



Photo Credit: Michael Wilson, CSIR-INSTI

LESSONS Learned

Ghana Ag-Data Hub

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Ag-Data Hub: Cultivating Innovation, Harvesting Insights, Growing a Sustainable Future.

Authors: Michael Wilson, Ghislain Tapa-Yotto, Mustapha Dalaa, Francisca Martey, Stephen Yeboah, John Awotwi, Paul Danquah - (AICCRA Ghana Cluster)



AICCRA
Accelerating Impacts of CGIAR
Climate Research for Africa



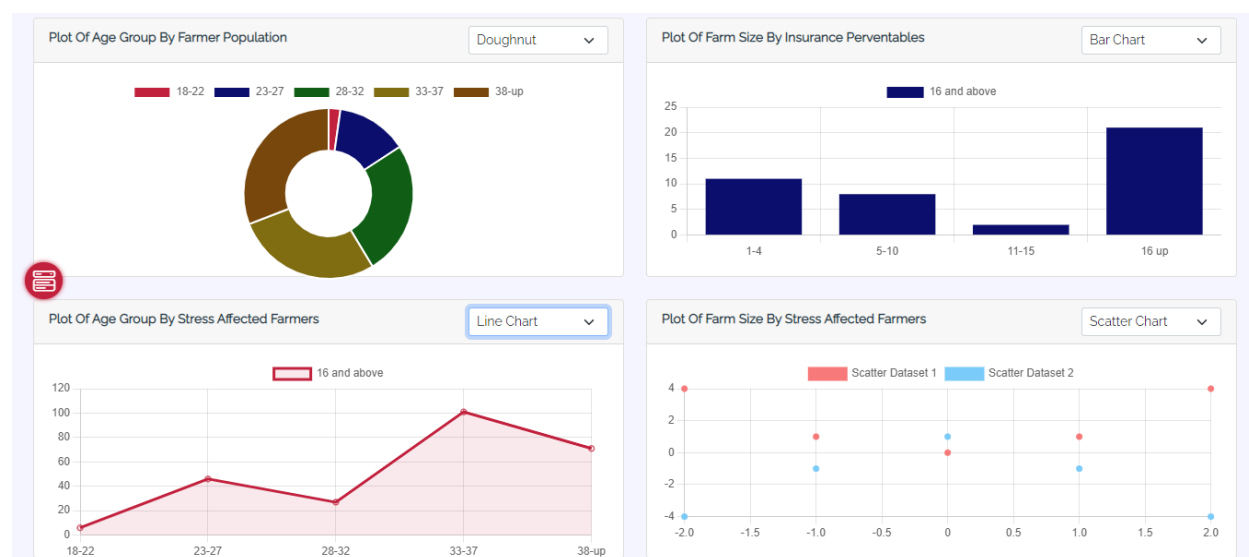
Overview - 2023

The Ghana Digital Agricultural Data Hub (Ag-Data Hub) has the ultimate goal of becoming the go-to national platform for digital data exchange and to serve as a backbone for information and data sharing among stakeholders and for the development of fact-based decision support systems to drive policy-making and to trigger a move towards sustainable climate smart agricultural practices. Detailed information on the implementation steps that were followed is available at <https://poc.miphost.com/>. In 2023, the Ag-Data hub transitioned from the planning phase to an implementation phase. The year ended with a Minimum Viable Product(MVP) of the hub that is currently undergoing final User Acceptance Testing for Go-Live. The current MVP is accessible at <http://ghanaaaghub.com/>. This document outlines and discusses key lessons learnt during the implementation phase of the Ag-Data Hub. We also discuss a high-level overview of our Go-Live plan and how we intend to scale from our current test servers to production servers to serve the nation.

Key Implementation Highlights – Ghana Ag-Data Hub

Dynamic and Customizable Dashboards

Imagine being able to handpick a dataset and select a specific data field of interest from various institutions. The Ag-Data Hub provides precisely this capability through its dynamic dashboard tool, developed under the Excellence in Agronomy project and powered by the Ag-Data Hub ETL Engine. This tool empowers you to populate graphs and charts tailored to your chosen data fields. Seize this opportunity to narrate your own story using authentic and validated data. The tool proves invaluable for top-level management decision-making, policy formulation, and research endeavors. Explore its features and possibilities at <https://aghub.miphost.com/main/dashboard>.



Collaborative Data Exchange

Within the AgData Hub, a comprehensive resource awaits, offering all the necessary data for your projects and research endeavors. Dive into our diverse datasets, carefully curated collections encompassing a wide range of fields and backgrounds. Originating from stakeholders in both the public and private sectors, these datasets provide a rich and varied pool of information. The collaborative nature of the platform allows you not only to access but also to contribute to this wealth of knowledge. By signing up, you gain the ability to upload and share your datasets with the entire community, fostering a dynamic and collaborative environment for data exchange and exploration.

**FARMER ACCESS TO AGRONOMIC AND CLIMATE DATA**

This data is teased out from the Excellence in Agronomy 2030 Initiative (EIA) in partnership with WorldCovers investigation on how best to characterize, boost and scale out promising agronomic options through cropping advisory services in Northern Ghana. The main dataset aimed at aims at profiling th...

[Preview →](#)

**POST-HARVEST MAIZE USAGE – NORTHERN GHANA**

The data details how farmers consume, sell or distribute the maize they harvest. This data is teased out from the Excellence in Agronomy 2030 Initiative (EIA) in partnership with WorldCovers investigation on how best to characterize, boost and scale out promising agronomic options through cropping...

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**FARMLAND TENURE SYSTEM – NORTHERN GHANA**

The dataset captures how farmers in the Northern Ghana access lands for their farming activities. This data is teased out from the Excellence in Agronomy 2030 Initiative (EIA) in partnership with WorldCovers investigation on how best to characterize, boost and scale out promising agronomic option...

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**IMPROVED SEED ADAPTION – NORTHERN GHANA**

The dataset capture farmer's access to and usage of improved seeds for maize, groundnut, soyabean, rice, cowpea, millet and some other value chains in Northern Ghnana. This data is teased out from the Excellence in Agronomy 2030 Initiative (EIA) in partnership with WorldCovers investigation on how bes...

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**ORGANIC FERTILIZER USAGE – NORTHERN GHANA**

The dataset capture farmer's access to and usage of organic fertilizer for maize, groundnut, soyabean, rice, cowpea, millet and some other value chains in Northern Ghnana. This data is teased out from the Excellence in Agronomy 2030 Initiative (EIA) in partnership with WorldCovers investigation on how bes...

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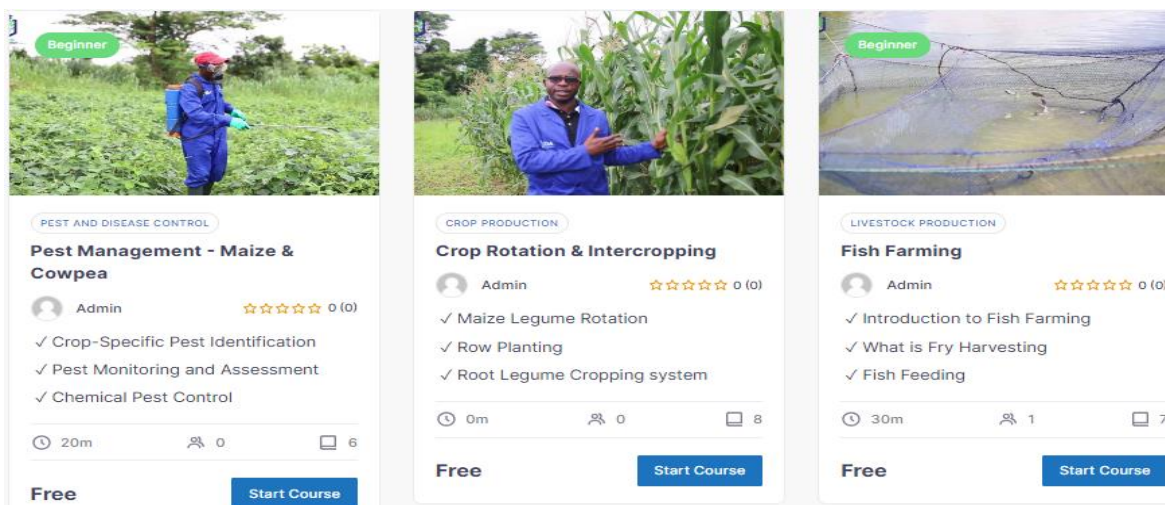
**CROP INSURANCE ADAPTION FACTORS – NORTHERN GHANA**

The dataset capture farmer's access to and willingness to purchase some form of crop insurance or credit facility for maize, groundnut, soyabean, rice, cowpea, millet and some other value chains in Northern Ghnana. This data is teased out from the Excellence in Agronomy 2030 Initiative (EIA) in...

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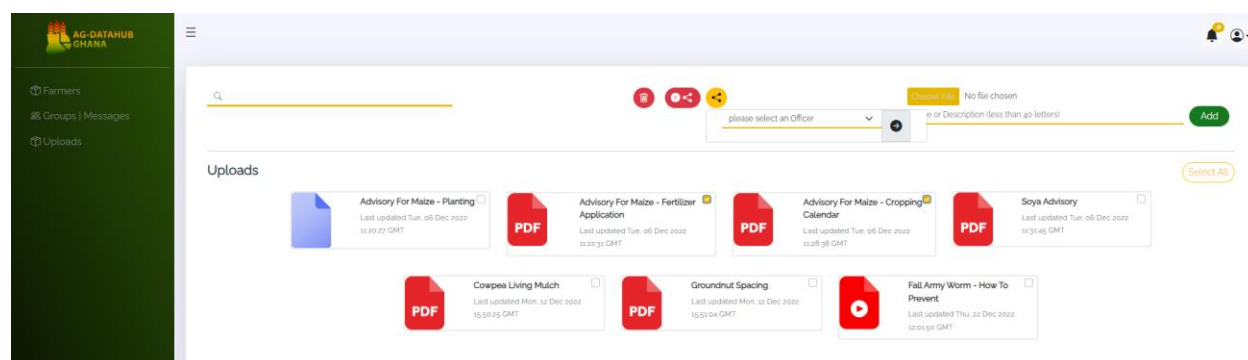
Farm Academy: The Agricultural Learning Community

Step into a world of agricultural knowledge enrichment through our e-learning platform designed exclusively for farmers by the Council for Scientific and Industrial Research and hosted by the Ag-Data Hub. This E-Learning platform offers accessible and comprehensive training to empower farmers in enhancing their agricultural practices. Our expert instructors bring forth a wealth of experience to deliver interactive courses covering diverse topics, including crop management, soil health, and irrigation techniques. Whether you are a seasoned farmer or just starting, our platform is tailored to meet your learning needs. Join our community of lifelong learners and embark on a journey to not only improve your farming skills but also connect with like-minded individuals passionate about sustainable and efficient agricultural practices. Embrace the opportunity to stay updated on the latest advancements and best practices in the field, ensuring your continuous growth and success in the realm of agriculture.

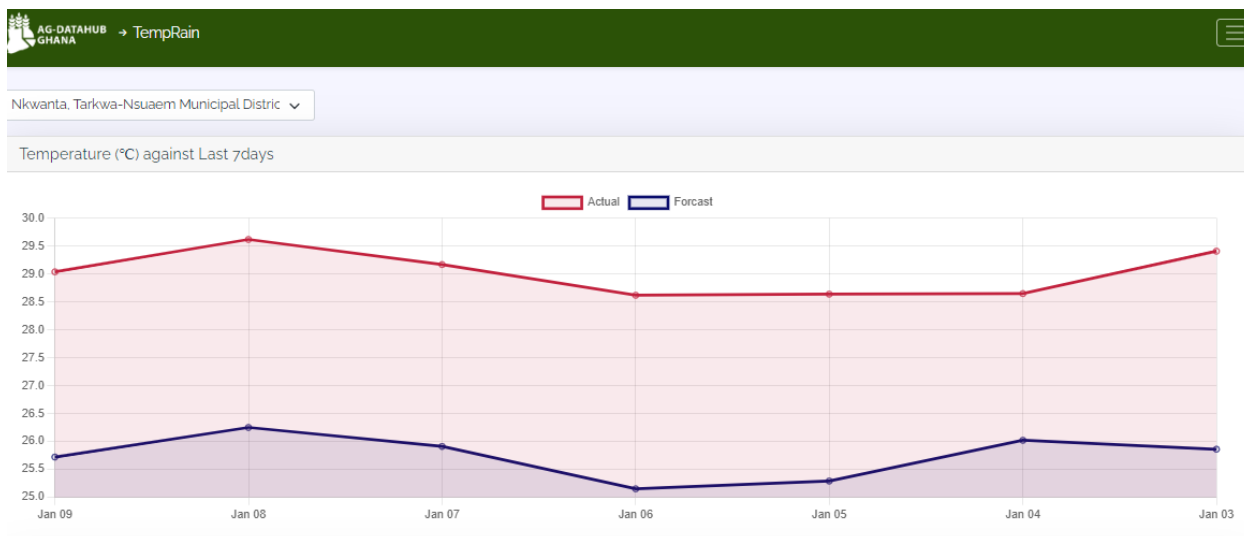


Digital Extension portal

Extension Officers play a pivotal role in the digital management of farmers through our Extension Portal. This platform facilitates their tasks by allowing them to add farmers to specific groups, send messages, and seamlessly share crucial information. The ultimate aim is to cultivate a thriving community of farmers and agronomists, fostering the exchange of information and the development of a robust network. By leveraging technology, we aspire to create a dynamic ecosystem where farmers can connect, share insights, and stay informed about the latest advancements in agriculture. This initiative is geared towards building a collaborative and digitally empowered community that contributes to the overall growth and sustainability of farming practices.



Weather is ever-changing, and staying informed about precise conditions is crucial for planning daily activities. Our Weather App empowers users to check weather details for various locations within Ghana. By accessing the app, users can verify up-to-date weather data that aligns with information provided by the Ghana Meteorological Agency. This ensures accurate and timely information, enabling users to plan their schedules with confidence based on the latest weather updates.



Implementation Lessons

The implementation gap seen during the implementation of the Ag-data Hub as national data hub can be attributed to several critical issues within the mandated national institutions responsible for managing relevant agricultural data. Below is a summary of key existing gaps identified:

Resource Constraints

A significant hurdle lies in the insufficient resources allocated to these institutions, hindering their ability to effectively handle and manage data. The Insufficient resources allocated to mandated institutions pose a significant obstacle, limiting their capacity to efficiently handle and oversee data-related tasks. This scarcity not only hampers data collection but also hinders endeavors to guarantee data compatibility across diverse digital platforms. Consequently, the current state of data quality is compromised in numerous instances, with noticeable data gaps in regions and locations where the collection of data faced resource challenges. The deficiency in allocated resources has a cascading effect, impacting the institutions' overall ability to manage and utilize data effectively. Addressing this resource constraint is crucial for enhancing the reliability and comprehensiveness of data across various contexts.

Data Format Incompatibility

In cases where data was available, often, the formats of the available data were such that they could not be seamlessly migrated into other digital platforms. Extensive and resource-intensive data formatting processes were required during the implementation phase, posing a significant challenge both financially and skill-wise. The identified lack of data compatibility impeded the efficient exchange and sharing of information across different stakeholders and sub-sectors within the Agricultural value chain. To navigate this obstacle, the development team had to go the extra mile of developing different data adaptors for different institutions, which was quite time and resource-consuming.

These identified challenges may lead to overall delays in establishing and maintaining the national Ag-Data Hub, particularly if the implementation team has to navigate these obstacles individually for each stakeholder with incompatible yet pertinent data holdings. Effectively addressing these issues requires the establishment of standardized protocols and data governance frameworks to ensure compatibility, interoperability, and the successful operation of a unified national Agricultural data hub.

Digital Infrastructure and API Absence

Approximately 90% of the agriculture sector's current data repositories face a dual challenge: either their data remains entirely non-digitized or the existing digital systems lack essential Application Programming Interfaces (APIs). The absence of APIs poses a significant obstacle, impeding the direct extraction of data from these systems and hindering smooth integration. Upon delving into discussions about potential solutions, it became evident that the institutions lacked the requisite skillset for data migration or API development. This deficiency is primarily attributed to the institutions' recruitment practices, which prioritize core mandates over specialized skillsets in data management.

To address this issue, national Agricultural institutions must forge strategic partnerships with both public and private entities. Collaborating with external partners is essential to overcoming the challenges posed by the absence of digitization and APIs. Several instances were noted where public institutions successfully leveraged the expertise and resources of private partners to effectively manage their data, highlighting the importance of such collaborations in the agricultural sector's data landscape.

Institutional Process Gaps

Numerous institutions have been observed lacking proper organizational structures and well-defined processes for accessing their existing data. The absence of standardized procedures creates a significant challenge for stakeholders, making it cumbersome to efficiently locate, retrieve, and utilize available data. Researchers, policymakers, and other practitioners frequently express frustrations over the difficulties encountered in finding specific datasets relevant to their needs. The absence of established structures and streamlined processes transforms the task of retrieving pertinent information into a time-consuming and arduous endeavor, thereby hindering decision-making processes, research initiatives, and the overall effectiveness of agricultural practices.

Furthermore, the absence of standardized procedures not only obstructs data access but also jeopardizes the reliability and accuracy of the retrieved information. Without clearly defined processes, there is an increased risk of misinterpretation or misapplication of data, potentially leading to flawed conclusions and misguided actions. This vulnerability was evident in certain aspects of our development process, as highlighted during user acceptance testing exercises where instances of misrepresentation were identified. Addressing these challenges is of paramount importance for institutions within the agriculture sector. It is crucial to establish robust structures and implement well-defined processes for data access. This involves the development of standardized protocols for data storage, cataloging, and retrieval. Recognizing the urgency of these improvements, the Ag-Data Hub has incorporated a data and resource lookup directory as part of its services. This feature aims to assist stakeholders in effortlessly finding the right data and information, thereby enhancing the overall efficiency and reliability of data utilization in the agricultural domain.

Data Availability Issues

In cases where data is expected to be made available for the national good, it is not readily accessible. This failure to share data contradicts the intended purpose and impedes potential benefits for policymaking, research, and development initiatives. Mandated institutions should recognize that the utility of their data extends beyond their immediate needs. The same data can serve diverse purposes when shared with other institutions. However, many institutions with data holdings are inclined to share information products rather than raw data. Establishing collaborative partnerships and engaging stakeholders effectively can foster productive collaborations where raw data is shared without conflicting uses. As the Ag-Data Hub scales, engaging stakeholders in this manner becomes crucial to persuading multiple entities to agree to share their data holdings.



SWOT Analysis

STRENGTHS

- Existing partners have a host of data relevant for climate smart agriculture
- Stakeholders agree to the need to share data
- Government of Ghana (GoG) support through national institutions like MOFA and CSIR
- Aligned with components 1 and part of component 2 of the Food Systems Resilience Program (FSRP)
- ESOKO and other private sector partner endorsement and support

OPPORTUNITIES

- Trigger a data driven approach to sustainable and climate smart Agriculture
- Create a demand for resources in research and academia.
- Meet the needs of growing demand for precise and predictive agronomic data.
- Develop data backed end-user tools for Climate smart and sustainable farming

WEAKNESSES

- Limited in-house technical developer expertise in many partner institutions.
- No guarantee of backing funds for operationalization of Data Hub after implementation
- High-Level Bureaucracy, data ownership and data security concerns of partners

THREATS

- Executive Sponsorship/Funding (support from leadership i.e. endorsement of stakeholders, money)
- Deciding on type of management for the operationalization of the Ag-Data Hub
- Establishing a clear-cut, long-term sustainability plan to scale and constantly improve the proposed Ag-Data Hub.

2023 Key Implementation Partners



CONCLUSION

The Ghana Digital Agricultural Data Hub, envisioned as the nation's premier platform for digital data exchange, is poised to revolutionize information and data sharing among stakeholders. With a focus on fostering fact-based decision support systems for policymaking and promoting sustainable climate-smart agricultural practices, the Ag-Data Hub is at the forefront of driving innovation in the agricultural sector. In 2023, the Ag-Data Hub transitioned from the planning phase to the implementation phase, culminating in the development of a Minimum Viable Product (MVP). The MVP currently has over a dozen services being offered by different national partners. The implementation phase revealed key challenges, including resource constraints, data format incompatibility, absence of APIs, institutional process gaps, and data availability issues. These challenges necessitate strategic interventions to enhance resource allocation, standardize data formats, develop APIs, establish institutional structures, and promote data sharing.

This year, the Ag-Data Hub is preparing for a seamless transition from test servers to production servers. The Go-Live plan involves thorough testing and validation to ensure the robustness and reliability of the platform in serving the nation. To scale effectively, the Ag-Data Hub emphasizes the importance of collaboration with external partners, fostering digital infrastructure development, and addressing institutional process gaps. Strategic partnerships and stakeholder engagements will play a crucial role in overcoming challenges and ensuring the success of the national Agricultural Data Hub.

In conclusion, the Ghana Digital Agricultural Data Hub represents a significant milestone in advancing the digital transformation of the agricultural sector. The comprehensive features, collaborative tools, and ongoing improvements position the Ag-Data Hub as a catalyst for sustainable development, innovation, and informed decision-making in Ghana's agricultural landscape.

About AICCRA

Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA) is a project that helps deliver a climate-smart African future driven by science and innovation in agriculture. It is led by the Alliance of Bioversity International and CIAT and supported by a grant from the International Development Association (IDA) of the World Bank. Explore our work at [**aiccra.cgiar.org**](https://aiccra.cgiar.org)