Terms of reference (ToR) for the procurement of services up to the value of EUR 20,000

giz

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General information

a. Brief information on the project

Since 2018, the GIZ project Green People's Energy (GBE) aims to improve the conditions for decentralised energy supply in selected sub-Saharan African countries with the participation of citizens and companies. Activities will focus on Ethiopia, Benin, Côte d'Ivoire, Ghana, Mozambique, Zambia, Senegal, Namibia and Uganda. In addition to country-specific measures, the initiative promotes renewable energy projects of common benefit across countries and strengthens partnerships between actors in Europe and Africa. For its operations in Ethiopia, GBE collaborates closely with the Ethiopian Ministry of Water, Irrigation and Energy (MoWIE) as well as with the Energising Development Ethiopia Project of GIZ (hereinafter: EnDev).

The main output areas of GBE in Ethiopian are as follows:

1. Promote small-scale renewable energy initiatives
2. Increasing vocational training capacities for solar PV
3. Promote use of solar PV energy for enhancing social services and production
4. Support decentralized, local energy supply and service provision initiatives

In this regard, GBE provides technical advice and support to a number of governmental institutions and non-governmental organizations, private institutions and enterprises, cooperatives and communities.

b. Context

One of the targets of the aforementioned output 3 of GBE is the establishment of a demonstration cluster for 20 smallholder irrigation systems that are to be set up in close collaboration with the GIZ Green Innovation Center (GIC) project and its partner farmers.
The project intends to develop a scalable pilot for small-holder size solar PV irrigation system (SPIS) in twenty smallholder farms in Amhara and Oromia regional state.

To start with, and based on the earlier conducted SPIS solar irrigation market study (to be shared with the successful bidder after contracting), a Contractor will be required to perform an assessment and subsequent selection of suitable sites among longlisted sites which are attached in the ANNEX. Furthermore, the Contractor is to conduct the sizing, design and BoQ development for small-holder sized SPIS for each site and also assess financing ability of the prospective end-users.

c. GIZ shall hire the contractor for the anticipated contract term, from 15.03.2021 to 25.04.2021

d. The contractor shall provide the following work/service

d.1 Geographical scope of tasks

The result of smallholder SPIS market study revealed that SPIS is more economical for shallow boreholes and surface pumping from rivers, lakes and ponds.

Based on mapping of SPIS for shallow boreholes as well as existing, strong partner structures of the GIZ Green Innovation Centre project, the communities and cooperatives indicated in the ANNEX in Amhara **(West Gojam zone)** and Oromia **(Arsi zone)** have been long-listed for micro siting and piloting purpose.

Following the site assessment, the Contractor shall propose a total of 20 sites, i.e. 10 potential sites in each zone for piloting purposes.

In each zone, the 10 sites can be either at one location or at a maximum of two locations nearby to each other and with ideally 5 sites each to allow for clustered supply and advisory services.

The Contractor is to work very closely together with the GIC staff in both regions.

d.2. Thematic scope, objective and outputs of works

Building on the findings and recommendations of the smallholder solar irrigation market study (will be availed at the beginning of the assignment), the following objectives and outputs are to be achieved by this assignment:

- Selection of 20 solar PV irrigation sites in Amhara and Oromia region following detailed suitability assessment from given preselected sites. During micro siting gender (women farmer) balance must be kept as much as possible.
- Assess willingness to pay (WTP) and ability to pay (ATP) as well as Pay-As-You-Go financing options for end-users
- Sizing and design of SPIS for each site and preparation of of a Bill of quantity (BoQ)

d.3. Description of works

Work package 1: Site assessment including financing option assessment

- Agree with GIC and GBE on the sites to be visited in those areas listed in the ANNEX. GIC will conduct a long-listing of sites beforehand. Priority shall be given to farmers / agriculturalists proposed by GIC that are located next to already existing boreholes and who have at least one year experience with irrigated crop production.

- Familiarize with local irrigation context and to determine in coordination with GBE and GIC the most appropriate methods for conducting site assessment and preparatory work needed.
- Conduct site visit and obtain all information that may be necessary for design. Propose for each of the two zones 10 potential sites for SPIS from longlisted / pre-selected sites (hence a total of 20 sites). The Contractor will be accompanied by GIZ staff to facilitate contacting, communication and site-visits. **Important**: Contractor is still to arrange for his own transport.
- The contractor should assess available water sources (ideally wells), their current use by end-users and measure or at least professionally estimate safe yield of the borehole (discharge rate) for each site during dry season.
- If needed, the Contractor will suggest potential site for shallow groundwater well drilling in case it turns out that the well yield is not sufficient in preselected sites.
- Collect all necessary data from target sites (irrigable plot size, head, safe yield of bore hole, pumping distance, crop /vegetable type and their irrigation needs, number of harvesting seasons).
- Incorporate input from the Integrated **Soil Fertility programme of GIZ**, which is a partner programme of GIC (contacts to be established by GIC)
- During micro siting gender (women farmer) balance must be kept as much as possible
- Rapid assessment whether potential households have alternative need/use of electricity produced by a SPIS (e.g. DC lighting, phone charging)
- Assessment of willingness to pay (WTP) and ability to pay (ATP) for a smallholder-size SPIS system on a weekly or monthly or another suitable base to cover for around 25% of system (costing details to be provided at the beginning of the assignment)
- Assessment of practicality of Pay-As-You-Go (PAYGO) options (e.g. M-Birr, CBE-Birr, others) for end-users costs (e.g. do the end-users have suitable phones at hand, and/or a CBE account?)
- Elaborate on the experience of credit facilitation in the area and the challenges associated with it
- Prepare a site assessment report with a proposed site selection (includes GPS coordinates for each site) and share it with project stakeholders for discussion

Work package 2: Sizing and designing of SPIS and development of BoQ

- Provide a system design based on the worst scenario (dry season) of the site, irrigable land size (**not more than 3,000m^2**), usually cultivated crop type and drawings of SPIS for respective selected sites based on data from site assessment for GBE approval - use appropriate software when required.

  The pumping system and ideally also the irrigation systems should ideally be as <u>standardized and homogenic as possible</u> (eases the procurement afterwards).

  This system design and specifications shall include, amongst others:

- crop water requirement (from site assessment) / hectare /day
- total dynamic head for the pump
- required minimum and maximum amount of water to be pumped per day
- yield of the borehole in the dry season
- size of other components required for solar PV irrigation system considering sprinkler or drip irrigation or any other resource efficient irrigation method (riser pipe size, distribution line routes and size, sprinkler size etc.)

- Basing on the aforementioned SPIS design, preparation of listed bill of quantity with specifications. This shall include, amongst others, the following

  Pumping equipment specifications

  - Hydraulic energy required
  - Pumping motor performance required
  - Minimum and maximum amount of water to be moved per day (in the dry season)
  - Total dynamic head

  Irrigation system specifications

  - Material and quantities and other specifications of water-transport and delivery piping
  - Delivery system specifications and quantities (drip, spray/sprinkler)
  - Borehole and tube-well specifications (material, depth etc.) where required
  - Non-return and control valves, strainers
  - Water storage tank specifications (volume, stand – if required)

Important: The Contractor shall use the following parameters developed earlier for our planned pilot as guideline:

- Solar pump with minimum output of 12 m^3/day at total dynamic head (TDH) of 15m. Based on borehole discharge rate and minim pumping rate, select similar pump size per cluster as much as possible.
- Spray tube or other low-cost efficient irrigation system covering 2000 – 3000m^2. If a spray tube system is chosen, the recommended field set-up is to use multiple lines of 20m each.
- Storage tank or reservoir on the ground of at least 2m^3 and support structure
- Functioning tube-well with year-round water supply, minimum yield of 1 l/s and water depth between 8 and 12 meters in the dry season.
- Integrated, small-holder pumping systems that are considered in the Global LEAP 2019 Buyers Guide: https://storage.googleapis.com/e4a-website-assets/2019-Global-LEAP-SWP-Buyers-Guide_final.pdf

Therefore, the Contractor **shall NOT design a completely new solar pumping system** but use **instead already developed integrated solar pumping system** developed by Lorentz,

Sunculture and others. The Contractor shall therefore focus on the development of an **appropriate irrigation system** that corresponds to the context and needs of the selected sites and matches with the above-mentioned solar pumping parameters.

- Prepare a design report with drawings as well as BoQ with specifications and share it with project stakeholders for discussion

d.4. Deliverables

Basing on the above work packages, the consultant is to produce the following deliverables:

- Inception presentation
- Report featuring all findings to be collected under the above work packages, including – amongst others - :
  - Site assessment results and ranking of sites to be chosen for piloting
  - Assessment of willingness and ability to pay and PAYGO potential
  - Technical design including drawings for each selected site
  - Technical specification and bill of quantity for each selected site

Certain milestones, as laid out in the table below, are to be achieved by certain dates during the contract duration:

Milestone	Deadline / person responsible
o Inception presentation	5 days after contract signature
o Site assessment and site selection	3 weeks after contract signature
o Irrigation system design done for each site o Technical specification and Bill of quantity prepared	4 weeks after contract signature
o Final report submitted	5 weeks after contract signature

Tender requirements

1. Qualifications of proposed staff

1.1 Expert 1: Lead Consultant

1.1.1 General qualifications
Education: Bachelor or Master degree in agricultural engineering, natural sciences, renewable energies, electrical engineering or other relevant field
Professional experience: 7 years' experience in professional experience in developing small-scale irrigation systems with expertise and experience in SPIS

1.1.2 Experience in the region/knowledge of the country: Work and research experience in rural Amhara and Oromia

1.1.3 Language skills: business fluency in English and Amharic and ideally in Afan Oromo too

1.2 Expert 2: Agriculturalist

1.2.1 General qualifications
Education: Bachelor or Masters degree in smallholder agriculture, agricultural engineering, irrigation or equivalent engineering or in related field
Professional experience: 10 years in development and establishment irrigation-based smallholder agricultural production and value chains

1.2.2 Experience in the region/knowledge of the country: Work experience in rural Amhara and Oromia

1.2.3 Language skills: business fluency in English and Amharic and ideally Afan Oromo

CVs for both experts to be included in the bidding documents

2. Appropriateness of proposed concept

Next to the CV the bidder should include a **technical concept of a maximum of 8 pages** on **how and when** the task will be implemented.

The **technical concept should clarify on**

- Appropriateness of suggested concept and work plan
  - 2.1. Reflection and full understanding of the tasks and objective
  - 2.2. A workplan including timeline on how and when the processes will be implemented, managed and monitored during the assignment
- Technical capacities
  - 2.3. Submit description/references on developing small-scale irrigation systems / SPIS
  - 2.4. Submit description/references on developing activities regarding irrigation-based smallholder agriculture; flexible financing mechanism for end-users

3. Specification of inputs

Fee days	**Number of experts**	**Number of days per expert**	**Comments**
• Preparation/debriefing	2	3	
• Field trip	2	14	
• Reporting	2	5	

Travel expenses	Number of experts	Number of days/nights per experts	Comments
• Per-diem allowance in country of assignment	2	14	Field research including travel time. Contractor is to cater for his own transport throughout the assignment.
• Overnight allowance in country of assignment	2	14	
• Travel costs (rented / private vehicle)	2	14	
Flights	**Number of experts**	**Number of flights per experts**	**Comments**
• Domestic flights	2	1	Addis to Bahir Dar
Other costs	**Number of experts**	**Amount per experts**	**Comments**

Note: please provide information on the preferred mode of transport (travel within Germany should ideally be by train) and travel class, etc. All costs that are incurred as part of the assignment must be set out in the specification of inputs (costs-by-cause principle).

Calculate your financial bid exactly *in line with the quantitative requirements of the specification of inputs above. There is no contractual right to use up the full days/travel or workshops or budgets. The number of days/travel/workshops and the budgets will be contractually agreed as* ***maximum amounts****. The regulations on pricing are contained in the price sheet.*

Note:

If restrictions are introduced to combat coronavirus/COVID-19 (restrictions on air travel and travel in general, entry restrictions, quarantine measures, etc.), GIZ and the contractor are obliged to make adjustments to their contractual services to reflect the changed circumstances on the basis of good faith; this may involve changes to the service delivery period, the services to be delivered and, if necessary, to the remuneration.

ANNEX

Arsi Zone, Oromia region

S.N	Name of beneficiary	Woreda (district)	Kebele	Drilling type	Depth (meter)	Borehole discharge rate (yield) Litre /Sec	Size of irrigated land (Hectare)	GPS coordinate		
								X	Y	Z
1	Waldaa Gazaanyii	Doodota	Amudde	Tube well	10	4.8	5	08º18’80	039º04’77’’	1600
2	A/karim Kurke H/Binoo	Doodota	Amudde	Tube well	8	3.8	2.5	08º18’63”	039º04’57’’	1601
3	Geetaa Shuuquxee nabii	Doodota	Amudde	Tube well	12	5.8/5.3	3/2	08º18’60”	039º04’77’’	1598
4	H/janno Badhasoo Jaatani	Doodota	Amudde	Tube well	9	4.3	2	08º17’88”	039º04’47’’	1602
5	Ahimed Heey’ii badhasoo	Doodota	Amudde	Tube well	12	5.8	3	08º17’08”	039º04’85’’	1602
6	Zahara Muhammad Tongoo	Doodota	Amudde	Tube well	16	7.7	2	509714	918077	1598
7	Muhammad Tongoo Qumbii	Doodota	Amudde	Tube well	17	8.2	5	509517	917929	1592
8	Amman Gannaa Biiftuu	Doodota	Amudde	Tube well	12	6.7	1.25	509281	917876	1587
9	Sulxii Gammachuu	Doodota	Amudde	Tube well	14	6.7	3			
10	Alamayyoo Doori	Doodota	Amudde	Tube well	12	5.8	2			
11	Tesfaye Getachew Bwaxa	Doodota	Amudde	Tube well	13	6.2	3			
12	Aasha Bute	Z/Dugda	Sembero	Tube well	11	2	2			
13	Abe Tafa	Z/Dugda	Sembero	Tube well	9	2	2			

14	Abbitu Negewo	Z/Dugda	Sembero	Tube well	11	2	1			
15	H/Feko Abdulahi	Z/Dugda	Sembero	Tube well	11	2	1			
16	Abbe Tafa	Z/Dugda	Sembero	Tube well	9	2	2			
17	Kedro H/Aman	Z/Dugda	Sembero	Tube well	6	2	1			
18	Temam Biftu	Z/Dugda	Sembero	Tube well	5	2	1			
19	Kemal H/Geda	Z/Dugda	Sembero	Tube well	6	2	1			
20	Amane H/Biftu	Z/Dugda	Sembero	Tube well	3	2	1			
21	Kaso H/Gena	Z/Dugda	Sembero	Tube well	6	2	1			

West Gojam Zone, Amhara region

Admin. Zone	**W/Gojjam Zone**			
Woreda	**Wonberma**	**Bure Zuria**	**Demebecha**	**Sekela**
Kebeles	Heret	Zalma	Yeworeda wojet	Achayta
	Dend	Sertekez	Asteboji	Tilim
	Wogedad	Fezel	Jajirab	Kolel
	Markum	Santom	Wad	Sawsa
	Wobo	z/shewn	Egzabher ab	Gumbila
		Denbun		Gullie
				Rebu gebeya