Terms of Reference

CNF/2024/ARM-RAP

Functional title	**Aghstev River Aeration project**
Project	River Aeration Project in the Republic of Armenia
Duty station:	The project will be implemented in Tavush region
Duration of assignment:	26 April 2024 to 31 December 2024
Starting date:	26 April 2024, or as soon as possible thereafter
Type of contract	Delivery-based
Application procedure:	The full Application Package should be sent to recruiting@caucasus-naturefund.org marked as **Aghstev River Aeration project**
Application deadline	COB Yerevan (UTC/GMT +4h) on April 23rd 2024
For additional information:	Mr. Arman Avagyan, Program Manager aavagyan@caucasus-naturefund.org

BACKGROUND OF CNF

The Caucasus Nature Fund (CNF) is a conservation trust fund founded in 2007 with the support and encouragement of the German Federal Ministry for Economic Cooperation and Development (BMZ) through the German Development Bank KfW, Conservation International (CI) and WWF.

By providing long-term funding and management assistance to help meet the core needs for Protected Areas (PAs) in Armenia, Azerbaijan and Georgia, CNF supports the conservation of the unique flora, fauna and ecosystems of the Caucasus for future generations, while at the same time improving the lives of local people today.

CNF's support to PAs ensures that basic needs are met through supplements to operational and personnel expenses, and that capacities are strengthened to ensure an improved management of PAs in addressing poaching, logging and other illegal activities, in monitoring flora and fauna species diversity and the health of natural ecosystems, in education of the public, and in promoting tourism and sustainable development.

OVERALL OBJECTIVE

The overall objective of the assignment is to implement pilot project on restoring the natural ecological balance of the Aghstev River which will significantly improve the water quality and enhance the social and economic well-being of the local communities through environmental rejuvenation.

The Service provider will test the **Aeration system in Aghstev river.**

SCOPE OF WORK

The following phased will be fulfilled by the service provider:

1) Inception Phase:

During the Inception Phase a Service Provider will have inception working meetings/consultations with all key stakeholders (Ministry of Environment, CNF, Dilijan National Park and local communities) to confirm the objective, methodology, timetable and deliverables. The existing literature, including previous reports on river aeration (if any) should be reviewed at this stage. At the inception phase, preliminary design and planning of the system should be conducted.

Deliverable 1: Inception report with confirmed methodology (including preliminary design and planning of the system), timetable, and final deliverables.

2) Field Working Phase:

The proposed technical solution involves the installation of a Vertical Axis Wind Turbine (VAWT) coupled with Toring Aerators. This system is designed to increase the levels of dissolved oxygen efficiently and sustainably in the river, a critical component for maintaining a healthy aquatic ecosystem. The VAWT is specifically chosen for its efficiency in varying wind conditions, low maintenance requirements, and suitability for the local environmental conditions. The Toring Aerators, powered by the wind turbine, are responsible for the even distribution of oxygen throughout the river system.

Deliverable 2: Final narrative report. The narrative report should contain photo and video materials, detailed description of the activities, findings and outputs. Intermediate financial report (24.04.2024-31.07.2024) by 15 August 2024 and final financial report by 31 December 2024.

The language for notices, instructions, and other formal messages between CNF and the Organization under this Agreement shall be Armenian/English. The language for final report shall be Armenian and English languages.

METHOTOLOGY

Aeration system description

The innovative aeration system designed for the Aghstev River encompasses a VAWT integrated with mechanically adapted Toring Aerators, including a crucial float support mechanism. This combination is specifically chosen to utilize renewable wind energy to increase the dissolved oxygen levels in the river, thus promoting a healthier aquatic ecosystem.

Vertical Axis Wind Turbine (VAWT)

Structure and Design: The VAWT is characterized by its vertical orientation of rotor shaft and blades, capturing wind from any direction. This design is particularly beneficial in areas with variable wind patterns, such as riverbanks.

Efficiency and Adaptability: Engineered for optimal performance in low to moderate wind conditions, the VAWT maximizes energy capture with aerodynamically efficient blades, ensuring consistent operation even in turbulent airflows.

Installation: Sensitive to the environmental impact, the VAWT's installation process aims to preserve the natural riverbank integrity while ensuring that the turbine is securely positioned for maximum energy harnessing.

Modified Toring Aerators

Wind-Powered Mechanism*:* The conventional electrically powered Toring Aerators have been modified to couple with the VAWT, thus eliminating reliance on external power sources and enhancing the system's sustainability.

Aeration Process: These aerators employ a venturi system to draw in atmospheric air which is then diffused into the water, significantly improving oxygenation. The aerators are driven by the mechanical force generated by the wind turbine, translating wind energy into life-sustaining oxygen for the river.

Configuration and Deployment: Positioned strategically, the aerators ensure an even distribution of oxygen across the river's breadth, factoring in the flow rates and depth for optimal dispersion.

Float Support System

Design and Function: The float support provides stable buoyancy for the aerators, constructed from environmentally friendly, high-density materials that resist UV degradation and impacts from river debris.

Adjustability: Designed for versatility, the float support can be adjusted to maintain the correct depth of the aerators, accommodating fluctuations in water levels across seasons.

Anchoring: The system includes secure anchoring to the riverbed or bank, ensuring the aerators remain in the designated position, providing consistent oxygenation even in varying flow conditions.

Integration of the VAWT and Aerators

Transmission System: A mechanical linkage, consisting of gears and shafts, transfers the rotational energy from the VAWT to the aerators. This system is crafted for maximum energy efficiency and durability.

Control System: An embedded control system within the VAWT allows for real-time adjustments to the aerators' operation, ensuring that aeration levels are maintained consistently despite changing wind conditions.

Positive Environmental Impacts

Restoration of Aquatic Ecosystems: Increased dissolved oxygen (DO) levels will contribute to the restoration and maintenance of healthy aquatic ecosystems, supporting a diverse range of flora and fauna.

Reduction in Pollution Impact: Enhanced oxygenation accelerates the breakdown of pollutants and organic matter, improving overall water quality.

Sustainable Energy Utilization: The use of a wind turbine for power generation highlights the project's commitment to sustainability, minimizing carbon footprints and ecological disruption.

PRELIMINARY WORK SCHEDULE

The following activities and deliverables apply according to the tentative time schedule:

Activities	1	2	3	4	5	6	7	8	9	10	11	12
Inception Report				X								
Acquisition of Permits				X	X	X						
Installation of VAWT												
- Site analysis and finalization							X					
- Procurement of equipment and materials							X					
- Setting up base and rotor shaft							X	X				
- Assembling blades and control system connection							X	X				
Intermediate Reporting												
- Intermediate financial report								X				
Aerators Configuration and Deployment												
- Modifying Toring Aerators							X					
- Installing float support system							X					
Integration of VAWT and Aerators												
- Establishing mechanical linkage								X				
- Calibration of control systems								X				
System Testing and Optimization												
- Testing for energy generation capacity								X				
- Adjusting aerators for targeted aeration								X				
Initial System Activation												
- Starting the aeration process								X				
- Monitoring initial oxygen distribution									X			
Data Collection and Analysis												
- Systematic DO monitoring									X	X		
- Data on aquatic life and water quality									X	X		
Adjustments and Fine-Tuning												
- Necessary adjustments based on data analysis											X	
- Optimizing oxygen injection and distribution											X	
Community Engagement and Feedback												
- Involving local communities											X	
- Gathering feedback for enhancements											X	
Final Reporting												
- Final narrative report												X

Activities	1	2	3	4	5	6	7	8	9	10	11	12
- Final financial report												X

BUDGET

For the complete and satisfactory completion of the tasks specified in this TOR, CNF shall agree on the two disbursements with the organization, negotiable according to the qualifications and experience of the organization in consideration of the listed requirements, as well as the further detailing of the work program and approach proposed in the Application Package.

The two disbursements shall include a detailed breakdown of costs for all fee payments for the project management and administration, installation and equipment, system testing and optimization, data collection, monitoring, and analysis, maintenance, and unexpected expenses as to be specified in financial offer submitted as part of the Application Package.

Specifically, the financial offer shall also include any relevant costs.

KEY QUALIFICATIONS

Organizations interested in signing an agreement with CNF for the implementation of the above listed activities should meet the following generic qualifications:

Minimum 5 Years in Environmental Project Management: Demonstrable experience in managing and implementing mid and large-scale environmental restoration or conservation projects.

Proven track record of Innovative Project Implementation: Demonstrated capability in creatively and effectively solving environmental challenges.

Past and current experience in working with international funding organizations: If Yes, list funding agencies

Technical Proficiency in Water Ecosystem Management: Specific technical knowledge in water ecosystem restoration, aeration systems, and related technologies.

Proven Community Engagement and Stakeholder Collaboration: Strong track record in engaging local communities and collaborating with various stakeholders for environmental projects.

Advanced Research and Data Analysis Skills: Ability to conduct thorough research, analyze complex environmental data, and produce actionable insights.

Financial and Resource Management Experience: Demonstrated capacity in effective budgeting, resource allocation, and financial management for sizable environmental projects.

Effective Communication and Reporting Skills: Proficiency in clear and effective communication, both in writing and orally, including the ability to produce high-quality reports.

ADDITIONAL INFORMATION

Any costs or expenses incurred in preparing the application are at the applicant's risk, and are not eligible for reimbursement by CNF.

The successful Applicant may propose subcontracting additional experts as considered needed, and he/she shall bear full responsibility for the services any expert performs. The assignment of all activities to one or several subcontractors is not permissible. The Application Package shall include a description of experience and CVs of proposed subcontractors as well as a Declaration of Intent signed by all proposed subcontractors, describing the envisioned form of cooperation, lead consultant, division of work, etc.

Awarding of the contract shall be based on an evaluation by the CNF Tender Commission, consisting of representatives of CNF and third-party representatives as relevant. The Tender Commission may interview one or more applicants to assist its evaluation process. The Tender Commission reserves the right to cancel the procedure at any moment and not conclude any contract, without further notice to the applicants. It also reserves the right not to accept the lowest bid.

The applicant will act as an independent contractor under a Technical Assistance Grant Agreement with CNF. The applicant will not be an employee of CNF, and accordingly will be personally responsible for the payment of taxes according to relevant legislation.

Only short-listed candidates will be contacted.

MODE OF APPLICATION

Applicants are requested to submit a full Application Package in the English language, including the following:

- **Detailed Description of Approach (max. 3 pages)** to deliver the outcomes sought, including an understanding of the work required, main implementation activities, etc. as considered relevant. It should also include work plan and timetable, including a description of methodology, as well as the itinerary and timetable of missions, site visits and deliverables. The work plan should include detailed information regarding inception and field working phases.
- **Full CVs for** Organization, Team leader, key experts proposed.
- **Detailed Financial Proposal**, including a breakdown of costs – per for the project management and administration, installation and equipment, system testing and optimization, data collection, monitoring, and analysis, maintenance and unexpected expenses, any applicable VAT or other taxes, other costs, etc. - in AMD.


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