



# INCENTIVIZING AGRICULTURAL RESEARCHERS

TO SHARE **OPEN &  
INTEROPERABLE DATA**

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Module Lead | **CGIAR Platform for Big Data in Agriculture**

CABI: Opening up Agricultural Research and Data (Nov 11, 2020)



# A FUTURE FARM

Feeding the future. Byte by byte.

## SURVEY DRONES

Aerial drones survey the field to map crop health and yield, and soil variation.

**Cloud storage** enables faster data movement, analysis and exchange, **increasing computational capacity** while decreasing costs.

## BIG DATA-DRIVEN SOLUTIONS

Find, access data  
Interpret  
Aggregate

Visualize  
Analyze



## FARM TO CLOUD

Farms generate vast amounts of **rich and varied data**, which can now be stored, processed, and shared in the cloud, to be delivered **back to farms as important advisory services**.

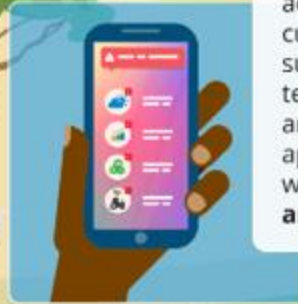


## LIVESTOCK LIVE

**Decreasing costs** of small devices, such as mobile phones and sensors, **are increasing access** to get rural farmers - and their livestock - online and benefiting from data exchange.

## UBER AGRIBOTS

**Peer-to-farmer services** allow smallholder farmers access to cost-effective cutting edge technology such as agribots that can tend to or harvest crops, and provide precise application of fertiliser and water, **saving economic and environmental costs**.



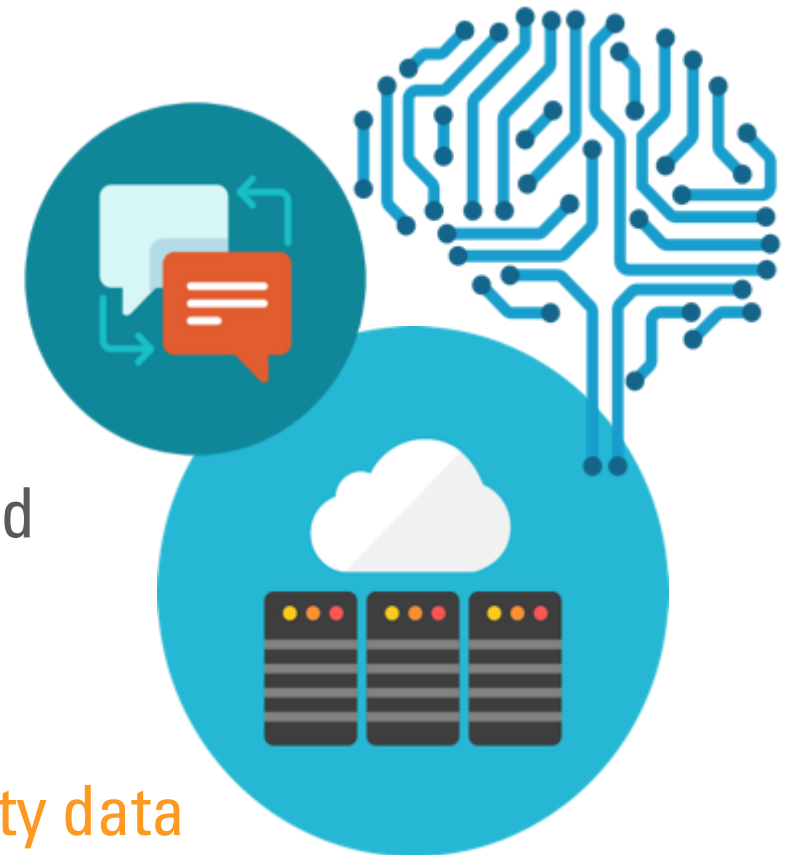
Platform for  
Big Data  
in Agriculture





***Hey Cigi,** When should I plant my maize?  
How should I manage my crop?*

- Real-time **decision support** for farmers
- Easy **natural language** as an interface
- Smart **artificial intelligence** trained by CGIAR and partners
- ...requires leveraging multiple open, **harmonized, interoperable databases** with **quality data**



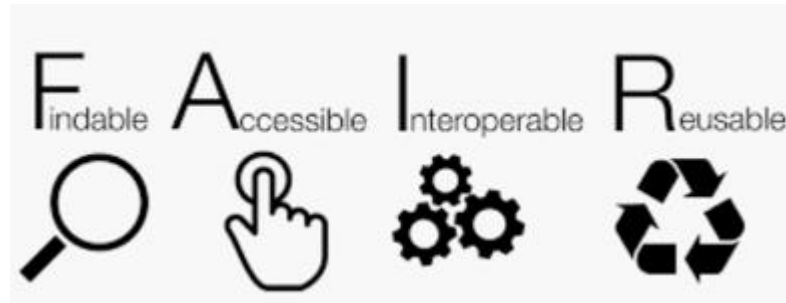
*We need data on crop management and yield response to validate our model and DSS. Help??*

*Where do I find data or pubs on nutrition status in rural households?*

*Where in Sub-Saharan Africa is fertilizer use profitable?*

Open data...

that is also



E<sub>thical</sub> R<sub>eproducible</sub>

# KISR:

## KEEP IT SIMPLE FOR RESEARCHERS

### WHAT DO I NEED TO DO?

- Clear policy (2013; 2021); digital strategy (2021)

### HOW DO I DO IT?

- Capacity enhancement: guidelines to implement; webinars; workshops; data curathons/sprints; bespoke help sessions...

<https://bigdata-cgiar.course.tc/catalog/course/fair>



All courses > FAIR Data Management

Data assets that are interpretable and interoperable for humans and machines are critical to enhance the impact of research in the agricultural domain and to catalyze innovation and transform agricultural research for development. This course has been developed to strengthen capacity in the CGIAR System and beyond to create, manage and share research and development data assets that are not only open (i.e., discoverable and downloadable), but also easily interpretable, interoperable, and reusable. The FAIR Principles embody the guidelines to make resources Findable, Accessible, Interoperable, and Reusable (FAIR); this course is intended to provide more concrete "how to" help in operationalizing these, and ensuring that assets are responsibly managed.

Next Session

Started Jan 8, 2020

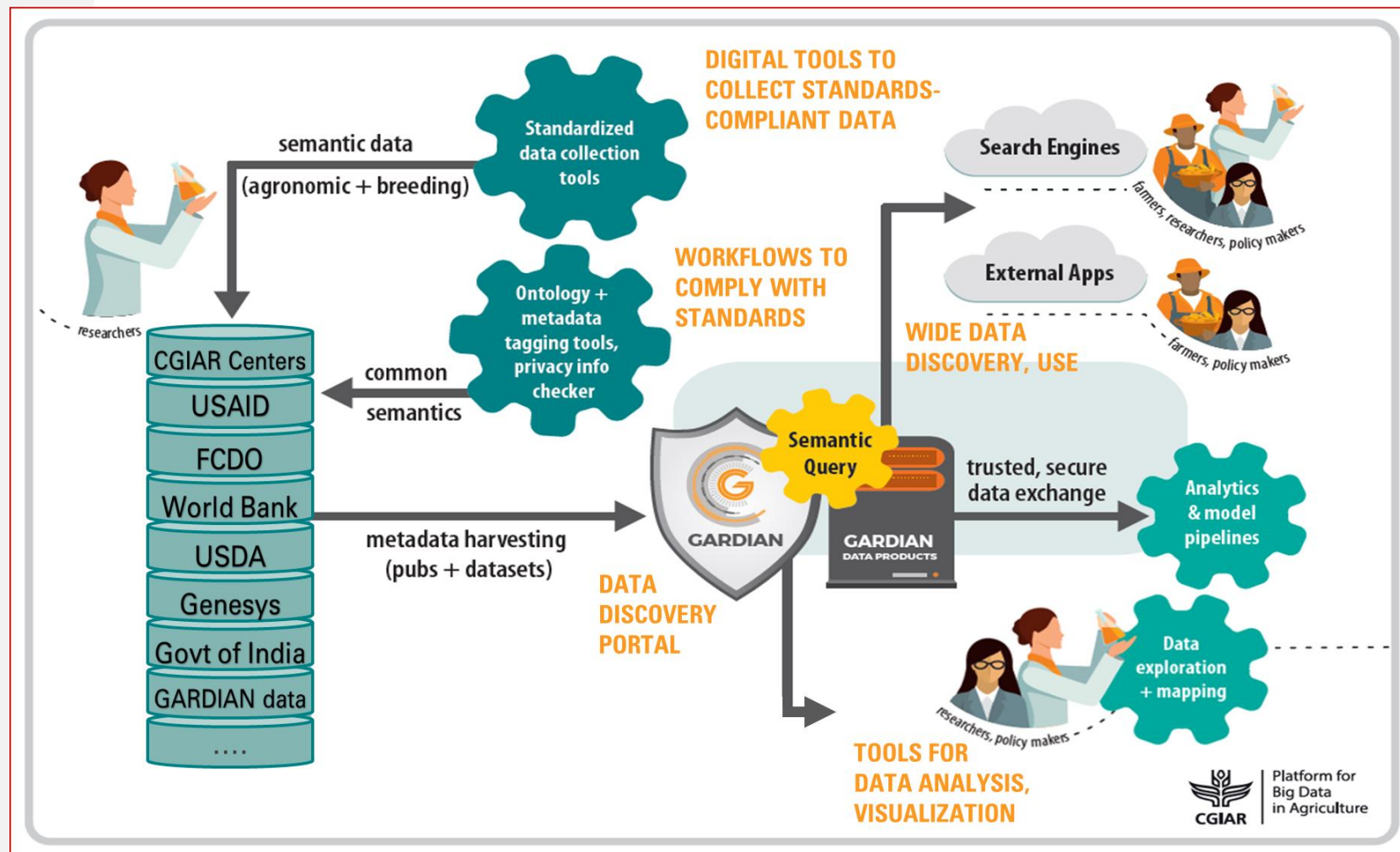
[Change](#)

[JOIN COURSE](#)

# KISR: KEEP IT SIMPLE FOR RESEARCHERS

## HOW DO I DO IT?

- Tools, services, data processing scripts that are easy to use



# GARDIAN DATA PORTAL



**GARDIAN**

Global Agricultural Research Data Innovation Acceleration Network

Enter your keywords to search GARDIAN



**170,329**

**PUBLICATIONS**



**27,656**

**DATASETS**



**DATA MANAGEMENT  
TOOLKIT**

[gardian.bigdata.cgiar.org](http://gardian.bigdata.cgiar.org)

## EXPLORE

- ▶ publications and datasets
- ▶ global crop production data
- ▶ global climate model projections

## COLLABORATE

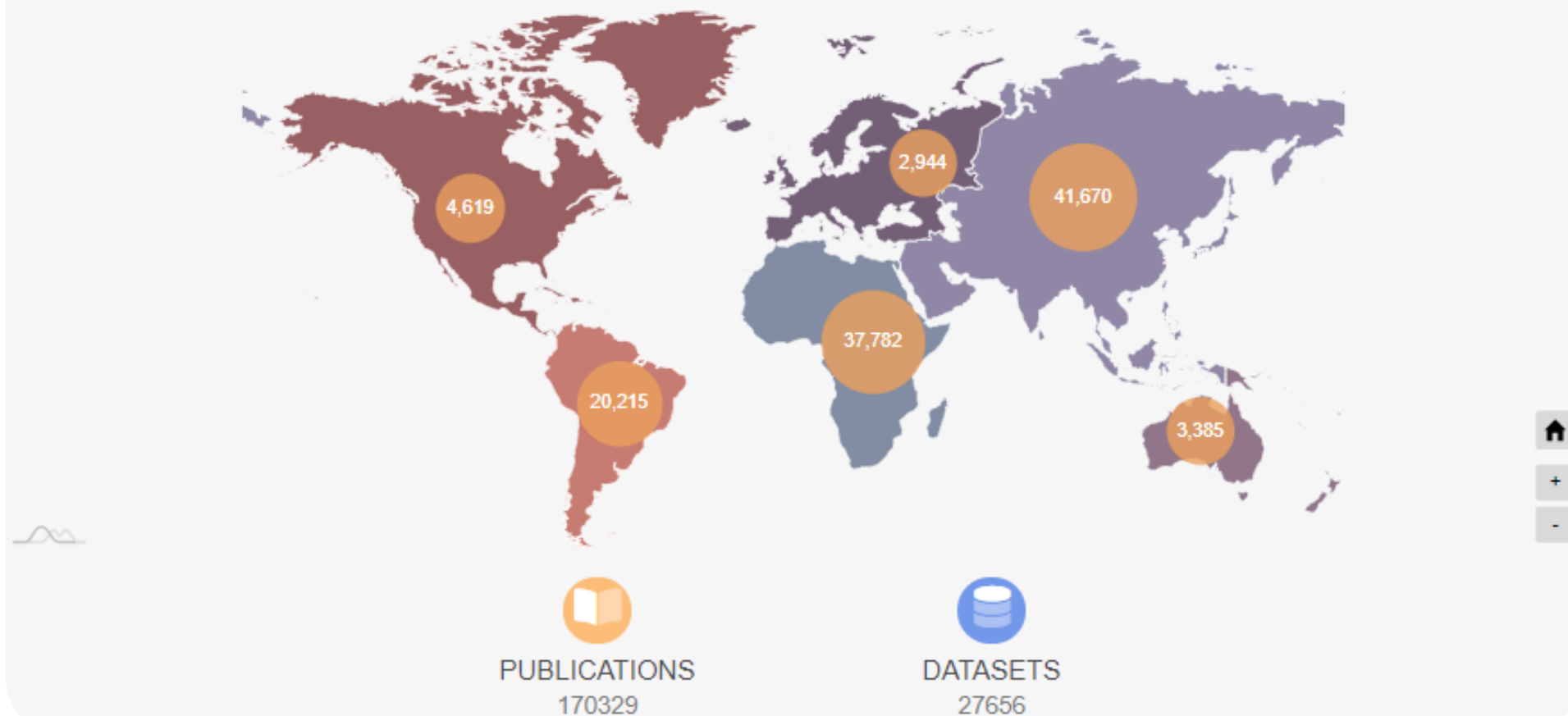
- ▶ on a data science project

## GET HELP

- ▶ with your metadata
- ▶ with your PII
- ▶ with your FAIRness

## EXPLORE GARDIAN'S ASSETS BY GEOGRAPHY

Explore data assets from across CGIAR and a growing set of institutional partners, including: USAID, the UK's Foreign, Commonwealth & Development Office, the World Bank, the US Department of Agriculture, the Indian Council for Agricultural Research, and the Open Government Data Platform India.





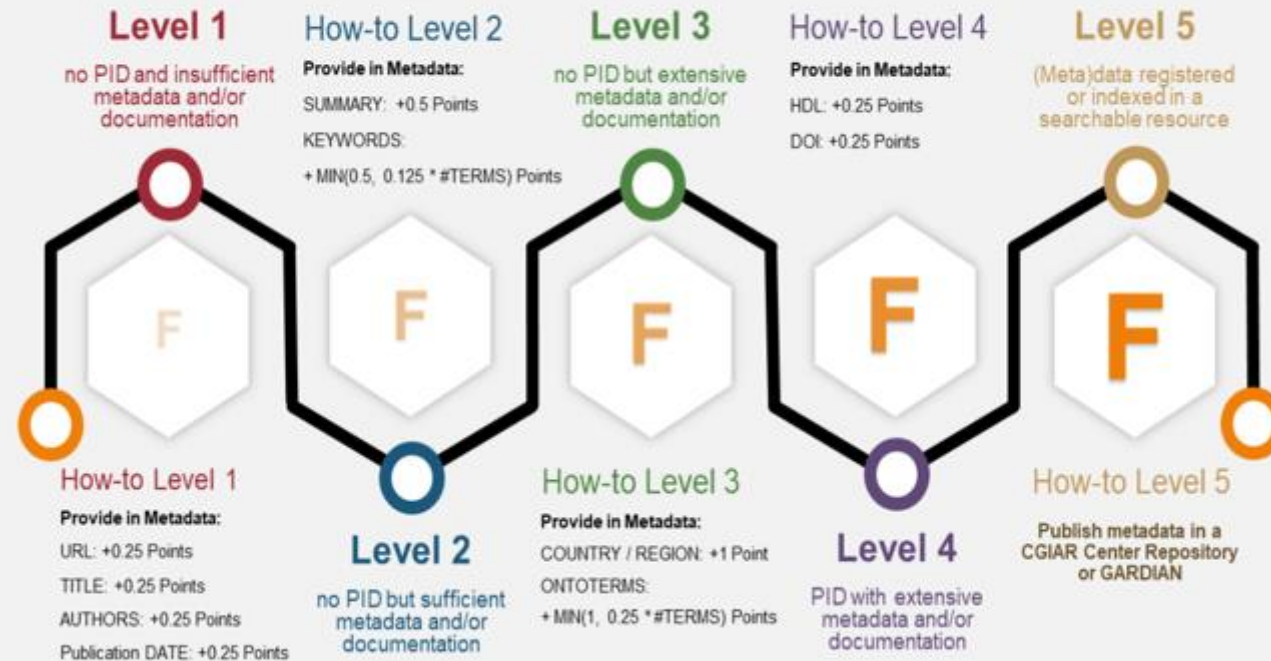
# KISR: KEEP IT SIMPLE FOR RESEARCHERS

## HOW DO I DO IT?

- FAIR guidance and workflows

### FINDABLE

[gardian.bigdata.cgiar.org/metrics.php](http://gardian.bigdata.cgiar.org/metrics.php)



### FAIR COMPLIANCE



F = 4.75 / 5  
A = 5.00 / 5  
I = 4.25 / 5  
R = 4.67 / 5

[VIEW METRICS](#)

“I’ve been told  
I need to make  
my data FAIR.  
How do I do  
this?”



[www.croponontology.org](http://www.croponontology.org)



**GARDIAN**  
FAIRification Workflow



Sign in with Globus

[gardian.bigdata.cgiar.org/fair-workflow.php](http://gardian.bigdata.cgiar.org/fair-workflow.php)

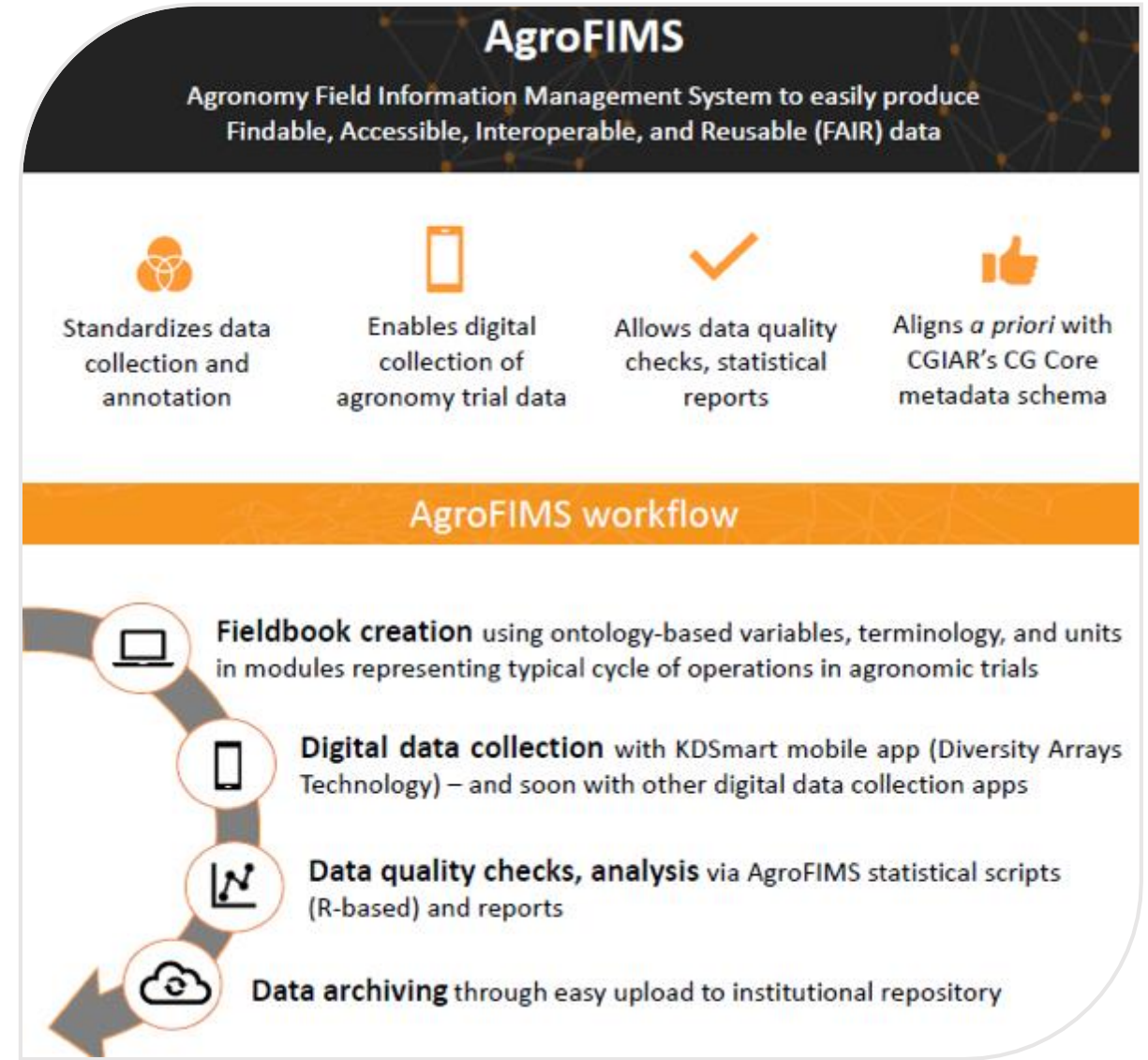
“Are there tools to help me collect standards-compliant agronomic data?”

## AgroFIMS

Agronomy Field Information Management System

Generate standardized field books to collect agronomic data that is...

F<sub>indable</sub> A<sub>ccessible</sub> I<sub>nteroperable</sub> R<sub>eusable</sub>



[agrofims.org](http://agrofims.org)

# KISR: KEEP IT SIMPLE FOR RESEARCHERS

## HOW DO I DO IT?

- Capacity enhancement
- Tools, services, data processing scripts that are easy to use
- FAIR guidance and workflows
- Publish datasets – data journals or accompaniments to publications
- DMPs – Open and FAIR from project conception (Funder requirements would help!)
- Budgetary recommendations and guidance (Funder requirements?!)

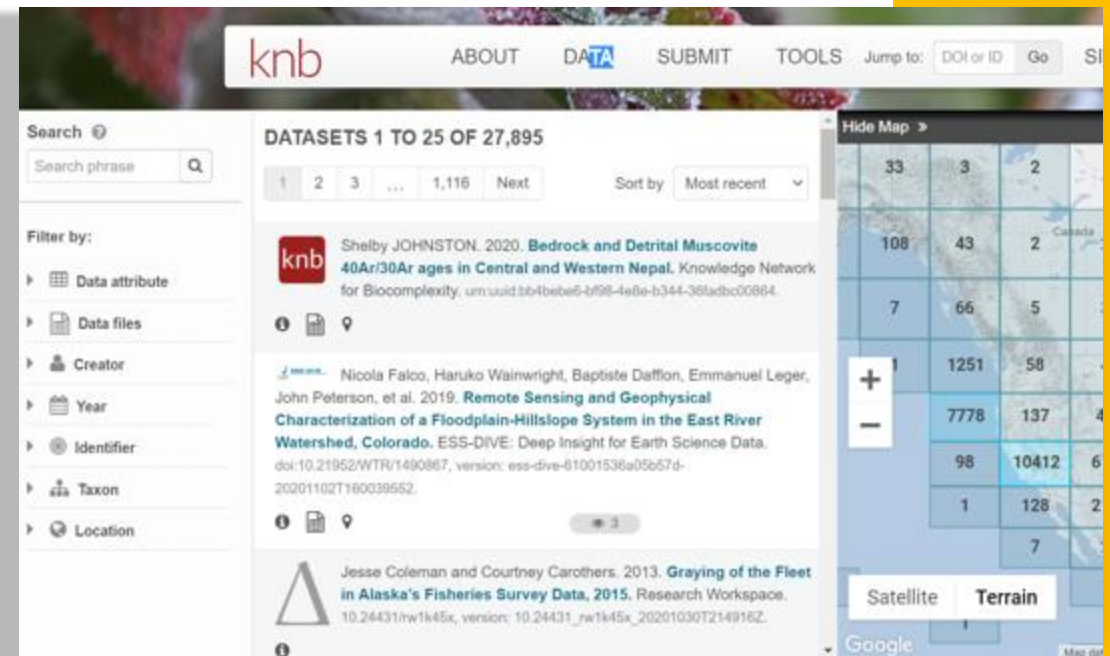
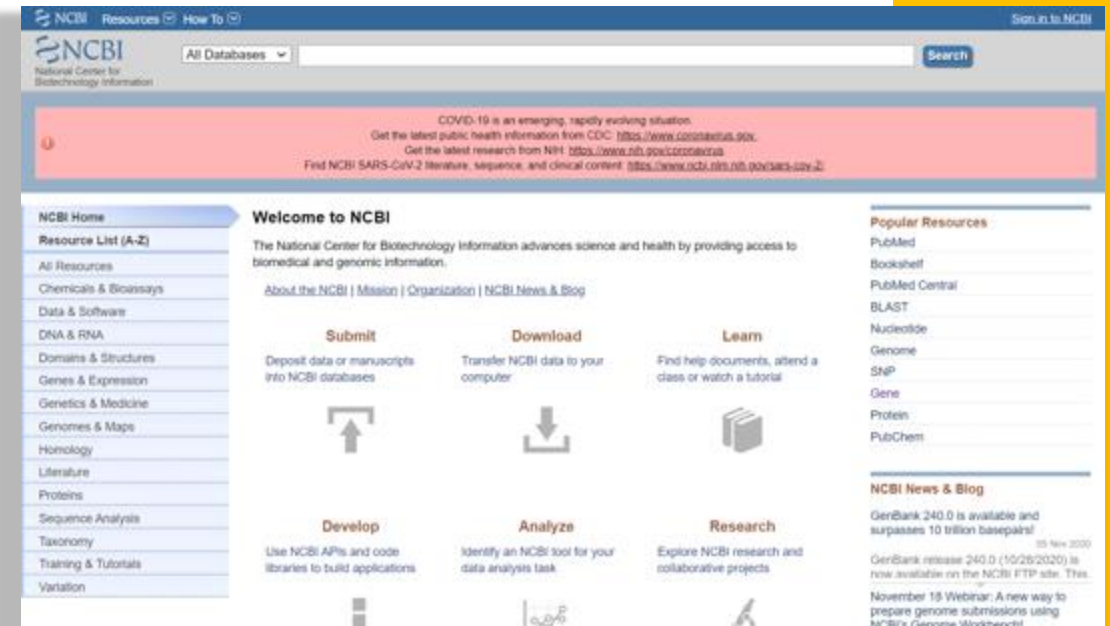




# KISR: KEEP IT SIMPLE FOR RESEARCHERS

## ...WHY DO I NEED TO DO IT?

- Open, FAIR data has transformed other sectors (biomedical, environmental research...)
- Enables realization of the value of data (exemplars; data products that can be leveraged)



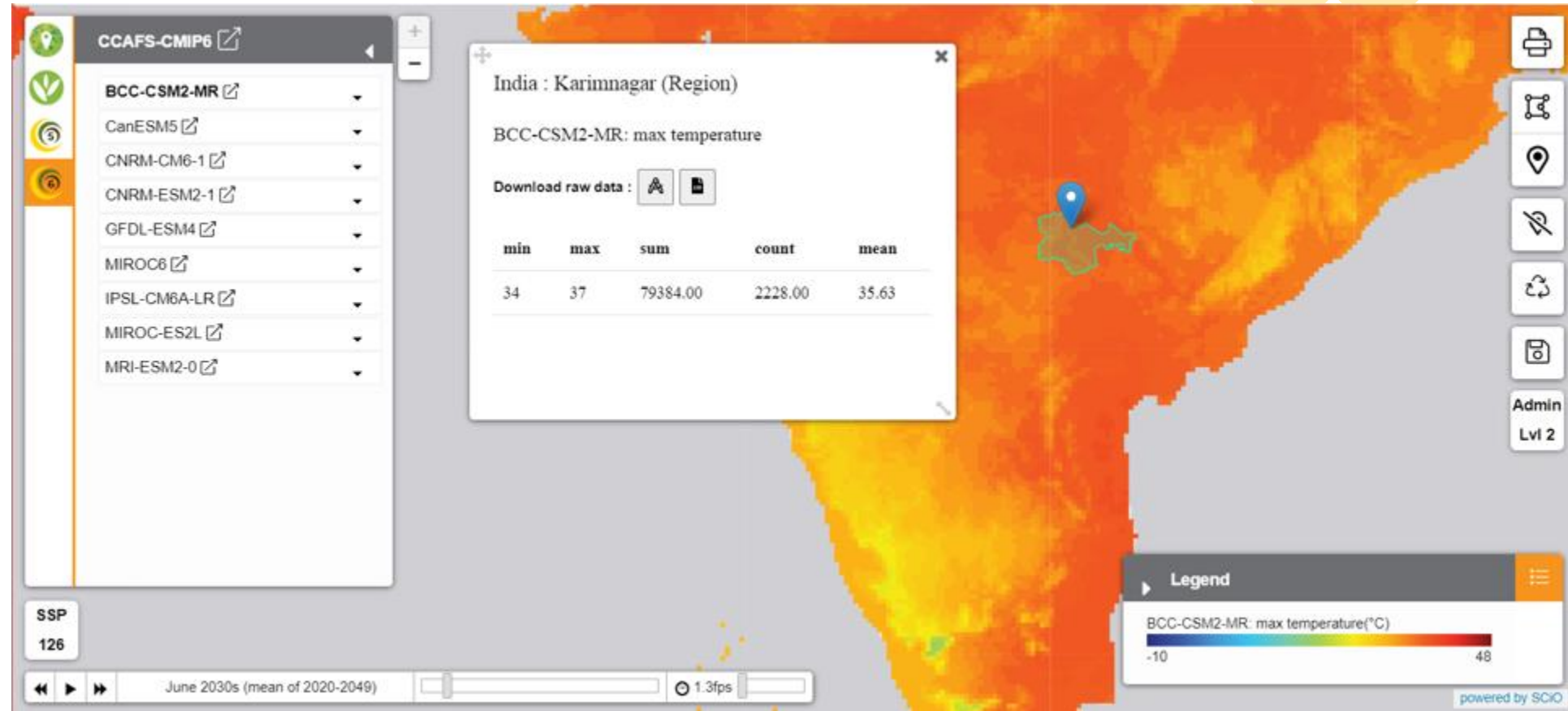
# "I want to be able to explore data visually!"

**CLICK 1:**  
Select CMIP6 Model

**CLICK 2:**  
Pin region

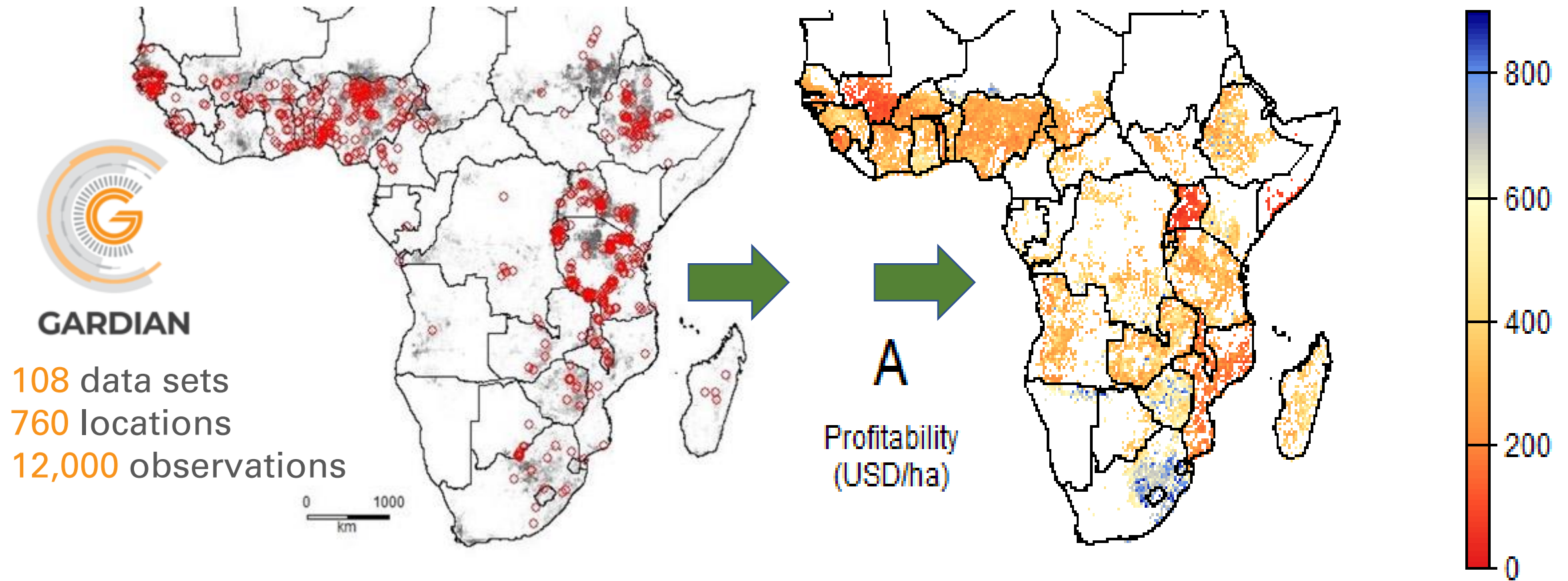
**CLICK 3:**  
Select time period

**CLICK 4:**  
Download data as  
GeoJSON or CSV



[gardian.bigdata.cgiar.org/labs.php](http://gardian.bigdata.cgiar.org/labs.php)

# “Where in Sub-Saharan Africa is fertilizer use profitable?”



# KISR: KEEP IT SIMPLE FOR RESEARCHERS

## WHY DO I NEED TO DO IT?

- Open, FAIR data has transformed other sectors (biomedical, environmental research)
- Enables realization of the value of data (exemplars; data products that can be leveraged)
- Annual evaluation, KPIs, project indicators (should!) demand it
- Rewards?? (salary increments; publicity)
- Project management should not close project financially w/out FAIR data
- Institutional, individual reputation, as funder OA/OD policies evolve  
(Funders – non-compliance??)

— How We Work —

### BILL & MELINDA GATES FOUNDATION OPEN ACCESS POLICY

**3. Publications and Underlying Data Will Be Accessible and Open Immediately.** All Funded Research including articles accepted for publication shall be available immediately at publication, without any embargo period. Each accepted article must be accompanied by a Data Availability Statement that describes where any primary data, associated metadata, original software, and any additional relevant materials necessary to understand, assess, and replicate the reported study fundings in totality can be found.

The Foundation shall require that underlying data supporting the accepted article shall be immediately accessible and open upon article publication. Grantees are encouraged to adhere to the [FAIR principles](#) to improve the findability, accessibility, interoperability, and reuse of digital assets.



# THANK YOU!

Join our Community of  
Practice if you would like  
to know more.

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[bigdata.cgiar.org/communities-of-practice/info-data-mgmt](http://bigdata.cgiar.org/communities-of-practice/info-data-mgmt)