

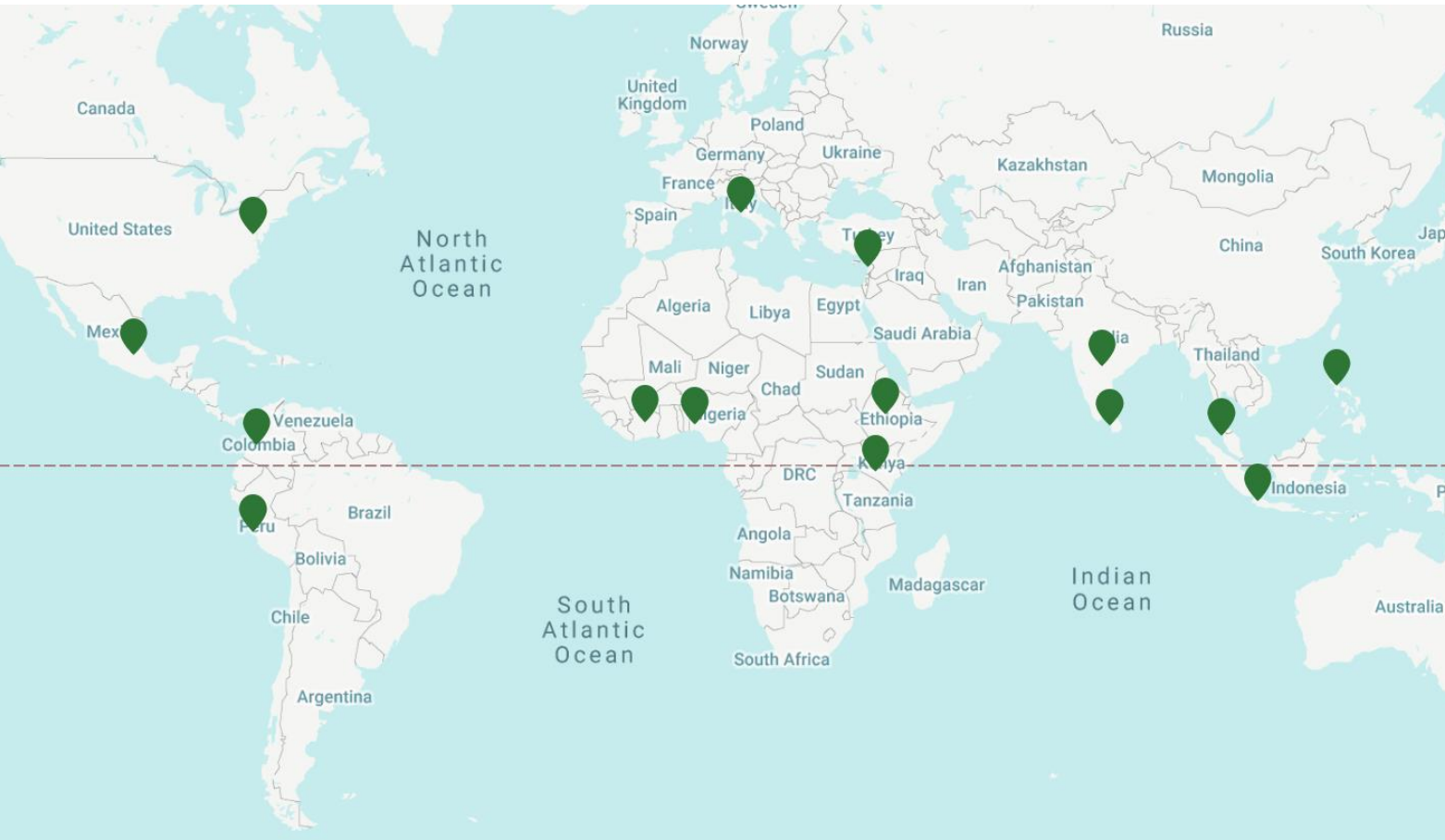
Use of FOSS4G for spurring innovation in agricultural research for development

Presented by Jawoo Koo (International Food Policy Research Institute), Francis Muthoni (International Institute for Tropical Agriculture), Mansoor Leh (International Water Management Institute), and Aniruddha Ghosh (UC Davis) with inputs from Chandra Biradar, George Karwani, Henry Juarez, Jan Kreuzer, Kai Sonder, Muhammad Ahmad, Murali Gumma, Pablo Carhuapoma, Shwu Jian Teoh, Tunrayo Alabi, Yating Ru, and Andy Nelson



26 talks on the use of FOSS4G in agriculture

1. Where and how well do crops grow around the world – SPAM2010 tells you!
2. Mapping inequality in access to resources in R
3. A FOSS-based remote sensing data analytics tool for smallholder crops in sub-Saharan Africa and South Asia
4. Application of free and open source software and data for spatial targeting of agricultural technologies
5. Digital diffusion and geodesigning for ecological intensification
6. Advanced data exploration tools to enhance data analysis and knowledge management in Africa
7. Time to Sow: Mapping the adoption of cropping practices from space
8. Tracking the adoption of pigeonpea in Malawi using time series satellite imagery and spectral matching technique
9. Mapping paddy rice cropping pattern and phenology in Cambodia
10. Accuracy of maizeland classification in smallholder farming systems using imagery from UAV and Sentinel-2A
11. Application of unmanned aerial vehicle (UAV) and object-based approach for satellite-based rice area validation
12. Pre-harvest loss estimation using satellite data calibrated with drone data in Tanzania
13. Rice monitoring and crop insurance system using MODIS, Sentinel-1 SAR, and ORYZA crop growth model
14. Assessing the impact of national food security policies on irrigated rice production in Senegal
15. Multi-source satellite data fusion for agricultural monitoring
16. Landcover classification with R and Google Earth Engine to predict Human-elephant conflict
17. Bush encroachment mapping in Otjozondjupa region, Namibia
18. The open source web mapping solution: an Experience from the BOBLME Marine Protected Area (MPA) Atlas
19. Targeting spatio-temporal dynamics in floodplain agro-ecosystems with GIS-based analysis of MODIS
20. Live spatial simulation to develop a shared vision for a sustainable livestock value chain transformation
21. Mapping livestock keepers and their herds across Africa based on households' survey
22. ILCYM's index interpolator tool for regional pest risk assessments in mountainous regions
23. Mapping fertilizer prices in Africa: Where to start?
24. Geospatial Analysis to Spur Technology Adoption for Increasing Bean Productivity in Tanzania
25. FOSS4G for developing agriculture insurance products: experience from Eastern Africa
26. Economics of land degradation in Niger



AfricaRice
Africa Rice Center



Bioversity International
Bioversity International



CIFOR
Center for International Forestry Research (CIFOR)



ICARDA
Science for resilient livelihoods in dry areas
International Center for Agricultural Research in the Dry Areas (ICARDA)



CIAT
International Center for Tropical Agriculture
Since 1967 Science to cultivate change
International Center for Tropical Agriculture (CIAT)



ICRISAT
INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS
International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)



INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
IFPRI
International Food Policy Research Institute (IFPRI)



IITA
Transforming African Agriculture
International Institute of Tropical Agriculture (IITA)



ILRI
INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE
International Livestock Research Institute (ILRI)



CIMMYT
International Maize and Wheat Improvement Center
International Maize and Wheat Improvement Center (CIMMYT)



CIP
INTERNATIONAL POTATO CENTER
A CGIAR RESEARCH CENTER
International Potato Center (CIP)



IRRI
International Rice Research Institute (IRRI)



IWMI
International Water Management Institute
International Water Management Institute (IWMI)

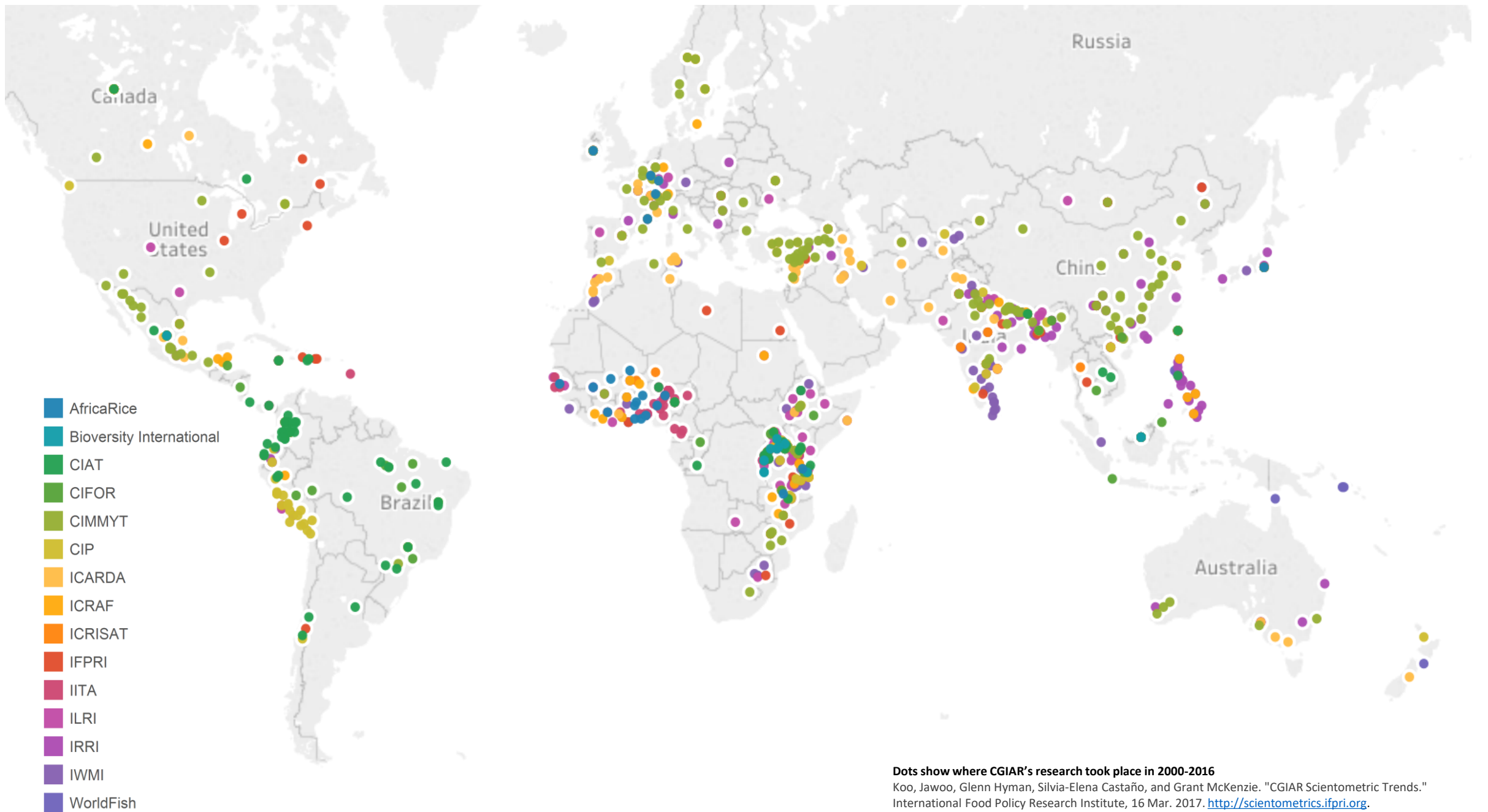


World Agroforestry Centre
World Agroforestry Centre (ICRAF)



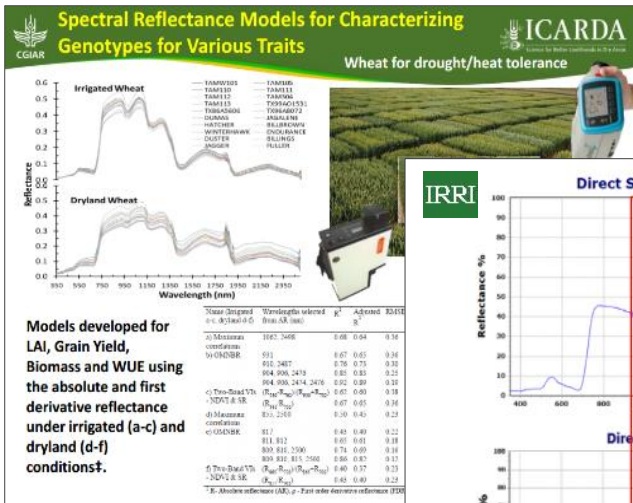
WorldFish

CGIAR is a global research partnership for a food secure future dedicated to reducing poverty, enhancing food and nutrition security, and improving natural resources.

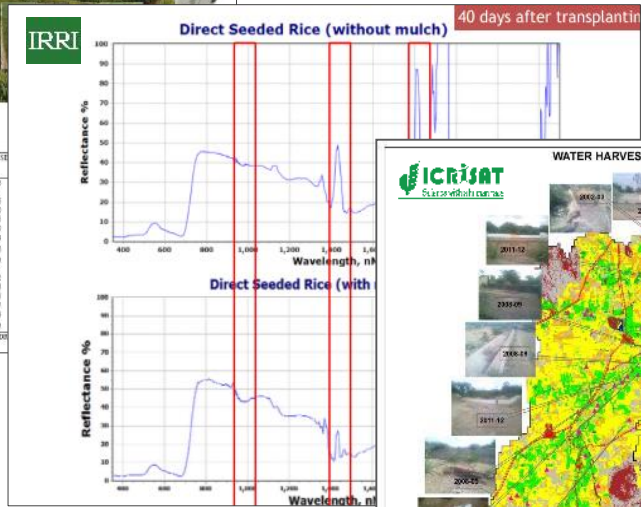


Dots show where CGIAR's research took place in 2000-2016

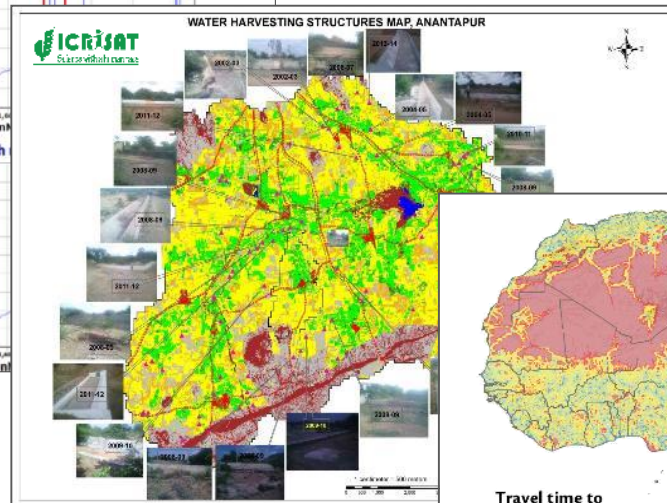
Koo, Jawoo, Glenn Hyman, Silvia-Elena Castaño, and Grant McKenzie. "CGIAR Scientometric Trends." International Food Policy Research Institute, 16 Mar. 2017. <http://scientometrics.ifpri.org>.



Courtesy of Chandrashekar Biradar (ICARDA)



Courtesy of Andy Nelson & Parvesh Chandna (IRRI)

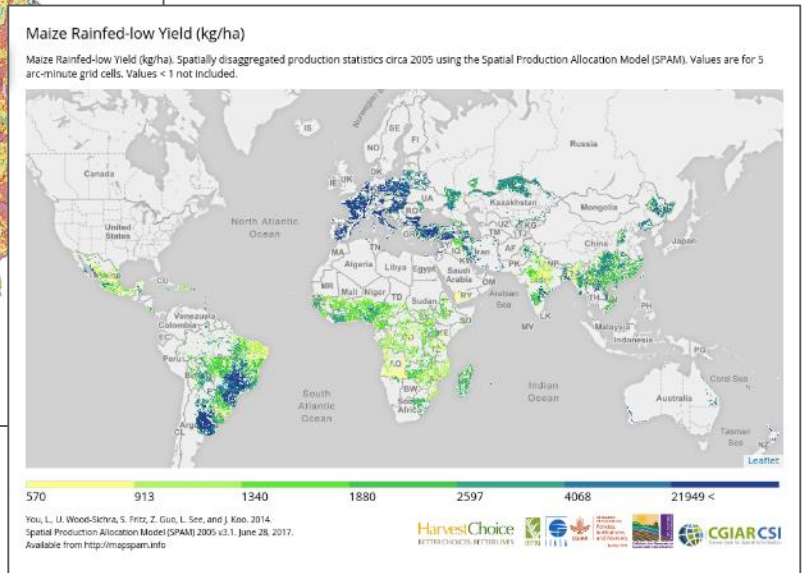
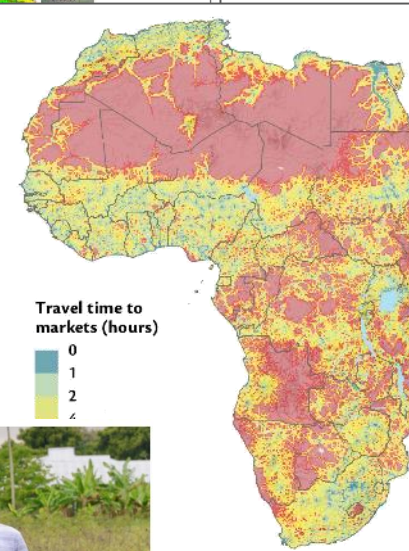


Courtesy of Murali Gumma (ICRISAT)



CGIAR CSI
Consortium for Spatial Information

Courtesy of Zhe Guo (IFPRI)



Courtesy of Liangzhi You (IFPRI)



Sustainable Intensification Innovation Lab (SIIL)

Vision of the SIIL is to become global leader in interdisciplinary research, knowledge sharing and capacity building on sustainable intensification producing measurable impacts on improving farm productivity, income and nutrition of smallholder farmers.





FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

SIIL
(Kansas State University)



Appropriate Scale Mechanization Consortium
(Univ. of Illinois – Urbana Champaign)

Geospatial and Farming Systems Consortium
(University of California – Davis)

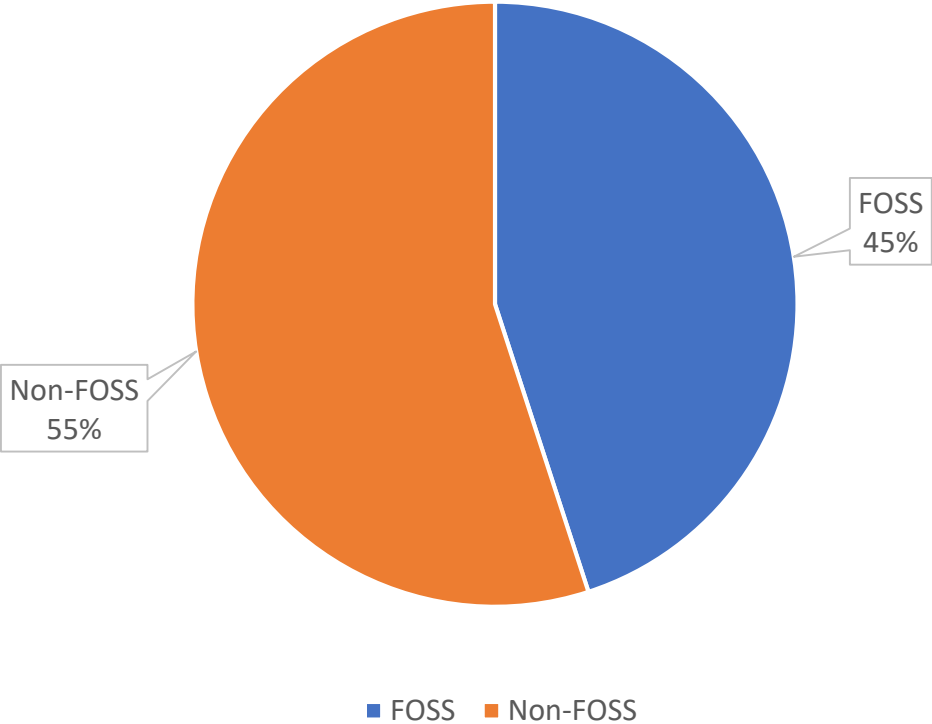
Tanzania (TZA)

SIIL: CGIAR Partnerships

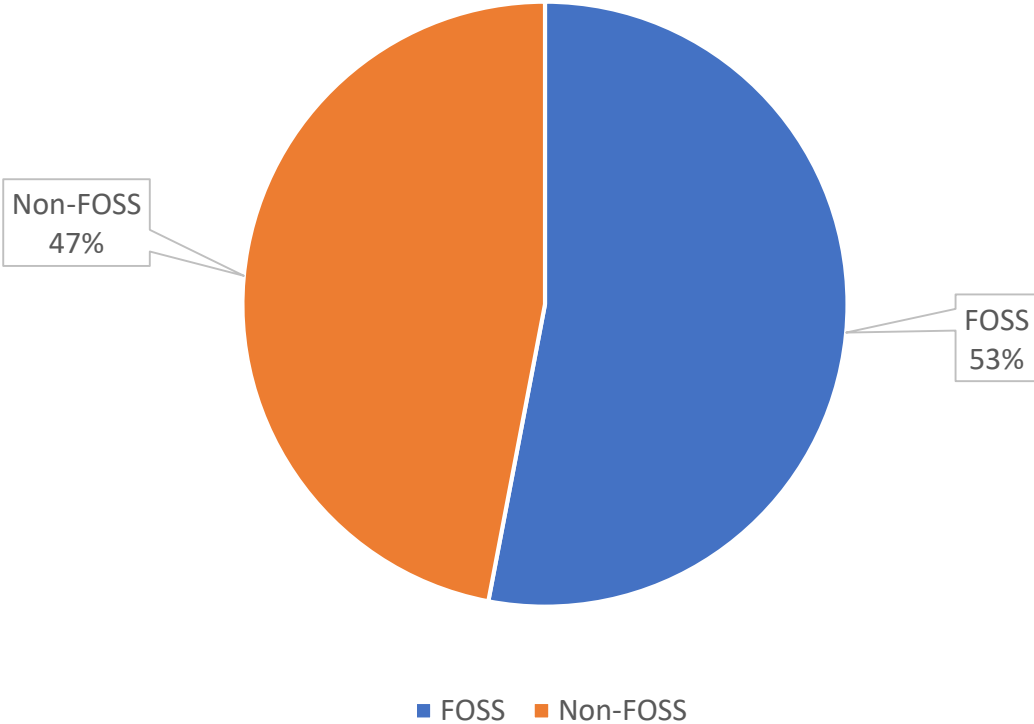
- Collaborating with 8 CGIAR Institutes with direct funding supported.
- Hosting Regional Coordinators (Direct Sub-Awards)
 - CIMMYT (Bangladesh: Asia)
 - CIAT (Tanzania: East Africa)
- SIIL Research Sub-Awards:
 - Lead Award: ILRI (Burkina Faso)
 - Co-Lead Award: IRRI (Bangladesh)
 - Collaborators: IWMI and IFPRI (Ethiopia);
 - + AVRDC (World Vegetable Center) – Cambodia
 - IFPRI, CIAT, CIMMYT, ILRI (Geospatial Consortium)...
- About 25% (\$1 M) of FY 2016 total budget to SIIL (\$4 M; including management entity and two consortia) was allocated to CGIAR

About 50% of our work uses FOSS4G

Our Own Research



With Partners



... but we don't customize much

“Only when I need to translate into local languages”

“Only for internal uses in a limited extent”

... and rarely provide feedback.

“Only when I find critical bugs”

“Only to a specific module/plugin”

Sharing stories from the fields

Francis Muthoni (IITA – Tanzania)

Mansoor Leh (IWMI – Laos)

Our call to action

- **We are the force of FOSS4G**

We now use the same research tools internally and externally. FOSS4G is mainstreamed. We've come so far!

- **Spur innovations**

DIY and share. Ensure the reproducibility of work. Collaboratively improve the science with FOSS4G. Document impact.

- **Give back**

Proactive engagement with the developers, establish partnerships, participating Hackathon/Bug BBQ events.

- **Credit**

Give proper recognition and acknowledgement of FOSS4G in the research publications.

Our wish list

- **More features**

Solar radiation modeling, automated typology, UAV imagery mosaicking, digital terrain manipulation, plant species extent mapping, fully functional GRASS in Windows.

- **Better documentations**

Step-by-step guide for DIY customization, repository of use-cases, consistent in-code commenting and documentations.

- **Easy citation of software**

Persistent Identifiers (PIDs; e.g., ISBN) and suitable metadata sets to cite software in research publications.