Sustainable Food Systems: Mainstreaming Natural Resource Management

USAID: Dr. Emily Weeks (RFS), & Kristi Tabaj (BHA); Consultants: Diane Russell, Michael Colby, Jennifer Harte

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Speakers

Dr Robert Nasi, Chief Operating Officer, CIFOR-ICRAF

Emily Weeks, Senior Policy Advisor Bureau of Resilience and Food Security, USAID

Alison Macalady, Water and Marine Team Lead, RESG, USAID/Peru

Moffatt Ngugi, Natural Resources Team Leader, Resilient Econ Growth Office, USAID/Mozambique

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Background

- USAID supported multiple innovative and important approaches to the integration of NRM in agriculture and food systems over decades.
  - Integrated rural development approaches of the 1980s focused on ag; had few ENRM components
  - Ag and “environment” have been in a dance at USAID over the last couple of decades
    - (Environment Center—>EGAT—>BFS/E3—>RFS/DDI—>REFS)
- We can learn a great deal from these experiences and resources for REFS.

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What is the challenge?

- Protecting the natural resources and ecosystems that underpin agriculture and food systems is currently ad hoc and uncoordinated.
- Welter of sector requirements inhibits coordination (priority zones, targets, indicators).
- Need to show and measure benefits to people AND to nature.

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Purpose:

- To get a comprehensive understanding of NRM within RFS and Mission portfolios.

- To further mainstreaming of natural resource management (NRM), including water resources management (WRM), climate change mitigation and adaptation, environmental policy, and land & resource governance (LRG) into food security, agriculture, and resilience programming.

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WHY MAINSTREAM ?

"To achieve USAID's ambitious food security and climate goals, NRM interventions should be expanded, coordinated and monitored across scales and sectors."

What did USAID do to review …

- Covered **11 countries in depth**, including literature reviews and mission staff interviews, **plus 6 with just literature reviews**.
  - **17/33 RFS priority countries** (FTF, Resilience, Water)*
- Incorporated **group interviews with staff of all RFS technical centers and offices.**
- Described **key programming that integrated NRM/WRM, climate change, and LRG** into agriculture and food security activities.
- **Identified gaps at country level** that may be significant across RFS.
- Elicited **recommendations from Mission staff** on RFS support, integration, valuation and monitoring.
- Sought **indicators and measures** for NRM/WRM integration/value.

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What is USAID doing?

- **Resilience** programming generally, including **co-programming with BHA** (e.g. Ethiopia)
- Conflict-sensitive climate and ag programming to **address pastoralist-farmer and interethnic conflict.** (Sahel, Kenya, Uganda)
- **Safety net programming including watershed restoration** (BHA; Ethiopia)
- **Large-scale farmer- & pastoralist-led vegetation regeneration** (RISE/BHA/Sahel)
- **Co-programming around Protected Areas** (DRC, Mozambique, Ghana, Guatemala, HEARTH)
- Support to **Malawi's** National Resilience Strategy
- **HEARTH and Sustainable Intensification Innovation Lab MEL approaches**
-

What is needed?

- **Mobilize leadership and high-level support** to prioritize NRM and
- **Align funding streams** to achieve mutual results.
- **Increase some forms of RFS funding**, particularly for resilience, climate change adaptation, LRG.
- Develop **mechanisms that foster integration** across topics, projects, offices, and/or contractors and grantees.
- **Bolster mission staffing to support NRM** and **on-site support from RFS staff** for design and strategy development.
- Identify and deploy **better indicators and measures** of NRM value and impact.

What is needed?

- **Structure Zones of Influence (ZOI) around agroecosystems, watersheds and/or landscapes**
- **Synchronize watershed work across Mission offices** (e.g., FTF, economic growth, health, water, conflict, biodiversity, democracy and governance, humanitarian assistance).
- **Synergize NRM actions across Implementing Partners** working in one zone.
- I**ncrease support for environmental compliance** (Reg 216) and consider risks of agricultural expansion in Environmental Mitigation and Monitoring Plans.
- Incorporate **NRM approaches to reduce food loss and waste and greenhouse gases *in ways that benefit farmers***.

What resources are available ...

- Policy Review

- Portfolio Review - three products:
  - Full Review (internal USAID)
  - Leadership Brief
  - Mission Technical Note

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Today's Agenda

- **Opening Remarks:**
  - Dr Robert Nasi, Chief Operating Officer, CIFOR-ICRAF
- **Panel Session:**
  - Alison Macalady, Water and Marine Team Lead, USAID - Peru
  - Moffatt Ngugi, Team Lead, Environment, USAID - Mozambique
- **Q&A**

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Thank you!

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Forests, trees and food security:
The multiple benefits of system-oriented, transformative action research

Ravi Prabhu
(*with colleagues at CIFOR-ICRAF, African Orphan Crops Consortium, African Plant Breeding Academy*)

24th May 2023

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Your take home messages today

- System approaches *Multiple Benefits*
- Trees & Forests feed the present *and* the future
- When you hear '*action research*', think transformative adaptive learning based on actionable evidence

I will start with a quick recap…

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In March 2023, my colleague Amy Ickowitz introduced Nutriscapes – landscapes that serve nutrition needs of the under nourished - *right here*

2022 Science Week

Agrobiodiversity

- Fruit Tree Portfolios that Link Agriculture with Nutrition
- Fruit and vegetable biodiversity for nutritionally diverse diets
- Dietary Diversity and Ag production diversity

Forest & Diets

- **Forest foods and healthy diets**
- **Sustainable wild meat**
- Links Between Dietary Transition, Food Security, and Forests

Landscape Change & Dietary Change

- Agricultural intensification, dietary diversity and markets
- Growing food vs growing cash
- Impacts of land use change on diets

Consumer Behaviour

- Understanding the drivers of food choice in LMICs
- Urban food environments
- Food choice motives

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Together for global challenges

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She connected these dots

- Forests are not ‘the silver bullet’ to solve malnutrition. BUT…
- Cutting forests (including mangroves) for food security can make diets worse for local communities
- If there is no measurement of benefits, hard for policy makers to value forests’ & dietary benefits
- Need information on individual intake and on food composition to understand nutrient contributions

While explaining the vital importance of wild foods to food and nutrition security…

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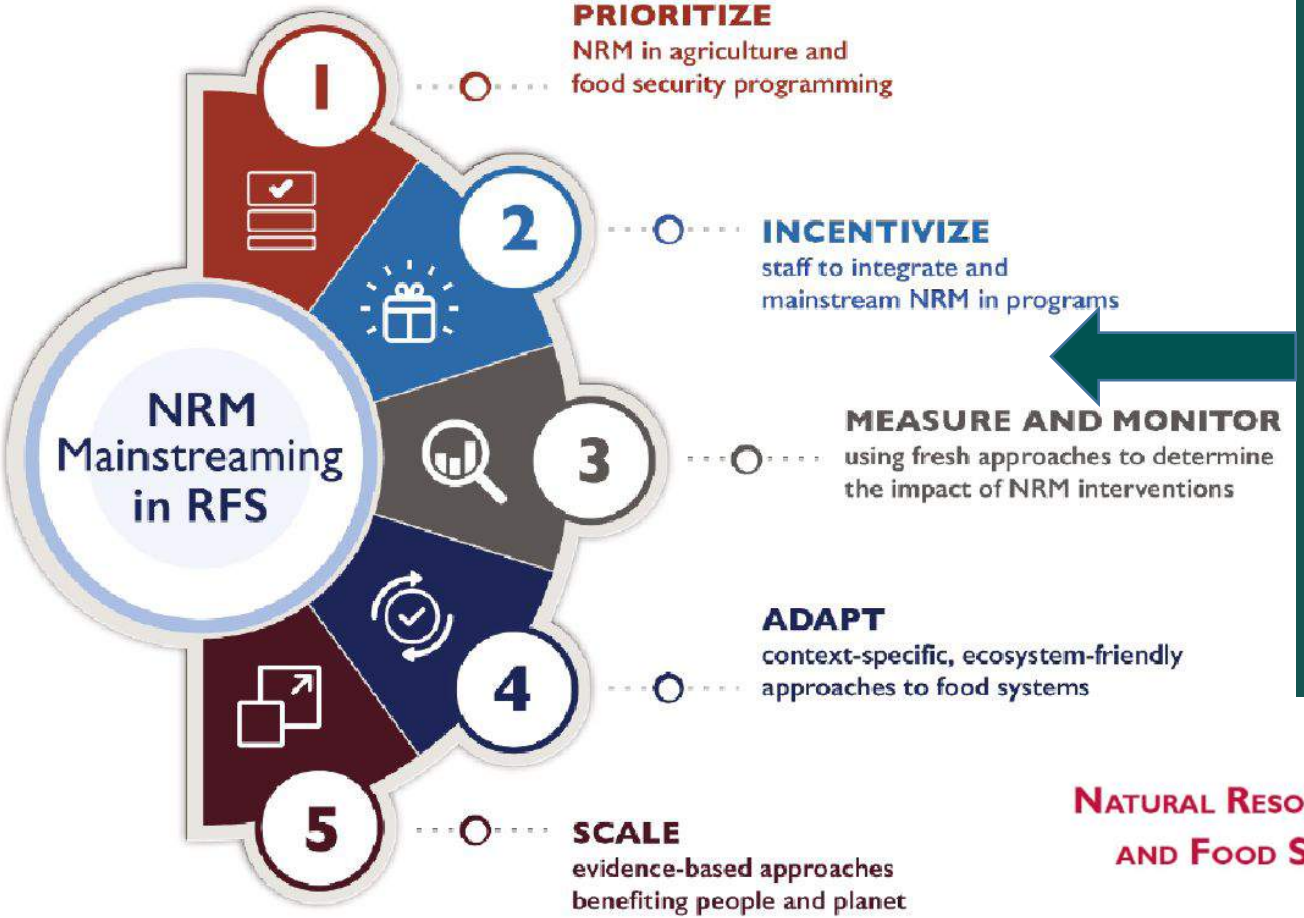
Figure: Five Steps to NRM Mainstreaming



I found this recent USAID report useful and thought provoking…

… but propose we add these 3 steps today (after incentivize and before measure and monitor):

- ***Hypothesise***
- ***Consult, innovate, co-create***
- ***Act***

TECHNICAL NOTE:

NATURAL RESOURCE MANAGEMENT IN RESILIENCE AND FOOD SECURITY (NRM-RFS) PORTFOLIO REVIEW

But … are we really looking in all the right places for the roots of our present insecurity? *(And I don't just mean ignoring the trees and the forest, obviously!)*

Harris et al. 2021. Equity in agriculture-nutrition-health research: A scoping review

	Agriculture					Nutrition			Health			
Level of equity	Primary production (on farm)	Value chains (off farm)	Food safety	Food security	Environment	Diets	Undernutrition	Overnutrition	Clinical health	Occupational health	Environmental health	Total*
Unequal outcomes	278	51	14	68	48	96	139	13	118	108	13	207
Material circumstances	123	12	5	27	18	32	51	3	49	51	4	160
Structural determinants	43	10	3	11	4	9	22	1	19	18	2	51

Density of studies
1-50
51-100
101-200
201+

* Total number of studies looking at each level of equity (Does not add up from the row numbers because some studies cover multiple levels of equity)

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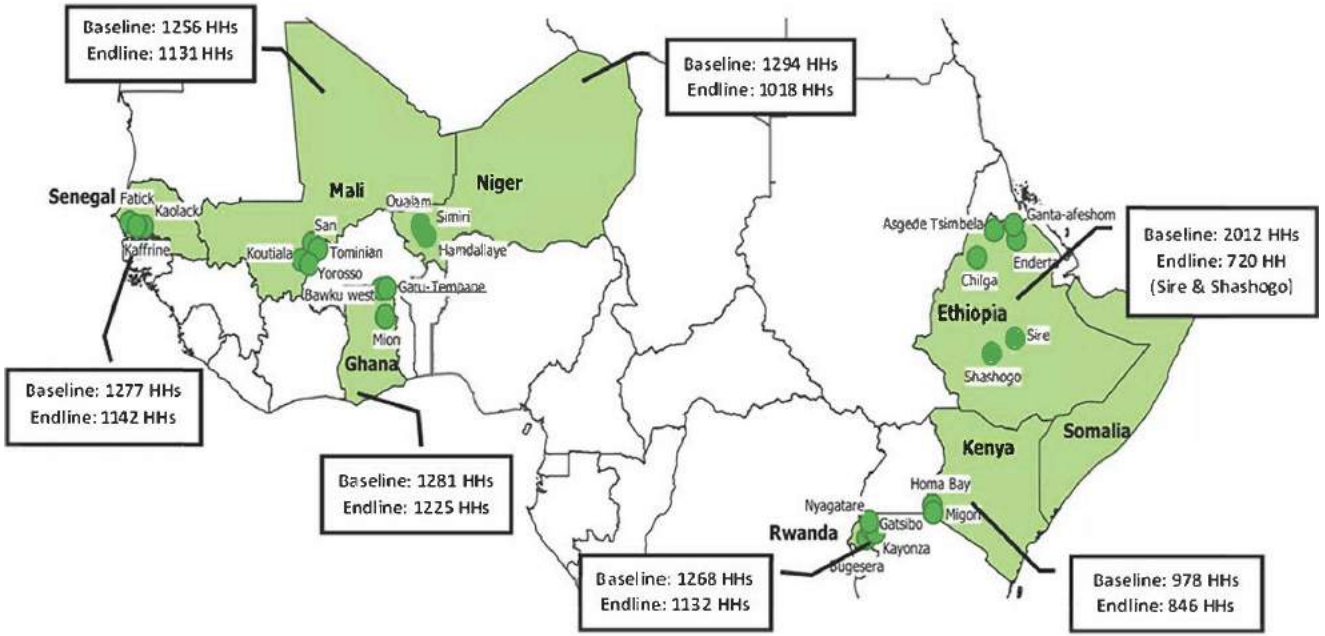
Let’s get started…

This is going to be a gallop across a variety of different landscapes … buckle up?

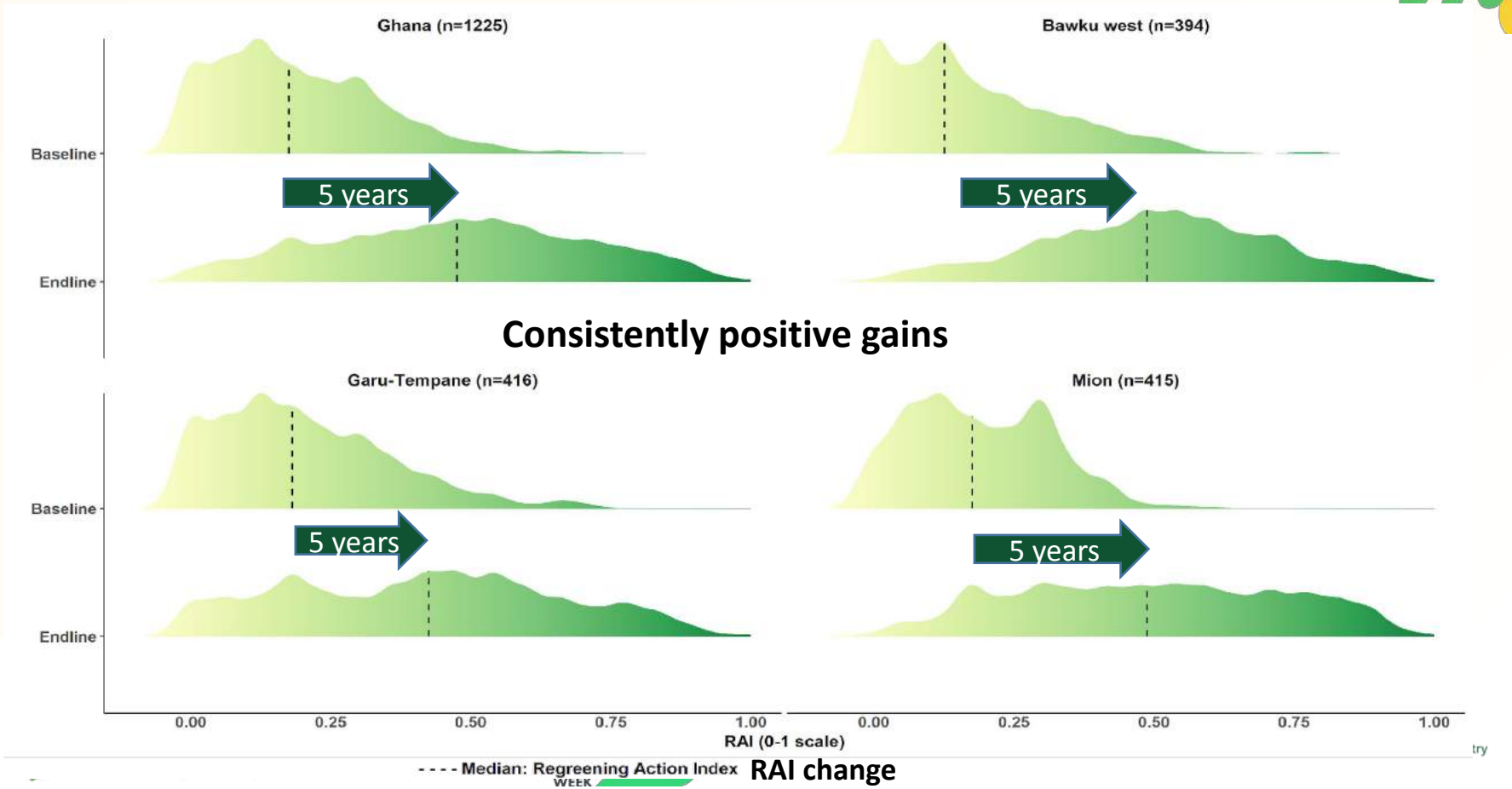
Across 7 countries in Africa – *proof* that systemic action action research to restore tree cover & NRM functions has *worked* in multiple ways

Baseline (2018) and Endline (2022) survey data

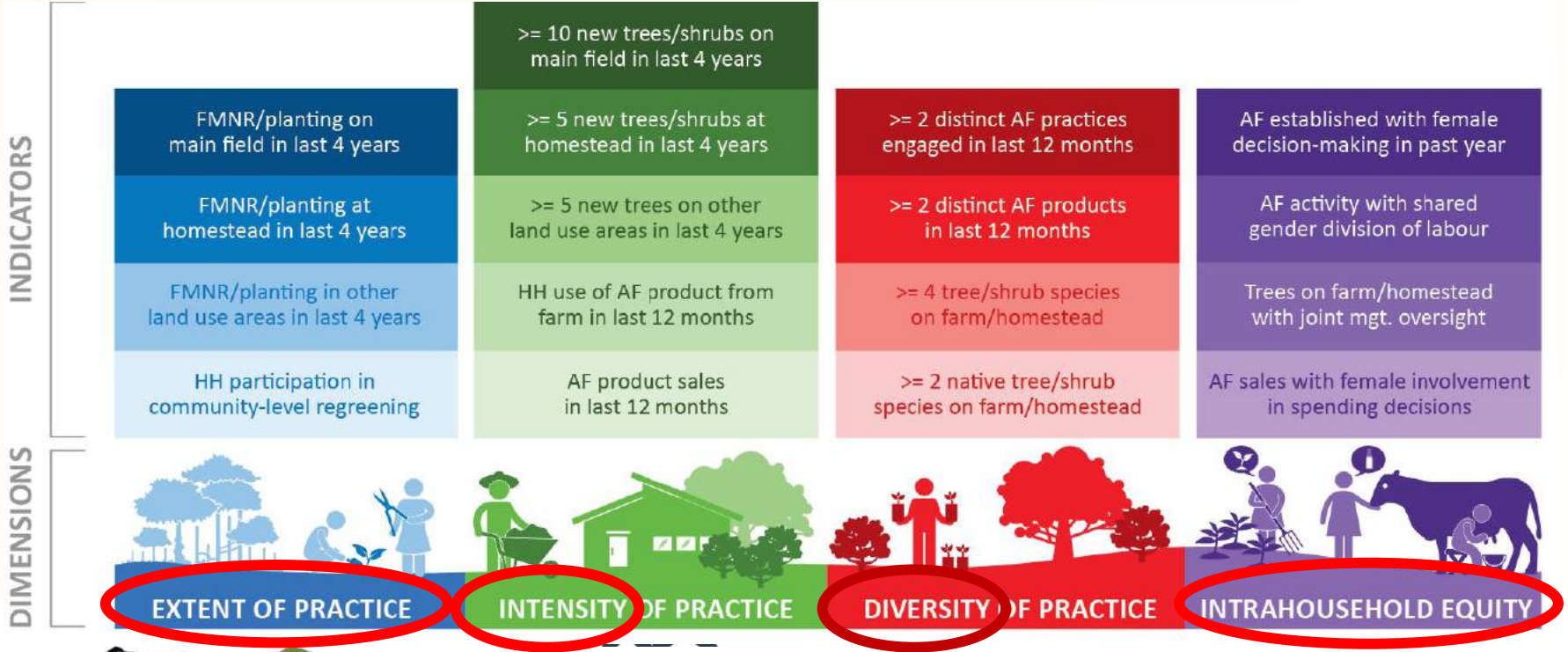


Regreening Africa (2017-23) Impact Assessment…

… worked across several landscapes using systemic indicators …



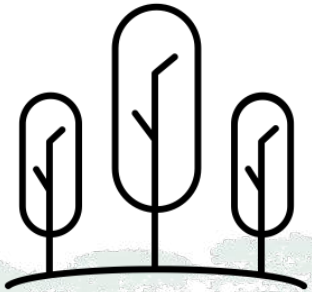
… these systemic indicators …

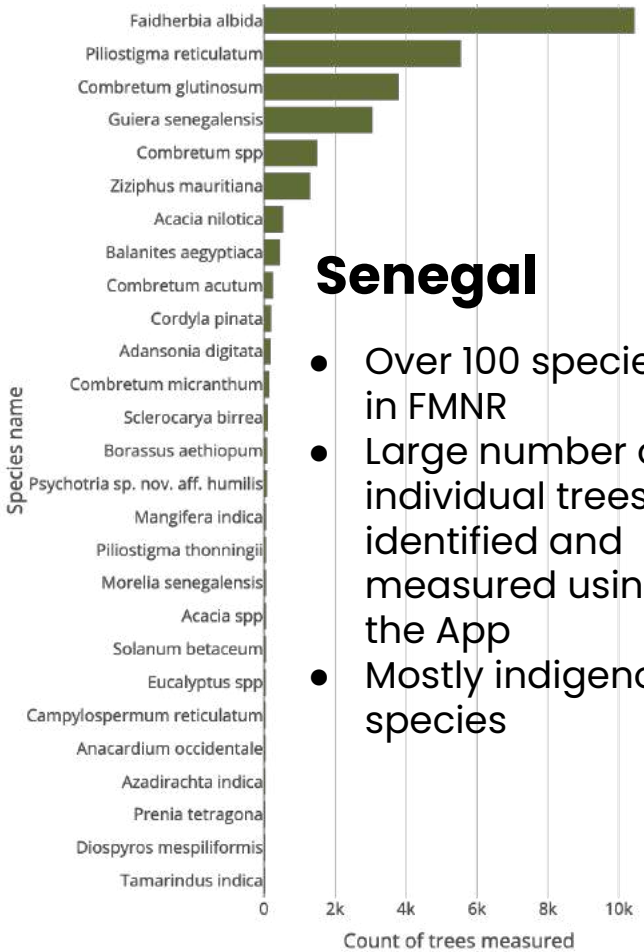


FMNR: Farmer managed natural regeneration
HH: Households
AF: Agroforestry

… and this kind of data … (*Regreening App: >150,000 participating farmers and counting*)

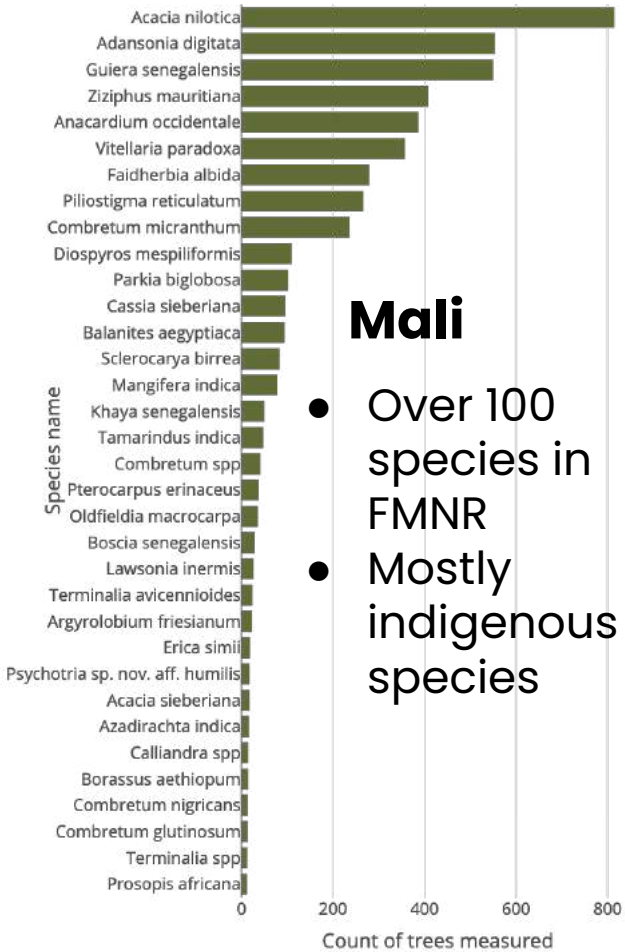
FMNR data from the Regreening Africa App: tree species





Senegal

- Over 100 species in FMNR
- Large number of individual trees identified and measured using the App
- Mostly indigenous species



Mali

- Over 100 species in FMNR
- Mostly indigenous species

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Key attributes to keep in mind…

- Scale matters! *Spatial, temporal and social*
- Costs (and benefits) matter! *Harnessing ecology and the power of complex adaptive systems lowers costs (and increases benefits)*
- The is **always** need to innovate from one adaptive cycle to the other: *We use a range of tools and approaches that speed up evidence gathering as a basis for understanding*

Let's start by looking at scale: multiple, nested scales

Starting at the top – leveraging policy change: India's Agroforestry Policy (2014) and knock-on effects

Breaking news!
QPM Initiative of Government of India (2023)
USAID TOF(I) Project

~$40m+

About 70 % of country's timber requirement met from trees on-farm

Generates about $ 25 billion/ year

During 2015-2019, India's tree cover increased by about 2%. About 1.7% of this comes from trees outside forests

CGIAR Research Program on Forests, Trees and Agroforestry
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Scale: landscapes, long term engagement, diversity of partners

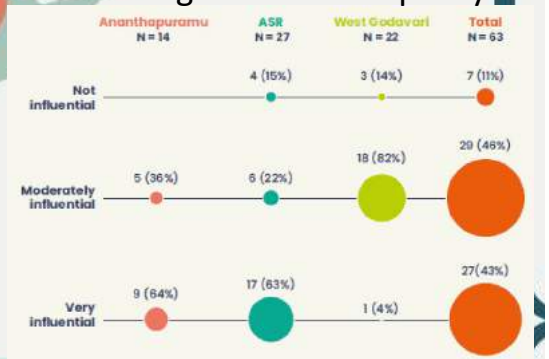
e.g. #1 Andhra Pradesh EL – Natural Farming

What is an engagement landscape?

Engagement landscapes are geographical locations where we carry out concentrated, long-term work to support transformation and enhance resilience. Included in engagement landscapes are:

- Partners who are interested in collaboration and engagement, because they see themselves as benefitting from or contributing to generating opportunities for themselves, their organisations or their communities.
- Different types of land-uses, agro-ecological zone and climates.
- Multiple layers of governance.
- Diverse groups of stakeholders, from farmers to governmental and non-governmental partners to value chain actors etc.

Tracking influence on policy



What is an exemplar landscape?

Exemplar Landscapes are smaller geographic areas within the Engagement Landscape where focused work can take place

- Common land and landless people
- Linkages between urban and rural areas
- Differing socio-economic and cultural aspects, health and nutrition status
- Ecosystem services
- Varying value chains and collectives

The scale of the APCNF programme is massive!

Largest agroecology farming programme in the country, in terms of farmers participating *(which is why influence matters)*

Transformation driven by –

- More than 10,000 (58% women) champion farmers and their mentors
- 200,000 women self-help groups and their federations
- Research support – national and global
- Govt ownership and support

Number of farmers in 2021 - increased 15x
Number of villages increased 5x

86% - small and marginal farmers 1 ha per capita

Plan
16% of farmers
7.5 % of area

27% of villages
10% of farmers
4% of area

2016-17	2020-21	2021-22	2022-23
40,656 farmers	480,000 farmers	630,000 farmers	1,060,000 farmers
704 (v)	3730 (v)	3730 (v)	3730 (v)
	220,000 Ha	290,000 Ha	460,000 Ha

1. Transition of a farmer – 3 to 5 years
2. No cash incentives during transition, and,
3. No promises of market premia after transition

Funds: Govt, KfW Bank – 235 million USD upto 2024

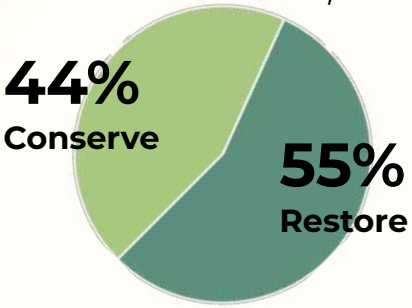
Grants: 1. Azim Premji Philanthropy – 20 million USD upto 2027
2. Co Impact – 15 million USD)upto 2027

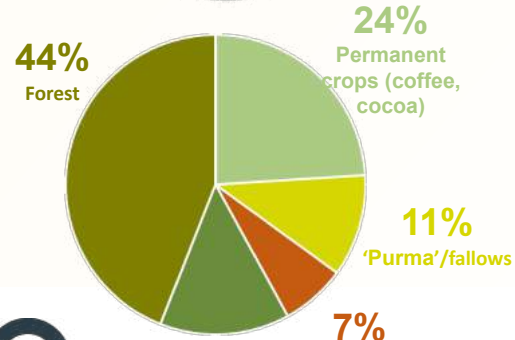
#2 SMART Engagement Landscape in San Martin, Peru
(e.g. leveraging policy space – agroforestry concessions)

In Peru: Agroforestry concessions offer a sufficiently complex entry into food and income security, along with forest conservation and and restoration over land claimed by 120 thousands family farmers across the Amazon, > 1.2 M ha.

78%
Small-scale farmers
<15 ha lowland jungle

22%
Medium-scale farmers
15-115 ha lowland jungle





AVOIDED DEFORESTATION
Emission reduction potential -20.3% of LULUCF emissions (2012 GHG inventory)

AGROFORESTRY BASED RESTORATION increases the potential of carbon storage in 3345 Gg CO_2 per year

* Cenagro 2012 , *Robiglio, Vargas and Suber 2018*

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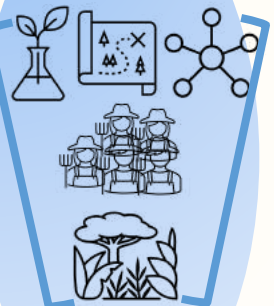
Partners in SMART EL (in Peru)

3 LANDSCAPES



1. CHARACTERIZATION OF OPTIONS, DEVELOPMENT OF TOOLS, AND MEASUREMENTS

- PUBLIC FUNDING GUIDELINES AND REGULATIONS FARM REGISTRY
- MONITORING
- ZONING
- MITIGATION NDC

National and regional Forest Authorithies

San Martín GOBIERNO REGIONAL

LORETO GOBIERNO REGIONAL

GOBIERNO REGIONAL AMAZONAS

SERFOR

OSINFOR

Organismo de Supervisión de los Recursos Forestales y de Fauna Silvestre

PERÚ MEF

PERÚ MIDAGRI

PERÚ MINAM

Ministries at National level

- GREEN PUBLIC INCENTIVES
- SAFEGUARDS AND BENEFITS SHARING

PERÚ MIDAGRI

CIVIL SOCIETY

SERFOR

2. REVIEW AND FORMULATION OF REGULATIONS AND METHODOLOGIES, ROADMAP AND ALIGNMENT WITH PNRAD

AD HOC TECHNICAL GROUPS , PLATFORMS ETC.

- AF AND SSF OPTIONs MANUALS
- DECISION MAKING SUPPORT TOOLS
- PLATFORMS

3. REVIEW OF PUBLIC FUNDING SCHEMES, TECHNICAL ASSISTANCE AND INCENTIVES PROGRAMMES, PES MECHANISMS.

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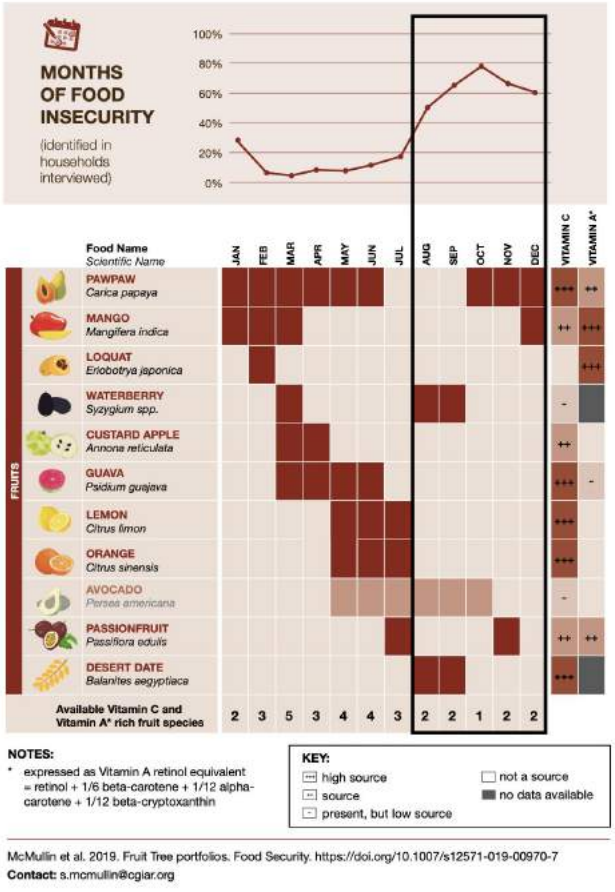
#3 Para EL in Brazil: linking and scaling key *innovations* for multiple benefits. *(Incomes, carbon, biodiversity, nutrition, food security…)*

1. **Restoration with Agroforestry** for livelihood, land and carbon
2. **Fruit trees portfolios** for food and nutrition security

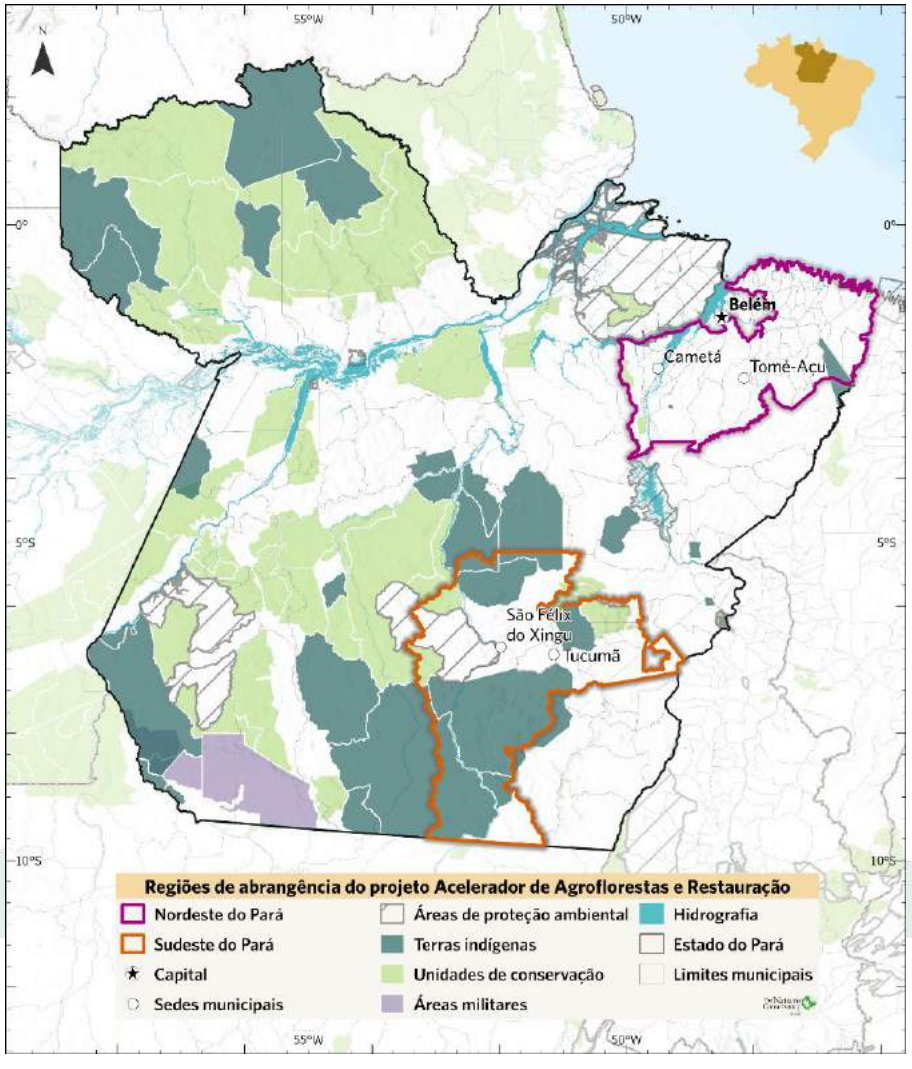
1 - **Agroforestry system :** example here with oil palm, cocoa and açai in the Brazilian Amazon. Photo: ICRAF/Martin Meier

2 - Fruit trees portfolios
Learning from our work in East Africa



Leveraging on the “Agroforestry and Restoration Accelerator” project to scale out to the whole state …

- The ARA project (2022-2025) was originally designed as a land **restoration** (working on degraded pastures) with agroforestry initiative, together with a carbon crediting scheme for the **climate benefits**.
- Now **adding a nutrition dimension** to one of the landscapes of the project: **Tomé-Açu** municipality (Northeast Pará).
- This is a **unique mobilization of two of CIFOR-ICRAF’s key delivery mechanisms:** a Transformative Partnership Platform (here, Nutriscapes TPP) working in an engagement landscape (here the Pará EL)



... And nationally, to create institutional demand for agroforestry and forest foods by linking to the Biodiversity for Food and Nutrition (BFN) Initiative in Brazil

Public policy signed by Brazilian Ministry of the Environment and Ministry of Social Development and Fight Against Hunger.

The Ordinance on Sociobiodiversity is the first to define and support nutritionally important native species:

- Ordinance n. 163 (2016):
  - Lists 82 native plant species with food value
  - Government encourages development of value chains: processing and marketing
  - Direct market outlet: Food Acquisition Program (PAA)
- Ordinance n. 284 (2018):
  - Updated list of 101 species

Photo: Flickr/M. Adams

Zooming in on harnessing diversity …

- Restoring diversity, tree and forest cover for multiple benefits
- “The right tree, for the right place, for the right reason”
- Within a ‘whole of system’ approach

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Harnessing ecology & diversity to build resilience: *Think 'portfolios' not 'species'*

Climate Appropriate Portfolios of Tree Diversity

CAPTD are mixes of tree species' planting materials, delivered to growers, that are environmentally-matched to planting sites and purpose-matched to planting requirements. They are necessary to supply tree diversity to respond to climate change and other challenges that tree planting can address.

Where are they being used?

Currently mainly in Africa, shortly in Asia and Latin America as well.

And one of the less obvious benefits …*reversing undernutrition amongst the most vulnerable*

Example. Tree Portfolios for Food and Nutrition

	Common Name	Local Name	Botanical Name	*	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Vit A	Vit C	Iron	Folate
Food Trees	Mango	Mango	*Mangifera indica*	e													+++	++	~	~
	Avocado	Kota Pela	*Persea americana*	e														~	~	~
	Guava	Magwaba	*Psidium guajava*	e													~	+++	~	
	Orange	Amachungwa	*Citrus x sinensis*	e													~	+++		
	Lemon		*Citrus limon*	e														+++		
	Chocolate berry	Imfutu	*Vitex doniana*	i														~	~	
	Baobab	Mu-Uyu	*Adansonia digitata*	i														+++	+++	~
	Mobola plum	Mbula/Impundu	*Parinari curatellifolia*	i													++			+++
	Wild pear	Makole	*Azanza garckeana*	i														+++	++	
		Mfungo	*Anisophyllea boehmii*	i															+++	
	Wild Loquat	Amasuku	*Uapaca kirkiana*	i													~	++		++
	Monkey Orange	Ifisongole	*Strychnos cocculoides*	i													~		~	
	Wild Granadilla	Amateke	*Passiflora herbertiana*	i													++	++	~	
Wild Vegetable	Mushroom	Tente/Bulyaluku	*Amanita Zambiana*	i															~	+++
	Mushroom	Chitondo/ Chito	*Cantharellus spp*	i															~	
	Mushroom	Samfwe	*Termitomyces microcarpus*	i																++
	Mushroom	Kabansa	*Lactarius kabansus*	i															~	
	*Exotic(e) or Indigenous (i)																Some values for illustration only			

Example: Food Tree Portfolio – Chibale, Zambia

- Customized Food Tree Portfolios **promote diversity** to provide micro-nutrients in staple-based systems
- Combination of **indigenous** and **exotic** species (cultivated & wild) – food trees & crops
- **Seasonal availability**, each month at least 1 fruit/food species is ready for harvest, (lean season)
- **Micronutrients** - vitamins A + C supply (+ iron, folate, zinc with GLV) –scored low, medium, high source

*Food trees include those that provide fruit, nuts, seeds, oils, leafy vegetables

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Engaging communities in co-development of Portfolios: *realizing social diversity is an asset*

Community Priority Setting and Validation

- Empower communities (by using their own knowledge)
- Centred around their participation
- Social values and diets
- Resource mgt. & use
- Species preferences
- Decision-making
- Overall livelihood priorities

Gender, generation disaggregation

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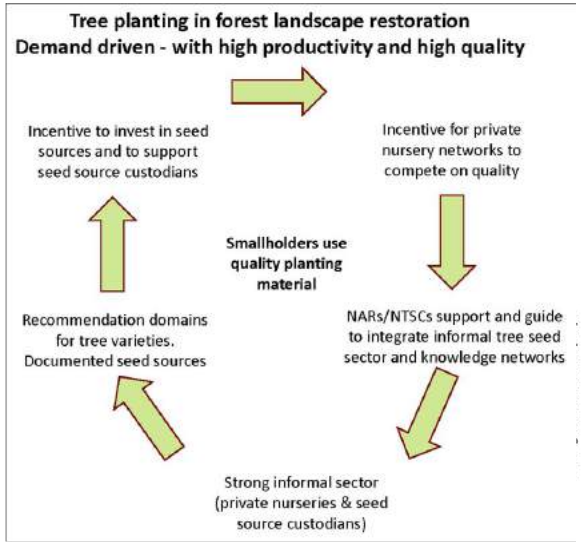
Tree diversity portfolios within a larger systems view – e.g. *thinking through how to unroll the 'doughnut' (Raworth et al)?*

Typical current situation for agroforestry and forest restoration

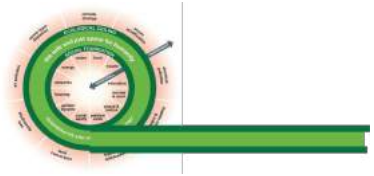
Enabling environment to facilitate transformation

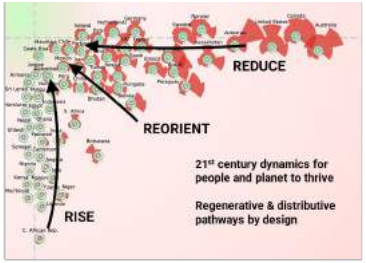
- Normative re-orientation of NTSCs from seed/seedling suppliers **to enablers of networks** that exchange information and seed/seedlings
- **Inclusive low-input breeding** programmes and long-term investments in quality material
- Documentation of seed sources and recommendation domains (current-> future)
- Integration of formal and informal seed systems (seed **source custodians, -dealers, small-scale nurseries**)
- Support to knowledge networks - **informal entrepreneurs and smallholders**
- Support to **smallholder value chain participation**
- Government policies and regulations in support of smallholders

NTSCs - with help from NGOs and other tree planting projects - support an ISSD process of change from supply-driven to demand-driven tree seed systems



Some examples of this situation for specific tree crops in specific locations (e.g. tea in Kenya, acacia in Vietnam, poplars in India, rubber in Thailand, also cases in Europe and North America)





Within the means of the living planet

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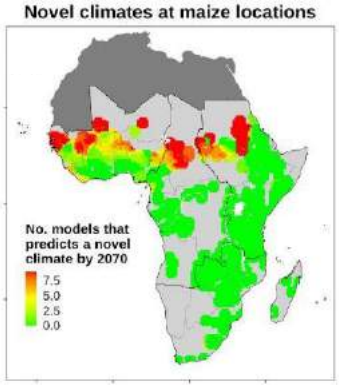
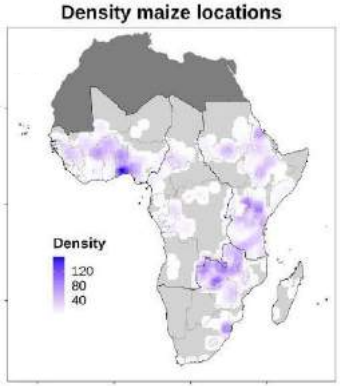
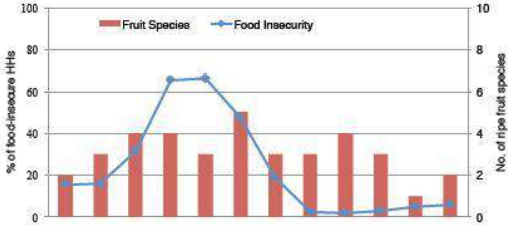
Along with species (and life form) diversity, genetic diversity needs to be harnessed too…*for effective adaptation & development*







English name	Species name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Vit A	Vit C
Jackfruit	*Artocarpus heterophyllus*														(+)
Passion	*Passiflora edulis*													+	
Water berry	*Syzygium spp.*													+++	
Pawpaw	*Carica papaya*													+++	+
Guava	*Psidium guajava*													+	+++
Avocado	*Persea americana*														
Loquat	*Eriobotrya japonica*													+++	
Mango	*Mangifera indica*													+++	+
Soursop	*Annona muricata*														(+)
Lemon	*Citrus limon*														+
Orange	*Citrus sinensis*														+
	Available vitamin C and A- rich fruit species	2	3	4	4	3	5	3	3	4	3	1	2		

… the African Orphan Crops Consortium

RESEARCH ARTICLE

Forgotten food crops in sub-Saharan Africa for healthy diets in a changing climate

Maarten van Zonneveld, Roeland Kindt, Stepha McMullin, Enoch G. Achigan-Dako, Sognigbé N'Danikou, Wei-hsun Hsieh, Yann-rong Lin, and Ian K. Dawson
Authors Info & Affiliations

Edited by Loren Rieseberg, The University of British Columbia, Vancouver, Canada; received June 27, 2022; accepted January 31, 2023

March 27, 2023 | 120 (14) e2205794120 | https://doi.org/10.1073/pnas.2205794120

McMullin, S., Njogu, K., Wekesa, B. *et al.* Developing fruit tree portfolios that link agriculture more effectively with nutrition and health: a new approach for providing year-round micronutrients to smallholder farmers. *Food Sec.* **11**, 1355–1372 (2019).

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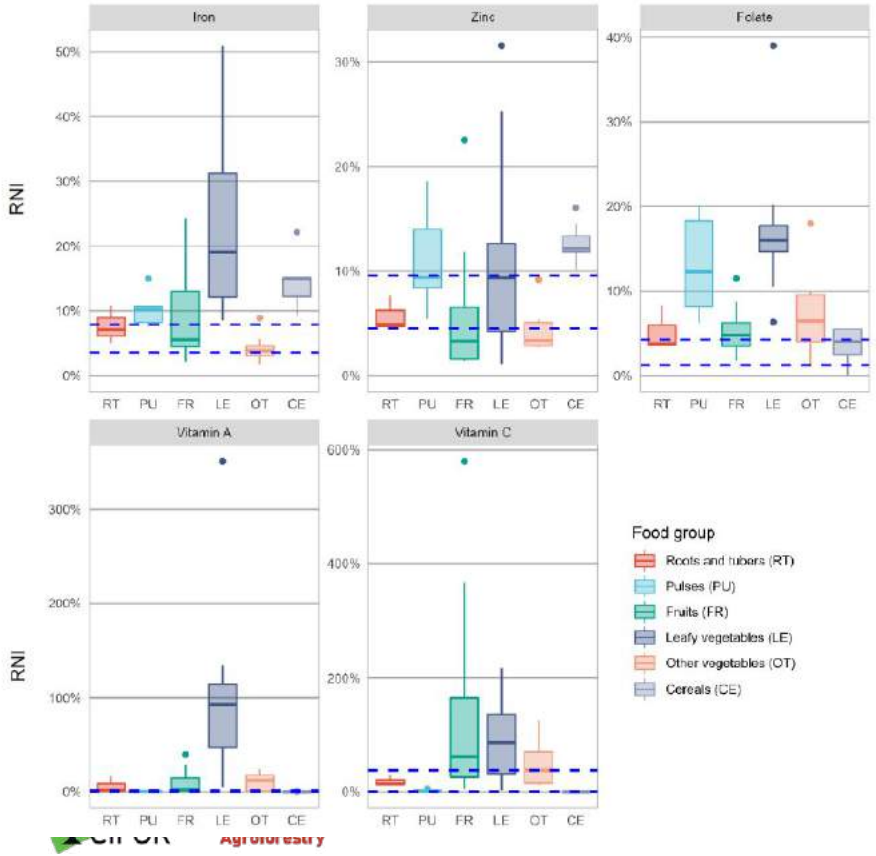
… the African Orphan Crops Consortium

58 Prioritized Forgotten Food Crops Selected from across Food Groups: Covers over 95% of Major Staples' Novel Climate Conditions in the Year



Standouts

Iron	*Amaranthus hybridus*	Amaranth
	Gynadropsis gynandra	Spider plant
	Anacardium occidentale	Cashew
Zinc	*Anacardium occidentale*	
	Amranthus cruentus	
Folate	*Celosia argentea*	Celosia
	Amaranthuis graecizans	
	Vigna radiata	Mung bean
Vit A	*Moringa oleifera*	Drumstick tree
	Gynadropsis gynandra	
	Xanthosoma sagittifolium	Arrowleaf elephant ear
Vit C.	*Psidium guajava*	Guava
	Sclerocarya birrea	Marula
	Carissa spinarum	Bush plum

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African Orphan Crops Consortium: an Uncommon Collaboration

Benefits include systemic capacity strengthening of partners:
e.g. for African plant breeders and national programs

- 5 cohorts including 150+ scientists from 28 countries across the African continent: 90% PhDs, 40% women
- 125 crops including 60 African Orphan Crops
- 520+ breeding programs – truly Pan African!

New!
AfPBA CRISPR Course

UCDAVIS Plant Breeding Academy

World Agroforestry

Jon and Terase Curtis

MARS incorporated

AGRA Growing Africa's Agriculture

AUDA-NEPAD AFRICAN UNION DEVELOPMENT AGENCY

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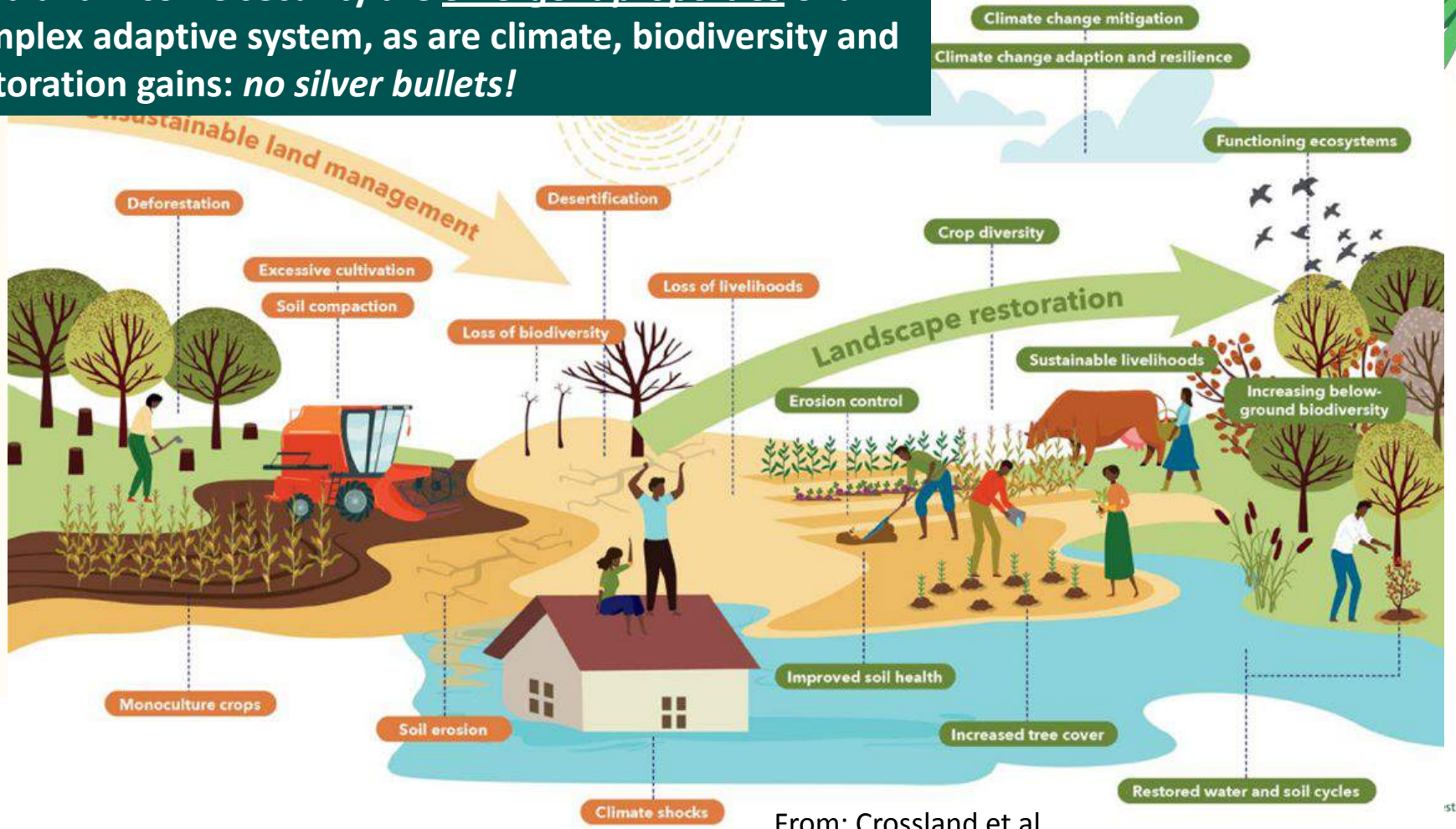
and Agroforestry Partnership

Food and income security are *emergent properties* of a complex adaptive system, as are climate, biodiversity and restoration gains: *no silver bullets!*

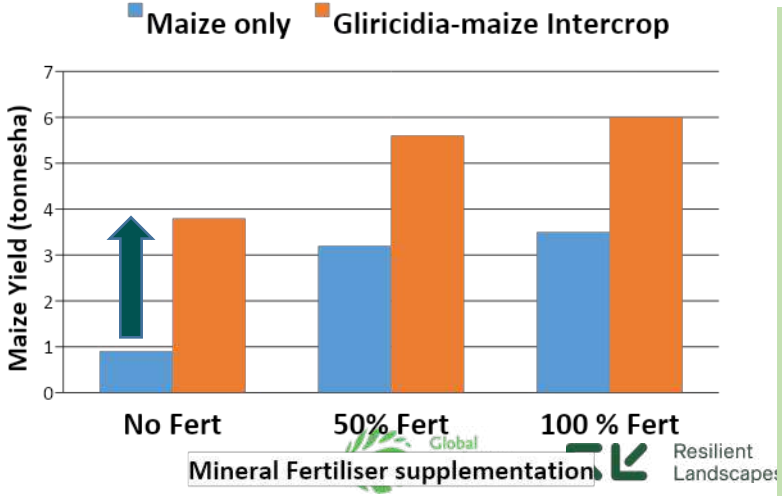


From: Crossland et al., 2022

Unless you consider harnessing tree diversity and nature a silver bullet!

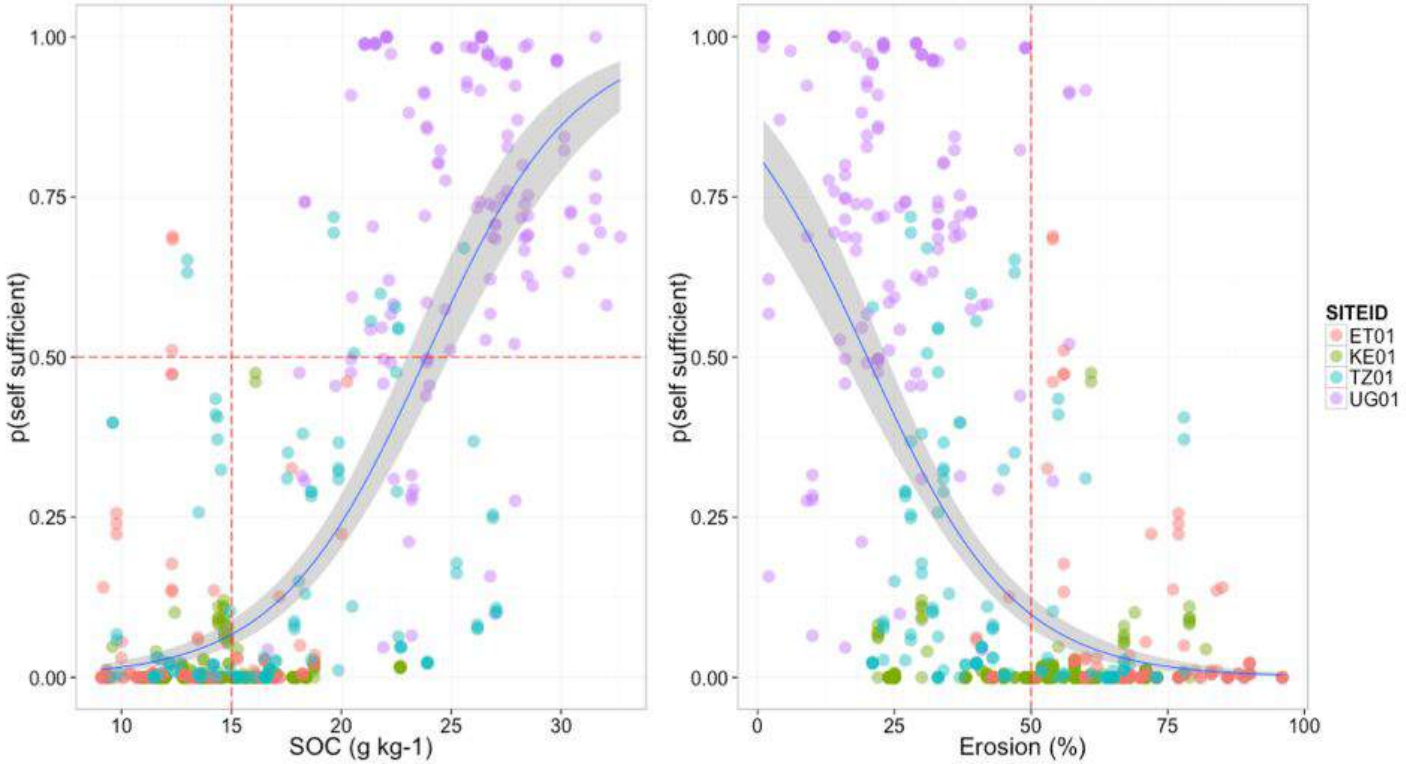
Intercropping maize with legume trees to supply Nitrogen-rich green manure is Climate Smart

Reduced GHG and household economic savings!



Response to mineral fertiliser is enhanced with green manure fertilisation

Harnessing our understanding of complexity: *Linking Food Security and Land Health*



In E Africa, farm households with **higher soil organic carbon and less erosion are more likely to be food secure**

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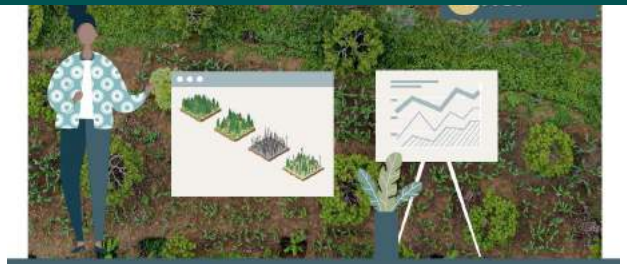
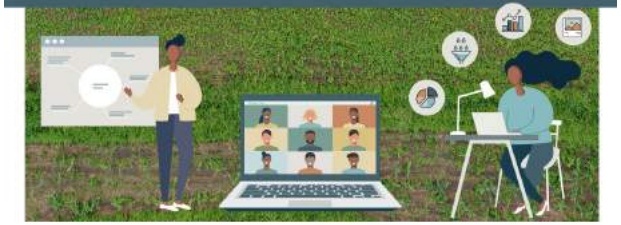
By connecting insights to transformation through a*ctionable evidence - data, information and knowledge*



Enhancing policy and strategy planning.

How to tailor data visualisation and evidence sharing for improved stakeholder uptake and application

Authors: Mieke Bourne, Constance Neely, Christine Magaju, Christine Lamanna, Nathanial Peterson, Rosina Wanyama, Tor-G. Vågen, Sabrina Chesterman and Leigh Winowiecki



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MAKING DATA COUNT

INSIGHTS ON VISUALISATION AND ENGAGEMENT APPROACHES FROM THE KENYA AGROFORESTRY STRATEGY DEVELOPMENT PROCESS

Authors: Mieke Bourne, Christine Magaju, Constance Neely, Nathanial Peterson, Tor-G Vågen, Christine Lamanna, Leigh Winowiecki and Sabrina Chesterman

CIFOR World Agroforestry | SHARED The Decision Hub | Busara

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ELSEVIER

Enhancing co-production of knowledge: Visualisation and engagement approaches for evidence-based decision making within the Kenya Agroforestry Strategy

Mieke Bourne[a,*], Christine Magaju[a], Constance Neely[a], Nathanial Peterson[b], Christine Lamanna[a], Sabrina Chesterman[a], Tor-Gunnar Vågen[a]

[a] CIFOR-ICRAF, United Nations Avenue, Gigiri, Nairobi, Kenya
[b] Busara Center for Behavioural Economics, Dolphin Plaza, Ngong Lane, Nairobi, Kenya

ARTICLE INFO

Keywords:
Policy
Evidence
Root cause analysis
Co-production
Facilitation
Social learning

ABSTRACT

Shifting the relationship between science and decision making is a key challenge for sustainable development. We conducted a two-part behavioural study linked to the preparation of the Kenya Agroforestry Strategy. Two virtual workshops followed a data visualisation preference survey of 174 technical officers to compare the influence of a peer led and a facilitated workshop on inclusive, evidence-based decision making. A post workshop survey, facilitator or observer reports, coded transcriptions of group discussions, case causes capturing social actor perspectives, and strategy context were analysed. Results from the visualisation preference survey indicate that most respondents preferred more straightforward displays like tables and bar charts over the more complex sludge and box plots. Limited exposure to diverse visualisation formats calls for capacity development and innovative ways to share data in multiple formats. Engaging scientists in co-production processes allows more complex data to be accessed and understood by decision makers. Triangulation across diverse data sources associated with the workshops indicates facilitated groups had greater inclusion of participants and better integrated scientific and social actor perspectives in the strategies they developed. The importance of skilled facilitation and engagement processes are therefore highlighted. Small workshop sample sizes and complex interactions indicate that further studies are needed to validate our findings, but the results of this study provide valuable insights for knowledge translation and social learning as part of co-production to support inclusive, evidence based decision making in agricultural and environmental policy processes.

https://worldagroforestry.org/publication/making-data-count

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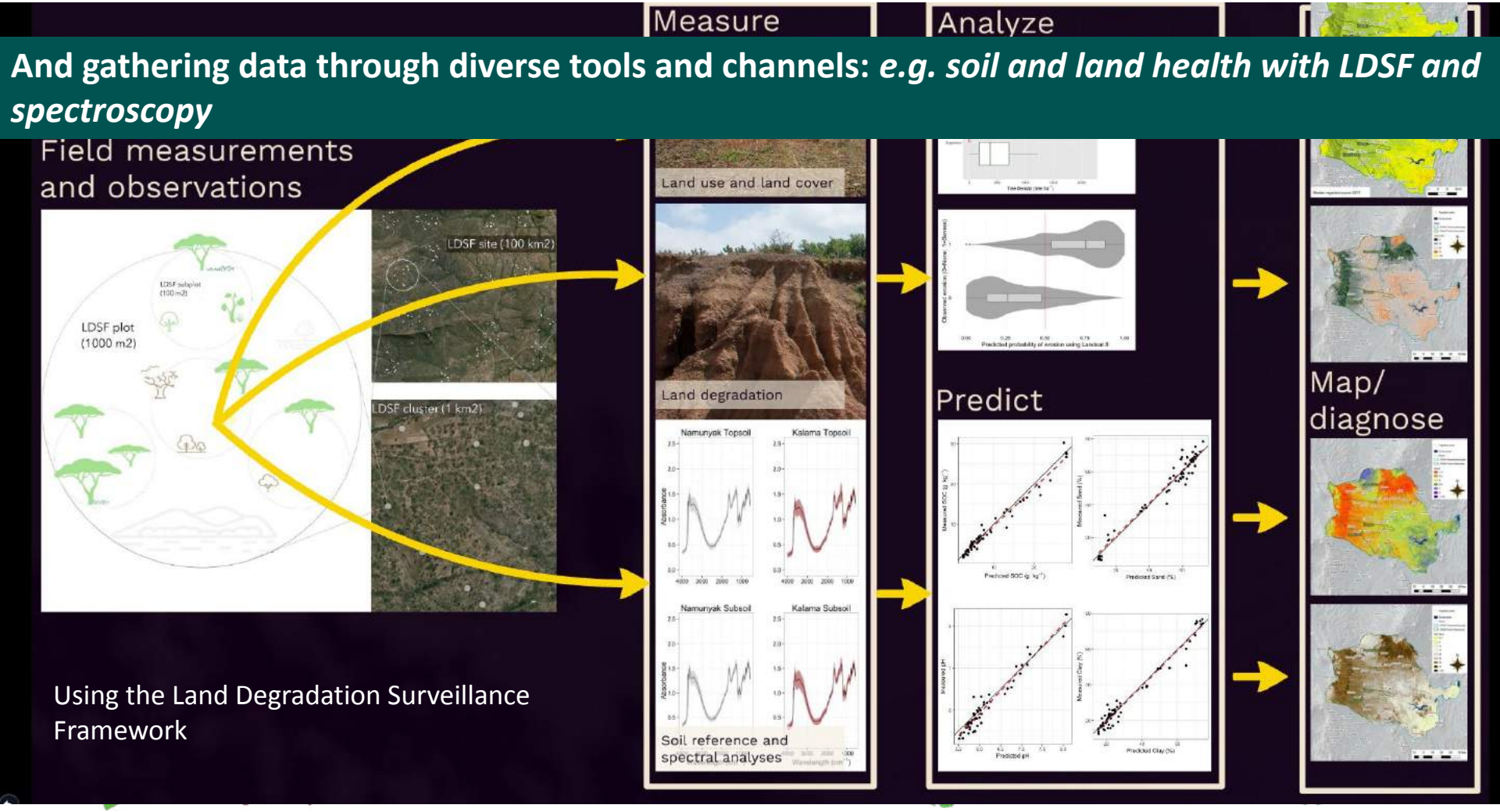
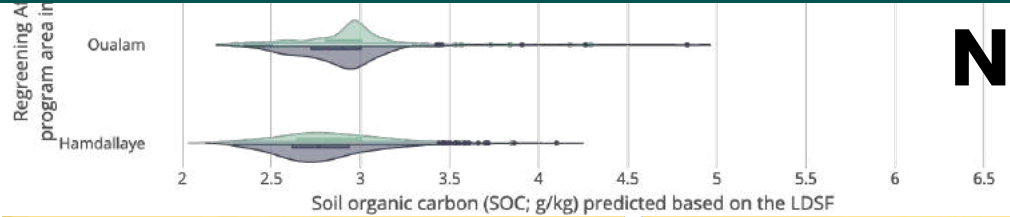
And gathering data through diverse tools and channels: *e.g. soil and land health with LDSF and spectroscopy*



Using the Land Degradation Surveillance Framework

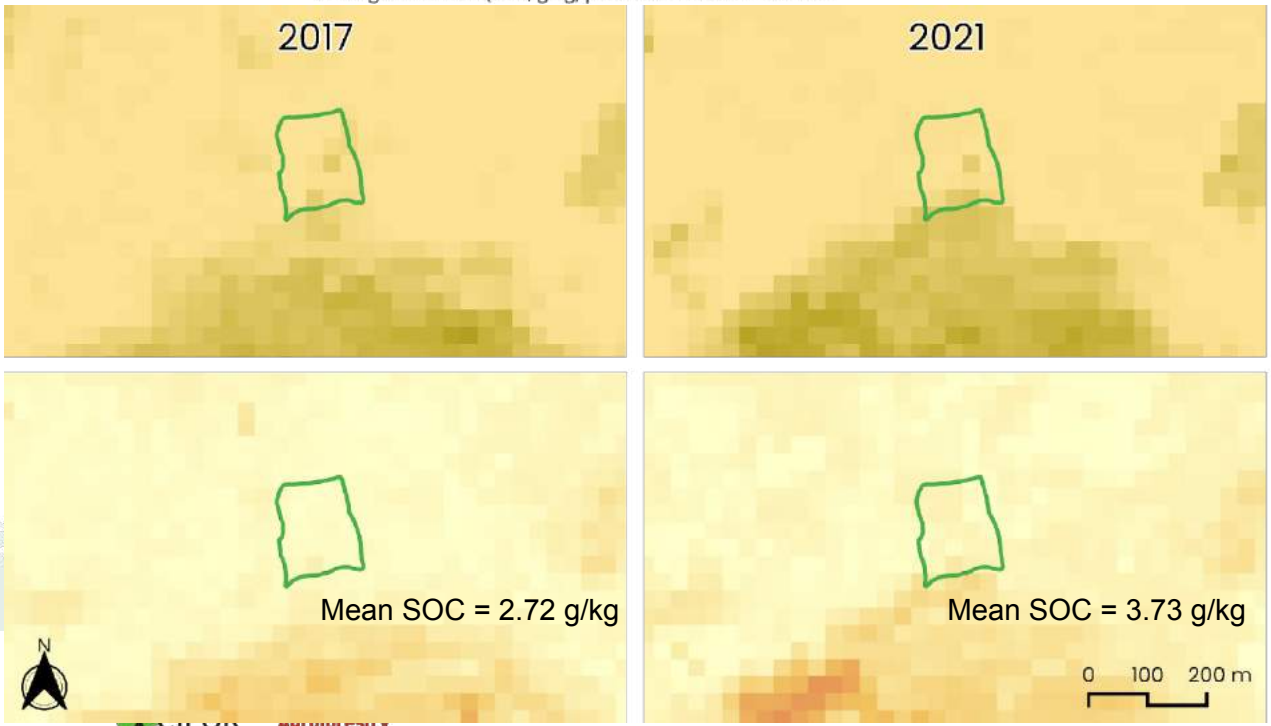
Source: Leigh Ann Winowiecki

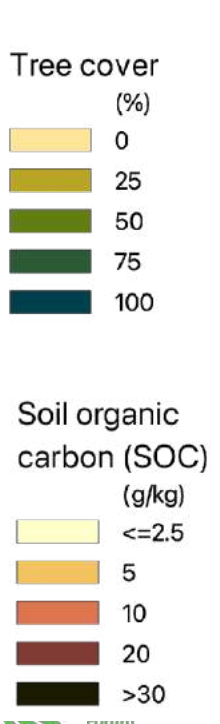
Understanding and following changes through nested scales – *e.g. changes in Soil Organic Carbon (the technology helps us to track impacts without blowing the budget)!*

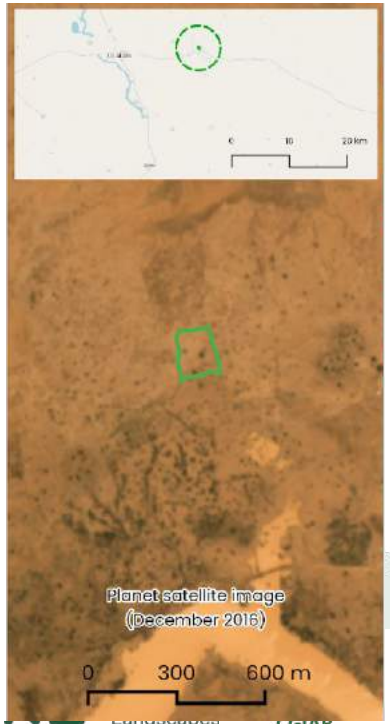


Niger

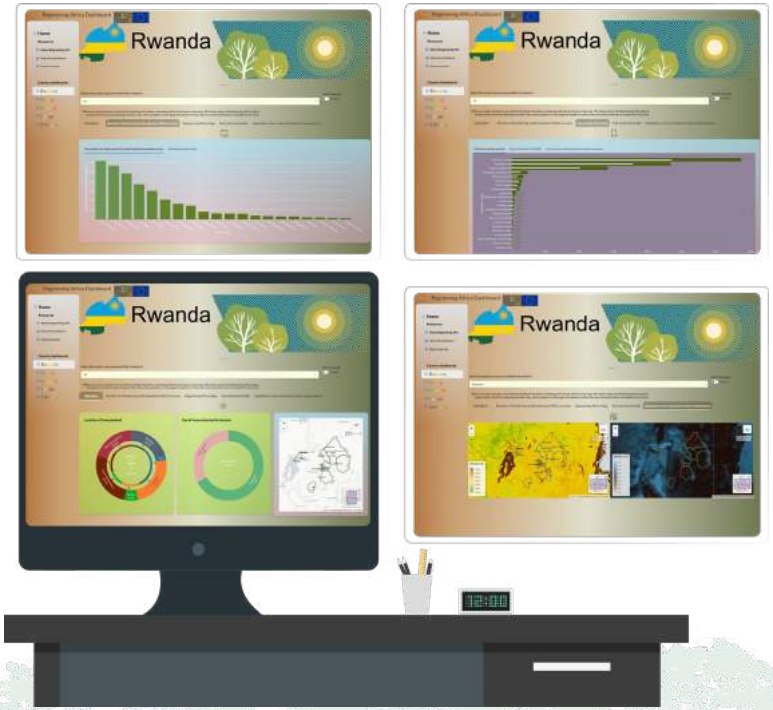
- changes in **vegetation and SOC** even in very marginal areas.
- Combined with the farmer polygons







Finally, bringing it all together in management dashboards to visualize, share and interrogate data



- Platform to unify and bring together data, evidence and learning from the different project components.
- Over 200,000 users of the Regreening App

- Regreening Africa dashboard: https://dashboards.icraf.org/app/ra_dashboard

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In closing, a personal look back … to look forward

- **Learn fast to adapt** → *From C&I for SFM, through adaptive collaborative management to linking data to wise choices*
- **Embrace diversity**, resilience and our future depend on it → *we have the models and understanding to muddle through now, nature is still an ally!*
- **Faced with uncertainty, learn to fail small and fail safe** → *while trying to win more often and more equitably*
- **Reward stewardship** (*think Aldo Leopold and the Sand County Almanac*) → *and move to a Stewardship Economy?*

Thank you

cifor.org | worldagroforestry.org

foreststreesagroforestry.org | globallandscapesforum.org | resilientlandscapes.org

The Center for International Forestry Research (CIFOR) and World Agroforestry (ICRAF) envision a more equitable world where trees in all landscapes, from drylands to the humid tropics, enhance the environment and well-being for all. CIFOR-ICRAF are CGIAR Research Centers.

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USAID/Peru - Natural Infrastructure for Water Security

2017-2027, Co-funded by Canada and USAID, Implemented by Forest Trends and partners

LAC Countries are Vulnerable to Degradation of **Water Quality** and **Water Scarcity**

- **Lack of water storage - 30% reduction** in glacier area in the tropical Andes since 1980s (50% or more in many areas of Peru)
- **Poor governance** - Increasing reliance on **groundwater** by cities, mining and agriculture without sufficient regulation is increasing contamination unsustainable withdrawals.
- **Lack of equity** - rural/urban divide in **service delivery** and **water management** and **allocation** are persistent development challenges and undermine trust in government and food security and poverty alleviation efforts.

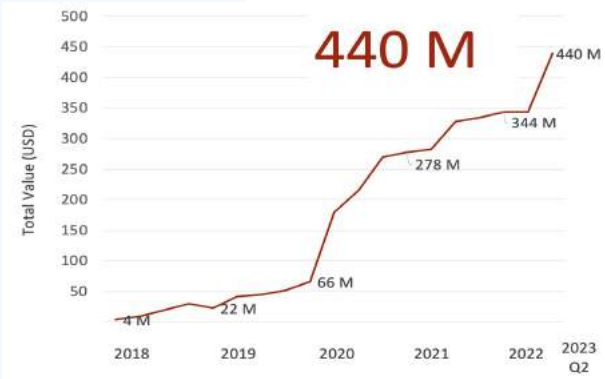
By intercepting, infiltrating, and filtering water where it rains and stabilizing soils,
natural infrastructure like **forests, grasslands, and wetlands**,
complemented by soil & water conservation practices like **amunas, qochas, and terraces**,
play a critical role in managing water risks like drought, floods, and contamination.

Natural Infrastructure for Water Security (NIWS)

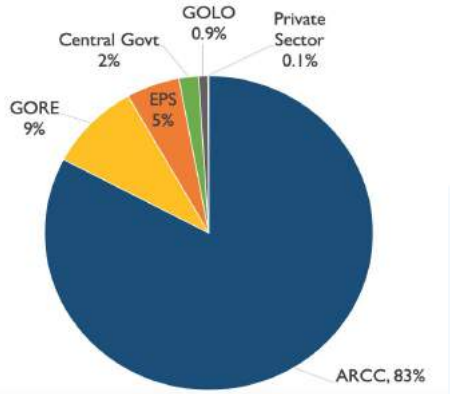
USAID Peru

The overall value of NIWS' portfolio of **natural infrastructure investments** under development is currently $440 million.

Growth of value of total portfolio under development with NIWS' support, 2018-2023



Value of portfolio by financing sector



Sustainable Food Systems: Mainstreaming Natural Resource Management

Highlights from African examples

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Moffatt K. Ngugi,
USAID/Mozambique Environment Officer

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Sustainable Food Systems: Mainstreaming Natural Resource Management

We need to reform food systems for both nourishment and environmental sustainability.

- A country's agricultural biodiversity provides culturally appropriate and locally adapted nutritious foods, as well as traits for climate-resilient crops and animal breeds.
- Agricultural biodiversity is already widely integrated into global farming and breeding systems.
- The Agrobiodiversity Index supports policymakers and the private sector in assessing agricultural biodiversity for informed interventions and investments in sustainable food systems.

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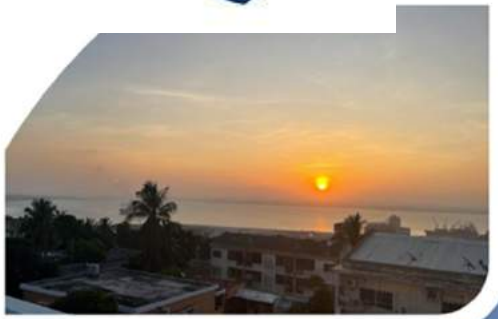
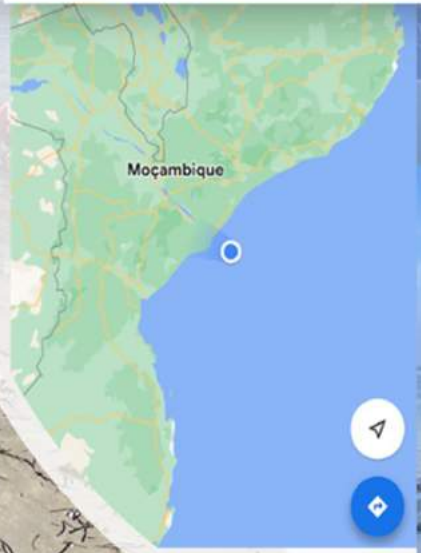
Regenerative food systems that work for people, nature and planet





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Natural Resources Management as a lynchpin of food systems that work for people, nature and planet

- Resilient Gorongosa
- RCC: Resilient Coastal Communities
- PLANETA

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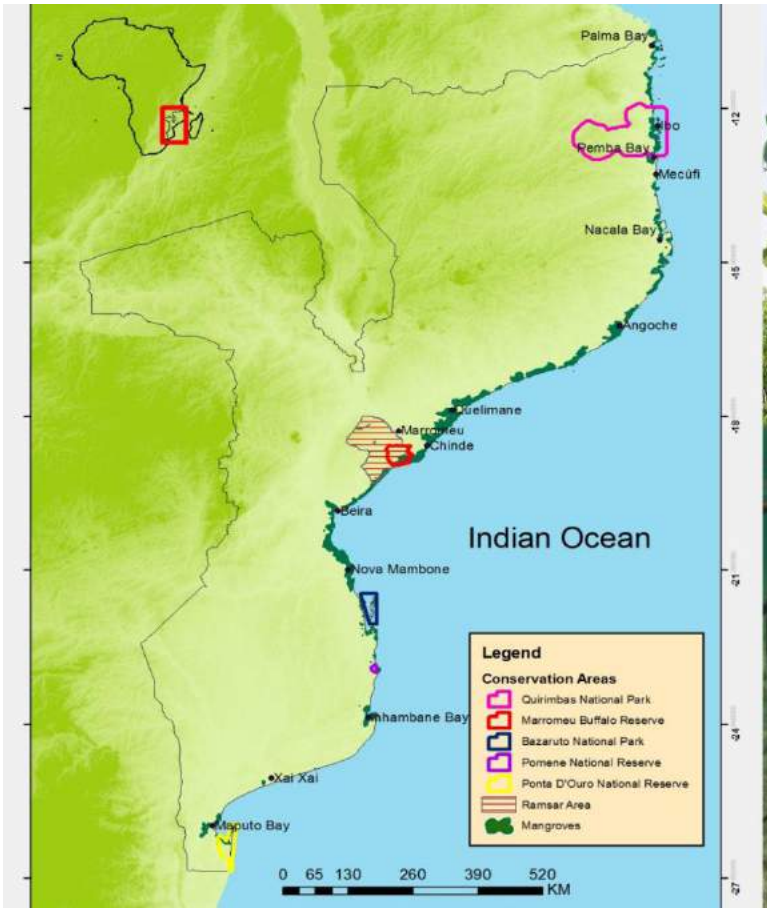

Q&A

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