National Council for Scientific Research

Center for Remote Sensing

Terms of Reference

FOR

Obtaining an Unmanned Aerial Vehicle (UAV) as part of the CNRS-SuNaR Early Warning System Platform

Technical and Administrative Terms and Conditions

Launched within the context of Disaster Risk Management in Lebanon and the ROFAKA2 AL NAHR Project (Agence Francaise de Developpement/AFD) and within the framework of an agreement signed between the National Council for Scientific Research – Lebanon (CNRS-L) and Solidarités International (SI) for the implementation of a River Basin Diagnosis.

Terms of reference and scope of services in order to obtain an unmanned aerial vehicle (UAV) as part of the CNRS-SuNar early warning system platform

Context

Drones or unmanned aerial vehicles (UAVs) technology is being investigated by monitoring environmental conditions and landscape change rates, responding to natural hazards, recognize the consequences and benefits of land and climate change, conduct wildlife inventories and support related land management missions.

The concept of employing unmanned aerial vehicles (UAVs) to acquire imagery for disaster research and management has progressed into actual implementation in recent years. UAV usage in disaster assessment, response and management is an active area of research. UAVs have been utilized following meteorological, geological, hydrological, ecological, and human-induced disasters. The flexibility, safety, ease of operation, and relatively low-cost of ownership and operation facilitate UAV implementation in disaster situations.

Moreover, Disaster Risk Response Framework Plan has been put forward in Lebanon that established a Disaster Risk Reduction Unit under the Prime Minister's Office with coordination responsibilities in the prevention and preparedness phases of risk management. In order to properly assist both emergency operations, but more importantly to implement proper prevention and preparedness actions the CNRS established in 2014 the Sustainable Natural Resource management platform and early warning system (SuNaR) equipped with skilled experts, hardware and software, internet based satellite receiving station and associated infrastructure for the production and storage of geo-information serving decision making for disaster risk mapping, management and reduction.

The SuNaR platform has been equipped earlier with an Ebee classic drone that has been of a great help in pre and post disasters studies (forest fires, landslides, floods), in addition to urban planning, environmental studies (quarries, river pollution, seashore oil spills. Consequently, there is an urge to increase constellation that can help to increase the SuNaR platform efficiency in collecting post disaster information to support post-disaster reconnaissance, disaster restoration and assessments, and aid in rapid map creation for disaster response. The collected data will also serve other research projects that are used to produce various derived data products (Contours, 3D modeling, NDVI, Agro-hydro indices, crop monitoring Point cloud generation, orthophotography, volumetric measurements). These generated products will help as well to answer scientific and natural resource questions.

Objectives:

The main objective is to equip the SuNaR platform of the CNRS with an unmanned aerial vehicle (UAV) that will generally help in monitoring environmental disorders and landscape change rates,

responding to natural hazards, identify land and climate change, conduct their related inventories and map the level of exposures and the vulnerability of communities and individual to natural hazards in pilot study localities. The desired UAV will particularly help to:

1. Flood damage assessment and mapping (Rofaqa2 Alnaher project)
2. Identify and map forest burnt areas. Assess annual fire burning severity
3. Landslide inventory and mapping
4. Risk management and prevention of potential losses prior to disasters
5. Topographic mapping for critical areas (mudslides, floodplains, etc.)
6. Drought monitoring
7. Crop yield estimates
8. Asses critical infrastructure damages post crises

Terms and Conditions

I. UAV General Characteristics:

- **Usage:** Mapping small to large scale
- **Application:** Land surveying, GIS, natural hazards, environmental protection, agriculture
- **Specs:** Fixed wing drone
- **Landing and takeoff:** Automated vertical takeoff and landing
- **Range:** not less than 100Km
- **Flight time:** 60 min
- **Cameras supplied:** 2 cameras should be included in the offer; one that can be used to create topographic maps and DEMS, Urban areas Quarries Monitoring (RGB, 42 Mp, 1.5 cm resolution), and the other useful for land cover mapping and vegetation indices extraction (RGB NIR RE/ LWIR: TIR, 4.5 cm per band and around 60 cm for thermal band) (see also below deliverables).
- **Cameras resolution:** 42MP (RGB)
- **Sampling distance**: ≈ 1.5 cm (RGB), ≈ 4.5 cm (NIR RE LWIR), ≈ 60 cm (TIR)
- **Payload capability and compatibility**: the payload should prove capability and compatibility to hold LiDAR scanners for future consideration.
- **Radio linkage range:** > 7 km
- **Automatic 3D flight planning:** Yes
- **Wind tolerance:** 9 m\sec
- **GPS with compass:** yes
- **PPK to reduce GNSS geotagging errors:** Yes
- **Ground control Station:** yes
- **GNSS reference station:** yes
- **Automatic landing:** linear and\or vertical landing with ≤ 5m accuracy
- **Multi-drone operation:** Yes

- **Software:** flight planning & control software,
- **Manufacture:** designed, engineered and manufactured in USA or EUROPE

II. Deliverables:

- Set of 1 drone equipped with camera, built-in autopilot for fully autonomous navigation, automatic vertical takeoff and landing control, camera battery chargers with cables, radio modem for data link, drone batteries with its recharger, ground control station and reference GNSS station, PPK, transport case and remote controller, user manual
- Software for mission planning (permanent license)
- Spare parts: a) Wing pairs, and\or body (airframe), b) propeller (2 pack) c) 2 X battery sets (UAV), d) any spare parts to properly and safely execute any mission
- 2 cameras (RGB, 42 Mp, <1.5 cm resolution) & (RGB NIR RE/ LWIR: TIR, 4.5 cm per band and around 60 cm for thermal band)
- 1-year warranty on parts failure
- Full board training 5 days (3 persons) and 5 days to execute a live project with the CNRS-L team

III. Delivery Time:

- 3 weeks upon approval

IV. Conditions:

- Delivered to the National Council for Scientific Research – Lebanon (CNRS-L) / Delivery Duty Paid / DDP

  The National Council for Scientific Research
  Rue Zahia Salman, Beirut – Lebanon
  Postal Code: 2047 8601
  http://www.cnrs.edu.lb
  Tel: +961 1 840260
  Fax: +961 1 822639

- The bidder will take on his burden shipment, transportation, customs, clearance, VAT, delivery and any related charges for delivery to final destination (to the address indicated above).

V. Payment

- Down payment (20 %)
- Complete payment shall be made upon the provision of the services, including training, and verification of its compliance with the specifications

VI. Penalties

- In case of failure to procure the requested goods, the contracting authority will apply a penalty amount of 10,000 Euros (Only ten thousand Euros)

VII. Financial guaranties

- No financial guarantee is requested.

VIII. Transmission of the tender

- Companies that are interested in this contract should submit a tender to the National Council for Scientific Research - Lebanon no later than **6 Sept, 2021 by 13:00 at** the following address:

The National Council for Scientific Research – Lebanon (CNRS-L)
Rue Zahia Salman, Beirut – Lebanon
Postal Code: 2047 8601
http://www.cnrs.edu.lb
Tel: +961 1 840260
Fax: +961 1 822639

Due to the current situation in Lebanon; Envelops should be **hand delivered** to the address above and/or **sent through a courier service** (DHL/Aramex, ….), kindly providing the Tracking Number/Airway Bill Number of mailed documents (by email to the following address: chadi@cnrs.edu.lb)

- Tenders must be placed inside a sealed envelope that must bear : (1) the above address, (2) subject of the tender, (3) the name and address of the tenderer; and (4) The words "***Not to be opened before the tender opening session***" should be clearly marked on the envelop.
- Tenders must be placed inside two sealed envelopes. The **outer envelope** must bear the address indicated above and the name and address of the tenderer. **The inner envelope must also contain two sealed envelopes**, one containing the administrative and technical specification and the other the financial bid. The **first interior envelope** shall strictly mention « Envelope No.1 – Administrative and Technical Part » and contain information on the tender in compliance with supporting evidence and competences described in the call for tenders, while the **second interior envelope** shall strictly mention « Envelope No. 2 - Financial Offer»

- Any envelopes that may be delivered after the above-mentioned deadline and closing time or delivered in non-sealed (unclosed) envelopes will be discarded and will be sent back to the senders.

IX. Content of the tender

- Offers for the service contract shall be written in English or Arabic, and prices shall be denominated in Euros (all-inclusive of VAT, Customs & Clearance for delivery to CNRS-L).
- All Pages of the Tender Document must be signed & stamped by the tenderer or his authorized representative.

« Envelope No.1 – Administrative and Technical Part », To Include:

- Technical specifications with supporting evidence and competences, in compliance with and as described in the call for tenders
- A cover letter for the submission of the offer signed by the tenderer or his duly authorized representative confirming the validity of his offer for 2 months from the deadline for the submission of the offer;
- The completed and signed Terms and condition sheet (see Annex A)
- Commitment to undertake the described tasks, including training, if the contract is awarded to the tenderer, signed by the tenderer or his authorized representative.
- Copy of Company Registration Documents
- Company Bank Account Details (Within same country as Registration)
- A statement, signed by the tenderer or his authorized representative,s attesting the origin of the supplies tendered (or other proofs of origin); an original Certificate of Origin should be sent to the CNRS-L at time of delivery of goods; for awarded tender only.

« Envelope No. 2 - Financial Offer»

- Financial Offer, including training and spare parts, as described in the call for tenders.
- Prices shall be denominated in Euros (all-inclusive of VAT, Customs & Clearance for delivery to CNRS-L).

X. Opening of the tender

- The tenders received will be opened **on 10 Sept 2021 in the CNRS 4th floor-Room #418 at 10:00 am** (in person or via Zoom)
- One representative per tenderer can be present at this opening session. Tenderers who plan to attend the opening session have to inform the CNRS-Remote Sensing Centre by **mail Chadi@cnrs.edu.lb by Sept 8th at most.**

N.B: All payments are issued by Check and/or Bank Transfer. In order to ensure the true value of the bidding amount/payments in Euros; only companies registered offshore or outside Lebanon are encouraged to enter the bid.

For any questions or inquiries please contact Dr. Chadi Abdallah; email: chadi@cnrs.edu.lb; Tel: 00961 3 534 436