CGIAR CLIMATE ACTION

Climate resilient food systems, agri-practices, and management of related non-CO_2 emissions

18th Dialogue RSO

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CGIAR System

CGIAR is the world's largest global agricultural innovation network. CGIAR works to address challenges to food, land, and water systems. Challenges and risks to agriculture and fisheries, including those associated with a changing climate, vary across regions, and require **solutions that are context-specific**.

- Climate actions exist across crops, livestock and aquatic foods
- Mitigation and adaptation co-benefits depend on system fit
- Scaling requires means of implementation including data, monitoring, finance, policy and implementing pathways
- **Research needs are moving from "what works?" to "what works, where, for whom, and under what conditions?"**

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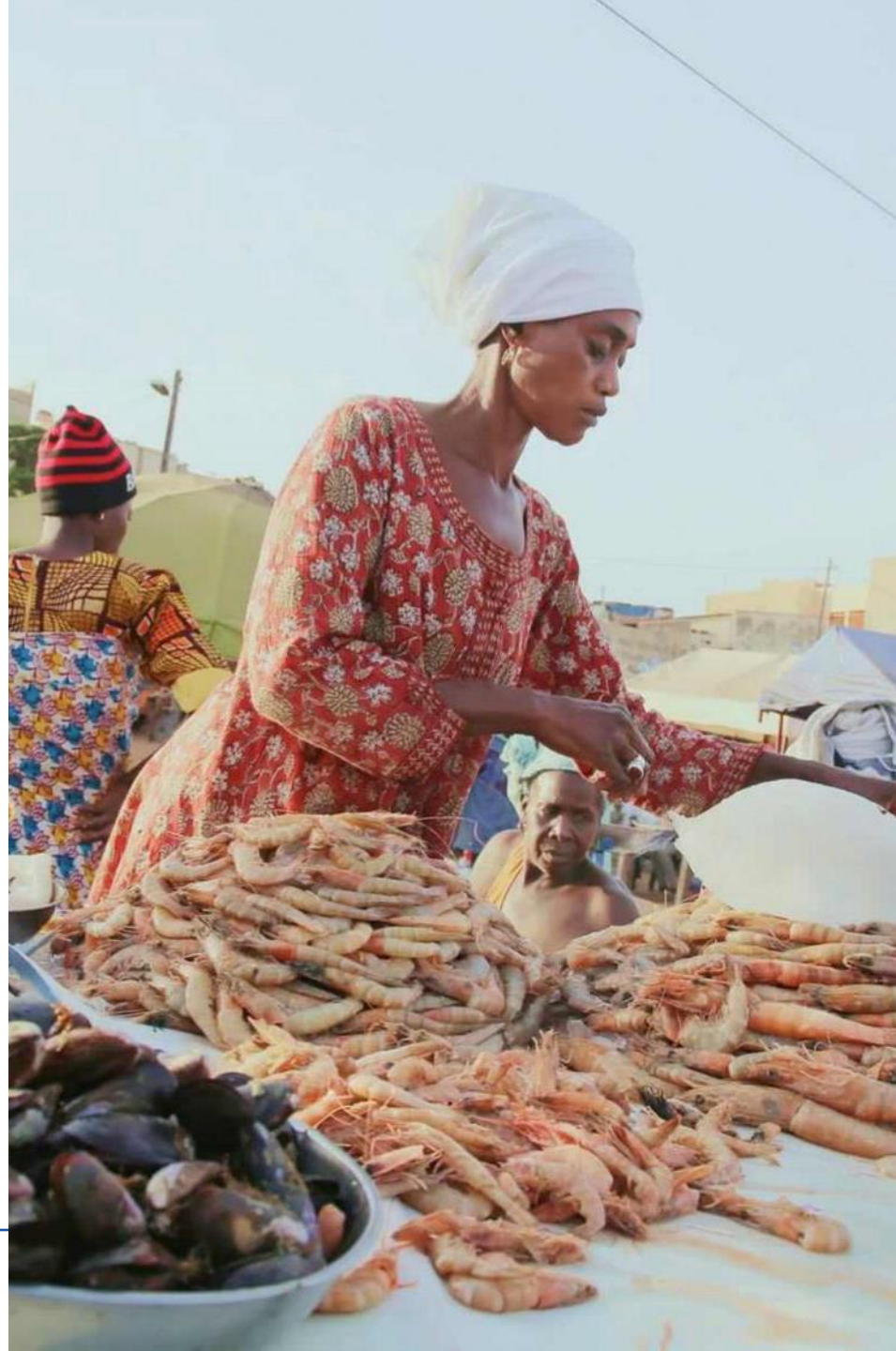

Research needs and knowledge gaps

- Quantification of adaptation and mitigation contributions across systems, *including trade-offs and synergies*
- Improve spatially explicit emissions data
- Develop fit-for-purpose MRV systems and improve Tier 2 readiness
- Understand adoption, finance, market access and policy incentives
- Strengthen gender-transformative approaches
- Invest in R&D for climate resilient food systems in low- and middle-income countries

Elements needed for climate-resilient food systems

Cross-cutting: Equity, gender & social inclusion · Women · Youth · Indigenous communities · Marginalized groups

Prioritisation & coordination of climate action

Harmonised climate data & methods · Synthesis & gap analysis · Global agrifood climate agenda · Science–policy bridge

Digital advisories & climate risk management

Early warning systems · Digital climate advisory · Resilient water systems · Anticipatory action

Locally led adaptation

Co-produced solutions · Scaling LLA · Avoiding maladaptation · Equity in adaptation

Low-emission transitions

High-carbon landscapes · Methane reduction · Carbon sequestration

Climate finance & policy for scaling actions

National climate policies (NDCs) · Development & climate finance · Private sector investment · Carbon markets & loss & damage · Translational science

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Local solutions for aquatic foods: nature-based and integrated aquaculture

- Aquatic foods support nutrition, economies and livelihoods
- Threatened by warming oceans, sea-level rise, saltwater intrusion, storms and drought
- Nature-based and integrated systems: seaweed, bivalves, rice-fish, rice-prawn, mangrove aquaculture, Integrated Multi-Trophic Aquaculture (IMTA)

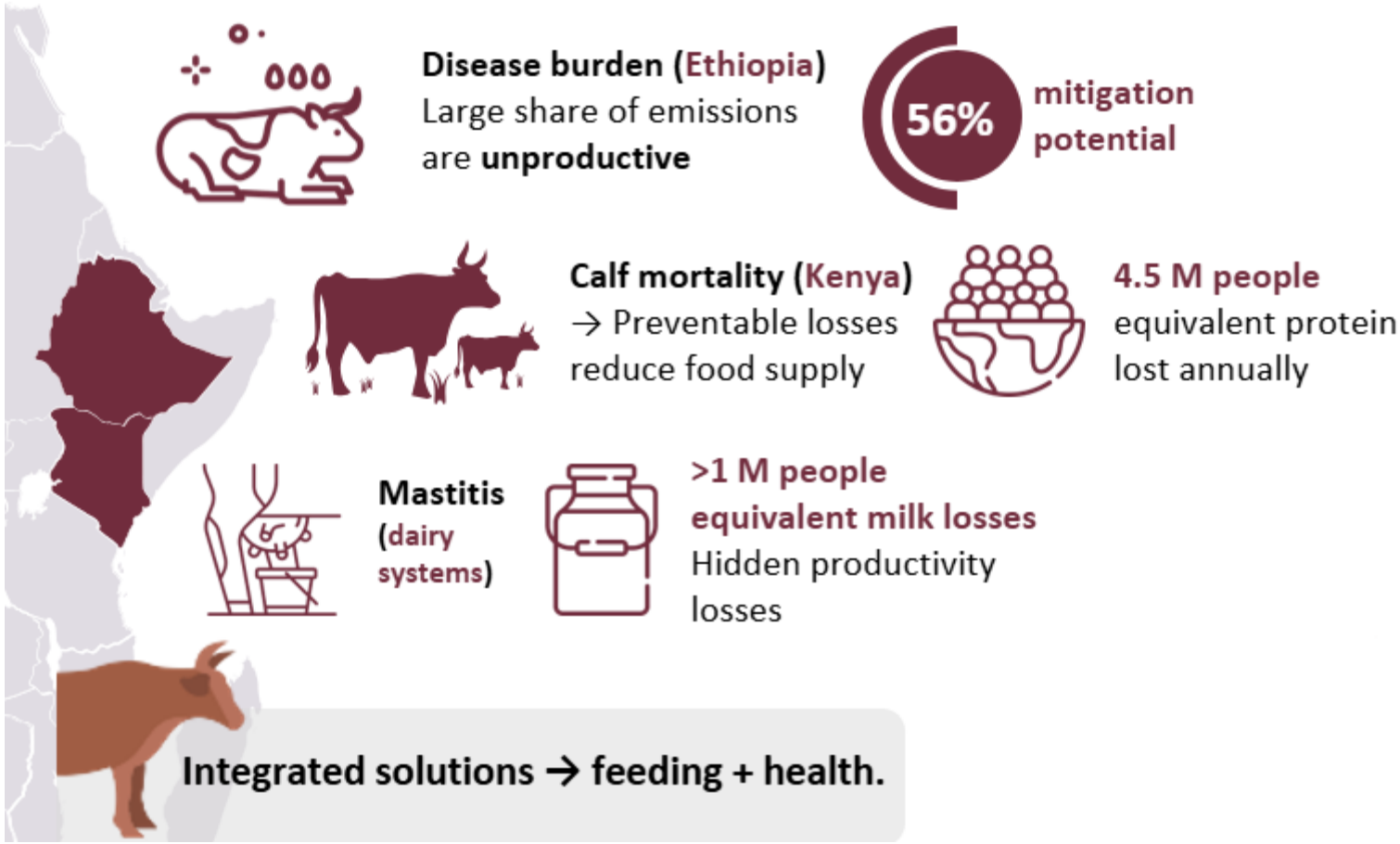
- Examples:
  - IMTA in Nigeria, Kenya and Bangladesh
  - Rice-prawn in Cambodia: 11–14x higher farmer profits
  - Rice-fish in India: higher rice production, improved soil and water quality

Low emissions transitions: Management of non-CO2 emissions

Livestock and Methane:

Climate-Smart Pathways for Food Security, Resilience and Development

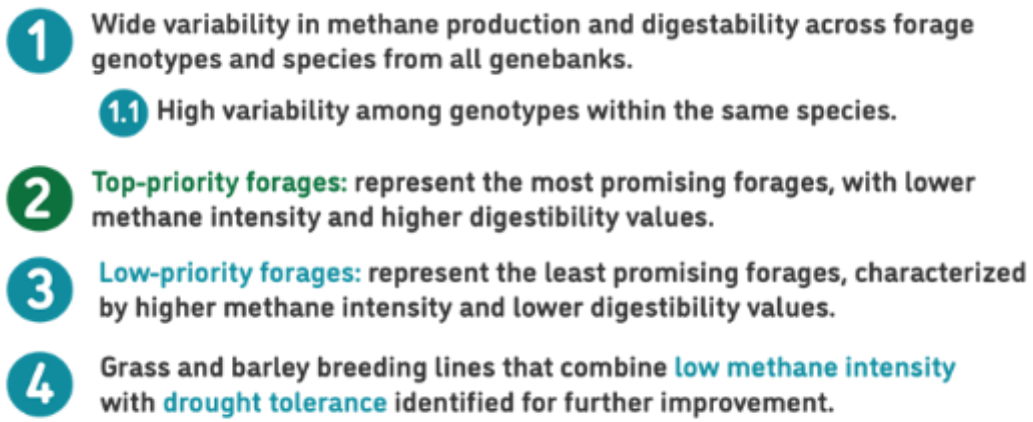
- The challenge is producing more food more efficiently and more resiliently
- Low-productivity systems have large mitigation potential
- Feeding innovation: +23% milk yield; −15% methane per kg milk
- Animal health: reducing “unproductive emissions”
- Manure management: 51–75% methane reduction potential; soil fertility, health and nutrient-cycling co-benefits



Low-methane forages and system-specific mitigation

Low-methane forages research

- Alliance, ICARDA and ILRI conserve almost 71,000 forage accessions
- +1,000 forage genotypes screened
- Aim: high-yielding, nutritive and drought-tolerant forages
- Reduce enteric CH_4 through anti-methanogenic compounds



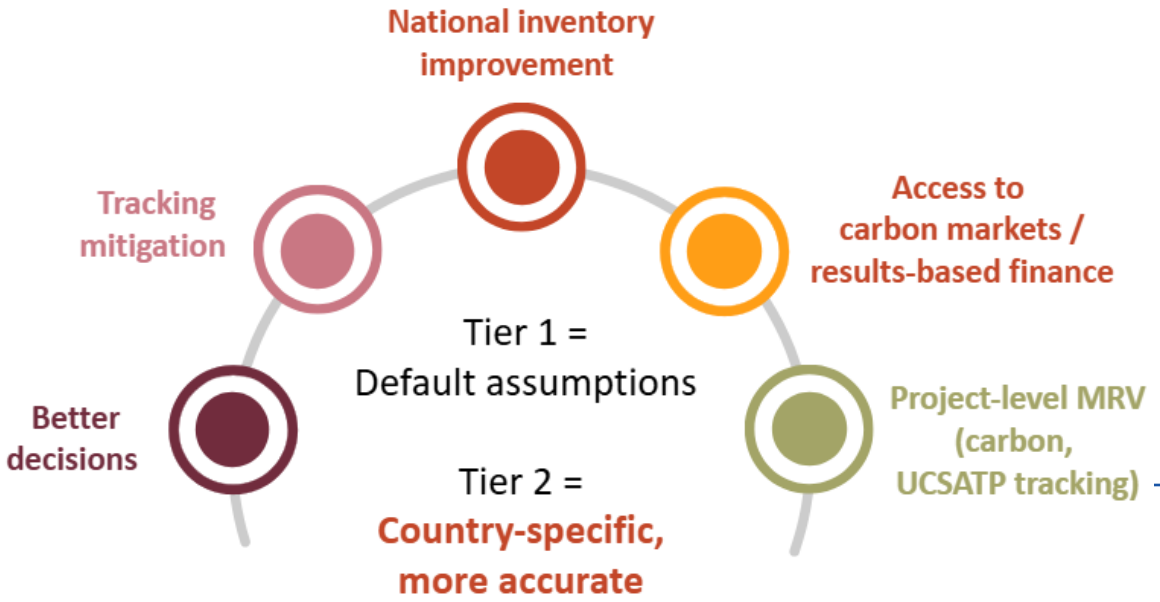
Meta analysis of Direct Seeded Rice in India

- Switching to direct seeding rice causes a moderate yield reduction.
- Direct seeding rice has the potential to sequester more carbon and save water.
- The CH4 and CO2 emissions were lesser whereas N2O emissions were higher.
- A trade-off exists between yield and ecosystem services in direct seeding rice.

Monitoring, Reporting, and Verification (MRV) for scaling

Co-Developing a Livestock Monitoring, Reporting & Verification (MRV) System for Uganda

- Core challenge: fragmented datasets, inconsistent methodologies, limited Tier 2 readiness
- MRV is a system: data collection, management, modelling, QA/QC, governance, institutional roles
- Minimum dataset: productivity, herd structure, feed system, manure management, intervention adoption
- **MRV is not reporting. It is a system to guide intervention and scaling.**



CompensACTION: Sustainable Finance and Climate-Resilient Agricultural Transitions for smallholders

Alliance of Bioversity International and CIAT (CGIAR) in collaboration with IFAD, the World Bank, Incofin, and GIZ

- Payment for Ecosystem Services (PES) and sustainable finance mechanisms for smallholders
- MRV for mitigation, adaptation, soil carbon, biodiversity and livelihoods
- Practical incentives for climate-resilient agriculture
- Scaling pathways through blended finance, PES and voluntary carbon markets

Assessing agroecological practices as non-market approaches for climate action: a synthesis of evidence from the Andes

- Conducted a systematic literature review on agroecological practices as non-market approaches for climate action in the Andes
- Developed a conceptual model for assessing agroecological initiatives against Article 6.8 criteria, structured around three tiers: non-market eligibility, functional climate contributions, and institutional alignment
- Developed a methodological framework for evidence synthesis integrating biophysical indicators (soil carbon, biomass, biodiversity) with socioeconomic and institutional dimensions
- Project indicators are being used in Bolivia to evaluate NMA candidates for UNFCCC registration

Alliance of Bioversity International and CIAT in collaboration with the International Potato Center and UMSA-Bolivia

Thank you

More information: https://www.cgiar.org/cgiar-research-portfolio-2025-2030/climate-action

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