

Research Application Summary

Factors influencing access to integrated soil fertility management information and knowledge and its uptake among smallholder farmers in Zimbabwe

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Abstract

Lack of access to information and knowledge generated through formal research has been identified as a major drawback to adoption of agricultural technologies among smallholder farmers in Zimbabwe. This study evaluated how farmers acquire, share and use knowledge on integrated soil fertility management (ISFM) for improved crop production and food security in Wedza district of Zimbabwe. A questionnaire survey showed that farmers' preferred sources of ISFM information were national government extension and farmer-farmer interactions, while newspapers and non-governmental Organisations (NGOs) were the least preferred. Learning-based meetings and field based learning centres (LCs) constituted the major information and knowledge sharing platforms. A logit regression analysis revealed that uptake of ISFM technologies is influenced by farmer resource group and farmers' visit to LCs as a proxy for interaction. Farmer experience, visits to LCs and access to extension services were in turn the major factors influencing farmers' access to ISFM information. Extension, LCs and farmer to farmer interactions were the prioritised methods of farmer information knowledge sharing suggesting that support is required for farmer knowledge platforms such as LCs that provide a continuum for extension to farmer- farmer interactions.

Key words: Dissemination, information and knowledge, ISFM, Logit, sharing platforms

Résumé

Le manque d'accès à l'information et aux connaissances générées par la recherche formelle a été identifié comme un inconvénient majeur à l'adoption des technologies agricoles parmi les petits exploitants agricoles du Zimbabwe. Cette étude a évalué la façon dont les agriculteurs acquièrent, partagent et utilisent des connaissances sur la gestion intégrée de la fertilité

du sol (GIFS) pour la production agricole améliorée et la sécurité alimentaire dans le district de Wedza au Zimbabwe. Une enquête par questionnaire a montré que les sources privilégiées de l'information des agriculteurs sur la GIFS étaient la vulgarisation du gouvernement national et les interactions agriculteurs-agriculteurs, tandis que les journaux et les organisations non-gouvernementales (ONG) étaient les moins préférés. Les rencontres basées sur l'apprentissage et les centres d'apprentissage sur terrain (CAs) ont constitué les majeures plates-formes de partage des connaissances et de l'information. Une analyse de la régression Logit a révélé que l'adoption de technologies de la GIFS est influencée par le groupe des ressources agricoles et la visite des agriculteurs au CA comme une procuration pour l'interaction. L'expérience des agriculteurs, les visites aux CAs et l'accès aux services de vulgarisation ont été tour à tour les principaux facteurs influant sur l'accès des agriculteurs aux informations de la GIFS. La vulgarisation, les CAs et les interactions entre agriculteurs ont été les méthodes prioritaires de partage des connaissances et de l'information entre les agriculteurs suggérant que le soutien est nécessaire pour les plates-formes de connaissances des agriculteurs tels que les CAs qui fournissent un continuum de l'extension pour les interactions entre les agriculteurs.

Mots clés: diffusion, information et connaissance, GIFS, Logit, plates-formes de partage

Background

Smallholder farmers in the Sub-Saharan African (SSA) region face severe soil fertility challenges (Smaling *et al.*, 1997). To mitigate this, several agricultural technologies aimed at combating declining soil fertility have been developed through research for many years (Gentile *et al.*, 2009). Adoption of soil management technologies by smallholder farmers in the SSA region including Zimbabwe have generally lagged behind This has often been linked to lack of access to information generated through formal research, appropriate information dissemination strategies and lack of knowledge sharing platforms, among other factors (Feder *et al.*, 1985; Mapfumo, 2009). There is evidence for lack of suitable mechanisms for transferring the available knowledge on integrated soil fertility management (ISFM) from researchers to major players in the agriculture sector in ways that promote innovation and sustainable adoption (Mtambanengwe and Mapfumo, 2008). The study is based on the hypothesis that decision making on uptake of ISFM technologies among different resource categories of farmers is

influenced by the nature of ISFM information they access and the approaches used to disseminate such information. The study focuses on two specific objectives i) to identify preferred sources of ISFM information and prioritised knowledge sharing platforms among smallholder farmers in Zimbabwe, and ii) to determine socio-economic factors that influence access to ISFM information and its subsequent use.

Literature Summary

Soils in Zimbabwe are characterised by low inherent fertility and unfortunately, farmers cannot afford mineral fertilisers due to their high cost. Yet alternative nutrient sources such as cattle manure and other organic resources are insufficient to meet demand (Mapfumo and Giller, 2001). Evidence from research has shown that systematically combined mineral and organic resources can result in considerable yield increases. However adoption of ISFM technologies has been low. Recent studies have seen the integration of local and scientific knowledge through participatory research (Baltissen *et al.*, 2000). This is postulated to improve flow of knowledge from researchers to farmers thereby enhancing technology adoption.

Study Description

The study was conducted in Dendenyore and Goto wards of Wedza district (18°41'S and 31°42'E) in Zimbabwe. Wedza (natural region II), is approximately 160 km southeast of Harare receives an average of > 750 mm rainfall annum⁻¹ between November and March. The soils are predominantly sandy often classified as lixisols. Over 80% of households derive their livelihoods from maize-based farming with low legume utilisation (Mtambanengwe and Mapfumo, 2005). Wedza is an old smallholder farming area (>75 years) with an average landholding of < 3 ha household⁻¹. Each ward has four agriculture extension workers (AEWs) with an AEW to farmer ratio of 1: 500 households, which is too low to meet farmer knowledge demands.

The study was conducted under the auspices of Soil Fertility Consortium for Southern Africa (SOFECSA)-Zimbabwe research for development initiatives which focuses on the promotion of ISFM technologies using the Learning Centre (LC) approach. A LC is defined as a field-based, interactive platform integrating local, conventional and emerging knowledge on superior agricultural innovations requiring promotion of farm-level adaptive testing with the participation of all (Mapfumo, 2007). Learning Centres are a platform in which information and knowledge on ISFM practices, general agriculture and

broader livelihood issues are shared. The LCs provided a basis for detailed data collection. A combination of focus group discussions, farmer meetings and a questionnaire survey were used for data collection. Focus group discussions were used in identification and ranking of sources of ISFM information. Farmer meetings helped to explore the current understanding of ISFM technologies by farmers participating in LCs versus non-participants and to identify variables that influence their access to ISFM technology and its use. A logit regression model was used to explore the influence of diverse variables identified by farmers against access to ISFM information and its subsequent uptake.

Research Application

Results showed that farmers who participated in LCs were consistent with researchers' definition of ISFM. They exhibited an appreciation of the different components of ISFM and its benefits compared to non-participants (Table 1). The results simply showed that communication exposure is an important aspect that strengthens perception about soil fertility management. Farmers identified national extension, farmer-to-farmer interactions (fellow farmers), private sector extension, non-governmental organisations, research agents, news papers, radio and schools as sources of ISFM information. However, national government extension and farmer- farmer interactions proved to be the major sources of information for all categories of farmers. This is explained by the traditional conventional research-extension information flow pathway characterising information dissemination in African agriculture. However, the interdependency of farmers on other secondary sources of information and knowledge suggest the inadequacies of this conventional approach. About 73% of farmers used learning-based farmer meetings, LCs and focus group discussions as common platforms to access agriculture information while demonstrations and agriculture shows accounted for only 5% and 14% respectively (Fig. 1). These findings suggest that interactive platforms attracting active farmer participation are likely to result in improved credibility as sources of information. A logit analysis has shown farmers' regular interaction with extension and farmers' visits to LCs as factors significantly influencing farmers' access to ISFM information whilst uptake was significantly influenced by farmers' resource group and farmers' visits to LCs. Overall, the study indicated superiority of farmer interactive knowledge sharing platforms such as learning-based farmer meetings, field days and LCs. Farmers

Table 1. Evaluation of ISFM technology and its benefits by farmers participating in SOFECSA learning centres and non-participants.

	Components of ISFM	Benefits of ISFM
Participants of SOFECSA learning centres	<p>Combined use of organic and inorganic nutrient resources.</p> <p>Inoculant use with legumes.</p> <p>Crop rotations in proper sequencing i.e., legume area proportional to cereal area.</p> <p>Knowledge of appropriate crop varieties and crop diversification.</p> <p>Knowledge of improved fallows.</p> <p>Record keeping.</p> <p>Knowledge of pest and disease control.</p> <p>Use of organic nutrient sources with legumes.</p>	<p>Increased yields and income from surplus sales.</p> <p>Enhanced soil fertility for sustainable yields.</p> <p>Improved health and food security for the family due to several options for available food.</p> <p>Conservation of natural resources.</p> <p>Participation in market outputs and contract farming.</p> <p>Improved interaction with service providers</p>
Non-participants	<p>No knowledge of inoculant use with legumes.</p> <p>Knowledge of use of organic and inorganic nutrient sources (not necessarily in combination).</p> <p>Not knowledgeable about green manures.</p> <p>Lack of knowledge of appropriate crop varieties, staggering of planting dates and importance of record keeping.</p> <p>Lack of knowledge about crop rotations in proper sequencing.</p>	<p>Low yields obtained thus limited income from surplus sales.</p> <p>Lack of interaction with service providers.</p> <p>Lack of participation in market outputs and contract farming.</p> <p>No track records of agriculture practices.</p>

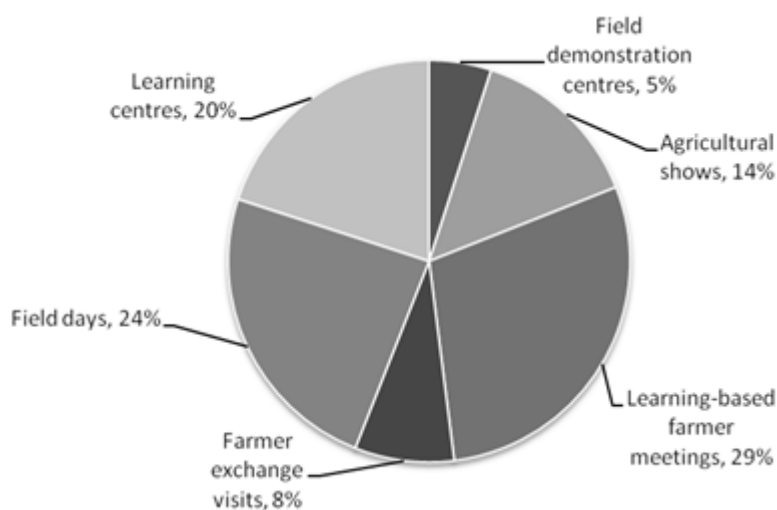


Figure 1. ISFM information and knowledge sharing platforms in Dendenyore and Goto wards, Wedza district, Zimbabwe.

participating in LC initiatives were able to characterise ISFM and its components providing scope for its enhanced uptake.

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