

**An assessment of the processes and pathways to achieve innovation in Conservation Agriculture in Malawi: A case of Machinga Agricultural Development Division**

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**Abstract**

A study was carried out in Machinga Agricultural Development Division, located in the Southern Region of Malawi to assess the institutional arrangements for implementation of conservation agriculture (CA). Social network analysis was used to characterise actors implementing CA, their goal orientation, and interactions between them. The preliminary findings reveal a breakdown in the institutional framework for CA as evidenced by variations among actors in their definition and practices of CA and the lack of coordination that exists at local level.

**Key words:** Conservation agriculture, innovation, institutional arrangements

**Résumé**

Une étude a été réalisée dans la division du développement agricole de Machinga, située dans la région sud du Malawi pour évaluer les arrangements institutionnels pour l'implantation de l'agriculture de conservation (AC). L'analyse des réseaux sociaux a été utilisée pour caractériser les acteurs mettant en œuvre l'agriculture de conservation (AC), leur orientation vers un but, et les interactions entre eux. Les résultats préliminaires révèlent une rupture dans le cadre institutionnel pour l'agriculture de conservation (AC) comme en témoignent les variations parmi les acteurs dans leur définition et leurs pratiques de l'AC et le manque de coordination qui existe au niveau local.

**Mots clés:** Agriculture de conservation, innovation, arrangements institutionnels

**Background**

In the face of increasing stress on agricultural production due to climate change, HIV and AIDS, and declining soil fertility in Malawi, conservation agriculture (CA) has become one of the attractive solutions to ensure increased levels of crop production. Conservation agriculture is defined as a resource saving agricultural crop production that strives to achieve acceptable profits together with high and sustained production levels while

concurrently conserving the environment (FAO, 2007). The main three principles of which it is comprised are maintaining soil cover with plant residues, reducing mechanical soil disturbance (tillage) and the use of rotation and cover crops.

Quite a number of institutions in Malawi have made efforts to implement CA projects at varying times and scope. However, there is a general individuality in implementing these projects. This has caused inconsistencies in the definition and practices of Conservation Agriculture across the country. Consequently, the cumulative achievement in adoption of Conservation agriculture is difficult to quantify. Also, the adoption levels have been quite low and patchy (Mloza Banda *et al.*, 2010).

Much as a number of studies have evaluated the agronomic, technical and economic aspects of adoption of CA, it is generally argued that CA is not only a production technology, but also a social construct which necessitates the creation and development of social networks and participatory research approaches if massive adoption is to occur (Ekboir, 2002; Erenstein, 2012). Based on the innovation systems framework as adopted by the World Bank (2006), this study was carried out to understand the current institutional arrangements surrounding CA at district level, and their effects on the application of the production system in Malawi.

The study addressed the following research questions:

- Who are the actors involved in CA? What are their respective attributes and roles in the promotion of CA?
- What is the nature of relationships amongst the actors and how does that affect the innovation process of CA?
- What are the various pathways that various actors use to promote CA amongst the farmers?
- What are the existent gaps and recommendations for a successful innovation transition path for CA in Malawi?

## Literature Summary

Conservation agriculture entails a qualitative change in agriculture that engages multiple actors and farming environments in a long process of social construction and reconstruction of both existing and new cropping techniques and institutional actors. Raina *et al.*, 2005 observed that such changes necessitate specific processes of knowledge sharing and learning from experience. The International Maize and Wheat Improvement Centre (CIMMYT) has been actively engaged in

adapting CA to smallholder maize and wheat systems in the tropics and subtropics since the 1980s including in areas like Mexico, South Asia and Southern Africa (Erenstein *et al.*, 2012). A common thread through these cases are the need for research for development partnerships with national research and extension systems, agri-business, farmers, and other stakeholders with an ultimate vision of sustainable smallholder wheat and maize systems based on the principles of CA. This reveals the significance of multi stakeholder processes in the promotion of CA.

Ekboir (2002) argues that complex technologies such as CA are developed and disseminated by networks of agents. The impact of these networks depends on the assets they command, their learning routines, the socio-economic environment in which they operate and their history hence the need for scientific and technology policies to foster interactions among agents (whether public or private).

In order to better understand the knowledge flow within the organisations promoting CA in Malawi, it is critical to study the knowledge sources, sinks, and constraints. A case study based on leading organisations is then used to illustrate how a set of analytical tools can be used to map networks of relationships and to provide an important means of assessing and promoting collaboration in strategically important groups (Chan and Liebowitz, 2006) for technology assimilation.

## Study Description

The study was conducted in Balaka, Zomba and Machinga districts in Machinga Agricultural Development Division (MADD) in the Southern Region of Malawi. These districts were purposely sampled since a lot of CA projects have been implemented for relatively long periods and would therefore provide substantive information of CA (Mloza Banda *et al.*, 2010). The Ministry of Agriculture and Food Security, (MoAFS) was used as the leading organisation because of the central role of coordinating agricultural activities in the country. An inventory of all other actors implementing CA in each district was developed. Analyses of the skills, competencies, roles and habits, relationships and interactions of the actors were conducted. Netmaps and actor maps were also developed. The various pathways that they use to disseminate and/or promote CA were also identified.

**Research Progress**

The study is still being conducted therefore not a lot of data is available. However, the preliminary findings have revealed that there are a wide range of actors implementing CA in MADD (Table 1).

**Table 1. List of Actors promoting CA in Machinga ADD.**

Organization	District
FIDP + MoAIWD	Balaka
Concern Universal*	Balaka
FAO + MoAIWD	Balaka
ASWAp (MoAIWD)	Balaka, Machinga, Mangochi, Zomba
Sub-Saharan Challenge Project- ICRAF	Balaka, Machinga, Zomba
Total Land Care	Machinga, Zomba
DAPP	Zomba
FAO + MoAIWD (Enhancing Food Security and Rural Livelihoods Programme)*	Balaka, Machinga
Lake Chilwa Basin Climate Change Adaptation	Machinga, Zomba
Emmanuel International	Zomba
NASFAM	Zomba

\*phased out; GoM-

These actors have different development agenda of which increased crop production through promotion of CA is a component, while others have sole CA promotion projects. Despite a nationally agreed definition of CA set by the National Conservation Agriculture Taskforce (NCATF), there are indeed significant differences in the CA practices among the actors at district level firstly due to minimal interaction amongst various implementers and secondly, because of inadequate skills and knowledge of the implementers themselves. It was also revealed that much as it is knowledge intensive, CA is also highly context specific. It has therefore been challenging to use blanket recommendations for areas in the absence of socio-ecological guidelines. These findings suggest that it is important to employ networking and participatory research approaches in adapting CA to the local context. This is in line with other studies that argued that *CA systems are best developed in situ through a multi-stakeholder adaptive learning process to create viable CA-based options that are technically sound, economically attractive, and socially acceptable* (Erenstein et al., 2012).

The government has the central role to coordinate all agricultural activities and stakeholders at district level, through the District Agricultural Extension Coordinating Committee. This function is guided by the Decentralisation Policy framework and the

Malawi Agricultural Extension Policy (2000). Other technology transfer platforms for interaction have also been created. These include stakeholder and review meetings, field days, and agricultural activity launches where various stakeholders are invited to participate and attend.

The extension delivery service follows the pathway depicted in Figure 1. However, there are some NGOs that short-circuit the channels and just go straight to the farmers without going through the established district-led extension network. Thus, they completely miss stakeholder platforms that have been created for implementation and lesson learning amongst the service providers and between the providers and farmers. This has caused duplication of efforts and perpetuated differences in the principles and practices of CA.

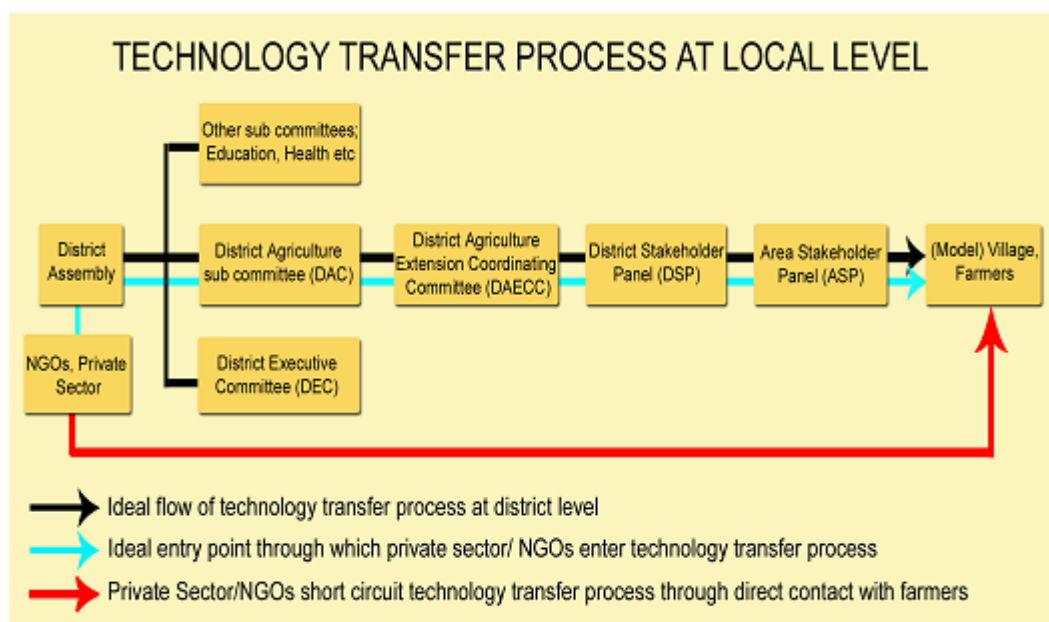


Figure 1. Flow of CA Projects at district level.

In as far as the various pathways used to promote CA are concerned; the issue of incentives has evidently created competition amongst various actors because farmers choose which CA projects to participate in, based on the inputs they will get. This has had a negative impact on the sustainability of Conservation Agriculture in the area because farmers have no motivation to practice CA sustainably because they 'perceive' they will need external assistance to access inputs to practice CA.

## Research Application

There is need to develop loci for local innovative networks in support of CA. The expanding network of CA advocates appear challenged to gain greater understanding of the underlying processes towards developing an indigenous culture of CA. Local CA initiatives provide an opportunity for expanding input-output markets. The local CA networks would thus enroll new (national) actors that deliver new technical resources and advisory assistance including tracking emerging CA research and development implementation results.

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