



Executive Summary

Conceptual Framework for the Design of the National Agriculture Management Information System

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Agriculture Data in Malawi

“Agriculture remains the mainstay of Malawi’s economy, contributing significantly to employment, economic growth, export earnings, poverty reduction, food security, and nutrition... the National Agriculture Policy seeks to sustainably transform the sector from a subsistence to a market orientation in order to increase agricultural production, marketed surpluses of commodities, and real incomes.”

Malawi National Agriculture Policy (2016)

Agricultural programs and activities in Malawi are guided by the Ministry of Agriculture, Irrigation, and Water Development (MoAIWD). To achieve the transformative goals set forth in the National Agriculture Strategy, MoAIWD must coordinate efforts across government, private sector, non-governmental, and development partner stakeholders.

While priority results areas are articulated in MoAIWD monitoring and evaluation (M&E) frameworks, **no national system exists to measure progress against these national goals.** This limits MoAIWD’s ability to measure progress and evaluate policy effectiveness.

Currently, relevant M&E data are hosted across government staff computers. These data are typically stored as Excel databases, and often saved on personal hard drives – which makes accessing data a challenge for stakeholders within and beyond MoAIWD. As a result, **interviewees identified the ability to access and analyze historical data as a key gap** in the national agricultural data ecosystem.

Concerns about quality further limit the use of available data. These concerns primarily stem from a reliance on paper-based data collection methods, due to limited technical infrastructure and varying staff capacities. Limited digitization increases the risk of human error, incomplete data, and time delays that impact data quality.

An under-utilization of M&E data limits the government’s ability to understand what works and how to allocate resources more effectively. An M&E management information system – when developed in close consultation with users, taking into account staff and infrastructure capacities – can improve the use of data and evidence to support decision-making.

Therefore, a **National Agriculture Management Information System (NAMIS) holds great potential to meet the needs of agriculture stakeholders in Malawi.** In what follows, we provide an overview of technical resource recommendations for implementing the NAMIS.



Methodology

The NAMIS conceptual framework was informed by several component activities:

1. A foundational concept paper and implementation plan developed by MoAIWD, the *NAMIS Project Implementation Plan*, was reviewed by DG technical experts. Building on this work, DG held initial consultations with key personnel in the MoAIWD M&E and Planning Units.
 2. Findings from desk research and initial consultations were mapped into DG's Custom Assessment and Landscaping Methodology (CALM), and a comprehensive assessment plan was co-designed by DG and the MoAIWD Planning Unit.
 3. DG and MoAIWD held a multi-sectoral workshop with the Technical Working Group on Agriculture Monitoring and Evaluation to surface methodological feedback and ecosystem insights.
 4. A research team composed of DG and the MoAIWD Planning Unit conducted 75 key informant interviews across government, non-governmental organizations, and civil society groups at district, central, and extension planning area levels during March-April 2018.
 5. DG analyzed and synthesized key findings from interviews and desk research, and validated findings through a final meeting with the Technical Working Group in Malawi.
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Tools for Technical Development

A digital platform can enable better data collection, management, sharing, and analysis. If the ultimate goal is for NAMIS to become the most comprehensive and utilized source of agriculture data in Malawi, the platform must be developed through a user-centric approach. Key to this approach is understanding available data sources, users, and collectors through a comprehensive landscape assessment.

Two practical outputs from this assessment include **user journeys** and a **data ecosystem map**. These resources were used to inform NAMIS technical recommendations and can be used as a technical resource throughout the design and implementation process.

User journeys outline how future NAMIS users interact with data to make key decisions. The journeys identify which users are mandated to make specific decisions; and which data sources are most useful for achieving their decision-making goals. **Articulating user journeys helps to ensure that NAMIS includes modules that respond directly to a decision-making need.**

Selected User Journeys

As an **Agriculture Extension Development Officer for an extension planning area**, I need to analyze the Agricultural Production Estimates Survey and obtain information about farmer households. My goal is to connect non-governmental organizations with farmers that could benefit from support services.

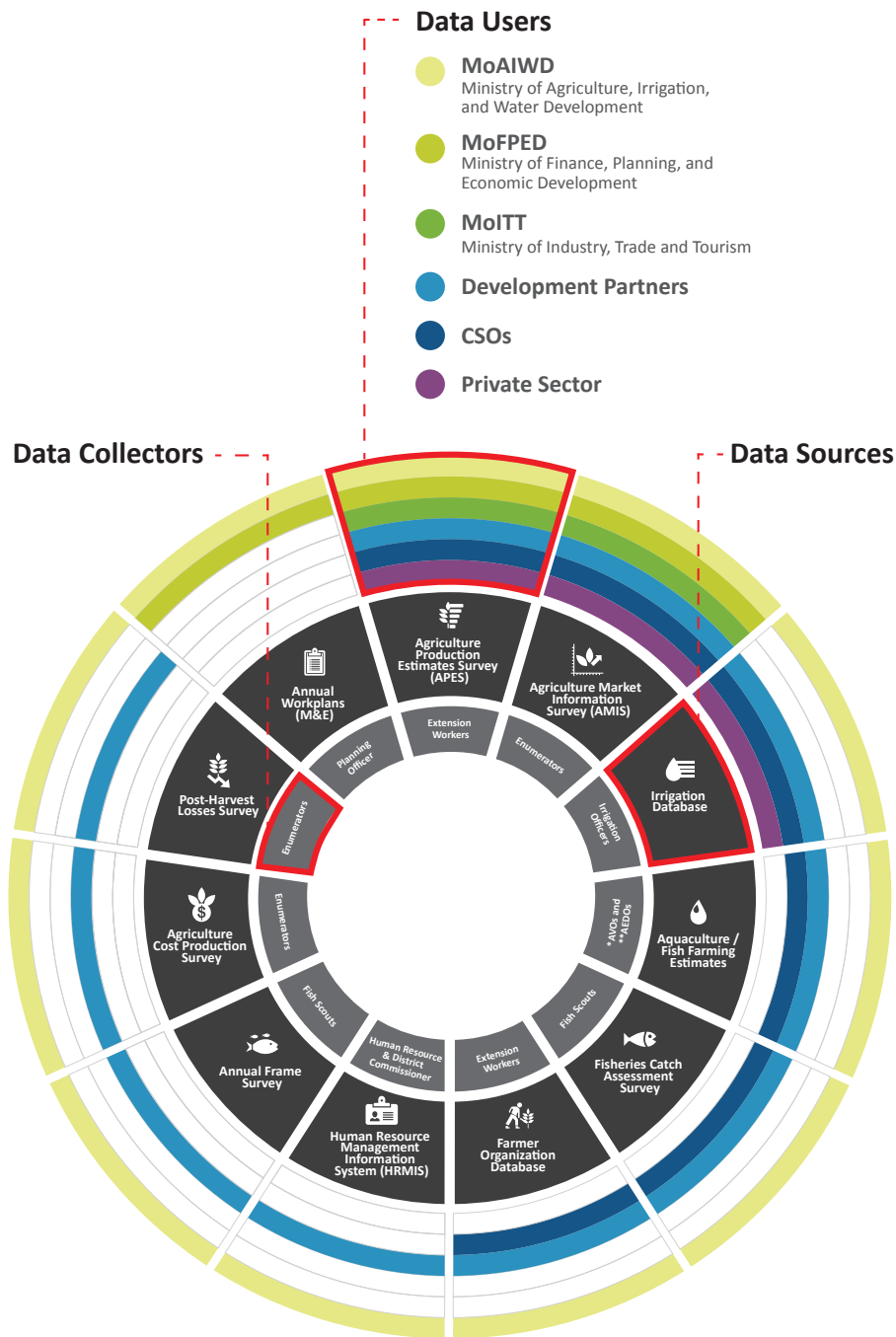
As an **Agriculture Development District Crops Officer**, I need to monitor food security by tracking yield estimates, weather, pests, and diseases. My goal is to identify issue “hot spots” so that I can inform stakeholders and help farmers with mitigation measures, like improving irrigation practices. I can access this information through reports and the Agricultural Production Estimates Survey.

As an **Agricultural Development Division Economist**, I want to analyze the Agricultural Production Estimates Survey results. My goal is to provide programming guidance to districts about matters like crop production levels. I can access this information through national statistics and routine reports from districts.

As national **Deputy Director of Planning**, I need to access technical outputs, like project indicators. My goal is to monitor ministry policy implementation and programming. I can access this information through reports prepared by implementing technical departments.

The Data Ecosystem

The data ecosystem map provides a comprehensive picture of the Malawi agriculture sector, highlighting **which data are gathered and used by which actors**. The NAMIS technical development team can use the data ecosystem map to identify which data sources are the most critical and should be prioritized during integration; and which sources can be prioritized in later phases.



*AVOs are Assistant Veterinary Officers

**AEDOs are Agriculture Extension Development Officers

Figure 1. Malawi Agriculture Data Ecosystem Map

Building a National M&E Platform

Based on user needs, the data ecosystem map, and good practices in digital development, **we propose NAMIS be structured around fourteen distinct modules.** Each module will respond to different user needs, as identified through user journeys; and each will incorporate relevant analysis and visualization tools.

NAMIS will be used by MoAIWD staff at national and local levels, as well as private sector, non-governmental, and development partner collaborators. As such, the platform should include functionalities tailored to low-connectivity contexts, such as a mobile data collection application, offline data entry, and a low-bandwidth website.

A modular tool lends itself to a phased implementation approach. Based on (i) the data ecosystem map; (ii) evidence about user needs and data gaps from the landscape assessment; and (iii) good digital development practice, **we recommend that NAMIS be implemented in three consecutive phases.**

Phased Development

Phase I will prioritize the digitization of existing data from national statistical surveys.

Phase II will integrate additional survey data, information about MoAIWD human resources and annual workplans, and information about farmers.

Phase III will integrate external data and data systems, including the Integrated Financial Management Information System and the Aid Management Platform.

Starting with modules that are high-priority and have clear data sources allows for more effective technical development. The successful completion of an early development phase creates positive momentum and provides time for needed preparations for future phases.

A phased, modular approach also allows for progressive change management and capacity strengthening across MoAIWD. Stronger analytical capacities and infrastructure capacities must be achieved within MoAIWD in order for the NAMIS to become the most cohesive and used resource for agriculture data.

Below is an overview of the recommended NAMIS modules, separated into three phases based on our assessment findings. Attached to each module are its Target Users and a Sample Journey.

NAMIS Modules: Phase I



Agriculture Statistics

Monitors production and productivity of crops and livestock, primarily through the Agriculture Production Estimates Survey.

Target Users and Sample Journey



MoAIWD; Ministry of Industry, Trade and Tourism; Ministry of Finance, Planning and Economic Development; Department of Disaster Management Affairs; development partners; non-governmental organizations; private sector

As Agriculture Extension Development Officer, I need to identify areas where there are low production estimates of livestock or crops so that I can provide support to farmers to increase production.



Trade and Marketing

Monitors local and international agricultural trading activities and commodity prices; provides real-time feedback to stakeholders, including farmers. Data are collected through the Agricultural Market Information System.

Target Users and Sample Journey



MoAIWD; Ministry of Trade; Ministry of Finance, Planning and Economic Development, development partners; non-governmental organizations; private sector

As an Assistant National Technical Manager for the Famine Early Warning System, I need to analyze commodity market price data so that I can determine our national production targets.



Meteorology

Provides timely data on weather and climate.

Target Users and Sample Journey



MoAIWD; farmers; development partners; non-governmental organizations; private sector

As an Agriculture Development Division Economist, I need information on weather patterns and an evaluation of last year's outputs so that I can set output targets in this year's budget.



Animal Health and Livestock

Monitors nationwide disease outbreaks.

Target Users and Sample Journey



MoAIWD; Ministry of Industry, Trade and Tourism; Ministry of Finance, Planning and Economic Development; development partners; non-governmental organizations; private sector

As an Animal Health Officer at the Agriculture Development Division level, I want to do livestock disease surveillance so that I can prevent disease outbreaks, for example by banning livestock movements.



Fisheries

Monitors nationwide fisheries production and prices.

Target Users and Sample Journey



MoAIWD; development partners; non-governmental organizations

As a District Fisheries Officer, I need to know good practices in fish farming, new technologies, and which farmers have ponds, so that I can encourage and train new fish farmers.

NAMIS Modules: Phase II



Water and Irrigation

Monitors the availability and use of water resources for the purposes of irrigation by geographic location and associated production levels.

Target Users and Sample Journey



MoAIWD; Ministry of Finance, Planning and Economic Development; development partners; non-governmental organizations

As the District Fisheries Officer, I need to know the location of new irrigation schemes and available water sources so that I can encourage the adoption of fish farming.



Human Resources

Tracks human resources information like staff availability, distribution, and workload across MoAIWD.



Target Users and Sample Journey

MoAIWD; development partners

As a District Agriculture Development Officer, I need to know what positions are vacant so that I can ask for the deployment of new personnel.



Public Agriculture Activity Monitoring

Monitors adherence to implementation of annual work plans by cost center and project.



Target Users and Sample Journey

MoAIWD; Ministry of Finance, Planning and Economic Development; development partners

As the District Crops Officer, I need access to monthly work plans so that I can decide how to manage my allocated resources.



Library

A repository of key policies, strategies and policy research papers for the sector.



Target Users and Sample Journey

Public

As an Economist at the MoAIWD Planning Department, I need to access historical data so that I can inform national planning.



Farmer Organizations

Tracks information on individual farmers and farmer organizations by demographic and geographic information; improves the targeting of agriculture programs and projects.



Target Users and Sample Journey

MoAIWD; development partners; Ministry of Industry, Trade and Tourism; non-governmental organizations

As a Field Coordinator for a non-governmental organization, I need to know the number of farmers interested in a new technology so that I can form farmer clubs.



Land Resources Management

Provides data on land resources for agriculture; monitors management of arable land, including utilization and conservation practices.



Target Users and Sample Journey

MoAIWD; development partners; non-governmental organizations

As a District Land Resource Conservation Officer, I need access to training materials so that I can teach staff about soil fertility.

NAMIS Modules: Phase III



Budget: Resource Mapping

Monitors implementation of annual budgets and expenditures in the public sector.



Target Users and Sample Journey

MoAIWD, Ministry of Finance, Planning and Economic Development

As a Principal Economist, I need access to project progress and M&E reports so that I can do end-of-project budget reviews to inform the development of new projects.



Non-State Actors: Resource Mapping

Tracks investments made by development partners in the sector; will include information on medium-term commitments, disbursements, activities, and expenditures.



Target Users and Sample Journey

MoAIWD; Ministry of Industry, Trade and Tourism; Ministry of Finance, Planning and Economic Development; development partners; non-governmental organizations

As a Project Manager at the Ministry of Industry, Trade and Tourism, I need to access information on agriculture expenditures so that I can assess the relationship between expenditures and sectoral growth.



Non-State Activity Monitoring

Monitors projects and programs being implemented in the sector by non-state actors.

Target Users and Sample Journey



MoAIWD; development partners; non-governmental organizations

As a District Agriculture Development Officer, I need to know which farmers could benefit from development partner activities so that I can guide targeting of new programs.



Social Accountability

Collects data on community participation levels, and feedback on government and service delivery.

Target Users and Sample Journey



MoAIWD; non-governmental organizations

As an Economist at the MoAIWD Planning Department, I want to access to social accountability data so that I can improve project design and implementation.

Strengthening the collection, management, and use of M&E data can support the achievement of Malawi’s agriculture development goals. NAMIS has the potential to address key stakeholder needs, strengthening users’ abilities to allocate resources more effectively. By documenting our methodological

approach, landscape tools, and key recommendations, we aim to provide practical inputs to technical implementation. Investment in a user- and decision-centric NAMIS will lead to a stronger, more sustainable, and more used resource for agricultural data in Malawi.

Project Background

Development Gateway and the Ministry of Agriculture, Irrigation, and Water Development (MoAIWD) of Malawi conducted a data landscape assessment of the national agricultural monitoring and evaluation system during March-June 2018.

The assessment built on an existing MoAIWD concept paper for the National Agriculture Management Information System (NAMIS). The assessment involved desk research; over 75 key informant interviews at central, district, and extension planning area levels; and three multi-stakeholder workshops. These activities were undertaken as part of the Results Data Initiative, supported by the Bill & Melinda Gates Foundation.

Findings from the assessment informed the Conceptual Framework for the Malawi National Agriculture Management Information System (2018), which provides user and technical requirements for implementing NAMIS.

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For more information about the Results Data Initiative, please visit <https://www.developmentgateway.org/expertise/results>.