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# TERMS OF REFERENCE (TOR)

ETHIOPIA

**RECRUITMENT OF INTERNATIONAL CONSULTANT FIRM**

## **GENERAL INFORMAION**

## Services/Work Description: Conducting Drone Training

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| --- | --- |
| Project/Program Title: | Enhanced Management and Enforcement of Ethiopia's Protected  Area Estate Project |
| Post Title: | Drone Training Consultant |
| Duty Station: | Addis Ababa and select Project Sites |
| Type of the Contract: | International Consultancy Firm |

Expected Places of Travel: 1) Awash National Park and / or project sites such as Chebera Churchura, Mago, and Omo National Parks (logistics depending).

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| --- | --- |
| Duration:  Expected Start Date: | 2 x 7 (14) working days distributed over three months  Immediately after Signing the Contract and/or indicate range of |

months the consultancy assignment will commence



## **BACKGROUND / PROJECT DESCRIPTION**

Driven by low risk and high profitability, the trade in wildlife products and live animals continues to flourish. Ethiopia has been identified as a key transit (as well as source) country for wildlife products and live animals. The proposed project is seeking to implement solutions that will counter the threats to biodiversity and overcome the barriers to effective management of protected areas and to combatting illegal wildlife trade. It seeks to achieve the project's objective: to build Ethiopia's capacity for biodiversity conservation through increased effectiveness of protected area management and implementation of measures to reduce Illegal Wildlife Trade (IWT) and poaching. The objective will be achieved through the implementation of three project components.

Component I: Protected area management and biodiversity conservation. This component will focus on demonstrating how effective management of protected areas in Ethiopia can be achieved by protected areas, given that the selected pilot sites are those protected areas in which key target species (elephants and big cats) are found.

Component 2: Implementation of anti-trafficking measures. This component will focus on improving different aspects of law enforcement so as to increase the deterrent to illegal wildlife trafficking.

Component 3: Landscape approach to forest and agro-biodiversity conservation. This component focuses on realizing the value of agro-biodiversity for the country and specifically for people living in the vicinity of the protected areas targeted in Component I.

Finally, Component 4 Knowledge Management, Gender Mainstreaming, and M&E: Lessons learned from the project via active participation of all stakeholder groups in the project implementation, gender mainstreaming and M&E will be made available nationally and internationally to facilitate the fight against IWT. Ultimately, the project will contribute to long-term impacts or global environmental benefits including: i) the recovery of wildlife populations in project sites Ethiopia, specifically targeting elephants, lions and cheetahs: these were selected as GWP flagship species to measure the success of the proposed project, and ii) there is no loss of habitat and agro-biodiversity, This project forms part of the GEF Programmatic Approach to Prevent the Extinction of Known Threatened Species and falls under the GEF Programme Global Partnership on Wildlife Conservation and Crime Prevention for Sustainable Development (9071). Under this programmatic framework, with the coordination through the programme steering committee, coordinated knowledge management and cross-fertilization of the individual regional and national projects will be assured.

One of the outcomes of the project is to ensure improved management effectiveness in order to deliver enhanced conservation in the targeted protected areas. The main target of the project is to reduce poaching and sustain wildlife populations within their natural habitat. Wildlife populations specifically Elephants and big cats are expected to increase during the project's lifespan through effective protection from illegal killing and improved habitat management. In order to simplify monitoring and evaluate how the project achieved its targets, baseline information is required on the various aspects of protected area management and ecological attributes of which wildlife populations and land cover is among the most important ones.

Drone surveys are an important source of data about the habitat, wildlife, livestock, and human activities in and around protected areas. Aerial surveys should be undertaken in similar timeframes (seasons) and following standard survey protocols to make consistent interpretations in terms of abundance, distribution as well as dynamics of species population. Drone survey data analysis (aerial imagery and topographic survey) could provide information on:

* the spatial distribution and abundance of conservation assets
* potential ecological connectivity corridors in a landscape;
* the effectiveness of current conservation efforts
* areas of conservation priorities and gaps
* the spatial patterns and nature of threats in a landscape
* critical habitat and species distribution and ecological processes to guide land use planning process
* the potential key area of interest for ecotourism development etc,

## **OBJECTIVES OF THE SERVICE**

The general objective of the training is to establish a core team of trained local drone operators who could collect baseline information in terms of vegetation, land cover, larger mammals especially elephants and associated threats for monitoring and evaluation purpose during the project.

The specific objectives include;

1. Train local staff in operations for both manual and autonomous drone missions.
2. Develop site-specific survey designs (determining of sampling units, sample size, method of sample selection, data recording procedures and protocols, etc.) using available satellite imagery while considering vegetation types of each respective PA.
3. Ensures that adequate sample sizes are designed for rigorous statistical analyses and the survey method is reproducible (repeatable other time).
4. Carry out aerial drone surveillance to determine the potential for observation and inventories (census) of elephants and other larger mammal populations in the selected sites.
5. Analyze the data of the aerial drone survey samples to produce orthophotos, digital surface models and point cloud datasets.
6. **Scope of the Work**

The training will be carried out in Addis Ababa and may extend to the following sites: Awash, Omo, Mago, Chebera Churchura, Kafta Shiraro National Parks, and Babile Elephant Sanctuary, for data collection and field training. The exact locations will be determined at the time through mutual discussion with EWCA staff according to logistics.

Standard training will take place under the following categories:

1. Introduction to drones and applications
2. Flight planning
3. Flight operations
4. Data processing
5. Advanced data processing and analysis
6. GIS and remote sensing integration

An advanced training course will take place at the later date to analyze data collected in the field that can be automated to produce animal counts, vegetation mapping and other activities that are necessary as described above. The advanced course will include using Artificial Intelligence software and a training assistant.

The result of the training courses should include 1) Flight safety 2) Flight operations both manual and autonomous 3) Data processing and analysis 4) Production of vegetation and habitat mapping 5) Associated threats monitoring including agriculture, settlements, deforestation, grazing, number of livestock sighted, 6) Animal census.

**IV. EXPECTED OUTPUTS AND DELIVERABLES**

The outputs and specific deliverables in sequence, corresponding to the work and their corresponding target delivery dates.

1. Training Workshop
2. Drone operations in selected project sites
3. Final Report

**V. METHODOLOGY**

## **Materials and Equipment**

This module introduces to the participants the world of civil drones. They will learn the basics of drone systems, the different types of devices and their main characteristics and functionalities. The participants will understand that not every drone type is suitable for every job and that it is important to select the right equipment to be successful. The module includes an extensive discussion about advantages and disadvantages of different drone types and provides a differentiated view on possibilities and limitations of drones for remote sensing in comparison to satellite and manned airborne based applications,

It is the sensor that transform a drone into a powerful remote sensing tool. In this module, participants will get to know the different sensors types and models available as well as some of the typical applications.

Drones have already been procured for the project. These drones include RGB optical sensor (camera) and FLIR infra-red thermal imaging cameras. Open-source GIS software should be used as part of the training.

## **Photogrammetry**

One of the most popular remote sensing methods practiced with drones is photogrammetry-based mapping. This technique allows the generation of high-quality orthophotomaps and the acquisition of 3D surface information. The generated data can be analyzed in many ways.

Participants will get a basic understanding of the principles of the photogrammetric processes for the generation of orthophotomaps and their implications on how a flight is planned.

A database structure for drone captured data is required and a methodology defined for storing and managing data captured implemented by area, project and time. The digital data captured is automatically geo-tagged by the onboard GPS. The data will be handled in geopackages and used with QGIS.

## **Protected Area Management and Conservation**

As in other fields, there are many advantages of using drones as remote sensing tools in the protected area management and conservation sector. The most popular application is mapping with conventional RGB or multispectral cameras and photogrammetric methods to generate three-dimensional surface information and high-resolution orthophotomaps of vegetation coverage. The data can be used to determine tree positions or tree heights. The module will show the possibilities and limitations of photogrammetric methods for forest mapping and monitoring. There are very inspiring examples of drones being used in conservation and there is a huge potential to develop applications in this field. In this module, some of the existing applications which have significantly improved the study and protection of natural resources will be demonstrated. From simple photography in forest audits in Ethiopia to complex 'artificial intelligence' based monitoring systems in the fight against poaching activities in Africa, this module contains a large spectrum of conservancy related drone applications.

**Animal Census**

Drones will be used to trial new approaches to animal census, particularly of larger mammals and especially elephants. The use of Artificial Intelligence (Al) and machine learning approaches will be applied to counting large mammals in this manner which will form the basis of future surveys and an increase in the use of drones for such work by EWCA staff.

## **Legal Requirements**

With the increase in the number of drones operating worldwide, governments have gradually established new laws to regulate their use by professionals and as well as for leisure activities. In many cases, these rules represent a significant limitation for remote sensing operations, more than any technical and practical limitation. This module will go through the specific legal situation of Ethiopia and discuss what the implications for typical drone-based remote sensing work are.

## **Mission Planning**

Number one cause for the loss of drones during flights is a not well conceived planning. Although drone systems become more and more sophisticated and secure and are able to execute missions in a fully autonomous way, the importance of a well-planned mission and a responsible operator is indisputable. Beside all formal preparation and planning steps, this first block of the training will give a special focus on typical beginner's mistakes.

## **Drone Setup and Field Training**

Learning by doing. After an initial demonstration of a full mapping mission, participants will learn to prepare and carry out drone missions themselves.

## **Post-processing**

A drone-based remote sensing job ends successfully when all acquired data are successfully processed. In this module, the participants will learn how to georeference the aerial photos and process them using the supplied software.

**VI. LOCATION, DURATION, AND TIMEFRAME OF THE WORK**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. | Deliverables / Outputs | Implementing  Partners | Location and Action | Estimated Duration to Complete |
| 1 | Training Workshop | Consultant firm and assigned experts of EWCA | Addis Ababa, EWCA headquarters / Awash NP. | 3 working days |
| 2 | Conducting drone surveys on-site | Consultant firm and assigned experts of EWCA | Selected sites in any of the following (to be agreed with EWCA staff): Awash, Omo, Mago, Chebera  Churchura National Parks, and Babile  Elephant Sanctuary | 4 working days |
| 3 | Animal count and vegetation mapping | Consultant firm and assigned experts of EWCA | Conducting Al software analysis of drone data capture on selected sites for animal counts and using semi-automated classification to map vegetation and habitat | 6 working days |
| 4 | Final report | Consultant firm | Prepare and submit the final report of the drone training | 1 working day |

## **Vll. INSTITUTIONAL ARRANGEMENT / REPORTING RELATIONSHIPS**

* The firm will report to the Project Management Unit (the Project Manager, the Project Coordinator, and the Chief Technical Advisor) of the Enhanced Management and Enforcement of Ethiopia's Protected Area Estate and the UNDP country office.
* The firm is expected to communicate, interact and collaborate with EWCA 's Director General, EWCA's Wildlife Research and Monitoring Directorate, protected areas coordinating directorate director, development and conservation directorate director, and protected areas wardens.

**VIII. Payment Milestone**

The qualified firm shall receive his/her lump sum service fees upon certification of the completed tasks satisfactorily, as per the following payment schedule:

|  |  |  |  |
| --- | --- | --- | --- |
| Installment of  Payment/ Period | Deliverables or Documents to be Delivered | Approval should be obtained | Percentage of Payment |
| 1st Installment | Signing of Contract agreement, submission of the training material and training schedule in soft copy | Y | 25% |
| 2nd Instalment | Workshop I | Y | 25% |
| 3rd Instalment | Workshop 2 + Final Report | Y | 50% |

## **IX. MINIMUM ORGANIZATION AND CONSULTANCY TASKFORCE REQUIREMENTS**

**Qualification of the Training Expert and Team Leader**

* 1. **Academic Qualifications:**

The training expert of the firm for drone survey should have.

* A minimum of MSc degree in Environment, Ecology, Wildlife Management, Conservation

Biology, Geographical Information System or related fields

* 1. **Years of Experience:**
* At least 5 years of experience in the design and conducting of aerial drone survey of wildlife in protected areas and should be able to provide evidence of previous works by testimonials
* The firm should submit valid evidence of experience from organization to whom similar consultancy service had been provided
  1. **Functional Competencies:**
* Excellent skills of computer, drone piloting, GPS survey, calibration, photographing, GIS and related skills
* Ability to analyze data from drone aerial survey and produce scientific report  Experience in drone training
* Ability to carry out vegetation and habitat mapping
* Ability to identify hotspots including settlements, deforestation, agriculture, livestock, and other man-made activities,
  1. **Language and other skills:**
* Excellent knowledge of English, including the ability to set out a coherent argument in presentations and group interactions.
* Capacity to communicate fluently with different stakeholders (civil society, government authorities, local communities, project staff); and
  1. **Compliance of the UN Core Values:**
* Demonstrates integrity by modelling the UN's values and ethical standards  Promotes the vision, mission, and strategic goals of UNDP;
* Displays cultural, gender, religion, race, nationality and age sensitivity and adaptability  Treats all people fairly without favoritism.
* Fulfils all obligations to gender sensitivity and zero tolerance for sexual harassment.

**Important Note:**

* The Consultant is required to have the above mentioned professional and technical qualifications.
* Only the applicants who hold these qualifications will be shortlisted and contacted.

## **X. CRITERIA FOR SELECTING THE BEST OFFER**

Upon the advertisement of the Procurement Notice, qualified Consultant Firm is expected to submit both the Technical and Financial Proposals. Accordingly, the shortlisted consulting firms will be evaluated based on Cumulative Analysis as per the following scenario:

* Responsive/compliant/acceptable, and
* Having received the highest score out of a pre-determined set of weighted technical and financial criteria specific to the solicitation. In this regard, the respective weight of the proposals are:

Technical Proposals will be evaluated:

1. Expertise of firm / Organization 30%
2. Propose methodology, Approach and Implementation Plan 40%
3. Management Structure and Key Personnel 30%

## **XI. LOGISTICS AND ADMINISTRATIVE SUPPORT**

The Consultant Firm will be provided with drones that will be used to conduct the survey training. The project will cover the DSA of assigned experts to assist the survey if necessary. The IP (EWCA) will assign the drone survey participants. Furthermore, the project together with the Ethiopian Wildlife Conservation Authority will facilitate the necessary preconditions and arrangements that are important to conduct the survey training from the beginning to the end.

## **XII. CONFIDENTIALITY AND PROPRIETARY INTERESTS**

The Consultant Firm shall not either during the term or after termination of the assignment, disclose any proprietary or confidential information related to the consultancy firm service without prior written consent. Proprietary interests on all materials and documents prepared by the firm under the assignment shall become that of UNDP.

**XIII. Annex**

PROPOSED STANDARD TECHNICAL PROPOSAL EVALUATION CRITERIA

Herewith please find the Standard Technical Proposal Evaluation Criteria along with respective allocated weight template for Requester's subsequent review.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Summary of Technical Proposal Evaluation Forms | | | | Score Weight | | | Points  Obtainable | | |
| 1 | | Expertise of Consultant Firm | | 30% | | | 300 | | |
| 2 | | Proposed Methodology, Approach and Implementation Plan | | 40% | | | 400 | | |
| 3 | | Key Personnel and level of skill | | 30% | | | 300 | | |
|  | | TOTAL | | 100% | | | 1000 | | |
|  | |  | |  | | |  | | |
| Technical Proposal Evaluation (FORM I) | | | | | | | |  | | |
| Expertise of the Firm / Organization | | | | | | | | Points  Obtainable | | |
| 1.1 | | | | Reputation of Organization and Staff/ Credibility / Reliability / Industry Standing | | | 50 | | |
| 1.2 | | | | General Organizational Capability which is likely to affect implementation   * Financial Stability - Loose consortium, Holding company or One firm * Age/size of the Consultant Firm * Strength of the Project Management Support * Project Financing Capacity * Project Management Control | | | 90 | | |
| 1.3 | | | | Extent to which any work would be subcontracted (subcontracting carries additional risks which may affect project implementation, but properly done it offers a chance to access specialized skills.) | | | 15 | | |
| 1.4 | | | | Quality assurance procedure, warranty | | | 25 | | |
| 1.5 | | | | Relevance of:   * Specialized Knowledge * Experience on Similar Programme / Projects * Experience on Projects in Africa * Prior Work for UNDP/ World Bank / Government Organizations / major multilateral / or bilateral programmes | | | 120 | | |
|  | | | | *SUB TOTAL* | | | *300* | | |
|  | | | |  | | |  | | |
|  | | | | Technical Proposal Evaluation (FORM II)  Proposed Methodology, Approach and Implementation Plan | | |  | | |
| 2.1 | | | | To what degree does the Proposer understand the task? | | | 30 | | |
| 2.2 | | | | Have the important aspects of the task been addressed in sufficient detail? | | | 25 | | |
| 2.3 | | | | Are the different components of the project adequately weighted relative to one another? | | | 20 | | |
| 2.4 | | | | Is the proposal based on a survey of the project environment and was this data input properly used in the preparation of the proposal? | | | 55 | | |
| 2.5 | | | | Is the conceptual framework adopted appropriate for the task? | | | 65 | | |
| 2.6 | | | | Is the scope of task well defined and does it correspond to the TOR? | | | 120 | | |
| 2.7 | | | | Is the presentation clear and is the sequence of activities and the planning logical, realistic and promise efficient implementation to the project? | | | 85 | | |
| *SUB TOTAL* | | | | | | | *400* | | |
|  | | | | | | |  | | |
| Technical Proposal Evaluation (FORM III)  Management Structure and Key Personnel | | | | | | |  | | |
| 3.1 | | | Project Manager / Senior Expert / Lead Consultant / General Qualification  Suitability for the Project | | | |  | | |
| * International experience | | | | 75 | | |
| * Training experience | | | | 75 | | |
| * Professional experience in the area of specialization | | | | 100 | | |
| * Knowledge of region | | | | 30 | | |
| * Language qualification | | | | 20 | | |
| *SUB TOTAL* | | | | | | | *300* | | |
| **Aggregate** | | | | | | | **1000** | | |