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Request for Proposal (RFP)
Development of an efficient, effective, and replicable digital tool to identify plot health and land management practices on cashew plantations in Benin

Date: 6. November 2020

Subject: Request for Proposal
TechnoServe Inc. (TNS) – Arlington VA, invites your firm to participate in this competitive solicitation for pricing, delivery and terms of potential sale on the following service for TNS office in Benin.

INTRODUCTION
TNS is a leader in harnessing the power of the private sector to help people lift themselves out of poverty. A non-profit organization operating in 29 countries, we work with enterprising men and women in the developing world to build competitive farms, businesses and industries. By linking people to information, capital and markets, we have helped millions to create lasting prosperity for their families and communities.

In Benin, TNS has been active since 2009, developing a competitive industry around the key crop cashew by strengthening and expanding the sector into a more productive, sustainable, and inclusive economic growth engine. To this end and with financial support from Enabel and USDA, TNS is applying latest technologies, such as drone and satellite data, to analyse agricultural best practices for cashew cultivation. After having collected almost 2.000 ha of cashew plantation imagery via drones, TNS is now seeking the services of a remote sensing analytics provider to analyse the captured imagery. Together with the selected provider, TNS aims to build a replicable software tool to allow for the automated analysis of cashew plantation imagery in the future.

BACKGROUND
Cashew production not only provides an important opportunity for economic growth in Benin, but also an opportunity for climate mitigation through tree planting. However, land pressure can lead to environmentally detrimental farming practices such as clearing for plot expansion or mono-cropping. As demand for cashew production rises, it is important farmers are provided the skills to simultaneously maximize productivity and environmental benefit, while also adapting to changing climate conditions.

In Benin, TNS has trained over 27.000 farmers in climate smart agricultural practices such as intercropping and agroforestry management through our BeninCajù program. As a result, over 38.000 ha of cashew plantations are now under sustainable forestry practices. Over the next two years, TNS will train an additional 22.000 farmers in these best practices. If TNS and its partners can target training to areas of highest land degradation and poor practices, we can change the farmers' practices and maximize the environmental benefits of cashew production.

Drone-assisted mapping provides a rapid and cost-effective solution to improve the targeting of climate smart training. By assessing land management through aerial imagery, TNS can identify the areas of highest need and target interventions and training services to reach them, ultimately increasing the number of new farmers engaged in the climate smart production of cashew in Benin.

To this end TechnoServe aims to develop an efficient, effective, and replicable digital tool to identify plot health and land management practices within cashew plantations in Benin. This tool shall allow for the analysis of drone imagery captured of cashew plantations and serve the elaboration of targeted recommendations for improved farming practices. While improved farming practices may include adequate tree spacing or intercropping, the tool shall also serve to identify new insights and provide the basis for the revision of existing best practices.

As part of the project, TNS has collected drone images across five departments and 17 communes across central Benin. A total of 8.000 ha of imagery has already been collected, amounting to 6,5 TB of data.

The collected imagery features a resolution of 6-10 cm and has been captured in the RGB as well as red edge and near-infrared spectra. A variety of drone-mounted sensors was used to collect the imagery, but for the majority of the data a Micasense sensor mounted on an EbeeX fixed-wing drone was used. The imagery was captured at a front-lap of 80%, side-lap of 60% and at an altitude of approximately 90m. These values are without guarantee and vary across the dataset.

For the performance of the work sought under this RFP, TNS is further ready to collect and provide additional geo-referenced ground data as well as to annotate and label images.

GENERAL REQUIREMENTS & SCOPE OF WORK
Following the data collection phase of the project, this RFP serves the selection of a provider of image analytics services for the analysis of approximately 8.000 ha ($\pm$ 10%) of multispectral drone imagery.

Upon receipt of the raw image data from TNS, the scope of work for the chosen provider includes:

1) Image storage:
    a. Receive and store raw images in cloud infrastructure
    b. Visualize imagery through an online interface

2) Photogrammetry:
    a. Assemble raw RGB and multispectral images to geo-referenced orthophotos
    b. Develop Digital Terrain Models (DTM)
    c. Develop Digital Surface Models (DSM)
    d. Develop reflectance maps

3) Image analysis:
    a. Calculate necessary image and vegetation indices (e.g. NDVI, NDRE, MCARI, etc.)
    b. Calculate plant height statistics (high resolution plant height models)
    c. Calculate vegetation cover statistics (e.g. vegetation cover, canopy density, etc.)
    d. Perform tree counts and species identifications (identify and count cashew trees)

4) Plot analysis:
   a. Provide cashew coverage indicators (cashew canopy in m^2 per plot)
   b. Provide tree health indicators (e.g. highlight dead trees or leaf stress)
   c. Provide tree density indicators (e.g. crown-interlocking or excessive density)
   d. (if possible) Provide tree species diversity indicators (e.g. diversity in spectral signatures)
   e. Provide soil coverage indicators (e.g. bare soil and intercropping indicators)
   f. (if possible) Provide carbon indicators (e.g. above ground biomass)
5) Process automation:
   a. Automate the process from image receipt through to provision of plot indicators

TNS aims to develop a replicable tool which shall be characterized by high levels of automatization. In future, this will mean that once drone images of a cashew plantation are sent to the service provider, plot and plant health indicators shall be developed and returned to TNS operators automatically. The time between image submission and indicator provision should be minimized as much as possible. Submitted proposals shall contain a roadmap on how and to what degree automatization can be achieved within the provider's range of services.

The submitted proposals shall remain valid until 31-Dec-2020.

PERIOD OF PERFORMANCE
The period of performance of any contract resulting from this solicitation is anticipated to begin on 01-Dec-2020 and last through 31-Jan-2021. Proposals shall detail the estimated length of time required to accomplish all requirements, with detail on individual activity implementation dates, as referenced in the Scope of Work.

CRITERIA FOR SELECTION
The evaluation of each response to this RFP will be based on the requirements set out in the solicitation and any addenda thereto. At the sole discretion of TNS, the top proposals may be selected for follow-up questions or to provide an oral presentation.

The following weighting and points will be assigned to the proposal for evaluation purposes:

Technical Proposal – 40 %		
Project Approach/Methodology	5 points (maximum)	
Quality of Work Plan	5 points (maximum)	40 total points
Project Schedule	10 points (maximum)	
Project Deliverables	20 points (maximum)	
Management Proposal – 30 %		
Project Team Structure and Internal Controls	5 points (maximum)	
Staff Qualifications/Experience	5 points (maximum)	30 total points
Experience of the Firm	10 points (maximum)	
Previous TNS experience with the Firm	10 points (maximum)	
Cost Proposal – 30 %		30 total points
TOTAL		100 POINTS

TechnoServe reserves the right to award the contract to the organization whose proposal is deemed to be in the best interest of and most advantageous to TNS and the Donor.

TechnoServe will not award a contract to any bidder where there is indication of a lack of business integrity.

The Organization with the winning proposal will be notified in writing. Those who were not selected may or may not be notified, at the sole discretion of TNS.

TERMS AND CONDITIONS
1. The Request for Proposal is not and shall not be considered an offer by TechnoServe.
2. All responses must be received on or before the date and time indicated below. All late responses will be rejected.
3. All unresponsive responses will be rejected.
4. All proposals will be considered binding offers. Prices proposed must be valid for entire period provided by respondent or required by RFP.
5. All awards will be subject to TNS contractual terms and conditions and contingent on the availability of donor funding.
6. TNS reserves the right to accept or reject any proposal or cancel the solicitation process at any time and shall have no liability to the proposing organizations submitting proposals for such rejection or cancellation of the request for proposals.
7. TNS reserves the right to accept all or part of the proposal when award is provided.
8. All information provided by TNS in this RFP is offered in good faith. Individual items are subject to change at any time, and all bidders will be provided with notification of any changes. TNS is not responsible or liable for any use of the information submitted by bidders or for any claims asserted therefrom.
9. TNS reserves the right to require any bidder to enter into a non-disclosure agreement.
10. The bidders are solely obligated to pay for any costs, of any kind whatsoever, which may be incurred by bidder or any third parties, in connection with the Response. All responses and supporting documentation shall become the property of TNS, subject to claims of confidentiality in respect of the response and supporting documentation, which have been clearly marked confidential by the bidder.
11. Bidders are required to identify and disclose any actual or potential Conflict of Interest.

FORM/CONTENT OF RESPONSE
All proposals shall:
1. Be in the **English** language.
2. Contain detailed cost in **Euro**, with applicable Tax/Charges clearly identified.
3. Provide requested payment terms and conditions.
4. Describe the qualifications, experience and capabilities of the firm in providing the type of

services being request by this RFP. Resumes or CVs of "key personnel" shall be submitted as an attachment.
5. Include a contact name, email address, and telephone number to facilitate communication between TNS and the submitting organization.
6. A brief outline of the organization and services offered, including:
   - Full legal name, jurisdiction of incorporation and address of the company
   - Full legal name and country of citizenry of company's President and / or Chief Executive Officer, and all other officers and senior managers of the company
   - Year business was established

SCHEDULE OF EVENTS

1. Questions regarding this request may be addressed to Devon Melville, dmelville@tns.org, and Christoph Weigl, cweigl@contractor.tns.org, and must be received no later than 13-Nov-2020. Responses to questions will be distributed to all interested parties no later than 16-Nov-2020.
2. Responses to the RFP should be addressed to the attention of Devon Melville, Deputy Chief of Party, BeninCajù, dmelville@tns.org, Nadia Mabaya, Grants & Contracts, nmabaya@tns.org, and Christoph Weigl, Technical Expert, CajuLab, cweigl@contractor.tns.org, and submitted **no later than 20-Nov-2020**.

End of RFP