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An Innovation Learning Platform for

Drought Tolerant Maize in Malawi:

Lessons Learned and the Way Forward

Girma T. Kassie, Olaf Erenstein, Wilfred Mwangi, Peter Setimela, Augustine Langyintuo, and K.K. Kaonga

CIMMYT®
International Maize and Wheat Improvement Center

Headquartered in Mexico, the International Maize and Wheat Improvement Center (known by its Spanish acronym, CIMMYT) is a not-for-profit agriculture research and training organization. The Center works to reduce poverty and hunger by sustainably increasing the productivity of maize and wheat in the developing world. CIMMYT maintains the world's largest maize and wheat seed bank and is best known for initiating the Green Revolution, which saved millions of lives across Asia and for which CIMMYT's Dr. Norman Borlaug was awarded the Nobel Peace Prize. CIMMYT is a member of the CGIAR Consortium and receives support from national governments, foundations, development banks, and other public and private agencies.

The Drought Tolerant Maize for Africa (DTMA) project is jointly implemented by CIMMYT and the International Institute of Tropical Agriculture (IITA). It's funded by the Bill & Melinda Gates Foundation and the Howard G. Buffett Foundation. The project is part of a broad partnership also involving national agricultural research and extension systems, seed companies, non-governmental organizations (NGOs), community-based organizations (CBOs), and advanced research institutes, together known as the DTMA Initiative. Its activities build on longer-term support by other donors, including the Swiss Agency for Development and Cooperation (SDC), the German Federal Ministry for Economic Cooperation and Development (BMZ), the International Fund for Agricultural Development (IFAD), and the Eiselen Foundation. The project aims to develop and disseminate drought tolerant, high-yielding, locally-adapted maize varieties and to reach 30–40 million people in sub-Saharan Africa with these varieties in 10 years.

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An Innovation Learning Platform for Drought Tolerant Maize in Malawi: Lessons Learned and the Way Forward

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Acronyms

ADMARC	Agricultural Development and Marketing Corporation
AIS	Agricultural innovation systems
AKIS	Agricultural Knowledge and Innovation Systems
CIMMYT	International Maize and Wheat Improvement Center
DADO	District Agricultural Development Office
DTMA	Drought Tolerant Maize for Africa
DTMV	Drought tolerant maize variety
EPA	Extension planning area
FISP	Farm Input Subsidy Program
ICRISAT	International Crop Research Institute for the Semi-Arid Tropics
ILeP	Innovation learning platform
mm	Millimeter
MoAFS	Ministry of Agriculture and Food Security
mt	Metric ton
NAES	National agricultural extension system
NAETS	National agricultural education and training system
NARI	National agricultural research institutes
NARS	National agricultural research systems
NGO	Non-governmental organization
NSF	National systems framework
OPV	Open pollinated variety
R&D	Research and development
SSA	Sub-Saharan Africa

Acknowledgments

The Innovation Learning Platforms (ILeP) are an integral part of the Drought Tolerant Maize for Africa (DTMA) project. DTMA is implemented by CIMMYT and the IITA, and is funded by the Bill & Melinda Gates Foundation (BMGF) and the Howard G. Buffett Foundation (HGBF). We are therefore very grateful for the financial support for the whole ILeP process and for this study that documents the achievements of and lessons from the platforms.

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Executive summary

Introduction

Innovation learning platforms have their roots in the agricultural innovation systems (AIS) approach. AIS emphasizes a systems view of agricultural innovations and conceptualizes an innovation system as all individuals and organizations that keep on interacting in producing and using knowledge and the institutional context of knowledge sharing and learning. Research creates knowledge and technology; but innovation process goes further to include putting that knowledge into use.

The Drought Tolerant Maize for Africa (DTMA) project of CIMMYT aims to address the challenge of combating the impacts of drought on people's livelihoods. For this to succeed, however, the initiative faces the challenge of how best to advocate and promote drought tolerant maize varieties (DTMVs). The initiative accordingly proposed to establish Innovation Learning Platforms (ILeP) in selected pilot countries (Malawi and Nigeria).

This report focuses on presenting detailed account of the implementation of the approach, the lessons learned, analyzing whether there is enough experience to suggest (or not) extrapolation of the approach to other areas and communities, and the way forward. The report is based on data and information generated from participating farmers and key individuals from important institutional stakeholders.

Methodology

Malawi was chosen as an initial ILeP case study as it combined a number of directly relevant challenges. Malawi is characterized by a predominance of maize, drought, and poverty. Maize yields are low, linked to, inter alia, poor climatic conditions, low use of chemical fertilizers and limited use of improved varieties.

In the first year (2008-09), ILeP had a two pronged focus. At the district level, it focused on Balaka District where a consortium of stakeholders implemented DTMV demonstrations on farmer fields. At the national level, it focused on ensuring the release of the two new DTMVs being promoted (ZM309 and ZM523) and the seed multiplication through private seed company (SeedCo Malawi).

In the second year (2009-10), seed multiplication was continued and expanded to two seed companies (SeedCo Malawi and Demeter - Farmers' World) thereby ensuring certified seed is available for the 2010/11 maize growing season. The district level focus was scaled out to include five new districts; i.e., Karonga in northern Malawi; Ntcheu, Neno in the central southern region; and Chikwawa and Nsanje in southern Malawi in addition to the initial Balaka District. However, the consortium approach was dropped and all demonstrations were implemented by Ministry of Agriculture and Food Security (MoAFS) and their frontline staff.

The demonstration trials were started in 2008/09 season with 299 farm households in Balaka District. The trials were implemented collaboratively by the government and the NGO community. More than 52% of the trials were implemented by the MoAFS. All the demonstrations had a similar lay-out, a side by side comparison of three improved open pollinated varieties (OPVs) - ZM521, ZM523, and ZM309 - and a control chosen by farmers' themselves.

In the second season (2009/10), 300 demonstration trials were implemented in all the six districts.

Results

ZM309 was the most preferred variety (46% of the respondents) followed by ZM523 (36%). The most important reasons behind variety preferences were earliness, drought tolerance, poundability and disease and pest tolerance.

Both female and male headed households prefer ZM309 above the others. For male headed households ZM523 is the second favorite whereas for female headed households both ZM521 and ZM523 are equally preferred. Female respondents prefer ZM309 for early maturity and poundability. They also highly rate ZM523 for its early maturity and disease tolerance. Male headed households also rank ZM309 and ZM523 high for early maturity and drought tolerance.

In improving ILeP, increasing the scope of the demonstration trials is the most frequently (~64%) suggested change by participating farmers. The dimensions of the scope include increasing the plot size, the quantity of seed and fertilizer, the number of farmers involved, and the number of field days held. The second most important improvement suggested is timely delivery of inputs (51%). The problem of timely delivery of seeds, fertilizer, and pesticides was found to be an important challenge across all six districts.

The key actors, apart from farmers, involved in the implementation of ILeP are MOAFS, Chitedze Research Center, Extension Planning Area (EPA) offices, and NGO's (World Vision International, Concern Universal, Self Help International, National Smallholder Farmers Association of Malawi (NASFAM), Catholic Development Commission in Malawi (CADECOM), and Livingstonia Synod's Aids Programme (LISAP).

Opinions of the different actors converge when commenting on the general suitability of the modality with which ILeP has been implemented. The participation of different actors was praised by all discussants. The localized nature of the approach and the attendance of the field days were also identified as important attributes of ILeP's approach. However, it was also highlighted that some important stakeholders – such as actors in marketing, banking, and seed production and marketing - were left out.

Conclusion and way forward

The two ILeP years have generated considerable demand for DTMVs, particularly in the ILeP districts – but so far seed for DTMVs was only available in limited quantity. The increasing demand for the seeds of the varieties being demonstrated entails timely response from the seed production and marketing sector. Fortunately, the seed companies in Malawi are reacting quickly and the seeds are being available albeit through the subsidy program.

The Malawian Farm Input Subsidy Program (FISP) has played an overarching role. It has greatly facilitated and enabled setting the stage for DTMV deployment and uptake. However, it has also undermined the institutional synergy that ILeP was meant to create.

As an institutional innovation ILeP, has been less successful – particularly when compared to the original conceptual model. Instead of providing a platform for increasing inclusive stakeholder learning and participation, it has evolved into an increasingly narrow operational platform for implementing DTMV demonstration trials within the MoAFS and their frontline staff.

Weaknesses of the design and implementation of ILeP are related to the level of participation of farmers and other stakeholders in the planning process, transfer and management of operational budget and other resources, timing and number of field days, and the inclusiveness of the monitoring and evaluation process of the platforms.

The data and information we generated and the observations made, do not warrant scaling out the ILeP model to other countries. The Malawian case was particularly context specific in view of the overarching role of the FISP and thereby inherently difficult to replicate elsewhere.

Institutional innovations that provide the necessary incentives and guarantees to seed producers, promoters and adopters of DTMVs and enhance their inter-linkages merit being explored. These institutional innovations are likely to be context specific, but need to be facilitated, monitored and documented in order to derive the scope for replication and scaling out.

1. Introduction

Successful agricultural research in Africa has produced several high-yielding crop varieties and technologies (FARA, 2006; Jones, 2005). Nevertheless, due to a lack of adaptive research, large-scale adoption has been limited (Babu, Anandajayasekeram, & Rukuni, 2007). Hence, agricultural research and development (R&D) in the continent is yet to address the formidable constraints that hamper agricultural production and productivity. The research efforts exerted over five decades in Africa could hardly abate the challenges of, *inter alia*, low and declining crop yield, low and declining livestock productivity, inefficient input and output markets, lack of agricultural credit and financial services, low profitability and limited market access, low investment, nutrient mining and soil degradation, severe household resource constraints, poverty and low purchasing power, and dysfunctional local institutions.

The apparent misalignment between the challenges African agriculture is facing and the effectiveness of agricultural R&D in dealing with these challenges has been the reason behind the numerous paradigm shifts that happened over the last 50 years. Over the years, the agricultural R&D system has been testing, adapting and adopting a number of concepts and approaches to make theories and practices more relevant, effective and efficient. Some of these concepts and approaches include: farming systems approach; participatory research methods; National Agricultural Research Institutes (NARIs); National Systems Framework (NSF) including National Agricultural Research Systems (NARS), National Agricultural Extension System (NAES) and National Agricultural Education and Training System (NAETS); Agricultural Knowledge and Innovation Systems (AKIS); rural livelihoods; agri-food chain/value chain; knowledge quadrangle; action research; research for development; doubly green revolution and rainbow revolution; positive deviance, and agricultural innovation systems (AIS) (Anandajayasekeram, Kassie, & Goverah, 2010).

Innovation learning platforms have their roots in AIS approach. AIS emphasizes a systems view of agricultural innovations and conceptualizes an innovation system as all individuals and organizations that keep on interacting in producing and using knowledge and the institutional context of knowledge sharing and learning. Research creates knowledge and technology; but innovation process goes further to include putting that knowledge into use (Hall, 2005). Innovation in this approach is seen as a process in which knowledge and technology are generated, disseminated and utilized by agents, whose interactions both condition and are conditioned by social and economic institutions. In its broadest sense, innovation covers the activities and processes associated with the generation, production, distribution, adaptation, and use of new technical, institutional and organizational or managerial knowledge. It does not mean new technology per se, but also the institutional and organizational innovations, that emerge as new ways of developing, diffusing and using technology and knowledge that already exists.

Similarly, innovation systems mean combination of skills (scientific, entrepreneurial, managerial and other skills); patterns of interaction (partnerships, alliances and networks); ways of working (routines, organizational culture, traditional practices); policies (clusters of supportive policies and outcomes of policy processes); and learning (the ability to continuously learn how to use knowledge more efficiently at the organizational, sector and national levels). In the contemporary context, research is not merely intended to develop and promote technologies to farmers but also empower farmers to better understand and respond to changing circumstances as they emerge. Collaboration is no longer approached in a top-down manner through assigned tasks; instead partnerships are forged and have recognized the importance of participation and interaction balanced with individual needs and goals. That is the rationale behind the intricate and multi-actor nature of innovation learning platforms.

The DTMA project aims to address the challenge of combating the impacts of drought on people's livelihoods. Developing, distributing and cultivating DTMVs is a highly relevant intervention to improve food security, reduce vulnerability to climate change and dependence on food aid in Sub-Saharan Africa (SSA). For this to succeed, however, the initiative faces the challenge of how best to advocate and promote DTMVs. The initiative accordingly proposed to establish ILeP in selected pilot countries (Malawi and Nigeria). In each of the pilot ILeP cases, multi-stakeholder workgroups have been supported as key players to organize and follow upon in-country activities and optimize effective linkages between various stakeholders with a view to integrate DTMV with other value adding agricultural inputs and services that maximize the value proposition of DTMV for drought affected smallholders and given country-specific needs and institutional frameworks. These cases would serve as a learning platform with a view to exchange and carry forward best practices with an increasing number of countries over time.

This report focuses on presenting detailed account of the implementation of the approach, the lessons learned, analyzing whether there is enough experience to suggest (or not) extrapolation of the approach to other areas and communities, and the way forward. The report is structured such that the following section presents the ILeP model as originally planned. Section three describes the implementation of the approach in Malawi. Section four presents findings from questionnaire based survey of farmer participants and institutional stakeholders of the ILeP. Section five documents the lessons learned and discusses the way forward.

2 Innovation Learning Platform

2.1 Conceptual model[1]

A learning platform can be perceived as a group of stakeholders brought together by their individual interests in a shared issue, objective, challenge or opportunity and the corresponding dynamics in institutional processes and institutions (Langyintuo, 2008a). An ILeP thereby focuses on a specific innovation and brings together all potentially relevant stakeholders. In the case of drought tolerant maize this would include an array of agricultural service providers (seed, inputs, extension, financial services, crop management, marketing, and product transformation) and their clients along the maize value chain. The project thereby envisioned establishing and facilitating such experimental learning platforms in pilot locations with adequate density of services to foster the adoption and impact of DTMVs.

To implement the ILeP model, a multilevel approach was designed (Figure 1). At the national level an overall governing body of the ILeP was established, which would among other things, provide strategic guidance on implementation and make recommendations on scaling-up and scaling-out of the platform. It would also be responsible for inviting additional stakeholders or asking for a replacement of a stakeholder if necessary. Potential membership and functions of the national governing body are summarized in Table 1. It has also been planned to meet once every year to review progress of the ILeP and plan for the coming year. In addition, each member should endeavor to join the district level activities on a monitoring tour during the crop season.

[1] This section draws heavily from Langyintuo (2008a).

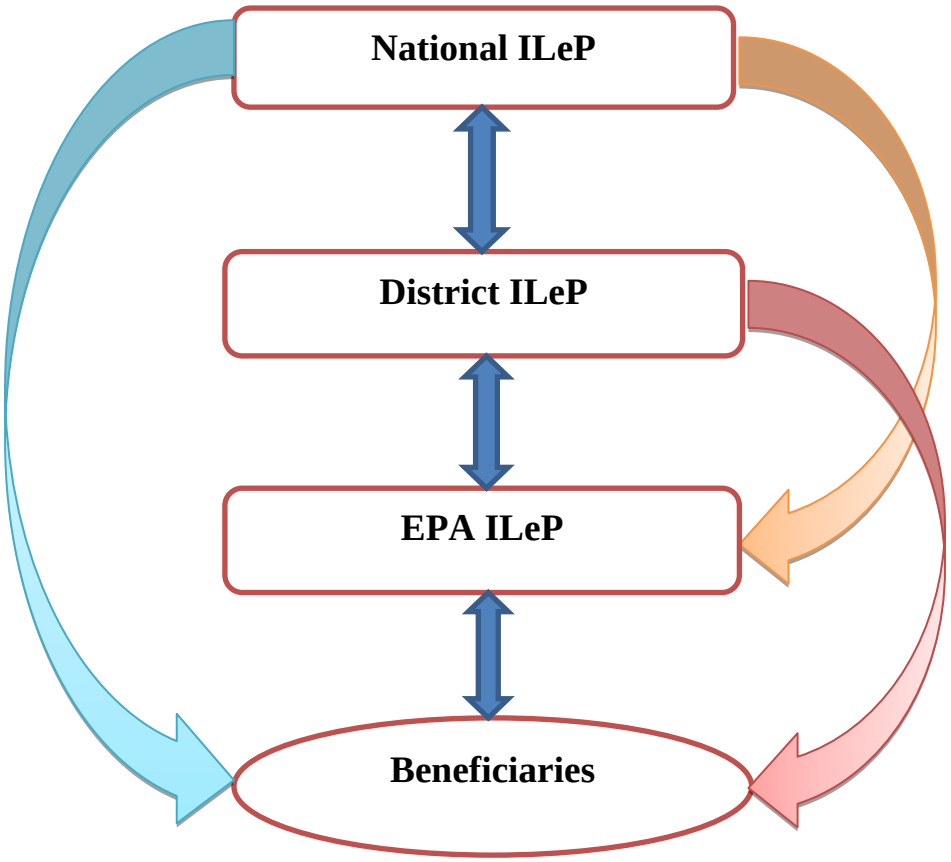

Figure 1: Innovation Learning Platform (ILeP) operational model.
Source: (Langyintuo, 2008b).

At the district level, the team of ILeP stakeholders needs to ensure that the beneficiaries have access to information, inputs and markets. This team thereby has a technical and monitoring function and needs to make sure that the ILeP is functioning effectively through their regular interactions with beneficiaries. The district team, in consultation with the national committee, shall determine the number and composition of the farmers in the target districts to be part of the ILeP and review the roles and contributions of the various stakeholders. The team was envisaged to meet twice a year, first at the beginning of the season to plan the activities for the season and second at the end of the season to review the past activities and organize the marketing of the grains. In addition, the team would organize at least one monitoring tour during the season to interact with beneficiaries. The tour might be used as a field day for beneficiaries to interact among themselves and with the monitoring team. The composition and functions of the district level team are enlisted in Table 1.

At the operational level, the ILeP comprises grass-root stakeholders who can collaborate with and facilitate farmers' engagements such as the frontline staff of extension and NGOs and farmer and community leaders. Their responsibility would be to organize beneficiaries for meetings and ensure group cohesion.

Table 1. Membership and functions of the national ILeP governing body.

Membership	Committee functions
National Agricultural Extension National Agricultural Research Seed Producers Agro-dealers Marketing Company Grain Traders Association Farmers Union Financial service providers NGO University DTMA scientists	Govern operations of the ILeP Make recommendations on scaling-up and scaling-out of ILeP Restructure membership of ILeP Shall meet once a year Members may participate in a monitoring tour of project site

Source: (Langyintuo, 2008a).

Table 2. Functions of the district level ILeP stakeholders.

Stakeholder	Functions
Ministry of Agriculture (extension services/crop services)	Disseminate improved agricultural technologies to beneficiaries and backstop crop management practices
Seed producer	Ensure that farmers have easy access to seed of improved drought tolerant maize varieties
Input dealer (agro-chemicals)	Make agro-chemicals easily and readily accessible to beneficiaries
Micro/rural-finance institutions	Facilitate farmers' access to production credit and ensure its proper use and prompt repayment
DTMA-national research system (breeder)	Advice and backstop beneficiaries on the choice of maize varieties to plant. The breeder shall also be responsible for sending feedbacks to DTMA and the National research system on the performance of the varieties.
National research system (agronomist)	Backstop beneficiaries in conservation agricultural and general agronomic practices.
National research system (Socio-economist)	Provide an economic assessment of the implementation of the ILeP and feedback on modifications necessary for scaling-up.
Marketing Company	Facilitate maize grain marketing and value addition
Non-Governmental Organization	Facilitate community mobilization, and provide input distribution and output marketing support to farmers

Source: (Langyintuo, 2008a).

2.2 The Malawian ILeP model

2.2.1 Why Malawi?

Malawi was chosen as an initial ILeP case study as it combined a number of directly relevant challenges. Malawi is characterized by a predominance of maize, drought, and poverty. Maize yields are low, linked to, *inter alia,* poor climatic conditions, low use of chemical fertilizers and limited use of improved varieties (Langyintuo, 2008b). The predominantly resource poor maize farmers operated in a challenging environment, including poorly developed input and output markets, with constrained access to production credit, chemical fertilizer and improved appropriate maize varieties (Figure 2). DTMV development and deployment was thereby deemed as a highly relevant intervention for Malawian farmers but requiring a stakeholder platform approach, as visualized by ILeP, so as to comprehensively address the interrelated challenges.

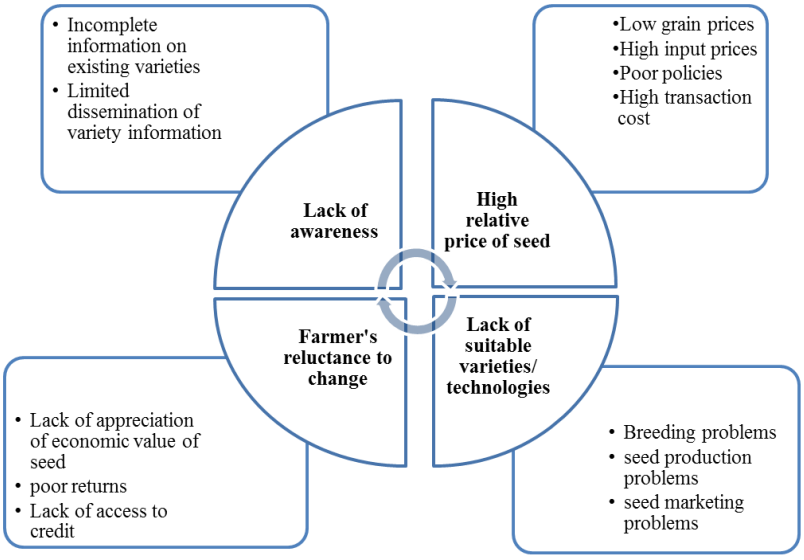

Figure 2: Reasons for the low adoption rates of improved maize varieties in Malawi.
Source: (Langyintuo, 2008b).

2.2.2 Institutional collaboration and synergy

ILeP's original objective as presented to the various stakeholders was to bring together all relevant stakeholders in the maize value chain in Malawi to discuss and plan for the implementation of such a platform in selected districts (Langyintuo, 2008b). A number of meetings were organized in Malawi prior to the 2008-09 maize growing season to create a shared understanding amongst the stakeholders at the various levels (Langyintuo, 2008b). These initial meetings had a heavy involvement of DTMA scientists to initiate the process which was novel to all stakeholders. To facilitate the subsequent process, a national ILeP facilitator was identified and supported within the Ministry of Agriculture and Food Security.

The first ILeP year (2008-09 maize growing season) had a two pronged focus. At the district level, it focused on Balaka District where a consortium of stakeholders implemented DTMV demonstrations on farmers' fields. At the national level, it focused on ensuring the release of the two new DTMVs being promoted (ZM309 and ZM523) and the seed multiplication through a private seed company (Seed-Co Malawi).

During the second ILeP year (2009-10), seed multiplication was continued, bringing on another seed company, Demeter - Farmers' World thereby ensuring certified seed was available for the 2010-11 maize growing season. The district level focus was scaled out to include five new districts - Karonga in northern Malawi; Ntcheu, Neno in the central southern region; and Chikwawa and Nsanje in southern Malawi - in addition to the initial Balaka District. However, the consortium approach was dropped and all demonstrations were implemented through the MoAFS and their frontline staff within each selected district.

3 Methodology

3.1 General background

The demonstration trials are very important components of the ILeP model in Malawi. The trials differ from the conventional demonstration trials in that they are not designed to be implemented only by research and extension personnel but also by a team of different stakeholders in the agricultural research and development arena. The whole procedure followed in implementing the demonstrations and the lessons to be learned will hence be immensely important to inform future plans to replicate the approach in other areas. Accordingly, a survey was conducted on 97 households for the purpose of this study. Similarly, the following sections present the details of the trials and the lessons learned from the farmers' perspective.

The 97 participating farmers were drawn from 79 villages in five districts; Balaka, Chikwawa, Neno, Nsanje, and Ntcheu. The main objective of the survey was to document farmers' experiences of one-two seasons in implementing the ILeP demonstration trials of ZM309, ZM521, and ZM523. Except for Balaka, the responses of farmers are based only on one season observation. Each district's list of names of participants served as a sampling frame and 20 farmers were randomly selected from each of the districts – except for Neno District where the selected EPA had only 17 demonstration trials. A brief questionnaire focusing on the trait based variety preferences of farmers and observations of farmers on management and outreach dimensions of the trials was administered to each of the farmers.

The demonstration trials were started in 2008/09 season with 299 farm households in Balaka District. The trials were implemented collaboratively by the government and the NGO community. More than 52% of the trials were implemented by the MoAFS. All the demonstrations had a similar lay-out, a side by side comparison of three improved OPVs (ZM521, ZM523,and ZM309) and a control chosen by farmers' themselves. Overall performance of demonstrations was favorable, with some 10 having failed due to dry spells.

In the second season (2009/10) 300 demonstration trials were implemented in six districts; Karonga in northern Malawi; Ntcheu, Balaka and Neno in the central southern region; and Chikwawa and Nsanje in southern Malawi. Each district was allotted 50 demonstrations which were fully implemented by MoAFS (Table 3). In this season, the demonstrations in Ntcheu and Karonga were reportedly good, mixed in Balaka, whereas in the other three districts they failed due to prolonged drought.

Table 3. ILeP demonstration trials implementation scheme.

	2008-09	2009-10
Layout	Comparison of 4 varieties: ZM309, ZM521, ZM523 and farmers' choice as control	Comparison of 4 varieties: ZM309, ZM521, ZM523 and farmers' choice as control
Geographic scope	299 demonstrations in 6 EPAs of Balaka District	300 demonstrations in 6 districts with 50 demonstrations per district in one EPA
Institutional scope	MoAFS and seven other stakeholders (Concern Universal; Self Help Int.; NASFAM; CADECOM; LISEP; World Vision; and Agro-dealers)	MoAFS only
Performance	Overall favorable. 10 demonstrations discarded due to dry spells	Southern districts severely affected by drought (Nsanje, Chikhwawa, Neno). Many trials thereby failed and farmers partially replanted with their own seed.
National field day	March 2009 (Balaka District)	April 2010 (Ntcheu District)

3.2 Farmers' participation

About 75% of the respondents do know the names of the varieties being tested. The demonstration trials have one control variety chosen by farmers. The most commonly chosen control was the local variety followed by hybrid varieties such as SC403 and PANNAR germplasms (Table 4). It is important to note that farmers could not clearly identify the variety included in the trials as their choice. Farmers usually know what variety they chose and this is an important observation when it comes to farmers' fruitful participation in the exercise. One might also ask the biological feasibility of testing the OPVs along with the hybrids, despite the fact that farmers choose whatever they presume appropriate. Drought tolerance – although perceived in different ways – is also considerably different among the varieties being tested altogether.

Table 4. Varieties chosen by farmers as checks (farmers' choices).

Variety	Percentage
Local seed	61.1
PAN67	8.9
SC403	7.8
DK 8033	3.3
Hybrid	3.3
ZM621	3.3
Demeter 623	2.2
Bantamu	1.1
MH18	1.1
PAN77(H)	1.1
Unknown to farmers	6.7
Total	**100**

3.3 Locations of the demonstration trials

The demonstration trials were conducted in six districts (Figure 3) and participating farmers from five districts have been consulted about the trials for this study. The demonstration trials in Balaka District were all in Mphilisi EPA while those in Ntcheu District were all in Sharpe Vale EPA. Mphilisi EPA of Balaka is located about 234 km south east of Lilongwe. It covers 40,604 ha and is divided in to 15 sections and 152 villages. Its average altitude is 50 masl and annual average rainfall is 800-1000 mm. About 40% of the EPA is cultivable while the remaining was reported to be uncultivable. There are 20,722 households residing in the EPA. The main crops grown in the area are maize, cotton, pigeon pea, cow pea, sweet potato, and tobacco. Sharpe Vale EPA of Ntcheu is located about 175 km south east of Lilongwe and covers 51,720 ha. In Sharpe vale, there is only 240 ha land cultivable in the wet season and about 34,326 ha of land cultivable in the dry season. The rainy season is very short in this EPA, ranging over the last 10 years from 48 to 85 days per annum. There are 25,311 farming households in the EPA's 15 sections and 45 villages.

In Neno District, the demonstration trials were conducted in Lisungwe EPA. Lisungwe is located in the southern part of Neno at about 300 km from Lilongwe. It covers an area of 94000 square meters with 26% of the EPA covered with forest, 17% uncultivable and the remaining 57% cultivable land. The EPA is located within the dry stretch of land that is situated along the Shire River. The dominant soil types in the EPA are clay soils, sand, and loam soils. The average annual rainfall of the EPA over the last seven years is 638.8 mm with a coefficient of variation of 25%. The main crops being grown in the EPA are maize, sorghum, millet, cotton, cow peas, and ground nuts. The EPA has a population of nearly 13 million with only 6% food insufficient.

The demonstration trials conducted in Chikwawa District were located in Mitole EPA. Mitole has an area of 90,392 ha composed of 69% cultivable land, 5% game and reserve, 3% wetland, and 2% settlement and infrastructure. There are about 18,200 households of which 67% are male headed, 32.7% are female headed and 0.2% are child headed. The EPA is divided into 19 sections and 15 of them are situated on the Shire Valley bottom usually receiving delayed and short rains. The rainfall levels received in 2008/09 season (over 59 days) and in 2009/10 season (over 67) days are 570 mm and 670 mm, respectively. The main crops grown in the EPA are maize, sorghum, millets, ground nuts, rice, pigeon pea, cow pea, and different fruits and vegetables.

The demonstration trials in Nsanje District of southern Malawi were conducted in Zunde EPA. Zunde has eleven sections subdivided into two geographical regions; the hilly sections and valley bottom sections. The EPA has about 16,700 households of which 36% are female headed. The average rainfall of the EPA ranges from 800 mm – 950 mm per year. The dominant soil types in the EPA are sandy clay in the hilly areas and clay loam in the valley bottom areas. Main crops grown in the area are maize, sorghum, millet, groundnut, rice, cowpeas, pigeon pea, sesame, ground beans, and different fruits and vegetables. The EPA is vulnerable to frequent dry spells and sporadic flooding resulting in low crop productivity.

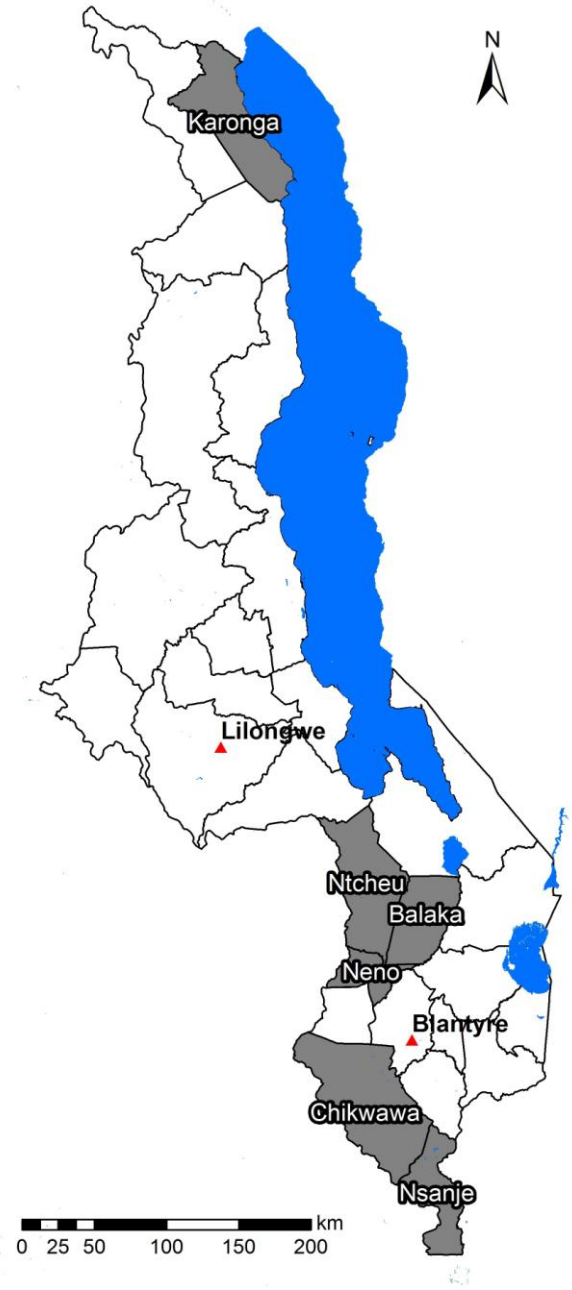

Figure 3: Districts wherein the demonstration trials are being conducted in 2009/10.

4 Results and discussions

4.1 Farmers' trait based preference of demonstrated varieties

All trials have included varieties chosen by farmers so as to make comparisons easier for host and other farmers. These varieties are labeled as "farmers' choice" and were used as checks (references) in comparing the demonstrated varieties vis-à-vis traits that farmers consider important. This section presents farmers' rating of the varieties compared to their choices.

Nearly 57% of the respondents reported ZM309 to out yield their varieties included as a check in the trial, whereas about 17% indicated it to be worse. About 59% of the respondents consider ZM521 as a better variety for yield, whereas 5% of them considered it to be worse. ZM523 was considered to be a higher yielder by about 69% of the respondents while 14% of them consider it to be as good as their varieties.

When it comes to yield stability, 45% of the farmers indicated ZM309 was better than their choices used as checks. However, 43% of the respondents considered it to be the same with their varieties. About 15% of the respondents considered ZM521 as a better variety than theirs for yield stability and only about 5% considered it to be worse. On the other hand, about 48% of the farmers rate ZM523 as better whereas 18% of the farmers believe that it is not that different from their varieties.

About 67% of the respondents considered ZM309 as a more drought tolerant, defined by farmers essentially as earliness, variety compared to their varieties while 9% of the respondents rate is less tolerant than theirs. For the same trait, ZM521 was considered to be better than their varieties by 43% of the respondents. About 6% indicated that it is the worst and the remaining respondents considered it as drought tolerant as their choice. ZM523 was considered to be better by 45.1% of the respondents while 39% of the farmers' believe that it is the same as their varieties.

On disease tolerance, most of the farmers (47%) considered ZM309 as a better variety and 28% indicated that it had the same tolerance levels with their varieties. About 4% of the respondents rated ZM521 better while about 25% of them considered it the same as theirs. More than 51% of the respondents considered ZM523 as more disease tolerant while about 24% think that is not different from their varieties. ZM309 was indicated by 91.4% of the farmers to mature earlier than their varieties while 1% of the respondents considered it to have same maturity period with their varieties. ZM521 was indicated to mature earlier than their varieties by 42% of the respondents. Nearly 33% of the farmers consider ZM521 as early maturing as their varieties. ZM523 was considered to mature earlier than farmers' choices by 45% of the respondents while 11% of the farmers reported that it matures later than their varieties.

On the basis of market price that the varieties can fetch, about 44% of the respondents considered ZM309 better than their own variety while 14% of them considered it to be the worse. Nearly 38% of the respondents believe that ZM521 fetches higher price compared to their varieties in the trial whereas about 7% of the respondents consider it less pricy. ZM523 was indicated by 54.1% of the farmers as better priced, with while 6.6% considering it as worse than their choices.

For the trait of food quality - in terms of the taste of meal prepared from the varieties - about 54% of the farmers considered ZM309 a better variety, whereas the other 36% considered it to be as good as the their varieties. About 35% of the respondents consider ZM521 as better and 1.6% of them consider it less so than theirs. ZM523 was indicated to be the better and less than their varieties by 44% and 5% of the respondents, respectively. Table 5 summarizes the trait based preference of the demonstrated varieties compared to farmers' choice varieties.

Table 5. Trait based comparison of demonstrated varieties with farmers' checks.

	Relative preference (%)	Yield size	Yield stability	Drought tolerance	Disease tolerance	Early maturity	Market price	Food quality
ZM309	Better	57.0	44.9	67.1	46.9	91.4	44.1	53.8
	Same	22.8	42.9	20.3	28.4	1.2	33.9	35.9
	Worse	16.5	2.0	8.9	-	-	13.6	-
	NA	3.1	10.2	3.8	20.6	7.4	10.2	10.3
	N	79	49	79	81	81	59	78
ZM521	Better	58.5	15.0	43.1	45.3	42.2	37.8	34.9
	Same	20.0	35.0	40.0	25.0	32.8	33.3	49.2
	Worse	4.6	5.0	6.2	-	1.6	6.7	1.6
	NA	16.9	42.5	10.8	29.7	23.4	22.2	14.3
	N	65	40	65	64	64	45	63
ZM523	Better	68.8	48.3	45.1	51.2	45.0	54.1	43.6
	Same	13.8	18.3	39.0	24.4	33.8	24.6	41.0
	Worse	2.5	1.7	2.4	-	11.3	6.6	5.1
	NA	15	31.7	13.4	24.4	10	14.8	10.3
	N	80	60	82	82	80	61	78

NA – not applicable. N = number of respondents

Respondents clearly indicated their variety preference such that ZM309 was the most preferred variety (46% of the respondents) followed by ZM523 (36%). The most important reasons behind variety preferences were indicated to be earliness, drought tolerance, poundability and disease and pest tolerance. The table below presents a cross tabulation of the types of varieties and the traits they are preferred for. Apparently, ZM309 is preferred mostly for its earliness and drought tolerance, whereas ZM523 is preferred mainly for its earliness and disease and pest tolerance.

The disaggregated look into the trait preferences shows that both female and male headed households prefer ZM309 to the other varieties. For male headed households ZM523 is the second favorite whereas for female headed households both ZM521 and ZM523 are equally preferred.

Female respondents prefer ZM309 for early maturity and poundability. They also rate ZM523 highly for early maturity and disease tolerance. Male headed households also rank ZM309 and ZM523 high for early maturity and drought tolerance.

Table 6. Trait preference of demonstrated varieties by gender of household heads.

	ZM 309	ZM 521	ZM 523	Farmer's choice
Female (n=18)				
Disease and pest resistance	5.60	11.10	16.70	-
Drought	5.60	-	11.10	-
Early maturity	33.30	11.10	16.70	-
Good cob	-	-	11.10	-
High yield	11.10	11.10	5.60	-
Poundability	16.70	5.60	-	-
Male (n=77)				
Big cob size	-	-	7.80	-
Disease and pest resistance	5.20	5.20	13.00	-
Drought tolerance	46.80	14.30	37.70	1.30
Early Maturity	46.80	14.30	37.70	1.30
Grain size	-	-	14.30	-
High yielding	6.50	6.50	14.30	1.30
Other traits	6.50	5.20	7.80	-
Poundability	2.60	1.30	1.30	-
Total sample (n=95)				
Cob size	-	-	9.47	-
Drought tolerance	18.95	1.05	5.26	-
Early maturity	36.84	9.47	13.68	-
High yielding	7.37	6.32	12.63	1.05
Other traits	4.21	6.32	6.32	-
Disease and pest resistance	5.26	6.32	13.68	-
Poundability	14.74	3.16	2.11	-

4.2 Improvements on the trials – farmers' suggestions

One way of generating data and information about an intervention in rural areas is to start from what improvements they aspire regarding the matter in hand. Accordingly, the discussions made with farmers as to what improvements they want to see in future demonstration trial management revealed a number of interesting issues that range from increasing the scope of the demonstration trials to improvement of some of the traits of the varieties being demonstrated (Table 7).

Increasing the scope of the demonstration trials is the most frequently suggested improvement by participating farmers (~64%). The dimensions of the scope include increasing the plot size, the quantity of seed and fertilizer, the number of farmers involved, and the number of field days held.

The second most important improvement suggested is timely delivery of inputs (51%). The problem of timely delivery of seeds, fertilizer, and pesticides was found to be an important challenge across all six districts. Therefore, it is imperative to highlight the importance farmers are attaching to this challenge to emphasize the need to address it sooner than later.

Another important improvement suggested by nearly 19% of the farmers is inclusion of herbicides in the package. Because of the relatively less intensity of land preparation on the demonstration plots, weed has become rather an important nuisance to farmers hence, the high demand for herbicides – a technology that is not part of the demonstration package. More than 8% of the farmers have also suggested frequent supervision of the trials by extension staff. This is important as farmers surely have questions to ask about the new varieties and other components of the trials. Farmers have also advised on improving traits related to yield, poundability, and cob-cover of the improved varieties (Table 7).

Table 7. Improvements suggested by trial hosting farmers.

Suggested improvement	Percentage (n=97)
Increasing scope of the demos	63.92
Timely delivery of inputs	50.52
Including herbicides	18.56
Improving yield of ZM309	2.06
Improving cob cover of ZM523	2.06
Poundability of varieties	3.09
Frequent supervision	8.25
Make ZM521/ZM523 shorter	1.03

4.3 Institutional stakeholders' assessment of ILeP

The key actors, apart from farmers, involved in the implementation of ILeP are MoAFS, Chitedze Research Center, EPA offices, and NGO's (World Vision International, Concern Universal, Self Help International, NASFAM, CADECOM, and LISEP). A brief structured discussion was made with the personalities in MoAFS, Chitedze, and NGOs about their experiences and opinions in designing and implementing ILeP in the country.

The individuals in these different institutions have had different roles in ILeP, including overall management and political backstopping, sensitizing key farmers and stakeholders about DT varieties to be demonstrated, general technical backstopping, identifying farmers and documenting their activities. The public institutions believe that they have contributed as much as they wanted to in the design and implementation of the platforms. On the contrary, NGOs and some national researchers revealed that the design of ILeP and particularly that of the demonstration trials was rigid and was not accommodative of the interest and opinions of other actors.

Most of the trials in the first year and all of them in the second year were implemented by the crops department of MoAFS and the research department could not have its suggestions incorporated. Some of the NGOs felt that the public actors did not crave for efficiency and effectiveness as their remunerations do not have anything to do with their performance. This argument of the NGOs implies that the very fact that the public sector was the sole decision maker has contributed to the limited success of ILeP.

Opinions of the different actors converge when commenting on the general suitability of the modality with which ILeP has been implemented. The participation of different actors was praised by all discussants. The localized nature of the approach and the attendance of the field days were also identified as important attributes of ILeP's approach.

However, it was also highlighted that some important stakeholders – such as actors in marketing, banking, and seed production and marketing - were left out. Some villages were also indicated to have been flooded with demonstrations of different purposes by different actors. For example, it was mentioned in some villages, there were demonstrations for conservation agriculture, demonstrations for hybrids, and demonstrations for OPVs. This was indicated to have resulted in the provision of different types and sometimes contradictory pieces of information.

The contributions of ILeP for the maize production system of Malawi were well articulated by the national researchers:

> *"We had a problem of maize technology uptake due to drought. The varieties we had were not good enough to be grown in the areas where we implemented our variety testing. ILeP has contributed to the effectiveness of the Agricultural Sector Wide Approach – Support Project. In some areas, such as Salima, Rumpi, Karonga, and Neno, farmers are growing maize as a result of the introduction of ILeP. The demand for the drought tolerant varieties is also high in areas so called high potential - such as central Malawi – because of the climate change and the resulting variability in moisture availability."*

The other actors have also emphasized specific contributions such as:

- Introduction of new technology (one-one planting, ridge spacing has been reduced to 25x75 cm, use of improved seed).
- Extension staff in non-participating areas benefited through experience sharing visits.
- The varieties are in the subsidy program and once a technology is embedded in the subsidy program it will automatically be available to the farming communities.

The key implementers of ILeP, nonetheless, believe that the demonstration trials could have been made more useful. The trials were indicated to have involved only farmers living in areas where the trials were being conducted. But, in areas where irrigation is available, the DTMV could be used as

they are early maturing and hence increase the cropping intensity of farmers. In areas where farmers have access to both rainfed and irrigated farming, there is a need to encourage farmers to use these varieties for better yield. The actors also emphasized that there is a need to have a forum that increases the exposure of farmers to the drought tolerant varieties. Further improvements in the contribution of ILeP were envisaged if the geographical scope of the demonstrations has been expanded, inputs and operational budgets are timely and adequately available, all important stakeholders are involved, and if technology supply is continuous.

Views on the general assessment of ILeP are quite polarized that only the main implementer – crops department of MoAFS – believes that the effort was successful as the final target of delivering the maize technologies to the farming communities was achieved. Others do not share this sense of success essentially due to exclusion of important key stakeholders. Credit, marketing, security, and other infrastructure sectors were not fully involved and this was because ILeP entry point was District Agricultural Development Office (DADO), which is accountable to District Council (DC). The DC could only mobilize those stakeholders within the agriculture sector.

Weaknesses of the design and implementation of ILeP are related to the level of participation of farmers and other stakeholders in the planning process, transfer and management of operational budget and other resources, timing and number of field days, and the inclusiveness of the monitoring and evaluation process of the platforms. Only the crops department of MOAFS was reported to have been spearheading the planning and implementation of the whole of ILeP without any framework to involve farmers and other important actors. It was indicated by some of the discussants that farmers should have been asked at least about their preferences and expectations and be part of the process of identifying lead farmers that host the demonstration trials. The field days were also indicated to have been held only once sometime around harvesting. It is clear that this one-shot approach will not enable collection of feedbacks or farmers' opinion all the way from planting to harvesting.

The provision of the operational budget, seeds and fertilizer in time and in sufficient quantity has also been an important weakness observed in implementing ILeP. The incentive system for the national coordination unit and the joint planning and implementation of monitoring and evaluation of ILeP were also emphasized as gaps observed in ILeP so far.

The discussants identified important strengths of the ILeP effort as well:

- The employment of different approaches and the sensitization of farmers about improved maize technologies that perform under drought.
- The entries of the demonstration trials were few in number and this enabled effective comparison of the entries and detailed understanding of farmers' preferences.
- Despite limited success the platform tried to bring onboard different stakeholders that play crucial role in agricultural research and development.

- Enhanced farmers' access and adoption of improved technology.
- ILeP provided the highly required innovation and dynamism in the maize production.
- Farmers are enjoying increased productivity per unit area.
- Sense of ownership of the whole effort by the ministry of agriculture and food security.
- Resources were made available by CIMMYT/DTMA for local efforts in the country.

4.4 Seed production and marketing

The two ILeP years have generated considerable demand for DTMVs, particularly in the ILeP districts – but so far seed of DTMVs was available only in limited quantity. Certified seed of DTMVs is now scheduled to be commercially available on a large scale. A critical aspect towards this achievement was making the release and making available to farmers seed of DTMVs - ZM309 and ZM523 - during 2008/09 season. Prior to the official release early 2009, SeedCo Malawi showed willingness to start bulking up seed starting in 2008/09 drawing from some 2 metric ton (mt) of breeder seed provided by CIMMYT. CIMMYT also donated a 10 mt consignment of ZM309 to the then President of the Republic of Malawi in September 2009.

SeedCo Malawi started the production of foundation seed of ZM309 and ZM523 in the 2008/09 season, planting approximately 12 ha per variety from where 24 mt ZM309 and 8 mt ZM523 was produced (SeedCo-Malawi, 2010). During the 2009/10 season, SeedCo's target was to produce 100 mt ZM309 and 100 mt ZM523 certified seed for sale during the 2010/11 season (SeedCo-Malawi, 2010). SeedCo sold 3 mt foundation seed of ZM523 to Demeter (Farmers' World) for their own multiplication during 2009/10, generating at least an additional 300 mt of certified seed for sale during the 2010/11 season (SeedCo-Malawi, 2010). Foundation seed was also issued to ICRISAT for their own winter seed production in Karonga.

The Malawi maize seed market is dominated by hybrids which are sold by a number of seed companies. Annual maize seed sales of OPVs amount to an estimated 2500 mt provided by only a handful of companies. The new DTMVs - ZM309 and ZM523 - are both OPVs, as is ZM521 which was released earlier and was one of the early varieties developed for drought prone areas. SeedCo produces both hybrids and to a lesser extent OPVs. SeedCo tentatively plans to produce 1000 mt of drought tolerant OPVs per year in the subsequent 3 years, and expects DTMVs to replace all existing OPVs in its portfolio. Demeter (Farmers' World) produces OPVs, and envisages DTMVs to comprise 20% of its maize seed portfolio. It expects ZM523 to replace its existing production of ZM521 and expects to start producing ZM309 in the near future. Both seed companies appreciate DTMA's ILeP, which is perceived as a useful approach to public-private partnerships. They thereby target their seed sales of DTMVs to ILeP districts.

Except for the purposive targeting ILeP areas, seed of DTMVs would be provided through the seed companies regular marketing channels. Off late, the seed marketing channels in Malawi have been dominated by the national Farm Input Subsidy Program (Nyekanyeka & Daudi, 2009), which

provides entitled households with vouchers to acquire improved seed (maize and beans) and chemical fertilizer. In the 2009/10 season, the maize seed voucher implied an entitlement to either 5 kg hybrid seed or 10 kg OPV seed. In the preceding year, the choice was between 2 kg hybrid and 4 kg OPV, and is likely to have been revised for the 2010/11 cropping season. The fertilizer coupons in 2009/10 provided an entitlement to 2 bags of fertilizer (1 each for basal application and top dressing) but could only be redeemed at the parastatal Agricultural Development and Marketing Corporation (ADMARC). The seed vouchers are more flexible and can be used in various seed outlets, with seed suppliers being centrally refunded a standard amount for redeemed vouchers (150 kwacha / kg seed in 2009/10). Seed companies are allowed to charge a variable top-up of 0-100 kwacha/kg to allow for some price differentiation. The seed vouchers provide access to certified seed to resource poor farmers and a guaranteed seed market for seed companies. The national agricultural input subsidy scheme thereby has had a paramount influence on the Malawian seed market – with seed companies marketing the bulk of their seed in bag sizes that correspond with the voucher entitlements. The seed vouchers can be used for all certified maize seed, thus including ZM309 or ZM523 in the 2010/11 season. Both DTMV producing seed companies expect to sell most of their DTMV seed through the vouchers.

5 Achievements and way forward

5.1 Farmers' interest and information dissemination

Farmers have strongly emphasized the need to increase the scope of the demonstration trials as well as timely delivery of the inputs required, inputs including herbicides and insecticides. The geographical scope of the demonstrations has already been increased such that in the 2010/11 growing season, 400 demonstration trials are being conducted in 10 districts with 40 trials in each of the districts. This expansion is not, however, in line with the interest of the farmers in the districts that have already hosted the trials. Farmers' interest is to have the trials expanded in their areas with more seed, fertilizer, plots and farmers. As much as the geographical expansion is necessary, it is necessary to follow up in the districts that started earlier so that the demonstrations are done with wider scope.

Given farmers' clear interest in drought tolerance of the varieties being tested and due to the fact that drought is the most important challenge farmers are facing in these districts, the whole effort of demonstrating drought tolerant maize varieties can be simply referred to as a very relevant and timely intervention. Farmers who have conducted the trials for two seasons have already retained and shared seeds of the improved maize varieties. The increasing demand for the seeds of the varieties being demonstrated entails timely response from the seed production and marketing sector. Fortunately, the seed companies in Malawi are reacting quickly and the seed is being available albeit through the subsidy program.

An equally important achievement of the demonstration trials is farmers' willingness to continue participating. They are also willing to use their subsidy vouchers to acquire the seed of varieties being demonstrated. Apart from their own interest, hosting farmers have become hubs of information for non-participating farmers. Based only on Balaka and Ntcheu observations, on average about 160 farmers have visited and asked about each of the demonstrations. That can simply translate to huge number of farmers in the 10 districts where the trials are being conducted. This is an important milestone in the project outreaching.

5.2 ILeP as a concerted institutional framework to disseminate DTMVs

The role drought tolerant maize varieties can play in enhancing production and productivity of maize in farming systems that depend on erratic rainfall cannot be overemphasised. One recent example that can highlight this is the widespread incidence of early season drought during 2009-10. The duration of the dry spell was such that even the DTMVs succumbed and many trials thereby failed as demonstrations. This implies the need for careful marketing of DTMVs and avoiding

deploying DTMVs into increasingly arid environments where other crops may have a comparative advantage. The farmers' general interest in ZM309 for its earliness also flags the potential of short duration material both to ease the severity of the hungry season and to escape eventual drought. ZM309 thereby appears as a useful addition to the maize seed portfolio and could have been used to (re)plant plots after the prolonged early season drought of 2009/10, had its seed been widely available. The ILeP demonstrations also show the general interest of resource poor farmers in OPVs, despite the increasing availability of maize hybrids in Malawi. OPV's recyclability has already been identified as an attractive feature in lieu of the erratic nature of the on-setting pattern of the rain.

The Malawian Farm Input Subsidy Program (FISP) has played an overarching role. It has greatly facilitated and enabled setting the stage for DTM deployment and uptake. It provides most of Malawi's resource poor maize farmers with an assured annual access to both improved maize seed and fertilizer. For seed companies FISP has also been instrumental as it provides an assured seed market. Seed companies thereby enhanced their investments in seed production and were likely more inclined to take the risk of expanding their seed portfolio with the new DTMVs.

However, FISP has also undermined the institutional synergy that ILeP was meant to create. The FISP provides farmers with an entitlement to maize seed and fertilizer and secured access to these inputs. This undermined the need to involve other partners/stakeholders or explore institutional innovations in terms of the provision of credit, seed and fertilizer.

As an institutional innovation ILeP has thus been less successful, particularly when compared to the original conceptual model. Instead of providing a platform for increasingly inclusive stakeholder learning and participation, it has evolved into an increasingly narrow operational platform for implementing DTMV demonstrations within MoAFS and their frontline staff. Any initiative implies transaction costs, which can be particularly substantial in the initial stages where there are substantial upfront learning costs and/or when the initiative itself is particularly novel to the stakeholders. For an initiative to succeed there should be something substantial in it for each of the relevant stakeholders to outweigh the transaction costs of their participation. ILeP as an institutional innovation is no exception.

5.3 Implementation peculiarities of ILeP

ILeP's implementation has some peculiar flaws in terms of lack of resources and incentives at the grassroots level, particularly in the second year. The required seed and fertilizer for the demonstrations reached very late at the very onset of the season leaving limited time to organize farmers and demonstrations. There was not sufficient seed (or fertilizer) to replant failed plots after the failure of the initial rains leading to the complete failure of many of the plots in terms of demonstrations as farmers replanted with whatever seed they could lay their hands on. Without additional resources or incentives, the demonstration trials simply became an additional burden to

the frontline staff often lacking resources including for mobility to facilitate greater farmer exchanges and learning. Farmers' involvement from the beginning in such field demonstrations is crucial. The scope of forming farmer clusters and more active facilitation of farmer group formation and group dynamics also merit stronger emphasis. Documentation also suffered with few if any of the progress monitoring forms being subsequently available. ILeP was more successful in creating high level political support, which was helpful to ensure some media coverage, the latter being crucial for information dissemination and awareness.

Successful implementation of an institutional innovation such as ILeP requires careful selection of stakeholders based essentially on relevance and subsequently making sure that all relevant stakeholders stay on board. This implies substantial backstopping of the various partners and the need for an ILeP champion who actively facilitates, generates and keeps the momentum. This relates to the concept of network broker (Anandajayasekeram, Davies, & Workneh, 2007; Hellin, In press) that leads the facilitation. According to Anandajayasekeram, Davies, & Workneh, (2007), the emphasis is less on whether the facilitators are external or internal agents and/or whether they are supported by the private or public sector, the key is that they need to be catalysts or knowledge brokers rather than instructors, working with communities to achieve the same communities' defined and perceived goals.

However, it also calls into question the comparative advantage of research versus development stakeholders. DTMA scientists can play important roles at various stages to create an enabling environment for the institutional innovation to take root, but they do not have the comparative advantage for the day-to-day facilitation and running of an ILeP. This role needs an active and versatile champion in the local development domain.

Questions also remain about the timing of the ILeP components, particularly in view of initial seed availability. DTMA/ILeP played an important enabling role in the release of the new DTMVs and the scaling up of seed production. The involvement of more than one commercial seed producer was also helpful in that regard. Nonetheless, there is still a need for substantial marketing and promotion of DTMVs in Malawi to ensure widespread deployment and uptake. The DTMV seed producers thereby benefited from some initial promotion from public entities through ILeP, but the seed companies still need to supplement this with their own efforts.

5.4 Way forward

In Malawi, ILeP is at a critical juncture having set the stage for subsequent DTMVs deployment and uptake. For the first time substantial amounts of DTMV seed were made available for the 2010/11 maize growing season. ILeP should thereby aim at further enhancing collaboration and information exchange between the seed providers, the other development agents and farmers. There is scope for scaling out demonstrations to other drought prone districts, provided seed will be available. There is

scope for enhancing the effectiveness of the demonstrations – by more carefully facilitating farmer group dynamics. There is also scope for more information dissemination and awareness raising of DTM that would be helped by a more thorough documentation of experiences and monitoring of early DTM adopters. Evidence of the success of DTMV and media coverage may also re-invigorate the interest of other development agents such as the NGO community and enhance farmer demand for DTMV seed.

The data and information we generated and the observations made do not warrant scaling out the ILeP model as such to other countries. The Malawian case was particularly context specific in view of the overarching role of the FISP and thereby inherently difficult to replicate elsewhere. Instead there is potential to explore narrower innovation platforms, specifically focusing on DTMV deployment and uptake. Of utmost importance is the need for a strategic alliance between the development partners and a proactive DTMV champion to facilitate the process. For DTMV deployment and uptake, the availability of DTMV seed are key and future innovation platforms should build on interested and capable potential DTMV seed producers. Institutional innovations that provide the necessary incentives and guarantees to DTMV seed producers, DTM promoters and DTMV adopters and enhance their inter-linkages merit being explored. These institutional innovations are likely to be context specific, but need to be facilitated, monitored and documented in order to derive the scope for replication and scaling out. These will be key building blocks to achieve DTMA's ambitious objectives.

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