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SWOT and Meta-analyses of Sustainable Agriculture Intensification systems (SAI) and Agricultural Extension Systems (EAS)

Deliverable No.: 1.4 SWOT analysis report
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Objective: •To identify and document the main strengthens, weaknesses, opportunities and threats (SWOT) of selected SAIs and EASs in the six **InnovAfrica** case countries.
•To conduct a systematic review and analytical synthesis (meta-analysis) of the selected SAI systems and EASs with respect to natural capital, knowledge, social capital, livelihood of the people in **InnovAfrica** case countries.

SWOT Analysis

Cereal-legume intercropping

Strengths	Weakness
-Increased yields and income, less market risk -Higher diversity in crop production and diet -Reduced risk of pest and weed infestations -Better distribution of water and nutrients	-Fluctuating market prices and yields -Challenge to control weeds and pests -High costs and low availability of inputs. -Timing of seeding legume is a critical factor
Opportunities	**Threats**
-Private sector extension support and training -Increased market existence for legumes -Input subsidy programs i.e. -"inputs voucher" system -Storage availability, -Co-operative organizations	-Climate change, -Pest and disease out breaks -Commodity price fluctuation -Lack of quality legume seeds in the market -Intercropping is difficult in mechanized systems

Brachiaria grass

Strengths	Weakness
-Adapted to drought and low fertility soils -Protects soil erosion and improves soil fertility -Reduces gas emission and water pollutions -Improves livestock health and productivity	-High establishment costs -Affected by prolonged drought, -High risk of pests and diseases, -Depletion of soil nutrition -Shortage of seeds, -Limited technical knowhow
Opportunities	**Threats**
-Increasing demand for improved forages -Forage, crop protection agent and agent for environmental protection and soil conservation -Can be propagated using root splits	-Climate change, -Pest and disease out breaks -Poorly developed forage-livestock value chain -Poor infrastructure and policy support -Limited resources to promote Brachiaria grass

Agricultural Extension System

EAS SWOT summary. An overview and more details per country is given in the D1.4 report.

Strengths	Weakness
- National agricultural extension strategy in place -Decentralized, wide coverage and well-structured -Infrastructure and facilities are available -Strong support networks, -Strong staff training	-Poor dissemination of extension information -Public dominated and supply driven -Weak research-extension-farmer-market linkages -Poor gender integration -Subsistence oriented
Opportunities	**Threats**
-Scope for market-oriented extension system -Multi-actor innovation platforms -Potential for pluralistic and participatory approaches -Improved ICT based technologies -Availability of climate-smart agric. technologies	-Top-down and command type management -Poor linkages and coordination and conflicts -Inadequate funding -Fluctuating international markets -Climate change (frequent & prolonged droughts)

Meta-Analysis

Cereal-Legume intercropping

- The weighted mean differences of maize grain yields between conventional practice and no-tillage maize legume intercrop (NTMLI) and no-tillage maize legume rotation (NTMLR) show that intercropping (NTMLI) had the highest weighted mean (407kg/ha) followed by rotation (NTMLR)(281kg/ha) and only maize (NTM)(189kg/ha).
- Maize intercropped with cowpea and pigeon pea is most common (ca. 80% of the studies).
- The increase in maize yield under both NTMLI and NTMLR indicates that minimum tillage and legume associations are important features of SAIs.
- Maize yield increase significant under NTMLI in the low to medium rainfall areas (72% of the studies).

Brachiaria grass

- Rhodes grass under-performed compared to most of the Brachiaria cultivars, whereas Napier grass out-performed all Brachiaria cultivars in all but one experimental site.
- Studies confirm high plasticity in biomass production in Brachiaria grass.
- Brachiaria can be a most reliable forage to alleviate livestock feed shortage in Sub-Sharan Africa.
- All tested Brachiaria cultivars had higher nutritive value than local Rhodes grass.
- A significant increase in milk production when livestock were fed on Brachiaria grass over local forages.

Agricultural Extension System

- EASs offered to farmers are context specific and determined by history and level of economic development.
- Systems are characterised by more weaknesses than inherent strengths.
- There are numerous opportunities abounding in country-specific extension delivery systems which implies unexploited potential for extension-driven agricultural growth.
- Renewed commitment and thrust towards increasing public spending in agriculture.
- Proliferation of affordable ICTs lessening the burden on extension services offers possibilities.
- Increasing interest from non-state actors towards provision of these services is a clear trend.

Key messages – SWOT and meta-analysis

- Intercropping of maize-legume gives higher yields compared to conventional practice, but the existence market for legumes needs to be stimulated and training is needed to plan the timing of seeding legumes correct. Input subsidy programs are needed to overcome the high costs and low availability of inputs.
- Brachiaria can be a reliable forage to alleviate livestock feed shortage in Sub-Sharan Africa. It has good yields, adapted to drought and low fertility soils, high biomass production, reduces greenhouse gas emissions and ground water pollutions, has high nutritive values and increase milk production. One of the opportunities is to increase the demand for improved forages and develop the forage-livestock value chain, increase infrastructure and resources, increase seeds availability.
- Each country has a comprehensive agricultural EAS which spells out the vision and mission but implementation varies among the countries. There is a need for increasing resources, more innovative methods instead of traditional methods and addressing all target groups including women and youth. There is a scope for more market-oriented extension systems and potential for pluralism and participatory approaches.
- In most countries, increasing new mobile phone based ICT services and the use of Innovation Systems approaches is an opportunity that needs to be exploited to transform EAS for timely delivery of information.

References

More details are given in the D1.4 report which can be downloaded at www.innovafrica.eu

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