

पादप कार्यिकी संभाग
DIVISION OF PLANTPHYSIOLOGY
भा.क[अ.प.—भारतीय कृषि अनुसंधान संस्थान, पूसा, नई दिल्ली—110012
ICAR-Indian Agricultural Research Institute, Pusa, New Delhi-110012

मिसिल संख्या File No. 50-11/SMRETL/19-20/NAHEP(71-01)

दिनांक Dated : 20/09/2019

निविदा—सूचना

निदेशक भा.कृ.अ.प.—भारतीय कृषि अनुसंधान संस्थान नई दिल्ली द्वारा निम्नलिखित वैज्ञानिक उपकरण/वस्तु की आपूर्ति एवं कार्य हेतु प्रतिष्ठित निर्माताओं/अधिकृत डीलरों/आपूर्तिकर्ताओं से दो बोली प्रणाली (तकनीकी एवं वित्त बोली) के अन्तर्गत सील बंद ऑनलाईन क्यूटेशन आमंत्रित की जाती है। क्यूटेशन/निविदा प्रस्तुत करने की अंतिम तिथि 14.10.2019 समय 1.00 बजे दोपहर तक। क्यूटेशन/निविदा को दिनांक 15.10.2019 को समय 02.30 बजे निर्धारित समिति के समक्ष खोली जाएगी।

Online quotations are invited from reputed Manufacture/Dealer/Supplier in two bid system (Technical bid & Financial bid) for purchase of following Scientific Equipment/Items on behalf of Director ICAR-Indian Agricultural Research Institute, New Delhi. The last date for submission of Bid 14-10-2019 at 1.00 PM. The bid will be opened on 15-10-2019 at 02.30 PM by the prescribed committee.

विस्तृत नियम व शर्तों को भा.क[अ.सं. की वेबसाइट www.iari.res.in पर देखें एवं ऑनलाईन के लिए www.eprocure.gov.in देखा जा सकता है। *Please visit www.iari.res.in for Details Rules and Regulation and Log on www.eprocure.gov.in for online.*

क्रम संख्या Sl. No.	वैज्ञानिक उपकरण/ वस्तु का नाम Name of Scientific Equipment/ Item	मात्रा Quantity
1.	Sensors (multispectral with red edge, Thermal and LIDAR) to be used in Drone/UAV and ground mobile platforms as listed below 1. Multi Spectral Imaging Sensor with red edge Mica sense-Rededge MX 2. Thermal Imaging camera 3. Sensor Platform with accessories for Data acquisition 4. Data processing Software with mobile processing unit	One

बोली लगाने के निर्देश और नियम एवं निविदा की शर्तें Instructions to the bidder and terms & conditions of tender:

- आपके द्वारा दी गयी मूल्य दर क्यूटेशन प्राप्ति हेतु निर्धारित अन्तिम दिन से कम से कम 180 दिनों तक मान्य होगी। यदि आपूर्तिकर्ता द्वारा 180 दिनों की न्यूनतम अवधि की वैधता के संबंध में कोई अन्तर हो तो उसका विशेष रूप से उल्लेख होना चाहिए। The rates quoted shall be valid for a minimum period of 180 days from the last date fixed for submission of bid.
- क्यूटेशन में दर्शायी गई दरों में भा.कृ.अ.सं. नई दिल्ली के संभाग/ईकाई पादप कार्यिकी संभाग, भा.क[अ.सं.संस्थान, नई दिल्ली—110012 में सामान/सामग्री की निःशुल्क आपूर्ति अथवा स्थापन शामिल होगा। हालांकि विदेशी मुद्रा में दर्शाए गए उपकरण को एफ.ओ.बी./सी.आई.पी. आधार पर दर्शाया जाए। The rates quoted shall be free of cost delivery and installation at the Division/Unit of **Plant Physiology**, IARI, New Delhi – 110012. However, equipment quoted in foreign currency must be quoted on FOB/ CIP basis
- यदि सामान विदेश—निर्मित है और दर विदेशी मुद्रा में दिया गया है तो ऐसी परिस्थिति में कस्टम ड्यूटी छूट प्रमाणपत्र (सी. डी.ई.सी.) जारी किया जाएगा जो कि केवल भा.कृ.अ.सं. के लिए ही मान्य होगा। Custom Duty Exemption Certificate (CDEC) will be issued only when the bid is quoted in foreign currency in case of foreign made items only and meant for IARI
- क्यूटेशन में संबंधित सामान का पूरा विवरण दिया जाएगा। Full specifications of the item/article quoted for shall be given in the quotation.
- उपरोक्त दिए गए दर में यदि किसी भी प्रकार का अतिरिक्त कर/टैक्स/ड्यूटी लगाया जाना है तो उसका संकेत स्पष्ट रूप से दिया जाना चाहिए If taxes, duties or any other charges over and above the rates quoted leviable, actual

percentage of such taxes/duties/other charges should be clearly indicated.

6. बोली के साथ बतौर बयाना राशि **रु. 50000/-** (रुपये पचास हजार मात्र) का **डिमांड ड्राफ्ट/भुगतान आदेश/मियादी जमा रसीद/ बैंक गारंटी** को निदेशक, भा. कृ. अनु. संस्थान, नई दिल्ली- 110012 के नाम किसी भी राष्ट्रीयकृत बैंक में देय हो, अवश्य संलग्न होना चाहिए। जिसके बिना, क्यूटेशन पर बिचार नहीं किया जायेगा। बयाना राशि की मूल प्रति सीधे तौर पर संबंधित निविदा आमंत्रित अधिकारी को आखिरी तारीख तक या ऑफलाईन दर जमा करने से पहले पहुंच जानी चाहिए। **डिमांड ड्राफ्ट/ भुगतान आदेश/मियादी जमा रसीद/ बैंक गारंटी** से संबंधित सभी जानकारी व्यक्तिगत रूप से भेजी जानी चाहिए, इस संबंध में प्राप्त स्कैन कॉपी/या जो डाटा आपूर्तिकता द्वारा दर जमा करने के दौरान दिया गया है उससे मिलान किया जाएगा अन्यथा इस क्यूटेशन को रद्द माना जाएगा। **EMD of Rs. 50,000/- Rupees Fifty Thousand only** should be in the form of D.D./Pay Order/Fixed Deposit Receipt/Bank Guarantee from commercial bank drawn in favour of Director, IARI payable at New Delhi. The original EMD should be submitted to the Tender Inviting Authority on or before the last date and time of offline bid submission. The details of D.D./Pay Order/Fixed Deposit Receipt/Bank Guarantee physically sent, should tally with the details available in the scan copy and the data enter during the bid submission time otherwise the uploaded bid will be rejected.
7. इस संस्थान द्वारा निविदाकर्ता को किसी भी सुरक्षा जमा राशि और बयाना राशि पर ब्याज नहीं दिया जाएगा। No interest on security deposit and earnest money deposit shall be paid by the Institute to tenderer.
8. क्यूटेशन प्रक्रिया पूरी होने के पश्चात असफल बोलीदाताओं को उनकी जमा की गयी बयाने की राशि वापस कर दी, जायेगी जबकि सफलतम बोलीदाता के मामले में यह राशि नियम के अनुसार सुरक्षा जमा के रूप में समायोजित की जा सकती है, जो कि ऑर्डर के राशि की 5-10 प्रतिशत होगी और यह **डिमांड ड्राफ्ट/ भुगतान आदेश/मियादी जमा रसीद/ बैंक गारंटी निदेशक, भा. कृ. अनु. संस्थान, नई दिल्ली- 110012** के नाम किसी भी राष्ट्रीयकृत बैंक में देय हो, जिसकी वैधता सभी कार्य को पूरा करने के 60 दिनों, साथ के साथ उपकरण/सामान जिसकी कीमत (रु.1.00 लाख या इससे अधिक) की गारंटी भी शामिल होगी। हालांकि जो उपकरण रु.1.00 एक लाख से कम है उस परिस्थिति में किसी भी प्रकार का निष्पादन जमा राशि नहीं दी जाएगी। The EMD shall be refunded to the unsuccessful bidders after finalization of the quotation. In case of successful bidder, it can be adjusted towards security deposit which is 5-10% of the order value in the form of D.D./Pay Order/Fixed Deposit Receipt/Bank Guarantee from commercial bank drawn in favour of Director, IARI payable at New Delhi and shall remain valid for 60 days beyond the date of completion of all contractual obligation of supplier including warranty obligation for the equipment/goods costing Rs.1.00 lakhs (Rs. One Lakh) or more. Here would however, be no performance security deposit for equipment/goods costing less than Rs. 1.00 lakh (Rs. One Lakh).
9. फर्म द्वारा एक वर्ष की वारंटी प्रदान की जाएगी। यदि सामान/उपकरण के विवरण में वारंटी की अवधि में किसी भी प्रकार परिवर्तन है, तो उस वारंटी को अंतिम माना जाएगा। One year warranty has to be invariable provided by the firm. In case, there is any variation in the warranty period given in the specification of the item/equipment, the warranty period shall be the final as given in the specification.
10. कार्य के पूरा होने के बाद फर्म/पूर्तिकता को तीन पूर्व रसीद बिल प्राप्त होने के बाद भुगतान e-payment के माध्यम से किया जाएगा। Payment will be made by mode of e-payment to the supplier/firm after satisfactory completion of work and receipt of pre-receipt bills triplicate.
11. निदेशक, भा. कृ. अनु. संस्थान, नई दिल्ली के पास बिना कारण बताये सभी क्यूटेशनों को पूर्ण या आंशिक रूप से स्वीकार या अस्वीकार करने के अधिकार प्राप्त हैं। The Director IARI, New Delhi reserves the right to accept or reject any or all the quotations either in full or in parts without assigning any reason.
12. उपरोक्त शर्तों का पालन न करने वाली क्यूटेशनों को अस्वीकार करने के लिये उत्तरदायी होंगी। Quotations not complying with the above conditions are liable to be rejected.
13. GST/TIN/VAT/PAN/C.S.T. Nos. के स्कैन कॉपी को क्यूटेशन के साथ में संलग्न किया जाए। Scanned copy of GST/TIN/VAT/PAN/C.S.T. Nos may be attached with the bid.
14. किसी कारण अनुबंध में कोई विवाद उत्पन्न होने पर भारतीय कानून और न्यायालय, नई दिल्ली की अधिकारिता के अधीन होगा। सचिव, भारतीय कृषि अनुसंधान परिषद द्वारा एकमात्र मध्यस्थ नियुक्त किया गया है, जिसका निर्णय दोनों पार्टियों (Supplier और Purchaser) पर अंतिम माना जाएगा। In case, any dispute arising out of this contract shall be subject to the jurisdiction of Indian laws & Court at New Delhi. Sole arbitrator is appointed by the Secretary, ICAR, New Delhi. His decision will be final and binding on both parties (Supplier and Purchaser)
15. सफल बोलीदाता को सौंपे गए कार्य को निर्धारित आपूर्ति आदेश के भीतर कार्य करना होगा जैसा आपूर्ति आदेश में दर्शाया गया होगा यदि ऐसा नहीं किया जाता तो कम से कम 2% तथा अधिकतम 10% की क्षति नष्ट कटौती के रूप में उनके बिल से काटी जाएगी। The successful bidder has to execute the indented Job/Work as mentioned in the supply order placed with them within the stipulated period as given in the supply order placed by this office failing which 2% per week and maximum of 10% deduction as liquidated damage charges will be made from the bill in case the job is not

completed within the given stipulated period.

16. फर्म को इस कार्य/क्षेत्र में 3 वर्ष के अनुभव का प्रमाण पत्र संलग्न करना चाहिए । Firms should 3 years experience in this line, proof should be enclosed.

"The Institute intends to procure the subject store/equipment from M/S Kambill Systems Pvt Ltd, New Delhi, authorized representative of M/s MicaSense, Inc. USA, for sensor -Micasense -Rededge MX, M/s FLIR Systems for thermal sensor-FLIR Vue Pro R and M/s PIX4D, Switzerland for UAV data processing software PIX4D mapper and M/S DJI for sensor platform on the understanding that these farms have the Proprietary rights on manufacturing of this equipment". However if any manufacture is engaged in business of manufacturing the same equipment/item and considers itself capable of supplying the same to the Institute as per desired technical specifications, delivery terms etc at competitive rates, he/she may intimate the same to the undersigned within 14 days of posting of this NIT on the website".

क्रम संख्या Sl. No.	विवरण/उपकरण मद की विशिष्टता Description / Specification of the Equipment/ Item
1.	<p>Name of Equipment : Sensors (multispectral with red edge, Thermal and LIDAR) to be used in Drone/UAV and ground mobile platforms as listed below</p> <ol style="list-style-type: none">1. Multi Spectral Imaging Sensor with red edge Mica sense-Rededge MX2. Thermal Imaging camera3. Sensor Platform with accessories for Data acquisition4. Data processing Software with mobile processing unit <p>Specification : As per Annexure -I</p>

(सहायक प्रशासनिक अधिकारी)
Asstt. Admn. Officer

Technical Specifications Sensor, platform and accessories

1 Multi Spectral Imaging Camera with red edge(Micasense -Rededge MX)

Type	Multi-spectral Imaging Camera with red edge
No. of spectral bands	5 (Blue, Green, Red, NIR, Red-Edge).
GPS and IMU	GPS and IMU must be present in-built.
Geotag.	Images must be geo-tagged for data processing and analysis.
Light Sensor	Sunlight Sensor for calibrating images for change in sunlight.
Weight	Not more than 250 gms.
FOV	Not Less than 46°
GSD	08 cm/px @ 120 m AGL.
Capture Rate	Not less than 1 image / sec with 12bit raw.
Output	Global shutter, aligned with all bands
Trigger Options.	Timer, Overlap mode, Manual.
Reference panel	For calibration and reflectance image
Interfaces	Serial, 10/100/1000 ethernet, removable Wi-Fi, external trigger, GPS, SDHC

2 Thermal Imaging Camera (FLIR Vue Pro R)

Feature	Type
Spectral Range	8 to 13 micrometer or wider
IR Resolution	640 x 512 or more
Temperature Range	-20 to +50 Degree C or wider
Full Frame Rate	25 Hz or more
Lens	13 to 20 mm
FOV	30° or more
Type	Radiometric with geotagger
External Power Source	Should be able to power from a DC battery
Size	No dimension should exceed 10cm
Weight	150g or less
Image storage	SD CARD
Type	Radiometric with geotagger.
Software options	PIX4D
Connection options	USB
Warranty	1 Year
Compatibility	DJI UAV platforms - Phantom 4 pro, Inspire 2 and Matrice 100, Matrice 600 pro

3.Sensor Platform

Type	Quadcopter with inbuilt GPS
Weight	Not more than 1.5 kg including camera, gimbal, battery, propellers
Diagonal Distance	Not more than 350 mm.
Max Take-off Level	Not less than 2500 mts.

Wind Resistance	Not less than 10 m/s.
Flight Time	Not less than 25 min. including camera payload.
Operating temperature	0° to 40° C.
Max Speed	Not less than 65 kmph.
Max Transmission range.	Not Less than 6 kms.
Obstacle Detection.	Five Directional. (Front, Back, Left, Right and downwards).
Camera:	
Sensor	1" Sensor with at least 20 MP.
FOV°	Not less than 80°
Video Resolution.	Not less than 4K @ 30 FPS.
Image Resolution	Not Less than 5472 x 3678.
Camera Rotation	360°
Display	Display unit with preloaded software, 512 GB Memory and accessories for manual and automated flights (Android).
Warranty	1-year warranty
Extra Battery	Two sets of extra battery

4. Data Processing Software with mobile processing unit (PIX4D Mapper)

Type	Data Processing software for images taken via aerial platform
License Type.	Perpetual
Features	<ul style="list-style-type: none"> • Process images taken from any angle with from aerial or terrestrial, manned or unmanned platform • Automatically extracts still frames from videos to create a project • Create a project using images from different cameras and process them together • Import and edit ground control points to improve the absolute accuracy of your project • Select EPSG code from known coordinate systems or define your own local system • Import point clouds from different sources, such as LiDAR, to generate DSMs & orthomosaic. • Rapid processing template for a quick dataset-check while still on site • Optimize internal camera parameters, such as focal length, principal point of autocollimation and distortions • Correct the warp of images taken with rolling shutter cameras (like GoPro, DJI Phantoms, etc.) to maintain accuracy, even when flying fast and low. • Process automatically with or without known camera exterior orientations: (x, y, z, w, f, k) • Produce a dense and detailed 3D point cloud, which can be used as a basis for DSM and 3D mesh • Use presets for point cloud filtering and smoothing options • Automatically classify the RGB dense point cloud into five groups: ground, road surfaces, high vegetation, buildings and human-made objects • Remove above-ground objects from DSM and create a bare-Earth model

Features

- Compensate automatically for change of brightness, luminosity and color balancing of images
- Detect and visualize incorrectly-clicked MTPs (Manual Tie Points)/GCPs (Ground Control Points)
- Assess the accuracy and quality of projects
- Combine multiple projects into one or split large projects into several for more efficient processing
- Import (.shp) or draw specific areas to faster generate results inside specific boundaries
- Set the number of keypoints to filter noise or speed up processing
- Increase the processing speed by leveraging the power of CPU cores and threads, as well as GPUs
- 2 System access in single license without the hassle of being hardware / MAC-ID / IP bound.
- Assess quality of optimized camera positions, 3D point cloud and mesh
- View 3D point cloud and mesh in standard, trackball, or first person viewing modes
- Accurately scale projects with no or imprecise geolocation by defining one/multiple distances
- Orientate projects with no or imprecise geolocation by defining directions of one/multiple axes
- Annotate and edit 2D and 3D GCPs, check points, and MTPs with the highest accuracy, using both original
- images and 3D information at the same time
- Visually assess the size of the error of the computed position of a GCP or MTP
- Reoptimize camera positions and/or rematch images based on GCPs & MTPs to improve reconstruction
- Data Processing software for images taken via drone.
- Carve: Remove points from 3D point cloud and create filters based on image content.
- Mask: Clear the unwanted background in orthoplane results.
- Global Mask: Disregard objects that appear in all images, such as a drone leg or a tripod
- Select, classify or delete points from the point cloud using various selection tools
- Define a plane to generate a DSM and orthomosaic from building facades, bridge piles, etc
- Annotate and measure polylines and surfaces in the point cloud.
- Accurately refine vertexes in multiple original images.
- Annotate & create surfaces in the point cloud to flatten an area or fill up holes in the mesh and DSM
- Create a virtual camera trajectory, play the animation in real-time and export it
- Make the indices more reliable and accurate by correcting illumination effects using a radiometric
- target
- Generate an accurate Reflectance map at the preferred resolution as a basis of index maps

	<ul style="list-style-type: none"> • Improve your analysis by managing and visualizing index values per region • Generate singleband and NDVI maps based on pre-defined formulas without user intervention • Create and save your own formulas choosing among each available input band and generate custom • index maps • Create a basis of your annotated vector map by segmenting the data into classes using statistical algorithms • (equal spacing, equal area, Jenks) • Match on-site scouts and observations by assigning annotations based on your decisions • Put your data into action and export the prescription map in .shp format • Output Results. (2D, 2.5D, 3D). • Process on the cloud -using any web browser. • Visualize 2D maps and 3D models -mesh & point cloud visualization options. • Instant measurement of distances and surfaces. • Inspect objects: visually connect a 3D point and the original images used to compute its location. • Share Projects with annotations via a simple link. • Embed project output in a webpage. • Real-time shading for digital surface model (DSM) visualization. • Mobile processing unit (Windows OS, 14in, min.512GB harddisk, min 16GB ram and min 2.7GHz CPU) backlit keyboard) Data Processing software for images taken from air borne platform (optional)
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Terms & Conditions

- Seller must be authorized Resellers / Distributors for the sensors and platform
- Seller must provide Integrated system of both multispectral and thermal sensor with platform and software.
- On site training on data acquisition, processing
- All the items must have One-year warranty
- Two years AMC (optional)
- Supplier must provide ETA of aerial platform without additional cost
- Supplier needs to provide NPNT compliant platform if available, otherwise supplier needs to give an undertaking indicating it will be upgraded to NPNT compliant of DGCA as and when manufacturer is ready with NPNT module without any additional cost.
- Must have documentary evidence of supplying similar items
