
- Appointment of necessary staff,
- Making a water distribution plan,
- Delivery of water from the well to water users based on distribution plan,
- Maintenance of well facility,
- Collection of water fee
- Necessary record keeping, and
- Attribution of dispute occurred among members

7.2. Powers

None of authorities are granted to WUA.

7.3. Rights

Water right belongs to well owners, not WUA

WUA has a right to use a water supply facility.

WUA has a right to request and receive advice from concerned government authorities.

8. Financing

Possible source of income is:

Revenue from water fee collected from water users, and possibly member fee from the members.

9. Government Role

Concerned government organizations support establishment of WUA in technical and managerial aspects.

Concerned government organizations establish necessary legislations or bylaws, which support WUA.

Concerned government organizations periodically check performance of WUA and give advice, if necessary.

10. Dissolution

WUA would be dissolved, when the well is no longer supplying water, and there is no alternative water source, which WUA can use.

11. Federation of Associations

Adjacent WUAs in a certain region can establish water service utility, which provides common water supply service in the area.

Related Legislations and Regulations

Water Law No. 3 / 2002

Final Draft License System, Palestinian Water Authority

Tariff Regulation & Guidelines, Palestinian Water Authority

Establishment of Management Committee for the Spring Water Conveyance System in the Pilot Project

Following steps were taken to establish a management committee of Nuweimeh spring.

(1) Orientation

(2) Stakeholder analysis

(3) Problem analysis

(4) Identification of present management system

(3) Problem analysis and objective analysis

(4) Organization set up

(5) Training on O&M

(1) Orientation

An intervention started with orientation of the pilot project. Following items were explained to stakeholders.

- The purpose of the pilot project
- Components of the pilot project
- Contents of each component (hardware and software)
- Schedule of the pilot project

(2) Stakeholders Analysis

Key stakeholders at local level were analyzed.

Water resources of Nwei'mah village that represented by Nwei'mah spring -the unique water resource- is controlled and managed through a well known social agenda in the village. The table below shows the different stakeholders and their interests to water resources.

Table Stakeholder Analysis

	Stakeholder	**Primary/ Secondary**	**Role**
1	The village council	Primary	It manages and provides domestic water.
2	Farmers	Primary	Following up the rehabilitation and the maintenance of the distribution system, and they are main water user.
3	Water right holders	Primary	Owners of spring water, exploiting and sometimes selling water to farmers
4	Inhabitants of village	Secondary	There is no role in management, but they are

			domestic water consumers.
5	Jericho Mineral water factory	Secondary	There is no role in management, but they purchase water for bottling.
6	Palestinian Water Authority	Secondary	Their role is limited in monitoring of quantity and quality of spring water.
7	Spring Water Distribution Committee	Primary	They manage and organize water allocations.
8	Ministry of Health	Secondary	There role are limited in quality monitoring.
9	Palestinian Hydrology Group (NGO)	Secondary	There role are limited in quality monitoring
10	Ministry of Agriculture	Secondary	There role are limited in farmers guidance.

(3) Problem Analysis

Identification of Water User Groups

The following table shows the interests and the problems that different water users currently face.

Table Interests and problems of various water users

	Group	**Interests**	**Problems**
1	Villagers	- Stable supply of domestic water - Good water quality - Low water price	- Water pollution, which causes water borne diseases
2	Farmers	- Having water pools to collect their water allocation. - Reducing the water losses by evaporation and leakage.	- Shortage of water mainly in downstream - Repeated damage of the main canal. - Sediment in the channels. - High cost of pond construction, and its regular maintenance.
3	Jericho Mineral water factory	Availability of good water quality	Water pollution and the sediment accumulation.
4	Farmers of animal raising	Availability of water for animal drinking	

Water related problems were analyzed, the problem tree is shown below.

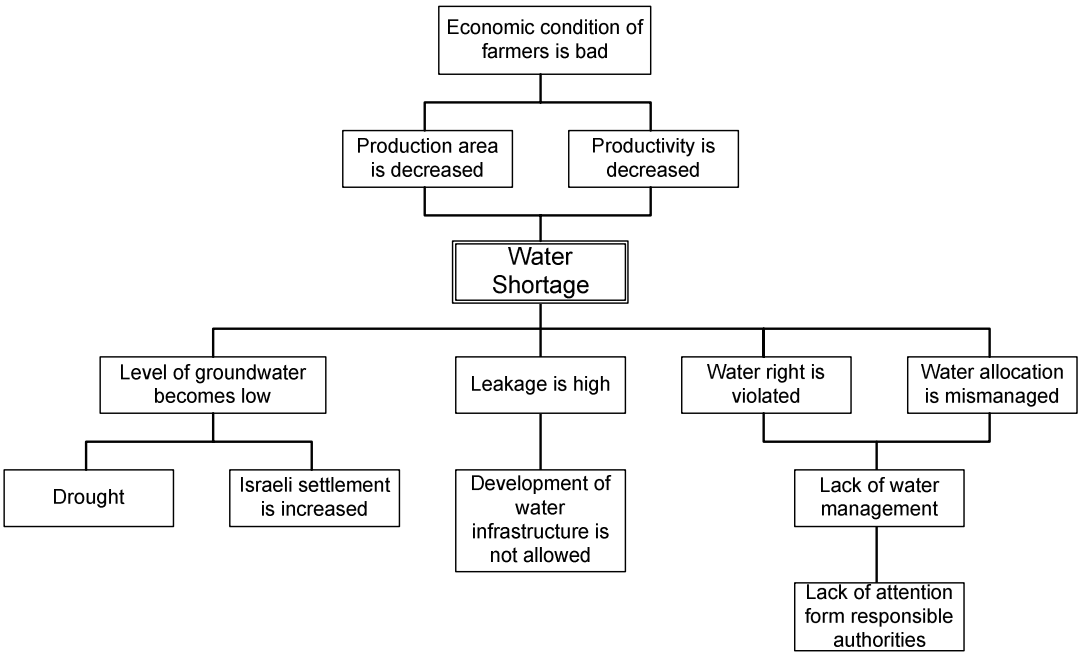


Figure The Result of the Problem Analysis

According to the identification of water users group and the problem tree, which was built with the participation of stakeholders in the village, the main problems can be summarized as follows:

Water shortage in downstream area is mainly caused by:

- The high leakage of water from the canal.
- High evaporation from canal and pools.
- Sediment accumulation in the canal that divert water outside the canal drainage.

Pollution of water is mainly caused by:

- Spread out of insects and germs on water.
- Dumping different wastes into the channel.
- Direct animal drinking from the channel.
- Soil erosion mainly during high intensity rainfall.

As the result of these main tow problems (water shortage and pollution), different effects are resulted as low productivity of the agricultural land area, desertification of the land, and changing the planting pattern in the area. Finally, these effects led to weak the agricultural sector in the area.

(4) Organization Set-up

1) Management Patterns

There are two water management bodies, Al Nwai'mah village council, which is responsible for drinking water supply to the villagers, and Irrigation Water Management Committee, which is responsible for farmers to provide agriculture water. This

committee is a voluntary committee comprises 10 persons, who were elected by the water right holders. Both parties have following roles.

Al Nwei'mah village council

- Measuring water meter at each house
- Issuing a water bill
- Collection of water fee

Irrigation water management committee

- Allocating water according to water shares and rights
- Documentation of water rights trading
- Supervising the canals and doing O&M
- Construct new canals
- Decision making of the GA (the users / Owners) of water rights
- Issuing necessary document all relations between the water rights holders and non holders (external parties).

2) Relations of the new water management body

Each party has an independent identity and functions. Both parties have been coordinated upon their necessity. But decision making mechanism is not clear among them, and their responsibilities are sometimes overlapped.

3) Proposed new management pattern

Through the discussions, both parties decided to combine functions under one water management body. They reached following conclusions.

- Establish drinking and agricultural water management division at Al Nwei'mah village council
- To combine roles of both parties.
- The new management body comprises two representatives of the village council, three water right holders (owner) and two farmers (water user).

4) Scope of Work For The New Management Body

- Compiling basic information related to the spring, such as spring discharge, water quality, water use for all purposes, water level, rainfall, evaporation, temperature, runoff, general information about aquifer, and water balance
- Define water right: review existing water right, and register the right for farmers in

Nwai'mah

- Maintain relation of the water right in upstream and downstream
- Define all possible contractual and commercial relations (Jericho water factory)
- Manage water rights under the natural disaster (severe drought, pollution, etc.)
- Listing and record all water development project (implemented and planned), and assess their impact.
- Keep records of population (natural and agriculture), develop water use scenarios for the future accordingly.
- Define all possible water uses in the future including any development and plan for water demand accordingly, including environmental aspect.
- Monitor water quality and consider the needs of water treatment.
- Define wastewater disposal practice (assess their impact on the spring, develop technology to collect and treat it properly.
- Develop water conservation programs for all users "agriculture, domestic, industry)
- Develop regulations to stop wastewater and enforce it
- Develop a monitoring program to prevent pollution and avoid any break through of severe disaster in the both quantity and quality aspects.
- Establish a mechanism for public participation to ensure balance representations of decision making and to make sure that users interests are considered in the planning and implementation.

(5) Proposed Structure of the Management Committee

The new structure proposed by the stakeholders is illustrated as follows.

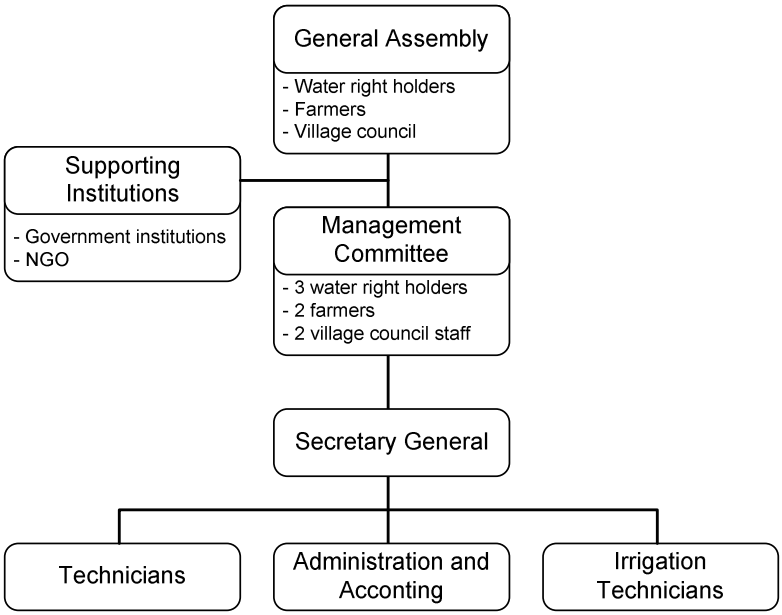


Figure Proposed New Management Structure

This set-up was proposed and agreed. It was also agreed to develop a detailed scope of work and also to draft some working procedures including building a tariff for the newly proposed water management body.

(6) Training on O&M

Technical Training

1) Operation

- Establishment of water distribution time table

Based on water right and needs of water users, the management committee develops a water distribution time table.

- Record keeping of water distribution (a format of record)

Based on the time table, the technician supervises gate operation, and keep the record using a format.

2) Maintenance

Maintenance of related structures installed in the pilot project and existing structures

Check list of periodical maintenance (a format)

Management Training

- Tariff setting

It will take a long time to develop tariff, because of large number of water users. And review of water right has to be necessary for identification of water users. Only procedures of tariff setting were advised to the management committee in this pilot project. When the whole system is rehabilitated, tariff will be set with consensus of stakeholders.

- Record keeping

The village council was advised for the improvement of present record keeping manner. Currently, there is no record kept for irrigation water distribution. At least, the part, which rehabilitated by the pilot project, the village council will regularly monitor and keep necessary records.

ANNEX 7

SOCIO-ECONOMY

ANNEX 7 SOCIO-ECONOMY

Table of Contents

Annex 7.1

Results of Baseline Survey of the Study Area

Results of Baseline Survey of the Study Area

Analyzed tables and charts, other than tables and charts shown in Chapter 6, are compiled in Annex 7, herewith.

Table A.1 Basic Information on Household by Village

Unit: persons

Village	No of HH member	Permanent farmer	Temporary farmer	Male and or more 15	Male under 15	Female and or more 15	Female under 15
Ad Duyuk	6.42	2.03	1.35	1.90	1.29	1.90	1.32
Ain Shbli	7.67	2.67	1.83	2.83	0.83	3.00	1.00
Al 'Auja	10.28	3.19	2.72	3.38	2.03	2.84	1.88
Al Badhan	7.11	1.89	1.47	3.21	0.84	2.21	0.79
Al Jiftlik	7.94	4.09	2.15	2.41	1.41	2.53	1.59
An Nassariya	8.28	2.72	1.28	2.48	1.62	2.21	1.93
An Nuwei'ma	5.65	1.57	0.96	1.78	1.04	1.65	1.17
Aqrabania	8.67	2.33	0.67	3.00	2.00	2.33	1.33
Az Zubeidat	13.91	5.05	3.23	4.41	3.41	2.95	3.14
Bardala	8.61	2.98	1.24	2.85	1.44	2.59	1.12
Beit Hasan	6.17	3.50	1.00	2.33	1.33	2.17	0.33
'Ein el Beida	7.76	2.97	1.69	2.38	1.93	2.03	1.38
Fasayil	8.42	1.42	1.83	2.58	2.00	2.33	1.50
Furush Beit Dajan	8.37	4.37	1.53	3.53	1.53	2.16	1.16
Jericho City	7.15	2.06	1.40	2.81	1.04	2.09	1.21
Kardala	6.14	2.36	0.64	1.86	1.21	1.57	1.43
Marj al Ghazal	9.44	4.00	2.44	2.78	2.50	2.67	1.50
Marj Na'ja	7.50	4.00	1.00	2.00	1.35	1.65	2.50
Total	8.14	2.96	1.65	2.70	1.58	2.27	1.52

Table A.2 Land Use of Cultivated Land by Village

Unit: dunum per household (Mean)

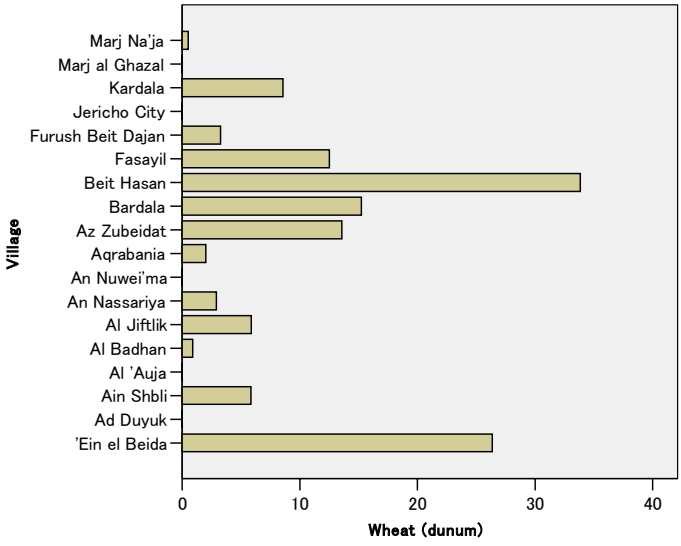
village	Irrigated land (open field)	Irrigated land (green house)	Rain-fed land	Pasture land
Ad Duyuk	27.62	0.23	0.00	0.00
Ain Shibli	0.00	0.00	5.83	0.00
Al 'Auja	93.82	0.38	0.00	0.00
Al Badhan	7.57	0.42	7.89	0.11
Al Jiftlik	33.44	3.65	15.79	0.00
An Nassariya	43.86	0.10	4.31	0.52
An Nuwei'ma	38.18	0.91	0.00	0.00
Aqrabania	33.00	0.33	18.33	0.00
Az Zubeidat	31.38	0.91	14.32	13.50
Bardala	44.97	3.98	19.10	0.00
Beit Hasan	72.00	0.00	33.17	0.00
'Ein el Beida	51.96	4.40	33.03	0.00
Fasayil	42.88	0.75	25.00	0.00
Furush Beit Dajan	24.12	5.37	2.11	2.11
Jericho City	56.39	1.26	0.00	0.00
Kardala	37.50	7.21	8.57	0.00
Marj al Ghazal	22.75	0.11	0.00	0.00
Marj Na'ja	21.63	0.10	1.00	0.25
Total	41.41	1.89	9.02	0.89

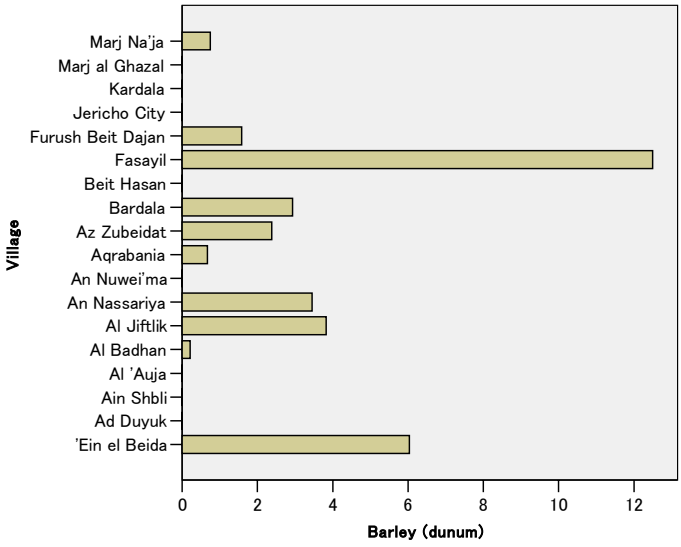
Table A.3 Land Use of Own Land By Village

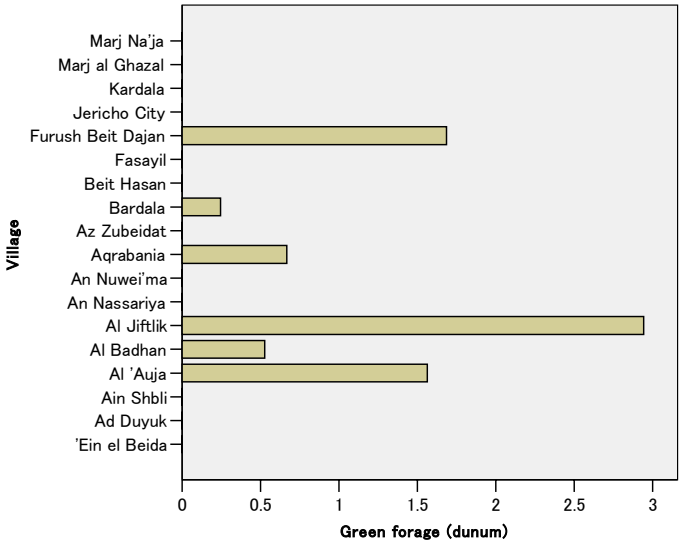
Unit: dunum per household (Mean)

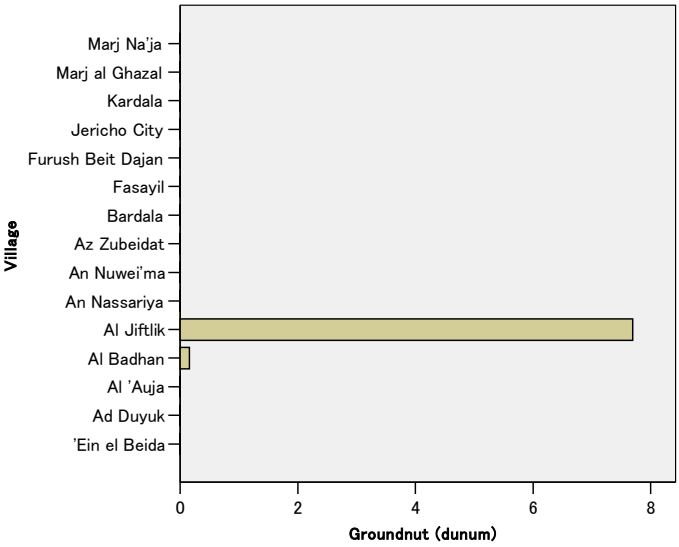
village	Irrigated land (open field)	Irrigated land (green house)	Rain-fed land	Pasture land	Unused land
Ad Duyuk	12.70	.13	.00	.00	.00
Ain Shbli	.00	.00	.00	.00	
Al 'Auja	30.78	.31	.00	.00	14.00
Al Badhan	4.53	.42	6.89	.11	.15
Al Jiftlik	4.35	.65	.00	.00	.00
An Nassariya	8.17	.03	3.45	.00	.39
An Nuwei'ma	9.86	.59	.55	.00	.00
Aqrabania	19.67	.33	1.67	.00	
Az Zubeidat	6.91	.64	14.32	4.55	3.62
Bardala	12.71	2.17	7.22	.02	.05
Beit Hasan	15.00	.00	12.33	.00	
'Ein el Beida	7.62	1.95	4.83	.00	2.75
Fasayil	15.00	.00	25.00	.00	220.00
Furush Beit Dajan	20.32	4.84	2.11	2.11	.00
Jericho City	12.13	.21	.00	.00	.00
Kardala	13.64	4.71	3.21	.00	.00
Marj al Ghazal	14.83	.11	.00	.00	.00
Marj Na'ja	9.35	.10	.50	.00	.00
Total	12.10	.97	3.64	.35	7.66

Average Cultivation Area By Village (Grain)





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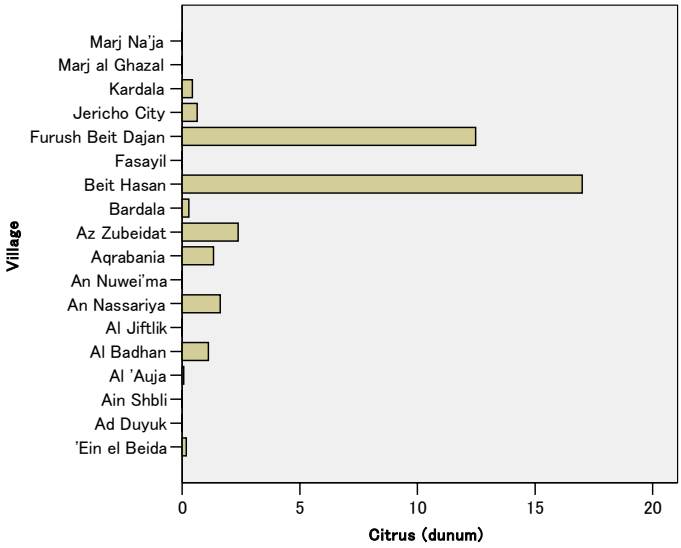
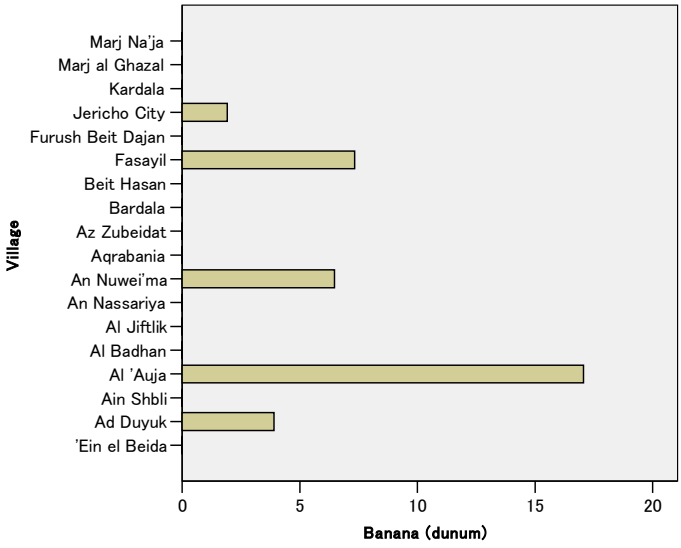
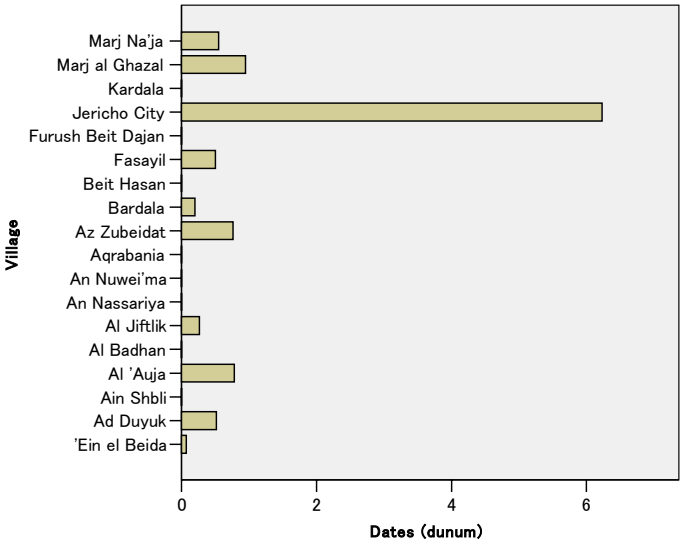
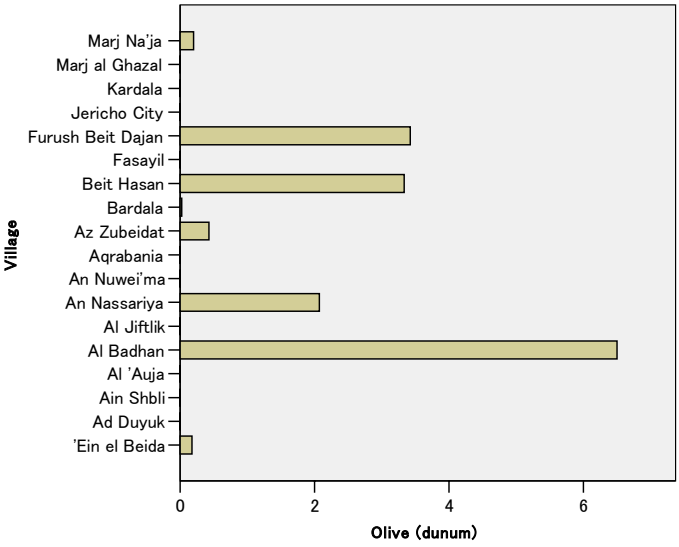
An Nuwei'ma
An Nassariya
Al Jiftlik
Al Badhan
Al 'Auja
Ad Duyuk
'Ein el Beida
Village
0
2
4
6
8
Groundnut (dunum)

Average Cultivation Area By Village (Fruits)








Marj Na'ja
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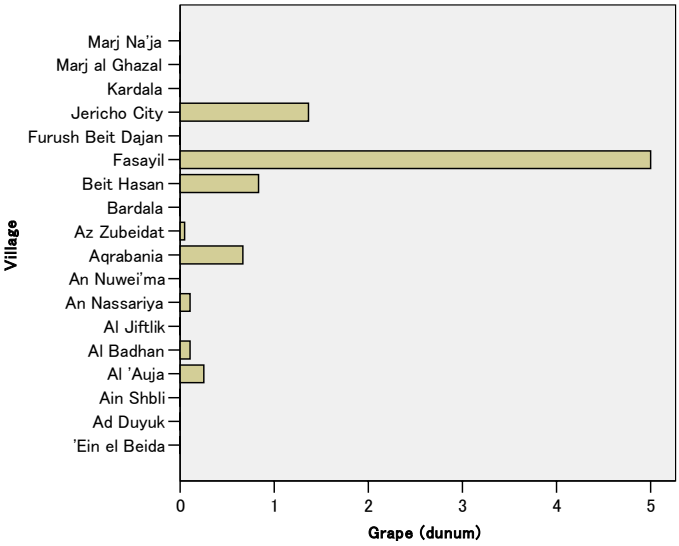
Jericho City
Furush Beit Dajan
Fasayil
Beit Hasan
Bardala
Az Zubeidat
Aqrabania
An Nuwei'ma
An Nassariya
Al Jiftlik
Al Badhan
Al 'Auja
Ain Shbli
Ad Duyuk
'Ein el Beida
Village
0
2
4
6
Olive (dunum)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Al Jiftlik
Al Badhan
Al 'Auja
Ain Shbli
Ad Duyuk
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Village
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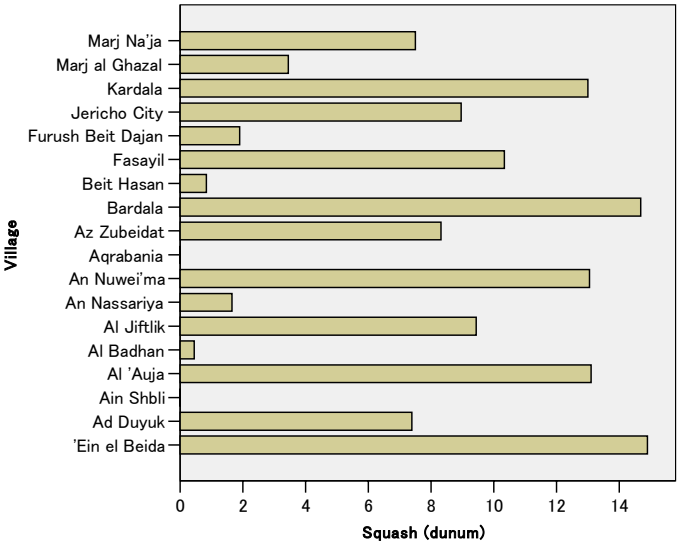
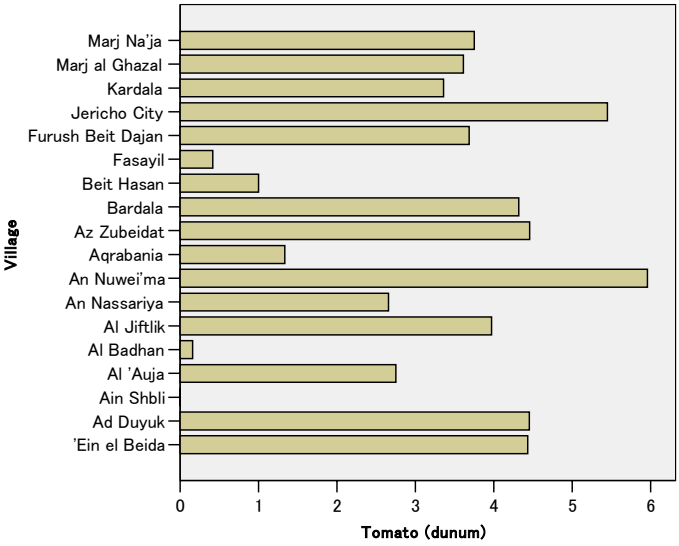
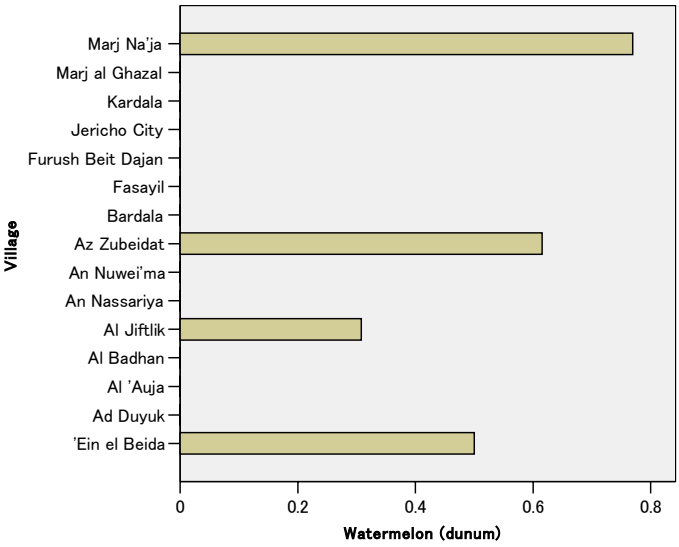
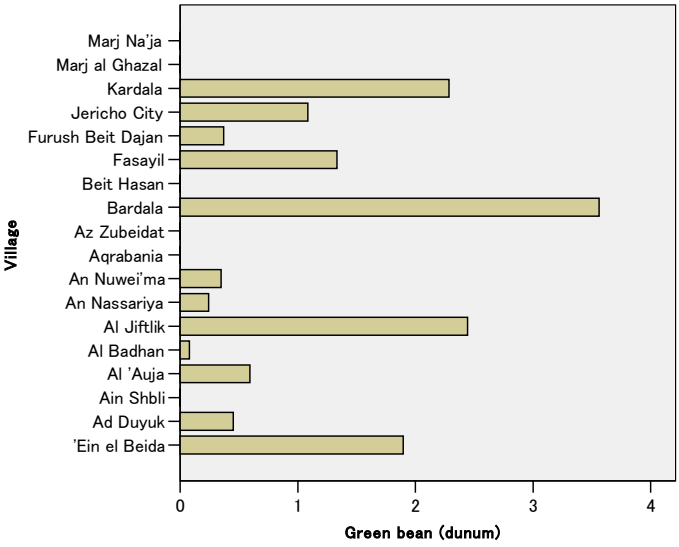
1
2
3
4
5
Grape (dunum)

Average Cultivation Area By Village (Vegetables)





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Az Zubeidat
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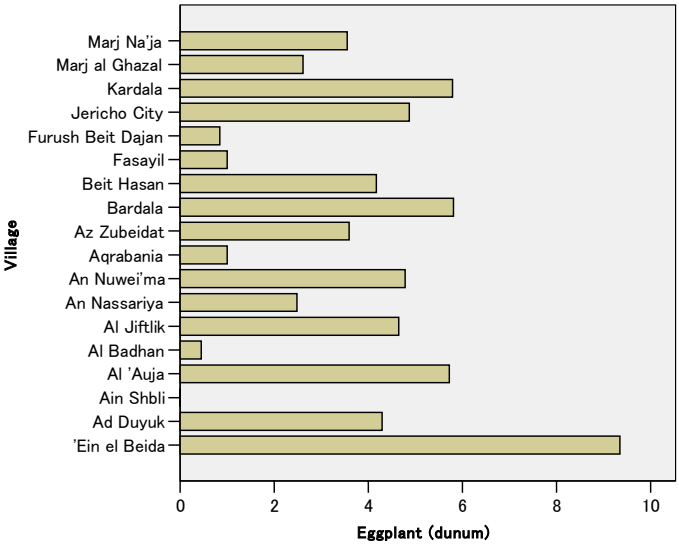
An Nuwei'ma
An Nassariya
Al Jiftlik
Al Badhan
Al 'Auja
Ain Shbli
Ad Duyuk
'Ein el Beida
Village
0
1
2
3
4
Green bean (dunum)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An Nassariya
Al Jiftlik
Al Badhan
Al 'Auja
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Ad Duyuk
'Ein el Beida
Village
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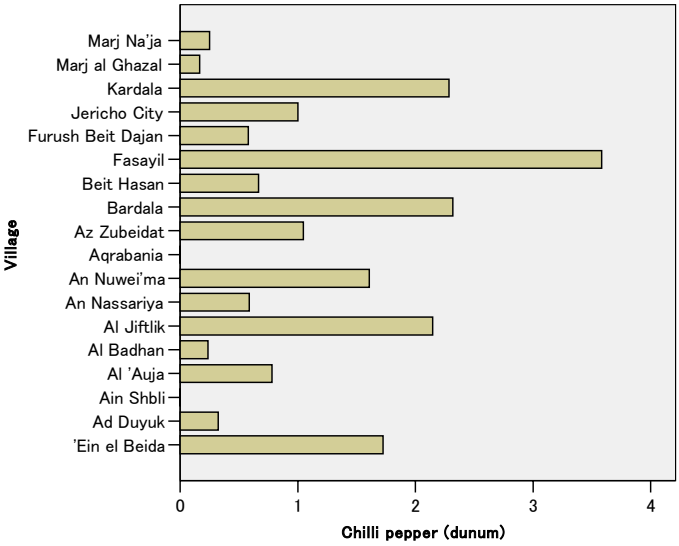
2
4
6
8
10
Eggplant (dunum)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An Nassariya
Al Jiftlik
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Ad Duyuk
'Ein el Beida
Village
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1
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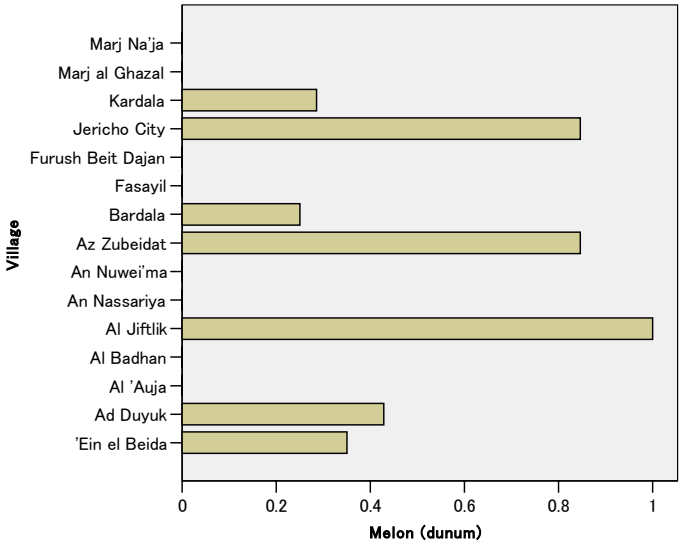
3
4
Chilli pepper (dunum)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Al Jiftlik
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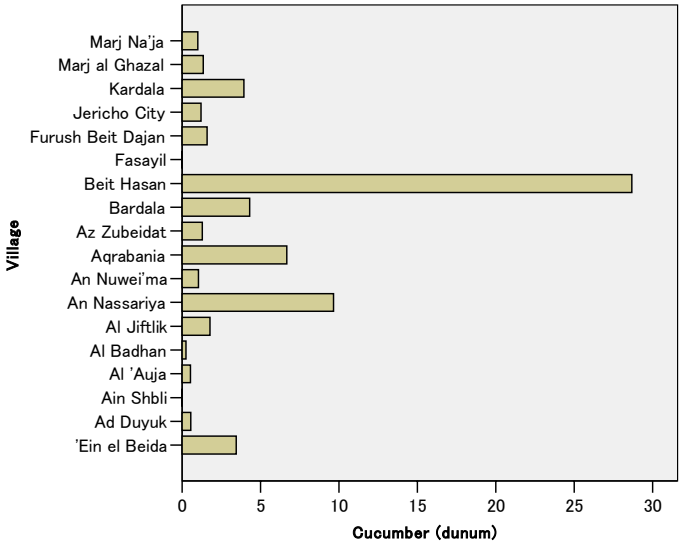
Melon (dunum)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Aqrabania
An Nuwei'ma
An Nassariya
Al Jiftlik
Al Badhan
Al 'Auja
Ain Shbli
Ad Duyuk
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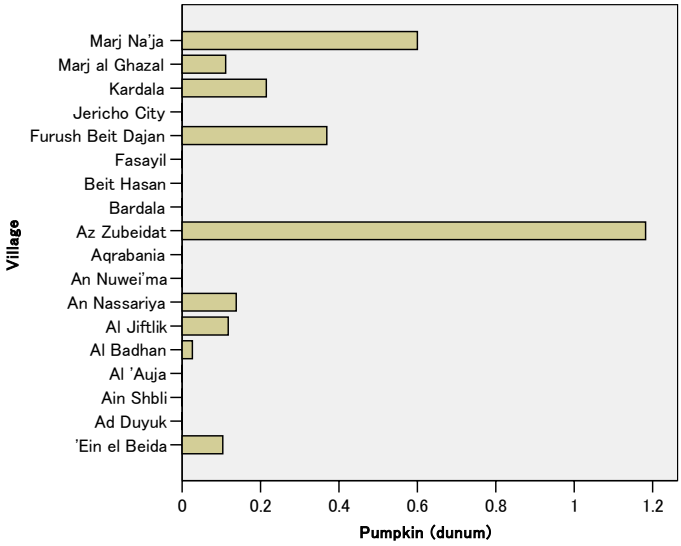
10
15
20
25
30
Cucumber (dunum)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Marj al Ghazal
Kardala
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Aqrabania
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An Nassariya
Al Jiftlik
Al Badhan
Al 'Auja
Ain Shbli
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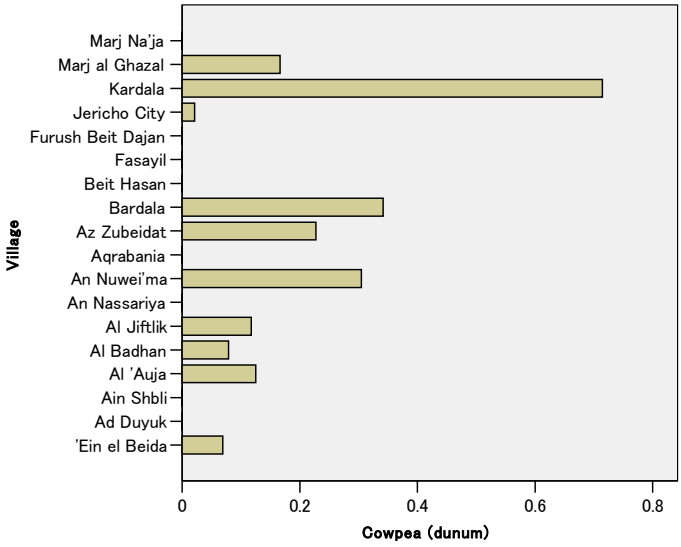
1
1.2
Pumpkin (dunum)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Al Badhan
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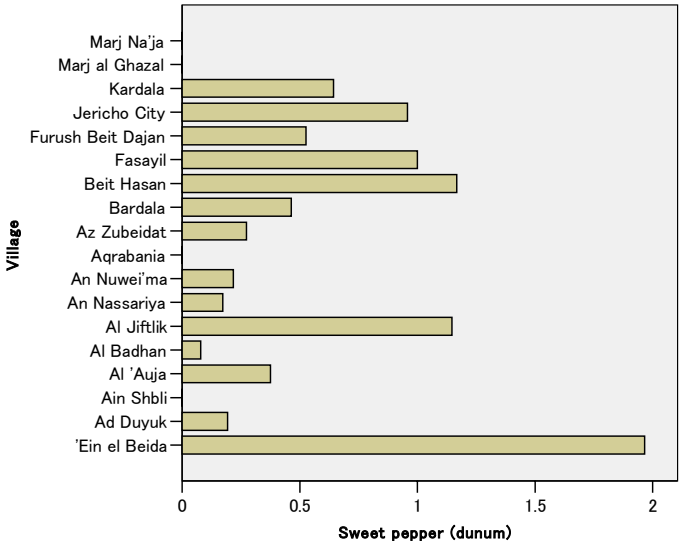
Cowpea (dunum)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Al Jiftlik
Al Badhan
Al 'Auja
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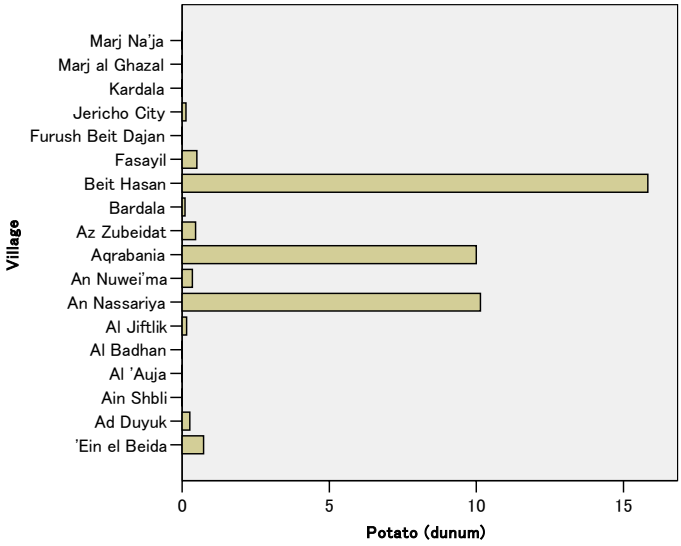
1.5
2
Sweet pepper (dunum)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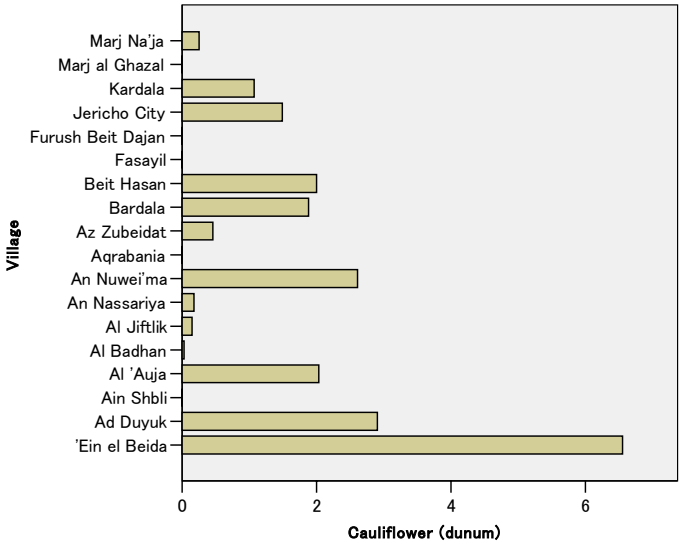
Jericho City
Furush Beit Dajan
Fasayil
Beit Hasan
Bardala
Az Zubeidat
Aqrabania
An Nuwei'ma
An Nassariya
Al Jiftlik
Al Badhan
Al 'Auja
Ain Shbli
Ad Duyuk
'Ein el Beida
Village
0
5
10
15
Potato (dunum)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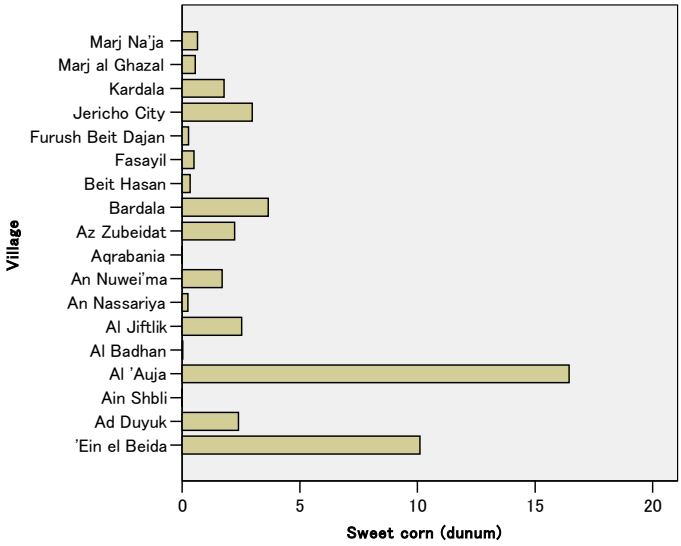
Marj al Ghazal
Kardala
Jericho City
Furush Beit Dajan
Fasayil
Beit Hasan
Bardala
Az Zubeidat
Aqrabania
An Nuwei'ma
An Nassariya
Al Jiftlik
Al Badhan
Al 'Auja
Ain Shbli
Ad Duyuk
'Ein el Beida
Village
0
2
4
6
Cauliflower (dunum)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Jericho City
Furush Beit Dajan
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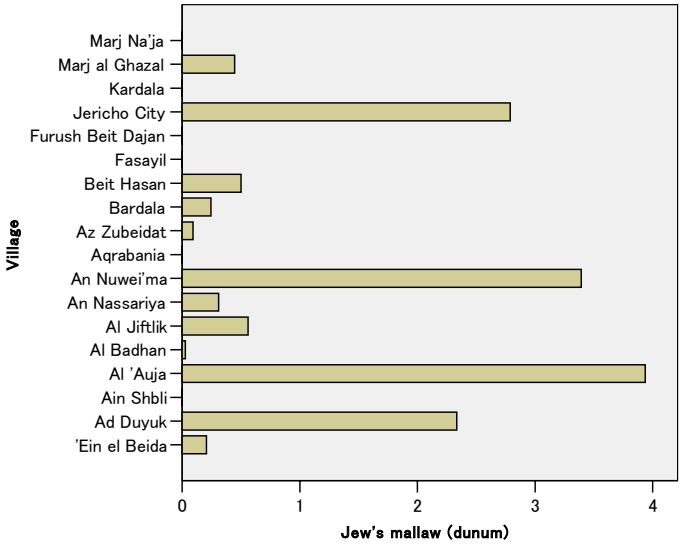
Bardala
Az Zubeidat
Aqrabania
An Nuwei'ma
An Nassariya
Al Jiftlik
Al Badhan
Al 'Auja
Ain Shbli
Ad Duyuk
'Ein el Beida
Village
0
5
10
15
20
Sweet corn (dunum)


Marj Na'ja
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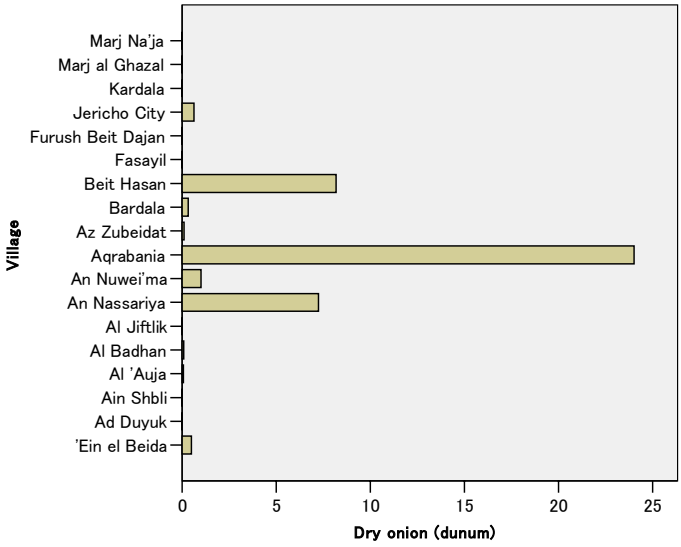
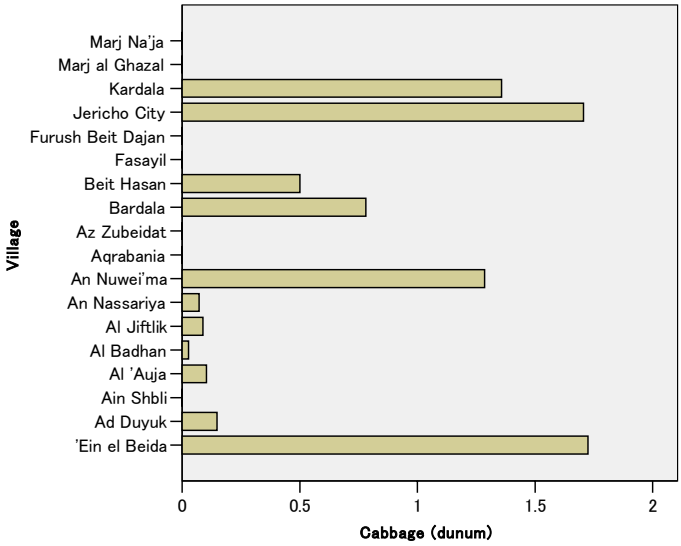
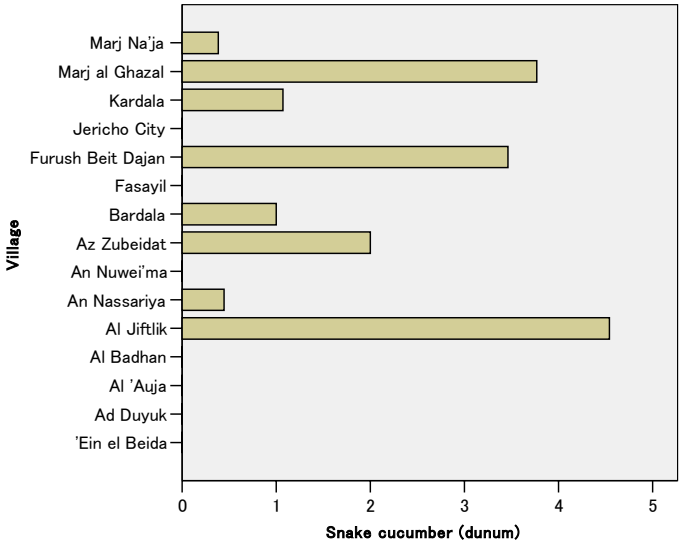
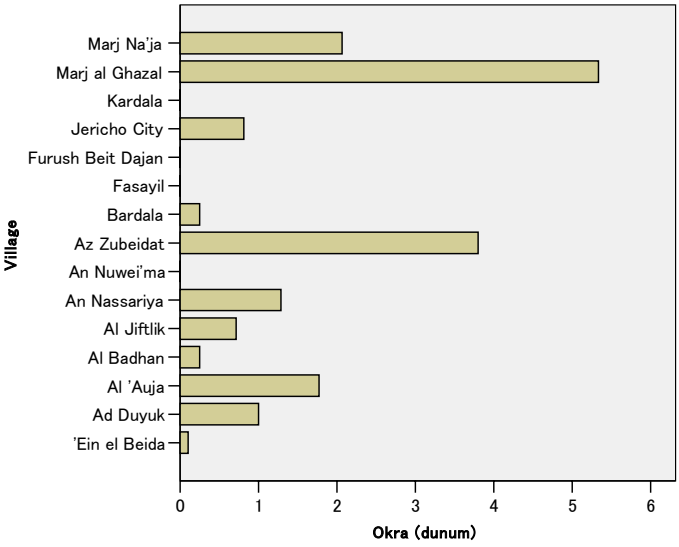
Kardala
Jericho City
Furush Beit Dajan
Fasayil
Beit Hasan
Bardala
Az Zubeidat
Aqrabania
An Nuwei'ma
An Nassariya
Al Jiftlik
Al Badhan
Al 'Auja
Ain Shbli
Ad Duyuk
'Ein el Beida
Village
0
1
2
3
4
Jew's mallaw (dunum)

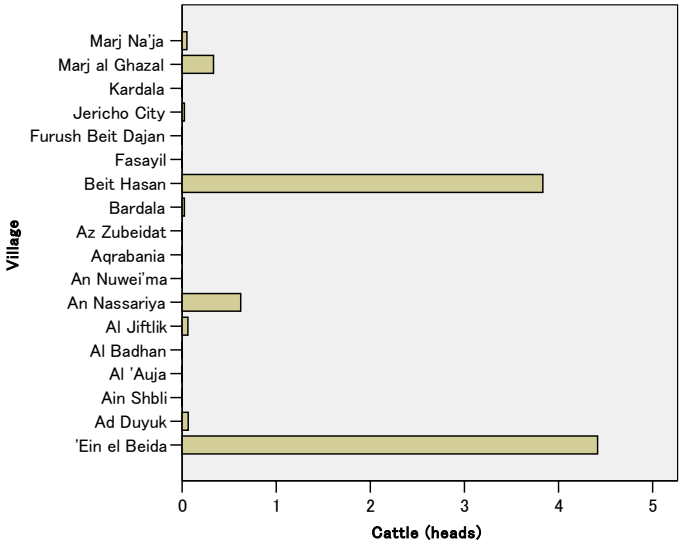

Village
Marj Na'ja
Marj al Ghazal
Kardala
Jericho City
Furush Beit Dajan
Fasayil
Beit Hasan
Bardala
Az Zubeidat
Aqrabania
An Nuwei'ma
An Nassariya
Al Jiftlik
Al Badhan
Al 'Auja
Ain Shbli
Ad Duyuk
'Ein el Beida
0
5
10
15
20
25
Dry onion (dunum)

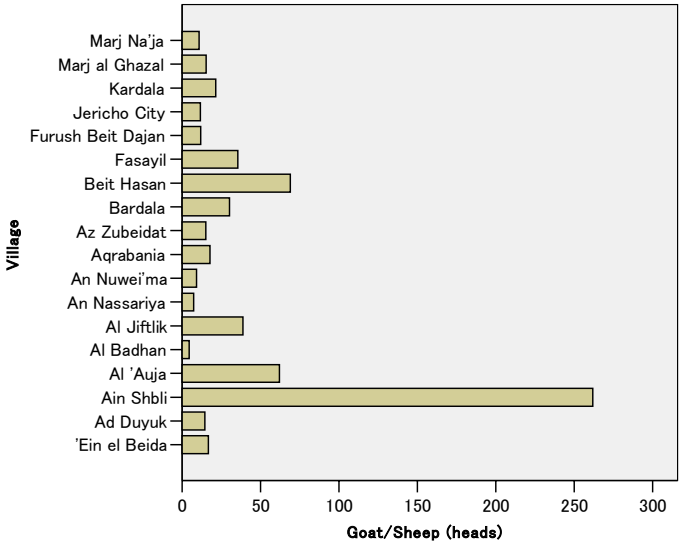

Village
Marj Na'ja
Marj al Ghazal
Kardala
Jericho City
Furush Beit Dajan
Fasayil
Beit Hasan
Bardala
Az Zubeidat
Aqrabania
An Nuwei'ma
An Nassariya
Al Jiftlik
Al Badhan
Al 'Auja
Ain Shbli
Ad Duyuk
'Ein el Beida
0
0.5
1
1.5
2
Cabbage (dunum)

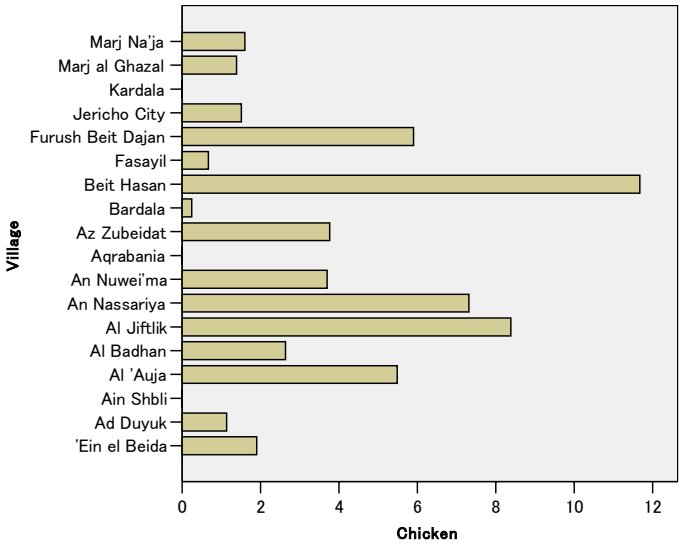

Village
Marj Na'ja
Marj al Ghazal
Kardala
Jericho City
Furush Beit Dajan
Fasayil
Bardala
Az Zubeidat
An Nuwei'ma
An Nassariya
Al Jiftlik
Al Badhan
Al 'Auja
Ad Duyuk
'Ein el Beida
0
1
2
3
4
5
Snake cucumber (dunum)


Marj Na'ja
Marj al Ghazal
Kardala
Jericho City
Furush Beit Dajan
Fasayil
Bardala
Az Zubeidat
An Nuwei'ma
An Nassariya
Al Jiftlik
Al Badhan
Al 'Auja
Ad Duyuk
'Ein el Beida
Village
0
1
2
3
4
5
6
Okra (dunum)

Average Number of Livestock By Village ()







Average Household Monthly Income in 2006 by Village

			Average monthly income (2006)					Total
			<1000NIS	1000–1999NIS	2000–2999NIS	3000–4999NIS	>5000NIS	
Village	Ad Duyuk	Count	1	16	11	3	0	31
		% within Village	3.2%	51.6%	35.5%	9.7%	0.0%	100.0%
		% within group	2.4%	10.1%	9.2%	4.9%	0.0%	7.7%
		% of Total	0.2%	4.0%	2.7%	0.7%	0.0%	7.7%
	Ain Shbli	Count	0	3	1	2	0	6
		% within Village	0.0%	50.0%	16.7%	33.3%	0.0%	100.0%
		% within group	0.0%	1.9%	0.8%	3.3%	0.0%	1.5%
		% of Total	0.0%	0.7%	0.2%	0.5%	0.0%	1.5%
	Al 'Auja	Count	1	13	10	6	2	32
		% within Village	3.1%	40.6%	31.3%	18.8%	6.3%	100.0%
		% within group	2.4%	8.2%	8.4%	9.8%	8.0%	7.9%
		% of Total	0.2%	3.2%	2.5%	1.5%	0.5%	7.9%
	Al Badhan	Count	2	11	5	1	0	19
		% within Village	10.5%	57.9%	26.3%	5.3%	0.0%	100.0%
		% within group	4.9%	6.9%	4.2%	1.6%	0.0%	4.7%
		% of Total	0.5%	2.7%	1.2%	0.2%	0.0%	4.7%
	Al Jiftlik	Count	6	17	8	2	1	34
		% within Village	17.6%	50.0%	23.5%	5.9%	2.9%	100.0%
		% within group	14.6%	10.7%	6.7%	3.3%	4.0%	8.4%
		% of Total	1.5%	4.2%	2.0%	0.5%	0.2%	8.4%
	An Nassariya	Count	6	8	11	1	3	29
		% within Village	20.7%	27.6%	37.9%	3.4%	10.3%	100.0%
		% within group	14.6%	5.0%	9.2%	1.6%	12.0%	7.2%
		% of Total	1.5%	2.0%	2.7%	0.2%	0.7%	7.2%
	An Nuwei'ma	Count	1	11	8	2	1	23
		% within Village	4.3%	47.8%	34.8%	8.7%	4.3%	100.0%
		% within group	2.4%	6.9%	6.7%	3.3%	4.0%	5.7%
		% of Total	0.2%	2.7%	2.0%	0.5%	0.2%	5.7%
	Aqrabania	Count	0	0	2	1	0	3
		% within Village	0.0%	0.0%	66.7%	33.3%	0.0%	100.0%
		% within group	0.0%	0.0%	1.7%	1.6%	0.0%	0.7%
		% of Total	0.0%	0.0%	0.5%	0.2%	0.0%	0.7%
	Az Zubeidat	Count	3	6	6	6	1	22
		% within Village	13.6%	27.3%	27.3%	27.3%	4.5%	100.0%
		% within group	7.3%	3.8%	5.0%	9.8%	4.0%	5.4%
		% of Total	0.7%	1.5%	1.5%	1.5%	0.2%	5.4%
	Bardala	Count	2	15	14	6	4	41
		% within Village	4.9%	36.6%	34.1%	14.6%	9.8%	100.0%
		% within group	4.9%	9.4%	11.8%	9.8%	16.0%	10.1%
		% of Total	0.5%	3.7%	3.5%	1.5%	1.0%	10.1%
	Beit Hasan	Count	0	2	2	1	1	6
		% within Village	0.0%	33.3%	33.3%	16.7%	16.7%	100.0%
		% within group	0.0%	1.3%	1.7%	1.6%	4.0%	1.5%
		% of Total	0.0%	0.5%	0.5%	0.2%	0.2%	1.5%
	'Ein el Beida	Count	4	11	10	4	0	29
		% within Village	13.8%	37.9%	34.5%	13.8%	0.0%	100.0%
		% within group	9.8%	6.9%	8.4%	6.6%	0.0%	7.2%
		% of Total	1.0%	2.7%	2.5%	1.0%	0.0%	7.2%
	Fasayil	Count	0	6	2	3	1	12
		% within Village	0.0%	50.0%	16.7%	25.0%	8.3%	100.0%
		% within group	0.0%	3.8%	1.7%	4.9%	4.0%	3.0%
		% of Total	0.0%	1.5%	0.5%	0.7%	0.2%	3.0%
	Furush Beit Dajan	Count	3	3	3	7	3	19
		% within Village	15.8%	15.8%	15.8%	36.8%	15.8%	100.0%
		% within group	7.3%	1.9%	2.5%	11.5%	12.0%	4.7%
		% of Total	0.7%	0.7%	0.7%	1.7%	0.7%	4.7%
	Jericho City	Count	1	12	15	12	7	47
		% within Village	2.1%	25.5%	31.9%	25.5%	14.9%	100.0%
		% within group	2.4%	7.5%	12.6%	19.7%	28.0%	11.6%
		% of Total	0.2%	3.0%	3.7%	3.0%	1.7%	11.6%
	Kardala	Count	0	10	2	1	1	14
		% within Village	0.0%	71.4%	14.3%	7.1%	7.1%	100.0%
		% within group	0.0%	6.3%	1.7%	1.6%	4.0%	3.5%
		% of Total	0.0%	2.5%	0.5%	0.2%	0.2%	3.5%
	Marj al Ghazal	Count	3	5	7	3	0	18
		% within Village	16.7%	27.8%	38.9%	16.7%	0.0%	100.0%
		% within group	7.3%	3.1%	5.9%	4.9%	0.0%	4.4%
		% of Total	0.7%	1.2%	1.7%	0.7%	0.0%	4.4%
	Marj Na'ja	Count	8	10	2	0	0	20
		% within Village	40.0%	50.0%	10.0%	0.0%	0.0%	100.0%
		% within group	19.5%	6.3%	1.7%	0.0%	0.0%	4.9%
		% of Total	2.0%	2.5%	0.5%	0.0%	0.0%	4.9%

Average Household Monthly Expenditure in 2006 by Village

			Average monthly expenditure (2006)					Total
			<1000NIS	1000-1999NIS	2000-2999NIS	3000-4999NIS	>5000NIS	
Village	Ad Duyuk	Count	2	21	7	1	0	31
		% within Village	6.5%	67.7%	22.6%	3.2%	0.0%	100.0%
		% within group	7.7%	10.6%	6.2%	1.7%	0.0%	7.7%
		% of Total	0.5%	5.2%	1.7%	0.2%	0.0%	7.7%
	Ain Shbli	Count	0	3	1	2	0	6
		% within Village	0.0%	50.0%	16.7%	33.3%	0.0%	100.0%
		% within group	0.0%	1.5%	0.9%	3.4%	0.0%	1.5%
		% of Total	0.0%	0.7%	0.2%	0.5%	0.0%	1.5%
	Al 'Auja	Count	1	18	10	2	1	32
		% within Village	3.1%	56.3%	31.3%	6.3%	3.1%	100.0%
		% within group	3.8%	9.1%	8.8%	3.4%	10.0%	7.9%
		% of Total	0.2%	4.4%	2.5%	0.5%	0.2%	7.9%
	Al Badhan	Count	1	11	6	1	0	19
		% within Village	5.3%	57.9%	31.6%	5.3%	0.0%	100.0%
		% within group	3.8%	5.6%	5.3%	1.7%	0.0%	4.7%
		% of Total	0.2%	2.7%	1.5%	0.2%	0.0%	4.7%
	Al Jiftlik	Count	3	19	9	3	0	34
		% within Village	8.8%	55.9%	26.5%	8.8%	0.0%	100.0%
		% within group	11.5%	9.6%	8.0%	5.2%	0.0%	8.4%
		% of Total	0.7%	4.7%	2.2%	0.7%	0.0%	8.4%
	An Nassariya	Count	4	11	10	3	1	29
		% within Village	13.8%	37.9%	34.5%	10.3%	3.4%	100.0%
		% within group	15.4%	5.6%	8.8%	5.2%	10.0%	7.2%
		% of Total	1.0%	2.7%	2.5%	0.7%	0.2%	7.2%
	An Nuwei'ma	Count	0	16	6	1	0	23
		% within Village	0.0%	69.6%	26.1%	4.3%	0.0%	100.0%
		% within group	0.0%	8.1%	5.3%	1.7%	0.0%	5.7%
		% of Total	0.0%	4.0%	1.5%	0.2%	0.0%	5.7%
	Aqrabania	Count	0	2	1	0	0	3
		% within Village	0.0%	66.7%	33.3%	0.0%	0.0%	100.0%
		% within group	0.0%	1.0%	0.9%	0.0%	0.0%	0.7%
		% of Total	0.0%	0.5%	0.2%	0.0%	0.0%	0.7%
	Az Zubeidat	Count	1	5	9	5	2	22
		% within Village	4.5%	22.7%	40.9%	22.7%	9.1%	100.0%
		% within group	3.8%	2.5%	8.0%	8.6%	20.0%	5.4%
		% of Total	0.2%	1.2%	2.2%	1.2%	0.5%	5.4%
	Bardala	Count	2	19	12	7	1	41
		% within Village	4.9%	46.3%	29.3%	17.1%	2.4%	100.0%
		% within group	7.7%	9.6%	10.6%	12.1%	10.0%	10.1%
		% of Total	0.5%	4.7%	3.0%	1.7%	0.2%	10.1%
	Beit Hasan	Count	0	4	2	0	0	6
		% within Village	0.0%	66.7%	33.3%	0.0%	0.0%	100.0%
		% within group	0.0%	2.0%	1.8%	0.0%	0.0%	1.5%
		% of Total	0.0%	1.0%	0.5%	0.0%	0.0%	1.5%
	'Ein el Beida	Count	3	15	6	4	1	29
		% within Village	10.3%	51.7%	20.7%	13.8%	3.4%	100.0%
		% within group	11.5%	7.6%	5.3%	6.9%	10.0%	7.2%
		% of Total	0.7%	3.7%	1.5%	1.0%	0.2%	7.2%
	Fasayil	Count	1	4	4	3	0	12
		% within Village	8.3%	33.3%	33.3%	25.0%	0.0%	100.0%
		% within group	3.8%	2.0%	3.5%	5.2%	0.0%	3.0%
		% of Total	0.2%	1.0%	1.0%	0.7%	0.0%	3.0%
	Furush Beit Dajan	Count	1	4	5	9	0	19
		% within Village	5.3%	21.1%	26.3%	47.4%	0.0%	100.0%
		% within group	3.8%	2.0%	4.4%	15.5%	0.0%	4.7%
		% of Total	0.2%	1.0%	1.2%	2.2%	0.0%	4.7%
	Jericho City	Count	2	19	10	13	3	47
		% within Village	4.3%	40.4%	21.3%	27.7%	6.4%	100.0%
		% within group	7.7%	9.6%	8.8%	22.4%	30.0%	11.6%
		% of Total	0.5%	4.7%	2.5%	3.2%	0.7%	11.6%
	Kardala	Count	0	8	4	1	1	14
		% within Village	0.0%	57.1%	28.6%	7.1%	7.1%	100.0%
		% within group	0.0%	4.0%	3.5%	1.7%	10.0%	3.5%
		% of Total	0.0%	2.0%	1.0%	0.2%	0.2%	3.5%
	Marj al Ghazal	Count	2	4	9	3	0	18
		% within Village	11.1%	22.2%	50.0%	16.7%	0.0%	100.0%
		% within group	7.7%	2.0%	8.0%	5.2%	0.0%	4.4%
		% of Total	0.5%	1.0%	2.2%	0.7%	0.0%	4.4%
	Marj Na'ja	Count	3	15	2	0	0	20
		% within Village	15.0%	75.0%	10.0%	0.0%	0.0%	100.0%
		% within group	11.5%	7.6%	1.8%	0.0%	0.0%	4.9%
		% of Total	0.7%	3.7%	0.5%	0.0%	0.0%	4.9%

Living Standard Evaluation by Monthly Expenditure Group

Unit: Number of households

Average monthly expenditure (NIS, 2006)	village	Living Standard Evaluation		Total	
		Better than others	Same as others	Poorer than others	
<1000	Ad Duyuk	0	2	0	2
	Al 'Auja	0	0	1	1
	Al Badhan	0	0	1	1
	Al Jiftlik	0	1	2	3
	An Nassariya	0	0	4	4
	Az Zubeidat	0	1	0	1
	Bardala	0	0	2	2
	'Ein el Beida	0	1	2	3
	Fasayil	0	1	0	1
	Furush Beit Dajan	0	0	1	1
	Jericho City	0	0	2	2
	Marj al Ghazal	0	2	0	2
	Marj Na'ja	0	1	2	3
	Total	0	9	17	26
1000-1999	Ad Duyuk	1	15	5	21
	Ain Shbli	0	1	2	3
	Al 'Auja	0	15	3	18
	Al Badhan	0	3	8	11
	Al Jiftlik	2	9	8	19
	An Nassariya	1	4	6	11
	An Nuwei'ma	1	11	4	16
	Aqrabania	0	2	0	2
	Az Zubeidat	0	4	1	5
	Bardala	1	7	11	19
	Beit Hasan	0	4	0	4
	'Ein el Beida	0	7	8	15
	Fasayil	0	2	2	4
	Furush Beit Dajan	0	1	3	4
	Jericho City	1	13	5	19
	Kardala	0	7	1	8
	Marj al Ghazal	0	2	2	4
	Marj Na'ja	0	7	8	15
	Total	7	114	77	198
2000-2999	Ad Duyuk	1	5	1	7
	Ain Shbli	0	1	0	1
	Al 'Auja	2	8	0	10
	Al Badhan	0	5	1	6
	Al Jiftlik	0	6	3	9
	An Nassariya	1	6	3	10
	An Nuwei'ma	1	5	0	6
	Aqrabania	0	1	0	1
2000-2999	Az Zubeidat	1	4	4	9
	Bardala	0	8	4	12
	Beit Hasan	2	0	0	2
	'Ein el Beida	0	3	3	6

	Fasayil	0	2	2	4
	Furush Beit Dajan	0	2	3	5
	Jericho City	0	9	1	10
	Kardala	0	4	0	4
	Marj al Ghazal	0	8	1	9
	Marj Na'ja	0	2	0	2
	Total	8	79	26	113
3000-4999	Ad Duyuk	0	1	0	1
	Ain Shbli	0	1	1	2
	Al 'Auja	0	2	0	2
	Al Badhan	0	0	1	1
	Al Jiftlik	1	1	1	3
	An Nassariya	2	1	0	3
	An Nuwei'ma	1	0	0	1
	Az Zubeidat	1	1	3	5
	Bardala	0	5	2	7
	'Ein el Beida	1	1	2	4
	Fasayil	1	1	1	3
	Furush Beit Dajan	3	3	3	9
	Jericho City	4	8	0	12
	Kardala	0	1	0	1
	Marj al Ghazal	1	2	0	3
	Total	15	28	14	57
>5000	Al 'Auja	1	0	0	1
	An Nassariya	1	0	0	1
	Az Zubeidat	0	0	1	1
	Bardala	1	0	0	1
	'Ein el Beida	0	1	0	1
	Jericho City	1	2	0	3
	Kardala	1	0	0	1
	Total	5	3	1	9

Evaluation of Income in Last 5 years by Village

Unit: Number of households

Village		Decreased very much, and life is very much harder than before	Decreased, and life is getting worse than before	Almost same, nothing changed	Increased, and life is getting better than before	Total
Ad Duyuk	Count	5	17	9	0	31
	% within village	16.1%	54.8%	29.0%	.0%	100.0%
Ain Shbli	Count	1	5	0	0	6
	% within village	16.7%	83.3%	.0%	.0%	100.0%
Al 'Auja	Count	7	24	0	0	31
	% within village	22.6%	77.4%	.0%	.0%	100.0%
Al Badhan	Count	14	3	2	0	19
	% within village	73.7%	15.8%	10.5%	.0%	100.0%
Al Jiftlik	Count	16	18	0	0	34
	% within village	47.1%	52.9%	.0%	.0%	100.0%
An Nassariya	Count	20	9	0	0	29
	% within village	69.0%	31.0%	.0%	.0%	100.0%
An Nuwei'ma	Count	6	16	1	0	23
	% within village	26.1%	69.6%	4.3%	.0%	100.0%
Aqrabania	Count	1	2	0	0	3
	% within village	33.3%	66.7%	.0%	.0%	100.0%
Az Zubeidat	Count	14	6	0	1	21
	% within village	66.7%	28.6%	.0%	4.8%	100.0%
Bardala	Count	28	10	2	1	41
	% within village	68.3%	24.4%	4.9%	2.4%	100.0%
Beit Hasan	Count	1	5	0	0	6
	% within village	16.7%	83.3%	.0%	.0%	100.0%
'Ein el Beida	Count	23	4	1	1	29
	% within village	79.3%	13.8%	3.4%	3.4%	100.0%
Fasayil	Count	6	6	0	0	12
	% within village	50.0%	50.0%	.0%	.0%	100.0%
Furush Beit Dajan	Count	11	8	0	0	19
	% within village	57.9%	42.1%	.0%	.0%	100.0%
Jericho City	Count	12	33	2	0	47
	% within village	25.5%	70.2%	4.3%	.0%	100.0%
Kardala	Count	8	6	0	0	14
	% within village	57.1%	42.9%	.0%	.0%	100.0%
Marj al Ghazal	Count	7	10	1	0	18
	% within village	38.9%	55.6%	5.6%	.0%	100.0%
Marj Na'ja	Count	13	6	1	0	20
	% within village	65.0%	30.0%	5.0%	.0%	100.0%
Total	Count	193	188	19	3	403
	% within village	47.9%	46.7%	4.7%	.7%	100.0%

Nobody selected the answer “Increase very much, and life is much better than before”

Evaluation of Income In Last 5 Years By Monthly Expenditure Group

Unit: Number of households

Average monthly expenditure (NIS, 2006)		Decreased very much, and life is very much harder than before	Decreased, and life is getting worse than before	Almost same, nothing changed	Increased, and life is getting better than before	Total
<1000NIS	Count	17	7	1	0	25
	% within group	68.0%	28.0%	4.0%	.0%	100.0%
1000-1999NIS	Count	95	87	14	2	198
	% within group	48.0%	43.9%	7.1%	1.0%	100.0%
2000-2999NIS	Count	51	58	3	1	113
	% within group	45.1%	51.3%	2.7%	.9%	100.0%
3000-4999NIS	Count	27	30	1	0	58
	% within group	46.6%	51.7%	1.7%	.0%	100.0%
>5000NIS	Count	3	6	0	0	9
	% within group	33.3%	66.7%	.0%	.0%	100.0%
Total	Count	193	188	19	3	403
	% within group	47.9%	46.7%	4.7%	.7%	100.0%

Nobody selected the answer “Increase very much, and life is much better than before”

Quantity of Domestic Water by Village

Unit: Number of households

Village		Quantity			Total
		Satisfied	Fare	Not satisfied	
Ad Duyuk	Count	9	8	14	31
	% within village	29.0%	25.8%	45.2%	100.0%
Ain Shbli	Count	1	2	3	6
	% within village	16.7%	33.3%	50.0%	100.0%
Al 'Auja	Count	17	9	6	32
	% within village	53.1%	28.1%	18.8%	100.0%
Al Badhan	Count	6	4	9	19
	% within village	31.6%	21.1%	47.4%	100.0%
Al Jiftlik	Count	15	8	11	34
	% within village	44.1%	23.5%	32.4%	100.0%
An Nassariya	Count	22	5	2	29
	% within village	75.9%	17.2%	6.9%	100.0%
An Nuwei'ma	Count	10	5	7	22
	% within village	45.5%	22.7%	31.8%	100.0%
Aqrabania	Count	3	0	0	3
	% within village	100.0%	.0%	.0%	100.0%
Az Zubeidat	Count	9	4	9	22
	% within village	40.9%	18.2%	40.9%	100.0%
Bardala	Count	6	15	18	39
	% within village	15.4%	38.5%	46.2%	100.0%
Beit Hasan	Count	6	0	0	6
	% within village	100.0%	.0%	.0%	100.0%
'Ein el Beida	Count	10	5	14	29
	% within village	34.5%	17.2%	48.3%	100.0%
Fasayil	Count	7	3	2	12
	% within village	58.3%	25.0%	16.7%	100.0%
Furush Beit	Count	7	7	5	19
Dajan	% within village	36.8%	36.8%	26.3%	100.0%
Jericho City	Count	26	8	10	44
	% within village	59.1%	18.2%	22.7%	100.0%
Kardala	Count	0	2	12	14
	% within village	.0%	14.3%	85.7%	100.0%
Marj al Ghazal	Count	9	7	2	18
	% within village	50.0%	38.9%	11.1%	100.0%
Marj Na'ja	Count	5	8	6	19
	% within village	26.3%	42.1%	31.6%	100.0%
Total	Count	168	100	130	398
	% within village	42.2%	25.1%	32.7%	100.0%

Quality of Domestic Water by Village

Unit: Number of households

Village		Quality			Total
		Satisfied	Fare	Not satisfied	
Ad Duyuk	Count	13	4	14	31
	% within village	41.9%	12.9%	45.2%	100.0%
Ain Shbli	Count	2	1	3	6
	% within village	33.3%	16.7%	50.0%	100.0%
Al 'Auja	Count	15	10	7	32
	% within village	46.9%	31.3%	21.9%	100.0%
Al Badhan	Count	11	4	4	19
	% within village	57.9%	21.1%	21.1%	100.0%
Al Jiftlik	Count	25	6	3	34
	% within village	73.5%	17.6%	8.8%	100.0%
An Nassariya	Count	24	2	3	29
	% within village	82.8%	6.9%	10.3%	100.0%
An Nuwei'ma	Count	11	7	4	22
	% within village	50.0%	31.8%	18.2%	100.0%
Aqrabania	Count	3	0	0	3
	% within village	100.0%	.0%	.0%	100.0%
Az Zubeidat	Count	10	10	2	22
	% within village	45.5%	45.5%	9.1%	100.0%
Bardala	Count	34	5	1	40
	% within village	85.0%	12.5%	2.5%	100.0%
Beit Hasan	Count	6	0	0	6
	% within village	100.0%	.0%	.0%	100.0%
'Ein el Beida	Count	27	0	2	29
	% within village	93.1%	.0%	6.9%	100.0%
Fasayil	Count	6	4	2	12
	% within village	50.0%	33.3%	16.7%	100.0%
Furush Beit	Count	9	5	5	19
Dajan	% within village	47.4%	26.3%	26.3%	100.0%
Jericho City	Count	28	12	4	44
	% within village	63.6%	27.3%	9.1%	100.0%
Kardala	Count	14	0	0	14
	% within village	100.0%	.0%	.0%	100.0%
Marj al Ghazal	Count	11	5	2	18
	% within village	61.1%	27.8%	11.1%	100.0%
Marj Na'ja	Count	1	3	15	19
	% within village	5.3%	15.8%	78.9%	100.0%
Total	Count	250	78	71	399
	% within village	62.7%	19.5%	17.8%	100.0%

Quantity of Agriculture Water by Village

Unit: Number of households

Village		Quantity of agriculture water					Total
		Not satisfied	Not so satisfied	Fare	Satisfied	Very satisfied	
Ad Duyuk	Count	2	2	14	9	4	31
	% within village	6.5%	6.5%	45.2%	29.0%	12.9%	100.0%
Ain Shbli	Count	1	5	0	0	0	6
	% within village	16.7%	83.3%	.0%	.0%	.0%	100.0%
Al 'Auja	Count	1	7	6	12	6	32
	% within village	3.1%	21.9%	18.8%	37.5%	18.8%	100.0%
Al Badhan	Count	5	6	0	4	0	15
	% within village	33.3%	40.0%	.0%	26.7%	.0%	100.0%
Al Jiftlik	Count	7	8	2	15	2	34
	% within village	20.6%	23.5%	5.9%	44.1%	5.9%	100.0%
An Nassariya	Count	18	2	1	4	4	29
	% within village	62.1%	6.9%	3.4%	13.8%	13.8%	100.0%
An Nuwei'ma	Count	1	4	8	7	2	22
	% within village	4.5%	18.2%	36.4%	31.8%	9.1%	100.0%
Aqrabania	Count	1	1	0	0	1	3
	% within village	33.3%	33.3%	.0%	.0%	33.3%	100.0%
Az Zubeidat	Count	11	5	1	3	2	22
	% within village	50.0%	22.7%	4.5%	13.6%	9.1%	100.0%
Bardala	Count	0	1	0	9	31	41
	% within village	.0%	2.4%	.0%	22.0%	75.6%	100.0%
Beit Hasan	Count	0	4	0	0	2	6
	% within village	.0%	66.7%	.0%	.0%	33.3%	100.0%
'Ein el Beida	Count	4	1	0	11	13	29
	% within village	13.8%	3.4%	.0%	37.9%	44.8%	100.0%
Fasayil	Count	0	5	2	3	2	12
	% within village	.0%	41.7%	16.7%	25.0%	16.7%	100.0%
Furush Beit	Count	10	8	1	0	0	19
Dajan	% within village	52.6%	42.1%	5.3%	.0%	.0%	100.0%
Jericho City	Count	1	8	9	13	13	44
	% within village	2.3%	18.2%	20.5%	29.5%	29.5%	100.0%
Kardala	Count	2	0	0	3	9	14
	% within village	14.3%	.0%	.0%	21.4%	64.3%	100.0%
Marj al Ghazal	Count	8	5	0	3	2	18
	% within village	44.4%	27.8%	.0%	16.7%	11.1%	100.0%
Marj Na'ja	Count	14	4	0	2	0	20
	% within village	70.0%	20.0%	.0%	10.0%	.0%	100.0%
Total	Count	86	76	44	98	93	397
	% within village	21.7%	19.1%	11.1%	24.7%	23.4%	100.0%

Quality of Agriculture Water by Village

Unit: Number of households

Village		Quality of agriculture water					Total
		Not satisfied	Not so satisfied	Fare	Satisfied	Very satisfied	
Ad Duyuk	Count	10	6	2	6	7	31
	% within village	32.3%	19.4%	6.5%	19.4%	22.6%	100.0%
Ain Shbli	Count	1	5	0	0	0	6
	% within village	16.7%	83.3%	.0%	.0%	.0%	100.0%
Al 'Auja	Count	7	5	4	11	5	32
	% within village	21.9%	15.6%	12.5%	34.4%	15.6%	100.0%
Al Badhan	Count	4	7	0	5	0	16
	% within village	25.0%	43.8%	.0%	31.3%	.0%	100.0%
Al Jiftlik	Count	6	12	1	12	3	34
	% within village	17.6%	35.3%	2.9%	35.3%	8.8%	100.0%
An Nassariya	Count	8	10	2	5	4	29
	% within village	27.6%	34.5%	6.9%	17.2%	13.8%	100.0%
An Nuwei'ma	Count	5	9	0	5	3	22
	% within village	22.7%	40.9%	.0%	22.7%	13.6%	100.0%
Aqrabania	Count	0	2	1	0	0	3
	% within village	.0%	66.7%	33.3%	.0%	.0%	100.0%
Az Zubeidat	Count	1	11	2	4	4	22
	% within village	4.5%	50.0%	9.1%	18.2%	18.2%	100.0%
Bardala	Count	24	5	7	5	0	41
	% within village	58.5%	12.2%	17.1%	12.2%	.0%	100.0%
Beit Hasan	Count	0	4	0	0	2	6
	% within village	.0%	66.7%	.0%	.0%	33.3%	100.0%
'Ein el Beida	Count	20	1	7	0	1	29
	% within village	69.0%	3.4%	24.1%	.0%	3.4%	100.0%
Fasayil	Count	4	5	2	0	1	12
	% within village	33.3%	41.7%	16.7%	.0%	8.3%	100.0%
Furush Beit	Count	6	12	0	1	0	19
Dajan	% within village	31.6%	63.2%	.0%	5.3%	.0%	100.0%
Jericho City	Count	16	6	3	11	8	44
	% within village	36.4%	13.6%	6.8%	25.0%	18.2%	100.0%
Kardala	Count	12	2	0	0	0	14
	% within village	85.7%	14.3%	.0%	.0%	.0%	100.0%
Marj al Ghazal	Count	1	9	0	6	2	18
	% within village	5.6%	50.0%	.0%	33.3%	11.1%	100.0%
Marj Na'ja	Count	4	3	3	10	0	20
	% within village	20.0%	15.0%	15.0%	50.0%	.0%	100.0%
Total	Count	129	114	34	81	40	398
	% within village	32.4%	28.6%	8.5%	20.4%	10.1%	100.0%

Credit Period by Source

Unit: Number of households

Credit period (months)		Credit source					Total
		Relative/friend	Middleman	Micro credit	Private bank	Public organization	
0	Count	1	4	0	0	0	5
2	Count	0	0	0	1	0	1
3	Count	0	4	0	0	0	4
4	Count	1	1	0	0	0	2
5	Count	1	0	0	0	0	1
6	Count	2	25	1	0	0	28
7	Count	1	0	0	0	0	1
10	Count	1	2	0	0	0	3
12	Count	9	27	0	0	0	36
15	Count	1	0	0	0	0	1
20	Count	0	1	0	0	0	1
22	Count	0	1	0	0	0	1
24	Count	3	3	0	0	0	6
30	Count	0	1	0	0	0	1
35	Count	0	0	0	0	1	1
48	Count	0	1	0	1	0	2
Total		20	70	1	2	1	94

Interest by Credit Source

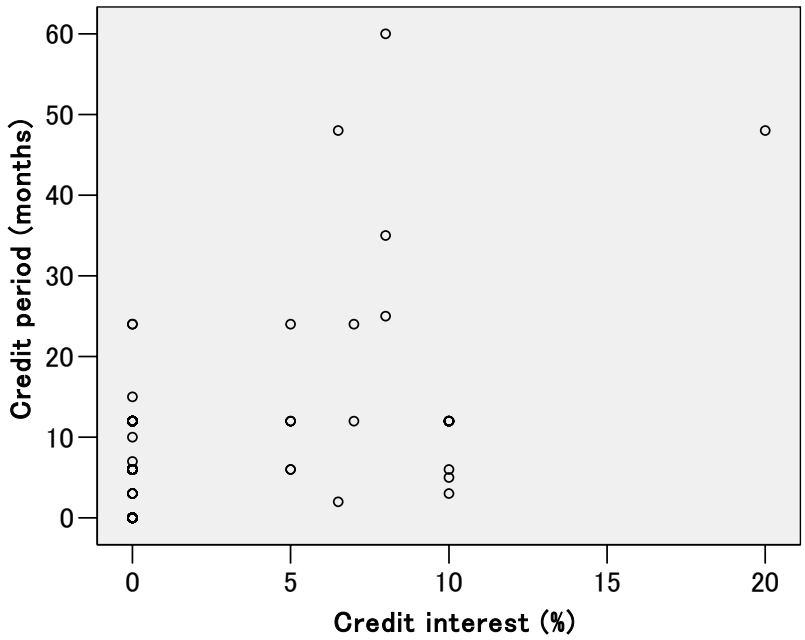
Unit: Number of households

Credit interest (%)		Credit source					Total
		Relative/friend	Middleman	Micro credit	Private bank	Public organization	
0	Count	13	67	0	0	0	80
5	Count	0	5	0	0	0	5
7	Count	0	1	0	1	0	2
7	Count	0	2	0	0	0	2
8	Count	0	0	0	0	1	1
10	Count	4	4	1	0	0	9
20	Count	0	0	0	1	0	1
Total		17	79	1	2	1	100

Borrowing Period by Interest

Unit: Number of households

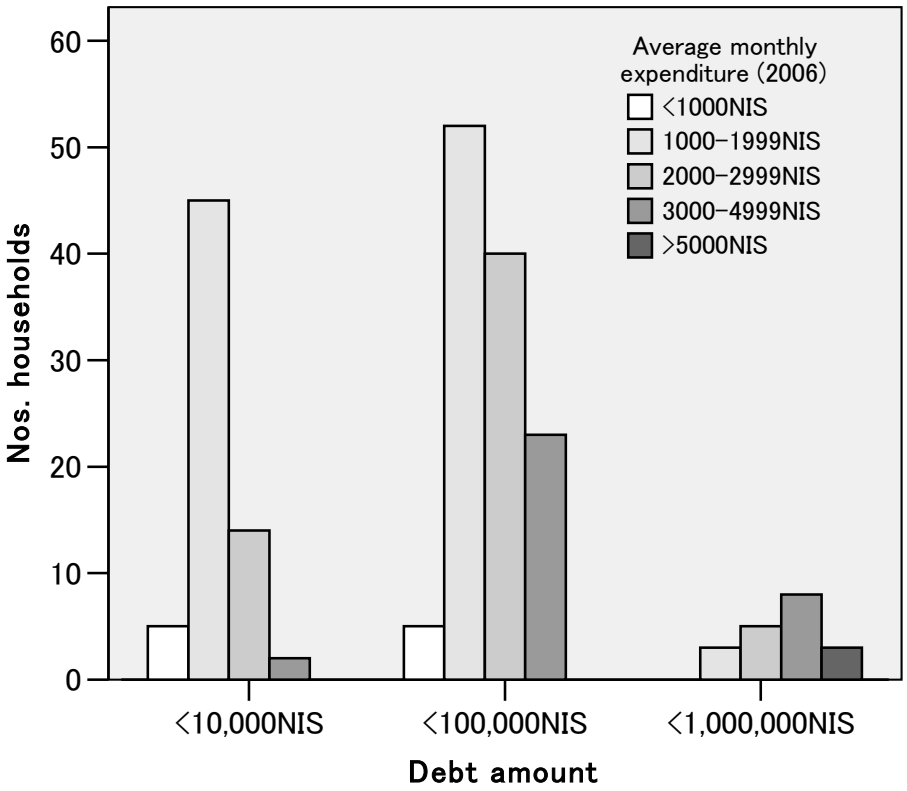
Borrowing period (months)		Credit interest (%)							Total
		0	5	7	7	8	10	20	
0	Count	34	0	0	0	0	0	0	34
2	Count	0	0	1	0	0	0	0	1
3	Count	3	0	0	0	0	1	0	4
5	Count	0	0	0	0	0	1	0	1
6	Count	25	2	0	0	0	1	0	28
7	Count	1	0	0	0	0	0	0	1
10	Count	1	0	0	0	0	0	0	1
12	Count	24	2	0	1	0	6	0	33
15	Count	1	0	0	0	0	0	0	1
24	Count	2	1	0	1	0	0	0	4
25	Count	0	0	0	0	1	0	0	1
35	Count	0	0	0	0	1	0	0	1
48	Count	0	0	1	0	0	0	1	2
60	Count	0	0	0	0	1	0	0	1
Total	Count	91	5	2	2	3	9	1	113
% within period		80.5%	4.4%	1.8%	1.8%	2.7%	8.0%	.9%	100.0%



Debt Balance by Expenditure Group

Unit: Number of households

Average monthly expenditure (2006)						
Debt balance group	<1000NIS	1000-1999NIS	2000-2999NIS	3000-4999NIS	>5000NIS	Total
<10,000NIS	5	45	14	2	0	66
<100,000NIS	5	52	40	23	0	120
<1,000,000NIS	0	3	5	8	3	19
Total	10	100	59	33	3	205



Farmer's Needs in Extension Service by Village

			Village																	
			Ad Duyuk	Ain Shbli	Al 'Auja	Al Badhan	Al Jiftlik	An Nassariya	An Nuwei'ma	Aqrabania	Az Zubeidat	Bardala	Beit Hasan	'Ein el Beida	Fasayil	Furush Beit Dajan	Jericho City	Kardala	Marj al Ghazal	Marj Na'ja
New variety	Yes	Count	4	0	3	5	5	7	4	1	1	13	2	12	1	7	5	0	3	2
		%	12.9%	0.0%	9.4%	26.3%	14.7%	24.1%	17.4%	33.3%	4.5%	31.7%	33.3%	41.4%	8.3%	36.8%	10.6%	0.0%	16.7%	10.0%
	No	Count	27	6	29	14	29	22	19	2	21	28	4	17	11	12	42	14	15	18
		%	87.1%	100.0%	90.6%	73.7%	85.3%	75.9%	82.6%	66.7%	95.5%	68.3%	66.7%	58.6%	91.7%	63.2%	89.4%	100.0%	83.3%	90.0%
Fertilizer application	Yes	Count	16	0	8	6	4	9	11	1	1	15	3	13	1	7	17	2	3	4
		%	51.6%	0.0%	25.0%	31.6%	11.8%	31.0%	47.8%	33.3%	4.5%	36.6%	50.0%	44.8%	8.3%	36.8%	36.2%	14.3%	16.7%	20.0%
	No	Count	15	6	24	13	30	20	12	2	21	26	3	16	11	12	30	12	15	16
		%	48.4%	100.0%	75.0%	68.4%	88.2%	69.0%	52.2%	66.7%	95.5%	63.4%	50.0%	55.2%	91.7%	63.2%	63.8%	85.7%	83.3%	80.0%
Chemical application	Yes	Count	12	0	4	6	5	9	11	1	1	18	3	13	2	7	18	0	4	4
		%	38.7%	0.0%	12.5%	31.6%	14.7%	31.0%	47.8%	33.3%	4.5%	43.9%	50.0%	44.8%	16.7%	36.8%	38.3%	0.0%	22.2%	20.0%
	No	Count	19	6	28	13	29	20	12	2	21	23	3	16	10	12	29	14	14	16
		%	61.3%	100.0%	87.5%	68.4%	85.3%	69.0%	52.2%	66.7%	95.5%	56.1%	50.0%	55.2%	83.3%	63.2%	61.7%	100.0%	77.8%	80.0%
Fodder cultivation	Yes	Count	5	0	5	2	6	4	2	0	1	2	2	4	0	1	4	1	2	1
		%	16.1%	0.0%	15.6%	10.5%	17.6%	13.8%	8.7%	0.0%	4.5%	4.9%	33.3%	13.8%	0.0%	5.3%	8.5%	7.1%	11.1%	5.0%
	No	Count	26	6	27	17	28	25	21	3	21	39	4	25	12	18	43	13	16	19
		%	83.9%	100.0%	84.4%	89.5%	82.4%	86.2%	91.3%	100.0%	95.5%	95.1%	66.7%	86.2%	100.0%	94.7%	91.5%	92.9%	88.9%	95.0%
Cultivation technique	Yes	Count	6	0	4	1	3	3	1	0	2	5	0	4	1	5	5	0	0	0
		%	19.4%	0.0%	12.5%	5.3%	8.8%	10.3%	4.3%	0.0%	9.1%	12.2%	0.0%	13.8%	8.3%	26.3%	10.6%	0.0%	0.0%	0.0%
	No	Count	25	6	28	18	31	26	22	3	20	36	6	25	11	14	42	14	18	20
		%	80.6%	100.0%	87.5%	94.7%	91.2%	89.7%	95.7%	100.0%	90.9%	87.8%	100.0%	86.2%	91.7%	73.7%	89.4%	100.0%	100.0%	100.0%
Improved seeds	Yes	Count	5	0	5	1	2	3	2	0	1	12	0	7	0	5	2	8	0	1
		%	16.1%	0.0%	15.6%	5.3%	5.9%	10.3%	8.7%	0.0%	4.5%	29.3%	0.0%	24.1%	0.0%	26.3%	4.3%	57.1%	0.0%	5.0%
	No	Count	26	6	27	18	32	26	21	3	21	29	6	22	12	14	45	6	18	19
		%	83.9%	100.0%	84.4%	94.7%	94.1%	89.7%	91.3%	100.0%	95.5%	70.7%	100.0%	75.9%	100.0%	73.7%	95.7%	42.9%	100.0%	95.0%
Improved livestock	Yes	Count	2	1	4	2	4	1	0	0	2	2	0	3	1	3	3	0	2	0
		%	6.5%	16.7%	12.5%	10.5%	11.8%	3.4%	0.0%	0.0%	9.1%	4.9%	0.0%	10.3%	8.3%	15.8%	6.4%	0.0%	11.1%	0.0%
	No	Count	29	5	28	17	30	28	23	3	20	39	6	26	11	16	44	14	16	20
		%	93.5%	83.3%	87.5%	89.5%	88.2%	96.6%	100.0%	100.0%	90.9%	95.1%	100.0%	89.7%	91.7%	84.2%	93.6%	100.0%	88.9%	100.0%
Water management	Yes	Count	7	0	3	4	3	5	6	1	1	4	1	4	1	7	8	0	2	1
		%	22.6%	0.0%	9.4%	21.1%	8.8%	17.2%	26.1%	33.3%	4.5%	9.8%	16.7%	13.8%	8.3%	36.8%	17.0%	0.0%	11.1%	5.0%
	No	Count	24	6	29	15	31	24	17	2	21	37	5	25	11	12	39	14	16	19
		%	77.4%	100.0%	90.6%	78.9%	91.2%	82.8%	73.9%	66.7%	95.5%	90.2%	83.3%	86.2%	91.7%	63.2%	83.0%	100.0%	88.9%	95.0%
Land conservation	Yes	Count	6	0	2	3	1	4	2	0	1	3	0	4	0	5	6	0	1	1
		%	20.0%	0.0%	6.3%	15.8%	2.9%	13.8%	8.7%	0.0%	4.5%	7.3%	0.0%	13.8%	0.0%	26.3%	12.8%	0.0%	5.6%	5.0%
	No	Count	24	6	30	16	33	25	21	3	21	38	6	25	12	14	41	14	17	19
		%	80.0%	100.0%	93.8%	84.2%	97.1%	86.2%	91.3%	100.0%	95.5%	92.7%	100.0%	86.2%	100.0%	73.7%	87.2%	100.0%	94.4%	95.0%
Environment friendly technique	Yes	Count	10	0	2	3	3	0	10	0	1	7	0	4	0	5	17	0	0	1
		%	33.3%	0.0%	6.3%	15.8%	8.8%	0.0%	43.5%	0.0%	4.5%	17.1%	0.0%	13.8%	0.0%	26.3%	36.2%	0.0%	0.0%	5.0%
	No	Count	20	6	30	16	31	29	13	3	21	34	6	25	12	14	30	14	18	19
		%	66.7%	100.0%	93.8%	84.2%	91.2%	100.0%	56.5%	100.0%	95.5%	82.9%	100.0%	86.2%	100.0%	73.7%	63.8%	100.0%	100.0%	95.0%
Resource recycling	Yes	Count	4	0	2	1	2	0	5	0	0	9	1	4	1	5	4	0	0	0
		%	12.9%	0.0%	6.3%	5.3%	5.9%	0.0%	21.7%	0.0%	0.0%	22.0%	16.7%	13.8%	8.3%	26.3%	8.5%	0.0%	0.0%	0.0%
	No	Count	27	6	30	18	32	29	18	3	22	32	5	25	11	14	43	14	18	20
		%	87.1%	100.0%	93.8%	94.7%	94.1%	100.0%	78.3%	100.0%	100.0%	78.0%	83.3%	86.2%	91.7%	73.7%	91.5%	100.0%	100.0%	100.0%
Vaccination/ artificial inseminatio n	Yes	Count	6	3	10	3	3	4	2	0	0	7	2	7	3	3	5	0	4	1
		%	19.4%	50.0%	31.3%	15.8%	8.8%	13.8%	8.7%	0.0%	0.0%	17.5%	33.3%	24.1%	25.0%	16.7%	10.6%	0.0%	22.2%	5.0%
	No	Count	25	3	22	16	31	25	21	3	22	33	4	22	9	15	42	14	14	19
		%	80.6%	50.0%	68.8%	84.2%	91.2%	86.2%	91.3%	100.0%	100.0%	82.5%	66.7%	75.9%	75.0%	83.3%	89.4%	100.0%	77.8%	95.0%
Fishery	Yes	Count	0	0	0	2	1	0	0	0	0	0	0	3	0	2	0	0	1	0
		%	0.0%	0.0%	0.0%	10.5%	2.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.3%	0.0%	10.5%	0.0%	0.0%	5.6%	0.0%
	No	Count	30	6	32	17	33	29	23	3	22	41	6	26	12	17	47	14	17	20
		%	100.0%	100.0%	100.0%	89.5%	97.1%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	89.7%	100.0%	89.5%	100.0%	100.0%	94.4%	100.0%
Market information	Yes	Count	4	1	3	2	3	1	1	0	1	8	0	7	1	5	2	1	1	0
		%	12.9%	16.7%	9.4%	10.5%	8.8%	3.4%	4.3%	0.0%	4.5%	19.5%	0.0%	24.1%	8.3%	26.3%	4.3%	7.1%	5.6%	0.0%
	No	Count	27	5	29	17	31	28	22	3	21	33	6	22	11	14	45	13	17	20
		%	87.1%	83.3%	90.6%	89.5%	91.2%	96.6%	95.7%	100.0%	95.5%	80.5%	100.0%	75.9%	91.7%	73.7%	95.7%	92.9%	94.4%	100.0%
Farm economy	Yes	Count	9	1	4	5	2	3	5	0	2	5	0	5	1	5	8	1	3	1
		%	29.0%	16.7%	12.5%	26.3%	5.9%	10.3%	21.7%	0.0%	9.1%	12.2%	0.0%	17.2%	8.3%	26.3%	17.0%	7.1%	16.7%	5.0%
	No	Count	22	5	28	14	32	26	18	3	20	36	6	24	11	14	39	13	15	19
		%	71.0%	83.3%	87.5%	73.7%	94.1%	89.7%	78.3%	100.0%	90.9%	87.8%	100.0%	82.8%	91.7%	73.7%	83.0%	92.9%	83.3%	95.0%
Income generation	Yes	Count	2	1	4	2	0	0	3	0	1	3	0	6	1	5	2	2	0	0
		%	6.5%	16.7%	12.5%	10.5%	0.0%	0.0%	13.0%	0.0%	4.5%	7.3%	0.0%	20.7%	8.3%	26.3%	4.3%	14.3%	0.0%	0.0%
	No	Count	29	5	28	17	34	29	20	3	21	38	6	23	11	14	45	12	18	20
		%	93.5%	83.3%	87.5%	89.5%	100.0%	100.0%	87.0%	100.0%	95.5%	92.7%	100.0%	79.3%	91.7%	73.7%	95.7%	85.7%	100.0%	100.0%
Collective work	Yes	Count	2	0	3	2	1	0	2	0	2	2	0	4	1	5	2	2	0	1
		%	6.5%	0.0%	9.4%	10.5%	2.9%	0.0%	8.7%	0.0%	9.1%	4.9%	0.0%	13.8%	8.3%	26.3%	4.3%	14.3%	0.0%	5.0%
	No	Count	29	6	29	17	33	29	21	3	20	39	6	25	11	14	45	12	18	19
		%	93.5%	100.0%	90.6%	89.5%	97.1%	100.0%	91.3%	100.0%	90.9%	95.1%	100.0%	86.2%	91.7%	73.7%	95.7%	85.7%	100.0%	95.0%
Agro-processing	Yes	Count	0	0	0	2	1	0	2	0	2	1	0	4	0	5	1	0	0	1
		%	0.0%	0.0%	0.0%	10.5%	2.9%	0.0%	8.7%	0.0%	9.1%	2.4%	0.0%	13.8%	0.0%	26.3%	2.1%	0.0%	0.0%	5.0%
	No	Count	31	6	32	17	33	29	21	3	20	40	6	25	12	14	46	14	18	19
		%	100.0%	100.0%	100.0%	89.5%	97.1%	100.0%	91.3%	100.0%	90.9%	97.6%	100.0%	86.2%	100.0%	73.7%	97.9%	100.0%	100.0%	95.0%

Farmer's Needs in Extension Service by Expenditure Group

Needs	Answer		Average monthly expenditure (2006)					Total
			<1000NIS	1000-1999NIS	2000-2999NIS	3000-4999NIS	>5000NIS	
New variety	Yes	Count	8	40	11	14	2	75
		% within group	30.8%	20.2%	9.7%	24.1%	20.0%	18.5%
	No	Count	18	158	102	44	8	330
		% within group	69.2%	79.8%	90.3%	75.9%	80.0%	81.5%
Fertilizer application	Yes	Count	9	65	26	19	2	121
		% within group	34.6%	32.8%	23.0%	32.8%	20.0%	29.9%
	No	Count	17	133	87	39	8	284
		% within group	65.4%	67.2%	77.0%	67.2%	80.0%	70.1%
Chemical application	Yes	Count	8	63	26	19	2	118
		% within group	30.8%	31.8%	23.0%	32.8%	20.0%	29.1%
	No	Count	18	135	87	39	8	287
		% within group	69.2%	68.2%	77.0%	67.2%	80.0%	70.9%
Fodder cultivation	Yes	Count	2	24	11	4	1	42
		% within group	7.7%	12.1%	9.7%	6.9%	10.0%	10.4%
	No	Count	24	174	102	54	9	363
		% within group	92.3%	87.9%	90.3%	93.1%	90.0%	89.6%
Cultivation technique	Yes	Count	4	16	9	9	2	40
		% within group	15.4%	8.1%	8.0%	15.5%	20.0%	9.9%
	No	Count	22	182	104	49	8	365
		% within group	84.6%	91.9%	92.0%	84.5%	80.0%	90.1%
Improved seeds	Yes	Count	3	29	10	10	2	54
		% within group	11.5%	14.6%	8.8%	17.2%	20.0%	13.3%
	No	Count	23	169	103	48	8	351
		% within group	88.5%	85.4%	91.2%	82.8%	80.0%	86.7%
Improved livestock	Yes	Count	2	20	3	4	1	30
		% within group	7.7%	10.1%	2.7%	6.9%	10.0%	7.4%
	No	Count	24	178	110	54	9	375
		% within group	92.3%	89.9%	97.3%	93.1%	90.0%	92.6%
Water management	Yes	Count	3	28	15	10	2	58
		% within group	11.5%	14.1%	13.3%	17.2%	20.0%	14.3%
	No	Count	23	170	98	48	8	347
		% within group	88.5%	85.9%	86.7%	82.8%	80.0%	85.7%
Land conservation	Yes	Count	4	17	8	8	2	39
		% within group	15.4%	8.6%	7.1%	13.8%	20.0%	9.7%
	No	Count	22	181	104	50	8	365
		% within group	84.6%	91.4%	92.9%	86.2%	80.0%	90.3%
Environment friendly technique	Yes	Count	5	31	14	12	1	63
		% within group	19.2%	15.7%	12.5%	20.7%	10.0%	15.6%
	No	Count	21	167	98	46	9	341
		% within group	80.8%	84.3%	87.5%	79.3%	90.0%	84.4%
Resource recycling	Yes	Count	4	18	7	8	1	38
		% within group	15.4%	9.1%	6.2%	13.8%	10.0%	9.4%
	No	Count	22	180	106	50	9	367
		% within group	84.6%	90.9%	93.8%	86.2%	90.0%	90.6%
Vaccination/ artificial insemination	Yes	Count	6	39	10	7	1	63
		% within group	23.1%	19.7%	8.9%	12.3%	10.0%	15.6%
	No	Count	20	159	102	50	9	340
		% within group	76.9%	80.3%	91.1%	87.7%	90.0%	84.4%
Fishery	Yes	Count	2	2	2	2	1	9
		% within group	7.7%	1.0%	1.8%	3.4%	10.0%	2.2%
	No	Count	24	195	111	56	9	395
		% within group	92.3%	99.0%	98.2%	96.6%	90.0%	97.8%
Market information	Yes	Count	3	19	9	9	1	41
		% within group	11.5%	9.6%	8.0%	15.5%	10.0%	10.1%
	No	Count	23	179	104	49	9	364
		% within group	88.5%	90.4%	92.0%	84.5%	90.0%	89.9%
Farm economy	Yes	Count	3	30	14	11	2	60
		% within group	11.5%	15.2%	12.4%	19.0%	20.0%	14.8%
	No	Count	23	168	99	47	8	345
		% within group	88.5%	84.8%	87.6%	81.0%	80.0%	85.2%
Income generation	Yes	Count	2	15	5	9	1	32
		% within group	7.7%	7.6%	4.4%	15.5%	10.0%	7.9%
	No	Count	24	183	108	49	9	373
		% within group	92.3%	92.4%	95.6%	84.5%	90.0%	92.1%
Collective work	Yes	Count	3	13	4	8	1	29
		% within group	11.5%	6.6%	3.5%	13.8%	10.0%	7.2%
	No	Count	23	185	109	50	9	376
		% within group	88.5%	93.4%	96.5%	86.2%	90.0%	92.8%
Agro-processing	Yes	Count	2	9	3	4	1	19
		% within group	7.7%	4.5%	2.7%	6.9%	10.0%	4.7%
	No	Count	24	189	110	54	9	386
		% within group	92.3%	95.5%	97.3%	93.1%	90.0%	95.3%