Request for Proposal: Development of a crop monitoring system using remote sensing and field data mapping

RFP n#: 2025-8-ID-CMRS
Location: Global
Start Date: 18-08-2025
End Date: 12-09-2025

Better Cotton key contact

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Impact & Fundraising Team

All applications must be submitted via this form.
You may submit questions to tender@bettercotton.org with the subject header RFP # 2025-8-ID-CMRS until 5th September 2025.

Questions, requests and applications sent after the deadline for queries (5th September 2025) will only be considered in exceptional circumstances. The deadline for submission of applications is 12th September 2025.

Submission Update:

We have changed how we are receiving bids. After submitting your details through the form, you will receive a separate email to upload your supporting documents to a secure platform.

Description

Better Cotton is the world's largest cotton sustainability programme. Our mission: to help cotton communities survive and thrive, while protecting and restoring the environment. In difficult times, we are meeting the challenge head on. Through our network of field-level partners we have provided training on more sustainable farming practices to more than 2.9 million cotton farmers in 26 countries. More than a fifth of the world's cotton is now grown under the Better Cotton Standard and our membership network includes more than 2,400 members.

More information about Better Cotton can be found on our website: www.bettercotton.org

Background

This work is part of a larger ISEAL funded project focusing on the Geospatial Information Technology for Outcome Verification (GIT4OV) as a means to pave the way for improved smallholder livelihoods. This work focuses on the integration of remote sensing and GIS technology to improve cotton farmers efficiency, productivity and sustainability by developing the algorithms for crop detection, crop monitoring and soil health monitoring.

Geospatial Information Technology (GIT) combines the principles of geography with advanced technology to collect, analyse and manage geographical data. The key components of GIT are geographic information system (GIS), Remote Sensing (RS), Global positioning system (GPS) and geospatial data. GIT is being used in various fields including agriculture and natural resource management. GIT is agriculture supports precision farming, crop monitoring, crop advisory and soil analysis for better natural resource management and conservation.

Remote Sensing is a modern-day requirement for agriculture and management practices. Remote sensing has its key implications in crop monitoring, precision agriculture, crop production/yield prediction, soil analysis and weather monitoring for informed decision making for the farmers regarding crop health, site specific fertiliser application, crop rotation and soil management, better planning for yield and market decisions and particularly about tracking weather patterns and predicting natural disasters allowing farmers to practice prevention and mitigation.

Better Cotton has conducted a detailed matrix review of remote sensing technologies in agriculture and GIS approaches that are being used in agriculture globally and have also documented the best practices and case studies from use of remote sensing and GIS applications in agriculture. The matrix review report recommended a hybrid approach for the Better Cotton that can integrate freely available Sentinel-2 imagery or commercial datasets for precise field boundary delineation, especially on fragmented small farms. The review recommendation also included the use of deep learning models to fine-tune through farmer-validated ground truthing via mobile tools such as ODK and introducing a centralised geospatial data warehouse on Azure and a Power BI dashboard to streamline monitoring of crop health, water use, and regenerative outcomes. The scaling should follow a pilot–scale–sustainability roadmap, culminating in a global open-source boundary repository to drive equitable digital agriculture. Based on the recommendations of the review, Better Cotton is looking for developing the crop monitoring system using remote sensing and field data.

Better Cotton distinguishes farms by size to adapt sustainability requirements. Small farms (up to 20 hectares) are typically family-managed with limited hired labour, focusing on basic record-keeping and participatory training. Medium farms (20-200 hectares) involve more structured operations, requiring formal management systems, enhanced documentation, and broader worker engagement. Large farms (>200 hectares) operate commercially with significant labour forces and mechanisation, demanding rigorous compliance with all Better Cotton Principles and Criteria, including integrated pest management, water stewardship, decent work, and biodiversity enhancement. Each category aligns with the Better Cotton Standard System, ensuring that practices are scaled appropriately to farm capacity while promoting continuous improvement. Criteria are adapted to reflect differences in decision-making, resource access, and workforce dynamics, enabling inclusive and measurable sustainability outcomes across all farm types.

A comprehensive remote sensing system must be useful for crops detection particularly cotton in the field with multi-temporal, openly available high-resolution, satellite imagery combined with ground-truthing protocols to ensure accuracy. It should support vegetation indices, canopy cover analysis, and phenological monitoring to detect crop health, stress, and yield potential. It must have integration with GIS platforms to enable spatial mapping and decision support. For rangelands and forests, biomass estimation and land cover classification are essential. The system must accommodate diverse crop cycles, local climatic conditions, and stakeholder needs, while ensuring interoperability with existing agricultural databases and enabling scalable, real-time monitoring for sustainable land management.

Scope of Work & Deliverables

Better Cotton invites qualified consultants or consulting firms to submit proposals for the development of algorithms and integrated tools for crop detection and field data mapping. The scope includes:

1. Design a machine learning-based solution to automate the delineation of agricultural field boundaries using remote sensing imagery. It must be a functional algorithm capable of segmenting satellite imagery to generate polygonal representations of field boundaries by integration of models fine-tuned for smallholder's context compatible with geospatial platforms.

2. Designing algorithms and tools for land cover classification and biomass detection, land conversion over time, crop detection, crop health monitoring, agriculture practices validation (e.g. land levelling, ridge sowing, intercropping etc.) pest and disease detection, yield estimation, soil health monitoring (e.g. soil organic matter, soil nitrogen status, moisture contents etc.) weather conditions and farmer advisories.

3. Integrating remote sensing data with local agricultural practices, weather patterns, and government datasets.

4. Develop dynamic web-based system with graphical user interface (GUI) to access the algorithms and tools developed under scope 1, 2 and 3.

5. Delivering a training module on Web-GIS application use in the field.

6. Creating farmer-friendly guidelines for interpreting localised data and applying insights.

The consultant/firm will develop a robust crop monitoring system integrating remote sensing and field data mapping to enhance agricultural decision-making, outcome verification and sustainability outcomes. The consultant/firm will be designing system architecture, identifying appropriate satellite datasets and ground-truthing protocols, and establishing data validation mechanisms. The system will monitor crop growth/health, stress indicators, and yield forecasts across designated pilot regions (Pakistan, India, Mozambique). It must align with stakeholder needs, support real-time updates, and ensure interoperability with existing agricultural platforms. The consultant/firm will conduct stakeholder consultations, propose user-friendly visualisation tools, and prepare training materials for system adoption. Deliverables include a detailed implementation plan, technical manual, and a pilot-tested monitoring dashboard.

Regions/Countries: Pakistan, India, Mozambique and Australia, but scalable to other cotton growing regions/Better Cotton working location.

IT requirements:

- The newly developed system including the technology stack must be compatible with Better Cotton's existing IT systems (can be further discussed at inception stage).

- The newly developed system must be access based and must have user permissions/restriction like super admin, global login, country login to access the specific country data only. The system must be capable of storing the farmers data in country specific

locations to ensure data protection, security and compliance with legal requirements.

- The proposed system must incorporate robust web security protocols and must comply with established security standards.

- The deployment should ensure scalability, security, and minimal disruption.

1. Purpose of the Assignment

The purpose of this assignment is to develop a crop monitoring system using remote sensing and field data mapping that leverages remote sensing and field data mapping to enhance agricultural decision-making. The system will enable timely detection of crop types, health status, and yield estimates, while also supporting environmental monitoring and farmer advisories to promote sustainable and climate-resilient farming practices and regenerative outcomes verification using the real time data.

2. Methodology

Better Cotton expects the consultant/firm to develop a methodology based on the purpose and scope of work of the assignment. The consultant/firm should also provide justification for proposing a particular approach and methodology with detailed discussion in their proposal. The final decision on the approach and methodology to be used will be done during inception meeting in consultation with the Better Cotton team. The proposed methodology for developing the remote sensing system must be aligned with IT requirements mentioned above.

3. Deliverables

Better Cotton is expecting the following deliverables to be completed by the consultant/firm.

1. **Inception Report:** The consultant/firm must deliver an inception report detailing the proposed methodology, implementation timeframe, cost-benefit analysis, risk assessment, and mitigation strategies. This report will serve as the foundational blueprint to ensure clarity and alignment across stakeholders.
2. **Remote Sensing Module**: A functional remote sensing module should be developed to analyse satellite imagery and other spatial data for crop detection, yield estimation, land cover changes, and environmental monitoring. The module must integrate seamlessly with existing geospatial systems.
3. **Web GIS Module:** The GIS module must enable interactive mapping, data visualisation, and spatial analysis. It should support functionalities like field boundary delineation and overlaying multiple environmental datasets to guide data-driven decisions at farm and landscape levels.
4. **Farmer Advisories Module:** The consultant/firm should design an intuitive module for delivering personalised advisories to farmers. It should use field data, crop health insights, and seasonal forecasts to generate recommendations on sustainable practices, pest control, irrigation, and climate resilience.
5. **Draft and Final Modules:** Initial drafts of each technical module must be submitted for Better Cotton review and feedback. Final versions should incorporate revisions based on validation results and user/field testing, ensuring each module is functional, user-friendly, and contextually relevant.
6. **System Deployment, Source Code, Manual and Guidelines:** The final system must be deployed within the Better Cotton's Azure-based infrastructure. The consultant/firm must also provide a comprehensive operational manual, source code, and user guidelines to support onboarding, troubleshooting, and long-term maintenance.

High-level Timeline

12 Sep 2025	Applications deadline All applications must be submitted via this form.
18 Sep 2025	Applications review & shortlisting / Interviews
25 Sep 2025	The successful applicant will be notified Unsuccessful shortlisted applicants will also be notified
01 October 2025	**Start of the consultancy**
By 30/03/2026	All deliverables completed and invoices submitted. We are aware of the short timeline and leave flexibility to the bidders on how to achieve this but do need to achieve full delivery before the end of the year.

Required Skills & Knowledge

Skills, Knowledge and Experience of the lead consultant
Essential
Firms/Companies: Companies of good standing and relevant track record. Legally be able to work on remote sensing and GIS technologies. **Individuals:** A postgraduate qualification preferably doctorate/post doctorate in a relevant field such of space science, remote sensing, geospatial technologies or other relevant fields.
A minimum of 7 years of professional experience in developing Web/GIS based system or working on geospatial technologies and applications.
Experience of developing large scale and scalable web-based systems and polygonal data generation and use for applications.
Have fulfilled obligations related to payment of government taxes and have valid registration certificate, Tax Registration, Certificate of Incorporation, and other legal business permit/license that allows the supplier/Service Provider to work legally.
Excellent written and verbal communication skills in English
Excellent facilitation and coordination skills
Optional
Working knowledge of the agriculture sector particularly cotton.

In addition to skills, competencies, and expertise, we will consider value for money and demonstrable commitment to the field of sustainability to evaluate applications.

Getting to know you

Company Information	• Full Legal Name • Address • Website • Background • Vision and Mission • Contact person & email address • Telephone number • Your customers
Experience	We'll ask you to tell us about previous assignments
Certifications & Credentials	What certifications and/or credentials do you have? How do these relate to your area of work?
Technical Skills	What relevant skills and expertise do you have? What methodologies have you used in past projects/assignments?
Data Security (Optional for individuals and smaller organisations, but mandatory for larger firms, and Traceability and Data Teams)	Technical Security – We'll ask a technical overview of how your keep data secure in your tool(s), including details of any technical security certifications you hold. Data Protection – Describe your approach to complying with data protection legislation from distinct parts of the world
Fees	Tell us about your fee structure and what it includes: • Hourly or daily rate / per head (if applicable) • Fees per specific tasks/deliverables • Refer to the financial proposal paragraph below.
Company Commitments	What policies do you have in place (as applicable) on sustainability, inclusion and decent work?

Application Requirements

Please note that we have changed our RFP submission protocol, and this is now in two phases:

- **Phase 1: Initial details will be submitted on the form found in this link.**
- **Phase 2: You will receive an email with live links to upload relevant documents (please check your Spam and Junk folders).**

Proposals sent to respond to this Request for Proposals must include the following:

- A succinct, well-documented **Technical Proposal** that includes:
  - Understanding of the assignment including a summary of tasks and main objectives
  - The proposed approach and methodology including working approach and justification for the working approach and methodology.
  - Activities and their corresponding timeline.
  - A clear description of the project team members with details of their relevant. experience and their CVs. If any external experts will be engaged, share their profiles as well.
  - At least three references from similar work conducted by the consultant/firm.

- At least one sample of previous relevant work ***(the contents of which will remain confidential and will be used for the sole purpose of evaluating the submission and link of online platform if publicly available).***
- A Financial Proposal: please provide a detailed budget including the time allocated for each activity and the daily rates per person. Please note that ALL costs must be included in the detailed budget including expenses, traveling costs, and taxes. Value for money is highly appreciated and preferred.
- Be capable of full invoicing and delivery before 30/03/2026.

Evaluation Criteria

Proposals will be evaluated based on the following criteria:

Technical Evaluation Criteria
- Demonstrated understanding of this RFP.
- Quality and clarity of the proposal.
- Relevant professional experience of the proposed consultant(s)/firm.
- Quality and relevance of the sample work submitted.

Financial Evaluation Criteria
- Quality and clarity of budget provided, and level of detail included.
- Value for money.

We thank all applicants for their interest. However, only shortlisted applicants will be contacted.

Better Cotton is committed to good practice and transparency in the management of natural, human and financial resources. All applications will be reviewed under the principles and subject to Better Cotton's policies on equal opportunity, non-discrimination, anti-bribery & corruption and conflict of interest.