

AfriCultuReS

Enhancing Food Security in African AgriCultural Systems with the support of Remote Sensing

13th EUMETSAT User Forum in Africa
24-28 September 2018. Abidjan, Côte D'Ivoire

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AfriCultuReS Project Coordinator



AfriCultuReS



This project has received funding from the European Union's Horizon 2020 Research and Innovation Framework Programme under grant agreement No 774652

WHAT IS AfriCultuReS?

H2020 - SFS-43-2017 "EO services for the monitoring of agricultural production in Africa"

17 Partners | Industry & Academia
50% African + 50% European | Multidisciplinary

GMV (lead, ES)



Aristotle University of Thessaloniki (GR)



DRAXIS Environmental Technologies (GR)



HCP International (NL)



Sapienza University of Rome (IT)



Swedish Meteorological and Hydrological Institute (SE)



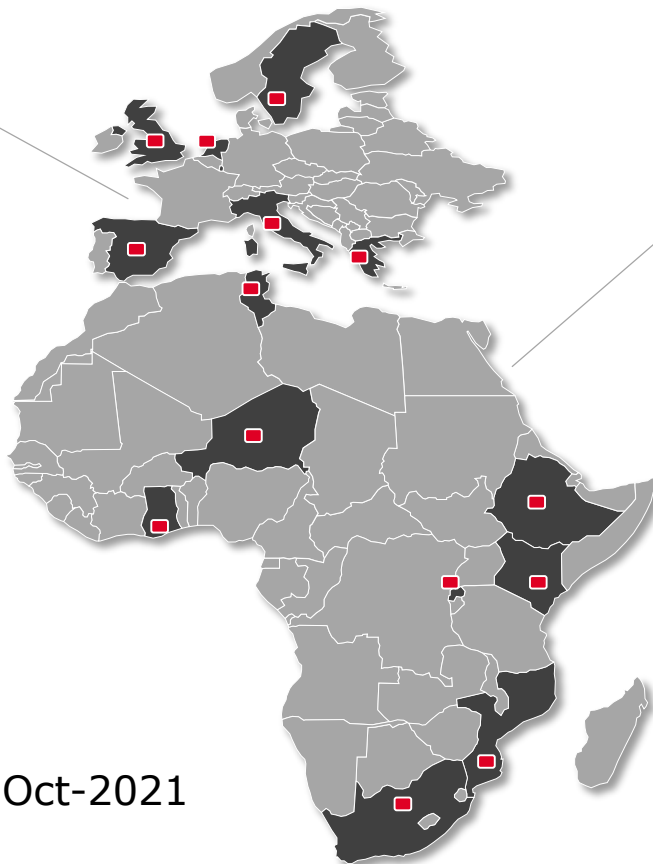
University of Cantabria (ES)



University of Leeds (UK)



University of Sheffield (UK)



Centre Régional AGRHYMET (NE)



CGIS – University of Rwanda (RW)



CERSGIS – University of Ghana (GH)



GeoSAS (ET)



LocateIT (KE)



Observatoire du Sahara et du Sahel (TN)



South African National Space agency (ZA)



Eduardo Mondlane University (MZ)

8.5M€ | 48 months | Nov-2017 to Oct-2021

13th EUMETSAT USERS FORUM IN AFRICA
SESSION #7 – EO PROJECTS AND INITIATIVES (LAND)



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SUPPORTED BY...



European
Commission

Horizon 2020
European Union funding
for Research & Innovation



African Union



NEPAD
TRANSFORMING AFRICA



GEO GROUP ON
EARTH OBSERVATIONS

AfriCultuReS is envisaged to be a **GEO** (GEOGLAM, AfriGEOSS, EuroGEOSS),
Copernicus and **GMES & Africa** contributing action

AfriCultuReS partners are **heavily involved in GEO, Copernicus and GMES & Africa**



**GMES
AND AFRICA**

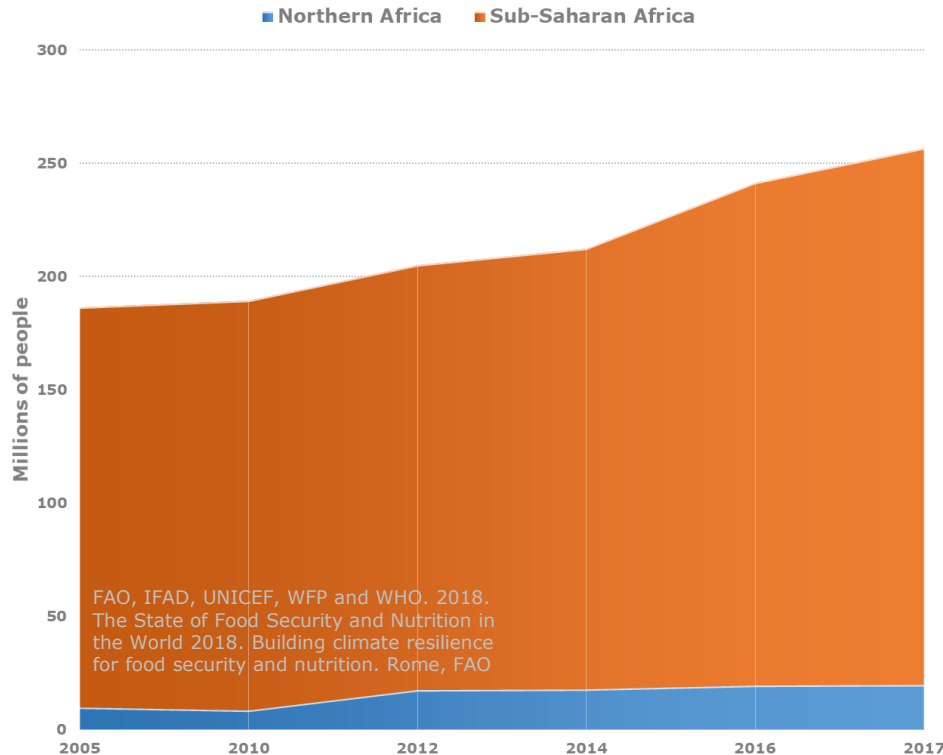


AfriCultuReS



CHALLENGE

Number of Undernourished people in Africa 2005 - 2017



256.5 million people in **Africa**, suffered from **severe food insecurity** in 2017

≈ **29% of the World's Population** affected by food insecurity in 2017 lives in **Sub-Saharan Africa**

Fao, Sep-2018

AfriCultuReS' CHALLENGE is to **IMPROVE PEOPLE'S** wellbeing through the **IMPROVEMENT** of **FOOD SECURITY** in **AFRICA**



Agricultural production will have to increase by an estimated 50% by 2050 to meet the needs of a growing population.



Malnutrition is the single largest contributor to disease in the world.

GOAL & OBJECTIVES

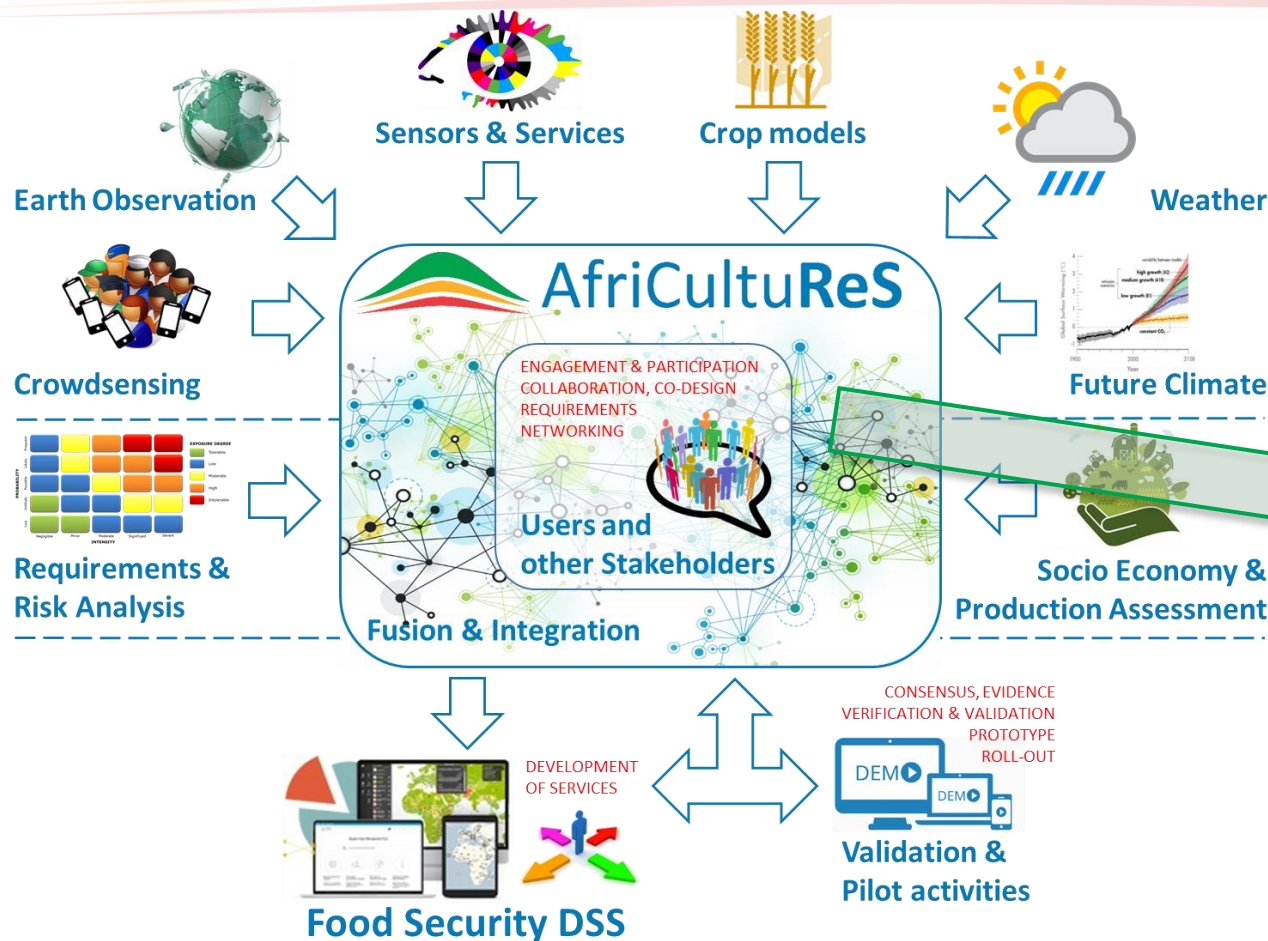
AfriCultuReS: Enhancing Food Security in
African Agri**Cultural** Systems with the Support of **Re**mote **S**ensing

To provide a **Decision Support System** to support **improved decision making** in the field of **food security in Africa**

1. To **IMPROVE** crop and grassland **monitoring and forecasting**
2. To **DIMINISH subjectivity** and **error** in crop area and yield estimates
3. To predict **UPCOMING THREATS** through risks assessment
4. To turn **OPERATIONAL** new monitoring and forecasting methods in Africa
5. To deliver a **USER FRIENDLY SERVICES PLATFORM**
6. To **BUILD CAPACITY** and leverage **awareness raising**



AfriCultuReS CONCEPT



Setting up a
CO-DESIGNED & USERS CENTERED

- ✓ *interoperable,*
- ✓ *sharable,*
- ✓ *replicable,*
- ✓ *re-usable and*
- ✓ *discoverable*

pool of **analytical geospatial services** on food security in Africa

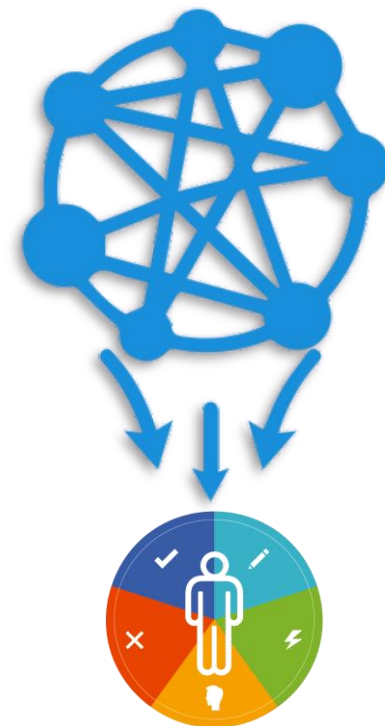
Stakeholders

Public Sector, Farmers, Agribusiness, Financial, Academia...

User Domain**Wisdom****Decision Making → KNOWLEDGE IN ACTION****Knowledge****Pieces of information connected to achieve a goal**
Options, Scenarios, Assessments, Risks...**Information****Clean, validated, documented data**
Ready to use, analysis, fusion, semantic linkage...**Data****Raw collection of facts**
Satellite, DB, networks, crowd-sensed...

KEY SECTORS, AGRI-AGGREGATORS

- ✓ **Public sector:** stimulating economic growth; feeding the population; improved risk management; effective, efficient and sustainable use of public and natural resources.
- ✓ **Agribusiness sector** (including smallholder food producers): Increased production and productivity; increased income; improved risk management; good long-term perspective.
- ✓ **Financial sector** (with inclusive finance catering to smallholders): improved risk management; lower costs; well-designed products; increased outreach.
- ✓ **Academic sector:** high-quality research output; high-quality education; contributing to solving societal problems; affordable education for all



USERS' SEGMENTS

Sectors have been further **divided into segments**:

- ✓ (Central) Government
- ✓ Local and regional authorities
- ✓ Government extension services
- ✓ Water authorities
- ✓ Commercial providers agricultural inputs & equipment
- ✓ Large food producing enterprises
- ✓ Farmers' cooperatives and organizations
- ✓ Small food producing enterprises
- ✓ Knowledge providers (education & research institutions)
- ✓ Donors and NGOs
- ✓ Technology providers (business)
- ✓ Mobile services providers
- ✓ Financial and Insurance
- ✓ Traders
- ✓ Citizens...



ASSESSMENT AND DEFINITION of

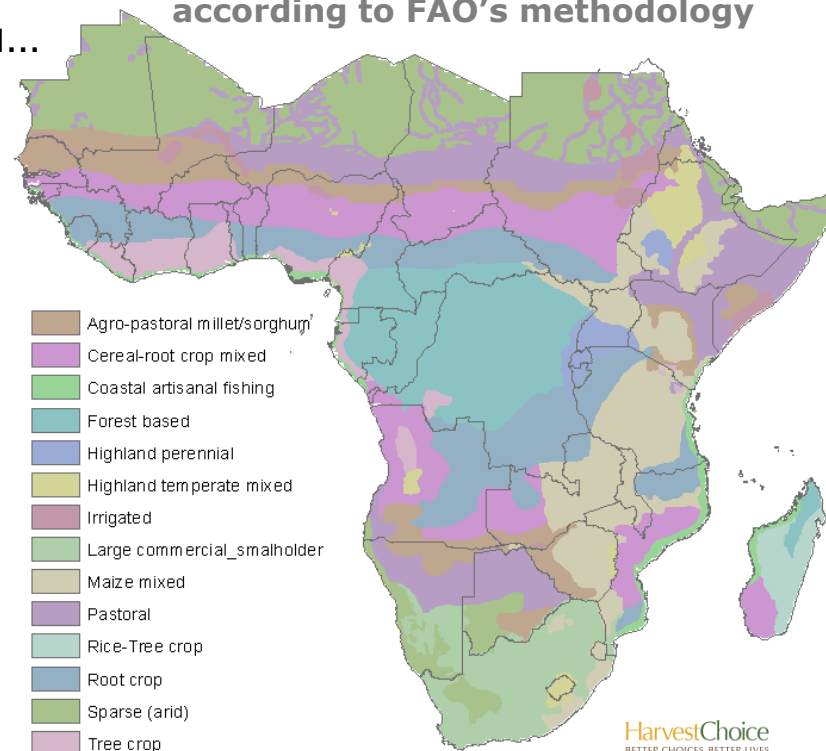
✓ **Input data:** EO, non-EO, ancillaries, sensors, in-situ...

✓ **Risks affecting food production**

✓ **Regional approach to farming systems:**

- ✓ Maize Mixed System
- ✓ Root Crop System
- ✓ Agro-pastoral Millet/Sorghum System
- ✓ Highland Perennial System
- ✓ Highland Temperate Mixed System
- ✓ Pastoral Farming System
- ✓ Rice/tree crop mixed system
- ✓ Comm. Largeholder and Smallholder System
- ✓ Irrigated Farming System
- ✓ Sparse (Arid) System
- ✓ Highland Mixed System
- ✓ Rainfed Mixed System

Farming Systems in sub-Saharan Africa according to FAO's methodology

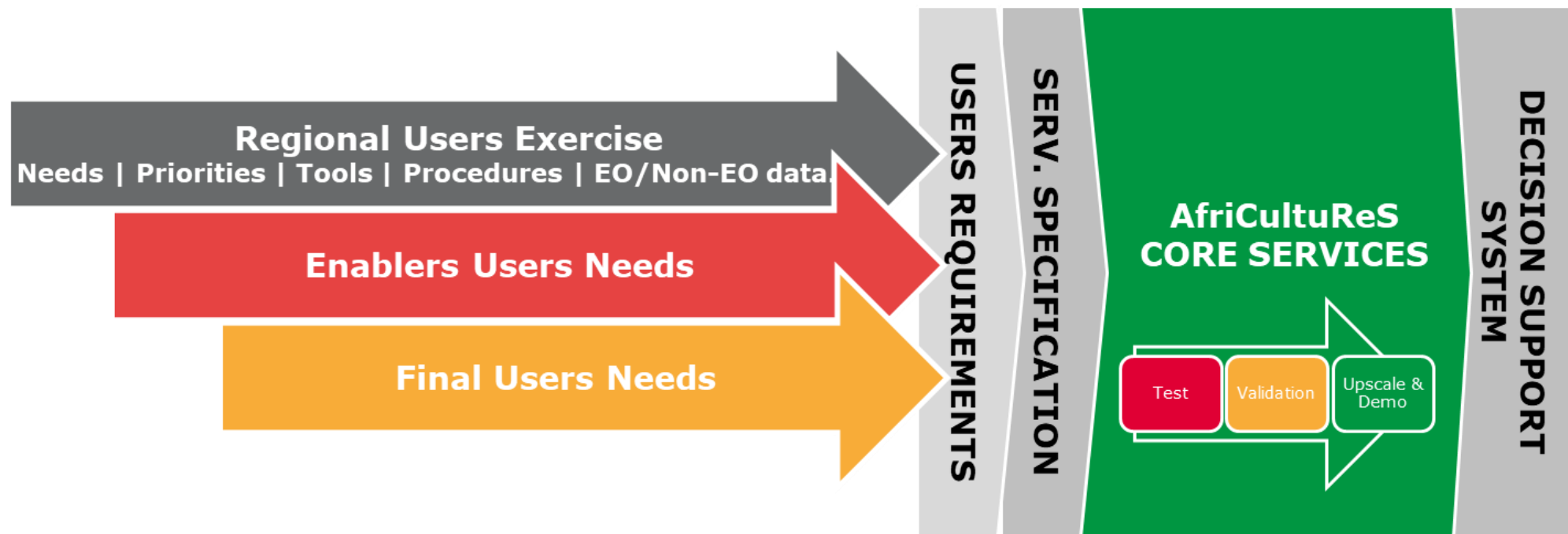


Dixon, J. et al. (2001): *Improving Farmer's Livelihoods in a Changing World*.
FAO/World Bank

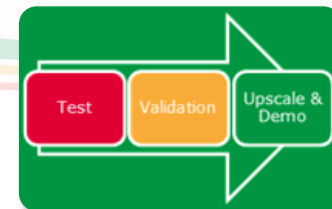
HarvestChoice
BETTER CHOICES, BETTER LIVES



PHASED APPROACH



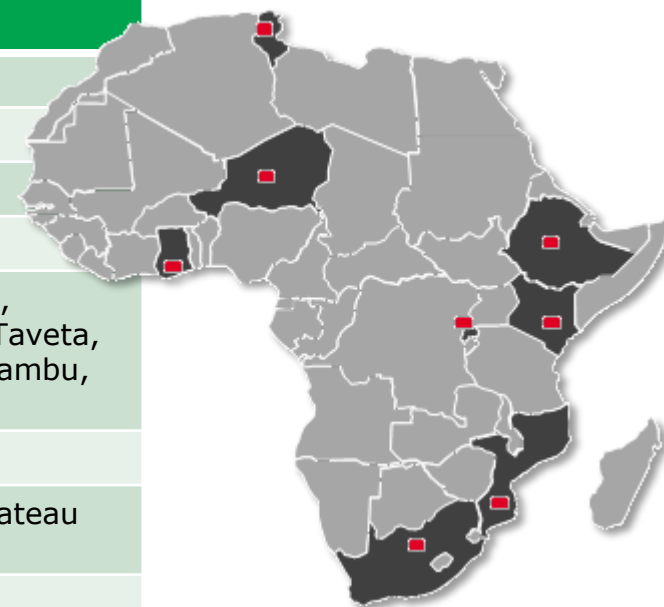
PHASED APPROACH



Where?

Eight pilot countries + a **transboundary basin**, representative of the **diversity of food production** in Africa (climate, culture, main crops, pastoralism..)

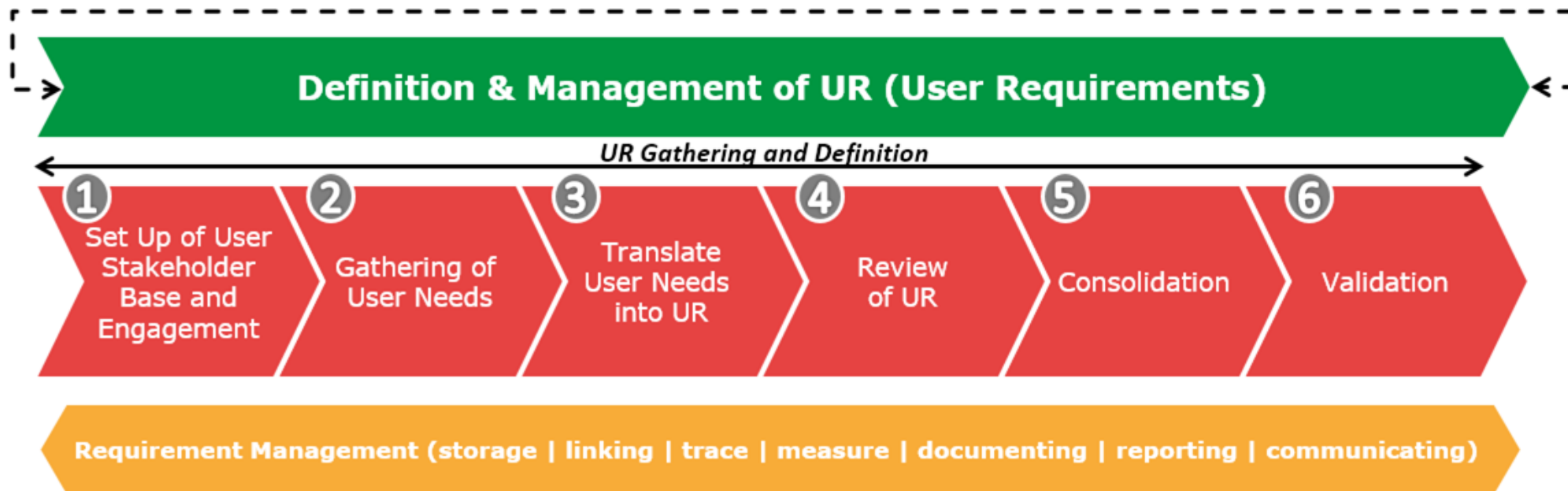
Region	Countries	Pilot Sites
North Medit. Africa	Tunisia	Jendouba, Kairouan, Médenine, Nabeul
Sahel	Niger	Sahel
Gulf of Guinea	Ghana	Northern Savannaah
Great Horn of Africa	Ethiopia	Aba Gawudi and Derba watersheds
East African Highlands	Kenya	14 Counties: Bungoma, Kericho, Laikipia, Machakos, Nakuru, Nandi, Narok, Taita Taveta, Tana River, Trans Nzoia, Uasin Gishu, Kiambu, Kisumu, and Vihiga
Lake Victoria Basin	Burundi, Kenya, Rwanda, Tanzania and Uganda	
Equatorial Central Africa	Rwanda	Eastern Savannah (lowlands), Central plateau and North-western highlands
Southern Africa	Mozambique South Africa	Limpopo and Umbeluzi basins (MZ) Free State and KwaZulu-Natal (ZA)



USERS REQUIREMENTS



Mixed approach, blend of **GEO** and **NEXTSPACE** methodologies. Iterative process



Engagement | Workshops | Consultation | Web Survey.

USERS REQUIREMENTS



Emphasizing **CO-DESIGN** & **CO-DEVELOPMENT**

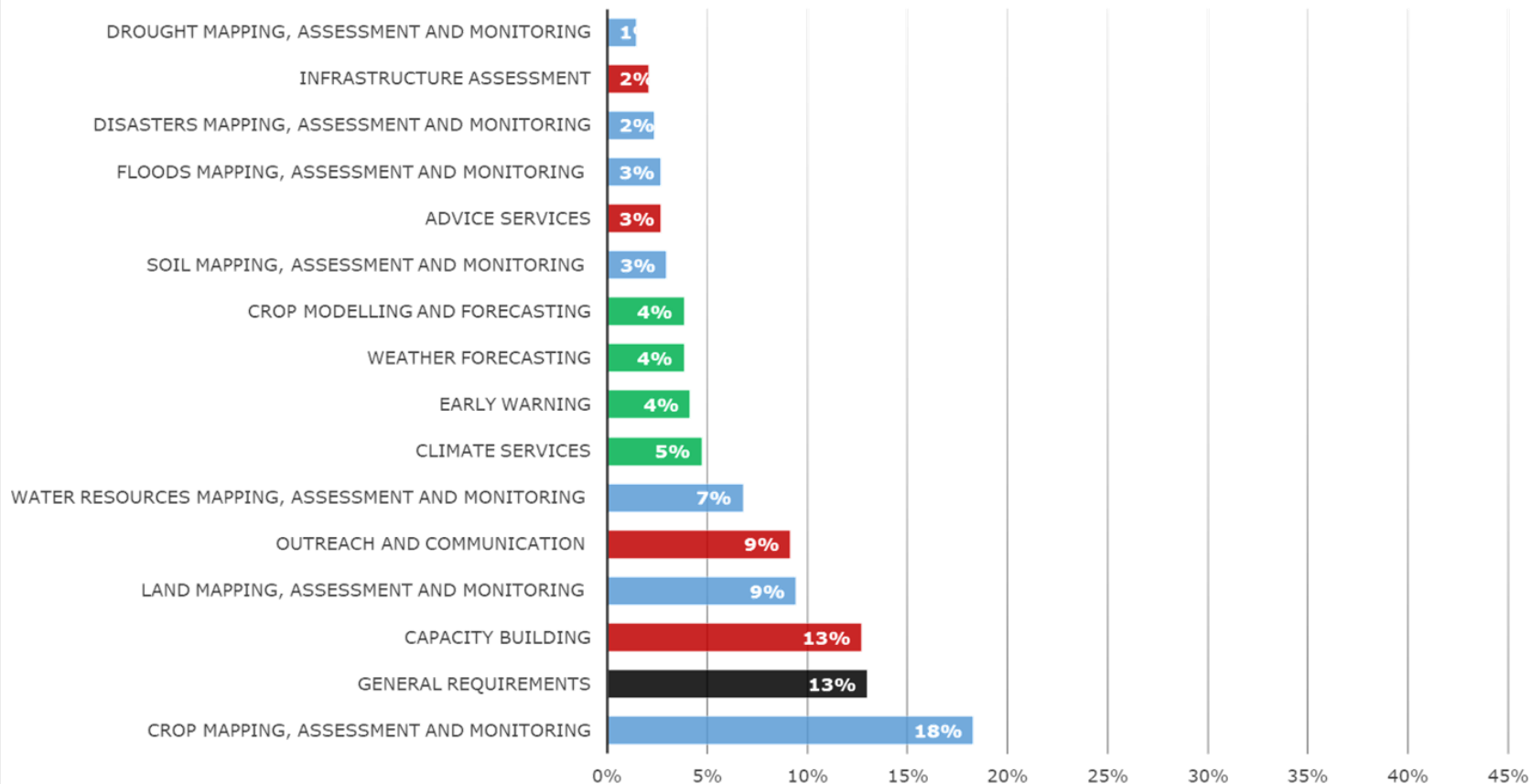
- ✓ **Users Exercises** – definition of first batch of **needs by African partners** (Nov, 2017)
- ✓ **Users Workshops** – (ongoing) **led by African** partners with support from the Univ. of Sheffield (Oct, 2018). First 2 already held (ZA & RW)
- ✓ **Users and Advisory Board(s)** enrichment, validation and expert advice (Nov, 2018)
- ✓ **3 iterations** - Test, Validation & Demo



USERS REQUIREMENTS



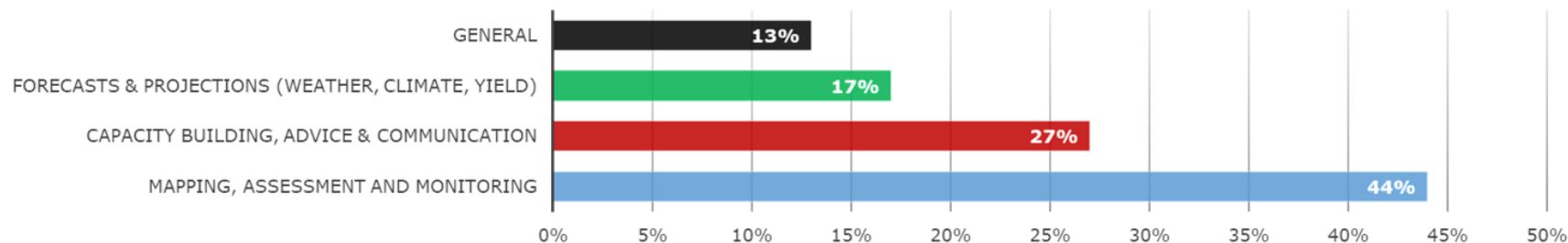
Requirements Share per category



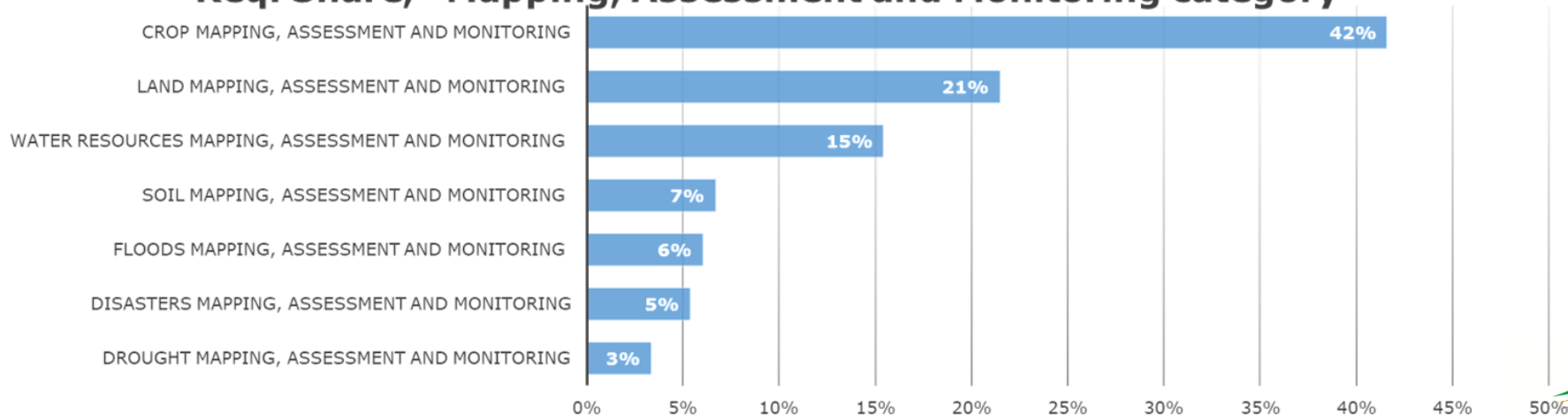
USERS REQUIREMENTS



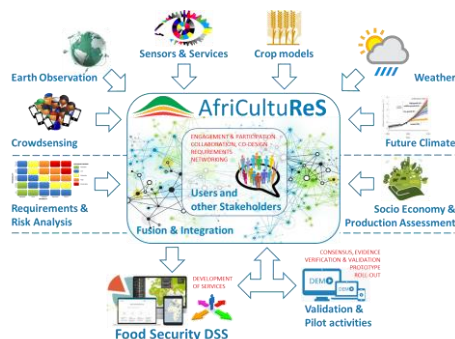
Requirements Share per groups



Req. Share, "Mapping, Assessment and Monitoring category"



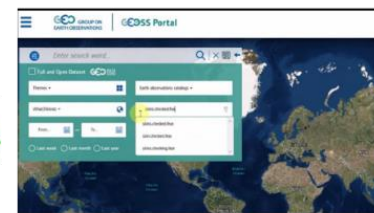
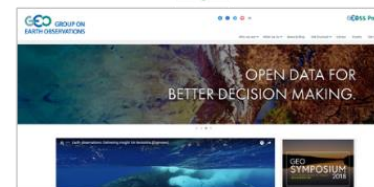
LONG TERM SUSTAINABILITY



- ✓ Use of free & long term **data availability, services** and... *infrastructure?*
- ✓ Long-term **institutional interest and support**
- ✓ Long-term user interest for a **solution that addresses real needs**
- ✓ **Marketing mix** based on users experience and success stories - **TRUST**
- ✓ **Capacity Building & Awareness Raising**
- ✓ **Business planning**, roll-out strategy



LONG TERM SUSTAINABILITY



Setting up a
CO-DESIGNED & USERS CENTERED

- ✓ *interoperable,*
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- ✓ *replicable,*
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- ✓ *discoverable*

pool of **analytical geospatial services** on food security in Africa



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thank you