

An update on the Global Strategy for the Conservation and Utilisation of Tropical and Subtropical Forage Genetic Resources

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Background and Introduction

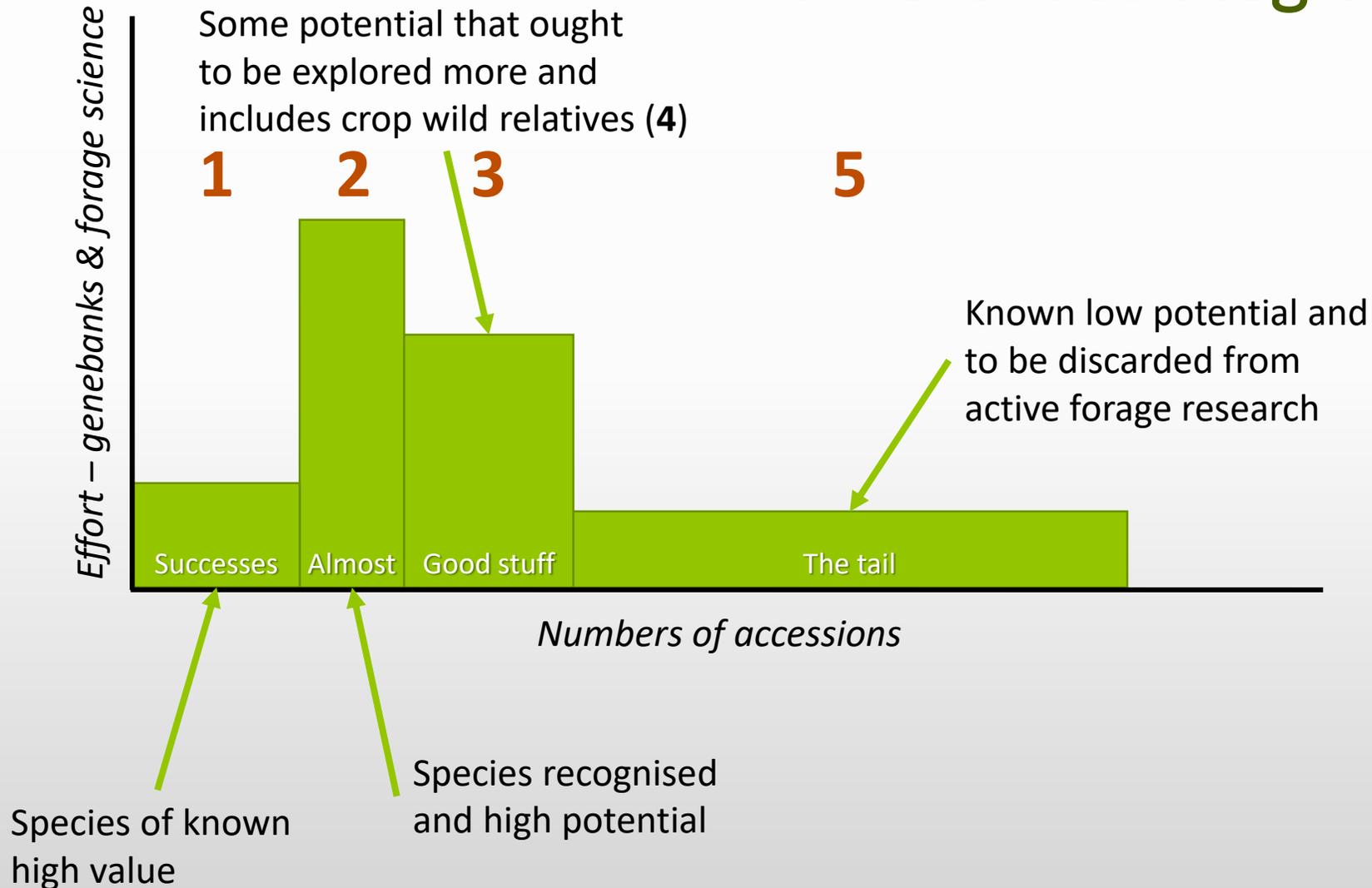
- 1960-1990 – A golden age for TSTF globally
- A decline of forages as priority R&D over last decades
 - Despite many examples of forages used to underpin large changes in systems
 - Brazil investment leading the way in many species and utilization
- TSTF Strategy 2015 aims to:
 - Rebuild community of TSTF genebanks & genebank users
 - Ensure more efficient, rationalized conservation and collaboration between genebanks and centres
 - Support utilization by anticipating needs & responding more directly to users' requests for information and seeds – Respond to the new global research and agricultural environments



Efficiency: Prioritisation, sharing the load – data, germplasm, and roles

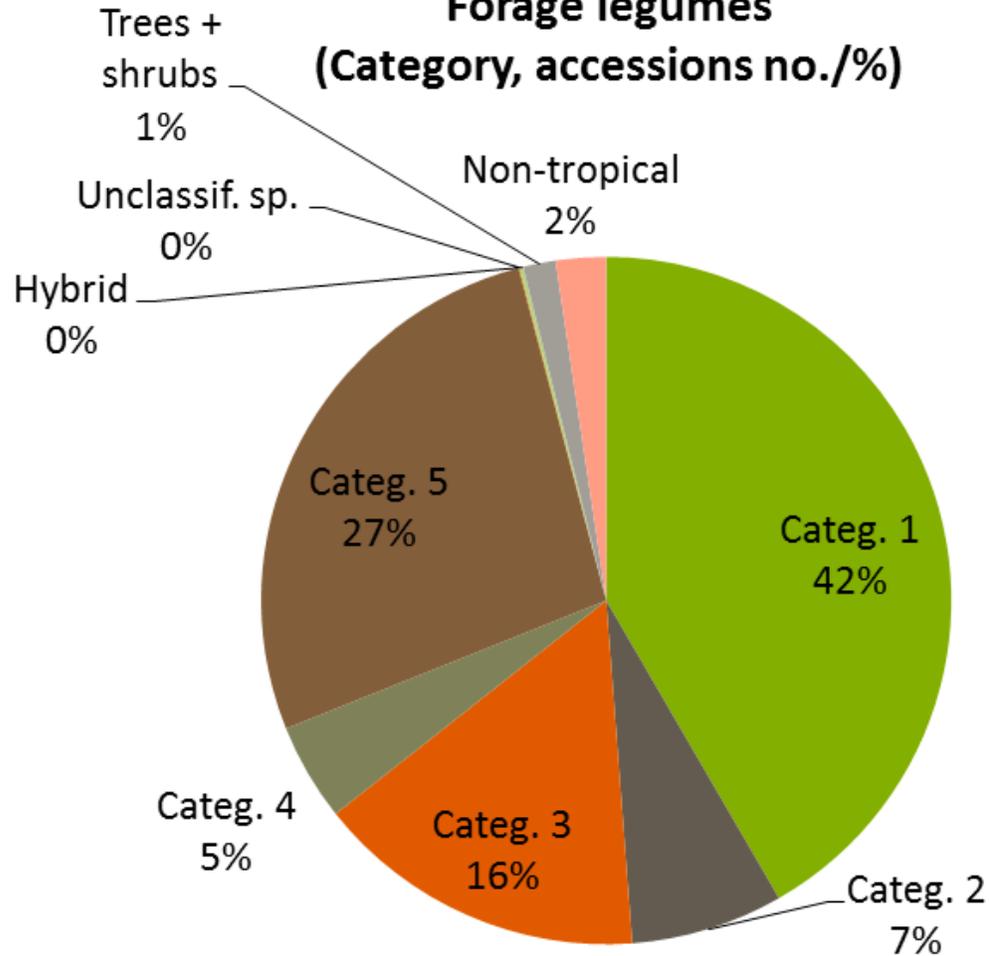
- Prioritisation
 - What taxa should we be concentrating on and why?
- Sharing the load
 - Should we spend valuable resources conserving what others are doing well?
 - Should we be putting valuable germplasm at risk by putting effort into species of little potential?
 - Making better use of and sharing data that is already available
 - Transitioning to common data sharing systems (Genesys)
 - Mentoring and training of the next generation of forage specialists

Prioritization groups with different strategies for each

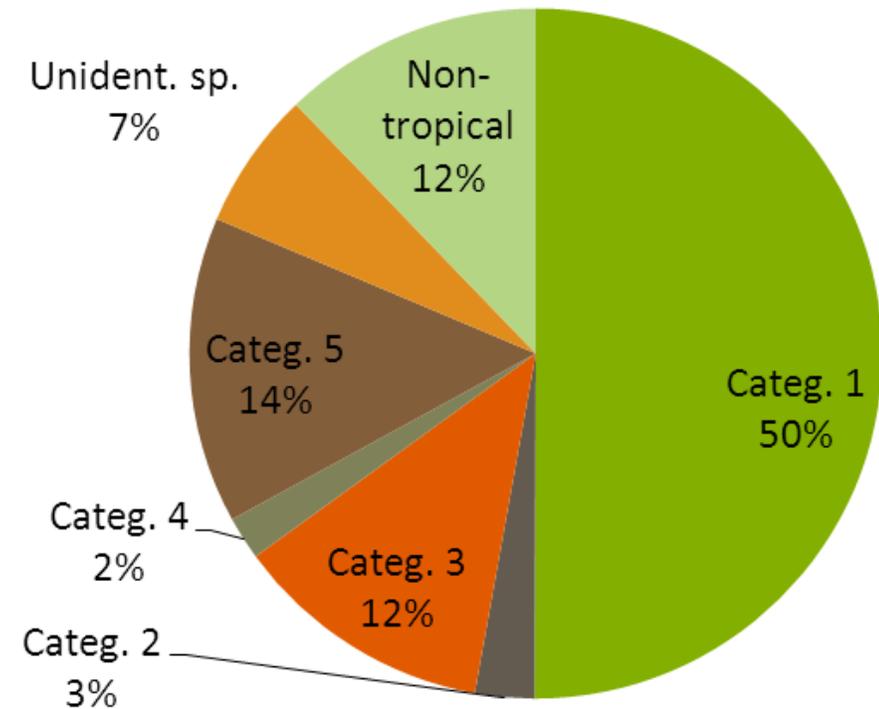


Prioritisation in tropical and subtropical forage collections

Forage legumes
(Category, accessions no./%)



Forage grasses
(Category, accessions no./%)





Potential actions:

Priority species from Category 1, 2 and 3

- Develop plans for the Category 1, 2 and 3 species
 - Who has what, and what actions are necessary to ensure conservation and safety
 - **Some national centres are at breaking point, others can play key roles**
 - Characterization:
 - Lots of data for some (esp. Cat 1 & 2?)
 - Nothing for others (Cat 3?)
 - Duplications within and between centres
 - Tidying up taxonomy and errors that have arisen over time
 - Core collections
- Appropriate regeneration and availability
 - Defining elite accessions of priority species
 - SoFT is essential – a new update on its way
 - Greater seed quantities to align with forage R4D more closely

Update to 'Tropical Forages' (SoFT)

- Houses information on 180 species
- Selection tool can now be accessed on more browsers
- Aim is for the selection tool to direct users to CGIAR gene banks and other sources of seeds.
- Additional features to include:
 - A link to Google translate
 - Printable versions of factsheets.
 - A downloadable version of the tool, for use in areas with difficult Internet access
 - A Web analytics tool, to determine who is the users of the site are and what they are looking for
 - A feedback mechanism, so users can alert those managing the portal of missing information
 - Brief manuals on how to establish forages and manage seeds



The image shows a promotional graphic for the 'Tropical Forages' interactive selection tool. The title 'Tropical Forages' is written in a white cursive font at the top right, with the subtitle 'An interactive selection tool' below it. A central image depicts a hand holding a seed, surrounded by various tropical forage plants and a cow in a field. To the right of the image is a vertical navigation menu with four orange circular icons and corresponding text: 'Getting started', 'Selection tool', 'Forages fact sheets', and 'About us'. Below the main graphic are four national flags: Australia, Cambodia, Vietnam, and Indonesia. At the bottom, there is a row of logos for the following organizations: Australian Government (Australian Centre for International Agricultural Research), Queensland Government (Department of Primary Industries and Fisheries), Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (DFID - Department for International Development), CIAT (Centro Internacional de Agricultura Tropical / International Center for Tropical Agriculture), and ILRI (International Livestock Research Institute).

<http://www.tropicalforages.info/>



Potential actions:

Category 4 – Crop wild relatives – to keep or reassign

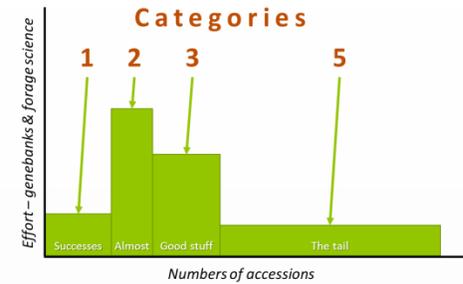
- Advantages and disadvantages in assigning to relevant crop genebanks
- Many plant improvement teams don't know forage relatives exist – would there be more chance of being used if they were housed with the crop specialists?
 - For some genera, the prime benefits might rest with forages
 - For others, that seems unlikely
- Examples
 - Pulses
 - Groundnut – *Arachis* – what species are close enough to the peanut (*A. hypogaea*) to warrant transfer. Perennial *Arachis* does have significant forage value
 - Pigeon pea – *Cajanus* – how wide to you stretch the species boundaries? (*Atylosia* is now *Cajanus*, *Rhynchosia* is probably just as close?)
 - Millets
 - Pennisetum (including *Cenchrus*) – how wide do you consider species in such large genus? Kikuyu?
 - *Panicum* and *Setaria*?



Potential actions:

Category 5 – germplasm that won't provide forages

- Options for conserving
 - Maintain an approach that all germplasm is more or less of equal value with respect to regeneration, characterisation, conservation
 - Hold where they are now as a low conservation priority (strategic archiving)
 - Svalbard (strategic archiving)
 - Other genebanks (Millennium genebank) conserved but no longer “managed”
 - Can we conserve core collections or other subsets? (e.g. only one of the accessions collected from narrow geographies)
 - Can we develop a system where the world relies on committed national systems to maintain collections that they have as priorities?



Utilisation – Contributing globally

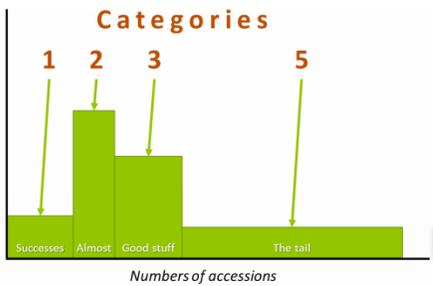
- Genebanks were established to provide forage impacts for developed and developing countries
- Donors, governments and managers are demanding more
- Need to respect the commitments made from source countries
- **We believe a different model is needed!**



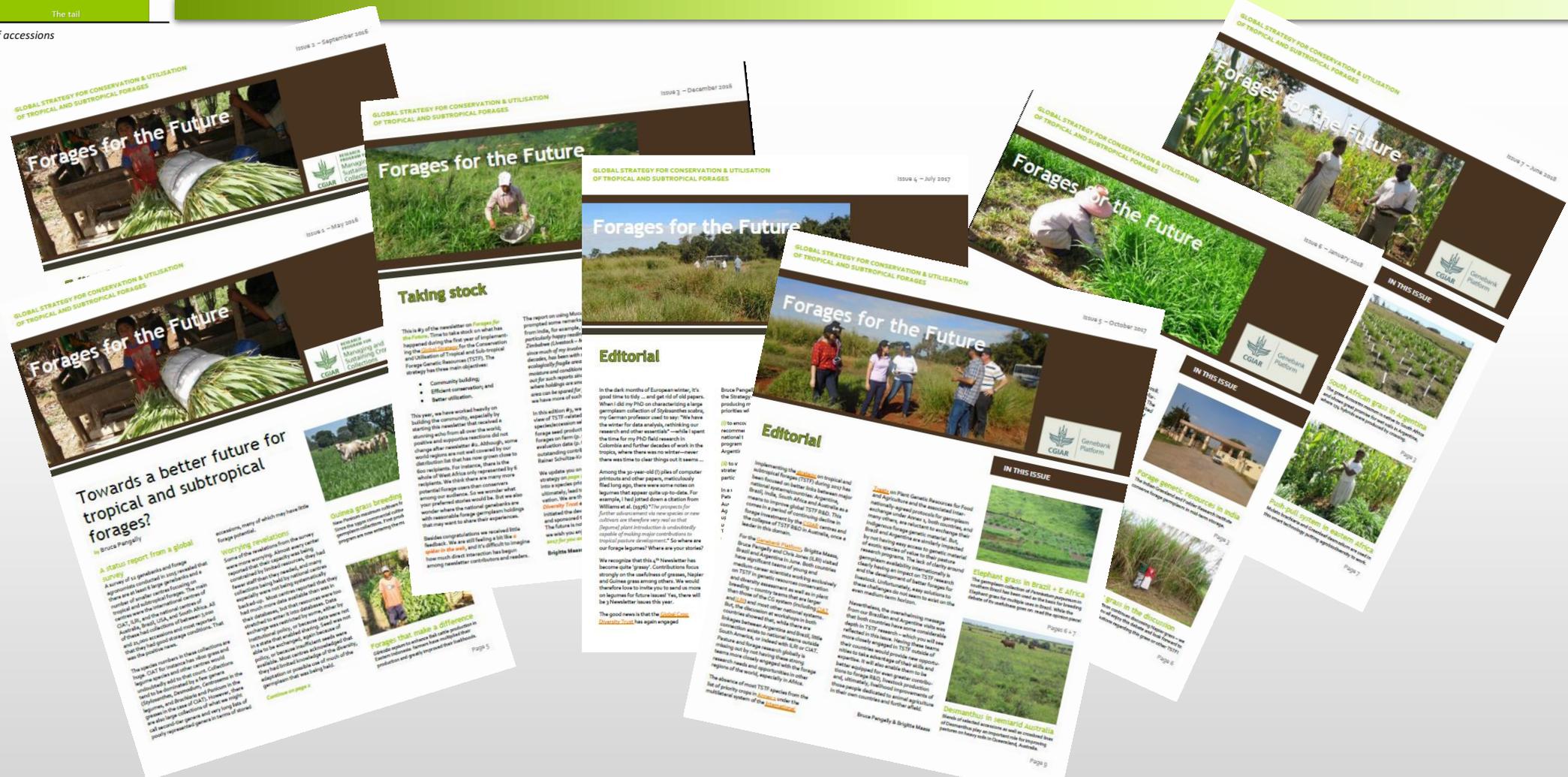
Utilization: - the role of forages in animal production, crop production and health and environment

- We already have outstanding contribution of forages to production and environment
 - Brachiaria, Stylosanthes, Pennisetum, Cenchrus, Leucaena and more..
 - Large scale production systems, smallholders, environment, amenity grasses and legumes
 - Beef production, small ruminants, dairy, poultry, fisheries
 - Impacts in Africa, South, Central and North America, Asia, Australia
- But, many of these are old news!

Effort - genebanks & forage science



Building a community: Newsletters



Available from: <http://www.tropicalgrasslands.info/index.php/tgft/pages/view/News>

Newsletter distribution

2016: three issues published

2017: two issues published

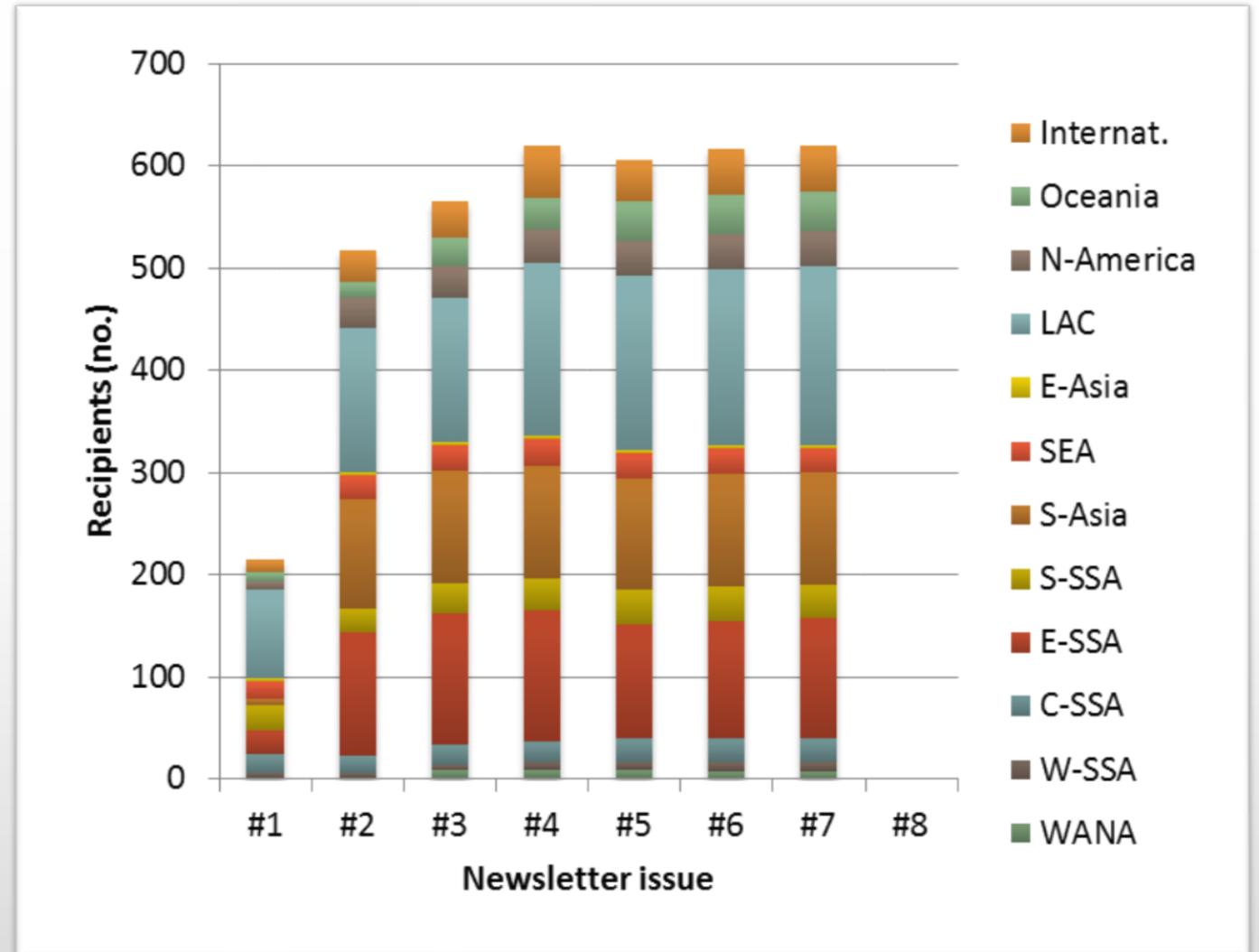
2018: two issues, one still planned

Quick increase of the distribution list to a relatively stable number of >600

Some regions and countries are missing:

- West and Central Africa little represented
- Southeast and East Asia almost not represented
- Little representation from Central America

The Newsletter is also redistributed by some other institutions, e.g. N2Africa Podcaster, Feedipedia





Summary – The conflict between forage use and conservation in a low and declining resource environment

- There is no evidence that more funding is on the horizon
- We keep doing what we are doing now and we will get the same result – further reduction in resources for TSTF R&D
- An improvement in resources can only be achieved by building the evidence that forages can have impacts – the Newsletters are a part of this
- Strategy implementation is **not** best done on a country by country basis -
- Strategy implementation should be a global effort
 - Consider what national systems can each contribute, and how
 - Consider what national systems can gain and how



Some ideas from visits to national genebanks

- Many identified linkages between national and international centers on particular genera
(e.g. *Cenchrus*, *Pennisetum*, *Urochloa*, *Desmanthus*, *Macroptilium*)
- Opportunities for "national" scientists to take global leadership
- Benefits from exchange of scientists, students and technicians
Training, mentoring and new research
Technology transfer e.g. seed production
- South-South collaborations
- Opportunities for data exchange and mining
- Repatriation of germplasm
- National and international agencies need to clarify collaboration policies

Thank you for your
attention

Crop Conservation Strategies

- For strategy development, it is as important to update the conservation status of major collections as it is to assess at global level significant gaps in collections and their links to *in situ* conservation
- The Crop Trust has worked with the world's crop leaders to facilitate the development of global conservation strategies based on crops and regions
- These are opportunities to review the history of crop collections and periodically assess the challenges that crops and their genetic resources face

