Food and Agriculture Organization of the United Nations

# Agricultural Information Management System

## Case study

Southern African Development Community (SADC) region

Funded by the European Union

# Preface

The development of the Southern African Development Community (SADC) Agricultural Information Management System (AIMS) is the result of a successful partnership between the SADC Secretariat and its 16 Member States, the Food and Agriculture Organization of the United Nations (FAO), and the European Union (EU). The AIMS is an integrated and multilingual system providing decision-makers with access to reliable and timely data on which to base policies, resource allocations, and emergency interventions. Through a longstanding alliance to promote productivity, sustainability, and market competitiveness of the region's agricultural products, the FAO and EU have teamed up with the SADC Secretariat to develop an information management system that will see the standardization and harmonization of agricultural data which will ensure policy makers and actors along value-chains have timely access to reliable information. It is hoped the platform will stimulate agricultural intensification, enhance food and nutrition security, and promote regional integration, trade liberalization and equitable economic growth.

The development of the SADC AIMS has been made possible through the collaboration between SADC and FAO under the 11th Economic Development Fund programme of 2014 - 2020 (EDF 11), financed by the European Union (EU). The overall objective of the programme is to accelerate progress towards implementation of SADC regional integration. The EU through this programme committed € 6.2 million to the project being implemented by FAO, titled ▫Support Towards the Operationalization of the SADC Regional Agricultural Policy, (STOSAR). The AIMS component of the Project seeks to enhance access to information on agricultural production, productivity, sustainability, and competitiveness for evidence-based decision-making. Once the SADC AIMS is fully established and implemented at regional and national levels it will facilitate timely exchange of reliable statistical data and information and improve communication between the SADC Secretariat and its Member States (MS), and among the MS themselves.

This case study:

i) provides an overview of the AIMS development process;
ii) an overview of the structure of the various components of the SADC AIMS; and
iii) seeks to capture early lessons learned during the development; with the hope that this will inform and provide some best practices for those wanting to set up similar agricultural information systems.

The SADC AIMS is the result of the work of a core team of technical experts consisting of information technology (IT) developers, statisticians, experts from various disciplines, crop, livestock, fisheries, and forestry, with the valuable contributions of the SADC Secretariat and its 16 Member States.

We are confident that the wide involvement and engagement of IT and agricultural experts, AIMS technical committees and other key stakeholders at regional and national levels will lead to a large consensus, essential for the broad adoption of the SADC AIMS.

Any comments or suggestions are warmly welcomed.

Contributions can be sent to: SFS-Stosar@fao.org.

# Acknowledgements

The development of the SADC AIMS has been a widely consultative and inclusive process involving all key stakeholders and partners. The process has been led and coordinated by the FAO STOSAR Project Team, namely: Elma Zanamwe (Regional Project Coordinator); Fadi Mujahid (Senior IT developer and document author); Aboubacar Daman (Information System Specialist); Gildas Nzingoula (Statistics Specialist); Zibusiso Sibanda (Plant Health Specialist); and Joseph Magona (Animal Health Specialist).

Overall technical guidance has been provided by Stuart Tippins (Information Technology Officer, SFE); Mathew Abang (Plant Production and Protection Officer and Project Lead Technical Officer, SFS); and Berhanu Bedane (Animal Production Health Officer, SFS).

The STOSAR Project team also acknowledges the contributions of SADC counterparts: Duncan Samikwa (Senior Programme Officer and RAP Programme Coordinator); Panduleni Elago (Programme Officer); Alphonci Muradza (Information Systems Officer); Esaiah Tjelele (Crops Officer), Gaolathe Thobokwe (Livestock Officer); Deepchandsingh Jagai (Senior Officer Statistics and Research), Ruth Zarafenosoa (Research and Statistics Officer) and Michael Ernest (Information and Communication Technology Officer).

The layout was realized by Enrique Anton (Creative and Graphic designer), and review of the document was done by Nelao Haimbodi and Sibusisiwe Ndlovu (Communications).

# Glossary of terms

Agile Project Management. Agile project management methodology is an iterative approach to delivering a project throughout its life cycle. Iterative approaches are frequently used in software development projects to promote velocity and adaptability since the benefit of iteration is that you can adjust as you go along rather than following a linear path.

Design Thinking methodology. Design Thinking is a design methodology that provides a solution-based approach to solving problems. It's extremely useful in tackling complex problems that are ill-defined or unknown, by understanding the human needs involved, by re-framing the problem in human-centric ways, by creating many ideas in brainstorming sessions, and by adopting a hands-on approach in prototyping and testing.

Information. Information is stimuli that has meaning in some context for its receiver. Information provides context for data. For example, a list of dates – data – is meaningless without the information that makes the dates relevant (dates of appointments).

Indicator. An indicator is a specific, observable and measurable characteristic that can be used to show changes or progress a programme is making toward achieving a specific outcome.

User Interface. The user interface (UI) is the point of human-computer interaction and communication in a device. This can include display screens, keyboards, a mouse and the appearance of a desktop. It is also the way through which a user interacts with an application or

a website. The UI is often talked about in conjunction with user experience (UX), which may include the aesthetic appearance of the device, response time and the content that is presented to the user within the context of the user interface.

Short feedback loops. The timeframe between a user testing and providing feedback on the features and functionalities of the platform.

Module. A module refers to all indicators that form part of a specific agricultural sector. For example, the Crops module will house all indicators related to Crops, and the Livestock module all indicators related to Livestock.

# Background

Southern African Development Community (SADC) Member States (MS) have the potential to be food secure and support vibrant economies based on intra and inter regional trade. The agriculture sector is one of the key drivers of the region's economic growth, creating employment and generating income for about 70 per cent of the region's population of 345 million people. Underpinning and supporting the growth of this vibrant sector are a number of policy initiatives, strategies and plans that have been developed and are being implemented, notably; the SADC Vision 2050, and the Revised Regional Indicative Strategic Development Plan (RISDP) 2020-2030. The SADC Regional Agricultural Policy (RAP) approved in 2014, was formulated within the framework of the SADC Common Agenda on sustainable and equitable economic growth and socio-economic development.

The RAP, which is aligned to the Comprehensive Africa Agriculture Development Plan (CAADP) pillars and the Malabo Declaration's new goals for the development of agriculture on the African Continent, sets out common objectives to guide, promote and support the actions of the agricultural sectors of SADC MS, with a view to enhancing regional harmonization and integration. The African Continental Free Trade Area (AfCFTA) agreement which came into effect in January 2021, presents another opportunity for MS to expand their geographic marketing footprint of agricultural commodities and services to the rest of the African Continent, as a result of reduced sanitary barriers and other constraints.

To successfully and effectively implement these initiatives, good and reliable statistical data is essential for attaining set targets and measuring progress. The importance of accessible, accurate and reliable statistical information cannot be overemphasized. Policy makers, producers (which includes small scale and commercial farmers), and the private sector (input and output suppliers, processors, and retailers) all benefit from information on agricultural sector input/output requirements, production volumes, prices, and potential markets. This information is valuable for investment, livelihoods, and trade purposes. An effective agricultural information system therefore contributes to the growth of the sector, enhances food and nutrition security, promotes economic development and regional and continental integration.

Since 2006, the SADC Secretariat has been working to establish a regional AIMS to facilitate the collection, analysis, dissemination, and archiving of information, and integration of various information systems in the region. Under the STOSAR Project, FAO is facilitating the development of web-based integrated information management tools that can support a variety of domains as well as the production of supporting documentation, such as, the SADC Regional AIMS Strategy (2020-2025), harmonized data collection tools, a manual of concepts, a statistical pocketbook, to

name a few (refer Fig. 1). The AIMS web-based application once fully operational will replace the existing fragmented data collection practices within SADC Member States (MS) and streamline them into a more standardized reporting format. Currently, data coverage includes crop and livestock production, fisheries and aquaculture, forestry, agricultural inputs, socio-economic, land cover, public finance, national accounts, production value prices, and animal and plant health. The system allows authorized end-users to enter and update agricultural information and statistical data, and to generate analytical tables/reports, graphics and maps, over vertical and horizontal comparisons. In short, the AIMS seeks to standardize and harmonize relevant agricultural data to ensure international comparability, reliability and accessibility.


Figure 1. Some of the documentation produced by the Project

# Objective of SADC AIMS

An effective AIMS provides policy makers, planners and economic players' access to reliable and timely information necessary for policy development, planning, emergency preparedness, and decision making. The SADC AIMS seeks to:

- Create a credible source of information that can be accessed by a growing number of organizations (public, private, development partners, and civil society);
- Enhance access to information on agricultural production, productivity, sustainability and competitiveness for evidence-based decision making;
- Facilitate timely collection, analysis and communication of information for early warning of disasters/risks and monitoring of vulnerability, food security and weather patterns in the region, contributing to timely interventions by the relevant authorities in the MS;
- Provide information on plant pests and animal diseases' that constrain SADC Member States from accessing lucrative markets, including dissemination of statistical information and time series data on key production indicators in the livestock and crop sub-sectors;

- Provide information needed for evidence-based decision-making and tracking of progress made towards attainment of the food and nutrition security goals stipulated in key development policies such as, the Regional Indicative Strategic Development Plan (RISDP), the Dar-es-Salaam Declaration on Agriculture and Food Security, relevant SADC protocols and commitments (e.g., Fisheries, Forestry), the RAP and CAADP;
- The establishment of a database for the Food, Agriculture and Natural Resources Directorate (FANR) in the SADC region, particularly with regards to basic statistical requirements and based on the region's network of national data bases and information systems.

# Rationale

The SADC Secretariat, FAO, and EU recognize the importance of the agricultural sector to the food and nutrition security, livelihoods, economies, marketing, and trade opportunities of SADC MS. For this reason, the STOSAR project focuses on strengthening information systems at regional and national levels, in order to ensure timely and easy access to reliable statistical data and information necessary for evidence-based decision-making. At present, the FANR Directorate is running a number of other information systems which include: the Regional Early Warning System, the Regional Vulnerability Assessment and Analysis system, the Regional Remote Sensing System, and the Livestock Information Management System (LIMS). Some of the systems were linked to time-bound donor funded projects and consequently faced sustainability constraints; other more specialized systems have been transferred to institutions outside the SADC Secretariat (e.g. the seed information system at the SADC Seed Centre). There are also other external systems, like the Famine Early Warning Systems Network (FEWSNET) and the Regional Strategic Analysis and Knowledge Support System (ReSAKSS), which collaborate with SADC.

Most SADC MS have in place some form of agricultural information management system, although in some cases it is fragmented and spread across several ministries, departments, systems, and/or captured in different formats - digital or paper-based. One challenge has been to collate and organize this data into a useful repository to provide a database resource for SADC MS and its stakeholders. Furthermore, the use of different terminologies by SADC MS to report on analogous data results in data mix-up and replication. There is also need to strengthen regional and national coordination mechanisms by setting up where non-existent, and building the capabilities of AIMS technical committees which are at the forefront and lead the data collection, collation, analysis, archiving and reporting processes.

It is against this backdrop that the rationale for developing the SADC AIMS was to create a centralized system based on existing national systems and linked to agricultural information systems run by other organizations. In addition, creation of such a system addresses the data management challenges, so that all the data and information emanating from SADC MS is harmonized and packaged in a standardized format, is readily accessible and easily disseminated to relevant stakeholders. Moreover, having accurate agricultural data and information is an essential tool for planning, formulation of policy and legislation, promotion of trade and advocacy, to attract and promote investment and resource allocation to the agricultural sub-sectors (crop, livestock,

forestry and fisheries) for development purposes. The platform also provides information on plant pests and animal diseases' that constrain SADC MS from accessing lucrative markets, including dissemination of statistical information and time series data on key production indicators in the livestock and crop sub-sectors.

# Partnership approach

The international trade of products of plant and animal origin requires strengthening inter-sectoral collaboration through strategic partnerships. The STOSAR is a three (3) year project funded to the tune of Euro 6.2 million by the EU under the EDF 11 Programme. The initiative is being implemented by a dynamic consortium of partners who are working together with the governments of the 16 MS in the SADC to improve production, productivity and competitiveness of agricultural products through the control of crop pests and animal diseases', and strengthening information gathering, analysis and use in the region.

The partnership comprises of:

- The SADC Secretariat (executing agency)
- The EU (principal funder)
- The FAO (main implementing agency)
- Regional Centers of Excellence (CoE) providing technical assistance; French Agricultural Research Centre for International Development (CIRAD), University of Pretoria, Eduardo Mondlane University, Agricultural Research Council of South Africa, Stellenbosch University, and the Centre for Agriculture and Bioscience International (CABI).

# Design methodology

The design and development of the AIMS has been done in accordance with industry standards and best practice, with a focus on integration with existing information systems at national level. The approach used was to break down the system development into six manageable steps or phases ensuring constant user feedback is considered and addressed, as tangible measurable deliveries are made. This approach was agreed among key stakeholders during a series of technical meetings held at the design stage of the system. Because AIMS is an immense system due to the amount of data and analytical tools that form an integral part of the finished product, the team agreed that the best way to build the system was to adopt an agile phase-by-phase approach where each phase produces a determined set of features and functionalities that when combined will result in the complete AIMS. These iterations and increments reduce the time spent on rework because the development team gets regular feedback. In short, the approach includes:

- Short feedback loops (after development of each module)
- Frequent adaptation of process (based on customer feedback)
- Reprioritization (as necessary)
- Regularly updated plans

- Frequent delivery (after completion of each phase)

Agile approaches work well for projects that involve new or novel tools, techniques, materials, or application domains. By building a small increment and then testing and reviewing it, the team can explore uncertainty at a low cost in a short time, reduce risk, and maximize business value delivery. Uncertainties often centre on suitability and requirements (is the right product being built?); technical feasibility and performance (can this product be built this way?); or process and people (is this an effective way for the team to work?). All three of these characteristics – product specification, production capability, and process suitability – typically have elements of high uncertainty.

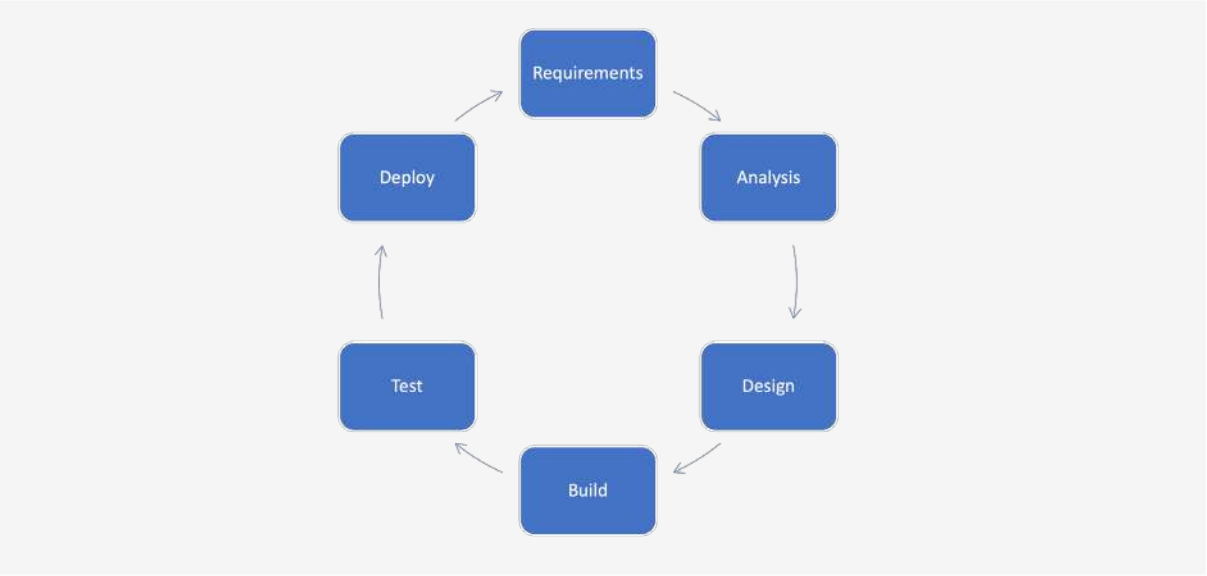



Figure 2. Methodology used to develop SADC AIMS

During the first stage of development, a needs assessment exercise was carried out to determine the requirements by sending out two different questionnaires - Statistical and IT questionnaires - to all 16 SADC member states. This first step was critical in formulating the systems requirements document which ensures that the system built achieves the project objectives meeting customer needs and expectations.

Following the needs assessment exercise, a data collection questionnaire with a proposed list of CAADP indicators was produced. The proposed list of agricultural indicators was presented to SADC MS during a regional workshop that was held in February 2020. The main objective of the workshop was to validate the list of the minimum set of core indicators that would form the foundation of SADC AIMS. A follow up regional workshop was conducted in March 2020 to provide data harmonization training which would result in better data quality by having in place one system that will eliminate data redundancy, and loss.

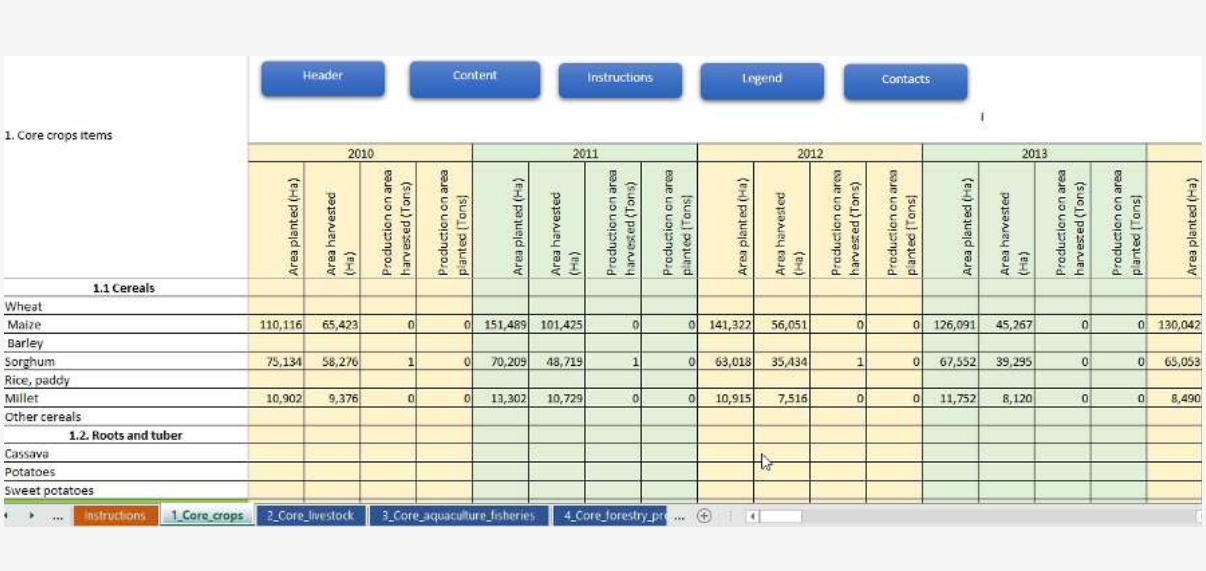



Figure 3. Validated list of minimum set of core indicators

The needs assessment exercise also taught us that MS have a number of different agricultural information management systems running at the same time. The information being generated by each of those fragmented systems is critical to each government institution within the MS. The information collected plays a critical role in guiding programmatic activities at both regional and national level. Having several different systems generating different data formats results in duplicated efforts, and redundant data.

Following the completion of these two workshops, the AIMS team began working on the SADC AIMS Strategy, and development of the regional AIMS system. The importance of the strategy cannot be understated as it will guide the production and dissemination of accurate and reliable agricultural information for the next 5 years.

The process of designing AIMS followed the Design Thinking methodology. This is distinguished by its application of critical and creative thinking to understanding, visualizing and describing complex, ill-structured problems and developing approaches to solving them. This software engineering methodology has been central to human-centered design (HCD)—the dominant methods of designing human-computer interface.

The design of AIMS adapted the following steps from the design thinking process:

1. Empathize: Collect available data and documentation and discuss the system with stakeholders
2. Define: Apply critical thinking to define and gain understanding of the problem
3. Ideate: Conceive the problem by visualizing a prototype which corresponds to the problem understanding
4. Prototype: Build a prototype based on concrete results and solutions and present it to the stakeholders to gain their feedback
5. Test: Implement user feedback and build a new prototype through iterating the process

This methodology relies on the experts for initially building the best design and then using user feedback to refine the model.

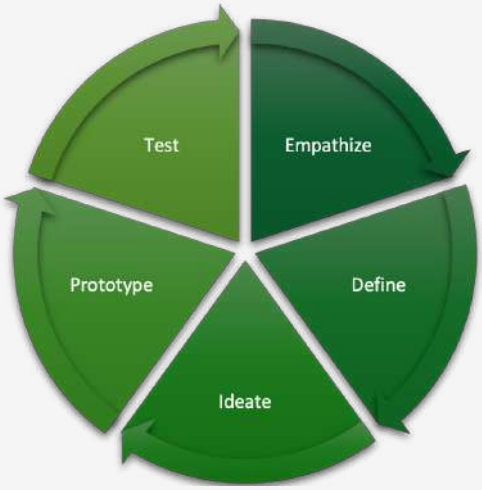
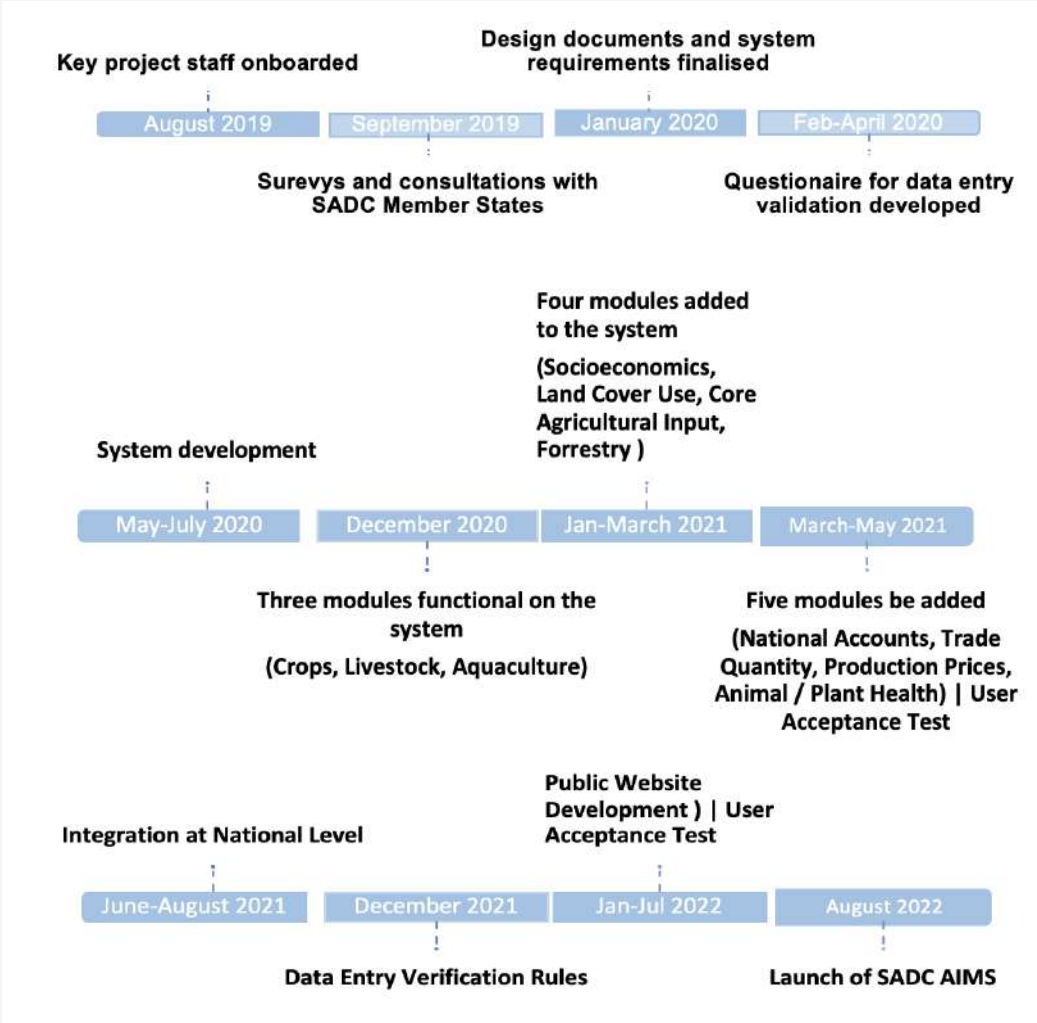



Figure 4. Design Thinking Process

# SADC AIMS timeline of development



# Developing the AIMS modules

AIMS was divided into 12 main modules that comprehensively cover all aspects of development related to agriculture in SADC region. Figure 4 illustrates the 12 modules that combine the minimum set of indicators.


Figure 5. AIMS Modules

# Defining the AIMS indicator's framework

AIMS indicators were selected as a minimum set of core indicators which intend to portray the status of the implementation of the RAP at regional and national levels. These indicators are organized into four components representing the specific objectives of the RAP, which are:

- Enhance sustainable agricultural production, productivity and competitiveness;
- Improve regional and international trade and access to markets of agricultural products;
- Improve private and public sector engagement and investment in the agricultural value-chains; and
- Reduce social and economic vulnerability of the region's population in the context of food and nutrition security and the changing economic and climatic environment.

## The conceptual framework for AIMS indicators

This conceptual framework was developed based on a wide variety of relevant sources of information and technical documents, especially the SADC RAP, the SADC Regional Indicative Strategic Development Plan (RISDP), the SADC Food Security and Nutrition Strategy, the framework for indicators of Comprehensive Africa Agriculture Development Programme (CAADP), the Framework for indicators of the Sustainable Development Goals and the framework for indicators of Agenda 2063.

To complement information collected from the documents and frameworks, desk reviews and exploitation of the questionnaires were used to collect information from SADC Member States in order to identify and craft a list of key indicators.


Figure 6. Some of the documents used to identify core indicators

# Data collection process

Several technical and organizational requirements needed to be put in place to implement the goals and objectives identified. At country level, systematic tracking and monitoring of the set of minimum core indicators will facilitate providing SADC AIMS with data. At the regional level, this information will guide in tracking progress and the performance of regional policies and generate a wide range of reports to guide decision-making.

The ultimate objective of the scheme is to provide an overview of how to channel agricultural statistics and aggregated information from villages and farmers up to national and regional levels. The proposed flow of information for AIMS will enable meeting the demand for information that comes from a diverse group of stakeholders, namely policymakers and their advisers in government, government officials, parliamentarians and their technical staff at the national/subnational level, local government authorities, civil society, the donor community, mass media, researchers, training institutions and the private sector.

Within SADC, there is currently no standardized institutional arrangement in place to collect data from lower levels and channel these up to national level. The Strategy lays down the foundation of how this can be done to ensure statistics are consistent, reliable, relevant and comparable.

The SADC AIMS Strategy strengthens, guides and in some cases lays down the foundation of how

data collection processes should be done to ensure data statistical information are consistent, reliable, relevant and comparable.

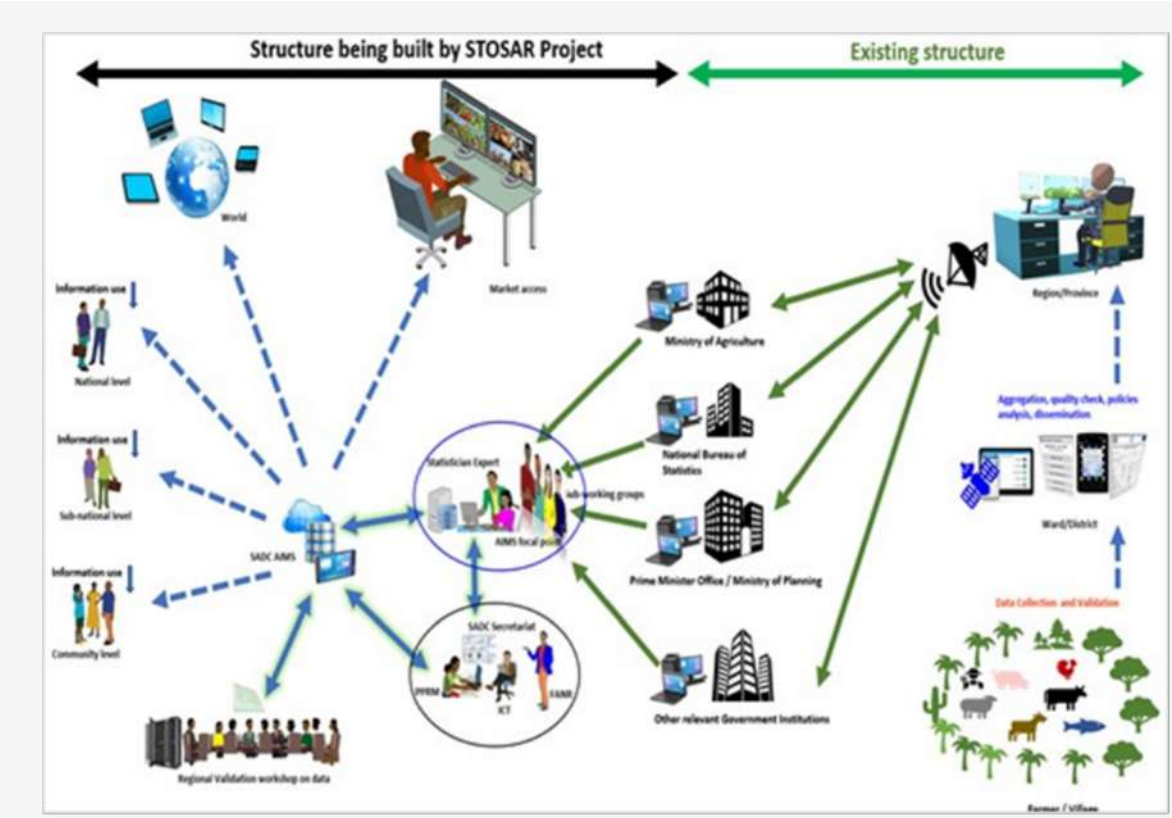



Figure 7. SADC AIMS data-collection and dissemination structure

# Data to information: The analytics engine

AIMS has an embedded data analytics engine which was designed specifically to analyze information received from Member States and make the information accessible to each stakeholder based on their needs and resources.

The data reporting user interface has a unique design that combines powerful features with intuitive usability. Using the Design Thinking methodology, the system was carefully crafted in order to solve the dilemma of representing hundreds of indicators with as many meaningful data charts as possible while keeping the user experience simple and efficient.

## Different Modules, Same Interface

Each AIMS module has 9 reporting screens that offer identical user experience customized to fit the module indicators. This feature reduces the learning curve of users as mastering the reporting

of one module allows for the mastering of the other modules.

## 9 Reporting Screen, Multitudes of Reports

The following is a list of the currently available reporting screens:

1. One Indicator - One Year - Grouped by Multiple Items then Multiple Countries.
2. One Indicator - One Year - Grouped by Multiple Countries then Multiple Items.
3. One Indicator - One Item - Grouped by Multiple Years then Multiple Countries.
4. One Indicator - One Item - Grouped by Multiple Countries then Multiple Years.
5. One Indicator - One Country - Grouped by Multiple Years then Multiple Items.
6. One Indicator - One Country - Grouped by Multiple Items then Multiple Years.
7. One Item – One Country – Grouped by Multiple Indicators then Multiple Years.
8. One Item - One Year - Grouped by Multiple Indicators then Multiple Countries.
9. One Country - One Year - Grouped by Multiple Indicators then Multiple Items.

## Compact All-in-One Criteria Selection

All criteria required to generate a report are integrated in one screen for the user to customize the report: Indicators, Years, Countries, Graph Types and Items.

## Dynamic Reporting

Reports are dynamically generated while the user changes the criteria selection with no need for page reloading. This offers a smooth experience and allows for fast analysis of data.

## Rich Graph Types

The reporting engine offers 6 graph types: Table Grid, Multi-Series Bars, Clustered Bars, Multi-Series Columns, Stacked Columns and when appropriate, Line graphs. Further graph types will be added as needed.

## Export Functionalities

All reports can be easily exported to Microsoft Excel for further customization and analysis, or as images to be included in documents and reports.

## Insightful Dashboards

Dashboard reporting is a visual representation of the key indicators of interest combined in one screen. Using reports selected from the different modules and different screens, dashboard visuals provide an at-a-glance vision to further enhance the reporting system user experience through an insight of all analytical reports of interest that AIMS can support.

The following figures illustrate some of the reporting engine screens:

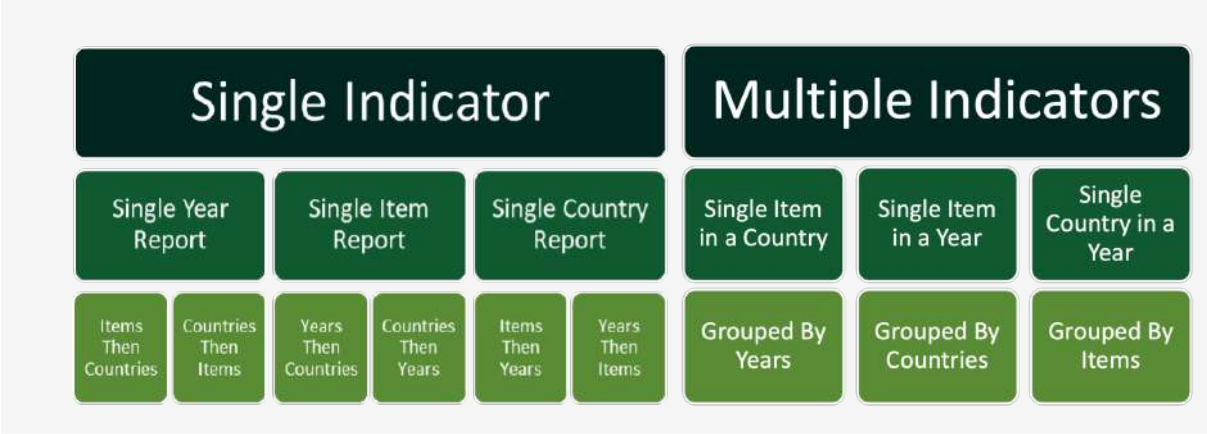



Figure 8. Different Reporting Screens

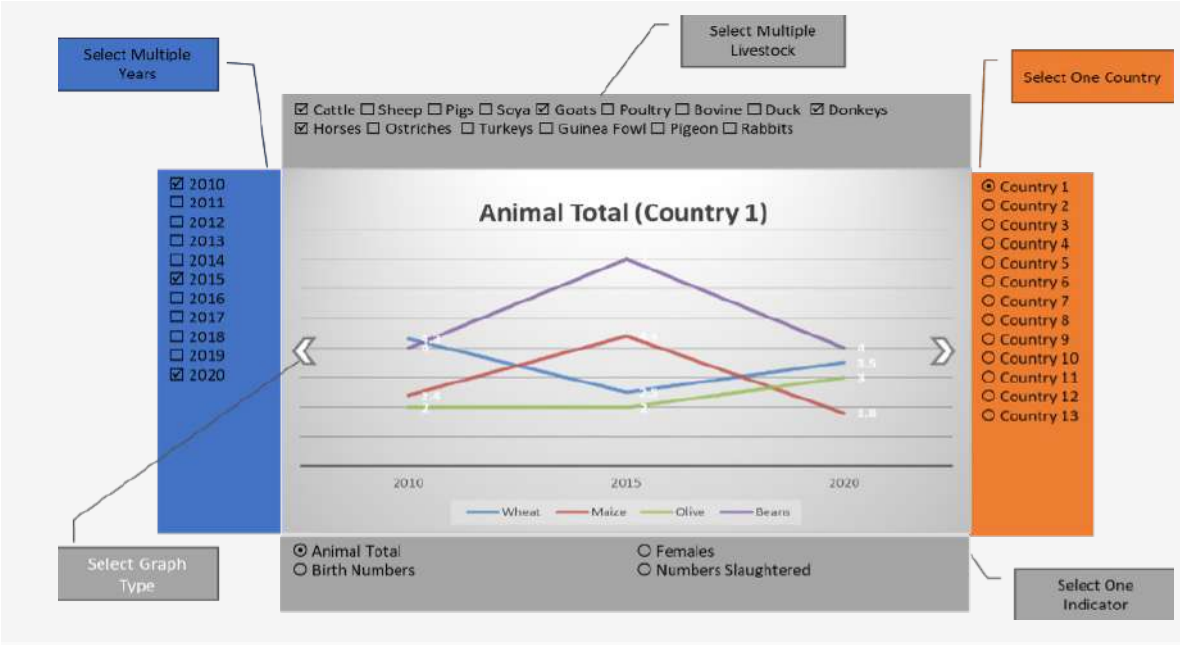



Figure 9. Sample Reporting Screen (Single Indicator – Single Country – Grouped By Years Then Items)

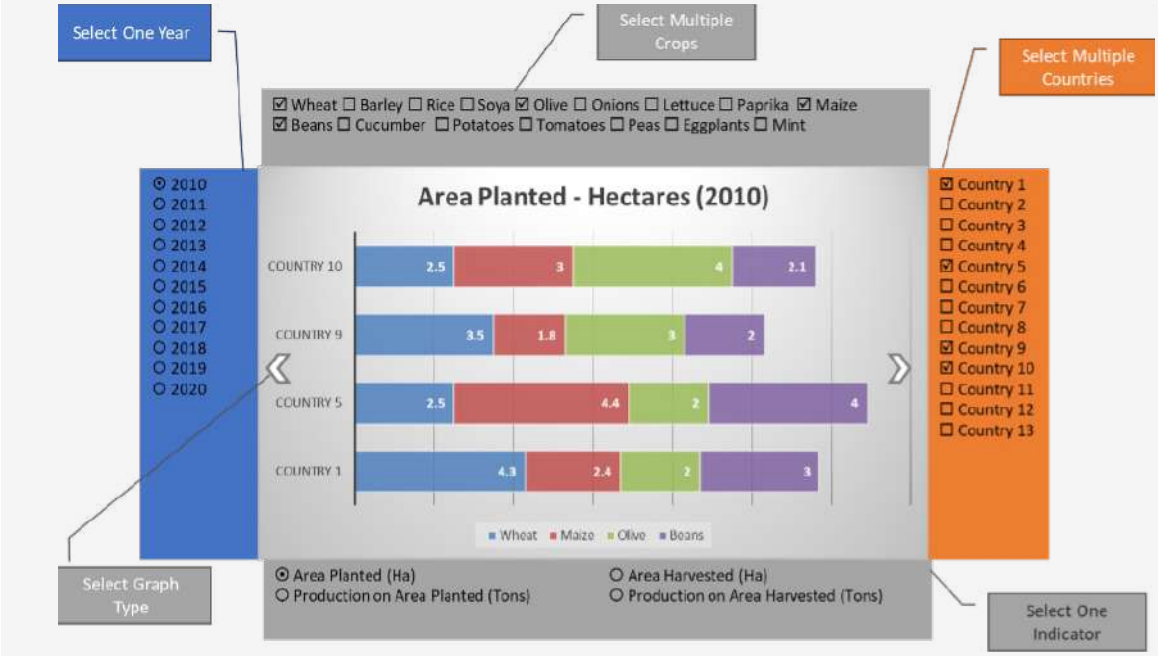
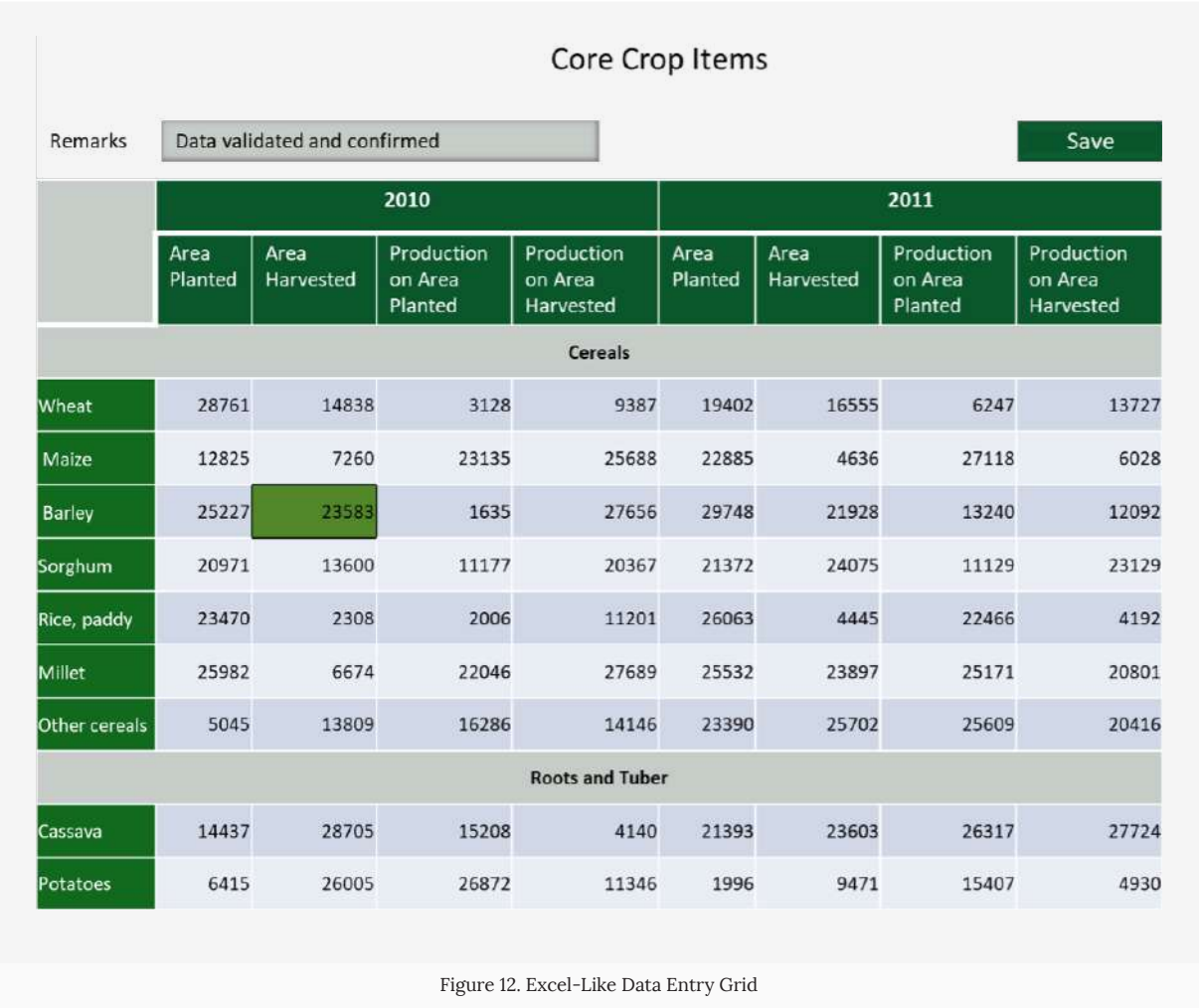



Figure 10. Sample Reporting Screen (Single Indicator – Single Year – Grouped By Countries Then Items)


Figure 11. Sample Reporting Dashboard

# Smooth data entry

The amount of data collected by AIMS in each module ranges between 120-3000 with an average of 1000 records. This wide range and large average number presented a challenge for designing the data entry user interface. The design ideally should be flexible and easy to use. The optimal design idea that was built through the design thinking process was similar to an Excel user interface with table grids to enter data in cells and navigate through them smoothly. The decision to use this design was widely welcomed by stakeholders as it achieves all design requirements, in addition to user familiarity which reduces the learning curve. The data entry grid allows for seamless copy-paste operations from Microsoft Excel and Google Sheets, thus facilitating data import and exchange with these popular systems. All cells can have comments/ remarks associated with them through entering data on the designated field above the table. The following figure illustrates the data entry screen for the Core Crops Module, and similar grids are used for all the other modules.




| | 2010 | | | | 2011 | | | |
|---|---|---|---|---|---|---|---|---|
| | Area Planted | Area Harvested | Production on Area Planted | Production on Area Harvested | Area Planted | Area Harvested | Production on Area Planted | Production on Area Harvested |
| **Cereals** | | | | | | | | |
| Wheat | 28761 | 14838 | 3128 | 9387 | 19402 | 16555 | 6247 | 13727 |
| Maize | 12825 | 7260 | 23135 | 25688 | 22885 | 4636 | 27118 | 6028 |
| Barley | 25227 | 23583 | 1635 | 27656 | 29748 | 21928 | 13240 | 12092 |
| Sorghum | 20971 | 13600 | 11177 | 20367 | 21372 | 24075 | 11129 | 23129 |
| Rice, paddy | 23470 | 2308 | 2006 | 11201 | 26063 | 4445 | 22466 | 4192 |
| Millet | 25982 | 6674 | 22046 | 27689 | 25532 | 23897 | 25171 | 20801 |
| Other cereals | 5045 | 13809 | 16286 | 14146 | 23390 | 25702 | 25609 | 20416 |
| **Roots and Tuber** | | | | | | | | |
| Cassava | 14437 | 28705 | 15208 | 4140 | 21393 | 23603 | 26317 | 27724 |
| Potatoes | 6415 | 26005 | 26872 | 11346 | 1996 | 9471 | 15407 | 4930 |

Figure 12. Excel-Like Data Entry Grid

# Data security: Bottom up

AIMS will be accessed by a large number of users from the 16 Member States and other designated organizations, thus, system security is critical in order to maximize data confidentiality and integrity.

The following are the major security features that were implemented as part of AIMS.

## User Registration

Accessing AIMS requires creating a user account with a username and password. The account is approved through a process to ensure that only authorized users are allowed inside the system.

## User Roles

All AIMS users are assigned a role that grants or denies the permission to access each page and functionality of AIMS. Roles and permissions are administered exclusively by designated system administrators.

### Access logs

All actions that are performed by users and system administrators are recorded on a secure database to ensure data integrity and responsible system usage by users.

### Data Integrity Manual

The system is delivered with a system administration manual to guide system administrators. The manual details the process that should be followed to attain optimal data security and integrity.

## Innovation and key success factors

Innovation has played a large role in the design and implementation of the SADC AIMS, with the project team enlisting approaches that have resulted in building a unique product.

### Design Methodology

The design thinking methodology was the accurate choice for tackling the design issues of AIMS. All product features went through this methodology's process of creating an innovative design concept, obtaining user feedback on the design and fine tuning it to fit the user's needs.

### System Localization

System localization was completely separated from the system development process. The system is localized to 3 languages namely: English, French and Portuguese. All translation work is done on a Google Sheets file that is shared between developers and translators. Any addition or modifications of the translation need no interference from developers, but merely changing the entry on the Google Sheets file.

### Data Reporting

The embedded data analytics engine that was designed specifically for AIMS is one of the key success components for the system. The dynamic, compact and thorough design offers an intuitive unified experience across all modules. Additionally, the integrated dashboards give users a consolidated view of all data from across all 12 modules on custom view that delivers valuable insights into the whole business.

### Data Entry

To accommodate users with varying levels of computer skills, the familiar table grid interface was used for easy data entry and manipulation. The easy interaction between AIMS data entry and Excel allows for a seamless data transfer between the two.

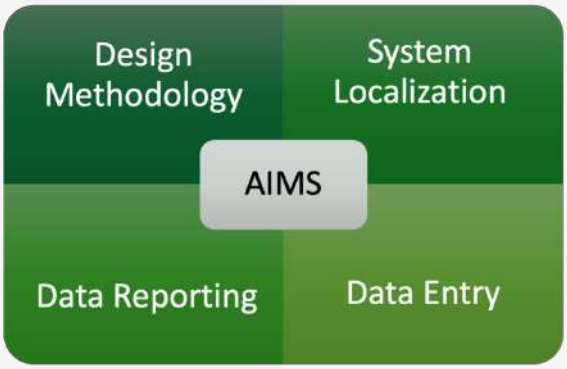



Figure 13 – Innovations & Key Success Factors

# Lessons learned

Given the fact that the project is still ongoing, and in progressive stages of implementation, the lessons learned are captured continuously as the system is expanded. Key lessons learned thus far:

- Special attention should be focused on the data collection/updating process. A system with no accurate, thorough and updated information has no utilization in the decision-making process.
- Selecting the right software development process and methodology (Agile Lifecycle and Design Thinking) is a critical factor to the success of the system.
- Efficient management of communication among stakeholders is key to meeting their expectations and gaining their satisfaction.

While many software developers prefer to deliver the whole required system at once, gradual delivery of concrete and tangible system components creates early sense of ownership and maintains trust with stakeholders. Two phases of AIMS have been delivered so far, with 50% tested tangible system functionality delivered and operational. The rest of the system functionality will be delivered within the upcoming phases.

# The future of AIMS

The team along with the stakeholders envision several functionalities for the future of AIMS:

GIS Reporting: AIMS reporting system will include a GIS component to view agricultural statistics through maps of SADC Member States

Early Warning System: Early warning of disaster/risks and monitoring of vulnerability, food

security and weather patterns within the SADC region will be made available on the system

Mobile Based AIMS: AIMS is currently a web app that requires a regular computer browser to operate. In the future, the site will be mobile-friendly to accommodate for mobile users

AIMS Public Website: AIMS will be accompanied by a public website that publishes approved statistics and information. The website will feature a similar reporting engine to allow for a rich and intuitive user experience while generating the statistics

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EDF 11 Project GCP/SFS/004/EC

Agricultural information & market access for all

### Project objective

The overall objective of this action is to accelerate progress towards implementation of SADC regional integration, which focuses on: i. enhancing information on agricultural production, sustainability and competitiveness for evidence-based decision-making; and, ii. improving access to markets through implementation of plant and animal pest and disease control strategies at the regional level.

### Beneficiaries

Member States of the Southern African Development Community (SADC), namely: Angola, Botswana, Comoros, Democratic Republic of Congo, Eswatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, United Republic of Tanzania, Zambia, Zimbabwe.

STOSAR Support towards the operationalization of the SADC Regional Agricultural Policy Project

Food and Agriculture Organization of the United Nations (FAO)
Subregional office for Southern Africa
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