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**GIZ Program: ECOServe Armenia**

**Project: Building Resilience to Enhance Food Security: Establishment of a Circular AgroFood Model at the ANAU-Balahovit Farm in Armenia**

**Recipient: Armenian National Agrarian University Foundation (ANAU)**

## **TERMS OF REFERENCE**

### **Dissemination of a demonstration model of fertilizers/biomass of organic origin in Armenia's marzes**

The Armenian National Agrarian University invites qualified organizations to provide a price offer for the services presented below within the framework of the project "Introduction of a Circular Agri-food Model in Armenia" at the Teaching-Experimental Farm of Balahovit, ANAU.

The Armenian National Agrarian University (ANAU) is implementing the measure "Introduction of a Circular Agri-food Model in Armenia" in the Teaching-Experimental Farm of Balahovit of ANAU with the support of ECOserve Armenia Programme implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ).

The constituent parts of this statement are:

#### **Participation criteria and evaluation procedure:**

- Any legal entities registered in Armenia can submit an application.
- The applicant can act as a joint activity (JA), with all members being jointly responsible for the full implementation of the contract.
- The contract will be awarded based on the principle of giving preference to the bidder who has submitted the lowest price offer among the bids evaluated as satisfactory.

#### **Content of the submitted application:**

The applicant must include in his/her application:

- The cost of the bid signed by the participant for ALL lots. The price offer should include all payments required to ensure the performance of the contract, including taxes, duties, fuel, labor calculations, etc.
- A copy of the certificate of registration in the State Register of Legal Entities.
- Documents certifying the applicant's experience in this field.

#### **Procedure for application submission**

- The application can be submitted in both paper and electronic versions until **September 26 of this year by 12:00 pm** to the Armenian National Agrarian University Foundation, located at 74 Teryan, Yerevan, RA. Alternatively, you can send the application to [hovh.anna.isyan@gmail.com](mailto:hovh.anna.isyan@gmail.com).
- The "Armenian National Agrarian University" Foundation reserves the right to accept or reject any bid and to cancel the tender process, rejecting all bids at any time before awarding the contract, without imposing any obligation on the bidder(s) or without explaining the Foundation's actions to the bidder(s).
- In case of any questions, you can contact the Program Coordinator at [hovh.anna.isyan@gmail.com](mailto:hovh.anna.isyan@gmail.com) or call +37494 48 87 85.

### **Description of the service provided**

In the scope of the “Introduction of a Circular Agri-food Model in Armenia,” at the ANAU Teaching-Experimental Farm of Balahovit, the Armenian National Agrarian University has established demonstration models to obtain fertilizers/biomass from manure in the teaching-experimental farm operating in Balahovit community of Kotayk marz to:

1. obtain dry and liquid biomass using microorganisms;
2. obtain dry fertilizer using simple composting technology;
3. obtain dry fertilizer using vermicomposting (Californian red worms) technology.

Taking into account the results obtained during the project, our plan is to disseminate the model of obtaining dry biomass with the use of microorganisms in marzes of the Republic of Armenia, namely in 10 leading farms which have definite experience in the field.

The service to be provided will include:

1. List of beneficiary farms where the proposed model will be implemented; the beneficiaries should be from the marzes of RA (with at least 7 marzes involved); demonstration centers, educational institutions, etc. can also be beneficiaries. The list of selected beneficiaries is to be re-confirmed by the project team of “Introduction of a Circular Agri-food Model in Armenia at the ANAU Teaching-Experimental Farm of Balahovit”.
2. The selected beneficiaries need to have experience in manure processing, such as simple composting technology, application of Californian red worms, etc.
3. The selected beneficiaries need to ensure an approximately 20 square meters of area with access to water to install the model with a volume of 3-5 cubic meters.
4. The selected beneficiaries need to ensure sufficient volume of chicken manure or cattle, sheep and swine manure to implement the model with 3-5 cubic meter volume.

5. The selected beneficiaries need to ensure transportation of the manure to the place intended for the model as well as mixing it with the help of a tractor at an interval of 10 days.
6. The selected beneficiaries should to be involved in animal husbandry or have a permanent access to chicken, cattle, sheep or swine manure and consider the biomass production as a continuous work for their operation.
7. The selected beneficiaries need to be willing to transfer their experience to other farms and act as a model demo farm.

The model needs to be implemented in each of the selected ten farms, providing the products/services mentioned below:

### List of products/services implemented in one farm

N	Name of item/operation	Unit of measure	Quantity required for one farm
1	Laboratory sampling, 2 times per farm, in the beginning and final phases of implementing the model, according to the criteria specified in Table 1	Package	2
2	Microorganisms, each package for at least 5 sq. meters, according to the criteria specified in Table 2	Package	1
3	Thermometer with the range of 0 °C-100°C, to measure the temperature of the manure	unit	1
4	Light-resistant covering polyethilen film 150-200 µm (the density of the material: 0,92 q/uf3 Thermal conductivity: 0.27 W/(m·K), Thermal resistance: 80 °C Frost resistance: 60 °C	Sq. meter	25
5	Manure mixing by a tractor and transportation	Hours	3
6	Professional consulting for implementation and application of the model		

### Description of production

The production will be carried out on open ground and will have an space of at least 20 sq. meters, where fresh chicken manure or cattle, sheep and swine manure will be accumulated, in volume of 3-5 cubic meters, and 1 package of microorganisms will be evenly distributed with a density of 10<sup>10</sup>. The obtained mass must be kept for up to 2 months at a temperature of 25°C and continuously have humidity of 60%-70% and mixed by a tractor every 10 days to ensure air access. During 2

months, 2 laboratory samplings should be carried out to determine the degree of mineralization. The list of laboratory samplings/agrochemical analyses are provided in Table 1:

<b>N</b>	<b>ID</b>	<b>Name</b>
<b>1</b>	NO <sub>3</sub> <sup>-</sup>	Nitrate nitrogen
<b>2</b>	NH <sub>4</sub> <sup>+</sup>	Ammonium nitrogen
<b>3</b>	P <sub>2</sub> O <sub>5</sub>	Phosphorus
<b>4</b>	K <sub>2</sub> O	Potassium
<b>13</b>	CO <sub>2</sub>	Carbonate
<b>14</b>	Ca <sup>2+</sup>	Calcium
<b>15</b>	Mg <sup>2+</sup>	Magnesium
<b>16</b>	EC	Electrical conductivity (amount of dissolved salts)
<b>17</b>	pH	Power of hydrogen
<b>18</b>	%C	Organic matter (humus)
<b>21</b>		Detection of nematodes

<b>The key feature</b>		<b>Results</b>
Appearance		Dust
Homogeneity		Homogenic
Smell		Specific
Color		Light brown
Solubility		Standard
<b>Components</b>	<b>Mass, %</b>	<b>Results</b>
Microbial part	1%	Guaranteed by the producer
Residues of fugate	No less than 1%	Guaranteed by the producer
Filler	98%-99%	Guaranteed by the producer
Microbiology	Norms	Results
Pathogens of the intestinal group: salmonella, Shigella	Absence in 25 grams	Absent, according to the results of the experiment

Titer	No less than 1 trillion cells per 1g of preparation, 10 <sup>10</sup> CFU/g	1,5 x 10 <sup>10</sup> CFU/g
<b>The bacterial preparation is mixture of 5 strain Bacillus type aerobic bacteria spores.</b>		
Bacillus amyloliquefaciens VA27 Bacillus amyloliquefaciens VA31 Bacillus subtilis VA34 Bacillus subtilis VA44 Bacillus subtilis VA46		

### Sample Form

#### of provision of price offer for service delivery (APPENDIX 1)

\_\_\_\_\_ / name, registration number, address of the organization, name and surname of the head/ with this price offer, presents its interest in providing the following services to the Armenian National Agrarian University **the full package of services** specified in the Terms of Reference of the announcement on the dissemination of the demonstration model of fertilizers/biomass of organic origin in the marzes of RA.

The price offer making AMD \_\_\_\_\_ is presented for the specified services and includes the taxes defined by the RA legislation.

Attached to the price offer, we present the organization's experience in this field and a copy of its certificate of registration.

We hereby inform you that we understand that the Armenian National Agrarian University is under no obligation to accept our offer, and in case of acceptance, the mentioned services may be changed depending on the progress in the project.

Name and surname of the head of the organization:

\_\_\_\_\_

<sup>1</sup> The Latin names of the strains of the microorganisms

**Date:**

**Signature:**

**Seal:**

**Phone number:**

**Email:**