

Equipment List

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Description	Item No.	Equipment Name	Specification Outline	Planned Qty
<b>A. Seed Processing Plant for Wheat</b>				
A-1. Weighing Facility	A-1-1	Truck Scale	Type: Load cells type weigh-bridge complete with digital display and printing device for gross/ tare/ net weight, underground pit (low-depth) type, Capacity: 100 ton Maximum possible size of vehicle: Overall length(distance between wheel centers) 16.0 meter / Overall width 2.7 meter, Accuracy: 1/5,000	1
A-2. Seed Processing Facility	Seed Processing Plant Composition		Target crop : Wheat Capacity : 15 ton/h (Raw material basis, Cleaning equipment)	1 set
	A-2-1	Receiving Hopper	Type:All steel made, underground pit type hopper, complete with reinforced gratings, discharge gate (electric remote control type) and smooth-finished inner surface of the hopper with 45 degree or steeper inclination angle (Vehicle shall not run over the hopper) Size: 8 m x 3 m	
	A-2-2	Pre-cleaner	Type:Air-screen type pre-cleaner consisting of (1) feed roll, (2) primary and final aspiration system, (3) two-layer oscillation sieves, and (4) sieve self-cleaning device Upper sieve shall have round perforations to remove large foreign matters (overs). Lower sieve shall have oblong perforations to remove small foreign matters (drops). Mesh sizes of the sieves to be made available depending on varieties, etc.: < Upper sieve > 6.5 / 6.75 / 7.0 / 7.25 / 7.5 mm < Lower sieve > 1.7 / 1.8 / 1.9 mm Capacity : 40 ton/h	
	A-2-3	Receiving Bin	Type:Square-shaped, hopper bottom bins (plural number), complete with discharge valves, level indicators (top and bottom position), buffer plates to keep seed from being damaged, inspection doors with ladder and smooth inner surface to make cleanup easier If and when all the bins have been fully loaded, discharge gate of the receiving hopper shall be automatically closed with alarming by sound and lamp blinking. If and when all the bins have been emptied, alarming by sound and lamp blinking shall be made. Holding capacity: 120 ton	
	A-2-4	De-awner	Type:De-awner consisting of (1) steel cylinder with rotating beater arms and (2) discharge gate to control the internal pressure of seed mass in the machine depending on characteristics of seed to be processed. Capacity:15 ton/h	
	A-2-5	Cleaner	Type:Air-screen cleaner type cleaning machine consisting of (1) feed roll, (2) primary and final aspiration system, (3) two screen shoes, and (4) sieve self-cleaning device Upper screen shoe shall have sieves with round perforations to remove relatively large matters (overs). Lower screen shoe shall have sieves with oblong perforations to separate small seed grains and foreign matters (drops). Mesh sizes of the sieves to be made available depending on varieties, etc.: < Upper sieves > 5.0 / 5.25 / 5.5 / 5.75 / 6.0 / 6.5 mm < Lower sieves > 1.7 / 1.8 / 1.9 / 2.0 / 2.1mm Capacity:15 ton/h	
	A-2-6	Indented Cylinder Separator	Type: Indented cylinder separator comprising two rotating cylinders placed one below another having numerous indents on the inside surface, complete with cylinder speed control, trough setting adjustment and device to make cleanup easier Upper cylinder shall have smaller indents to lift out relatively shorter grains/ particles and lower cylinder shall have bigger indents to eliminate relatively longer grains / foreign crop seeds and be used in series. Mesh sizes of the cylinders to be made available depending on varieties, etc.: < Upper cylinder > 5.25 / 5.50 / 5.75 mm < Lower cylinder > 7.50 / 7.75 / 8.0 mm Capacity: 15 ton/h	
A-2-7	Gravity Separator	Type: Specific gravity separator comprising (1) oscillating separation deck with adjustable inclination in longitudinal / latitudinal direction and (2) air distribution control system Incoming seed shall be classified to (a) Heaviest matters, (b) Lightest matters, (c) Medium matters and (d) Normal seed grains, of which (a) and (b) shall be taken as rejects and (c) shall be fed back to the gravity separator for re-separation. Capacity: 15 ton/h		

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Description	Item No.	Equipment Name	Specification Outline	Planned Qty
	A-2-8	Seed Treater	Type: Chemical seed treater, liquid type, comprising (1) seed intake with level indicator, (2) chemicals intake, (3) metering device for chemicals, (3) mixing chamber, (4) dust suction unit and (4) self-cleaning construction Automatic control of feeding rate of chemicals shall be made in connection with flow rate of seed. Chemicals to be used: (a) Quinolate 150 TS (Oxine Copper), 2 kg for 1 ton of seed, applicable for all varieties of Durum Wheat except variety- Sham 1 (b) Vitaflo 280, 2.5 kg for 1 ton of seed, applicable for variety- Sham 1 (Durum Wheat) and all varieties of Bread Wheat Capacity: 30 ton/h	
	A-2-9	Automatic Weigher	Type: Automatic weighing machine, load cell type (Bag handling and switch control to be manual) Material of bag: Polypropylene Net weight of final product per one bag: (1) 50 kg (Size of empty bag: 1,000 mm x 600 mm) (2) 25 kg (Size of empty bag: 850 mm x 450 mm) Accuracy: 1/1,000 (50 kg) Capacity: 720 bags/h (50 kg)	
	A-2-10	Bag Sewing Machine	Type: Semi automatic bag sewing machine complete with double sewing head and foot switch. Material of bag: Polypropylene Net weight of final product per one bag: (1) 50 kg (Size of empty bag: 1,000 mm x 600 mm) (2) 25 kg (Size of empty bag: 850 mm x 450 mm) Capacity: 720 bags/h (50 kg)	
	A-2-11	Dust Collecting Equipment	Type: Pneumatic dust-collecting equipment comprising fans, cyclones and rotary airlocks Efficient dust collection shall be made mainly from each processing machine with independent suction from seed treatment section. Cyclones shall be placed outside the plant building	
	A-2-12	Rejects Collecting Equipment	Type: Mechanical rejects-collecting equipment comprising screw conveyors, containers (square-shaped, steel made) and platform scale Rejected matters are classified to two(2) categories (relatively high and low grades); and weighed, bagged, hand-sewn and carried by forklift to rejects storage. Type of bags: Jute bags (size of empty bag: 1,200 x 700 mm)	
	A-2-13	Sampling Device	Type: Automatic sampling device, electrically controlled cross-cut diverter type Points for sample to be taken: Right after (1) Pre-cleaner, (2) Cleaner, (3) Indented cylinder separator and (4) Gravity separator.	
	A-2-14	Belt Conveyor	Type: Horizontal belt conveyor complete with driving unit and tensioning unit Belt conveyor under the receiving hopper shall be equipped with variable speed control with local panel, flow sensor, and magnet separator; and belt conveyor for bagged products shall be inclined type.	
	A-2-15	Bucket Elevator	Type: Vertically installed, centrifugal discharge, belt and bucket enclosed type bucket elevator, complete with driving unit, tensioning unit, inspection/maintenance deck, ladder to the top casing, inspection door, devices to make cleanup easier and keep seed from being damaged, and back-stop device	
	A-2-16	Buffer Tank	Type: Square-shaped, hopper bottom tank with discharge gate and level indicator (top position) If and when the tank has been fully loaded, all discharge gates of preceding equipment (Either receiving hopper or receiving bin or storage bin) shall be automatically closed with alarming by sound and lamp blinking. Holding capacity: Approx. 700~800 kg / 1 tank	
	A-2-17	Chain Conveyor	Type: Horizontal chain conveyor, complete with driving unit, tensioning unit, discharge gates and devices to make cleanup easier and keep seed from being damaged	
	A-2-18	Storage Bin	Type: Square-shaped, hopper bottom bins (plural number), complete with discharge valves, level indicators (top and bottom position), buffer plates to keep seed from being damaged, inspection doors with ladder and smooth inner surface to make cleanup easier If and when all the bins have been fully loaded, all discharge gates of the receiving bins shall be automatically closed with alarming by sound and lamp blinking. If and when all the bins have been emptied, alarming by sound and lamp blinking shall be made. Holding capacity: 120 ton/h	

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Description	Item No.	Equipment Name	Specification Outline	Planned Qty	
	A-2-19	Chute Pipe	Type: Steel made, cylindrical piping materials with smooth inside surface and gradual bends.		
	A-2-20	Air Duct	Type: Steel made, cylindrical piping materials with smooth inside surface and gradual bends.		
	A-2-21	Change Valves	Type: Multi-way change valves Arrangement shall be made so that any machine / equipment placed between pre-cleaner and storage bin can be skipped.	1 set	
	A-2-22	Structural support	Steel materials, structures, etc.	1 lot	
	A-2-23	Air Compressor	Type: Air compressor, pressure switch control type	1	
	A-2-24	Electric Control Panel	Type: Self-standing, square-shaped, steel made, rodent/ dust proof control panel, complete with; (1) push buttons to switch on/ off equipment individually, (2) pilot lamps to indicate 'switch- on' of each electric motor, (3) graphic panel, (4) instruments to protect the control panel and electric motors from short-circuit trouble, overheating, etc., (5) alarming and interlocking system in connection with level indicators, discharge gates, etc. in the processing line.	1	
	A-2-25	Electric Cable	Type: Electric cable between the control panel and each electric motor/ device (To be placed underground pit)	1 lot	
	Others				
	A-2-26	Forklift	Type: Forklift, electric-powered, self-contained standard type Max. load: 3 ton.	1	
	A-2-27	Vacuum Cleaner	Type: Vacuum cleaner, industrial type with wheels and cleaner pipes	1	
A-2-28	Workshop Equipment	Required equipment: Drilling machine, portable electric drill, welding machine, hammer, chisel, metal scissors, vise and standard hand tools kit (screwdrivers, wrenches, pliers, etc.) for maintenance and repair of the plant.	1 set		
<b>B. Quality Control Equipment for Wheat</b>					
B-1. Laboratory Size Seed Processing Machines	B-1-1	Air-Screen Cleaner	Type: Laboratory air-screen cleaner, self-contained type, comprising; (1) pre- and post- aspiration system with cyclone collector/ bag filter, (2) de-awner, (3) three-layer oscillation sieves and (4) sieve self-cleaning device Top sieve shall have round perforations. Second / third sieves shall have oblong perforations and be used in parallel. Capacity: 100 kg/h Mesh sizes of the sieves to be made available depending on varieties, etc.: < Top sieve > 6.5 / 6.75 / 7.0 / 7.25 / 7.5 mm (Round perforations ) < Second & third sieves each > 1.7 / 1.8 / 1.9 mm (Oblong perforations)	1	
	B-1-2	Gravity Separator	Type: Laboratory specific gravity separator comprising; (1) oscillating separation deck with adjustable stroke/pitch/length and (2) air distribution system Capacity: 100 kg/h	1	
	B-1-3	Indented Cylinder Separator	Type: Laboratory indented cylinder separator comprising one rotating cylinder having numerous indents on the inside surface complete with variable speed cylinder drive and vibrating conveyor for lifting discharge Capacity: 100 kg/h Mesh sizes of the cylinder to be made available depending on varieties, etc.: 5.5 / 7.5 mm	1	
	B-1-4	Auto Weigher	Type: Laboratory check-weighing platform scale with digital display Capacity: 100 kg x 0.05	1	
B-2. Testing Equipment	B-2-1	Seed Sample Divider	Type: Conical hopper type sample divider, constructed of brass and copper Accuracy of division: 1 % on 1 kg sample	1	
	B-2-2	Microscope	Type: Stereo microscope Total magnification: 800 x	1	
	B-2-3	Moisture Tester	Type: Moisture tester complete with digital display and printing device Temperature and specific gravity of grain shall be indicated with moisture content. Moisture range: 5 to 30 %	1	
	B-2-4	Seed Counter	Type: Seed grains counter, automatic electronic type, digital display Minimum number of count: 1,000 seed grains	1	
	B-2-5	Analytical Balance	Type: Analytical balance with digital display Capacity: 2 kg x 0.5 and 600 g x 0.2 each	1	
	B-2-6	Illuminated Magnifier	Magnifier with illumination Total magnification: Approx. 4 x	1	
	B-2-7	Seed Sample Pans	Type: Seed Sample Pans, Round & Square	1 set	
	B-2-8	Grain Dockage Sieves	Type: Seed grain sieves, square type for 100 g each Mesh sizes to be made available: (Round) 4.25/ 4.5 mm (Oblong) 1.6/ 1.7/ 1.8/ 1.9/ 2.0/ 2.1 mm	1 set	
	B-2-9	Sieve Shaker	Type: Sieve Shaker complete with motor driven oscillation and timer	1	

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Description	Item No.	Equipment Name	Specification Outline	Planned Qty
	B-2-10	Grain Shape Tester	Type: Grain Shape Tester, portable analog type	1
	B-2-11	Bag Sealer	Type: Bag Sealer, Table-top hand sealer type	1
	B-2-12	Seed Sample Refrigerator	Type: Seed Sample Refrigerator, ordinary house-use type Temperature range: -5 to 10 °C Net volume: Approx. 600 liter (for refrigerator parts only)	1
	B-2-13	Seed Germinator	Type: Seed Germinator, complete with stainless steel interior/exterior, self-contained humidifier and printing recorder Temperature range: 5 to 50 °C Regulator: Bimetal type Volume: 5 racks to put 20 cases of samples (400 grains per case)	1
<b>C. Tissue Culture Equipment for Potato</b>				
C-1 Water purification Room	C-1-1	Pure water system	Type: distilled, filtrated system Capacity: 10 liter/hr or more	2
C-2 Media Preparation Room	C-2-1	Autoclave (Large)	Type: horizontal type, stainless steel, security system of opening and closing, automatic operation, alarming, Temperature range: 110 to 150 , temperature recorder, water tank Capacity: 600 liter	1
	C-2-2	Autoclave (Small)	Type: horizontal type, stainless steel, security system of opening and closing, automatic operation, alarming, Temperature range: 110 to 150 , temperature recorder, water tank Capacity: 200 liter	2
	C-2-3	Large refrigerator with freezer	Temperature control: 4 to 10°C (refrigerator), -20 to -5°C (freezer) Capacity: 900 liter, temperature indicator	3
	C-2-4	Small refrigerator with freezer	Temperature control: 4 to 10°C (refrigerator), -20 to -5°C (freezer) Capacity: 200 liter, temperature indicator	4
	C-2-5	Electrical Balance	Type: digital display Capacity: 2,000 g, Accuracy 0.01g, auto calibration and adjustment	2
	C-2-6	Analytical Balance	Type: digital display Capacity: 300g (0.01mg/0.1mg), automatic calibration and adjustment, percentage information, with electric stabilizer	2
	C-2-7	pH meter	Type: digital display Measuring range: pH 0 to 14, sensitivity 0.01 Operation temperature: 5°C to 60°C, printer and stirrer	2
	C-2-8	EC meter	Measuring range: 0 to 99milsiemens /cm Automatic adjustment for temperature, accuracy ± 2 %, with standard	1
	C-2-9	Dispenser	Distribution capacity: 5 to 25ml, graduate 0.5ml Distribution material: glass or PVC, tank: 2.5 liter Pore pipe Capacity: 2.5, 5, 10, 25, 50, 100ml	5
	C-2-10	Electronical dispenser	Capacity: 5 to 500ml, accuracy 1% Distribution pipe: heat registered PVC or equivalent Media temperature: 20 to 90°C Tank capacity: 20 liter	1
	C-2-11	Automatic pipette	Type: Automatic pipette Capacity: 0.2ml, 2ml, 10ml, 25ml Tip: 100 pcs	3 each
	C-2-12	Magnetic stirrer	Rotation speed: 100 to 1,300 rpm, no-step speed control Capacity: 10 liter Heating capacity: 500 W	3
C-3 Cultivation Room	C-3-1	Laminar air flow (Clean bench)	Type: tissue culturing clean bench Material: stainless steel, working space: 1,200×600mm Ventilation: Pre-filtering, HEPA filter (99.99%), air flow control Normal lamp, UV lamp, gas valve, gas burner, chair	6
	C-3-2	Stereoscopic microscope	Type: binocular Magnification: 250x, Illumination: top and bottom side, 3 set of eye lens Photo system with camera set	4
	C-3-3	Universal microscope	Type: binocular Magnification: 1,500x, Illumination: bottom side, 3 set of eye lens Photo system with camera	2
	C-3-4	Tweezers	Size: 100mm, 150mm, 200mm, 300mm Material: stainless steel	24 each
	C-3-5	Scissors	Size: 145mm (standard type) Material: stainless steel	24 each
	C-3-6	Scalpel blade with handle	Size: No.3 Material: stainless steel, blade: 40	24

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Description	Item No.	Equipment Name	Specification Outline	Planned Qty
	C-3-7	Scalpel blade with handle	Size: No.4 Material: stainless steel, blade: 50	24
	C-3-8	Test tube rack (holder)	Capacity: 50 pcs/rack (φ 25mm test tube) Material: stainless steel round bar type	2,200
C-4 Incubation Room	C-4-1	Illuminated incubator	Control: 24 hr timer, automatic temperature control, programmed lighting control Capacity: 300 liter, vertical aeration Temperature control: 15~45°C±1.0°C Illumination: 5,000 lux - alarm system	3
	C-4-2	Rotary shaker	Type: Rotary and reciprocate Speed: 25 to 300 cycle/min, no-step, 24 hr timer Capacity: test tube 50 pcs / flask(100ml) 20 pcs, platform	1
C-5 Growth Room	C-5-1	Incubation growth room system	Component: Chiller system for cooling. Air treatment unit. Air distribution duct system. Insulation system. Growth shelf with lamps. Computer system for growth room control. One main control panel and 6 sub control panels for each chamber. Protection alarm system. Insulation door system with observation window for each chamber. 6 chambers of growth room and each chamber has about 50 square meters each Air condition temperature 17°C to 30°C, humidity 75%, light 6,000 to 8,000 lux by shelf Controlled HEPA filtrated (99.9%) air by 10, 12, 15, Control: Programmable for temp, light, ventilation, circulation of air duct: 8 points of inlet from side wall, 1 point of outlet on ceiling Culturing shelf: 4 rows/room, Shelf No.: 4 stories (height 350mm, lower shelf 200mm from floor), material: stainless steel and glass shelf	3
		Recording unit	Recording temperature: 0 to 50°C±1°C, humidity 0 to 100% ±3% Recording time: 1 day to 1 week	3
		Lux meter	Type: digital display, JIS C1609 class A Measuring range: 90~90,000lux ±5%, AC/DC	1
		Air quality tester	Suction Capacity: 100 liter/min, battery operation Incubation set, control time indicator for test	1
C-6 Glassware Room	C-6-1	Plant test tube	Material: heat registered glass (Borosilicate Glass) Size: 25φmm×200mm Autoclavable transparent plastic caps for tissue culture	110,000
	C-6-2	Jar with lid	Material: heat registered glass (Borosilicate) Capacity: 500 ml, φ60mm/ φ80mm	18,480
	C-6-3	Graduated cylinder	Material: heat registered glass (Borosilicate) Capacity: 5m l, 10m l, 25m l, 100m l, 250m l, 500m, 1,000m l, graduation	6 each
	C-6-4	Beaker	Material: heat registered glass (Borosilicate) Capacity: 10m l, 25m l, 100m l, 250m l, 500m, 1,000m l	6 each
	C-6-5	Volumetric flask	Material: heat registered glass (Borosilicate) Capacity: 10m l, 25m l, 100m l, 250m l, 500m, 1,000ml	6 each
	C-6-6	Conical flask	Material: heat registered glass (Borosilicate) Capacity: 25m l, 100m l, 250m l, 500m, 1,000m l, 2,500ml	6 each
	C-6-7	Pipette	Material: heat registered glass (Borosilicate) Capacity: 5m l, 10m l, 25m l, 50m l, pipette holder	6 each
	C-6-8	Petri dish	Material: heat registered glass (Borosilicate) Size: φ90mm	120
C-7 Glassware Washing Room	C-7-1	Ultrasonic Pipette washer	Cleaning method: ultra sonic (27 MHz), output 200W Capacity: φ 13×50cm, timer	1
	C-7-2	Automatic glassware washing machine	Type: fully automatic operation of washing, rinsing Capacity: 150 liter, washing volume: 250 liter/train. Washing material: test tube, flask, beaker, jar, washing rack	1
	C-7-3	Dry heat sterilize (oven)	Capacity: 150 liters Temperature control: OT to 300°C ±0.5°C Timer, digital display, safety device	2
	C-7-4	Dry oven	Air temperature: OT to 60°C, natural aeration Capacity: 300 liter	3

**Equipment List**

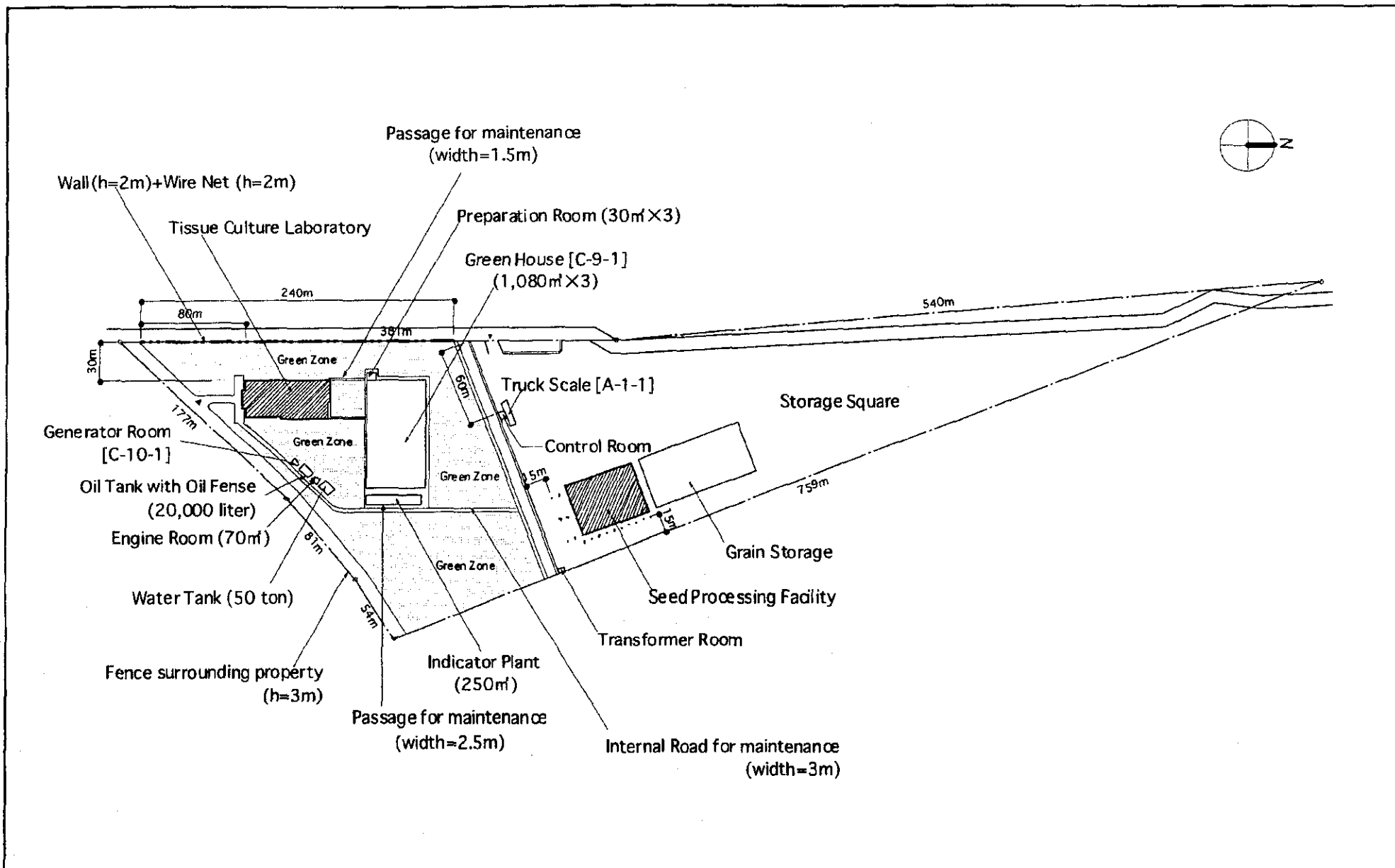
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Description	Item No.	Equipment Name	Specification Outline	Planned Qty
C-8 Quality Control Room	C-8-1	ELISA reader system	Component: ELISA reader (400 to 700 nm), auto sampler, plate cleaner, extractor, plate incubator, plotter, auto dispenser, auto micro pipette (8ch)	1
	C-8-2	Microscope for I.F. Test with photo system	Type: binocular, influence reaction unit Magnification: 1,500x, 3 set of eye lens with different magnification Illumination: halogen lamp, bottom Photo system with camera	1
	C-8-3	Illuminated incubator	Control: 24 hr timer control, Capacity: 1,200 liter, programmed lighting, aeration volume and ventilation ratio Cleanness: 10,000 Temperature: 15 to 35°C±0.1°C, alarm Illumination: 3,500 lux	1
	C-8-4	Fume hood	Type: standard type Working size: width 1,200mm, air volume: 12m <sup>3</sup> /min	1
C-9 Green House	C-9-1	High quality environmental controlled green house system	Type: steel and glass green house, total area 3,240m <sup>2</sup> , 3 division (1,080m <sup>2</sup> each) Number of divide: 2 Flame material: zinc plating steel/aluminum Wall structure: concrete, floor structure: concrete Roof material: transparency high reinforced glass Door structure: double insect protection	1
		Automatic environmental control system	Temperature control: 20~25°C, automatic Recorder: auto dry and wet temperature	
		Control unit	Control: temperature, humidity, irrigation, CO <sup>2</sup> , window/curtain, lighting Control method: programmable control (auto/manual), ups (10 min)	
		Alarm system	Alarm: sound and lighting Alarm condition: system error, low and high temperature	
		Heating system	Component: boiler (Room temperature 20°C), floor heating Circulation pump	
		Cooling system	Refrigerating method: pad and fan, circulation water, delivery pump	
		CO <sup>2</sup> gas supply system	Control: auto supply, 4m <sup>3</sup> /hr Gas delivery: fuel burning	
		Automatic curtain system	Shading system: over roofing and inner curtain Material: heavy duty, sun protection, protection ratio 60% Control: auto open and close	
		Drip irrigation system	Irrigation method: auto drip irrigation Irrigation point: 25 pot/m <sup>2</sup> Water supply: pump, filtering water, liquid fertilizer, tap water	
		Rolling bench system	Bench type: rolling bench type (350kg/m <sup>2</sup> ) Bench height: 850mm, 200mm depth Rolling width: 300mm	
		Spray system	Misting method: pump forced self trans unit (pump, piping, nozzle, etc.) Tank capacity for chemical: 3,000 liter	
		Light system	Lighting area: night time work, fluorescent lamp	
		Window system	Operation: ceiling (auto), wall (manual) Insect protection: PP net (UV, 40 mesh)	
		Water softener	Processing capacity: 3000 liter/hr Control: timer/manual, adjustable processing ratio	
Quality Control Room Virus test indicator plants and post harvest test of tuber	Area: 300m <sup>2</sup> Division: 8 rooms Flame material: zinc plating steel flame and aluminum flame Wall structure: concrete, floor structure: concrete Roof material: transparency high reinforced glass Door structure: double insect protection Control: temperature, humidity, sunray, lighting, co <sup>2</sup>	1		
Preparation Room Washing sink and working table	Material: stainless steel Size: 3,000x1,500x800mm(height) Accessory: sinkx2 (100 liter)	1		
Preparation Room Soil sterilizer	Type: Steam boiler Steam capacity: 500kg/h Fuel: heavy oil	1		
C-10 Other	C-10-1	Standby Generator	Fuel: diesel oil, auto operation, 500KVA	1

### **2-2-3 Basic Design Drawing**

#### **(1) Equipment Installation Plan**

Work efficiency was the major factor that was considered in preparing the installation plan for the equipment. The equipment installation plan for each facility is given in next page.

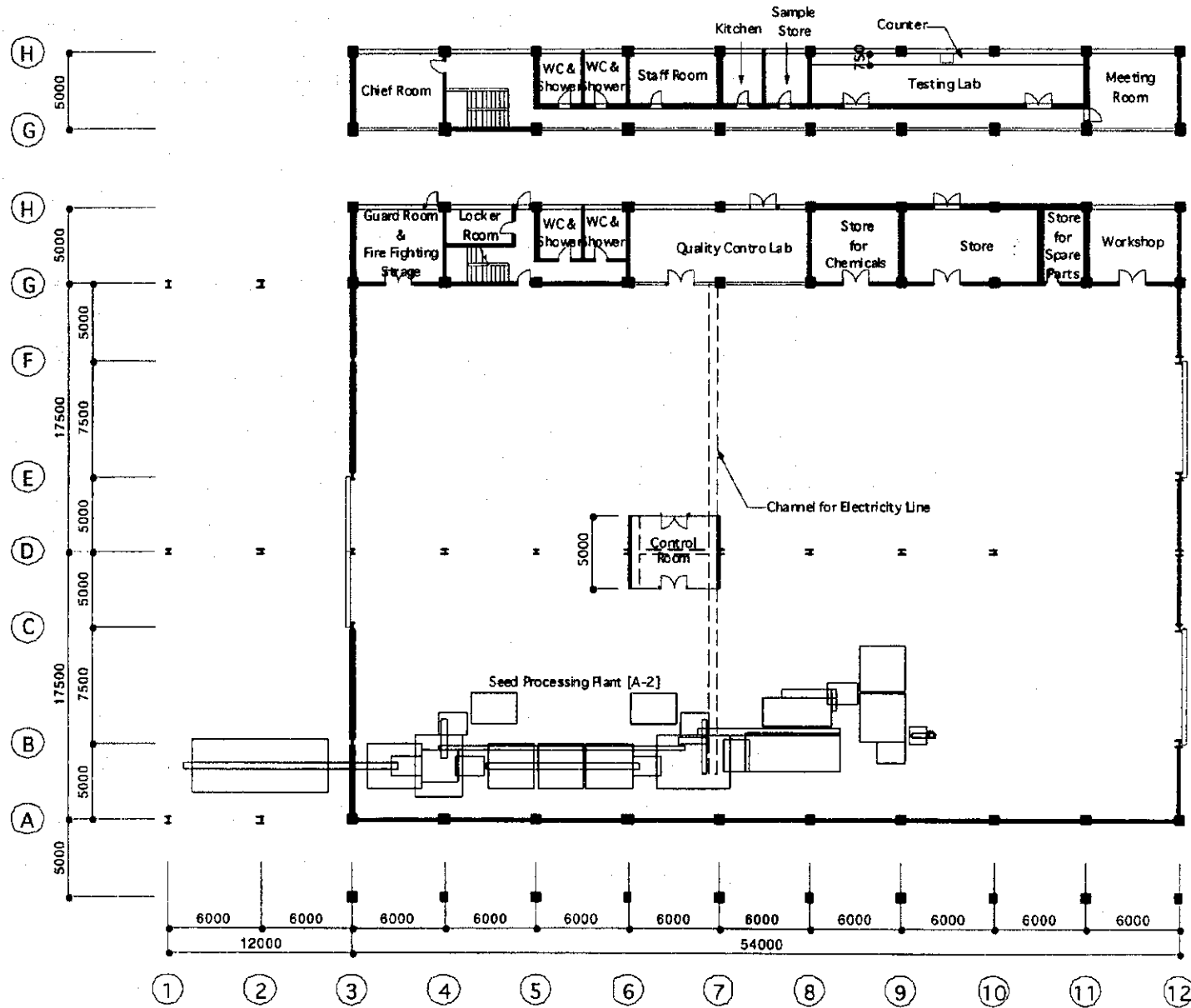


THE PROJECT FOR IMPROVEMENT OF SEED MULTIPLICATION CAPACITY  
IN THE SYRIAN ARAB REPUBLIC

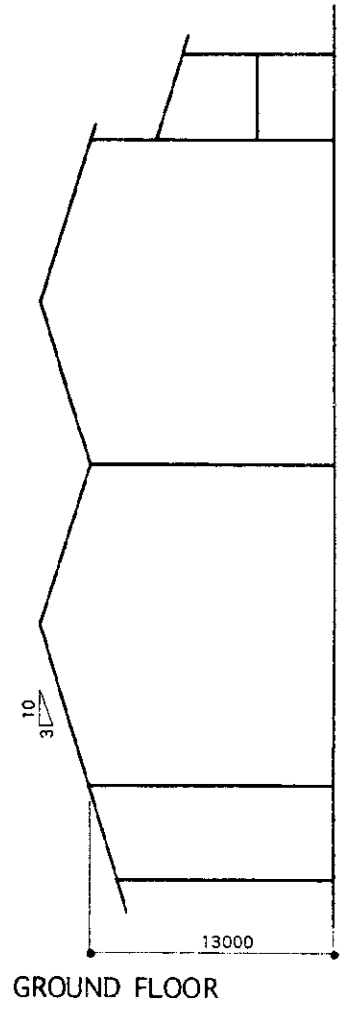
SITE PLAN FOR SEED PROCESSING PLANT  
AND TISSUE CULTURE LABORATORY

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FIRST FLOOR

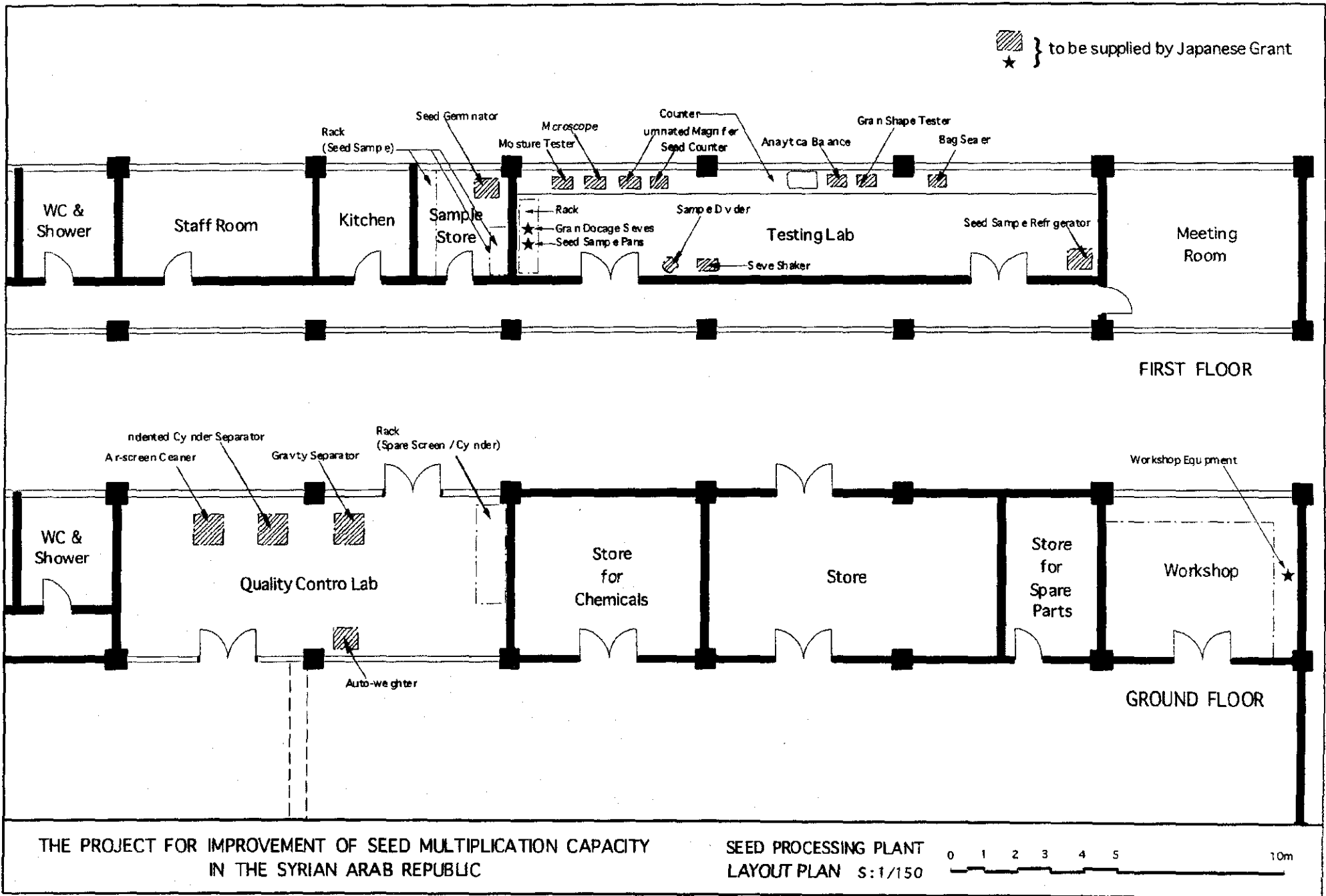


GROUND FLOOR

THE PROJECT FOR IMPROVEMENT OF SEED MULTIPLICATION CAPACITY  
IN THE SYRIAN ARAB REPUBLIC

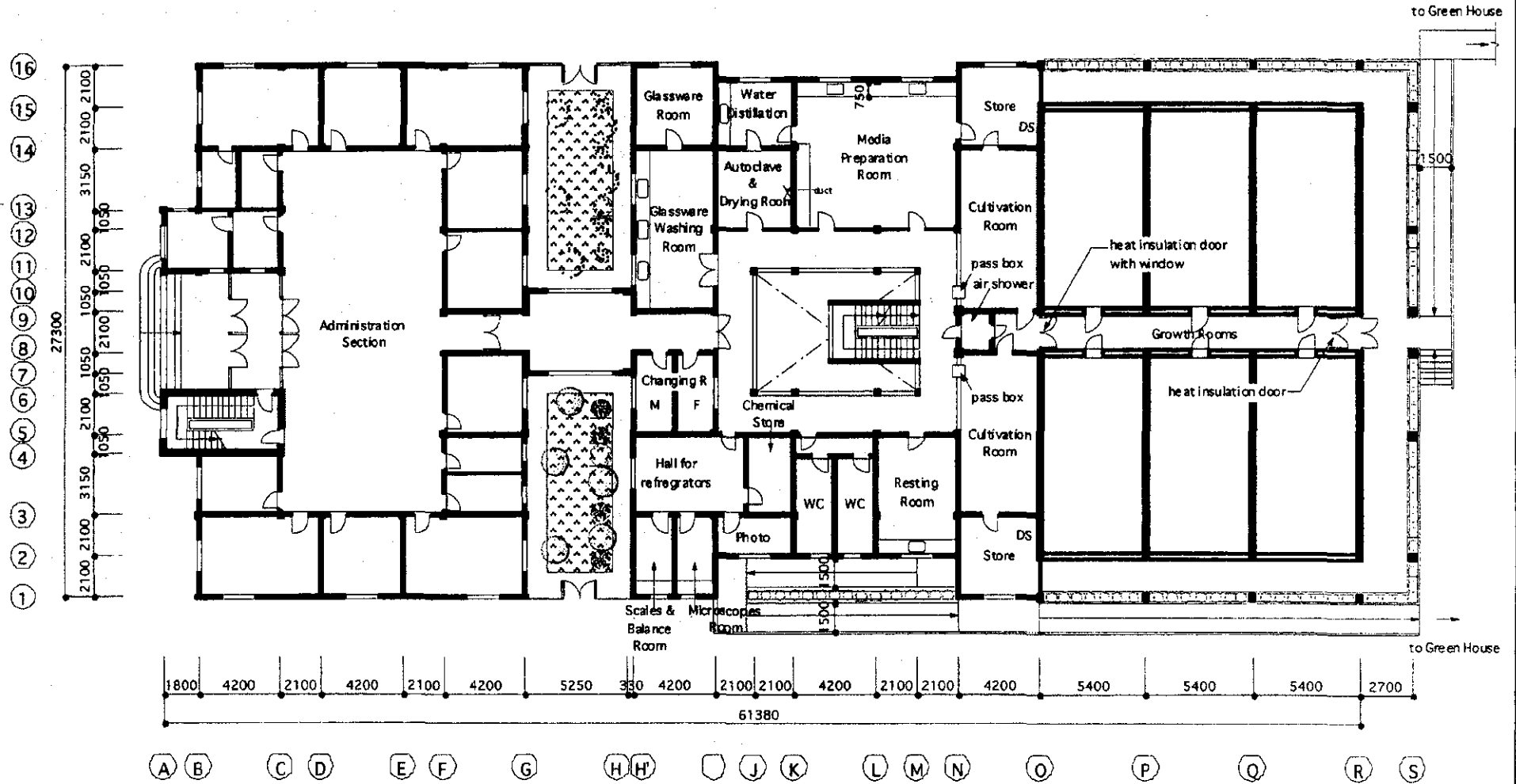
SEED PROCESSING PLANT LAYOUT PLAN

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THE PROJECT FOR IMPROVEMENT OF SEED MULTIPLICATION CAPACITY  
IN THE SYRIAN ARAB REPUBLIC

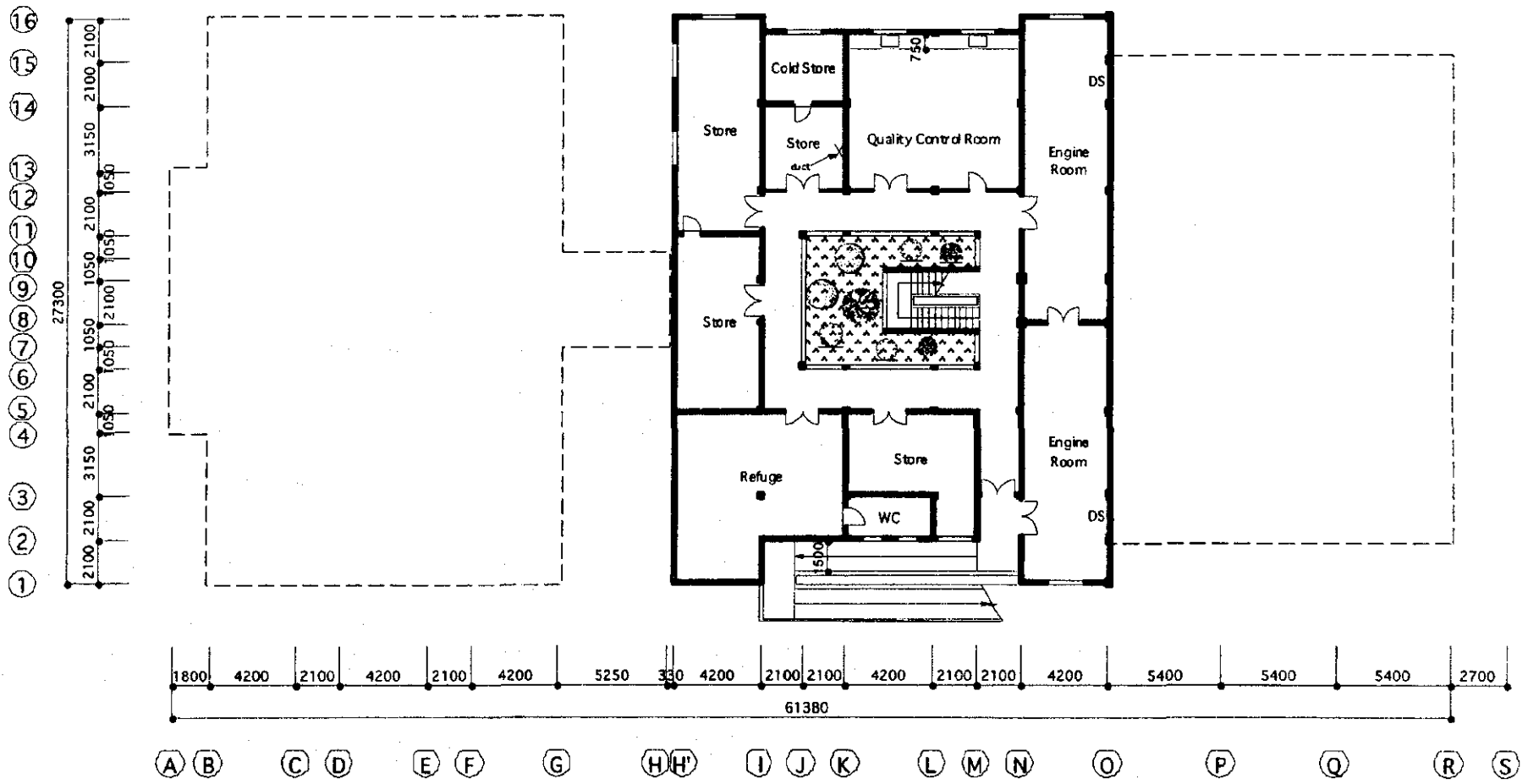
SEED PROCESSING PLANT  
LAYOUT PLAN S:1/150



THE PROJECT FOR IMPROVEMENT OF SEED MULTIPLICATION CAPACITY  
IN THE SYRIAN ARAB REPUBLIC

TISSUE CULTURE LABORATORY  
GROUND FLOOR PLAN

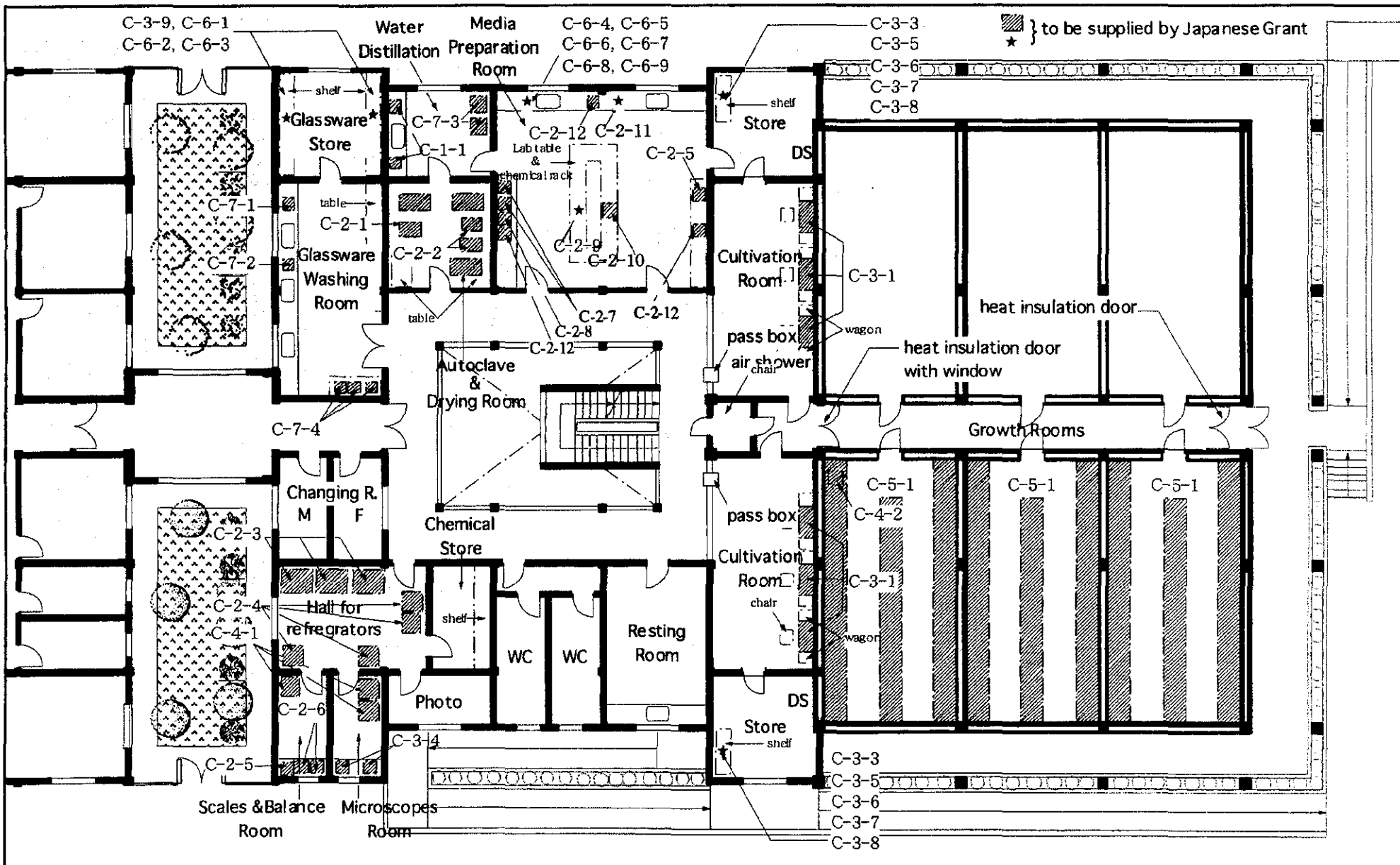
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THE PROJECT FOR IMPROVEMENT OF SEED MULTIPLICATION CAPACITY  
IN THE SYRIAN ARAB REPUBLIC

TISSUE CULTURE LABORATORY  
BASEMENT FLOOR PLAN

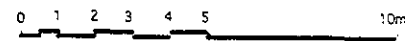
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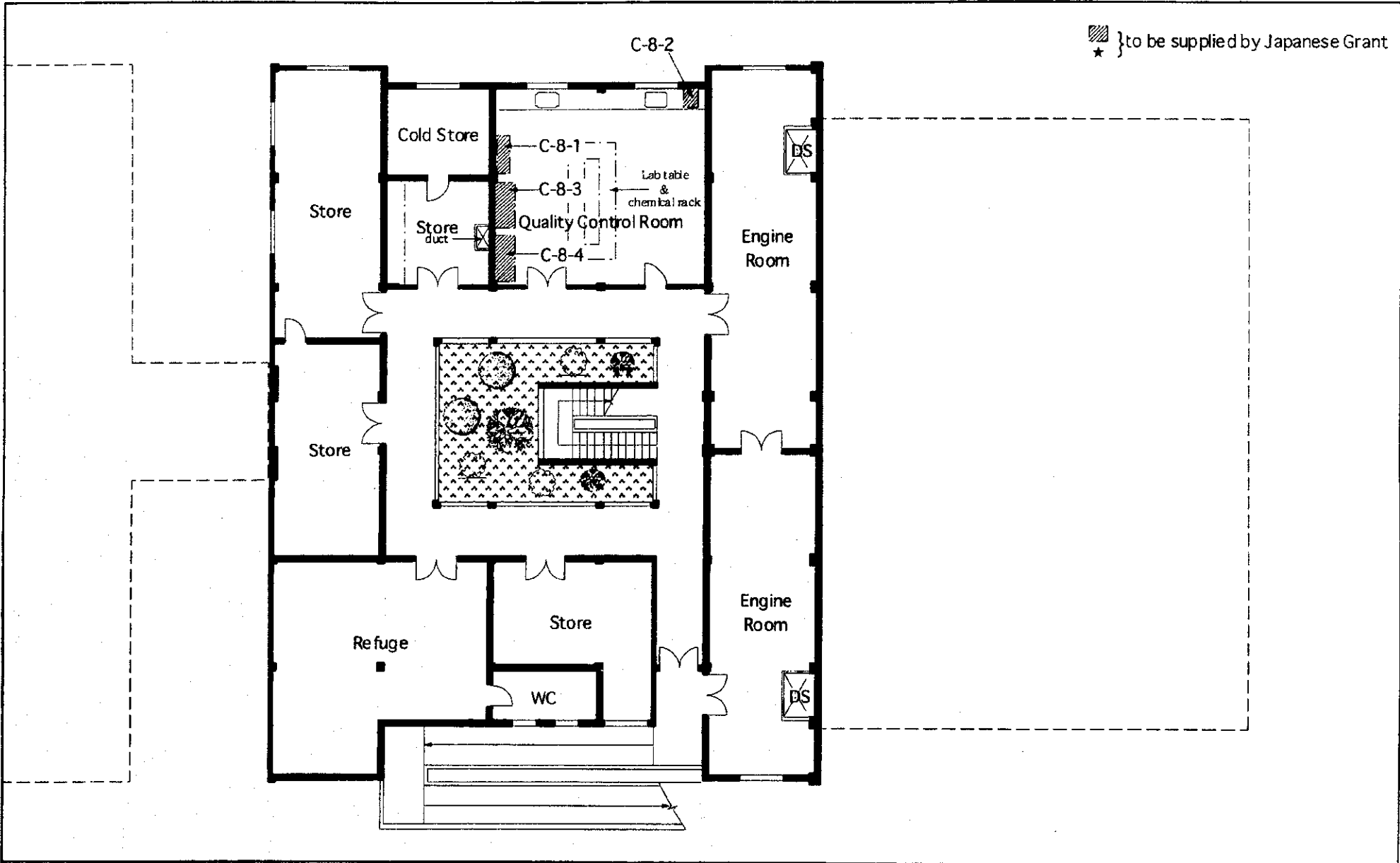


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THE PROJECT FOR IMPROVEMENT OF SEED MULTIPLICATION CAPACITY  
IN THE SYRIAN ARAB REPUBLIC

TISSUE CULTURE LABORATORY  
GROUND FLOOR LAYOUT PLAN S: 1/200

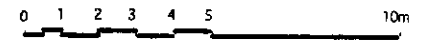




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THE PROJECT FOR IMPROVEMENT OF SEED MULTIPLICATION CAPACITY  
IN THE SYRIAN ARAB REPUBLIC

TISSUE CULTURE LABORATORY  
BASEMENT FLOOR LAYOUT PLAN S: 1/200



## **2-2-4 Implementation Plan**

### **2-2-4-1 Implementation Policy**

#### **(1) Project Implementation System**

The body that will be responsible for implementing the project on the Syrian side is the GOSM. Following the signing of the Exchange of Notes between the Syrian and Japanese governments, the Japanese consultant company will sign a contract with the Syrian side to prepare the tender documents and project implementation schedule. A Japanese trading company, under the supervision of the Japanese consultant company, will be responsible for procuring and installing equipment that will be provided by the project, following the signing of a contract between the trading company and GOSM.

After the project has been completed, the GOSM will operate and maintain the equipment as the project implementation agency.

#### **(2) Implementation Policy**

The project will be implemented as a Japanese government grant aid project according to the following policy.

Close communications and cooperation between the implementing agency on the Syrian side, the Japanese consultant company, and the Japanese trading company will be maintained at all times in order to ensure that the project is implemented efficiently and without interruption. The party that will be responsible for installing the electricity, water supply, and other utilities will be clearly defined and the installation work will be carried out smoothly and efficiently. All parties will endeavor to ensure that all work pertaining to the project equipment and its temporary storage, transport, delivery, and installation will be carried out safely; and proper accident prevention measures will be taken.

#### **【Dispatch of the Japanese Technician During the Implementation Period】**

Some of the equipment that will be provided by the project must be assembled as well as installed. Moreover, the installation of equipment allocated for the plant and the Growth Room must be carefully coordinated to enable work efficiency to be fully achieved. Unlike general machine tools or household appliances, tissue culture related equipment is not commonly utilized. Subsequently, the installation and adjustments of such equipment differs according to each manufacturer. Therefore, a Japanese technician will be sent to Syria to supervise the unpacking, transport, assembly, installation, the trial operation and adjustments of the

equipment, in addition to explaining the operation and maintenance of the equipment. The tasks of the Japanese technician will be included in the project implementation schedule. In the case of the seed processing facility, it is particularly important that a high work efficiency is achieved through adjustments made by the plant. Therefore, wheat seeds will be provided as raw materials for use during this adjustment period.

#### **2-2-4-2 Implementation Conditions**

- (1) The Syrian side will be responsible for informing the relevant parties about the progress of the construction work on the seed processing and tissue culture facilities, to adequately confirm the entire implementation process from the tendering stage, and to adopt appropriate countermeasures to ensure that project is implemented without interruption.
- (2) The equipment for the plant and the greenhouse are highly heavy items, that will encompass a large base area. Therefore, following the completion of the tendering process, adequate discussions will be carried out between the Syrian side, the Japanese consultant company, and the Japanese trading company to ensure that all construction work is completed before the equipment arrives in Syria.



### 2-2-4-3 Scope of Works

The work pertaining to the project will be apportioned between the Japanese and Syrian sides as shown in the table below.

Table 2-5 Division of the Scope of Works

No.	ITEMS	To be covered by Grant Aid	To be covered by Syria Side
1	To secure land		●
2	To clean level, construction of gate and fence		●
3	To construction of building for Seed Processing Facility and Tissue Culture Laboratory		●
4	To provide utilities (electricity, water supply, etc.) in the site		●
5	To provide furniture in the building		●
6	To supply the project equipment for seed multiplication	●	
7	To bear the following commissions to the Japanese Banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
8	To ensure unloading, customs clearance and inland transportation		
	1) Marine (Air) transportation of the products from Japan to recipient country	●	
	2) Tax exemption and custom clearance of the products at the port of recipient country		●
	3) Internal transportation from the port of disembarkation at the port to the project site	●	
9	To exempt Japanese nationals from custom duties, internal tax and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contracts		●
10	To maintain and use properly and effectively the facilities contracted and equipment provided under the Grant		●
11	To bear all the expenses, other than those to be borne by the Grant, necessary for construction of the facilities as well as for the transportation and installation of the equipment		●

### 2-2-4-4 Consultant Supervision

The basic policy and points that will be considered in managing the implementation of the project is explained below.

The Japanese consultant company will be responsible for closely coordinating the project's implementation with the GOSM, the project implementing agency, to ensure that the new equipment is installed efficiently and without any interruptions. In particular, the construction work on the plant, the greenhouse, and others, that will be carried out by the Syrian side, must be completed before the arrival of the equipment. Therefore, progress on the construction work will be closely monitored by both sides. In addition, the installation of electricity, water, and other utilities is closely related to the installation of the equipment by the Japanese side. Hence, the work period, content, volume, etc. will be thoroughly discussed by all three parties.

#### **2-2-4-5 Quality Control Plan**

The equipment to be procured in this project is manufactured at the plant and distributed on the market, and it is judged to involve no point concerning the qualities of individual products. However, the wheat processing plant needs to be completed as a plant by combining individual processing units (pre-cleaner, indent cylinder, gravity separator, etc.). In the case of the greenhouse for the potato tissue culture facility, too, it is necessary to make full study of its combination with the constituent equipment other than the greenhouse proper (heating system, cooling system, sterilizer, etc.). In regard to the installation of the plant and constituent equipment, therefore, the operations for the next step of work will be carried out upon confirming their performance and capability after the installation, so that the plan will make it possible to confirm the qualities of the plant and greenhouse facilities as a whole.

#### **2-2-4-6 Procurement Plan**

##### **(1) Equipment Procurement**

The equipment will be procured in Japan or a third country and it will not be locally procured in Syria. A supply of spare parts and consumables is important to effectively utilize the equipment that will be provided by the project. Presently, the GOSM purchases parts for equipment from Europe, due to the lack of branch sales offices of major manufacturers in Syria. Hence the purchase of equipment from manufacturers with sales offices in Europe will be reviewed for the project.

##### **(2) Spare Parts and Consumables**

Seed processing equipment is rotating or vibrating mechanical structures and the manufacturers of the bearings, belts, and cylinders used in the equipment guarantee the performance of their products when they are used under proper conditions (for example, the operational time is 200,000 to 300,000 hours for bearings, 2,000 to 3,000 hours for belts, 200,000 to 300,000 hours for cylinders). Therefore, if the equipment is used properly, the replacement of parts and consumables will not be required. However, excessive operational load from stones, metal, and other objects in the seeds due to inadequate adjustments, dropped instruments during inspections, and operational errors are anticipated. Therefore, in order to cope with such accidents and errors, the following spare parts and consumables will be provided by the project. However, spare parts that need to be replaced due to regular use and maintenance will not be provided (pure water switch, filters for the clean bench, the packing for the sterilizer and washer unit, etc.).

#### **2-2-4-7 Implementation Schedule**

The project will be implemented in two phases as a Japanese government grant aid project. Following the signing of the Exchange of Notes between the two governments, a contract will be signed between the Syrian government and a Japanese consultant company. The Japanese consultant company will be responsible for preparing the tender documents and for opening and evaluating the tendering for the procurement and installation of the equipment, following approval of the signed contract by the Japanese government. After the tendering has been completed, the project implementing body on the Syrian side will sign a contract with the Japanese company that will be responsible for procuring and installing the equipment. This entire process is expected to take slightly less than 12 months.

##### **(1) Preparing the Implementation Design**

Based on the basic design report, the consultant company will prepare a detailed design, excluding information on equipment specifications, and will complete the tender documents. The contents of the equipment specification document, that was prepared at the time of the basic design, will be confirmed to ascertain whether the equipment is still produced, whether the social conditions in Syria have changed, as well as other factors; and revisions will be made as needed. This process is anticipated to take about 2.0 months.

##### **(2) Tendering**

Following the completion of the implementation design, the consultant company will review the progress of the construction works undertaken by the Syrian side at the project site. Following this review, the consultant company will post a public announcement in the newspapers inviting relevant companies to participate in the tender to select the company that will be responsible for the procurement and installation of the equipment. A general competitive tender will be conducted in the presence of relevant parties. This entire process will take about 1.5 months.

##### **(3) Equipment Procurement and Installation**

Following the signing of the contract between the Syrian government and the company that will be responsible for procuring and installing the equipment and the approval of the signed contract by the Japanese government, the task of procuring and manufacturing the equipment in accordance with the contract, will begin. Phase 1 is estimated to take about 8.0 months and phase 2 will take about 7.5 months. The implementation schedule of the project is shown in next.

Table 2-6 Implementation Schedule  
Phase I Wheat Seed Processing Plant

Month	1	2	3	4	5	6	7	8	9	10	11	12
Detail Design and Tendering	■ (Site Survey)									[Total 4.5 months]		
	□		(Preparation work of Tender Documents)									
			■ (Approval of Tender Documents)									
			□		■ (Tender Procedure)							

Month	1	2	3	4	5	6	7	8	9	10	11	12
Execution and Procurement	□					(Equipment ordering and Manufacturing)			[Total 8.0 months]			
						■		(Transportation)				
									■ (Installation, Adjustment, Training)			

Phase II Potato Tissue Culture Lab.

Month	1	2	3	4	5	6	7	8	9	10	11	12
Detail Design and Tendering	■ (Site Survey)									[Total 4.5 months]		
	□		(Preparation work of Tender Documents)									
			■ (Approval of Tender Documents)									
			□		■ (Tender Procedure)							

Month	1	2	3	4	5	6	7	8	9	10	11	12
Execution and Procurement	□				(Equipment ordering and Manufacturing)			[Total 10.0 months]				
					■		(Transportation)					
								■ (Installation, Adjustment, Training)				

■ Works in Syria □ Works in Japan

### 2-3 Obligations of Recipient Country

The following tasks will be undertaken by the Syrian side.

#### (1) Construction of the Main and Supplementary Facilities

The project will procure and install the equipment for the seed processing and tissue culture facilities that will be constructed by the Syrian government. Therefore, the Syrian side is responsible for the construction of each main and supplementary facility where the equipment will be installed.

## **(2) Permits and Customs Clearance**

The Syrian side is responsible for paying for the cost of the required permits and to prepare all the documents needed for customs clearance.

## **(3) Tax Exemption Measures**

The Syrian side is responsible for obtaining tax exemptions for the equipment that will be provided by the project.

## **(4) Banking Arrangements in Japan**

The Japanese bank will be promptly decided during the project implementation stage and the Authorization to Pay will be issued.

## **(5) Estimated Project Cost borne by Recipient Country**

### **1) Construction Cost**

Preparing the land for construction: 7,000,000 Syrian pounds (about 16 million yen)

Constructing the seed processing facility: 14,000,000 SP (about 32 million yen)

Constructing the tissue culture facility: 14,000,000 SP (about 32 million yen)

### **2) Banking fees, permit handling fees**

Phase 1: 21,000 SP (about 480,000 yen)

Phase 2: 23,000SP(about 530,000 yen)

### **3) Condition of estimation**

#### **Exchange Rates Used in the Estimates**

The following exchange rates were used in the estimate.

Date of the estimate: September 2000

Exchange Rate: US\$1.00 :107.58 yen

US1.00 : 46 Syrian pounds

1 Syrian pound : 2.32 yen

## **2-4 Project Operation Plan**

### **(1) Operation and Maintenance**

#### **① Wheat seed processing facility**

The current GOSM seed processing facility employs ten staff members. These members were employed at the silos of the Ministry of Supply and Internal Trade and have been working at the seed processing plant for the past three years. One staff member at the existing seed processing

facility will be promoted to be the manager of the new plant. This person will work in a team with a newly recruited manager for the new plant. The two managers will each be assigned a team comprised of a mechanic, an electrician, a measurer, forklift operator, and warehouse manager. The two teams and managers will work in two shifts. Breakdowns and other problems related to plant operations are anticipated to surface during the first season of operations. Therefore, following the end of the season, the manager assigned from the existing seed plant will return to the former plant.

The newly employed mechanic and electrician will be responsible for the mechanical operations of the plant and for inspecting areas requiring a change of parts or repair work. Parts will be purchased by the GOSM main office at the request of the plant manager.

② Tissue culture facility for potato seeds

Presently, the GOSM plans to move the tissue culture lab for raw cotton to the main office and has moved a portion of the equipment to the first floor. The seed health section for seed tests has been located on the second floor. In addition to potato seeds, the tissue culture laboratory also cultures a limited amount of bananas and dates. As the current production system is based on the tissue culture of potato seeds, only the potato culture activities will be transferred to the new tissue culture facilities that will be provided by the project. All the other culture activities will be transferred to the first floor of the main GOSM building. The current chief of the tissue culture division will head the management system of the new facility, in view of his outstanding technical expertise and knowledge of tissue culture. The managers of the laboratory, greenhouse, growth room, etc. will be responsible for the maintenance and operations of the equipment in their respective sections.

(2) Operation and Maintenance Costs

The maintenance costs of the new equipment are estimated as follows.

Table 2-7 Cost Estimation for Operation and Maintenance

Facility	Electricity	Water	LPG	Fuel	Consumer	Staff	Parttime Worker	Total (SP)	Total (JY)
Seed Processing Plant	224,000	0	0	0	1,147,200	1,628,400	270,000	3,269,600	7,520,080
Tissue Culture Lab	323,000	416,000	5,000	1,540,000	1,018,200	0	270,000	3,572,200	8,216,060
Grand Total								6,841,800	15,736,140

The annual maintenance costs for the laboratory is estimated at 6.3 million Syrian pounds (about 14.5 million yen) as shown in the table above. This is approximately 0.16 percent of the total

GOSM budget (about 4 billion Syrian pounds in FY1999). However, nearly 80 percent of the GOSM budget is used to purchase seeds and if the purchasing cost for seeds is excluded from the FY1999 budget (about 890 million Syrian pounds), the maintenance cost is about 0.7 percent of the budget. Moreover, if it is compared with the maintenance costs of the overall GOSM budget that is about 3.5 to 4.0 percent (about 167 million Syrian pounds, FY 1999), it is about 3.7 percent. Therefore, the maintenance costs that are incurred from this project are minimal and can be adjusted within the GOSM budget.

When the project is implemented, the cultivation area required by contracted farms for increased wheat and potato seed production is shown in the table below.

① Wheat seed processing Facility

The GOSM will secure the following additional field area, from nucleus to Certified Seed II, for sufficient operation.

Table 2-8 Additional Planting Area for Seed Production

Year	Multiplication	Additional Field Area (ha)
1 <sup>st</sup> year	Nucleus	3
2 <sup>nd</sup> year	Basic Seed	48
3 <sup>rd</sup> year	Registered Seed	665
4 <sup>th</sup> year	Certified Seed I	9,281
5 <sup>th</sup> year	Certified Seed II	129,471

② Tissue culture facility for potato seeds

Following the implementation of the project, it will take five years from the time the tissue culture process commences, for the seeds cultivated by the contracted farms to be shipped. The seeds that will be produced during this period are the basic, elite, and class A potato seeds. They will be propagated in net houses and by contracted farms. Therefore, cultivation land area must be secured. The area of land needed for cultivation is shown in the table below.

Table 2-9 Necessary Area for Potato Seed Production

Year	Basic Seed (Net House) ha	Field Area for Elite (ha)	Field Area for Class A (ha)
1 <sup>st</sup> year	—	—	—
2 <sup>nd</sup> year	25	—	—
3 <sup>rd</sup> year	25	126	—
4 <sup>th</sup> year	25	126	624
5 <sup>th</sup> year	25	126	624
6 <sup>th</sup> year	25	126	624

As mentioned in the above, it will take five years before class A potato seeds can be distributed to regular farms. During this period, potato seeds must be imported and the operation and maintenance costs of the greenhouse and tissue culture laboratory will continue to be incurred. However, if the investment during this initial period is not made, it will take seven years before class A potato seeds can be shipped. Therefore, a permanent budget must be procured. The GOSM budget will require the most funding during the fourth year—an increase of about 1.5 percent of the entire budget. Hence measures must be taken to secure a budget prior to this time. The revenues and expenditures of the project after its implementation are shown in the table below.

Table 2-10 Revenues and Expenditures of Tissue Culture Facility for Potato

Unit: 1000 Syrian Pounds

F.Y. Year	1st year 2002	2nd year 2003	3rd year 2004	4th year 2005	5th year 2006	6th year 2007	7th year 2008	8th year 2009	9th year 2010
<b>Revenues</b>									
Basic Seed (The Project)	0	0	0	14,940	14,940	14,940	14,940	14,940	14,940
Elite Seed Sales	Imported	210,000	210,000	210,000	210,000	135,300	135,300	135,300	135,300
	The Project					74,700	74,700	74,700	74,700
Class A Seed Sales	Imported	504,000	504,000	504,000	504,000	504,000	414,360	414,360	414,360
	The Project			0	0	0	149,400	149,400	149,400
<b>Total</b>	<b>714,000</b>	<b>714,000</b>	<b>714,000</b>	<b>728,940</b>	<b>728,940</b>	<b>788,700</b>	<b>788,700</b>	<b>788,700</b>	<b>788,700</b>
<b>Accumulated Total</b>	<b>714,000</b>	<b>1,428,000</b>	<b>2,142,000</b>	<b>2,870,940</b>	<b>3,599,880</b>	<b>4,388,580</b>	<b>5,177,280</b>	<b>5,965,980</b>	<b>6,754,680</b>
<b>Expenditures</b>									
	2,136	3,329	3,329	3,329	3,330	3,332	3,333	3,844	4,151
Cost for Cold Storage	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000
Elite Seed Purchase	Imported	210,000	210,000	210,000	210,000	135,300	135,300	135,300	135,300
	The Project	0	0	0	62,250	62,250	62,250	62,250	62,250
Class A Seed Purchase	Imported	462,000	462,000	462,000	462,000	379,830	379,830	379,830	379,830
	The Project					82,170	82,170	82,170	82,170
<b>Total</b>	<b>716,136</b>	<b>717,329</b>	<b>717,329</b>	<b>779,579</b>	<b>704,880</b>	<b>704,882</b>	<b>704,883</b>	<b>705,394</b>	<b>705,701</b>
<b>Accumulated Total</b>	<b>716,136</b>	<b>1,433,465</b>	<b>2,150,794</b>	<b>2,930,373</b>	<b>3,635,254</b>	<b>4,340,135</b>	<b>5,045,019</b>	<b>5,750,413</b>	<b>6,456,113</b>
<b>Grand Total</b>	<b>-2,136</b>	<b>-5,465</b>	<b>-8,794</b>	<b>-59,433</b>	<b>-35,374</b>	<b>48,445</b>	<b>132,261</b>	<b>215,567</b>	<b>298,567</b>

Remarks: ① Sales price for Elite 30SP/kg      ⑤ Sales price for Basic 30 SP/kg  
 ② Sales price for Class A 12SP/kg      ⑥ Cost for Cold Storage 6 SP/kg  
 ③ Purchase price for Elite 30SP/kg      ⑦ Purchase amount is 60% of total product  
 ④ Purchase price for Class A 11SP/kg      ⑧ In the expenditure, cost of construction by Syrian side and equipment supply are not considered



The wheat processing plant estimate revenues and expenditure as follows, it will be taken good operation implementation.

Table 2-11 Revenues and Expenditures of Seed Processing Facility for Wheat

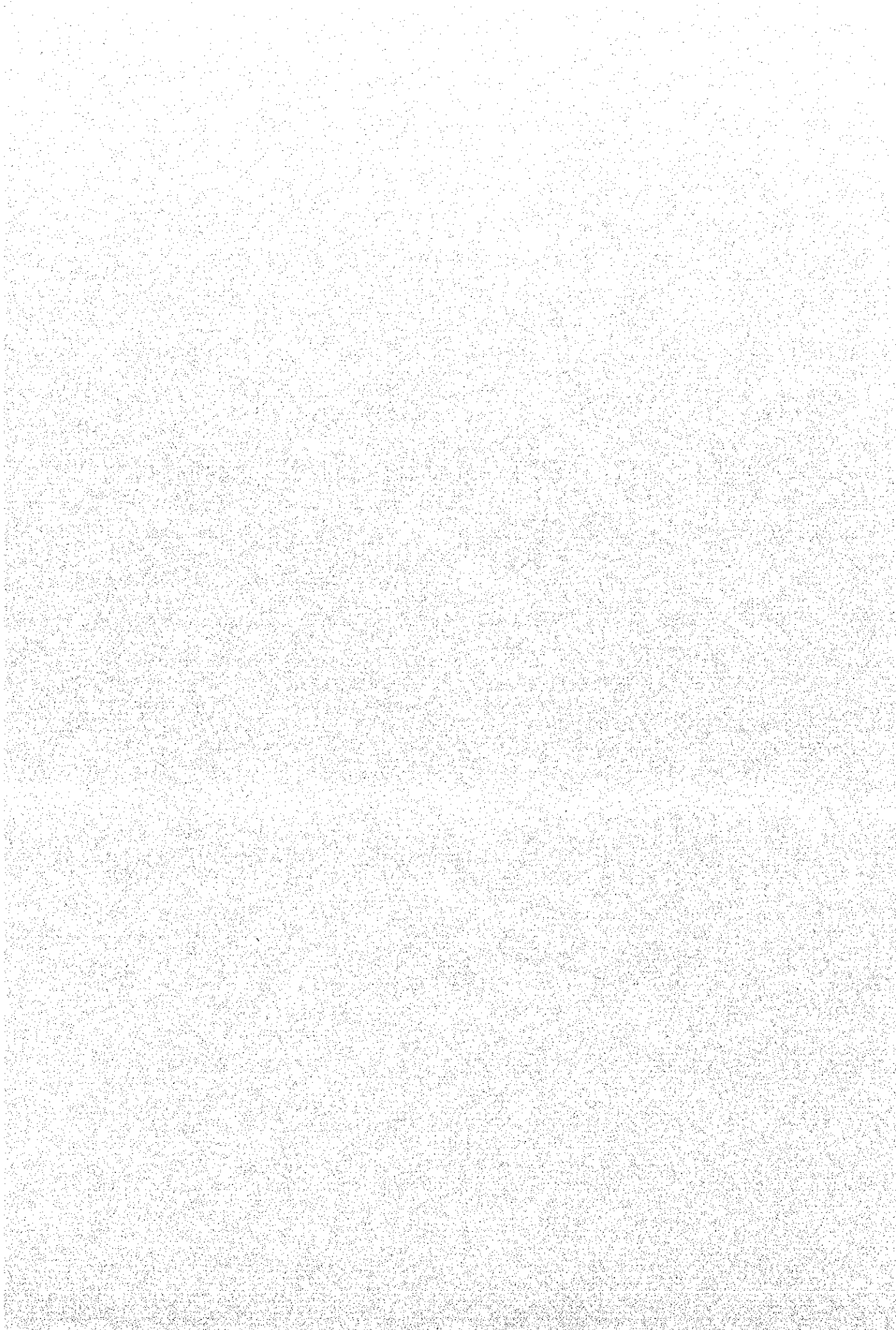
Unit: 1000xSyrian Poud

F. Y.	1st year	2nd year	3rd year	4th year	5th year
<b>Revenues</b>					
Seed Sales	806,008	806,008	806,008	806,008	806,008
Rejected Seed Sales	20,529	20,529	20,529	20,529	20,529
Used Seed Bag Sales	4,412	4,412	4,412	4,412	4,412
Total	830,950	830,950	830,950	830,950	830,950
Accumulated Total	830,950	1,661,899	2,492,849	3,323,798	4,154,748
<b>Expenditures</b>					
Seed Purchase	754,384	754,384	754,384	754,384	754,384
Seed Bag Purchase	22,984	22,984	22,984	22,984	22,984
Handling Charge for Sibs	19,539	19,539	19,539	19,539	19,539
Operation and Maintenance Costs	3,269	3,269	3,432	3,604	3,784
Total	800,175	800,175	800,338	800,510	800,690
Accumulated Total	800,175	1,600,350	2,400,688	3,201,198	4,001,888
Gran	30,775	61,549	92,161	122,600	152,860

Remarks	① Unit price for seed	15.50 SP/Kg	② Purchase price for certified seed II	13.45 SP/Kg
	② Unit price for rejected seed	6.00 SP/Kg (Grade I) 2.50 SP/Kg (Grade II)	③ Purchase price for seed bag	35.00 SP/Bag
	③ Sales price for used seed bag	8.50 SP/Bag	④ Purchase price for production bag	8.00 SP/Bag
	④ Purchase price for basic seed	14.70 SP/Kg	⑤ Handling charge for sibs	1,000 SP/ton
	⑤ Purchase price for registered	14.50 SP/Kg	⑥ Product yield	93%
	⑥ Purchase price for certified seed	14.00 SP/Kg	⑦ In the expenditure, cost of construction by Syrian side and equipment supply are not considered	



## Chapter 3 Project Evaluation and Recommendations



## Chapter 3 Project Evaluation and Recommendation

### 3-1 Project Effect

The indirect and direct benefits that are anticipated with the implementation of the project are summarized below.

#### (1) Direct benefits

##### ① Improved supply ratio of wheat seeds

The supply ratio of wheat seeds in the areas targeted by the project (presently 40 percent) will reach the national average level of about 57 percent.

##### ② Improved wheat seed quality

The quality of wheat seeds will increase since the mixture of different varieties or immature seeds, crushed seeds, and others will be eliminated.

##### ③ Domestic production of potato due a supply of basic potato seeds

A stable supply of potato seeds will be achieved due an increased domestic production volume of potato seeds, which is anticipated to reach 2,490 tons or about 35 percent of the current volume of 7,000 tons of imported potato seeds.

#### (2) Indirect benefits

##### ① Increased production of wheat and potatoes

An increased production volume of potatoes and wheat is anticipated due to the distribution of cleaned wheat seeds and virus-free potato seeds to the farmers.

##### ② Impact of the model facility on other seed processing facilities

The project will serve as a model for seed production in Syria with the introduction of new propagation methods and facilities; and its positive impact on other seed processing facilities is anticipated.

##### ③ Improved living standards of farmers

The supply of superior seeds is expected to produce a stable yield and a higher income, that is expected to improve the living standards of farmers.

④ Contribute to balance of international payments

Due to the domestic production of seeds, the volume of imported seeds will decline, which in turn, will contribute to the balance of international payments.

The implementation of the project will enable wheat to be supplied to about 335,000 people in Aleppo district and potato seeds to be distributed to about 37,000 farmers nationwide. Therefore, in view of the management and operation capabilities of the project implementing agency, the number of beneficiaries, and subsequent improvements in the living standards of the farmers which the project is anticipated to produce, it has been concluded that the project will be implemented as a Japanese government grant-aid project.

The effects of the project and the extent to which the present situation will be improved are shown in the following table:

Table 2-1 The effects of the project and improvement expected

Present situation and problems	Counter-measures for the project (The project)	Effects of the project and improvement expected
1. The seeds that are regarded as necessary to produce wheat, which is the principal food for the people, are not supplied sufficiently, so the volume of production is not sufficient.	Consolidation of the equipment for wheat seed processing facility.  Consolidation of the equipment for quality control.	The volume of seeds in the area covered by the project will increase, and the seed supply ratio (about 40%) will rise to the national level (about 57%).  The substantial improvement of the quality control equipment will promote the rise in the germination ratio, the seed-mixing ratio will fall. Thus a higher seed quality will be secured.
1. Potato seeds, which are dependent on imports from abroad, are swayed by the crops in foreign countries.	The equipment related to potato tissue culture will be put in perfect working order, and the equipment related to greenhouses will also be put in the same condition.	It will become possible for some of the potato seeds (2,490 tons: 35%) to be produced domestically, making stable supply possible.

### 3-2 Recommendations

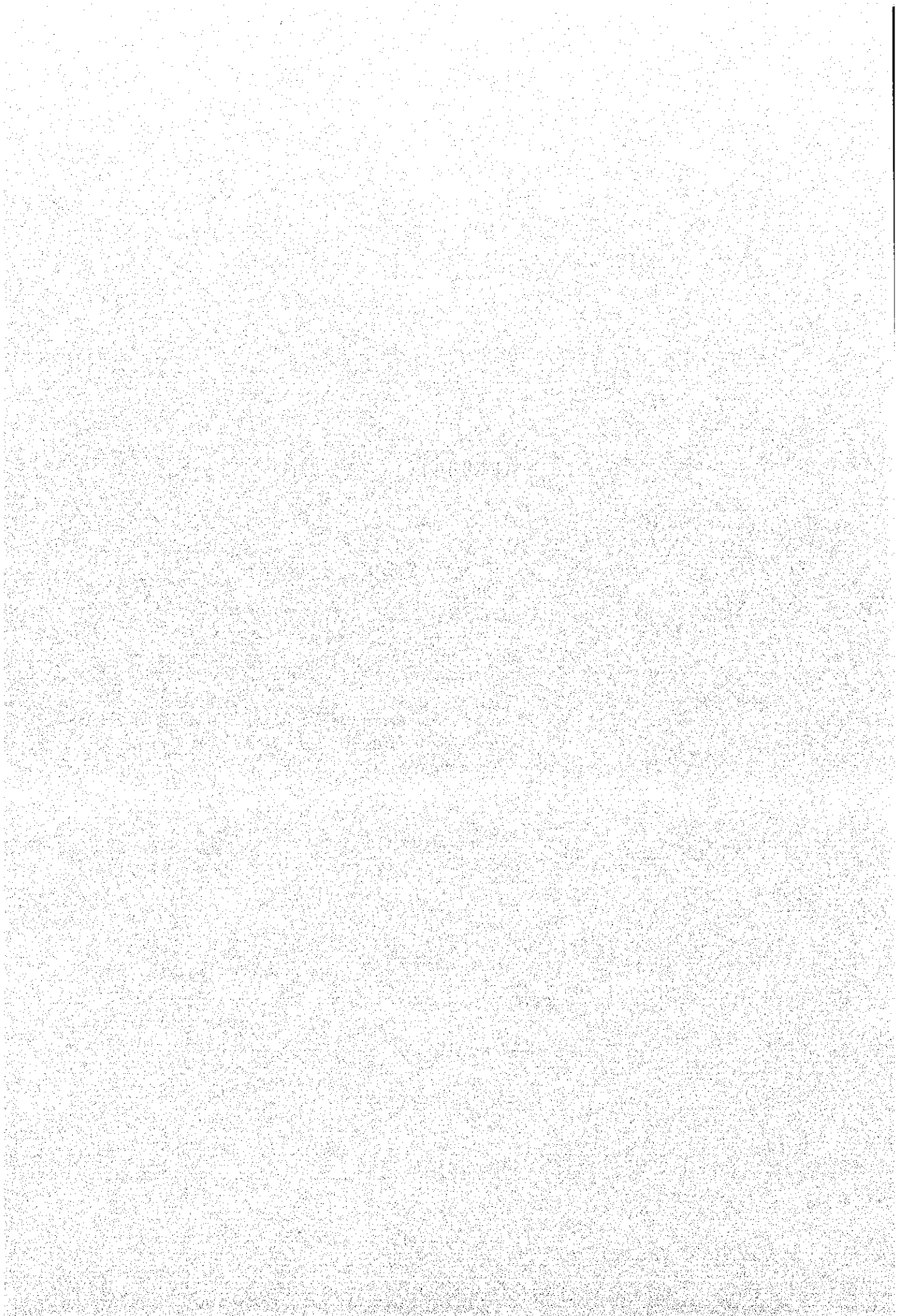
When the project is implemented, the Syrian government must carry out the following countermeasures in order to effectively operate the equipment that will be provided by the project.

- ① The facilities and equipment that will be provided by the project will increase the volume of seeds that are processed and distributed to farmers. Therefore, a larger number of contract farmers should be procured to cope with the increased volume of seeds that will be produced.
  
- ② The wheat seed processing plant will produce seeds that will be distributed to farmers within its first year of operations. However, the tissue culture related facility for potato seeds will not be able to produce basic potato seeds for distribution for five years due to the propagation process. Therefore, this initial five-year period should be viewed as a long-term investment period and a planned budget must be procured.
  
- ③ Wheat seeds are generally stored in the open field and a large volume of seeds are lost due to damages incurred by rats and birds. Therefore, in order to prevent such losses, a storage facility for seeds must be built.





## Appendices



## Appendix-1 Member List of the Survey Team

### 1.1 Basic Design Study

Title	Name	Institution
(1) Team Leader	Mr. Akira SHIMIZU	Fourth Project Management Division, Grant Aid Management Department, JICA
(2) Technical Advisor	Mr. Katsuhiko KAMIKITA	Foreign Production Section, Crop Production Division, Agricultural Production Bureau, Ministry of Agriculture, Fisheries and Forestry
(3) Project Manager / Seed Processing and Distribution	Mr. Toshiharu HATA	System Science Consultants Inc.
(4) Equipment Planning I (Seed Processing Plant)	Mr. Toshio WATANABE	System Science Consultants Inc.
(5) Equipment Planning II (Tissue Culture)	Mr. Takayoshi ITOIGAWA	System Science Consultants Inc.
(6) Facility / Equipment Procurement Planning / Cost Estimation	Mr. Akihiro HAYAHARA	System Science Consultants Inc.

### 1.2 Explanation of Draft Final Report

Title	Name	Institution
(1) Team Leader	Mr. Akira SHIMIZU	Fourth Project Management Division, Grant Aid Management Department, JICA
(2) Technical Advisor	Mr. Yoshinori MIURA	Production Control, Seed Management Center in Tumagoi Farm, Ministry of Agriculture, Fisheries and Forestry
(3) Project Manager / Seed Processing and Distribution	Mr. Toshiharu HATA	System Science Consultants Inc.
(4) Equipment Planning I (Seed Processing Plant)	Mr. Toshio WATANABE	System Science Consultants Inc.
(5) Equipment Planning II (Tissue Culture)	Mr. Takayoshi ITOIGAWA	System Science Consultants Inc.
(6) Facility / Equipment Procurement Planning / Cost Estimation	Mr. Akihiro HAYAHARA	System Science Consultants Inc.

## **Appendix-2 Study Schedule**

### **2.1 Basic Design Study**

No. of Days	Date	Official Members	Consultant Member				
			Project Manager/ Seed Production and Distribution	Equipment Planner I Seed Multiplication	Equipment Planner II Tissue Culture	Facilities/Equipment Procurement Planner	
1	14-Jul	Fri	Narita → Paris	—	—	—	—
2	15-Jul	Sat	Paris → Damascus	—	—	—	—
3	16-Jul	Sun	Courtesy Call to Embassy of Japan(EOJ) and JICA Office Courtesy Call to State Planning Commission(SPC) and Ministry of Agriculture and Agrarian Reforms(MOAAAR) Damascus → Aleppo	—	—	—	—
4	17-Jul	Mon	Discussion with GOSM on Contents of the Inception Report Site Survey (GOSM Head Quarters, Project Site, etc.)	—	—	—	—
5	18-Jul	Tue	Discussion with GOSM Site Survey (Existing Seed Processing Plants in Aleppo, which are possessed by GOSM and Ministry of Supply and Internal Trade)	—	Discussion with GOSM (Existing situation)	—	Discussion with GOSM (Construction Plan)
6	19-Jul	Wed	Discussion with GOSM (Framework of the Framework of the Basic Design Study (B/D), Requested Items, etc.)	—	Discussion with GOSM (Equipment Plan)	—	Discussion with GOSM (Procurement method)
7	20-Jul	Thu	Discussion with GOSM (Framework of B/D and Contents of the Minutes of Discussion : M/D)	—	Discussion with GOSM (Justification for equipment requested)	—	Discussion with GOSM (Demarcation of construction)
8	21-Jul	Fri	Internal Meeting	—	—	—	—
9	22-Jul	Sat	Discussion with GOSM (Contents of M/D) Signing of M/D	—	—	—	—
10	23-Jul	Sun	Aleppo → Damascus	—	Survey for Existing Facilities	—	Aleppo → Damascus
11	24-Jul	Mon	Report to EOJ, JICA Office, SPC, MOAAAR	—	Discussion with GOSM (Technical Level)	—	Inquiry of Equipment Agents
12	25-Jul	Tue	Damascus → London London →	Discussion with MOAAAR (National Plan, Action Plan of Other Donors)	Discussion with GOSM (Operation and Maintenance, Organisations)	Discussion with GOSM (Operation and Maintenance, Organisations)	"
13	26-Jul	Wed	Arrival at Narita	Discussion with SPC (National Plan, Other Donors) Discussion with Department of Agricultural Science and Research (DASR) (National Plan, Other Donors)	Discussion with GOSM (Contents of Plan)	Discussion with GOSM (Contents of Plan)	Inquiry of Construction Material Agents Inquiry of Construction Company
14	27-Jul	Thu		Discussion with Agriculture Co-operation Bank Discussion with Other Donors (ICARDA, ACSAD)	"	"	"
15	28-Jul	Fri		Damascus → Aleppo	Documentation and Meeting	Documentation and Meeting	Damascus → Aleppo
16	29-Jul	Sat		Discussion with GOSM (Contents of Plan)	Discussion with GOSM (Contents of Equipment)	Discussion with GOSM (Contents of Equipment)	Site Survey
17	30-Jul	Sun		"	"	"	Survey for Existing Facilities (Facilities for Quality Control, etc)
18	31-Jul	Mon		Discussion with MOAAAR Aleppo Branch Office (Overall of Agriculture Sector) Discussion with ICARDA (Seed Processing, Seed Production)	"	"	Discussion with GOSM (Construction Work and Plan by Syrian Side)
19	1-Aug	Tue		Discussion with GOSM (Back Ground, National Plan, Organisation, Budget)	"	"	Survey for Infrastructure
20	2-Aug	Wed		Discussion with GOSM (Seed Multiplication Plan, Marketing Plan, Distribution Plan)	"	"	Survey for Equipment Agents
21	3-Aug	Thu		Discussion for GOSM (Operation Plan and Recipient's Works)	"	"	Survey for Equipment and Material Agents
22	4-Aug	Fri		Internal Meeting and Documentation	—	—	—
23	5-Aug	Sat		Discussion with GOSM (Activities and Plan)	Discussion with GOSM (Specification)	—	Survey with Construction Company Inquiry for Transportation and Trading Company
24	6-Aug	Sun		Discussion with GOSM (Operation and Maintenance, Financing)	"	"	Discussion with GOSM (procurement Plan)
25	7-Aug	Mon		Discussion with GOSM (Other Donors Plan)	"	"	Discussion with GOSM (Contents of Recipient Works)
26	8-Aug	Tue		Survey for Similar Facility (Seed Multiplication)	"	"	Discussion with GOSM (Implementation Schedule)
27	9-Aug	Wed		Discussion with GOSM (Plan for Equipment Supply)	Discussion with GOSM (Maintenance Cost and Staff Plan)	—	Aleppo → Damascus
28	10-Aug	Thu		"	"	"	Data Collection from Equipment and Materials Agents
29	11-Aug	Fri		Internal Meeting and Documentation	—	—	Documentation
30	12-Aug	Sat		Discussion with GOSM (Contents of Equipment)	Discussion with GOSM (Equipment Plan)	Discussion with GOSM (Equipment Plan)	Data Collection from Construction Company and Transportation/Trading Company
31	13-Aug	Sun		Discussion with GOSM (Implementation Plan and Recipient Works)	"	"	Inquiry for Construction Matters (Regulation and Law)
32	14-Aug	Mon		Final Meeting with GOSM Aleppo → Damascus	—	—	Data Collection from Equipment, Material, Construction and Transportation/Trading Company
33	15-Aug	Tue		Report to MOAAAR and SPC Report to EOJ and JICA Office	—	—	—
34	16-Aug	Wed		Damascus → Paris →	—	—	—
35	17-Aug	Thu		Arrival at Narita	—	—	—

## **2.2 Explanation of Draft Final Report**

No. of Days	Date		Official Members	Consultant Member			
				Project Manager/ Seed Production and Distribution	Equipment Planner I Seed Multiplication	Equipment Planner II Tissue Culture	Facilities/Equipment Procurement Planner
1	7-Oct	Sat	Narita → Vienna	—	—	—	—
2	8-Oct	Sun	Vienna → Damascus Courtesy Call to Embassy of Japan(EOJ) and JICA Office	—	—	—	—
3	9-Oct	Mon	Courtesy Call to State Planning Commission(SPC) and Ministry of Agriculture and Agrarian Reform(MOAAAR) Damascus → Aleppo	—	—	—	—
4	10-Oct	Tue	Discussion with GOSM, Contents of DF Report	—	Discussion with GOSM (Contents of Equipment)	—	—
5	11-Oct	Wed	Discussion with GOSM, Contents of DF Report	—	"	—	—
6	12-Oct	Thu	Discussion with GOSM, Contents of the Project Plan and Minutes of Discussion	—	—	—	—
7	13-Oct	Fri	Internal Meeting	—	—	—	—
8	14-Oct	Sat	Discussion for Minutes of Meeting	—	—	—	—
9	15-Oct	Sun	Signing of M/D Aleppo → Damascus	—	Discussion with GOSM (Contents of Equipment)	—	Discussion with GOSM (Contents of Facility and Layout Plan)
10	16-Oct	Mon	Report to EOJ, JICA Office, SPC, MOAAAR	Report to EOJ, JICA Office, SPC, MOAAAR Damascus → Aleppo	"	—	"
11	17-Oct	Tue	Damascus → London →	Discussion with GOSM (Confirmation of Project)	Discussion with GOSM (Contents of Specifications)	Discussion with GOSM (Contents of Specifications)	"
12	18-Oct	Wed	Arrival at Narita	Discussion with GOSM Dconfirmation for Plan and Equipment	"	"	Discussion with GOSM (Procurement for Product)
13	19-Oct	Thu	/	Discussion with GOSM Dconfirmation for Plan and Equipment	"	"	Discussion with GOSM (Contents of Obligation by Syrian side)
14	20-Oct	Fri		Internal Meeting	—	—	"
15	21-Oct	Sat		Discussion with GOSM Dconfirmation for Plan and Equipment	Discussion with GOSM (Contents of Specifications)	Discussion with GOSM (Contents of Specifications)	Survey for Equipment and Construction Agent
16	22-Oct	Sun		Discussion with GOSM Dconfirmation for Plan and Equipment	"	"	"
17	23-Oct	Mon		Lap Up Meeting with GOSM Aleppo → Damascus	—	—	—
18	24-Oct	Tue		Report to MOAAAR, SPC, EOJ, JICA	—	—	—
19	25-Oct	Wed		Damascus → Paris →	—	—	—
20	26-Oct	Thu		Arrival at Narita	—	—	—

### Appendix-3 List of Parties Concerned in the Recipient Country

**(1) Ministry of Agriculture and Agrarian Reform**

Mr. Orffan ALLOUSH	Deputy Minister
Mr. Sulaiman KARBOOJ	Deputy Director Directorate of Internal Relations
Ms. Yusra ISSAQ	Directorate of Internal Relations
Mr. MHD. Zein EL.DEEN	Director of the Economical Sector

**(2) State Planning Commission**

Dr. Salim KABOUL	Adviser for the Minister on Agriculture Director
Mr. Hassan AL SALMAN	Director of Technical and Science Cooperation

**(3) General Organization of Seed Multiplication**

Dr. Ali Nasr DIBEH	General Director
Mr. Abdul Wahab MADARATI	Deputy General Director Cereals & Legumes Director
Mr. Ammar RAHMANI	Foreign Trade Director
Mr. Kazim ALDANDAL	Marketing Director
Mr. M. AL ALLOUSH	Statistics & Planning Director
Dr. Abbas ABBAS	Purity & Quality Director
Mr. Hassan BASMAGI	Chief of Potato Cooling Unit, Aleppo Branch
Mr. Hussain HAGI ABDO	Chief of Marketing Dept., Aleppo Branch
Mr. Gehad AL ABDALLAH	Production & Design Engineer Head of Garage Dept.
Ms. Marinet AKSH	Chief of Germination Lab.
Dr. Jamal Eddin RADWAN	P.T.C. Director
Dr. Omar HELALI	P.T.C. Lab
Ms. May HADDAD	Civil Engineer
Mr. Abd Alkader ASHKAR	Civil Engineer
Mr. Abdul Rahman KALACH	Agriculture Engineer Wheat Section

**(4) General Company for Engineering & Consulting : G.C.E.C**

Mr. Habib CHOUKRI	Aleppo Branch Director
Mr. Hikmat E. Zerbe	Head of Structural Eng. Section
Mr. Assadouz Saz Kissian	Deputy Manager of Constructors Sections
Mr. Mohamad Jamal MADDAFF	Head of Elec. Eng. Section
Mr. Peter MADYAWA	Head of Mech. Eng. Section

**(5) Department of Agriculture Science and Research**

Mr. Hassan AL SALMAN	Director of Technical and Science Cooperation
Mr. Waleed TAUUEEL	Director of Agriculture Research
Mr. Ali SHE HADEH	Head of Crop Research Dep.

**(6) Embassy of Japan**

Mr. Kishichiro AMAE	Ambassador
Mr. Seizo MATSURA	Second Secretary



**(7) JICA Syria Office**  
Mr. Katsuhiko OZAWA  
Mr. Miyoshi YASUDA

Resident Representative  
Officer

**(8) JICA Expert**  
Mr. Akira Matsukawa

Agricultural Statistics, Ministry of Agriculture and  
Agrarian Reform

## **Appendix-4 Minutes of Discussions**

### **4.1 Basic Design Study**

**Minutes of Discussions**  
**on**  
**the Basic Design Study on the Project**  
**for**  
**Improvement of Seed Multiplication Capacity**  
**in**  
**the Syrian Arab Republic**

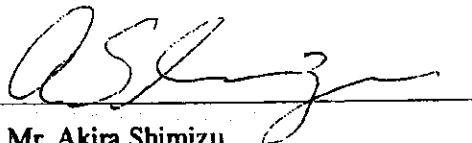
Based on the results of the Preparatory Study conducted from February 19 to March 7 2000, the Government of Japan decided to conduct a Basic Design Study on the Project for Improvement of Seed Multiplication Capacity (hereinafter referred to as "the Project"), and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to the Syrian Arab Republic (hereinafter referred to as "Syria") a Basic Design Study Team (hereinafter referred to as "the Team"), which is headed by Mr. Akira Shimizu, Fourth Project Management Division, Grant Aid Management Department, JICA, and is scheduled to stay in the country from July 15 to August 16, 2000.

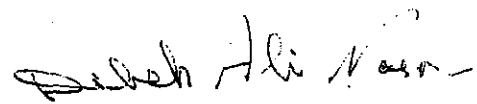
The Team held discussions with the officials concerned of the Government of Syria and conducted field surveys at the study area.

In the course of the discussions and field surveys, both parties have confirmed the main items described on the attached sheets. In accordance with the matters confirmed, the Team will proceed to further work and prepare the Basic Design Study Report.

Aleppo, July 22, 2000



**Mr. Akira Shimizu**  
**Leader,**  
**Basic Design Study Team**  
**JICA**



**Dr. Ali Nasr Dibeh**  
**General Director,**  
**General Organization for Seed**  
**Multiplication**

Attachment

1. Objective

The objective of the Project is to improve the seed production capacity for distribution of Wheat seeds to Aleppo and Idlib districts / Governorates and for distribution of Potato seeds to whole country, which leads to the improvement of the production of above crops by establishing a new seed multiplication center, mainly consisting of seed processing, tissue culture and quality control facility.

2. Project Site

The Project site is located at Belleramoun, in the suburb of the city of Aleppo (See Annex-I).

3. Responsible and Implementing Agency

The responsible and implementing agency is General Organization for Seed Multiplication (GOSM).

4. Items requested by the Government of Syria

Through the discussions between the Syrian Side and the Team, the items requested by the Syrian Side were confirmed as described in Annex-II. JICA will assess the appropriateness of the contents of the request, and will recommend it to the Government of Japan for approval.

5. Japan's Grant Aid Scheme

5-1. The Syrian Side has understood the Japan's Grant Aid Scheme explained by the Team as described in Annex-III.

5-2. The Syrian Side will take the necessary measures described in Annex-IV for the smooth implementation of the Project as a condition for the Japanese Grant Aid to be implemented.

6. Schedule of the Study

6-1. The consultants will proceed to further studies in Syria until August 16, 2000.

6-2. JICA will prepare the draft report of Basic Design Study in English and dispatch a mission in order to explain its contents around early October 2000.

6-3. In case that the contents of the draft report is accepted in principle by the Government of Syria, JICA will complete the final report and send it to the Government of Syria by January 2001.

## 7. Other Relevant Issues

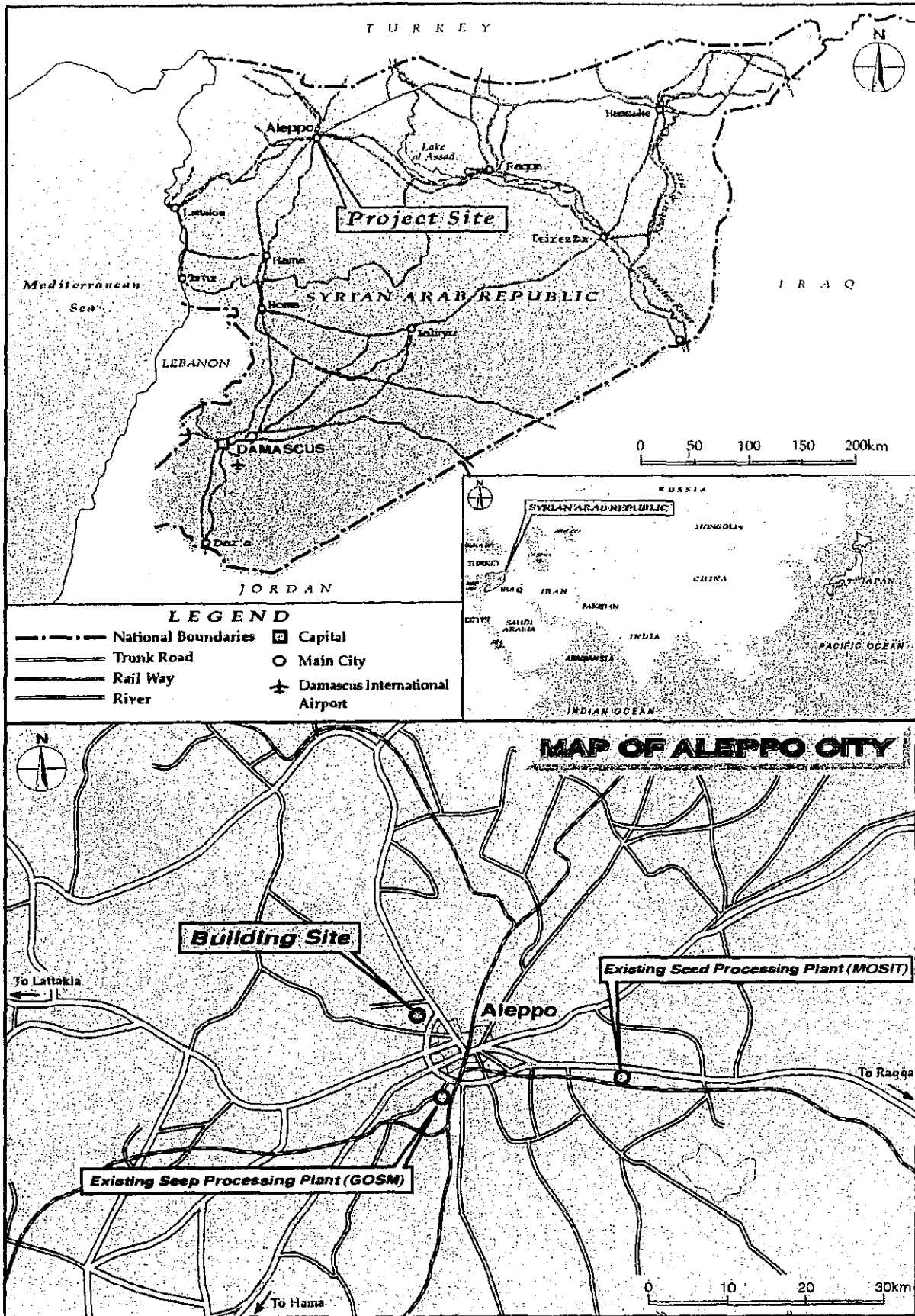
- (1) Among the main components of the Project, both sides agreed that at least the following issues should be borne by the Syrian side. Additional undertakings by the Syrian side may be required in the process of further study.
  - 1) Construction of following building facilities, which include necessary infrastructures such as electric, gas, water supplies, sewage telephone lines and furniture such as office desks,
    - i. Administration office
    - ii. Seed processing building for Wheat (equipped with quality control room)
    - iii. Tissue culture laboratory building for Potato (equipped with quality control room)
    - iv. Seed storage yard
    - v. Other building facilities needed for equipment installation, if necessary (shades for truck scale, room for stand-by generator, etc.)
  - 2) Foundation work for assembling, as well as assembling green house,
  - 3) Procurement and assembling of net houses,
  - 4) Recruitment of necessary personnel and securing the adequate budget for proper management and operation of the new seed multiplication center,
  - 5) And securing adequate number of contract farmers for seed multiplication for Wheat and Potato.
- (2) On assumption that the Project would be implemented in two phases, both sides agreed that the first phase would be seed processing facility and the second phase would be tissue culture laboratory facility.
  - 1) On this understanding, the Syrian side expressed that they shall complete the construction of the relevant buildings by the following dates.
    - a) Building for seed processing plant and seed storage yard : by October 2001
    - b) Administration office, tissue culture laboratory building for Potato and foundation work for assembling green house : by October 2002
  - 2) For preparing the above-mentioned construction works, the Syrian side confirmed that they prepare the construction schedule by September 2000 and send it to JICA Syria Office.
  - 3) The Syrian side also confirmed that they shall complete budget allocation for the construction works by October 2000.

*Abdel A. M.*

- 4) The Syrian side assured that they start land clearance and leveling on the Project site at the earliest time, and they expressed their intention to start construction works on the Project site by early October 2000.

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Location Map of the Project Site

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List of Request for Japan's Grant Aid

**1. Seed processing plant for wheat**

(1) Receiving facilities

Truck scale  
Receiving hopper  
Pre-cleaner  
Receiving bin

(2) Cleaning facilities

De-awner  
Cleaner  
Indented cylinder separator  
Gravity separator  
Storage bin  
Seed treater

(3) Bagging facilities

Auto weigher  
Bag sewing machine

(4) Other equipment

Conveying equipment (Bucket elevators, Belt conveyors, Screw conveyors, etc.)  
Piping materials (Shoot pipe, Air duct, etc.)  
Buffer tank  
Dust collecting equipment  
Rejects collecting equipment  
Sampling devices  
Electric control panel  
Electric cable  
Fork lift  
Others (Air compressor, Vacuum cleaner, Change valves, Structural supports, etc.)

**2. Quality control equipment for wheat**

(1) Laboratory size seed processing machines

Air-screen cleaner  
Gravity separator  
Indented cylinder separator  
Auto weigher

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*[Signature]*



(2) Testing equipment

Seed sample divider  
Microscope  
Moisture tester  
Seed counter  
Analytical balance  
Illuminated magnifier  
Seed sample pans  
Grain dockage sieves  
Sieve shakers  
Grain shape tester  
Bag scaler  
Seed sample refrigerator  
Seed germinator

**3. Tissue culture equipment for potato**

(1) Preparation equipment

Pure water system  
Autoclave  
Dry heat sterilizer (oven)  
Large refrigerator with freezer  
Small refrigerator with freezer  
Electrical Balance  
Analytical Balance  
pH meter  
EC meter  
Dispenser  
Electron dispenser  
Automatic pipette  
Magnetic stirrer  
Microwave oven

(2) Cultivating equipment

Illuminated incubator  
Incubation growth room system (Chiller cooling unit, Air treatment unit, Air distribution duct,  
Growth shelf with lamps, control unit, etc.)  
Laminar air flow (Clean bench)  
Air cleaning system for clean bench room  
Stereoscopic microscope  
Universal microscope  
Hygrothermograph  
Hygrothermometer  
Rotary shaker  
Lux meter  
Air quality tester

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(3) Glassware

Test tube  
Graduated cylinder  
Beaker  
Volumetric flask  
Conical flask  
Pipette  
Petri dish  
Jar with lid

(4) Implement tools

Tweezers  
Scissors  
Scalpel blade with handle  
Test tube rack  
Electric sterilizer

(5) Washing apparatus

Ultrasonic Pipette washer  
Automatic glassware washer  
Hot air dryer for glassware

(6) High quality environmental controlled green house

Glass type, Temperature control unit, humidity control unit, co<sup>2</sup> gas delivery unit, Shading and ventilation controller, Drip irrigation system, Equipment for soil preparation and treatment, etc.

(7) Quality control equipment

ELIZA reader set  
Microscope with photo system  
Illuminated incubator for testing purpose

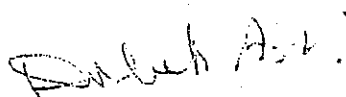
(8) Others Equipment

Laboratory table  
Fume hood  
Vacuum cleaner  
Sprayer

**4. Other equipment**

Standby generator for emergency

Note: Items and contents in this list will be further analyzed in Japan based on the Study in Syria.



## Japan's Grant Aid Scheme

### 1. Grant Aid Procedures

- 1) Japan's Grant Aid Program is executed through the following procedures.

Application	(Request made by a recipient country)
Study	(Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and Approval by Cabinet)
Determination of Implementation	(The Notes exchanged between the Governments of Japan and the recipient country)

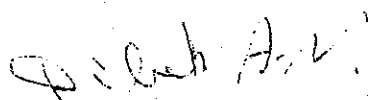
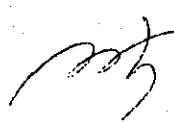
- 2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the Project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the Project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.



## 2. Basic Design Study

### 1) Contents of the Study

The aim of the Basic Design Study (hereafter referred to as "the Study"), conducted by JICA on a requested project (hereinafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Japanese Government. The contents of the Study are as follows:

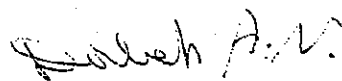
- a) Confirmation of the background, objectives, and benefits of the requested Project and also institutional capacity of agencies concerned of the recipient country necessary for Project's implementation.
- b) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.
- c) Confirmation of items agreed on by both parties concerning the basic concept of the Project.
- d) Preparation of a basic design of the Project.
- e) Estimation of costs of the Project.

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

### 2) Selection of Consultants

For smooth implementation of the Study, JICA uses (a) registered consultant firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms. The firm(s)



selected carry(ies) out a *Basic Design Study* and write(s) a report, based upon terms of reference set by JICA.

The consultant firm(s) used for the Study is(are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchanges of Notes, in order to maintain technical consistency and also to avoid any undue delay in implementation should the selection process be repeated.

### ***3. Japan's Grant Aid Scheme***

#### **1) What is Grant Aid?**

The Grant Aid Program provides a recipient country with non-reimbursable funds to procure facilities, equipment and services (engineering services and transportation of the products, etc.) for *economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan*. Grant Aid is not supplied through the donation of materials as such.

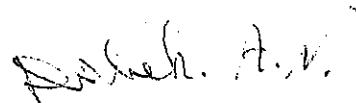
#### **2) Exchange of Notes (E/N)**

Japan's Grant Aid is extended in accordance with the Notes exchanged by the Governments concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid, etc. are confirmed.

#### **3) "The period of the Grant Aid" means the one fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and a final payment to them must be completed.**

However in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

#### **4) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.**



When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country.

However the prime contractors, namely, consulting, contracting and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

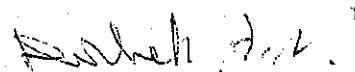
5) Necessity of the "Verification"

The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

6) Undertakings required of the Government of the Recipient Country

In the implementation of the Grant Aid project, the recipient country is required to undertake such necessary measures as the following:

- (1) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction.
- (2) To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities in and around the sites.
- (3) To secure buildings prior to the procurement in case the installation of the equipment.
- (4) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid.
- (5) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts.



(6) To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

(7) Proper Use

The recipient country is required to maintain and use facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.

(8) Re-export

The products purchased under the Grand Aid should not be re-exported from the recipient country.

(9) Banking Arrangement (B/A)

a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the verified contracts.

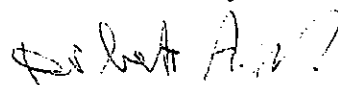
b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.

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**Necessary measures to be taken by the Government of the Syrian Arab Republic  
in case Japan's Grant Aid is extended**

1. To provide data and information necessary for the Project.
2. To secure the land necessary for the execution of the Project.
3. To clear the sites prior to the commencement of the construction, if required.
4. To make passable all roads and bridges leading to the Projects sites before the commencement of inland transportation of materials and equipment, if required.
5. To bear commissions to the Japanese foreign exchange bank for its banking services based upon the Banking Arrangement, namely the advising commission of the "Authorization to Pay" and payment commission.
6. To ensure prompt unloading, tax exemption, customs clearance at the port of disembarkation in the Syrian Arab Republic and prompt internal transportation of the materials and equipment for the Project purchased under the Grant Aid.
7. To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the verified contracts.
8. To accord Japanese nationals whose services may be required in connection with the supply of products and the services under the verified contract such facilities as may be necessary for their entry into the Syrian Arab Republic and stay therein for the performance of their work.
9. To provide necessary permissions, licenses and other authorizations for implementing the Project, if necessary.
10. To maintain and use properly and effectively the facilities constructed under the Project.
11. To coordinate and solve any issues related to the Project which may be raised from third parties or inhabitants in the Project area during implementation of the Project.





## Major Undertakings to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To secure land		●
2	To clear level and reclaim the site when needed		●
3	To construct gates and fences in and around the site		●
4	To construct the parking lot	—	—
5	To construct roads		
	1) Within the site		●
	2) Outside the site		●
6	To construct the building		●
7	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities		
	1) Electricity		
	a) The distributing line to the site		●
	b) The drop wiring and internal wiring within the site		●
	c) The main circuit breaker and transformer		●
	2) Water Supply		
	a) The city water distribution main to the site		●
	b) The supply system within the site (receiving and elevated tanks)		●
	3) Drainage		
	a) The city drainage main (for storm sewer and others to the site)		●
	b) The drainage system (for toilet sewer, ordinary waste, storm drainage and others) within the site		●
	4) Gas Supply		
	a) The city gas main to the site		●
	b) The gas supply system within the site		●
	5) Telephone System		
	a) The telephone trunk line to the main distribution frame/panel (MDF) of the building		●
	b) The MDF and the extension after the frame/panel		●
	6) Furniture and Equipment		
	a) General furniture		●
	b) Project equipment	●	
8	To bear the following commissions to the Japanese banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
9	To ensure unloading and customs clearance at port of disembarkation in recipient country		
	1) Marine (Air) transportation of the products from Japan to the recipient country	●	
	2) Tax exemption and custom clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	●	
10	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
11	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contracts		●
12	To maintain and use properly and effectively the facilities contracted and equipment provided under the Grant		●
13	To bear all the expenses, other than those to be borne by the Grant, necessary for construction of the facilities as well as for the transportation and installation of the equipment		●

#### **4.1 Explanation of Draft Final Report**

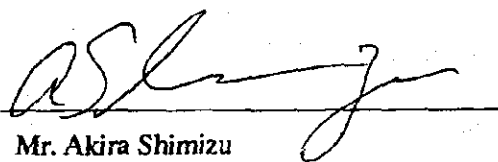
**MINUTES OF DISCUSSIONS  
ON  
BASIC DESIGN STUDY ON THE PROJECT  
FOR  
IMPROVEMENT OF SEED MULTIPLICATION CAPACITY  
IN  
THE SYRIAN ARAB REPUBLIC  
(EXPLANATION ON DRAFT REPORT)**

In July 2000, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Basic Design Study Team on the Project for Improvement of Seed Multiplication Capacity (hereinafter referred to as "the Project") to the Syrian Arab Republic (hereinafter referred to as "Syria"), and through discussion, field survey, and technical examination of the results in Japan, JICA prepared a draft report of the Study.

In order to explain and consult the Syria on the components of the draft report, JICA sent to Syria the Draft Report Explanation Team (hereinafter referred to as the "Team"), which is headed by Mr. Akira Shimizu, Fourth Project Management Division, Grant Aid Management Department, JICA, from October 8 to 25 2000.

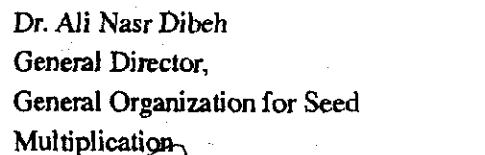
As a result of discussions, both parties confirmed the main items described on the attached sheets.

Aleppo, October 14, 2000

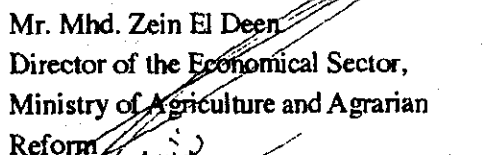


Mr. Akira Shimizu  
Leader,  
Draft Report Explanation Team  
Japan International Cooperation Agency

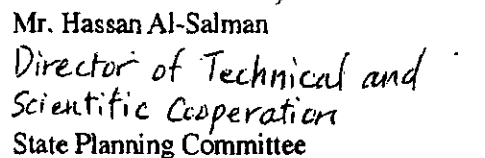
Witness



Dr. Ali Nasr Dibeh  
General Director,  
General Organization for Seed  
Multiplication



Mr. Mhd. Zein El Deen  
Director of the Economical Sector,  
Ministry of Agriculture and Agrarian  
Reform



Mr. Hassan Al-Salman  
Director of Technical and  
Scientific Cooperation  
State Planning Committee

## ATTACHMENT

### 1. Components of the Draft Report

Syrian side agreed and accepted in principle the components of the draft report explained by the Team. They have also agreed to delete the component stated below.

*Deleted component: Humidity control system for the green house*

Reason: There is not a frequent usage of a humidity control system for growing the plantlets inside the green house, and overuse of this system sometimes cause fungus damages to the plantlets. Its function is low in cost for benefit compared to other components of the Project.

### 2. Japan's Grant Aid scheme

Syrian side understands the Japan's Grant Aid scheme and the necessary measures to be taken by the Government of Syria as explained by the Team and described in Annex -III, IV and V of the Minutes of Discussions signed by both parties on July 22, 2000.

### 3. Schedule of the Study

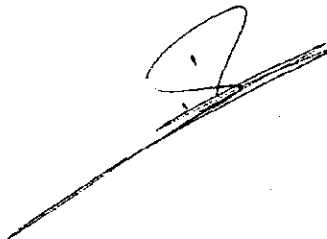
*Based on the results of discussions of the draft report, JICA will complete the final report and send it to the Government of Syria by January 2001.*

### 4. Other relevant issues

#### 4-1. Main undertakings taken by the Syrian side and its schedule

4-1-1. The Syrian side has submitted the final schedule chart for their undertakings of construction work, described in 7. (2) 1) of the Minutes of Discussions signed by both parties on July 22, 2000, as per Annex -I and II in this Minutes of Discussions.

4-1-2. The Syrian side also confirmed that they shall make every efforts to maintain this schedule on construction works above. And they have appointed Mr. Madarati, Deputy General Director and Mr. Rahmani, Foreign Trade Director of General Organization for Seed Multiplication as the person in charge of the management of this schedule. GOSM, through the Ministry of Agriculture and Agrarian Reform, shall submit a monthly progress report on this matter to JICA Syria Office.



4-1-3. Syrian side expressed that the budget allocation for the construction work had already been confirmed as follows. They shall also procure additional equipment for the Project as listed below.

1) Budget allocation for the construction works

a) Budget for the Year 2001

i) Land reclamation, Building for seed processing plant and seed storage yard :  
21million Syrian Pound

ii) Administration office, Tissue culture laboratory building for potato and  
foundation work for green house : 14million Syrian Pound

b) Budget for the Year 2002

Additional budget for above stated 4-1-3. 1) a) ii)

2) Additional equipment to be procured by the Syrian side

a) Water tank for green house,

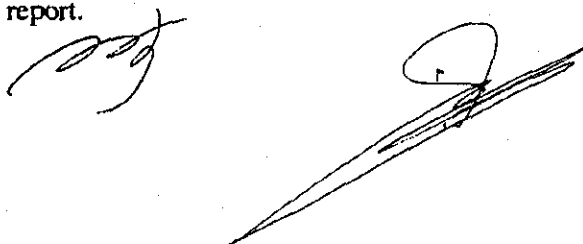
b) Fuel tank for green house, and

c) Other equipment, if necessary

4-1-4. Issues other than mentioned above 4-1-1,4-1-2 and 4-1-3, undertakings by the Syrian side shall be remained unchanged as is stated in 7. (1) of the Minutes of Discussions signed on July 22, 2000 by both parties.

4.2. Securing the adequate budget, recruitment of necessary personnel, necessary numbers (areas to be covered) of contract farmers and adequate numbers of net houses

The Syrian side has expressed the adequate budget, recruitment of necessary personnel, necessary numbers (areas to be covered) of contract farmers and adequate numbers of net houses for proper management and operation of this Project as is stated in the draft report.



## Construction Schedule for Seed Processing Plant and Base for Truck Scale

TOTAL MONTH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
MONTH	2000 OCT	NOV	DEC	2001 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	2002 JAN	FEB
Tender / Contract	Announcement			Tender		Contract											
Temporary Work																	
Preparation					Grading												
Earth Work					Excavating		Backfilling			Excavating				Backfilling			
Reinforced Concrete Work					Footings		Column lev.1		Lev. 3						Basement Wall		
Concrete Block Wall Work					Strip		Column lev.2						Base for Equipment		GF Slab		
Roof Work					Steel Structure & Metal Sheet Roof												
Interior Finishing Work																	
Exterior Finishing Work																	
Mechanical & Electrical Work																	
Landscaping Work																	
Cleaning, Inspection Hand over																	
Equipment Installation																	

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## Construction Schedule for Tissue Culture Laboratory and Base for Green House

TOTAL MONTH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22			
MONTH	2000 NOV	DEC	2001 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	2002 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG			
Tender / Contract	Announcement		Tender		Contract																				
Temporary Work																									
Preparation																									
Earth Work																									
Reinforced Concrete Work																									
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Roof Work																									
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Exterior Finishing Work																									
Mechanical & Electrical Work																									
Landscaping Work																									
Cleaning, Inspection Hand over																									
Equipment Installation																									

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## Appendix-5 Cost Estimation Borne by the Recipient Country

### (1) Operation and Maintenance Cost

The operation and maintenance cost for the wheat processing and potato tissue culture equipment provided by the project has been estimated as follows.

#### 1) Utilities (Electricity, Water Supply, Fuel, Gas)

Items	Consumption Volume per Year			
	Electricity 1.5SP/ k w	Water Supply 7SP/m <sup>3</sup>	Fuel 6.1SP/L	LPG 7SP/m <sup>3</sup>
<b>A. Wheat Seed Processing Plant</b>				
Weighing Facility	216	—	—	—
Seed Processing Facility	147,950	—	—	—
Laboratory Size. Seed Processing Machines	992	—	—	—
Testing Equipment	773	5	—	—
Sub Total	149,931	5	—	—
<b>B. Potato Tissue Culture Equipment</b>				
Water Purification Room	9,600	1,008	—	—
Media Preparation Room	45,809	—	—	—
Cultivation Room	4,919	—	—	715
Incubation Room	7,565	—	—	—
Growth Room	114,049	—	—	—
Glassware Room	6,498	—	—	—
Quality Control Room	1,176	—	—	—
Green House	25,119	58,415	243,500	—
Standby Generator	—	—	9,000	—
Sub Total	214,735	59,423	252,600	715
<b>Grand Consumption Total</b>	<b>364,666</b>	<b>59,428</b>	<b>252,500</b>	<b>715</b>
<b>Total Price (SP)</b>	<b>547,000</b>	<b>416,000</b>	<b>1,540,000</b>	<b>5,000</b>



2) Spare Parts and Consumables

A. Wheat Seed Processing Plant

Equipment Name	Spare Parts and Consumables	Unit Price (SP)	Quantity	Unit	Total Price (SP)
<b>A. Wheat Seed Processing Plant</b>					
Truck Scale	Bill Sheet	5	5,000	Sheet	25,000
Receiving Hopper	Air Cylinder	84000	1	pc.	84,000
Chain Conveyer	Bearing	4000	1	pc.	4,000
	Plate	800	100	pc.	80,000
Elevator	V-Belt	3000	3	pc.	9,000
	Bucket	2000	200	pc.	400,000
	Electric Motor	31000	1	pc.	31,000
Storage Bin	Air Cylinder	12700	2	pc.	25,400
Indent Cylinder Separator	Bearing	6000	1	pc.	6,000
Gravity Separator	Bearing	6300	1	pc.	6,300
Quality Control	Sample Bag	5	5,000	Sheet	25,000
Seed Treater	Chemical (disinfectant)	15	30,100	Litter	451,500
<b>Sub Total</b>					<b>1,147,200</b>

B. Potato Tissue Culture

Equipment Name	Spare Parts and Consumables	Unit Price (SP)	Quantity	Unit	Total Price (SP)
<b>B. Potato Tissue Culture</b>					
Pure Water System	Filter	42,000	1	pc.	42,000
Autoclave	Gasket	4,000	2	pc.	8,000
Clean Bench	Filter	12,000	6	pc.	72,000
Growth Room	Filter	42,300	3	pc.	126,900
	Recording Sheet	800	12	Roll	9,600
Oven	Gasket	2,000	2	pc.	4,000
ELISA Reader System	Chemicals	127,000	1	Lot	127,000
Green House	Nozzle	12,700	1	pc.	12,700
Soil Sterilizer	Nozzle	8,000	2	pc.	16,000
Media	MS Media	8,000	75	kg	600,000
<b>Sub Total</b>					<b>1,018,200</b>
<b>Grand Total</b>					<b>2,165,400</b>

### 3) Person costs for newly employment

#### A. Wheat Seed Processing Plant

Operation for seed processing plant will be carried out by 2-shift system. The Syrian side has to employ under mentioned new workers.

Team	Title	Salary	Annual Income	Number of Workers	Sub Total
	Manager	9,000	108,000	1	108,000
Team I	Mechanical Eng.	13,600	163,200	2	326,400
	Electrical Eng.	10,200	122,400	2	244,800
Team II	Mechanical Eng.	13,600	163,200	2	326,400
	Electrical Eng.	10,200	122,400	2	244,800
Other	Weighing Unit	8,500	102,000	1	102,000
	Driver	14,000	168,000	1	168,000
	Storage Keeper	9,000	108,000	1	108,000
Total					1,628,400

### 4) Person costs for temporary workers

#### A. Wheat Seed Processing Plant

During the operation, seed processing plant has to employ temporary workers for loading/unloading and packaging work.

Work	No. of Workers	Period	Total	Salary (100SP/day)
loading/unloading	5	180	900	90,000
packaging	10	180	1,800	180,000
Total				270,000

#### B. Potato Tissue Culture

The tissue culture section has to employ under mentioned temporary workers for planting and harvesting work in green house.

Work	No. of Workers	Period	Total	Salary (100SP/day)
Planting/Harvesting	30	90	2,700	270,000

Result of above estimations, operation and maintenance costs for the project are as follow.

Facilities	Electricity	Water Supply	Fuel	LPG	Spare Parts and Consumables	Person costs newly employment	Person costs for temporary	Total (SP)	Total (JY)
Wheat Seed Processing Plant	224,000	0	0	0	1,147,200	1,628,400	270,000	3,269,600	7,520,080
Potato Tissue Culture	323,000	416,000	1,540,000	5,000	1,018,200	0	270,000	3,572,200	8,216,060
<b>Grand Total</b>								<b>6,841,800</b>	<b>15,736,140</b>

## Appendix-6 References

	Title	Source
<b>Development Plan</b>		
1.	Evaluation of Agriculture Policies in the Syrian Arab	UNDP
2.	Program Management Plan	UNDP
<b>Statistics</b>		
1.	Statistical Abstract 1999	Office of the Prime Minister, Central Bureau of Statistics
2.	The Annual Agricultural Statistical Abstract 1999	Ministry of Agriculture And Agrarian Reform
<b>Construction</b>		
1.	SUMMARY OF GEOTECHNICAL STUDY FOR POTETO MULTIPLICATION SITE IN ALEPPO	GENERAL COMPANY FOR ENGINEERING & CONSULTING
2.	CONDITIONS AND TECHNICAL SPECIFICATION FOR BUILDINGS WORK	UNION OF ENGINEERS
<b>Agriculture</b>		
1.	The Directorate of Agricultural Scientific Research "Goal and Achievement"	Department of Agriculture Scientific Research
2.	General Organization for Seed Multiplication	Ministry of Agriculture and Agrarian Reform
<b>Others</b>		
1.	This is ICARDA	ICARDA
2.	Manual of Morphological Variety Description for Wheat and Barley with Example from Syria	ICARDA

JICA