CGIAR

Science for a food-secure future

Co-design of Socio Technical Innovation Bundles – Concept and application to Sustainable Intensification of Mixed Farming Systems

WP2 and WP5 Sustainable Intensification of Mixed Farming Systems (SI-MFS) teams

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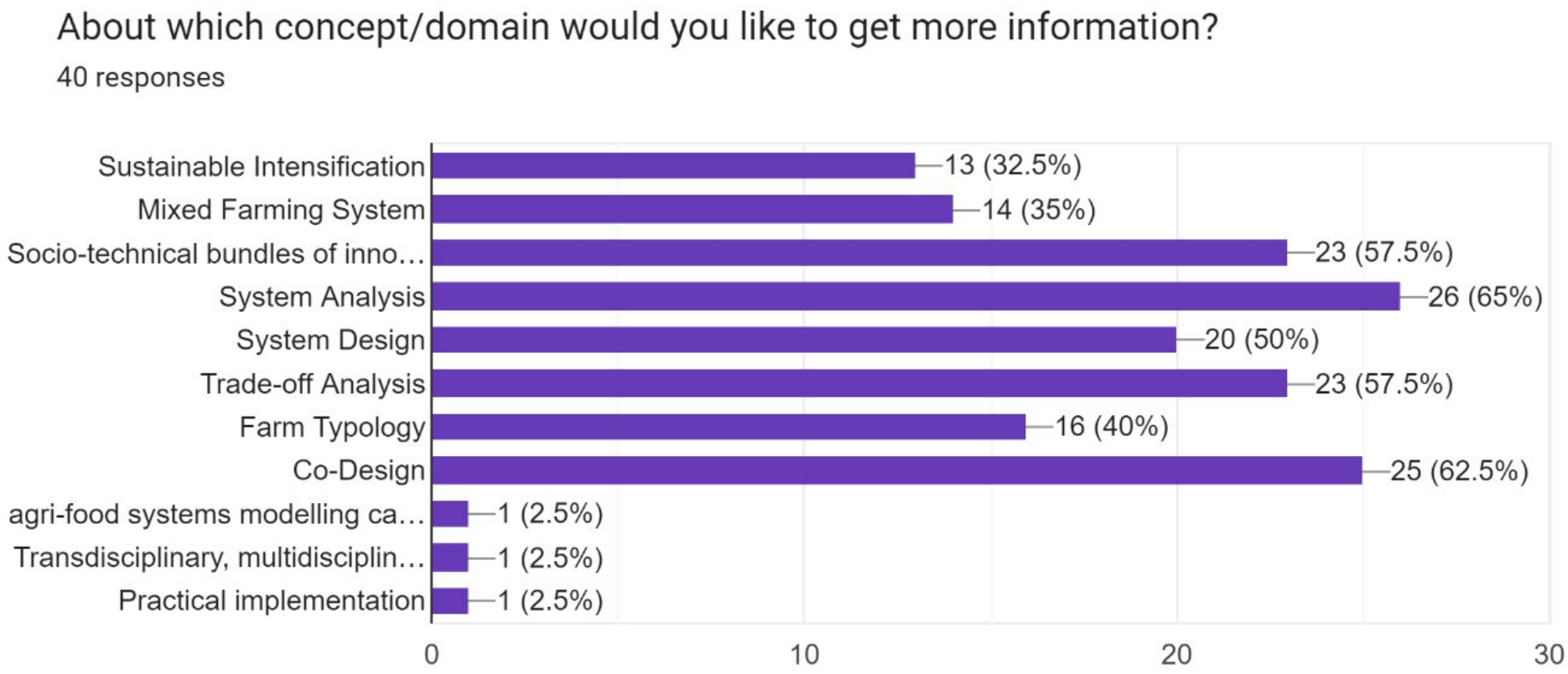
Background
SI-MFS CGIAR initiative on mixed farming systems

- SI-MFS, beyond disciplinary research for development

- SI-MFS promises to take **a systems approach** for the **co-design**, implementation, evaluation and scaling of **socio-technical bundles of innovations** that ensure the **sustainable intensification** of **mixed farming systems**.

- Internal “levelling the field” on concepts. A quick survey among SI-MFS colleagues.

Background
High demand for more information about most of the concepts



Terminology (1)

Mixed Farming Systems (MFS) are complex systems where multiple components (e.g. livestock, trees, subsistence and cash crops, horticultural crops, fisheries, value adding activities) are tightly interlinked and the whole system is managed towards the satisfaction of multiple productivity, economic, environmental and societal goals (e.g. food security, income generation, risk management, resource conservation, preservation of cultural values and traditions).

Socio-technical innovation bundles (STIBs) are contextualized combinations of interrelated technical advances and social, organizational and policy/institutional enablers that are packaged for impactful implementation and scaling.

Systems analysis allows understanding the characteristics, dynamics, and interconnectedness of different components in the system (as well as multiple actors), and their role on the overall system's performance. It also relates to the set of interrelations amongst system components and external (and internal) drivers of change. Systems analysis can be quantitative and qualitative and can be used for ex-post and ex-ante studies.

Terminology (2)

Systems Design means to define, conceive, implement and assess an improved system with regards to:

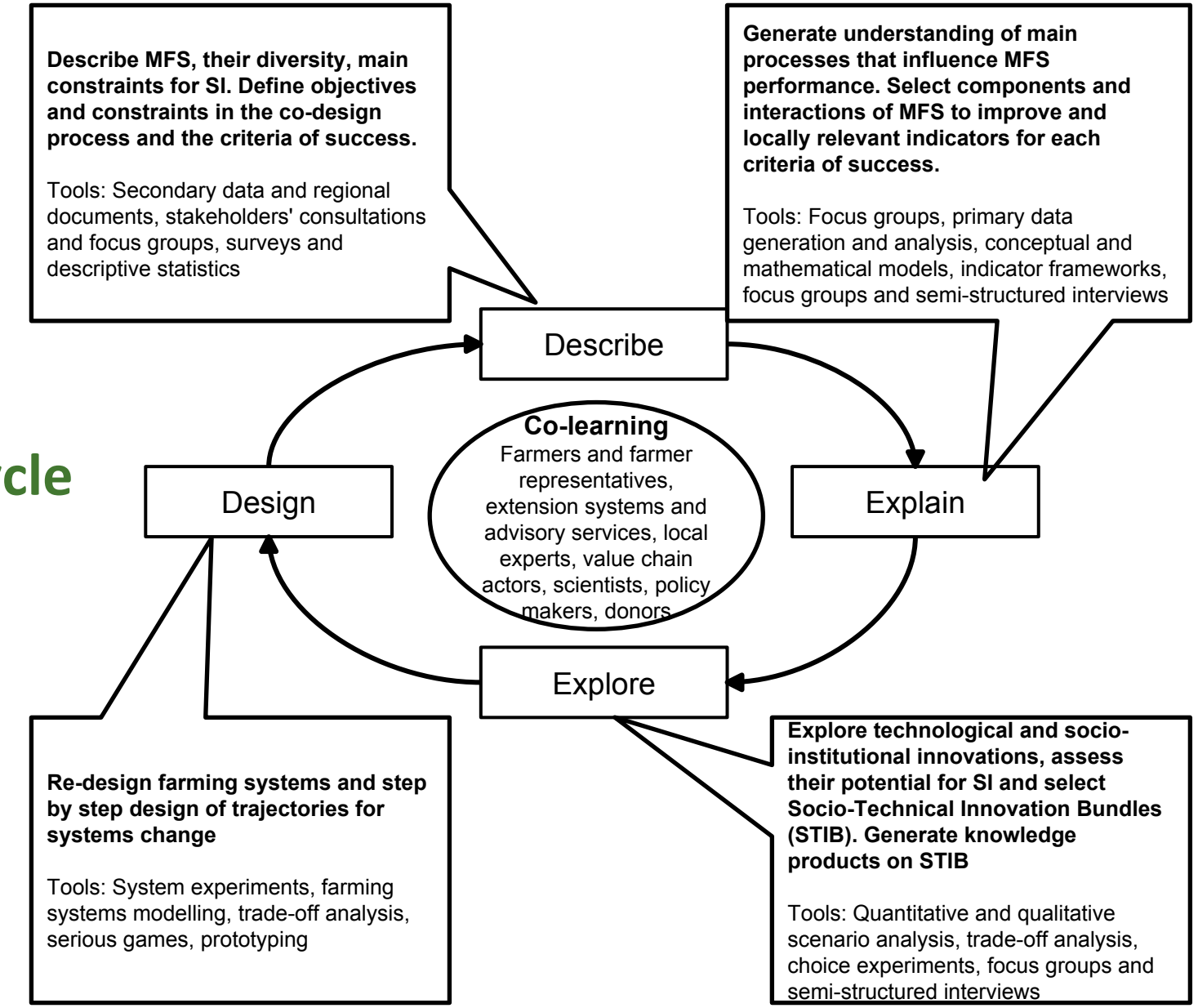
A set of pre-defined objectives (e.g. sustainability, resilience, climate-smart, social inclusion) and

A set of constraints imposed by the context (e.g. soil types, rainfall distribution, labour availability, market price, policy).

The design of system can be operationalise at different scales, from a component of a farming system (e .g. a crop or livestock enterprise, a crop rotation), the integrated farming system (e.g. a forage-based crop-livestock system) and its integration into a value chain (e.g. a new crop into an environmental certification scheme) or a landscape (e.g. crop landscape mosaics with pest suppressive or water saving objectives).

Co-Designing implies the engagement of stakeholders (i.e. farmers, farmer representatives, value chain actors, policy makers, development organization and civil society) along the whole design process including the *definition of the system*, *identification of objectives and constraints*, the *development and testing of innovations* as well as in their *assessment, adaptation and promotion*.

The DEED cycle



Two main pathways for co-designing socio-technical innovation bundles

"De-novo": Transform the system into a better one or even change it to a totally new and desirable system..

> " 'De novo' design aims at designing cropping or farming systems that break away from existing systems. It involves opening the field of possibilities, without submit-ting to any restraint" (Meynard et al. 2012)

Modeling approaches often used to explore various possibilities of system changes and assess their consequences. Stakeholders are engaged on the definition of the desired state and choice of system components to re-design, on the assessment of alternative systems, and on the delineation of possible pathways for systems transformation

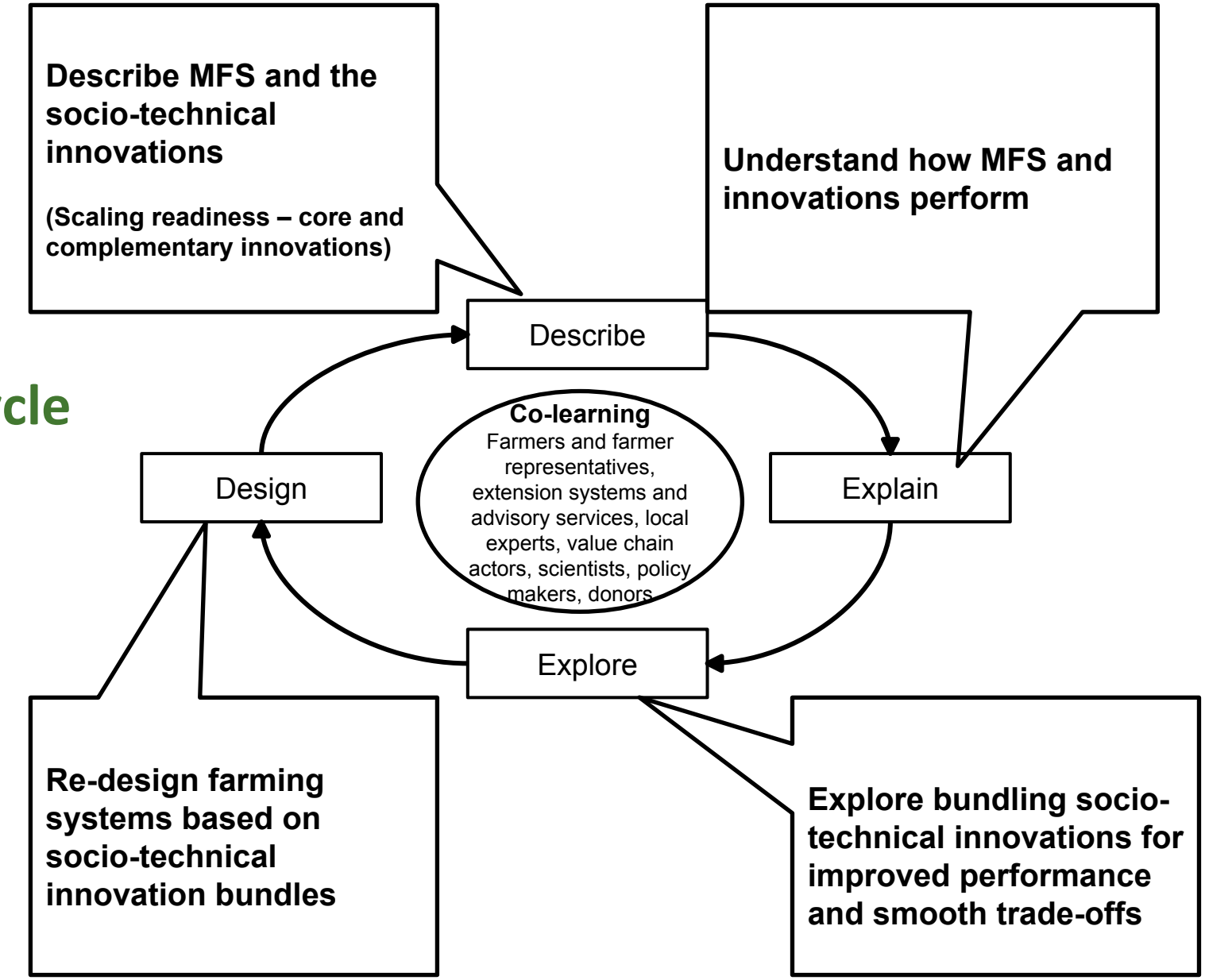
"Step-by-step": Incremental changes are embraced, and the aim is to change the system one step at a time, implementing approaches for system change as understanding of the system and system interventions continues.

> " Step-by-step design, the aim is not to create a break, but to organise a progressive transition towards innovative system" (Meynard et al. 2012)

Stakeholders participate on joint assessment of current systems, definitions of the desired state of and visions for system changes, identification of entry points and identification/generation of innovations, deployment, monitoring, evaluation and reflection of innovations and continue the cycle for the next level system improvement. Modeling approaches often used to assess the potential impact of innovations on systems performance

Meynard et al. 2012. Re-design and co-design of farming systems. An overview of methods and practices. Available from: https://www.researchgate.net/publication/230689177_Re-design_and_co-design_of_farming_systems_An_overview_of_methods_and_practices

The DEED cycle



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To capitalize on previous research and development investments, and because of the complexity of implementing interventions across farm components, a **step-by-step** approach is most often followed. But at the same time considered "conservative" towards transforming systems. **De-novo** design "opens the field of possibilities, giving free rein of inventiveness, and can in this way provide a source of inspiration" for incremental, step-by-step, approach.

A **combination of both pathways** (incremental/step-by-step and transformational/de-novo), in **close interaction with stakeholders all along the whole process of co-design**, can provide the basis for developing socio-technical innovation bundles for truly transformation of MFS towards their sustainable intensification

Thank You

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