UNDP – HOST COMMUNITIES PROJECT

SCOPE of WORKS
Apple Sorting line and Potato / Onions sorting line

Support of the Agriculture Sector in West Beka'a – Kefraya
through Procurement of Equipment for the Kefraya Agricultural Service Center

1. BACKGROUND

Lebanon is entering fifth year of the Syrian Crisis, and the ramifications have been felt by every Lebanese Household. Lebanon hosts 38% of the displaced Syrians in the region, more than any other country.

The population of displaced Syrians in Lebanon is expected to reach 1.5 Million by December 2014. The Syrian crisis is creating a negative impact at the macro and micro economic levels resulting in environmental degradation, increase competition over economic resources, increase of conflicts and disputes among Lebanese communities and between Lebanese and displaced Syrians. Unemployment rates are escalating, production costs have gone up, trade routes have closed with reduced export opportunities, and sectors, which traditionally were able to generate employment such as tourism and construction, are faced with significantly less demand. The Governorate of Bekaa has been particularly impacted given the poor state of service delivery and infrastructure, in addition to the fact that Bekaa has received the highest number of displaced Syrians compared to the other governorates.

Agriculture is the main economic sector in West Bekaa, an area that is heavily affected by the high influx of displaced Syrians. However, the agricultural produce market in Lebanon has suffered due to a slump in export of fresh fruit and vegetables resulting from the blockage of key land-routes through Syria. A recent assessment of the impact of the Syrian crisis found that it has become extremely difficult for Lebanese farmers to sustain their livelihoods. One of the main challenges to small scale farmers in the Bekaa area, as stated by the assessment, is their struggle to sell their products, as they are competing with cheaper agricultural products smuggled in from Syria. This has manifested in a sharp drop in the farmers' income locally. Combined with the high cost of diminishing storage facilities for fresh farm produce, these factors are reportedly forcing some farmers to exit the agricultural sector altogether as a desperate coping mechanism.

UNDP Response to the Impact of the Syrian Crisis is rooted in the UNDP Stabilization & Recovery Program fully integrated within both the Humanitarian Regional Response Plan and Lebanon Roadmap for Priority Interventions for Stabilization from the Syrian Conflict. The Lebanon Host Communities Support (LHSP) Project, in coordination with the Ministry of Social Affairs (MOSA) is a specific response to stabilize the Lebanese Communities and increase their capacities and ability to host the Syrian displaced community. The Project aims to strengthen the capacity of national and local government and civil society actors for inclusive priority setting and conflict mitigation, dispute resolution, and participatory service delivery as well reinforcing business skills and marketing opportunities in vulnerable areas, enhancing the dialogue among key stakeholders.

Priority measures to protect the profitability of agricultural produce and farmer livelihoods in the current crisis and beyond include better diversification of cropping patterns through the introduction of suitable alternate crops, as well as the promoting modern techniques for efficient farming, with optimal use of inputs and updated crop husbandry techniques. Crops with a lesser

energy-intensive storage requirement, higher transportability and longer shelf life such as almonds, pistachios and pomegranates etc., can contribute significantly to the efficiency and profitability of perennial cropping, helping households and communities remain resilient in the face of mounting economic and social pressures.

To this end, a technical service center for small-scale farmers is being established in Kefraya, West Beka'a. While the basic infrastructure of the center has been developed through the Kuwait Development Fund, there is yet a need to procure the needed equipment and supplies which have been identified as per the functionality of the center, type of facilities it will be housing, as well as its operationalization and management modality.

2. PROJECT OBJECTIVE

The overall objective is the procurement of equipment with a set of technical specifications for the service center in Kefraya.

3. SCOPE OF WORKS

The procurement of:

1. **Apple sorting line** (Lot 1) of:
   - Capacity Min 6 MT per hour, Max 8 MT per hour
   - Unloading belt.
   - Washing /precooling /mixer tank for possible post-harvest chemical treatment.
   - Drying belt.
   - Apple grader by weight with a minimum range of 80 grams to 500 grams per apple fruit
   - Packing tables.
   - Made of water resistant non-corrosive material certified for food industry.
   - Electrical control station.
   - Power 220 – 380 V, 50 Hz.
   - Full pledged warranty for one year
   - Not limiting ISO 22000

2. **Potato / Onions sorting line** (Lot 2) of:
   - Capacity Min 6 MT per hour for smaller weight per piece, Max 16 MT per hour for larger weight per piece.
   - Unloading belt.
   - Washing /precooling /mixer water tank for possible post-harvest chemical treatment.
   - Drying belt.
   - Oblong and round potato/onions grader by weight with a minimum range of 0 grams to 1000 grams per potato/onion head.
   - Detect defect, blemish, foreign material, greening and weight.
   - Packing tables.
   - Made of water resistant non-corrosive material certified for food industry.
   - Electrical control station.
   - Power 220 – 380 V, 50 Hz.
   - Full pledged warrantee for one year
   - Not limiting ISO 22000

Lot 1 apple sorting line

	Quantity	DESCRIPTION OF EQUIPMENT AND MINIMUM REQUIREMENTS
CRATE DUMPING AND ACCUMULATING TANK IN STAINLESS STEEL consisting of:	1	
	1	Entry belt for full crates; width 400 - 420mm x Length 2000 - 2500mm;
	1	Elevation belt for full crates; width 400 - 420mm x Length 2500 - 2500mm;
	2	Belt 400 - 420mm x length 900 - 1000mm
	1	Device for continuous immersion of crates (including stainless guides and steel tank)
	1	180º curve for empty boxes
	1	belt for empty boxes; length 3600 - 4000mm x width 400 - 420 mm
	1	stainless steel flotation tank 3600 - 4000mm long x 1400 - 1500mm wide,
	1	Water level detection with automatic water feed with electro valve.
	1	Pump 200 m3 / hour with pipework.
	1	Motorized leaf extractor with stainless steel chassis and plastic mesh. Tank 1500 - 1700mm x 550 - 600mm wide.
	1	Stainless steel exit tank 1750 - 1900mm long x 1400 - 1500mm wide.
	1	Set of waterproof connections. Dimensions: width 1400 - 1500 mm, overall length approx. 7500 - 8500 mm.
SUBMERGED ROLLER ELEVATOR / SORTING TABLE WITH STAINLESS STEEL FRAME Consisting of:	1	
	1	Set of anodised aluminium rollers. Rising section 1400 - 1500mm long plus horizontal section serving as sorting table 2800 - 3000 mm long. Width 1100 - 1250mm
	1	Fixed device for roller rotation.
	1	Suitable drive with variable speed and phase inverter switch.
	2	Aluminium platforms 900 - 1000mm wide x 2800 - 3000 mm long, with access steps
	2	Flat belt conveyor under sorting section, 3800 - 4000 mm x 280 - 300 mm with galvanized or stainless steel frame for removal of culls, minimum 2 ply belting with underside grip surface and reinforced drive drum. Stainless steel contact points for removed product. Culls to be mixed with leaves. Suitable drive with fixed speed motor.
	4	Chutes for cull fruit onto belt conveyor
SMALL FRUIT ELIMINATOR Consisting of:	1	
	1	Painted structure which has been properly welded and treated.
	1	Motorized hexagonal metal screen 100 - 1200mm wide with opening to allow elimination of fruit of less than 35mm diameter.
	1	Drive motor with variable speed with a switch.
	1	Two ply belt for small fruit 2400 - 2500mm x min. 200mm wide with stainless steel contact points.
WASHER BRUSHER (Stainless steel structure which has	1	
	1	Suitable drive motor with variable speed, with a switch
	32-38	Brush rows including:

been properly welded and treated) Consisting of:		1. Nylon brushes for washing. Diameter 120mm. 2. Rollers with "donut" sponges for pre-drying. Diameter 100 - 120mm. 3. Nylon separator rollers. Diameter 120mm. 4. Rollers with natural horse hair for waxing. Diameter 100 - 120mm.
	1	Set of nozzles and proportioning pump to apply cleaner to the fruit.
	1	Set of nozzles to sprinkle fresh water on the fruit.
	1	Drip tray to collect water and take to a central point for drainage.
	1	Set of ventilators and hot air conductions from the drying tunnel, allowing drying before passing to the waxer **Dimensions:** internal width 1200 - 1250 mm, length 4200 - 4400 mm.
WAXER BRUSHER (Stainless steel structure which has been properly welded and treated). Consisting of:	1	
	1	Suitable drive motor with variable speed, with a switch.
	12	Brush rows including: Rollers with natural horse hair for waxing. Diameter 100 - 120mm.
	1	Drip tray to collect water and take to a central point for drainage. Dimensions: internal width 1250 mm, length 1440 mm.
DRYING TUNNEL Metal structure with primer and gloss finish. Consisting of:	1	
	1	Set of anodised aluminium rollers 55mm diameter.
	1	Device for roller rotation.
	1	Roller cleaning device
	1	Fairing device to convey hot air.
	1	Generator to produce hot air with 110,000 - 120,000 Kcal / hour, LPG burner and generator.
	1	Drive motor with variable speed, with switch.
	1	Thermostat to maintain the temperature at 45 – 50°C.
	1	Electrical control board. Burners to go out if rollers cease to advance for any reason. Dimensions: internal width 1100 - 1250 mm, length 8000 - 9500 mm.
ELECTRONIC SIZER Minimum characteristics are:	1	
		Four lanes Sizing accuracy: +/- 1 gr. •Speed: Nominal speed 450 up to 700 carrier/min/lane •Pre alignment on V belts with differential speed driven automatically depending on the diameter of the fruits. •Independent weighting conveyor. The weighing elements cannot be carried along the sizer, but must be limited to a maximum length of 2 metres. It should be an independent part from the carriers that run along the sizer. It should be provided with 4 weighing points •Although at this moment sorting will be done only by weight, futures upgrades have to be possible allowing color, diameter, shape and external quality sorting. Singulation and under cameras for vision system, must be independent. (This is for upgrading purposes) •Only one chain used for 2 sizing lanes: Fruits cannot run directly above the chain. The chain is to be protected from humidity or dust or any element coming from the fruit and damaging/oxidising the chain. •Main conveyor of special plastic allowing good flexibility and good resistance. Each "cup is clipped in the chain making it easy to replace if needed and protecting the chain at the same time. • Smooth transfer from roller singulation into main conveying

		mechanism without transfer or any other cradle conveyor on top. ● Designed to eventual placement of labellers, NOT allowing labels to stick to any element entering the conveyor under cameras area. ● All carriage chains slide on polyethylene elements in order to reduce as much as possible wearing and noises ● Strong Frame ● Infeed up to 80% ● Motorized rotation of the rollers for singulation and rotation under the cameras (future options). ● Sizer outlets: rotating solenoids and outlet cards. Support and ejector in high mechanic resistance plastic injection. ● Rollers covered by rubber ● Cleaning of rollers: incorporated automatic system with brushes, water, soap and air. ● Automatic centralized Chains oiler ● Speed variator included: Speed of the sizer controlled by a frequency inverter. ● Variable gear motors connected to a frequency variator for progressive start up and switch off operations. ● User-friendly interface and electronics based on Windows OS. **PRE-SINGULATION & SINGULATION:** ● Differential variable speed between even and uneven belts ● Pre alignment on V belts with differential speed driven automatically depending on the diameter of the fruits. The smaller the fruit is, the higher the differential speed is ● Endless polyurethane belt with central guiding driving belt of 65 - 70 mm wide ● 7% V- belt opening angle to gently carry the product onto the soft rollers. ● Length 1800 - 1900 mm ● Deported greasing system when difficult access **SINGULATION:** ● Rollers to be designed specifically for difficult to orient fruit to enhance the stability, singulation and rotation, and in a soft material to avoid damages. ● Infeed cup fill up to 80%. ● Roller's speed controlled by frequency inverter ● Rollers made of 3 soft rubber discs. **WEIGHING SECTION** ● Independent weight device with only 48 weighing cups per lane, leading to an easier maintenance because all the weighing cups are not carried by the main sizer conveyor. ● 4 weight points per cup to give full stability of the weight cup on the load cell. ● ONLY one load cell per lane for optimal accuracy.

		● Sizing accuracy: +/- 0.5 % in weight & diameter at 700 - 750 hands/minute. ● Running accuracy is closer to +/- 0.5 % EVEN SEVERALS MONTH AFTER START UP. ● Permanent auto calibration of empty cups. ● Calibration or adjustment of the load cells maintenance free. ● Automatic centralized chain oiler. ● Cup made of simple plastic without assembly Accurate sizing, with synchronized transfers but without any drop between the different elements, giving the end user a good homogeneity without any risk of fruit's damage. **<u>CONVEYING HANDS/CUPS:</u>** ● Only one chain for 2 lanes of hands (1 lane on the left hand side of the chain, 1 lane on the right) ● Fruits are not directly above the chain. The chain is then protected from humidity or dust or any element coming from the fruit and damaging/oxidising the chain ● Lower maintenance cost ● Chains slide on self-lubricated polyethylene elements in order to reduce as much as possible wearing and noises ● Upper self-lubricated polyethylene guide on the main body of conveying hands to prevent twisting of the chain ● Longer longevity of the chain and no costly replacement of the UHMW (Ultra-High Molecular Weight) chain guide due to wear caused by the chain dragging on top of it. ● Ergonomic carrying conveyor in « hand » shape to respect the fruit ● Opening of the hand unloading the fruit into the receiving hammock. Fruit gravity centre has a descending movement without ascending phase (Fruit is not thrown out) ● Clip on "delivery hands" that facilitates quick changes. ● Soft plastic with shape memory, very simple, light and strong, only 3 pieces, very easy to clean each element is clipped in the chain making it easy to replace if needed and protecting the chain at the same time. ● Cleaning of conveying black hands: incorporated automatic system with brushes, water, soap and air. ● Main conveyor only clipped on the carrying chain for an easier maintenance. **<u>EJECTION DEVICE:</u>** • Rotating switch with cam • Fruit is carried on a hand and released gently on a brush descent using a solenoid • Solenoids: rotating solenoids water spray, humidity and dust resistant • Outlet cards are moulded by plastic injection that produces

		a very tough mechanical structure. • Sizer can run at speeds from 250 to 750 per minute per lane without having to manually adjust the solenoids. • Noise levels are extremely low (less than 80 decibel). • Variable speed units are included • Variable gear motors connected to a frequency inverter for progressive start up and switch off operations. • Easy maintenance as long as all the procedures are completed per the recommended maintenance schedules. • Daily maintenance costs reduced to a minimum. • Spare parts replacements at minimal and offered at reasonable rates. **HARDWARE AND SOFTWARE DEVICES:** • User-friendly interface and electronics based on Windows OS. • Software is pre-set to the customer's requirements and way of working and only small adjustments need to be done afterwards. • Able to design up to 50 different grading programs for each variety of fruit. It is also possible to print statistics of the work that was made for each variety and every day. • Internet connection for resolution of Electronics/software/PLC problems directly from manufacturer's headquarters
	12	Set of brush transfers for gentle transfer of fruit from carrier to outlet belts.
	12	Outlets for calibrated fruits with outlet belts 1600mm long x 400mm wide. Stainless steel lateral frame
	1	Outlets for return fruits with outlet belt 1600mm long x 400mm wide. Stainless steel lateral frame.
	1	Main drive with frequency inverter controlled directly from PC.
PACKING BELTS Consisting of:	12	• Flat belt conveyors 5 - 6 metres long x 550 - 600mm wide, with accumulation at the end; • Lateral frame made of stainless steel • Photocell to control accumulation of fruit; • Control cabinets. • Stations with ergonomic facilities to fill cartons.
SYSTEM FOR FEEDING EMPTY CARTONS TO PACKING STATIONS	12	
SET OF TAKE AWAY CONVEYORS Consisting of:	6	
	6	Belt conveyor for full boxes. Length 5500 - 6000mm; width 400 - 420 mm.
	6	2 m gravity roller conveyor, 450 - 500 mm wide.
ELECTRICAL MAIN BOARD AND GENERAL PANEL	1	General electric board and panel installed in accordance with EU quality and safety regulations

Lot 2 Potato / Onions sorting line

Receiving, Washing & Grading System, comprises of	1	
		Bulk Receiving Hopper • 5.5 – 6.5 m long x 2230 - 2750mm wide • Hopper to have 3 – 3.5 m long flat section, 2.5 – 3 m long incline section • 1100 – 1300 mm wide belt. • Belt supported on galvanized cross lathes with 4" pitch side chains • 3 phase side mounted motor with boxed inverter • Feed over height 950 - 1050 mm with 'D' shaped buffer strip fitted to loading side • Coated PVC lining to hopper on loading side and back only • Mild steel construction
		Fixed Coils • 4 rows, 1100 – 1300 mm wide • First roller rubber covered • 3 phase variable speed motor • Coil diameter 100 – 120 mm x 13 – 16 mm • Soil/waste conveyor 800 – 1000 mm wide x 2.8 – 3.2 m long
		Elevator 900mm wide • 3.8 – 4.2 m long x 800- 1000 mm wide • Endless side tracked belt • Flights 50mm high and at 300mm pitch • Mild steel construction
		Mild Steel Barrel Washer • Rubber lined infeed chute • Stainless steel perforated sheet barrel drum, 2.8 3.2 m long x 1100 1300 mm diameter • Water holding tank with flat floor • Overflow pipe to control water level • Large cleaning out access door to side of the machine • 100 mm diameter drain valve • Washing barrel supported on rubber belts and powered by a variable speed drive motor • Manually adjustable product outfeed door to control flow of crop • Stainless steel outfeed elevator with self-draining rubber door stop belt • Fresh water final rinse spray bar fitted above belt
		Sponge Dryer • 800 - 1000mm wide, 8 - 12 rollers long • Donut style sponge rings suitable for handling

		potatoes • Zinc plated squeeze rollers • Fixed speed drive motor with soft start • Drip tray to move water to side of machine • Adjustable height support legs • Fork lift tines • Manufactured in mild steel with stainless steel produce contact points
		Screen Sizing Module • Triple screen unit mounted on one chassis • 3 off 1.5 – 1.7 m long x 1100 -1300 mm wide • 3 x dual pintle roller drives • 3 x variable speed screen motor • 3 x variable speed agitator motor • Long tuber handling devices • 2 x Pintle transfer roller • End baffle chute to box • Forklift tubes • 3 x 850 – 950 mm wide conveyors, slideable and reversible • Adjustable height legs

4. DELIVERY PLACE AND DEADLINE

The contracting company is expected to deliver the item within **4 months** effective from the contract signature date.
The requested items will be delivered to Kefraya Agricultural Service Center in Kefraya, Bekaa.

5. TERMS OF PAYMENT

100% upon complete delivery, installation, training and testing of goods value at designated sites and within 30 days from receipt and acceptance of related invoices and documentation.

Incoterms will be DDP, Delivered Duty Paid: Delivery at Place and Customs Paid

6. AFTER-SALES SERVICES

- Warranty on Parts and Labor for minimum period of **One** year is required;
- Technical support upon delivery of equipment;
- Provision of Service Unit when pulled out for maintenance/ repair.

7. Bidders have to price for the two sorting lines as a whole

8.

9. **Interested bidders can apply for 1 or 2 lots.**

10. APPROVAL

This TOR is approved by:
Signature: _____
Date: