

Info Note

Unlocking the power of digitalization for faster transformation of Ethiopian Agriculture

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Introduction

There is high hope on digital agricultural solutions to increase agricultural productivity and food security in Ethiopia. The country has prepared a Digital Strategy 2025 which is set to transform the country's national economy through four major sectoral pathways including agriculture, manufacturing, IT-enabled services, and tourism. Particularly, the recent effort in the development of the “National Digital Agricultural Extension and Advisory Services Roadmap to 2030” is a clear indication of the country’s commitment to transforming its agriculture through digital solutions. Such solutions are expected to provide digitally enabled services to agricultural producers and other actors in agricultural value chains.

To realize digitalization in the agricultural sector in Ethiopia, the Alliance Bioversity International and CIAT with its partners organizations has put tremendous efforts in the last couple of years in developing different digital tools with national and international partners. This info note is prepared to introduce these digital tools and their prospect in transforming Ethiopian agriculture.

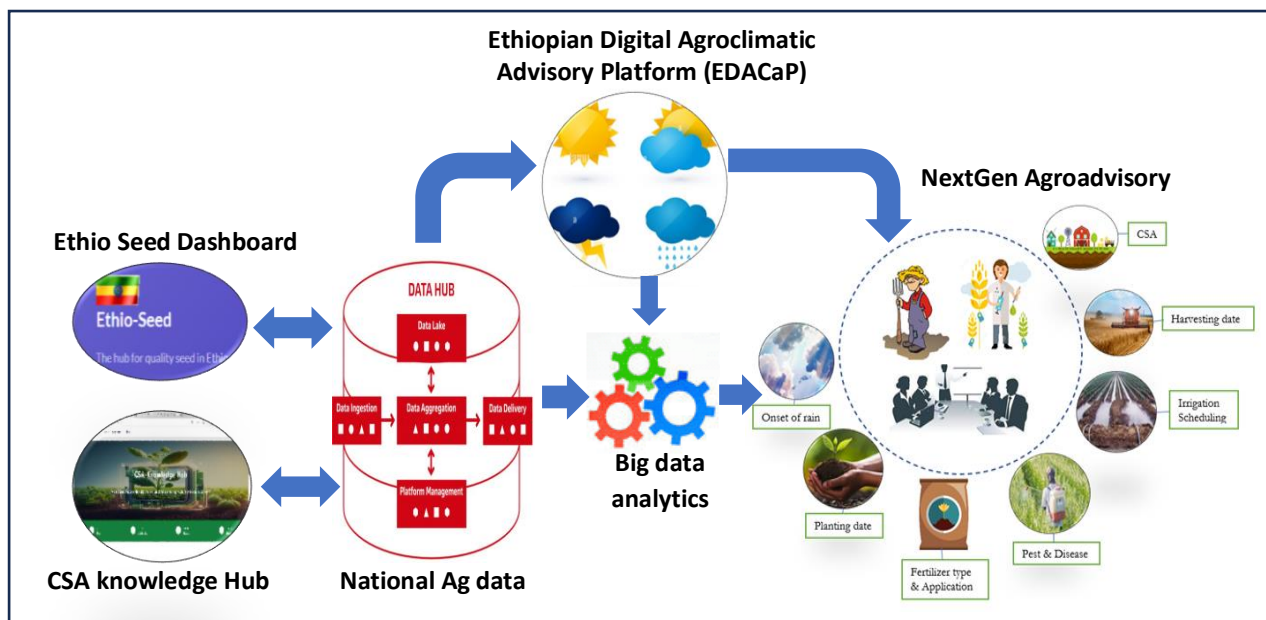


Figure 1: Digital tools developed by Alliance Bioversity International and CIAT and Partners

The digital tools

1. National Ag-Datahub

The National Ag-data hub is one of the main digital tools developed by Alliance Bioversity International and CIAT together with the Ministry of Agriculture (MoA). The agricultural Data Hub is

supposed to harmonize and standardize agriculture-related datasets in the county and facilitate access and sharing. In addition, the data hub is to be instrumental to facilitate and encourage innovations in the development of decision-support tools and advisories across different use cases. The data hub is being co-developed to be a dedicated, and publicly owned and operated - one-stop shopping national ag-data hub for Ethiopian government policymakers, experts, ag extension officers, farmers, value chain actors, and other end users (through consolidation, integration, and upgrading of the existing systems) that provides all relevant data, insights, and analytics needed to make fact-based decisions when conducting agricultural operations.

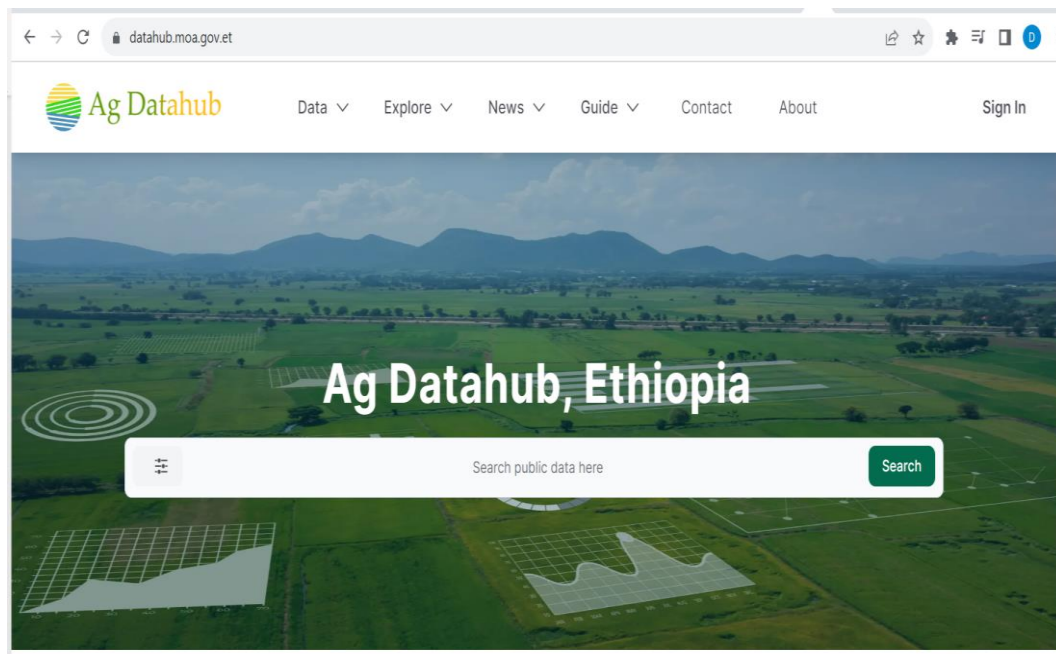


Figure 2: National Ag data hub ([link](#))

The National ag data hub is currently giving access to different datasets which are categorized into Crop, Livestock, Natural resources, Marketing and Socio-economic.

2. **NextGen Agroadvisory**

NextGen Agroadvisory is a digital tool developed by Alliance Bioversity International and CIAT with national and international partners which is used to provide site-specific and climate smart fertilizer advisory in Ethiopia. The NextGen Agroadvisory is one of the use cases developed using the National Ag-data hub.

The NextGen Agroadvisory is developed by integrating long years crop responses to fertilizer data with environmental covariates. The approach employs state of the art machine learning predictive model to generate site specific fertilizer rate. The advisory generations also consider climate information when developing recommendations, making it season-smart. The development of NextGen Agroadvisory has significant contribution in terms of optimal use of fertilizer rate so that increase productivity, wise use of hard currency to import fertilizer amount from abroad and reduce environmental impacts. The advisory was validated and piloted in different part of Ethiopia in the last three years, and it was found that up to 25% yield increment.

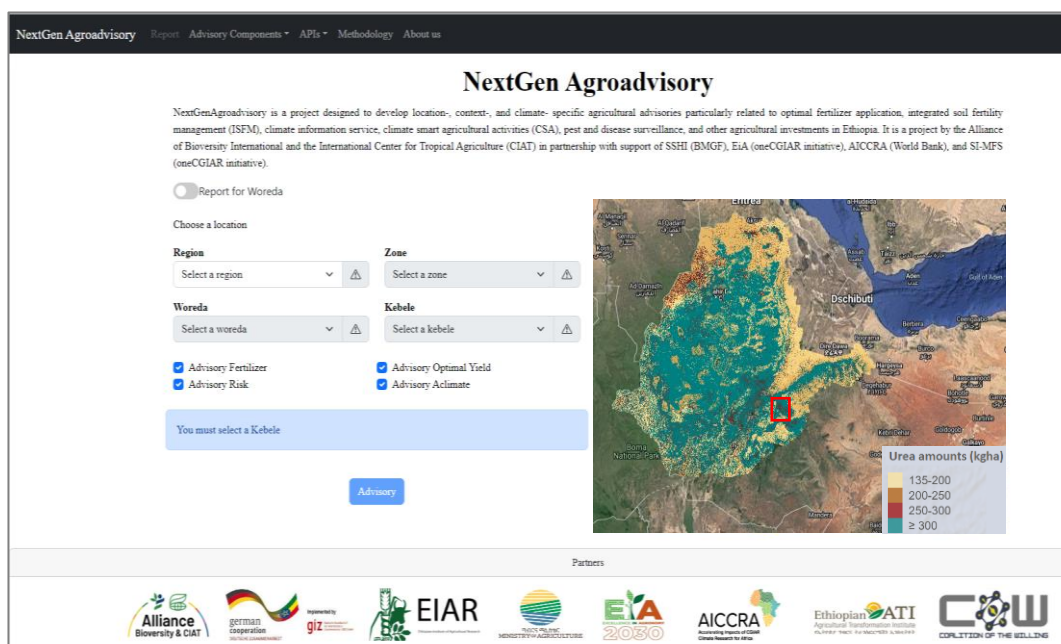


Figure 3: NextGen Agroadvisory ([link](#))

3. Ethiopian Digital Agroclimatic Advisory Platform (EDACaP)

One of the main problems for Ethiopian smallholder farmers is a general lack of reliable weather and climate forecasts. The lack of climate forecasting information becomes more and more challenging for smallholder farmers as the variability in weather increases, which results in an unpredictable and highly variable agricultural yield. To address this challenge, EDACaP is developed by Alliance Bioversity international and CIAT, CIMMYT, MoA and EIAR to advise farmers and different actors along value chain on climate forecast and actionable agro advisories like planting windows, fertilizer application timing, yield forecasting and other very relevant climate sensitive agricultural decisions.

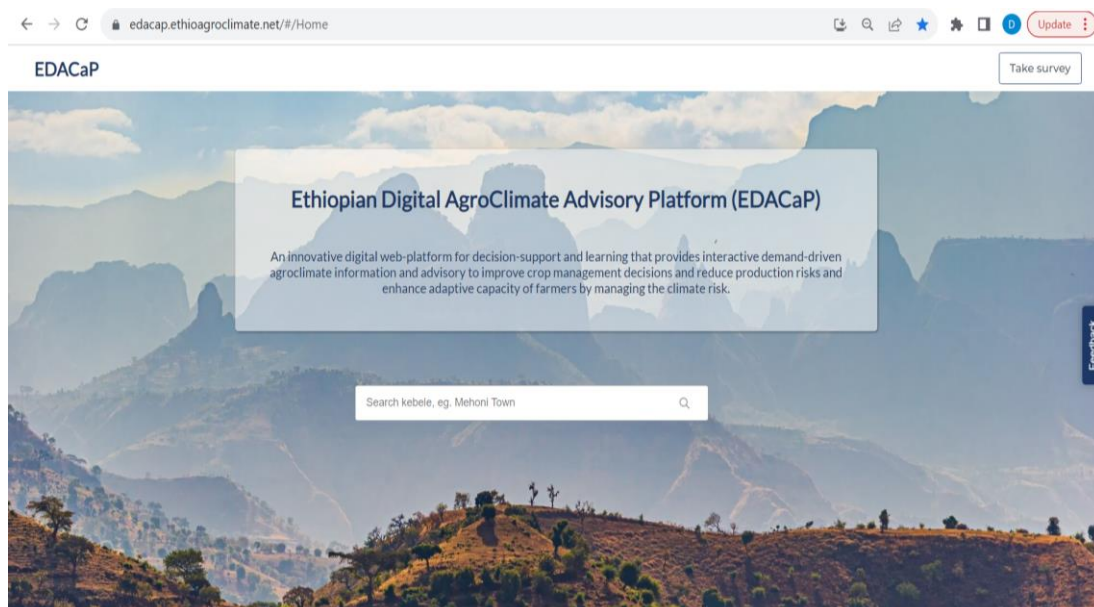


Figure 4: Ethiopian Digital Agroclimate Advisory Platform ([link](#))

EDACaP integrates state of the art seasonal and sub-seasonal climate prediction system and crop model to generate pre-season and in-season agr-advisories. EDACaP was piloted in those last two years through an innovative partnership with LERSHA Plc. and a very good achievement was recorded.

4. **Ethio-Seed Dashboard**

One of the major challenges in Ethiopian agriculture is unavailability of seed system that provide information in due time for making decisions by farmers, seed producers and government officials. Cognizant of the challenge, the Alliance Bioversity International and CIAT with MoA, ILRI, ICARDA and other partners developed Ethio-Seed Dashboard that provide up to date information on seed demand, seed supply, seed distribution at different spatial scale. The system computes near real time seed demand-supply balance. It also registers seed producers and the different seed grades like breeders, pre-basic, basic and certified seeds.

The development of Ethio-Seed dashboard is used for demand driven efficient planning of seed production and distribution. The dashboard is fully developed and tested. It is expected to be operationalized soon by the MoA.

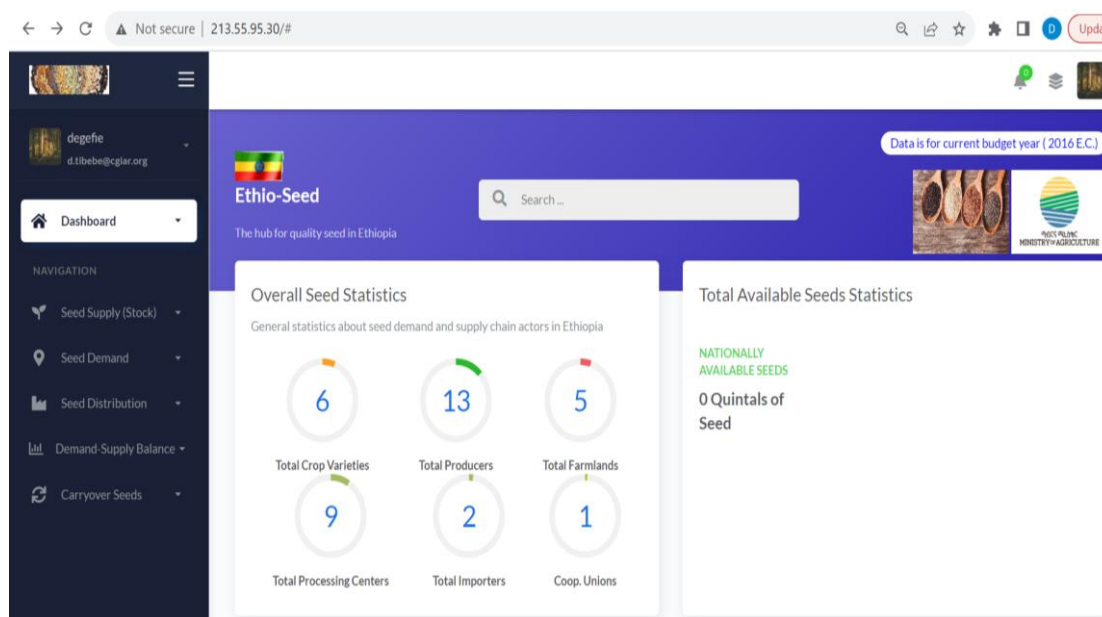


Figure 5: Ethio-Seed Dashboard (link)

5. **Climate Smart Agriculture Knowledge Hub**

Climate change is already negatively impacting agricultural production in Ethiopia. Climate risks to agriculture are expected to increase in coming decades in country like Ethiopia where the adaptive capacity is weaker. Impacts on agriculture threaten both food security and agriculture's pivotal role in rural livelihoods and broad-based development. On the other hand, agriculture contributes to climate change through greenhouse gas emission. All these challenges can be addressed through implementation of climate smart agriculture in the Ethiopian landscape. However, there is challenge of targeting context and site-specific CSA solutions.

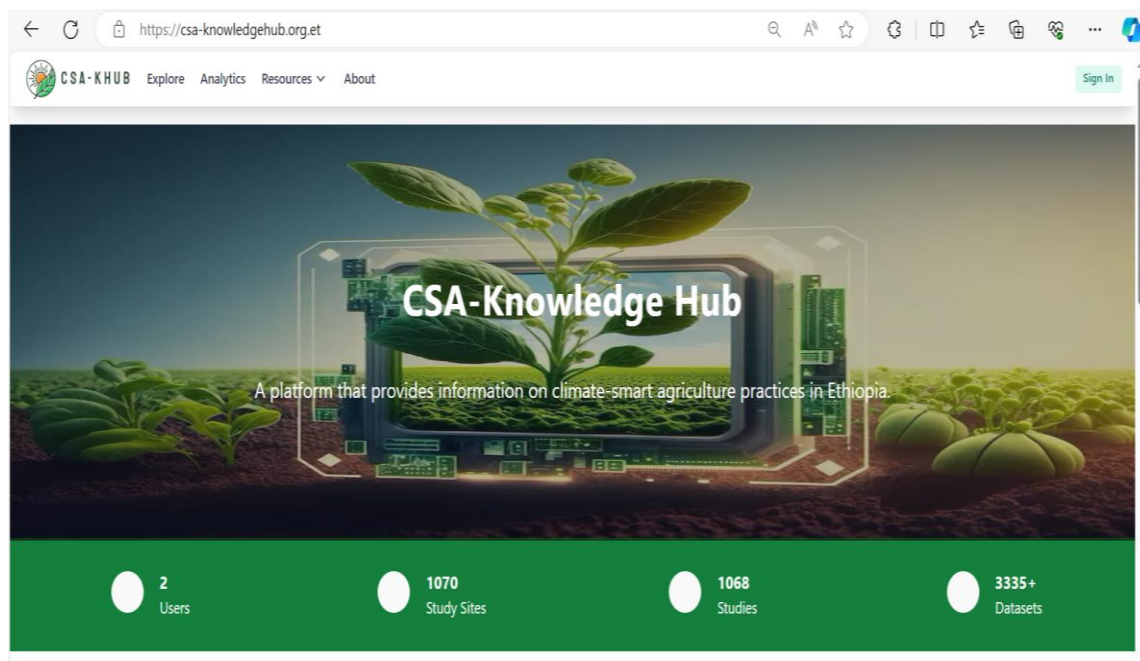


Figure 6: Ethio-Seed Dashboard ([link](https://csa-knowledgehub.org.et))

Cognizant of the problem, Alliance Bioversity International and CIAT together with different partners come up into developing Climate Smart Agriculture Knowledge hub who can provide spatially disaggregated information for users. The Knowledge hub is built by integrating data collected from long years experiments of climate smart agriculture practices response to productivity, adaptation and mitigation. Different analytics techniques employed to prioritize, trade-off analysis and targeting climate smart agriculture solutions. The knowledge Hub currently has more than 3335 observations collected from 1068 studies and 1070 study sites. It is expected more data yet to come by uses of the platform.

Conclusion and way forward

In agriculture, digitalization is a game changer in boosting productivity, profitability, and resilience to climate change. An inclusive, digitally enabled agricultural transformation could help achieve meaningful livelihood improvements for smallholder farmers and pastoralists. Ethiopia is now in the right track towards digitalizing of agricultural processes and services aiming for fast transformation. For that different digital tools are now being developed by partners and supporters of the agricultural sector. Alliance Bioversity international and CIAT is one of the main partners and working towards supporting the government of Ethiopia in the digitalization of Agriculture. In this regard, Alliance Bioversity international and CIAT developed different digital systems that are very align and demand by the sector. Currently Alliance Bioversity international and CIAT together with the Ministry of Agriculture are developing digital agriculture road map which is key for the Ministry to guide future development of any digital systems in the agricultural landscape. This will ensure that the digitalization process would be integrative and interoperable so that fast transformation can be achieved.

Acknowledgment

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. The supporting soil health initiatives (SSHI) project of GIZ-Ethiopia also provides technical and financial support towards the realization of the data hub, including developing a mini-hub at EIAR. The Excellence in Agronomy (EiA) program of the CGIAR is supporting the data hub building exercise by providing technical support related to Carob extract, transform and load (ETL) data flows among others.