Sustainable livestock intensification

Solomon Mwendia

The livestock sector plays a key role in:

FOOD

and nutrition security

POVERTY

Alleviation

- Other roles: an avenue for **resilience** and **quality manure** for cropland fertilization

But it is also associated with **causing negative environmental impacts**:

EMISSIONS

of greenhouse gases

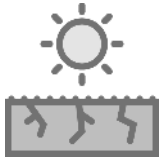
WATER

pollution and depletion

BIODIVERSITY

threatened

DEFORESTATION



LAND

degradation and deforestation

Alliance Bioversity & CIAT

CGIAR

MAIN TYPES OF FORAGES

- **Grasses:** Most widely used and commercialized i.e. >> 150 Million ha worldwide
  - Selection parameters: Biomass, forage quality, tolerance to biotic (pests and diseases) and abiotic stresses (scarcity and access of water)
  - Contribution to organic matter, favorable GHG balances and mitigating nitrate leaching and N20 emissions

- **Legumes**
  - High protein content
  - BNF and positive effect on GHG balances

- **Forage shrubs and trees** (also mainly legumes)
  - Nutrient cycling
  - Often high drought tolerance
  - Slow establishment but often long term persistence

Forages in livestock productivity (livelihoods, human nutrition)

Improved tropical forage technologies have been promoted for use in smallholder systems in Sub-Saharan Africa (SSA) for their potential multiple benefits: increased herbage productivity and better nutritive quality, leading to increased livestock productivity (meat, milk, manure), soil quality (erosion, carbon, nutrients), economic performance of the household, and food crop productivity (grains and stover). Photo credits: B.K. Paul (forages, livestock + manure, soil), G. Smith, CIAT (economics) and B.L. Maass (food crop)

Paul et al. 2020

Alliance Bioversity & CIAT

CGIAR

Examples of nutritious forages-Brachiaria hybrids

Mulato II

- ✓ Higher crude protein
- ✓ Highly palatable
- ✓ Adaptation to acidic soils
- ✓ Resistant to diseases and pests (Spittlebugs)
- ✓ Increased drought tolerance

Cobra

- ✓ Growth in erect and easily cut strains
- ✓ High crude protein 14-18%
- ✓ Excellent quality as cutting grass
- ✓ Excellent for cutting due to its large mass production
- ✓ Ideal for hay and silage production

Cayman

- ✓ Relatively drought tolerant
- ✓ Highly palatable
- ✓ Resistant to damp soil
- ✓ High crude protein 17% leaves & 10% stem
- ✓ Fits under cut-and-carry

Camello

- ✓ Increased drought tolerance
- ✓ Fast establishment
- ✓ Decumbent growth type
- ✓ Forage for longer periods
- ✓ Less soil erosion
- ✓ Better moisture collection
- ✓ Resistant to diseases and pests
- ✓ Deep rooting

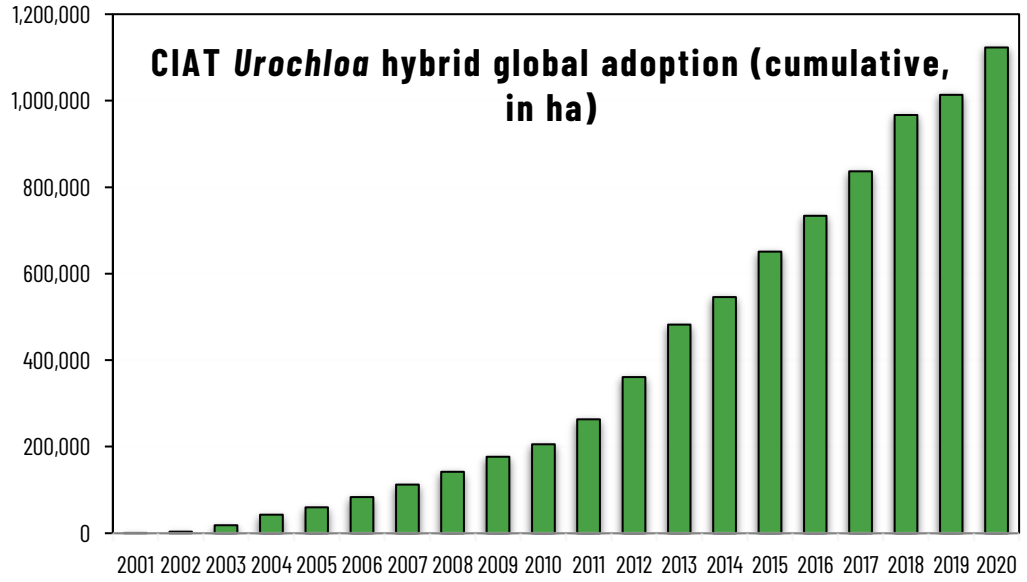
Alliance Bioversity & CIAT

CGIAR

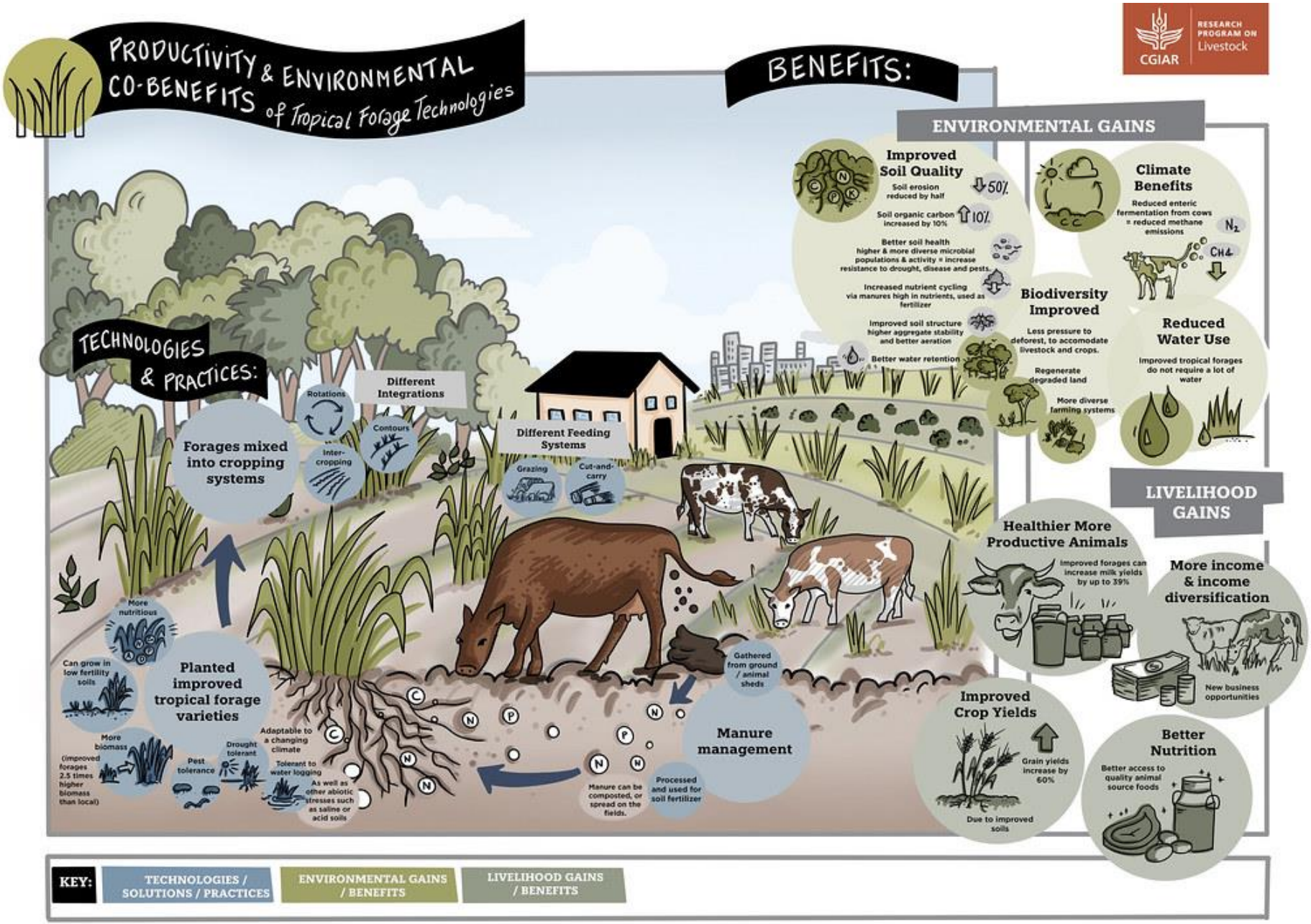
Examples of success in adoption of planted forages

Table 1. Area planted with *Urochloa* hybrids released under a PPP of the Alliance of Bioversity International and CIAT and Papalotla

*based on a seed rate of 7 kg/ha **Region**	vegetative propagation not accounted for **Cultivated area in ha***			
	Total	2000-2011	2012-2014	2015-2020
Latin America and Caribbean	1,074,674	244,186	274,710	555,778
Africa	5,905	400	2,291	3,213
Asia	12,992	2,951	2,137	8,530
Elsewhere	29,388	16,143	3,589	9,656
TOTAL	1,122,959	263,056	282,726	577,177



- During the COVID year 2020 seed sales globally increased compared to 2019; sales were largely maintained in LAC, reduced in Asia.
- In Eastern Africa seed sales doubled from about 2t in 2019 to 5t in 2020, with another doubling projected for 2023.
  - Private sector- U-farm- 40 t cold store, 700 tonnes warehouse
- There are also steep increases in import of seed of other forages into the region, by government institutions, development actors and the private sector



Conclusions

- Growing demand for ASF in the developing world to continue.
- Improved forages a pathway to sustainable intensification
  - resilience,
  - addressing cost of production,
  - ecosystems services,
  - soil fertility.
- Adoption of forages is below potential in in tropical Africa and Asia.
- In intensifying systems we observe an increasing demand for improved forages
- In in Eastern Africa, we observe rapidly increasing adoption of improved forages
- Expect to see at least 100,000 forage adopters over the next 5 years (starting from 2019).

Alliance Bioversity & CIAT
CGIAR

Thanks!