Decision Support Tools for Smallholder Agriculture in Sub-Saharan Africa

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A Practical Guide

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Foreword

Agriculture remains the key to Africa's economic future. With approximately 200 million people chronically hungry, advances in African agricultural research and development (R&D) are urgently needed. This will require considerable investments and increased efficiency and effectiveness of agricultural R&D. Access to information and communication technology (ICT) is rapidly increasing in many African countries and provides tremendous opportunities to accelerate their economic growth and development through the enhanced efficiency and effectiveness of R&D.

This trend offers scope for the use of decision support tools (DSTs) that can improve the efficiency and effectiveness of agricultural R&D in Africa. Such tools can, in principle, assist with the diagnosis of problems and opportunities in agricultural systems, the identification of options for alternative management, the analysis of experiments, and the diffusion of promising technologies/approaches. The use of DSTs to advance smallholder agriculture in these countries faces a number of specific constraints, however. These include lack of exposure of the development staff to DSTs, the complexity of African farming systems, and the lack of reliable data.

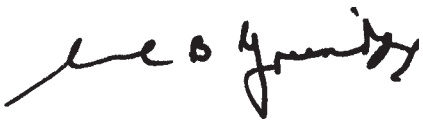
The COSTBOX project, financed by the Ecoregional Fund to Support Methodological Initiatives and carried out by IFDC and partner institutions in West Africa, was established to investigate opportunities for the use of DSTs in smallholder agriculture in sub-Saharan Africa with special reference to soil management issues. The COSTBOX experience shows that there is considerable interest among research and extension staff in Africa in applying these tools but also that access to appropriate tools, reliable data, and training in the application of such tools is essential.

This guide provides a number of case studies that illustrate how combinations of DSTs can be used to address a specific situation.

Some case studies also show how the use of DSTs can be combined with farmer participatory learning and action research. The case studies served to develop a framework that will guide the user to decide what tool(s) to use in a particular stage of agricultural R&D.

We hope that this guide will contribute to increased knowledge and use of DSTs in sub-Saharan Africa leading to the increased efficiency and effectiveness of agricultural research and development in the region in general.

Amit H. Roy
President and CEO
IFDC



Carl B. Greenidge
Director
CTA

Message From the Ecoregional Fund

African smallholder farmers are operating in a highly variable and complex environment; soil fertility levels may show considerable variations over short distances, and rainfall patterns are irregular. Blanket recommendations regarding fertilizer applications, choice of variety, sowing date, etc., are, therefore, unlikely to be effective. On the other hand, the cost and time required for the development of site-specific recommendations are prohibitive. In such situations, the use of generic decision support tools (DSTs) may allow cost and time savings and improve the quality of decision-making for the smallholder farmers.

Nevertheless, DSTs in research and extension are still rarely used in sub-Saharan agriculture. An important reason for this is that many research projects focus on the introduction of one single tool, whereas a systems approach is clearly needed to cover the diverse and sometimes contrasting demands of the farmer. Another problem is the limited availability and access to data that are required as inputs for the DSTs.

In 1999 the Africa Division of an International Center for Soil Fertility and Agricultural Development (IFDC) started to develop, evaluate, and promote a set of DSTs for soil fertility management in smallholder farming systems in sub-Saharan Africa. These efforts were implemented through a project entitled "A Client-Oriented Systems Toolbox for Technology Transfer Related to Soil Fertility Improvement and Sustainable Agriculture in West Africa (COSTBOX)," financed by the Ecoregional Fund to Support Methodological Initiatives and carried out in collaboration with a number of national agricultural research institutes and universities in West Africa. To promote the use of DSTs, the project organized several train-

ing courses and workshops at national research institutes and agricultural universities in Ghana, Benin, Togo, and Nigeria. Researchers applied the DSTs to problems and areas of interest to farmers in these countries. The number of DSTs gradually expanded because some problems could not be tackled by one particular DST alone. Contacts were, therefore, established with other groups that are developing and introducing DSTs in sub-Saharan Africa, thus contributing to learning experiences in a network context.

The present guide has been developed to provide potential users with a practical overview of existing DSTs and their applications. The guide includes a number of case studies with special reference to integrated soil fertility management (ISFM). In addition, a general overview is provided of the various stages in agricultural decision-making whereby, for each stage, tools are identified that can be used in that particular stage. Information is provided about ways to obtain each tool.

I consider this book to be an accessible and valuable guide that promotes the use of DSTs. I sincerely hope that it will increase the use of these tools and contribute to an accelerated and sustainable development of the agricultural sector in sub-Saharan Africa and the improvement of the well-being of farmer families in the region.

Prof. Dr. Johan Bouma
Chairman
International Scientific Advisory
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to Support Methodological Initiatives

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