UNODC
United Nations Office on Drugs and Crime

Southern Africa

CORE VALUES: *INTEGRITY, PROFESSIONALISM, RESPECT FOR DIVERSITY*

CONTRACT ANNOUNCEMENT

TERMS OF REFERENCE

CONSULTANCY TITLE	**:**	Installation of Solar Powered Drip Irrigation System
ORGANIZATION	**:**	United Nations Office on Drugs and Crime
TYPE OF CONTRACT	**:**	Individual Contract (National)
COUNTRY OFFICE	**:**	UNODC Office, MALAWI
DUTY STATION	**:**	Kasungu Prison Farm
DURATION OF WORK	**:**	60 working days (beginning 1st May 2021)
ESTIMATED COST	**:**	USD76,200.00

1. Background

The United Nations Office on Drugs and Crime (UNODC) with support from the Government of Norway is implementing a Prison Reforms Project in Malawi. The project is aimed at contributing to the initiation of a process towards development of an effective and sustainable national response to the chronic drivers of the current prison challenges such as food shortages, and overcrowding, thereby improving the health and living conditions for Malawi's prisons population.

With three main outcomes, the project aims to improve management of prisons in Malawi where economically efficient and sustainable food production, storage and distribution systems are developed within the Malawi prisons to ensure appropriate nutrition support to prisoners.

Through this funding, the project has identified two prisons with adequate agricultural land and capable of managing solar powered drip irrigation system, to achieve sustainable food production and availability for the prisoners.

This will involve structural interventions in the selected prison farms to enable them to produce more agricultural food primarily cereals, legumes, and horticulture crops, to sustain the daily food demand for prisoners. Kasungu Prison Farm which is 124 kilometers from Lilongwe with a total of

90 hectares of cultivatable land, has been earmarked for a five-hectare banana production (main horticultural cash crop) to be supported by a solar powered drip irrigation system.

The project intends to engage a contractor to install a solar powered drip irrigation system to irrigate primarily five hectares of banana plantations at Kasungu prison farm, with the aim of diversifying food production and generating income to sustain agriculture activities in the prisons.

2. Main objectives of the assignment

1. Installation of solar powered drip irrigation system at Kasungu prison farm.
2. Train agriculture staff on system operations and maintenance of equipment.

   Take note that the participants for the training will be selected by UNODC in consultation with MPS.

3. Expected outputs/deliverables

In line with main objectives outlined above, the consultant will be expected to produce the following outputs at the site.

a) Conduct pump yield tests and flush out if the yield volume is below the recommended minimum threshold (as boreholes were drilled in early 2019, it would be very necessary to test the water yield from each pump again before installations begin).
b) Solar stand installation
c) Solar system installation for the two boreholes including submersible pumps.
d) Pump house construction
e) Pipe network installation
f) Drip irrigation system installation
g) Installation of water reservoir
h) Operation and maintenance training

Please take note that the materials in the table below were already purchased by UNODC and delivered on the site.

KASUNGU BOREHOLE 2.0.1 - 12m3/h at 55m TMH	
QTY	DESCRIPTION
18	Solar modules, 275Wp each.
50	Clamps for solar modules placement
1	PV Array distribution box with DC 1000V fuses, 16Adc, IP66
1	Grundfos Submersible SP11-15 of 3kW 3x400VAC 50Hz, 4" pump 2" outlet discharge
1	Control panel 3kW with electrical protections, MPPT version. Only solar operation. Without water sensors relay
100	meters electrical cable from PV Array to Control Panel, 3x4mm2 section
150	meters electrical cable from Control Panel to Pump, 4x4mm2 section
1	Resine connector for pump cable 4x4mm2
1	Steel cable for pump secure and fasteners, 5mm
3	Units grounding rods with clamp and electrical cable
KASUNGU BOREHOLE 2.0.2 - 14m3/h at 55m TMH	
QTY	DESCRIPTION
22	Solar modules, 275Wp each.
50	Clamps for solar modules placement
1	PV Array distribution box with DC 1000V fuses, 16Adc, IP66
1	Grundfos Submersible SP14-15 of 4kW 3x400VAC 50Hz, 4" pump 2" outlet discharge
1	Control panel 3kW with electrical protections, MPPT version. Only solar operation. Without water sensors relay
100	meters electrical cable from PV Array to Control Panel, 3x4mm2 section
150	meters electrical cable from Control Panel to Pump, 4x4mm2 section
1	Resine connector for pump cable 4x4mm2
1	Steel cable for pump secure and fasteners, 5mm
3	Units grounding rods with clamp and electrical cable

UPVC TANKS	
QTY	DESCRIPTION
4	Supply of 10m3 Upvc rotto tanks

4. **Work plan and specific tasks**

Since the exact workload can only be estimated, the below mentioned information are maxima, indicated by using the term "up to". The chosen contractor will be asked to keep a record of the actual workload, which will serve as a basis for the invoice. The contractor will also be required to consult regularly with UNODC Malawi office and provide regular updates. The spirit of teamwork with both UNODC and Malawi Prison Service department will be highly essential.

PROPOSED WORK SCHEDULE

ID	Activities	Up To (working days)	MONTHS/WEEKS									
			1st Month				2nd Month				3rd Month	
			1	2	3	4	5	6	7	8	9	10
1	Submission of an inception report	5										
2	General work preparation	5										
3	Solar system installation for 2 boreholes	10										
4	Construction of security fencing and security lights	10										
5	Construction of a structural holder, mounted 3.5m above ground, designed to withstand local winds.	10										
6	Construction of a pump control house in line with the technical proposal	15										
7	Excavation for pipe works	10										
8	Pipe network and drip system installation	20										
9	Construction of water storage structure	20										
10	Training and production of operation and maintenance manual	15										
11	Work finalization, presentation and submission of report	15										

5. Qualifications/Competencies

The lead contractor shall have the following attributes:

- Have a minimum of Bachelor of Science Degree in Agriculture Engineering or Irrigation Technology from a reputable higher learning institution.
- A Master of Science Degree in the specified fields above will give an added advantage.
- The consultant should be a registered graduate irrigation engineer with the Malawi Board of Engineers.
- Should have not less than 10 years of practical field experience in drip irrigation systems design, and installations with traceable or proven records.
- Should have a wide knowledge and experience in large-scale horticultural crops production in the tropics, both under conventional farming and greenhouse systems.
- Should be well conversant with the Irrigation Code of Practice & Equipment Standards, as prescribed by the Ministry of Agriculture, Irrigation and Water Development in Malawi.
- Must be a team player with good networking attributes and should be willing to communicate with project staff at UNODC office in Lilongwe for project updates, and capable of meeting strict deadlines in line with project schedule.
- Submit three previous contracts of similar value and magnitude with traceable referees.

6. Method of Application and Enquiries

Qualified and interested candidates are invited to submit their consultancy's profile, p11 form, as well as technical and financial proposal with the subject line ***"Drip Irrigation Installation Contract_KASUNGU"*** to unodc-rosaf.procurement@un.org on or before the 15th April *2021.* Use the same email address for any technical inquiries.

Any incomplete proposals or proposals received after the deadline will not be considered in the recruitment process.

These ToRs will also be available on the UNODC website: https://www.unodc.org/southernafrica/en/consultancies-and-opportunities.html

Correspondence will be limited to shortlisted candidates only.

UNODC reserves the right not to make an appointment

Appendix 1

Please fill the attached Bill of Quantities (BOQs) for your submission.

	DEVELOMENT OF KASUNGU PRISON FARM IRRIGATION SYSTEM IN KASUNGU DISTRICT				
BILL No. 1	**PRELIMINARY AND GENERAL**				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**Amount (USD)**
1.0.1	Allow for mobilization and demobilization on site	LS	1		
1.0.2	Site Establishment	LS	1		
1.0.3	Provide, erect, and maintain contract signboard	LS	1		
1.0.4	Health and safety obligations	LS	1		
1.0.5	Environmental and social obligations	LS	1		
1.0.8	Construction survey and provision of as-built drawings	LS	1		
	SUB-TOTAL				
BIILL No 2	**SOLAR SYSTEM INSTALLATION FOR TWO BOREHOLES**				
2.0.1	Installation of 2 Pumps and solar modules at Kasungu prison farm boreholes	nr	2		
	SUB-TOTAL				
BILL No. 3	**SECURITY FENCING AND LIGHTS**				
3.0.1	Construction of security fence with Diamond wire surrounding pump house and solar farm including angle irons (dimensions as shown in the drawings)	nr	1		
3.0.2	Supply and install security lights for the one solar farm including pole	nr	1		
3.0.3	Field security fence with barbed wire and wooden poles for 5HA	nr	5		
	SUB-TOTAL				
BILL NO 4	**STRUCTURE HOLDER, MOUNTED 3.5M ABOVE GROUND**				
4.0.1	Supply and erect 150mm Steel pipe to support holder	m	24		
4.0.2	Concrete footings to hold solar steel pipe stands	m^3	2.5		

4.0.3	Supply and Weld Ripped Channels and 40 x 40 x 3mm Angle Iron on site to hold panels and prohibit easy removal of panels, hence limit theft.	m	70		
	Sub Total				
Bill No 5	**CONSTRUCTION OF A PUMP CONTROL HOUSE IN LINE WITH OUR TECHINCAL PROPOSAL**				
5.0.1	Clearing of pump house site	m^2	16		
5.0.2	Excavation in soft material for pump house foundation	m^3	6		
5.0.3	50mm concrete blinding to foundation footing	m^3	2		
5.0.4	Mass concrete for foundation footing of class C15	m^3	3.7		
5.0.5	500mm think masonry to pump foundation walls up to 2000mm depth	m^3	2		
5.0.6	Construct 100mm reinforced concrete of class C20	m^3	1.2		
5.0.7	230mm Block walls to pump house using 1:4 mortar fitted with brick force wire every three courses	m^2	20		
5.0.8	Supply and fit steel breeze blocks on sides of pump house as shown on drawing in technical specifications.	m^2	1		
5.0.9	Construct reinforced ring beam	m^3	1.6		
5.0.10	Reinforcement bars Y12	kg	120		
5.0.11	Roofing for pump house with IBR 28-gauge iron sheets (dimensions as shown in the drawings)	LS	0.5		
5.0.12	Supply and Fit 6 mm thick flat sheeted steel door, including all iron monger and heavy-duty rocking system	nr	2		
5.0.13	Plastering of inside walls of pump houses using 1:3 mortar	m^2	32		
5.0.14	Pointing to outside walls of pump house	m^2	16		
	Sub Total				
BILL No.6	**PIPEWORKS**				
ITEM	**DESCRIPTION**	**UNIT**	**QTY**		
6.0	**PIPEWORK**				
6.0.1	Excavation of pipe trenches	m3	600		

6.0.2	Supply, Install, test and commissioning of 90mm uPVC pipeline class 5	m	450		
6.0.3	Supply, Install, test and commissioning of 63mm uPVC pipeline class 12	m	500		
6.0.4	Supply, Install, test and commissioning of 63mm uPVC pipeline class 6	m	400		
6.0.5	Supply and install 63mm HDPE pipelines class 6 as a submain	m	625		
6.0.6	Supply, install and commission 63mm galvanized gate valve	No	14		
6.0.7	Supply and install uPVC 63mm end caps	No	14		
6.0.8	Supply and Install Clamp saddles (63mm to 32mm)	No	14		
6.0.9	Supply and install hydrants complete with fittings	No	14		
6.0.10	Supply and install banana LDPE driplines for 5 Ha including fittings with a lateral spacing of 3m	Ha	5		
6.0.11	Supply and install filters with 300micron mesh	nr	2		
6.0.12	Supply and install miscellaneous fittings	LS	1		
	SUBTOTAL				
Bill No 7	**WATER STORAGE STRUCTURE**				
7.0.1	Site clearance	m^2	200		
7.0.2	Excavate:1200mmx1200mmx900mm for pad footings	NR	8		
7.0.3	100mm thick blinding on pad foundations	m^3	3		
7.0.4	Pad footing (1200mmx1200mm x900mm)	m^3	28.3		
7.0.5	Reinforcements for the pad (starter bars with threaded ends and mesh Y16) as shown in the drawings	nr	8		
7.0.6	Supply and Installation of 150mm GI pipes stand poles for the tank stand	nr	6		
7.0.7	Provide 152mmx152mmx11kg/m UC (H-Channel); welded, braced, and bolted to 16mm base plate	m	184		
7.0.8	Provide 100mmx50mmx37kg/m as primary beams	m	37.5		
7.0.9	Provide 152mmx152mmx37kg/m as secondary beams	m	62		

7.0.12	25mm steel grating 50mmx50mm	m^2	62		
7.0.13	Allow for steel ladder cage, handrails	LS	1		
7.0.14	Bolts, angle iron, and connection/ plate accessories	LS	1		
7.0.15	Prepare Stanchion to receive paint (scrapping, brushing & cleaning rust and dirt), treat with 3 coats of red oxide and apply 3 coats of approved paint (Berger or equivalent) on stanchion (Aluminum color)	nr	1		
7.0.16	Install approved 10,000Litres black PVC tank and complete with technical specifications requirements	nr	4		
7.0.17	Plumbing fittings for the tanks	LS	1		
	Sub Total				
BILL NO 8	**TRAINING**				
8.0.1	Operations and Maintenance manual production including training	LS	1		
	Sub Total				
	KASUNGU PRISON SUMMARY				
1.0	PRELIMINARY AND GENERAL	nr	1		
2.0	SOLAR SYSTEM INSTALLATION FOR TWO BOREHOLES	nr	1		
3.0	SECURITY FENCING AND LIGHTS	nr	1		
4.0	STRUCTURE HOLDER, MOUNTED 3.5M ABOVE GROUND, DESIGNED TO WITHSTAND LOCAL WINDS (up to more than 190km/h winds and Tilted 20º towards North).	nr	1		
5.0	CONSTRUCTION OF A PUMP CONTROL HOUSE IN LINE WITH OUR TECHINCAL PROPOSAL	nr	1		
6.0	PIPEWORK	nr	1		
7.0	WATER STORAGE STRUCTURE	nr	1		
8.0	TRAINING	nr	1		
	GRAND TOTAL				