A NEW INITIATIVE ON BALANCED SOIL NUTRITION - NOVEMBER 2021

EXECUTIVE SUMMARY

In Kenya, deficiencies of macro- and micronutrients and soil acidity are major constraints to increasing crop yields in most regions. The project aims to refine ISFM recommendations with "context-best-fit" balanced-nutrition technologies (BNT) for enhanced crop productivity, profitability, and nutritional quality. The "context-best-fit" technologies will be up-scaled using Farmer training ground model approach that focuses on improvement of knowledge base among stakeholders and farmers. A multi-institutional, multidisciplinary team comprising of both biophysical and social scientists will implement the project. Project sites are Tharaka-Nithi and Machakos Counties with Sorghum being the test crop. Expected outcome is increased sustainable food productivity through the use of balanced nutrition technologies and innovations.

STATEMENT PROBLEM

Arresting soil fertility decline remains a key challenge to increasing crop production per capita across many landscapes in Africa due continuous practices of cropping without addition of adequate fertilizers and manures by resource constraint farmers. In Kenya, deficiencies of macro- and micronutrients are common in most smallholder farms and acidic soils cover about 13% of the land area (Kanyanjua *et al.,* 2002). Most of the commonly applied fertilizers in SSA contain mainly N, P, and/or K, which do not replenish secondary and micronutrients critical in crop growth and overall performance. Lime is also minimally used with less than 5% of the farmers from Embu applying it (Muindi *et al.,* 2016). Most of the farmers in Kenya are not aware of benefits of liming acidic soils hence farmer's do not use lime in their farms (Kanyanjua *et al.*, 2002).

In view of this, the farmers' ability to increase yields and profitability requires that the aforementioned soil fertility challenges be addressed. This can be achieved by providing balanced nutrition to the crops, liming and using ISFM. The current project is therefore proposing to work with stakeholders to improve the knowledge base of balanced plant nutrition application and use of ISFM practices by farmers both at plot-level towards the regional scale. This will be achieved through up-scaling of ISFM knowledge, technologies and innovations for food and nutrition security improvement through innovation platforms.

IMPACT PATHWAY

Goal The project seeks to improve smallholder farmers' agricultural productivity for sustainable reduction of hunger and poverty in Eastern Kenya though unlocking the potential of ISFM

Objectives. Specific objectives are be:

1. To refine ISFM recommendations with "context-best-fit" balanced-nutrition technologies (BNT) for enhanced crop production, profitability and nutritional quality
2. To test and adapt "context-best-fit" BNT to the prevailing farmers' socio-economic conditions
3. To develop a balanced-nutrition multi-agency-systems' tool for extension personnel to support context-fit out-scaling of the best-fit ISFM technologies
4. To establish a learning platform on best-bet agricultural practices through appropriate institutional arrangements and structures (policy)
5. To enhance the capacity of different stakeholders in ISFM with balanced plant nutrition for increased crop

Outputs:
1. Context-Best-fit" ISFM options refined for enhanced productivity and profitability in the region
2. At least four "Context-best-fit" BNT technologies tested and adapted to the prevailing farmers' socio-economic conditions
3. A Multi-Agent-Systems' tool for context-fit extension personnel developed
4. Increased smallholder farmers' knowledge on ISFM, liming, and best agronomic practices
5. Increased capacity on balanced nutrition, visual nutrient deficiency diagnosis, liming and group dynamics by extension staff leading to improved food production among smallholder farms
6. Recommendations on institutional arrangements and structures to support adoption of ISFM on a sustainable basis
7. At least 500 farmers trained on ISFM, liming and micronutrients management

Outcome:
1. Resilience of land systems under ISFM systems adopting balanced nutrition
2. Economic returns and profitability from investments on balanced nutrition, lime and ISFM improved
3. Food and nutrition security enhanced

PARTNERS

The proposed project will be implemented through active involvement of multiple institutions with distinct mandates and capacities. In addition, several experts will be involved; including soil scientist, agronomists, socio-economics and institutional analysis and development, policy analysis expert and GIS

Core partners

1. **KALRO** will lead the project and play key role in testing and validating technologies and innovations with farmers; promote uptake of the technologies as well as monitor and evaluate progress.
2. **Kenyatta University** will provide expertise in utilization of knowledge in ISFM through training and capacity building
3. **University of Embu** will take charge of developing multi-agency tool, modelling and GIS. The University will also lead in institutional analysis and advancement of policy aimed at supporting the promotion of ISFM technologies and
4. **PAD-** in charge of developing personalised agricultural advice for farmers and dissemination through mobile phones

UNIVERSITY OF EMBU TECHNICAL TEAM
Dr Mogaka Hezron   Team Leader
Dr Jeremiah Okeyo   GIS Expert
Ms Debra Onyango   Policy Expert
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STRATEGIC INVESTOR
The Kenya Climate Smart Agriculture Programme (KCSAP) is supporting project.