ANNEX

CLIMATE-SMART SOLUTIONS STUDY

Assessment of climate-smart dashboards to serve farmer facing organizations

August 2021

MERCY CORPS | AGRIFIN | Dalberg

GARDIAN aggregates publications and data sets to enable quick discovery and collaboration among researchers

Dashboard's application of data

Aggregation

Agroclimatic information
- Crop production (e.g. yield, harvested area)
- Climate model projections (from other sources)
- Soil contents

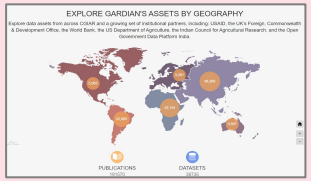
Geographic range
- Global

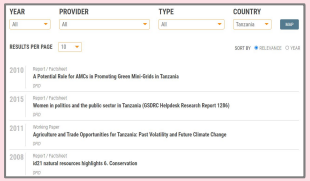
Geographic granularity
- Users can view crop production data and aggregated projections at national and sub-national levels

Time horizon
- Crop production estimates since 2000

Processing

- GARDIAN enables the discovery of publications and datasets from ~30 institutional publications and data repositories from CGIAR Centers and beyond
- GARDIAN allows users to map and spatially query production estimates for 30+ crops globally for 2000, 2005 and 2010
- It also aggregates and allows users to view several global climate model projections from the 2030s through to the 2080s
- Plans for GARDIAN include further demonstration of the value of interoperable data via seamless interactivity of discovered data with key analytical/visualization tools, including models and maps
- A key component of the platform's objective is to establish the infrastructure, tools, and approaches to making CGIAR data Findable, Accessible, Interoperable, Reusable (FAIR)





Use cases

Actionability for farmer facing organizations

- GARDIAN is designed for a wide range of users seeking to leverage data for agricultural research
- The potential use cases of the data aggregated in GARDIAN are vast (e.g. crop/livestock management, weather-based insurance, pest forecasts)
- However, it requires partners' own processing power (rather than being provided by GARDIAN itself) and it therefore has low actionability for farmer facing organizations

Governance model

Dashboard host

CGIAR

Dashboard partners

amazon, BAYER, CSIRO, ASU, FAO, aWhere, Bill & Melinda Gates foundation, Columbia University, Conservation International, Berkeley Lab (Bringing Science Solutions to the World)

Pricing model
- Free of charge

Data sharing policy
- Open (Including access to underlying data repository)

FEWSNET provides early warning and analysis on acute food security around the world primarily to inform humanitarian response efforts

Dashboard's application of data

Aggregation

Agroclimatic information
- Weather (e.g. rainfall, temperature)
- Climate conditions (e.g. soil moisture, evapotranspiration)
- Staple food prices and cross-border trade

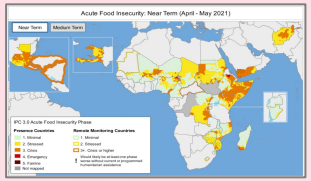
Geographic range
- Global

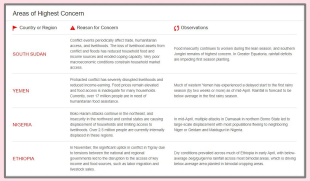
Geographic granularity
- Provides national and sub-national analysis in 28 vulnerable countries across the globe

Time horizon
- Provides 8-month food security forecasts

Processing

- FEWSNET maps and classifies the level of food security stress in its focus countries according to a simple five-step scale, ranging from minimal food insecurity to famine
  - Based on this information, it flags areas of greatest food security concern with supporting explanations/observations
  - It enables users to interactively view detailed food security reports for individual countries and navigate the data that underpins these reports (e.g. trade, precipitation, vegetation)
- FEWSNET shares special reports on factors that contribute to or mitigate food insecurity (e.g. weather, trade, agricultural output)
- FEWSNET also provides access to underlying data on food security classification, administrative boundaries, country livelihood zones, price and cross-boundary trade





Use cases

Actionability for farmer facing organizations

- FEWSNET is primarily designed for use by governments and relief agencies who plan for and respond to humanitarian crises
- Its food insecurity classification and forecast could potentially be used to inform the activities of some farmer facing advisory services providers (e.g. extension services) to target the provision of agronomic advice in periods of drought

Governance model

Dashboard host

USAID FROM THE AMERICAN PEOPLE

Dashboard partners

USGS science for a changing world
USDA
Chemonics Development works here.
NASA
Kimetrica
Climate Hazards Center UC SANTA BARBARA
NOAA

Pricing model
- Free of charge

Data sharing policy
- Open (Including access to underlying data repository)

Gro Intelligence hosts an extensive agriculture data platform through which it offers advanced data analytics and forecasts

Dashboard's application of data

Aggregation

Agroclimatic information
- Weather (e.g. rainfall)
- Crop health, yield, production, import and export
- Pricing and financial markets

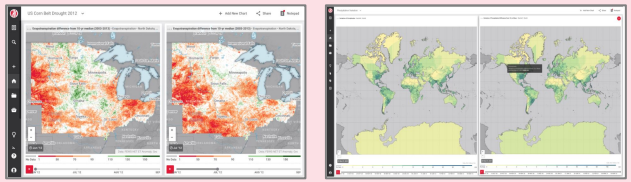
Geographic range
- Global

Geographic granularity
- National and sub-national (customized to user needs)

Time horizon
- Shows near real time data
- Shows historical data as well as future projections

Processing

- Through the Gro portal, users can navigate Gro's range of data, build dynamic visual displays using a variety of charts and maps for a wide range of processing applications, including:
  - Analytics (e.g. crop yield, planting intention, demand, aflatoxin forecast)
  - Indices (e.g. drought index, precipitation variation, price index)
- Gro's API enables users to access tens of millions of series and trillions of points from public, licensed or Gro derived data which can be satellite or ground-based, environmental or socio-economic, supply-side or demand-side; this data can then be used alone or with the user's proprietary data to build or improve climate and agriculture models



Use cases

Actionability for farmer facing organizations

- Gro primarily serves private companies across a range industries, including climate and agriculture (seed, crop insurance, fertilizer, etc.) in developed economies
- It could therefore have significant applicability to farmer facing organizations' use cases, including:
  - Weather surveillance
  - Yield forecasting
  - Pest/disease warning
  - Fertilizer planning
  - Weather-based insurance
  - Soil monitoring

Governance model

Dashboard host

Gro Intelligence

Dashboard partners

n/a

Pricing model
- Hybrid (Gro for Good gives free access to growers, educational institutions, and nonprofits and researchers seeking to use the platform for the public good)

Data sharing policy
- Closed behind paywall

1) Through Gro for Good, Gro gives growers, faculty members/students at educational institutions, employees at nonprofits and those working on a project or research focused on food security or climate security with the ambition to use the platform for good free access)

AgMIP Impacts Explorer examines farming systems' vulnerability and adaptation to climate change to inform potential responses

Dashboard's application of data

Aggregation

Agroclimatic information
- Crop Yield (e.g. maize, pearl millet, peanut)
- Income
- Temperature
- Rainfall

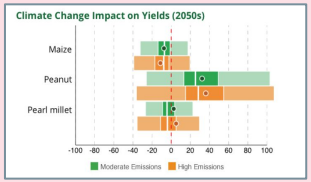
Geographic range
- SSA (Senegal, Zimbabwe, South Africa, Kenya)
- South Asia (Pakistan, India)

Geographic granularity
- National and sub-national

Time horizon
- Historical data collected to make 30-year future projections

Processing

- The AgMIP Impacts Explorer dashboard explores impacts, vulnerability and adaptation of farming systems through modelling and presents the key findings via maps and infographics (e.g., graphs of climate change impacts on yields)
- AgMIP also offers a data explorer that enables access, filtration, and creation of custom figures from regional assessment outputs (e.g. agriculture pathways, emission scenarios)
- In addition, AgMIP has a descriptive component that provides regional snapshot of the areas of study (e.g., area, climate, weather and crops being grown)
- To interact with the AgMIP dashboard, users pick a specific location to find localized data (e.g., on climate change impacts, vulnerability and adaptation trends within specific crop systems)



Use cases

Actionability for farmer facing organizations

- The AgMIP Impact Explorer is primarily designed to inform policy-making and planning in light of climate change
- The information it presents could inform the longer-term transition planning across different farmer facing organizations (e.g. through long-term crop yield forecasts) but it offers limited shorter-term advice that would be more directly actionable to farmer facing organizations

Governance model

Dashboard host

Dashboard partners

Pricing model
- Free of charge

Data sharing policy
- Open (Including access to underlying data repository)

Cropin applies artificial intelligence to provide live reporting, analysis and inform decision-making across agricultural value chains

Dashboard's application of data

Aggregation

Agroclimatic information
- Weather (Rainfall, Temperature, Wind)
- Crop
- Hectarage of arable land

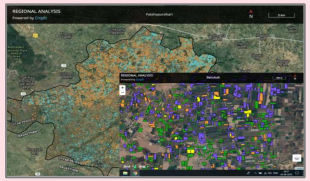
Geographic range
- Global (in 52 countries including India)

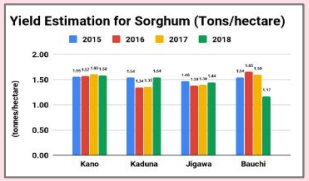
Geographic granularity
- Local (Customized to client needs)

Time horizon
- Shows near real time data
- Shows historical data as well as future projections

Processing

- Cropin's SmartFarm is a SaaS platform aggregates data from a range of sources (satellite imagery, remote sensing, etc.) and processes this information to monitor crops, forecast yields and provide actionable crop management advice (e.g. planting, harvesting)
- Cropin also offers SmartRisk – a predictive and prescriptive solution for risk monitoring, mitigation and forecasting Intelligence in which an AI and Machine-learning based platform detects cropping patterns and predicts the future of the crop, thereby highlighting the associated risk and opportunity for users
- Cropin's applications are presented in user-friendly formats (e.g. interactive maps, mobile app, SMS notifications) to enable use by both farmer facing organizations and farmers themselves





Use cases

Actionability for farmer facing organizations

- Cropin is designed for a range of farmer facing organizations (e.g. growers, input providers, insurers, advisory service providers financial service providers)
- It can inform a range of use cases for farmer facing organizations, including:
  - Crop monitoring
  - Soil monitoring
  - Fertilizer planning
  - Weather-based insurance
  - Credit risk assessment
  - Market pricing

Governance model

Dashboard host

Cropin

Dashboard partners

Pricing model
- Charged

Data sharing policy
- Closed behind paywall

KALRO's KAOP provides local weather forecasts and agricultural advice to farmer facing organizations and farmers in Kenya

Dashboard's application of data

Aggregation

Agroclimatic information
- Precipitation
- Temperature
- Wind
- Cloud cover

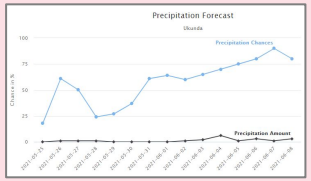
Geographic range
- Kenya

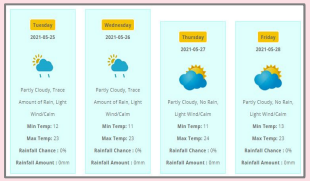
Geographic granularity
- Ward level e.g. Shella ward in Malindi sub-county, Kilifi county

Time horizon
- Shows near real time data
- Shows historical data as well as future projections

Processing

- KAOP (Kenya Agricultural Observatory Platform) extracts satellite data from AWhere through APIs to provide customized local weather forecasts and agriculture advice
- KAOP generates 14-day, Ward-level precipitation and temperature forecasts and visualizes them on simple interactive maps and charts; it is also in the process of developing an SMS service to disseminate such forecasts directly to farmers
- KAOP also combines its weather surveillance and forecasting capability with local agricultural data (e.g. soil moisture) to provide a crop, livestock and pasture selection advice at the Ward level





Use cases

Actionability for farmer facing organizations

- KAOP is primarily used by farmer facing organizations (e.g. Arifu, Digifarm) and farmers themselves (via SMS updates)
- Its localized weather forecasts to inform a wide range of farmer facing organization use cases (e.g. crop monitoring and calendaring, weather index insurance)
- Its crop, livestock and pasture selection advice can also inform how advisory service providers should serve farmers

Governance model

Dashboard host

KALRO

Dashboard partners

THE WORLD BANK IBRD • IDA

KCSAP

aWhere

Pricing model
- Free of charge

Data sharing policy
- Open

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