

Strengthening research capacities for the uptake of sustainable agriculture intensification

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Outline of Presentation

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About ATPS

ATPS is a

- **Trans-disciplinary network of researchers, policy makers, private sector actors, and civil society actors.....**
- promoting the generation, dissemination and use science, technology and innovation (STI) for the sustainable development of Africa

Our focus

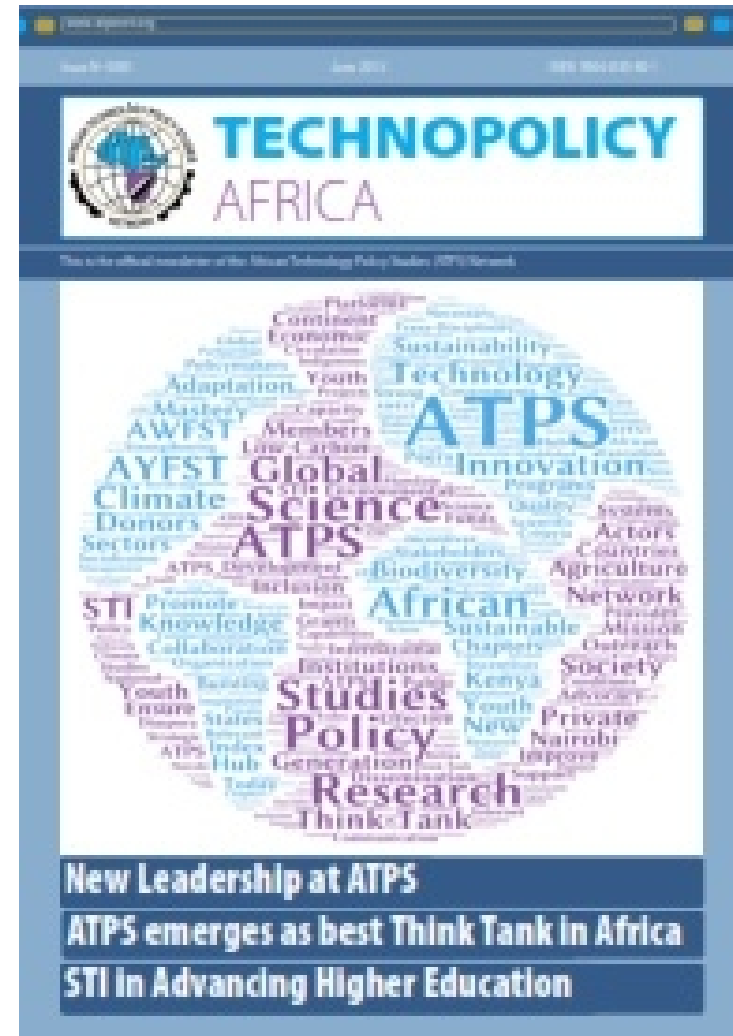
Improving the understanding and functioning of STI policy research and policymaking processes and systems to strengthen capabilities, social responses, and governance of STI-led sustainable development in Africa

Our approach



ATPS Core Functions

- **Knowledge Generation** (Research & Research Capacity);
- **Knowledge Brokerage** (Stakeholder Dialogue, Knowledge Circulation and Networking);
- **Knowledge Dissemination & Outreach** (Publications, STI Journalism, Policy Advocacy);
- **Knowledge Valorization** – (Innovation Challenge Programs).



Introduction

The shift in the geological epoch:-

From the **Holocene** to **Anthropocene** due to the effect that human activities on the planet.

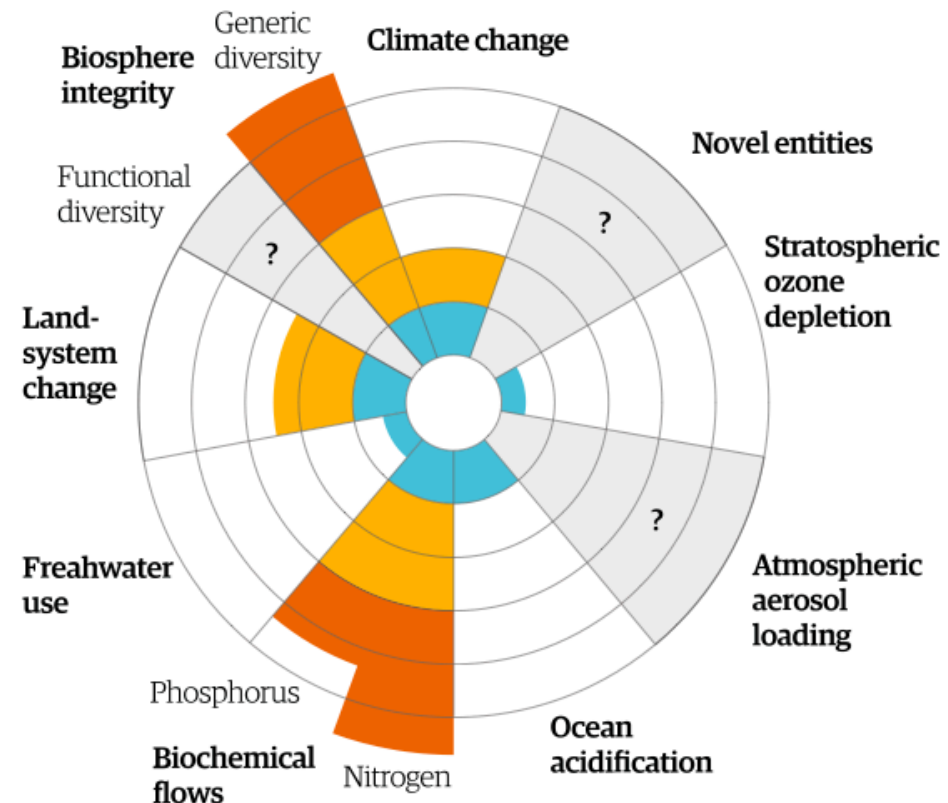
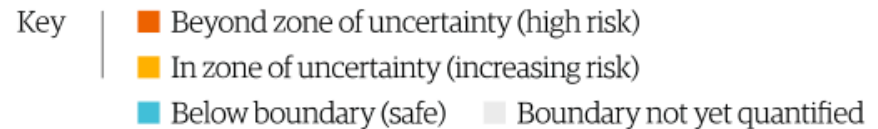
Of nine worldwide processes that underpin life on Earth, five have exceeded “safe” levels —

- **human-driven climate change,**
- **loss of biosphere integrity,**
- **land system change**
- **high level of phosphorus and**
- **nitrogen flowing into the oceans due to fertilizer use.**

“Mankind is nearly exceeding the ecological capacity of the planet”

Rockström et al. 2009

Planetary boundaries



Agricultural in the new era

Agriculture faces new challenges in the future:

- Urbanization will result in 4-8 % loss of agricultural land
- Climate change impact will diminish water supply and deepen drought for agriculture in some places
- In other, it will increase the intensity of rainfall and contribute to flooding

Double edge sword

- contributes to the emissions of CO₂ and hence to human induced climate change.
- a serious determinant of how the climate will change in the future
- the single greatest human activity that changes the biosphere
- contribute to high degree of the biodiversity loss



Global Challenge for Agriculture

Three simultaneous task:-

- To produce more food for a growing population
- Reduce environmental impact of agriculture and its demand for ecosystem services.
- Agriculture must sustain itself

Past agricultural production strategies is no longer adequate to achieve the multiple tasks

The key:-

- Intensification of the land and water resources use through more sustainable methods and through changing current production systems and diversifying into new, more productive enterprises.



Prospects for agricultural intensification in Africa

Africa as a key global producer:-

- with an estimated 65% of the uncultivated agricultural land remaining in the world
- potential to expand irrigated land by 100 million hectares
- international investment in African agricultural systems is already growing rapidly, eg. Southern Agricultural Growth Corridor of Tanzania (SAGCOT)

However, Africa's agricultural growth over the last couple of years has come from land expansion rather intensification

Agricultural intensification means increasing productivity of existing land and water resources to produce food and cash crops, livestock, forestry, and aquaculture.



Sustainable Agricultural Intensification

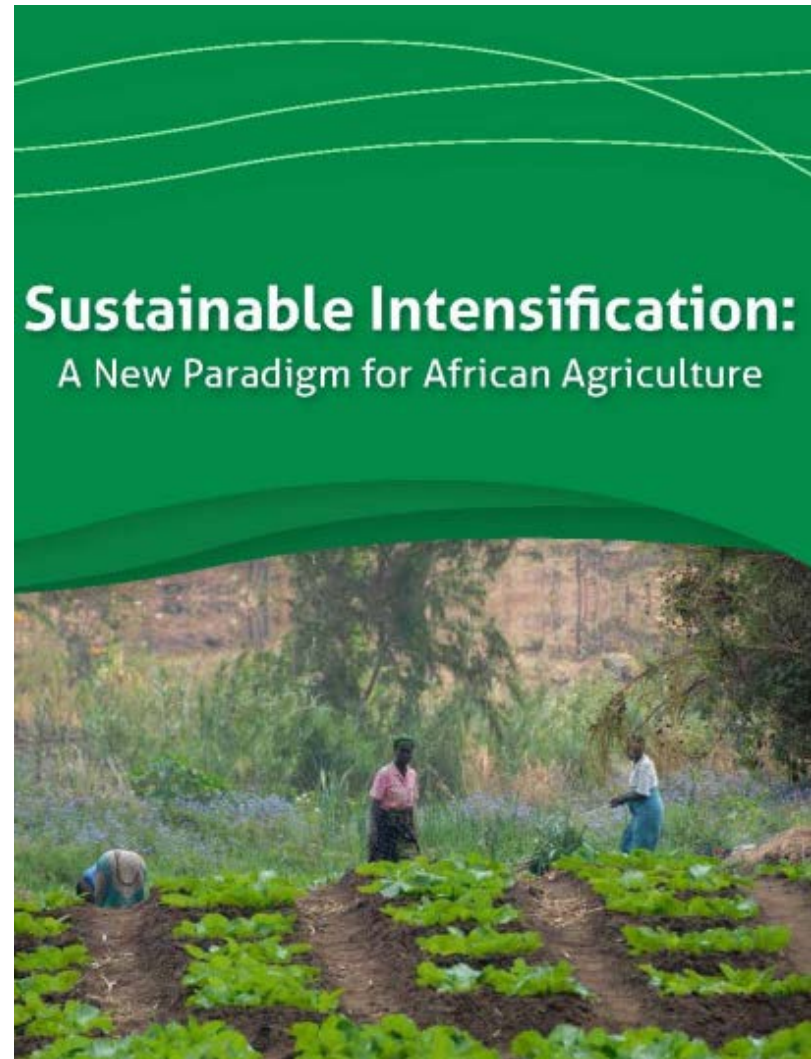
Actors within the global development discourse are agitating for a **sustainable paradigm for integrated development**.

Sustainable Agricultural Intensification is an emerging paradigm that targets:-

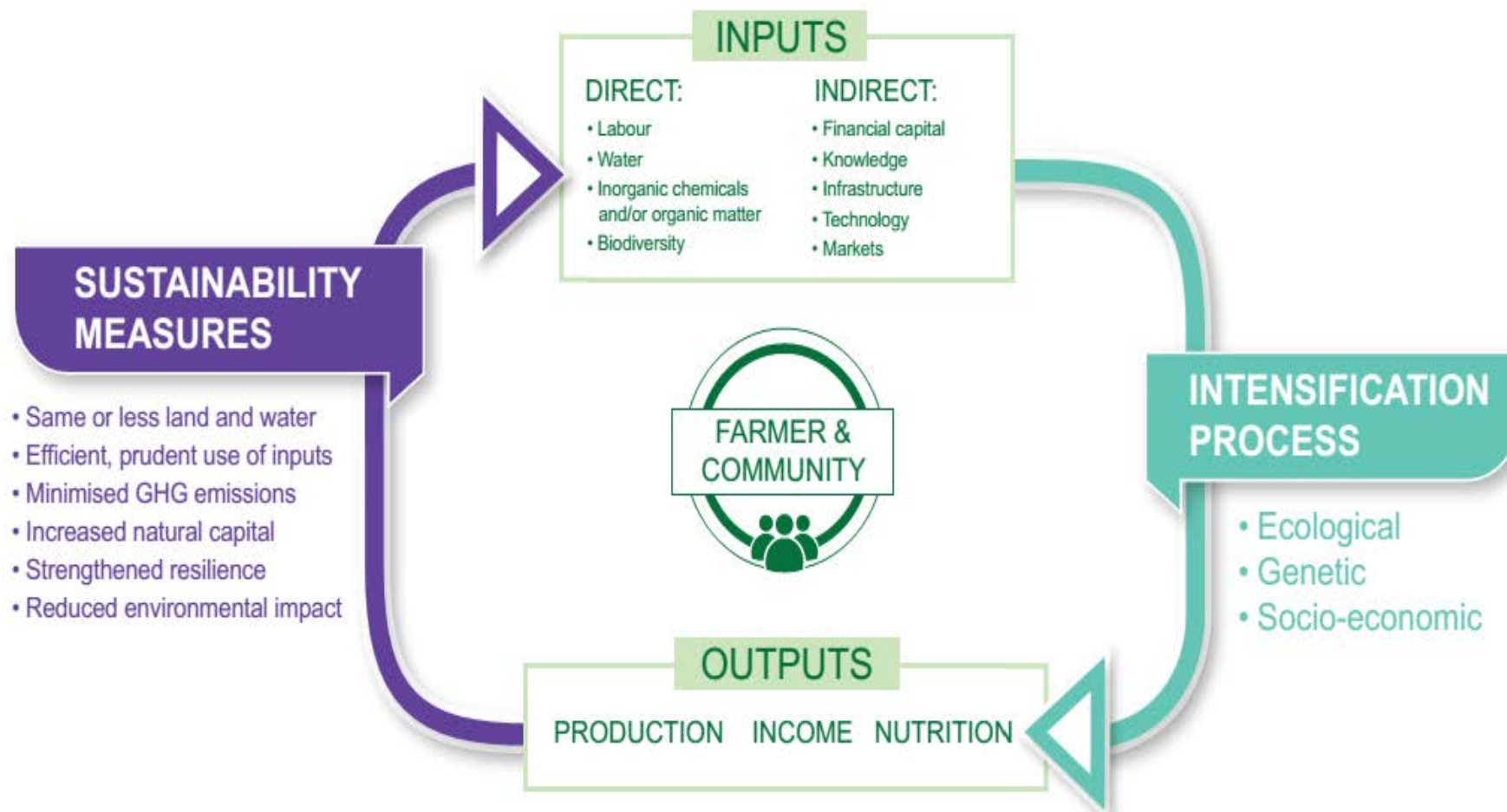
- Increased production, income, nutrition or other returns on the same amount of, or less, land and water,
- Efficient and prudent use of inputs,
- Increase in natural capital and the flow of environmental services.

Aim

- have a smaller environmental footprint by reducing fertilizers and pesticides usage, generating lower emissions of GHGs,
- contributes to the delivery and maintenance of a range of public goods, such as clean water, carbon sequestration, flood protection, etc



Theoretical model of Sustainable Agricultural Intensification



Towards Sustainable Agricultural Intensification (SAI) – Strengthening Research Capacity

In pursuing a SAI agenda, **research capacity** is required to assure social, economic and environmental sustainability in the context of growing food demand and climate change.

Strengthening Research Capacity includes the ability of individuals, institutions and countries to: -

- define problems, set objectives and priorities
- conduct sound scientific research
- Produce solutions and products relevant to address key societal problems
- build sustainable institutions
- engage with the wider community of stakeholders.

Three levels of at which research capacity can be strengthened

- Individual
- Organizational
- Environmental



Levels of research capacity strengthening

Individual: involving the development of researchers and teams

- Low flow of doctoral/ PhD students from universities in Africa countries
- Financial constraints mean that laboratories are ill-equipped,
- Overwhelming increase in undergraduate student to teach lowering the priority of research
- Low pay causes researchers to pursue other professions, or to supplement income with consultancy work

Organizational: developing the capacity of research departments in universities, research institutes, thinks tanks and others to fund, manage and sustain themselves, and to interact with society.

- Decades of under-investment in research institutions in developing countries
- Low organizational capacity in may Africa countries
- With insufficient concentrations of expertise in departments and limited physical facilities for conducting research

Environmental: changing the 'rules of the game' at the national or regional level to create an enabling environment for research.

- Lack of national research funding
- Weak policy-setting institutions (e.g. science councils)



Levels of research capacity strengthening

Three integrated and interrelated levels

Individual

- PhD training, post-docs, fellowships
- Soft skills, attitudes, project management, communications
- Research grants
- Career support
- Mentoring and peer review
- Networking and collaboration

Organisational

- Laboratories
- Libraries
- Research leadership, culture and management
- Financial management
- Research into use support
- Networks and collaboration

Environmental

- National research strategies and budget lines
- Legal frameworks
- National research councils and coordination structures
- National research priorities
- Infrastructure: energy, ICT, utilities
- Policy-demand for research
- Public interest in research and informed debate on development challenges
- Innovations policies and clusters: research-into-use

Research dissemination, academic publishing

Research links to government, business and civil society

Fund-raising and resource mobilisation

Information and Communication Technologies

Support Schemes for strengthen research capacity for SAI

- **Regional small grants** to support priority research and knowledge management activities for SAI
- **Advanced SAI research training** including degree training, re-entry grants, and career development fellowships in collaboration with public and private partners
- **Short-term learning** to support individual or group training linked to SAI research projects, special initiatives or institutional development programmes
- **Institutional** programme-based support to selected institutions to acquire sustainable critical research and training capabilities, including regional hubs on SAI
- Research **networks and working group** to **strengthen collaboration** in research, training, production of analytical reports and build consensus or protocols around areas of common interest



Concluding Remarks

- In sum, SAI can be a new paradigm for African smallholder farmers as long as suitable, sufficient resources and practices are supported and delivered at scale
- As a new paradigm, there are new areas that are yet to be explored in pursuing the ambitious goals of SAI
- What is critically need is research into appropriate innovations (technological and socio-economic), targeted financial investments and public private partnerships, smallholder famers in active participation and, above all, political leadership.
- This means strengthening the research capacity of individual, institutions and the environment will be key to achieving the goals of SAI



Thank You

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