Terms of Reference for Developing an E-Catalogue of Agricultural Technologies and Digital Agricultural Advisories

1. Background

Agricultural development is crucial for food security, economic growth, and rural livelihoods. A digital compendium in the form of an e-catalogue is required to enhance access to innovative and sustainable agricultural technologies. This e-catalogue will serve as a comprehensive and interactive platform for stakeholders, including farmers, researchers, policymakers, and extension service providers. The platform aims to bridge the knowledge gap by facilitating easy access to detailed information on proven and emerging agricultural technologies.

CCARDESA is a subsidiary organization of SADC, which was established in 2011 by SADC Member States as a specialized implementing body for agricultural research and development (R&D) in Southern Africa. The CCARDESA charter identifies five major objectives: (i) to coordinate and promote collaboration among regional and national agricultural research and extension systems (NARES) through regional and international cooperation; (ii) to facilitate the exchange of information and technology among the SADC regional R&D institutions; (iii) to promote SADC region partnerships between public, private, civil society and international organizations in R&D; (iv) to improve agricultural technology generation, dissemination and adoption in the region through collective efforts, training and capacity building; and (v) to strengthen national R&D institutions by mobilizing human, financial and technological resources to implement and sustain demand-driven activities.

Over the years, CCARDESA has been facilitating the generation and dissemination of agricultural technologies, innovation, and management practices (TIMPs) as well as digital advisories through different projects, including the Agricultural Productivity Programme for Southern Africa (APPSA). To enhance the access and adoption of TIMPs and use of digital agricultural advisories amongst end-users and the verification process, CCARDESA is adding the use of an e-catalogue to the available dissemination strategies.

2. Justification

The development of an e-catalogue is justified by the following factors:

- **Accessibility**: A digital platform ensures that farmers, researchers, policymakers and other users can access agricultural technologies and advisories anytime and anywhere, overcoming geographical limitations.
- **Efficiency**: Traditional paper-based compendiums are often bulky, expensive to produce, and difficult to update. An e-catalogue allows real-time updates and seamless information dissemination.
- **Interactivity**: The inclusion of multimedia elements such as images, videos, and interactive tools enhances user engagement and understanding of agricultural technologies.
- **Knowledge Sharing**: Facilitates collaboration between agricultural institutions, researchers, and practitioners by providing a centralized repository of best practices and innovations.
- **Sustainability**: A digital solution reduces the need for paper-based materials, contributing to environmental conservation and cost savings in printing and distribution.
- **Data-Driven Insights**: The e-catalogue can incorporate analytics to track user engagement, technology adoption rates, and feedback, enabling continuous improvement of agricultural practices.

3. Objective

The objective of this assignment is to design and develop an e-catalogue that consolidates and presents a wide range of agricultural technologies and advisories in an accessible, user-friendly, and interactive digital format. For TIMPs, the e-catalogue will provide detailed descriptions, benefits, application procedures, case studies, and expert insights for each technology or management practice listed.

4. Scope of Work

To reach more users of these technologies, the consulting firm is expected to develop a database of the best technologies with an online interface (e-catalogues) that are customized to the main regional audiences or user segments (governments, private sector, and development institutions). The e-catalogue will need to be adapted to meet the needs of the main target audiences, and the database should include a transparent system of technology vetting and selection, leveraging the technology scaling readiness framework to inform the technology vetting process.

CCARDESA intends to solicit and engage a consultancy firm to deliver the following:

i) Design of the database and new e-catalogue interfaces
ii) Web Development Services for the new e-catalogue website
iii) Plan for hosting services and maintenance

Specifically, the firm is expected to provide the following deliverables:

a) A complete Product Requirements Document, including the following:

i. A clear description of the Objective/Goal (explaining why you are building the e-catalogue and what you hope to accomplish);
ii. Features (a complete list of features with description, goal, and use case);
iii. UX Flow & Design Notes (the UX design of all features);
iv. System & Environment Requirements (which end-user environments will be supported, such as browsers, operating systems, memory, and processing power, etc.);
v. Assumptions, Constraints & Dependencies: List what is expected of users, any limits for the implementation to be aware of and any outside elements required for the final solution to be functional.

b) A fully functional and deployed website with the underlying database
c) A training module for CCARDESA teams and partners on the use of the site and of the database
d) The maintenance of the site and database over a period of one year

The firm must identify and provide a team of specialists with the necessary know-how and experience required to perform all the tasks (database developer, webmaster, web designer, web developer, etc.) in order to complete the database and website design and subsequent implementation of any approved new solution.

4.1 Description of the Database

The database will be built within the existing CCARDESA website and should contain various fields describing individual technologies, including the possibility of uploading documents in Word, PDF, pictures, or videos, etc. The database will need an online entry form, a verification and validation process, an automated assessment of the readiness to scale, return on investment, Gender considerations, and an assessment of the environmental impact of each technology, based on information provided in dedicated fields. Each field must be duplicated in the database to allow the entry of raw information and then rephrased in a simple and easy-to-understand language by the technology profiling team.

4.2 Description of e-catalogue

E-catalogues are the visual interface (read-only) to the database and are a central tool for showcasing the vetted and validated technologies. The firm should ensure that the website incorporates a user-friendly way to display, browse, search, evaluate, download, or save technologies, and record search results. The website should also be automatically available in a version suitable for use on mobile devices. As a default, only technologies over a defined level of Scaling Readiness will display in the e-catalogue. Users of the e-catalogue will have the option to switch off this default filter.

Each e-catalogue should display a subset of the fields from the database according to its audience's needs. Similarly, the e-catalogue should be able to filter and display the technologies that are deemed appropriate for this audience. The firm should ensure that the e-catalogue's appearance and functionality are appropriate for its audience.

The firm is encouraged to research similar e-catalogues (including this link: https://qcat.wocat.net/en/wocat/) to gain inspiration for design, features, UX flow, and e-catalogue architecture.

4.3 Suggested workflow steps for integrating and showcasing new technologies into e-catalogs:

Below is the proposed workflow for integrating the TIMPs and advisories into the e-catalogue. The firm is expected to review and suggest modifications/additions where necessary.

i. Technology submission (database) using an online form. The information within the database is expected to be updated as and when required by the technology holder
ii. Vetting and Validation (database) – this will be done automatically based on the scaling readiness ranking. A final validation of the ranking by an expert committee will then be recorded.
iii. Feedbacks (database and e-catalogue): the system must be able to receive feedback in the database itself and from the e-catalogue users.
iv. Update/Improvement of the technology/information (database) – as specified under “technology submission”

4.4 Proposed Design and Layout for the e-catalogues

The firm is expected to design and build a user-friendly interface with an intuitive and clear navigation structure to accommodate users with varying digital literacy levels and provide easy access to information. CCARDESA will evaluate the options provided in terms of design, layout, and ease of use, and provide feedback to the firm on the preferences. If the design and layout include images or other material that CCARDESA cannot provide, the firm will need to provide them (where possible) without extra charge. The new design and layout must be implemented on the entire website. If hosted elsewhere, the e-catalogue web pages must be linked to the CCARDESA website and accessible seamlessly from that site as if they were a part of it. The firm should develop a system that is robust, scalable, and capable of storing and managing agricultural technology information, ensuring data security and easy retrieval. It should integrate multimedia elements such as images, videos, infographics, and downloadable resources to enhance user engagement. It should also ensure mobile responsiveness and cross-platform compatibility to facilitate access on various devices, including smartphones, tablets, and desktops.

4.5 Search Engine Optimization (SEO)

A powerful and user-friendly internal search engine will be required. The firm is expected to integrate a search and filter system for easy access to specific technologies based on categories such as crop type, farming practice, geographical relevance, and environmental sustainability. The availability of user guides, a mini online help desk, and feedback mechanisms (such as pop-up text boxes on cursor hover) to support users will be a core requirement. Users should be able to create

accounts so that they can save their favourite technologies and access them at any time. An automatic editing system (identical to that of scientific journals) should be set up to allow users to edit their own technology toolkits and download them in an easy-to-print, user-friendly format. The e-catalogue needs to integrate a translation option into the main SADC languages (at least French and Portuguese on top of the English underlying system). The use of an on-the-fly translating system such as Google Translate is preferred.

4.6 Intellectual Property Rights (IPR)

All intellectual property rights and the complete website content, as well as all work performed under the contract, are the express and exclusive property of CCARDESA as described in its contractual agreement with its donor.

4.7 Hosting and Deployment

The Contractor is expected to advise on the hosting solution (server or cloud-based), deploy the database and e-catalogue website and ensure that the site operates and renders correctly. During the deployment, the firm shall make sure no links are broken, especially external links leading to the main website.

4.8 Training

The firm will be required to provide user training and technical documentation for users and administrators to ensure effective management and updates. The end-user instructional documentation must not be overly technical and should be easy to understand for CCARDESA staff with a minimum background in web management.

4.9 Testing

Rigorous testing, debugging, and refining of the platform will be required before deployment to ensure a seamless user experience and functionality.

A test/demonstration system will be required to be made available for CCARDESA staff to follow and continuously evaluate the system. This system will also be used for preliminary acceptance testing prior to any final staging and production solution deployment.

4.10 Staging Services

The firm will be responsible for the transfer/deployment of the website from the firm's servers (if applicable) via FTP or any other approved means to the approved server(s) identified for production deployment to ensure uninterrupted service. After completing the contract term and successfully transferring all content to the new web server, all CCARDESA information should be deleted from the firm's server(s).

5. Timeline

The assignment is expected to be completed within 12 weeks from the contract start date, with key milestones as follows:

- Week 0: Negotiations and contract signing.
- Week 3: Needs assessment, literature review, stakeholder consultations, and inception report.
- Weeks 4 to 8: Design and development of the prototype, including database architecture and UI/UX design.
- Week 9: Initial testing, refinement, and stakeholder feedback.
- Week 10: Full system deployment, training, and final testing.
- Weeks 11 and 12: Final adjustments, submission of the final report, and recommendations for sustainability.

6. Payment schedule

The proposed payment schedule based on the satisfactory performance of the contract, which will be negotiated with the successful firm, will be as presented in the Table below:

S/No	Deliverables/Reports	Timelines after contract commencement	% of the contract amount
1	Negotiations and contract signing	Week 0	10%
2	Inception report: Needs assessment, literature review, stakeholder consultations,	Week 3	10%
3	Report of the design and testing of the prototype, including database architecture and UI/UX design.	Week 7	20%
4	Accepted report of the initial testing of the database and e-catalogue incorporating stakeholder feedback	Week 9	30%
5	Final report of a full system deployment and user training	Week 12	30%

7. Required Expertise of the Firm and Experts

7.1 Experience of the firm:

The firm should have the following:

7.1.1 At least 10 years of experience in developing and managing e-catalogues for Agricultural Technologies or providing similar services to clients;
7.1.2 At least 5 years of experience in conducting similar assignments at regional level; and
7.1.3 A solid technical and management structure with clear reporting formats.

The firm should have a combination of skills in technical, design and agricultural technology dissemination-related **academic qualifications**. The Firm is expected to assign experts with a minimum of the following experience and qualifications:

- Proven experience in web development, database management, and UI/UX design, particularly for knowledge management systems.
- Experience in developing digital platforms for the agricultural sector, rural development, or similar fields.
- Strong background in data structuring, visualization, and multimedia integration.
- Knowledge of agricultural technologies and rural development practices is an advantage.
- Strong communication, documentation, and training skills to ensure knowledge transfer.
- Expertise in developing mobile-responsive and cross-platform solutions.
- Familiarity with integrating analytics tools for user engagement tracking and system improvements.
- Ability to provide technical support and maintenance post-development.

7.2 Qualification of experts:

7.2.1 Team Leader:

- At least a Master's degree in Computer Science, Information Technology, Software Engineering, or any other related qualification.
- At least 10 years of experience in carrying out similar work and managing a team of specialists
- Experience in creating the back-end, database, and front-end of an e-catalogue system.
- Practical experience in using programming languages such as HTML, CSS, JavaScript, PHP, and Python
- Experience using data management systems such as SQL NoSQL
- Proven experience in innovative and creative web design with specific attention to user friendliness and audience customization.
- Traceable work in web development.
- Be able to easily demonstrate value for money based on any assessment of your budget proposal.
- Experience working in the international development sector will be an advantage.

7.2.2 Team Member 1: Digital Design & UX/UI Fields Expert

- A bachelor's degree with at least 7 years of experience or a Master's degree with at least 5 years of experience in the following fields: Computer Science, Library, Information Science, Software Engineering, Graphic Design, UX/UI Design, Multimedia Design, or any other related field.
- Practical and traceable experience in designing attractive and user-friendly e-catalogues or similar platforms.
- Knowledge of the use of tools like Adobe Photoshop, Illustrator, Figma, and UX/UI principles.
- Strong experience in front-end development languages such as HTML, CSS, JavaScript; back-end development such as SQL, Nodejs, Python, PHP, etc.

- Proven experience in innovative and creative web design with specific attention to user friendliness and audience customization.
- Ability to integrate, if justified, data analysis and Game Theory into website development
- Strong track record in website design, security, and administration; Google Analytics; Search Engine Optimization.

7.2.3 Team Member 2: Agricultural Technology Dissemination Specialist

- At least a Master's degree with 7 years of experience in Agricultural extension and education, agricultural Information and communication management, Digital agriculture, Data Science, or related disciplines.
- Experience in disseminating agricultural practices using different extension methodologies, including e-extension.
- Knowledge of precision farming, remote sensing, GIS, AI in agriculture, and IoT applications will be an added advantage.
- Experience in using and managing digital extension tools (e.g., Farm Radio, SMS-based advisory, Mobile Apps) and community engagement
- Understanding of End Users' needs to match with adequate technical solutions.

8. Management and accountability of the assignment

The firm will report the Regional Programme Coordinator for Food Systems Resilience Programme (FSRP) who will be responsible for the assignment's overall technical and administrative. The Regional Coordinator will work closely with designated technical teams, content specialists, and IT support teams to ensure the successful implementation of the e-catalogue. The firm's personnel will, on reasonable notice, participate in meetings and discussions as required by the Regional Coordinator. All meetings, discussions, presentations, training materials and deliverables shall be in the English language.

9. Obligations of the Client

The Client will provide the following support to the firm, where necessary:

(i) Office space, office equipment (shared printer, copier, scanner), stationery, internet access, and transport services for official use in the delivery of the services.
(ii) All available relevant documentation to the firm, such as the Project Appraisal Document, Periodic reports, Implementation Manual, etc.
(iii) Contacts of key stakeholders.
(iv) Introductory letters to key stakeholders to facilitate communication.
(v) Facilitate review and dissemination meetings with key stakeholders; and
(vi) Facilitate liaison with other program implementing partners.

10. Obligations of the Firm

The Firm shall be responsible for the provision of all the necessary resources to carry out the services (if necessary) such as international travel, project transportation for visits in countries, subsistence allowances, accommodation, information technology, and means for communications, reporting materials, insurance, and any other required resources. The firm is expected to undertake activities that will ensure that outputs are consistent with the professional and legal requirements and are provided in a timely manner.

11. Proprietary Rights of Client in Reports and Records.

All the reports, data, and information developed, collected, or obtained from the implementing agencies and other Institutions during this exercise shall belong to the Client. No use shall be made of them without prior written authorization from the Client.

At the end of the Services, the Firm shall relinquish all data, manuals, reports and information (including the database, codes, and related documentation) to the Client and shall make no use of them in any other assignment without prior written authority from the Client.