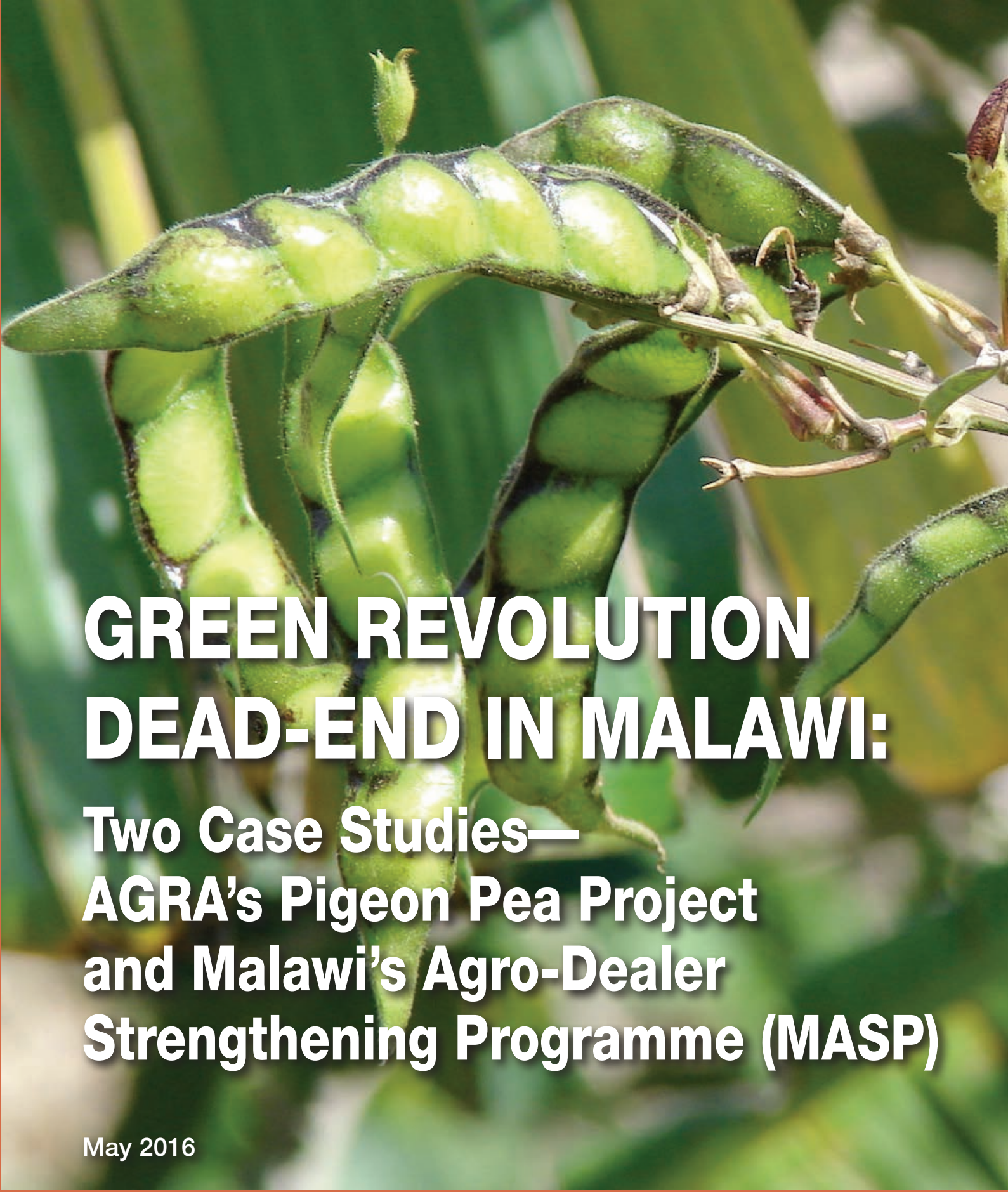

GREEN REVOLUTION DEAD-END IN MALAWI:

Two Case Studies— AGRA's Pigeon Pea Project and Malawi's Agro-Dealer Strengthening Programme (MASP)

May 2016

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CONTENTS

On 7 April 2015 the African Centre for Biosafety officially changed its name to the African Centre for Biodiversity (ACB). This name change was agreed by consultation within the ACB to reflect the expanded scope of our work over the past few years. All ACB publications prior to this date will remain under our old name of African Centre for Biosafety and should continue to be referenced as such.

We remain committed to dismantling inequalities in the food and agriculture systems in Africa and our belief in peoples' right to healthy and culturally appropriate food, produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems.

www.acbio.org.za
PO Box 29170, Melville 2109, Johannesburg, South Africa. Tel: +27 (0)11 486 1156

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ACRONYMS

ACB	Africa Centre for Biodiversity
ADMARC	Agricultural Development and Marketing Corporation
ADP	Agro-dealer Development Programme
AEDC	Agricultural Extension Development Coordinator
AEDO	Agricultural Extension Development Officer
AGRA	Alliance for a Green Revolution in Africa
CA	Conservation Agriculture
CGIAR	Consultative Group for International Agricultural Research
CNFA	Cultivating New Frontiers in Agriculture
CSO	Civil society organisation
DARS	Department of Agricultural Research Services
EACI	Education for African Crop Improvement
EPAs	Extension Planning Areas
FAO	Food and Agriculture Organisation
FGDs	Focus group discussions
FIAC	Fund for the Improvement and Adoption of African Crops
FISP	Farm Input Subsidy Programme
GACs	Group Action Committees
ICRAF	International Centre for Research in Agro-forestry
ICRISAT	International Research Institute for the Semi-Arid Tropics
ISFM	Integrated Soil Fertility Management
MAIWD	Ministry of Agriculture, Irrigation and Water Development
MASP	Malawi Agro-dealer Strengthening Programme
MoAFS	Ministry of Agriculture and Food Security
NASFAM	National Association of Smallholder Farmers of Malawi
NGOs	Non-governmental organisations
PASS	Programme for Africa's Seed Systems
R&D	Research and development
RUMARK	Rural Market Development Trust
SAPs	Structural Adjustment Programmes
SEPA	Seed Production for Africa
SFFRFM	Smallholder Farmer Fertiliser Revolving Fund of Malawi
SHP	Soil Health Programme

KEY FINDINGS

Research which has resulted in the production of this report has highlighted a number of issues for consideration. These appear below.

It is important to take into account the market demand for a product and its links to seed varieties. Understandably, farmers tend not to want to adopt new varieties if there is no market for the output. There are two main potential markets, industrial and local. Industrial markets (agro-processing and food manufacture) require standardised and uniform produce in high and consistent volumes. In most cases, an external agent is responsible for facilitating and/or coordinating access to industrial markets. Conversely, local markets communicate the need for more diverse produce at different times of the year. This requires diverse varieties and localised experimentation to develop context-specific adaptations to meet changing local demands. Research and development (R&D) will be shaped by these different needs, depending on the focus of the intervention. Industrial markets will focus on standardised products with high yields. Local markets will focus on local adaptation and diversity, which is more amenable to direct producer control. While the promise of lucrative markets for introduced varieties often convinces farmers to try new varieties, widespread experience indicates that these markets often do not materialise and farmers are left with excess product which they cannot use or sell.

The pigeon pea project distributed certified varieties only, as did agro-dealers, due to seed laws that prohibit the sale of non-certified varieties. The project did not allow for farmer seed production and farmers became the passive recipients of crops and varieties which were decided without their involvement. An alternative approach could be to include farmers in the R&D and production processes, as well as in discussions about the crops and varieties they would prefer to use. These might be certified varieties from the public sector or locally enhanced varieties with farmer-based quality controls. The latter option makes more sense because it is cheaper and the seed adapts more easily to local conditions. Farmer varieties will also have a longer history of local consumption.

Pigeon pea has added value in that it improves soil fertility, adds nutritional diversity and has a potential economic benefit for producers if markets can be secured. However, the pigeon pea project emphasised formal, commercial markets for products that are not consumed locally. From a soil improvement point of view, the project set unrealistic goals of complete self-sustainability after three years. Since soil fertility enhancement takes time, farmers were not able to incorporate this potential benefit into their assessment of whether or not it would be useful to continue planting pigeon pea after the end of the project. The introduction of pigeon pea without first discussing with farmers and consumers about which legumes they favoured—and in at least some of these areas pigeon pea had not been consumed historically—resulted in an inappropriate intervention. A better starting point would have been to assess the diversity of legumes in a given area, and to orient support towards re-establishing or strengthening the presence of these legumes, based on farmer priorities. But because pigeon pea had been identified and developed at a national level, this was the only choice farmers were given. Legume use also needs to be integrated with other agro-ecological practices for soil fertility; it cannot succeed on its own.

Agro-dealers are primarily a conduit for Green Revolution technologies and associated advice, and are sponsored by government or private companies to support their own technologies. Agro-dealers cannot replace the role of public sector extension services which engage with farmers in the fields, are ideally responsive to context-specific priorities, and should tailor their responses to these priorities. While public sector extension services are also subordinated to a Green Revolution agenda, agro-dealers are structured on a private for-profit basis and as such it would be difficult for them to serve a public purpose. Agro-dealers have no links to R&D that can facilitate direct farmer engagement with the R&D system, and do not play a facilitative role. Rather, they offer narrow advice for specific, mostly corporate products. Further, research reveals that the small-scale private enterprise model is generally not viable

due to the seasonality of demand, unequal competition with corporate outlets, limited demand when subsidies are absent, and challenges related to stock and supply chain management and control. In many cases agro-dealers are merely passive recipients of stock and when the supplier stops supplying their stock disappears. The National Association of Smallholder Farmers of Malawi (NASFAM) has furnished direct evidence of this experience regarding the provision of pigeon pea seed.

The research also indicates the need for the integration of public sector and farmer association/civil society organisation (CSO) extension services, and for these to work together where possible. Findings suggest there would be value in exploring decentralisation, to the farmer level, of seed R&D to serve local markets and own use for farming communities. Cross-learning could enable localised activities to reach other practitioners in other places, and not be caught in a local trap. The facilitation of cross-learning is a role for extension services: sharing and learning could be coordinated at various levels from local all the way to global (e.g. through farmer exchanges with critical reflection). The facilitation of farmer exchanges would enable direct interactions between local players in different settings and their discussion of key issues, priorities and various ways forward.

Yet again our research has revealed the heavy dependence of small-scale farmers in Malawi on synthetic fertiliser. This was evident also in our 2014 study.

Recommendations

- Implementation of participatory R&D on seed needs for local markets;
- Integration of individual three-year projects with the longer-term processes of multi-stakeholder cooperation, to promote and support seed systems, with the active involvement of farmers;
- Integration of legume use or rotations, based on appropriate varieties, into a wider set of agro-ecological practices, to enhance soil fertility;
- Intensification of public sector and farmer association extension services, to strengthen on-the-ground interactions with farmers and links to R&D;
- Application of cross-learning and farmer exchanges to bring farmers into contact with one another, with a key role for extension services regarding the facilitation and coordination of these activities;
- Investment in some alternative resources, such as the above, to reduce the dependence of small-scale farmers on costly and inefficient synthetic fertilisers, and hybrid maize seed in particular.

EXECUTIVE SUMMARY

Introduction and methodology

This study is a continuation of the research programme conducted by the African Centre for Biodiversity (ACB) on the impacts of the Green Revolution on smallholder farmers in southern Africa, with a focus on seed and soil fertility. Earlier research—focussing on the Alliance for a Green Revolution in Africa (AGRA), and supported by the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT) based at Chitedze in central Malawi—highlighted the activities of NASFAM regarding the production of improved pigeon pea varieties. It also revealed the role of private agro-dealer networks as a key channel for the dissemination of Green Revolution technologies. The objectives of this current research project were to follow up the earlier study, to acquire more detail on these AGRA-sponsored activities and to consider the implications for small-scale farmers in Malawi.

The AGRA pigeon pea project and the Malawi Agro-dealer Strengthening Programme (MASP) were implemented under AGRA's Soil Health Programme (SHP) and the Programme for Africa's Seed Systems (PASS), respectively. The main goal of the SHP is to promote integrated soil fertility management (ISFM) practices among smallholder farmers. ISFM uses conservation agriculture (CA) techniques as a base, i.e. no till or minimum till; permanent ground cover; and crop rotations or intercropping, especially of legumes and grains, and adds to these the application of synthetic fertiliser and, often, herbicide use. The Agro-dealer Development Programme (ADP), a sub-programme under PASS, is geared to facilitate access to Green Revolution inputs using a private enterprise model. The model is believed to be more sustainable because it is expected over time to attain financial self-sufficiency. Since the structural adjustment programmes (SAPs) of the 1990s Malawi's agriculture has been characterised by a weak public sector extension system. Strategies to remedy this weak extension have included the promotion of agro-dealers as private enterprises. Agro-dealers are a private sector model for extension that emphasises the product rather than the farmer.

Across the country the productivity levels of smallholder farmers are greatly constrained by depleted soils. The Farm Input Subsidy Programme (FISP) may have produced higher yields for a time, but this came at the longer term cost of declining organic soil fertility, which has created dependency on subsidised synthetic and hybrid seed inputs. Synthetic fertiliser is very expensive and for a number of reasons farmers struggle to revive or adopt agro-ecological soil fertility practices, which include labour intensity, competing demands for crop residues and limited livestock availability. Conservation agriculture and other methods have been employed as a bridge between agro-ecological practices and synthetic fertiliser use.

Markets are important to farmers who seek to realise value from surplus production but, with many sellers and relatively few buyers, farmers are forced into the position of price 'takers' and consequently receive low prices for their products. The Agricultural Development and Marketing Corporation (ADMARC) previously supported marketing but since the SAPs has done so only sporadically. As is to be expected, farmers are not keen to adopt new varieties that require costly inputs without more certainty that there will be markets for their output.

Fieldwork for the pigeon pea project was conducted in Kasungu and Lilongwe districts in central Malawi, while fieldwork for the MASP was conducted in the Balaka and Machinga districts in southern Malawi. Fieldwork involved engagement with officials from NASFAM and the Ministry of Agriculture and Food Security (MoAFS). Key informant interviews and focus group discussions (FGDs) were conducted with both participants and non-participants in the pigeon pea project areas, and semi-structured interviews were conducted with randomly selected smallholder farmers in the vicinity of each agro-dealer interviewed.

AGRA's PIGEON PEA PROJECT

The AGRA pigeon pea project, named Upscaling of Pigeon Pea in Central Region of Malawi, was implemented within the framework of AGRA's SHP, from 2009–2012. The main aim of the SHP is to showcase integrated soil health and fertility practices, with the anticipated result of boosting farm-level productivity. This is achieved through ISFM which incorporates the use of synthetic and local farm inputs and other management practices that conserve soil resources, improve its fertility and increase crop yield, together with the promotion of synthetic fertilisers and herbicides.

Led by NASFAM and comprising a consortium that included ICRISAT, the Department of Agricultural Research Services (DARS) and the International Centre for Research in Agro-forestry (ICRAF), the project was implemented in five districts in central Malawi—Kasungu, Nthisi, Nkhotakota, Salima and Lilongwe. The overall purpose of the project was to introduce pigeon pea into a maize-dominant farming system in central Malawi while, at the same time, promoting CA to improve the texture and structure of soils.

Each member of the consortium was responsible for specific aspects of the project. ICRAF was responsible for promoting CA among participating farmers through training and extension efforts; ICRISAT was responsible for the provision of pigeon pea and groundnut seed to the farmers, through NASFAM; DARS, in close collaboration with ICRISAT, was responsible for designing and monitoring the impact of different pigeon pea planting technologies on soil fertility; and NASFAM facilitated the implementation of the project through the identification of farmers and management of the implementation processes.

Technologies that were implemented, using pigeon pea and groundnut seed, included: i) pigeon pea maize intercropping; ii) pigeon pea phosphorous micro-dosing; iii) pigeon pea and groundnuts in a 'doubled up' legume system; and iv) trials of Fusarium wilt resistant pigeon pea. All seed used in the programme was certified 'improved' seed.

Using its operational structures on the ground, NASFAM identified and invited farmers to participate in the project. NASFAM members are organised into Group Action Committees (GACs) as the smallest unit of operation. All farmers who participated in this project were drawn from NASFAM's GACs in selected extension planning areas (EPAs) across the five districts. Farmers received training on how to mix pigeon pea, groundnut and tephrosia (a genus of flowering plants in the pea family, Fabaceae) with maize, in order to improve soil fertility. Lead farmers were identified to develop demonstration plots.

NASFAM procured basic pigeon pea seed from ICRISAT using funds provided by AGRA and distributed the seed to farmers participating in the project. Farmers were given 2 kg of pigeon pea seed and were expected to repay 5 kg after harvest. They were also given 20 kg of groundnut seed, to repay 50 kg after harvest. Farmer repayments to NASFAM were intended to extend the number of farmers participating in the project in the subsequent years.

Most FGD participants emphasised that the project managed to introduce pigeon pea into farming systems within which it had not been grown at all. Before the introduction of pigeon pea farmers were intercropping maize with groundnuts or practicing crop rotation with maize and tobacco. Also, while animal manure was used as an alternative to synthetic fertiliser, limited livestock has meant the decline of such practices. Pigeon pea production offers the potential to improve livelihoods for resource-poor farmers. It grows well even with limited fertiliser and water, and at the same time achieves nitrogen fixation that boosts the nutrition of associated cereals, particularly maize.

Farmers did not participate in the decision making processes leading to the introduction of pigeon pea in central Malawi. The project idea was conceived by the consortium members and marketed to farmers through NASFAM. Although there was a significant decline in the planting of pigeon pea, which

was estimated at less than 25% following the end of the project, key informants and FGD participants alike observed that its introduction in these areas had some positive impact on the livelihood of project participants. The majority of farmers who embraced pigeon pea were tobacco farmers frustrated by the unprecedented collapse of tobacco prices.

Farmers highlighted the lack of output markets as one of the major constraints to the success of the project. In the project design, NASFAM was to provide a market to farmers with surplus pigeon pea, i.e. over and above the amount repaid to NASFAM for the seed they had initially received. However, NASFAM proved to be an unreliable market, either buying late or not at all, or offering lower than expected prices. Farmers observed that NASFAM markets for pigeon pea were irregular during the lifespan of the project, and were completely discontinued once the project ended. Although alternative markets existed alongside NASFAM, such as regular local markets, vendors and agro-dealers, the prices offered in these markets were equally unattractive. According to NASFAM officials, it was difficult for them to provide predictable and lucrative markets for pigeon pea because of challenges in cash flow. Funds available to them through the project were sufficient only to procure seed from ICRISAT, and did not allow them to create predictable markets.

The lack of markets for the varieties offered through the programme suggests the top-down introduction of external technologies—which cannot be sustained if farmer priorities are not taken into account in the initial design of the intervention. Although grain-legume crop rotations may be of value from an agro-ecological point of view, the project imposed pigeon pea as the type of legume to be used. There is no indication that farmers were first engaged in a discussion about what types of legumes they may have preferred to use, based on local production and consumption histories. Neither was there any indication that the local legume crops and varieties already in use prior to the project were ever considered. Improved varieties are developed in laboratories without farmer involvement and then provided to farmers as an already accomplished solution. In addition, markets were understood by the programme as commercial markets for processing standardised products—not as local markets for local consumption, offering products that would have been more appropriate for the conditions faced by farmers. It is little wonder that farmers did not continue to farm with pigeon pea once the provision of subsidised certified seed varieties came to an end.

Implementation of this project has underlined certain deficiencies in the extension support and services offered to farmers. In the face of a denuded public sector extension service, different compensatory methods were applied, including lead farmers and NASFAM extension services. While farmers generally praised the extension support they received from NASFAM extension workers during the life of the project, there were no mechanisms to ensure the continued effective coordination of extension services by the public sector to farmer associations. Public sector extension officials indicated that this was one of the reasons for the low uptake of technologies, as well as the low number of farmer participants due to the lack of reach. However, even with the provision of public sector extension services it would have been difficult for the project to succeed, given the serious design flaws at the outset.

Evidence of any positive impact by the project on soil fertility is also uneven. There is some scientific evidence of improved soil fertility, and farmers supported this assessment. However, farmers also said they remained dependent on synthetic fertiliser. Other alternative technologies such as CA, the use of organic manure and nitrogen fixing legumes are regarded as being merely supplementary to the use of synthetic fertiliser. There is the larger issue of the promotion of synthetic fertiliser, which undermines piecemeal efforts to adopt fragments of agro-ecological techniques. This came out quite strongly during the assessment of the pigeon pea project. It perhaps explains that farmers embraced it largely as a means to generate cash, rather than a soil fertility improvement intervention. Some officials at the national level argued that it is difficult to talk definitively about soil health (improved texture, structure and fertility), because a three-year project does not allow enough time to capture all the relevant data.

The most striking finding is that the majority of the farmers who were project beneficiaries are no longer cultivating pigeon pea, or have substantially scaled down their cultivation of this crop. This was attributed to the lack of ready access to seed, which is a direct result of not having been empowered to produce their own seed. Seed multiplication was not a formal part of the project. The pigeon pea seed was made available to farmers only from ICRISAT, through NASFAM. Farmers were uncomfortable with the requirement to pay back more seed than they had received and argued that this was unfair. It is also clear that the varieties and even the crop—pigeon pea, rather than other local legume varieties—were inappropriate for the context.

THE MALAWI AGRO-DEALER STRENGTHENING PROGRAMME (MASP)

MASP was designed to improve Green Revolution input supply and output marketing. The latter aspect sought to provide distribution channels for smallholder farmers in remote areas of Malawi, by developing a network of rural enterprises known as agro-dealers. These agro-dealers were expected to become self-sustaining and profitable businesses by the end of the intervention. Between 2007 and 2013 AGRA supported the implementation of MASP under its PASS programme. The implementation was led by the US-based international non-profit organisation, Cultivating New Frontiers in Agriculture (CNFA), (formerly the Citizen's Network for Foreign Affairs), and later by the Rural Market Development Trust (RUMARK).

The overall objectives of the MASP programme were (1) to construct a network of agro-dealers; (2) to strengthen these agro-dealers by providing them with training in business management and Green Revolution farming methods; in order (3) to provide inputs to smallholder farmers and promote Green Revolution practices through demonstration plots. MASP targeted all 28 districts across the country and aimed to train at least 1 500 agro-dealers.

MASP implemented several interventions, including: business training; credit and financial services for selected participants; development and delivery of technical training to agro-dealers regarding product knowledge, the handling and safe use of pesticides, herbicides and fertilisers, and the use of improved seed; support for farmer field days and demonstration plots; small grants to support output marketing; and organisational development.

As small private enterprises the MASP agro-dealers were challenged by having to compete; first and foremost with large corporate outlets, and secondly with urban-based agro-dealers who sprang up to take advantage of FISP and the combination of state and corporate power that drives FISP. Although there are several challenges associated with agro-dealers—such as using defective measurement scales, selling expired products and overcharging for their products, farmers and extension workers generally gave agro-dealers positive evaluations. They noted that agro-dealers have made it easier for farmers to access improved seed for maize and legumes during the main farming season, and that they are the only option on offer.

Instead of directing resources to strengthen the denuded public sector extension service, private sector extension advice and demonstration plots were built into the programme. Agro-dealers were trained to provide extension advice and services, over-the-counter and through demonstration plots, linked to specific corporate input products. Demonstration plots became an important feature of agro-dealership during the project implementation period. Agro-dealers, in conjunction with seed companies and supported by government extension workers, introduced demonstration plots as a way of showcasing the efficacy of various seed varieties and farming practices, to the farmers. Companies that instigated these demonstration plots include Monsanto, SeedCo and Pioneer-Pannar.

These activities declined when the programme came to an end. Agro-dealers no longer feel obligated to present demonstration plots and do not have access to the resources that were available to them during the course of the programme. Since the closure of the project agro-dealers will present demonstration plots only when seed companies take the initiative. This provides a clear indication that agro-dealers function chiefly as a conduit for corporate inputs, and that agro-dealer programmes essentially are subsidised opportunities for the promotion and dissemination of corporate Green Revolution inputs. While it may be that agro-dealers are simply individuals trying to establish small businesses, they are undoubtedly subordinated to a bigger agenda concerned with the expansion of markets for Green Revolution inputs. The main problem with agro-dealers dispensing advice and managing demonstration plots is that they are limited to a corporate-sponsored range of Green Revolution inputs and technologies. Their advice and demonstrations may be useful for introducing new technologies to farmers, but they are unable to offer a diversity of technologies and approaches. These limitations ensure that agro-dealers operate primarily as marketing agents for seed and synthetic fertiliser corporations.

In the first two years of the programme agro-dealers were involved in the distribution of fertiliser through credit facilities which were discontinued due to high default rates, estimated at 70–80%. Agro-dealers attributed the high default rate on the credit facilities, which were brokered and guaranteed by CNFA and other financial institutions, to high interest rates which ranged from 50–60%. The collapse of credit facilities made it impossible for most agro-dealers to sell large volumes of fertiliser and seed on their own. Clearly this was not a viable strategy. The approach had been based on the expectation that the demand for Green Revolution products would be strong enough to sustain thousands of profitable agro-dealer businesses, but without the subsidies provided through the programme, the demand evaporated and agro-dealer businesses could not succeed on the terms defined by the project designers.

Our assessment revealed that most agro-dealers are compelled to operate a diversified business model and, due to the intermittent seasonal demand for agricultural inputs, must stock groceries and other goods in addition to agricultural commodities. They are also competing with subsidised FISP suppliers. MASP promoted the involvement of agro-dealers in the purchase of farm produce as a strategy to shield farmers from the exploitative tendencies of other vendors. During the first two years of the project some agro-dealers engaged in product marketing using credit facilities extended to them by various financial institutions, which were guaranteed by CNFA. Once again, since the end of the project, very few agro-dealers have continued to provide markets for farmers' produce, citing reasons such as financing constraints; higher transportation costs; bogus coupons; delays in processing commissions; the lack of good infrastructure for warehousing; tough conditions for loans; and stiff competition from migrant vendors during the harvest season.

Research methodology

The present study was conducted in four districts across the country, as shown in Figure 1 below. Fieldwork for the AGRA pigeon pea project was conducted in the Kasungu and Lilongwe districts in central Malawi, while fieldwork for MASP was conducted in the Balaka and Machinga districts in southern Malawi. These two sets of districts fall within distinct agro-ecological zones. Kasungu and Lilongwe belong to the central Malawi mid-altitude plateau zone. It lies at about 1 000–1 300 m; experiences 600–800 mm of rainfall annually, starting from November to April; and has sand, sandy loam and loam sandy soil textures, with soil acidity projected at 6.4 pH. The main crops grown in these areas include maize, tobacco, groundnuts, soya beans and common beans. Balaka and Machinga belong to the Malawi Lakeshore agro-ecological zone which lies at an altitude of 200–500 m; experiences 600–800 mm of rainfall annually, starting from October to March; the soil texture for these areas is predominantly sand and loamy sand with an estimated soil acidity of 6.1 pH. The main crops grown in these areas include maize, cotton and legumes. Both ecological zones generally are experiencing similar challenges in as far as farming is concerned. These include a high degree of climate variability that entails a frequent interchange of floods and droughts; poor access to produce markets dominated by vendors who offer smallholder farmers very low prices; limited availability of qualified extension workers; and outbreaks of new crop pests and diseases.

Figure 1: Fieldwork sites for the pigeon pea project and MASP

Source: http://www.d-maps.com/

For each of these projects, fieldwork was conducted at the national, district and local levels. At the national level, semi-structured interviews were held with stakeholders drawn from government agencies, NGOs, institutions allied to the Consultative Group for International Agricultural Research (CGIAR) and seed companies, to discuss key programmatic issues with reference to the pigeon pea project and MASP. Fieldwork for the pigeon pea project was conducted in the Chipala and Lisasadzi Extension Planning Areas (EPAs) in Kasungu, and the Chiwamba and Mpenu EPAs in Lilongwe. Fieldwork for MASP was conducted in the Nyambi and Nsanama EPAs in Machinga, and the Mpilisi and Ulongwe EPAs in Balaka. At the district level, fieldwork involved engagement with officials from NASFAM and MoAFS. Local level fieldwork comprised engagement with farmers in all four districts. Focus group discussions (FGDs) were conducted with both participants and non-participants in the pigeon pea project areas, and semi-

structured interviews were conducted with randomly selected smallholder farmers in the vicinity of each agro-dealer interviewed. In both the semi-structured interviews and FGDs, a checklist was used merely as a pointer in a flexible manner to make the discussions more conversational while still maintaining structure and control. The flexible and open-ended nature of the discussions permitted an iterative process of refinement whereby lines of thought identified in earlier discussions were presented later to participants.

Eight FGDs were conducted for the pigeon pea project. In each EPA, two FGDs were held, one with participants and another with non-participants. Each FGD had an average of 12 participants divided equally between men and women. For MASP, three agro-dealers were interviewed per each EPA, bringing the total to 12. For each agro-dealer interviewed, two smallholder farmers (a male and a female) were interviewed in their vicinity. These smallholder farmers were randomly selected to assess the role and performance of agro-dealers in their respective areas. Thus an equal number of male and female farmers, estimated at 56 respectively, were engaged during the fieldwork in Kasungu, Lilongwe, Balaka and Machinga districts.

THE AGRA PIGEON PEA PROJECT

Project description

The AGRA pigeon pea project, named Upscaling of Pigeon Pea in Central Region of Malawi, was implemented within the framework of AGRA's SHP and was rolled out in 2008. The main aim of the SHP is to showcase integrated soil health and fertility practices, with the anticipated result of boosting farm-level productivity. This is achieved through integrated soil fertility management (ISFM) which incorporates the use of synthetic and local farm inputs and other management practices that conserve soil resources, improve its fertility and increase crop yield (Mutegi and Zingore, 2014), together with the promotion of synthetic fertilisers and herbicides. The programme is implemented through four thematic sub-programmes, namely: i) ISFM scale out; ii) extension and advisory; iii) fertiliser supply and policy; and iv) training and education.

A consortium led by NASFAM implemented this project from 2009 to 2012, with financial support from AGRA. The other members of the consortium included ICRISAT, the Department of Agricultural Research Services (DARS) and the International Centre for Research in Agro-forestry (ICRAF). The project was implemented in five districts in central Malawi, namely: Kasungu, Nthisi, Nkhotakota, Salima and Lilongwe. The overall purpose of the project was to introduce pigeon pea into a maize-dominant farming system of central Malawi, while at the same time promoting CA to improve the texture and structure of soils. Pigeon pea was introduced to improve soil fertility and add organic matter to the soil mainly because pigeon pea has the ability to fix up to 235 kg of nitrogen per hectare and produce more nitrogen per unit area from biomass than many other legumes. Moreover, it has been demonstrated that maize yields from unfertilised maize intercropped with pigeon pea could equal the yields of moderately fertilised monocropped maize (Myaka, et al., 2006).

Each member of the consortium was responsible for specific aspects of the project. ICRAF was responsible for promoting CA among participating farmers through training and extension efforts; ICRISAT was responsible for the provision of pigeon pea and groundnut seed to the farmers through NASFAM. DARS, in close collaboration with ICRISAT, was responsible for designing and monitoring the impact of different pigeon pea planting technologies on soil fertility; and NASFAM facilitated the implementation of the project through identification of farmers and management of the implementation processes. The project targeted 20 000 to 30 000 farmers across the five districts. All seed used in the programme is certified, "improved" seed. ICRISAT provided three varieties of pigeon pea, namely: ICEAP 01514/15; ICEAP 00557; and ICEAP 00040. ICRISAT also provided groundnut seed known as CG7. The technologies that were implemented using the pigeon pea and

groundnut seed included: i) pigeon pea maize intercropping; ii) pigeon pea phosphorous microdosing; iii) pigeon pea/groundnut doubled up legume system; and iv) trials of Fusarium wilt resistant pigeon pea.

NASFAM identified farmers to participate in the project using its operational structures on the ground. NASFAM members are organised into Group Action Committees (GACs) as the smallest unit of operation. All farmers who participated in this project were drawn from NASFAM's GACs in the selected EPAs across the five districts. The farmers received training on how to mix pigeon pea, groundnut and tephrosia with maize, in order to improve soil fertility. Lead farmers were identified to develop demonstration plots where they planted two lines of legumes alternating with two lines of maize. Training was offered to farmers jointly by members of the consortium with each focusing on their specific aspects of the project.

NASFAM procured basic seed from ICRISAT, using funds provided by AGRA, and distributed the seed to farmers participating in the project. NASFAM gave farmers 2 kg of pigeon pea seed and expected farmers to repay 5 kg after harvest. Farmers were given 20 kg of groundnut seed and were expected to repay 50 kg. These repayments to NASFAM were intended to extend the coverage of farmers participating in the project in subsequent years. All participating farmers received seed from NASFAM while lead farmers who developed demonstration plots also received fertiliser, pesticides and herbicides. The rest of the participating farmers had to procure fertiliser, pesticides and herbicides on their own. In addition to providing financial support, AGRA played a key role in building the capacity of the project implementers in relation to the technologies with which the project worked. AGRA was further engaged in field monitoring and evaluation visits to assess progress towards the goals of the project. All consortium members provided progress reports to AGRA at quarterly intervals.

Project results

FGD participants emphasised that the project managed to introduce pigeon pea into farming systems within which it had not been grown at all.[1] Pigeon pea was introduced in selected districts in central Malawi primarily as a new crop with potentially lucrative markets, but also as a strategy to enhance soil fertility. The soils are heavily depleted due to continuous maize cultivation and most of the farmers are unable to afford sufficient fertilisers and other farm inputs to produce efficiently. Before the introduction of pigeon pea farmers were either intercropping maize with groundnuts or practicing crop rotation with maize or tobacco. Further, animal manure was used as an alternative to synthetic fertiliser but "the progressively diminishing ownership of livestock per capita over the years, worsened by shortage of grazing space and total collapse of public veterinary services, has made the use of animal manure no longer a viable option for most farmers".[2]

The decision to introduce pigeon pea in central Malawi was motivated by the apparent superiority of pigeon pea to fix nitrogen in the soil. According to Mutegi and Zingore (2014), pigeon pea production offers the potential for improving livelihoods for resource poor farmers as it can grow well even with limited fertiliser and water and fix nitrogen that can boost the nutrition of associated cereals, particularly maize. One of NASFAM's extension officers observed that "pigeon pea is often the only crop that gives some grains during dry spells, when other legumes and cereals wilt and dry up as a result of moisture stress".[3]

Farmers did not participate in the decision making processes leading to the introduction of pigeon pea in central Malawi. The project idea was conceived by the consortium members and sold to farmers through NASFAM, targeting primarily the 19 districts in which NASFAM operates. The five districts where the project was implemented rank as

1. FGD with participants in Chiwamba EPA, Lilongwe District, 15th August 2015.
2. Interview with a government extension worker, Mpenu EPA, Lilongwe District, 20th August 2015.
3. Interview with a NASFAM extension worker, Chipala EPA, Kasungu District, 2nd August 2015.

the hardest hit in terms of depletion of soil fertility. In fact, most farmers pointed out that "we had a very negative attitude towards pigeon pea; we labelled it the food of the people of the southern region ... Prior to the project people who were seen eating pigeon pea in this area were considered destitute".[4] NASFAM recruited farmers who were members of their GACs, giving priority to those farmers who had paid their membership fees, had adequate land to accommodate the cultivation of pigeon pea, and those whose land was along main roads and could serve as demonstration plots to showcase the benefits of pigeon pea cultivation in their respective areas.

Although the continued cultivation of pigeon pea is relatively low, estimated at less than 25% following the end of the project, key informants and FGD participants alike observed that its introduction in these areas had some positive impact on the livelihood of the project participants. They observed that:

- Some farmers had accumulated assets arising from cash realised from the sale of pigeon pea that can fetch prices as high as MK400/kg;
- The project had contributed to improved nutrition because pigeon pea are no longer used exclusively as a cash crop but also prepared for consumption at household level;
- Pigeon pea stalks have eased fuel problems as they are being used as source of firewood;
- The project had contributed to improvement in the soil condition of most farmers because pigeon pea breaks soils—however hard they may be, prevents runoff and the leaves act as a mulch preventing rapid evaporation.

In some cases the introduction of pigeon pea has replaced tobacco farming in Kasungu district. Other tobacco growing districts such as Lilongwe were not affected because "NASFAM had intensified the promotion of groundnuts as an alternative cash crop to tobacco that was experiencing price crises".[5]

The majority of the farmers who embraced pigeon pea were tobacco farmers frustrated by the unprecedented collapse of tobacco prices. Tobacco prices have recovered somewhat but some of these farmers continue growing pigeon pea "because of its quadruple benefits: improves soil fertility, generates income, provides protein rich supplement, and serves as a source of fuel".[6]

Farmers preferred mainly two varieties of pigeon pea: ICEAP 00557, known locally as '*mwayi wathu alimi*'; and ICEAP 00040, known locally as '*kachangu*'. The former is an early maturing variety which takes about six months to mature, while the latter takes nine months. Farmers preferred '*mwayi wathu alimi*' as a sale crop, because its early maturity affords farmers the opportunity to maximise returns, while '*kachangu*' was chosen for consumption. Of all the pigeon pea varieties introduced by this project, '*kachangu*' cooks very easily and is tastier than the rest. Farmers who are still cultivating pigeon pea rely almost entirely on recycling the seed they received through the project. According to NASFAM officials at the national level, once the project is over farmers are supposed to procure fresh seed from ICRISAT on a yearly basis. However, this is very difficult for most farmers because the unsubsidised improved seed is very expensive and it is not yet available from alternative outlets. Farmers have found also that it is not necessary to purchase pigeon pea seed every year, because it can be recycled for at least three years without significant yield loss. Recycling legumes can be considered good agricultural practice but proposals in Malawi's draft seed policy aim to limit such activities in favour of breeders' rights (Ministry of Agriculture, Irrigation and Water Development (MAIWD), 2014). This will threaten both the livelihoods of farmers and the adaptation of varieties for local conditions, which will fundamentally undermine agricultural biodiversity. This is discussed in more detail in the section on seed, below.

4. Ibid.
5. Interview with a NASFAM extension worker, Lisasadzi EPA, Kasungu District, 3rd August 2015.
6. FGD with participants in Chipala EPA, Kasungu District, 4th August 2015.

Markets for farm produce

Farmers emphasised the lack of output markets as one of the major constraints to the success of the project. According to the project design, NASFAM was to provide a market for farmers with surplus pigeon pea, i.e. over and above the amount repaid to it against the amount of seed given to farmers at the beginning of the farming season. Farmers claimed that NASFAM promised to offer them "a steady and lucrative market for surplus pigeon pea".[7] As a main buyer, NASFAM turned out not to be an unreliable market, either buying late or not at all, or offering lower than expected prices. Farmers observed that NASFAM markets had been reliable during the first year of the project only and that they became routinely unpredictable thereafter.

It is against this backdrop that most FGD participants argued that "the project could have transformed their lives on a sustainable basis if there was a guaranteed market for the pigeon pea".[8] In this regard, smallholder farmers blamed NASFAM for failing to honour its promise to provide ready and lucrative markets for pigeon pea. While alternative markets exist alongside those of NASFAM, such as regular local markets, vendors and agro-dealers, the prices offered in these markets were equally unattractive, often lower even than those offered by NASFAM. Thus the absence of NASFAM markets further depressed the prices available to farmers in these alternative markets.

NASFAM markets for pigeon pea were irregular during the entire lifespan of the project and were discontinued when the project ended. According to NASFAM officials, it was difficult for them to provide predictable and lucrative markets for pigeon pea because of challenges in cash flow. The funds they received via the project were enough to procure seed from ICRISAT but not enough to create predictable markets for the surplus pigeon pea produced by smallholder farmers. They argued that there were not enough resources for marketing because the project was designed principally as an intervention to enhance soil fertility. In subsequent years, although NASFAM used the pigeon pea purchased from farmers to scale up the project, these markets were discontinued completely after the end of the project, due to high operating transaction costs. This suggests that they were not economically viable from the outset. The volume of pigeon pea produced by farmers has decreased substantially—in the absence of seed and extension support most farmers have abandoned its cultivation altogether.

The conclusion reached by farmers is that market demand for pigeon pea, in the absence of NASFAM, is too limited to support lucrative cultivation of this particular crop. Consequently, there is uncertainty over the sustainability of pigeon pea farming in central Malawi, an area that is very much dependent on the availability of markets for smallholder farmers, especially in the context of unstable tobacco prices. Fieldwork has demonstrated that farmers were focused on the cultivation of pigeon pea as a means to generate cash, rather than for soil fertility improvement or nutritional benefits.

The lack of markets for the varieties offered through the programme suggests the top-down introduction of external technologies, which cannot be sustained unless farmers' priorities are taken into account at the outset, and incorporated into the design of the intervention. Although grain-legume crop rotations may be of value from an agro-ecological point of view, the project chose and imposed pigeon pea as the type of legume to be used. There is no indication that farmers were first engaged in a discussion about what types of legumes they may have preferred to use, based on local production and consumption histories. There is also no indication that the local legume crops and varieties already in use prior to the project were considered as an option. Improved varieties were developed in laboratories without farmer involvement and then provided to farmers as an already accomplished solution.

7. FGD with participants, Chiwamba EPA, Lilongwe District, 19th August 2015.
8. FGD with participants, Lisasadzi EPA, Kasungu District, 5th August 2015.

In addition, markets were understood by the programme as commercial markets for processing standardised products and bore no resemblance to markets for local consumption, which would have offered products that are more appropriate for the conditions faced by farmers. It is little wonder that farmers did not continue to farm with pigeon pea once the provision of subsidised certified seed varieties came to an end.

Extension support and services

Implementation of this project has underlined deficiencies in the extension support and services offered to farmers. Extension services in Malawi have suffered a great deal following extensive reforms in the agricultural sector, which can be traced back to the early 1980s (Mvula, *et al*., 2003). The numbers of extension workers have substantially declined and those who remain are often not properly resourced to discharge their duties effectively. The project introduced the concept of lead farmers with demonstration plots to address the shortage of extension workers. Organisations like NASFAM have their own extension workers to ensure the sustainability of the interventions they initiate.

Farmers generally praised the extension support they received from NASFAM extension workers during the lifespan of the project. NASFAM extension workers were described as "hardworking and committed to the project's activities; the project should have been a huge success if we had access to predictable and lucrative markets".[9] Farmers did not evaluate government extension workers as positively as NASFAM's extension workers. Comparing government and NASFAM extension workers, farmers characterised government extension workers as "demotivated, less reliable and not always available".[10]

Although NASFAM provided its own extension officers to the project, there were no mechanisms for ensuring effective coordination between extension services in the farmer association and those offered by the public sector. Proper coordination is imperative in order to ensure the long-term sustainability of initiatives such as those introduced by the project. This requires adaptation, experimentation and learning about the extension system itself, rather than just taking its existence for granted. Public extension services are very critical for ensuring that new practices are mainstreamed, but are challenged by the fact that the existing menu of extension services is geared towards Green Revolution crops, technologies and methodologies. Public extension is further weakened by the lack of commitment shown by existing staff who often prioritise activities that generate personal rewards. This may be a question of political motivation—they may feel they are not working towards shared goals.

However, the picture painted by government extension workers portraying themselves in the context of this project is quite different. Most government extension workers attributed the apparent limited success of the project to the non-existent working relationship between themselves and NASFAM extension workers. They argued that "as a project, they [NASFAM] should have ensured that they established a working relationship with us, which would have enhanced the prospects of sustainability beyond its expiry date".[11] One of the extension workers described this more emphatically: "the low adoption rate of the pigeon pea in the post project period is largely a result of the failure of the project to recognise the significance of government extension workers"[12] They further argued that "as people who live closer to the farmers, we were in a good position to play a key role in marketing the crop among farmers through field days and demonstration plots, as well as searching for alternative lucrative and stable markets for pigeon pea especially in the post project period".[13] However, even with public sector extension it would have been difficult for the project to succeed, given the

9. FGD with participants, Chiwamba EPA, Lilongwe District, 17th August 2015.
10. FGD with non-participants, Lisasadzi EPA, Kasungu District, 4th August 2015.
11. Semi-structured interview with a government extension worker, Mpenu EPA, August 2015.
12. Semi-structured interview with a government extension worker, Chiwamba EPA, August 2015..
13. Ibid.

serious design flaws at the outset—especially regarding the choice of crops and purpose for introduction.

Synthetic fertiliser and soil fertility

Although evidence of the project's positive impact on soil fertility is uneven, some stakeholders at the national level argued that the positive impact on soil condition has been scientifically proven. One of the officials handling the soil fertility component of the project observed in an interview that "participating farmers' soil status improved quite tremendously on the basis of the comparison of the soil samples before and after the project".[14] He argued further that their analyses provide sufficient evidence to suggest that improved pigeon pea production can boost food security and improve household incomes, due to increased soil fertility.

This was corroborated by some participating farmers who stated that signs of improved soil fertility are evident. Farmers reported good stands of maize in the rotation, plus changes to the soil texture from hard to soft, on plots that were planted to pigeon pea. Farmers attributed these developments to the decomposition of pigeon pea crop residues which enrich the soil. They indicated that the softness of the soil texture is enhanced by the deep root system of pigeon pea. They observed further that the soft soil texture enables the absorption of high levels of water, leaving the soil moist even during prolonged dry spells.

The difficulty of depleted soil fertility is widely acknowledged by farmers in central Malawi. They are still firmly wedded to the idea that the lasting solution to this problem is the use of synthetic fertiliser and confirmed that they remain dependent on synthetic fertiliser.[15] Similar sentiments were echoed by another FGD whose participants observed: "... our fields are indeed looking healthier but this does not mean we do not need fertiliser; we also need fertiliser to boost our production".[16] Alternative technologies such as CA, applications of organic manure, and the use of nitrogen fixing legumes are regarded as being merely supplementary to the use of synthetic fertiliser. This perspective was especially apparent during the assessment of the pigeon pea project. It perhaps explains that farmers embraced the use of pigeon pea largely as a means to generate cash, rather than a soil fertility improvement intervention. This situation is exacerbated by the promotion of synthetic fertiliser which undermines piecemeal efforts to adopt fragments of agro-ecological techniques.

Farmers felt that intercropping or rotation with pigeon pea planted fields is not a perfect substitute for synthetic fertiliser. They argued that "while pigeon pea improves soil fertility the increase in productivity levels cannot rival that brought about by synthetic fertiliser".[17] Farmers can, of course, acquire fertiliser through FISP, but not everyone is entitled to it since FISP serves only half the total farming population in Malawi. Moreover, the quantities of fertiliser that farmers access through FISP are not enough to meet all their needs. In most cases, farmers who benefit from FISP share with others fertiliser that is provided in limited amounts only. This further undermines the overall efficiency of fertiliser use. The limited landholding sizes per capita make it very difficult for farmers to experiment with alternative productivity enhancing technologies, without threatening their household welfare.

Constraints on the use of pigeon pea for soil fertility raise questions about how the project was introduced in the five districts. There are no questions about the desirability of the project on a purely scientific basis—evidence shows clearly that soils in these areas are heavily depleted due to the continuous cultivation of maize, and that pigeon pea contributes to nitrogen fixation which

14. Semi-structured interview with an official at the Department of Agricultural Research Services (DARS), 1st August 2015.
15. FGD with participants in Lisasadzi EPA, Kasungu District, 6th August 2015.
16. FGD with participants in Chipala EPA, Kasungu District, 7th August 2015.
17. FGD with participants, Mpenu EPA, Lilongwe District, 16th August 2015.

improves the quality of soil. However, fieldwork demonstrates that the project was introduced in the districts as a top-down initiative, with no or inadequate engagement with farmers about the underlying logic of the project within the framework of ISFM. This would have allowed the project's architects to appreciate several other variables critical to its success. A participatory research project design would have enabled farmers fully to understand the project, and also to contribute their own ideas. This would have allowed action learning which, in turn, would have facilitated adaptation to changing circumstances, during the course of project implementation.

Pigeon pea varieties were brought from afar to rural farmers, who were told they would be provided with a market for their produce. But if farmers had been able to decide for themselves which products they wanted to farm, they may have preferred to work with local legumes and varieties with already existing value for local consumption. There must be some use for a crop beyond soil fertility, and when the commercial markets promised to farmers did not materialise, they could not have been expected to continue planting a variety purely for the purpose of improving soil fertility. There must be either an external commercial market or local use value for any crop, otherwise the effort is too much. It is apparent that there was no prior local consumption of the introduced crop and varieties. So the question at the outset of the project should have been: what local legumes are farmers already using? Eschewal of this question suggests that soil fertility was a secondary consideration only, and that what the project really hoped to achieve was the introduction of new crop varieties for commercial markets—which did not actually materialise in the end.

Some officials at the national level argued that it would be difficult to talk definitively about soil health (improved texture, structure and fertility) because the three-year lifespan of the project was not enough for full capture of all the relevant data or benefits. One of the stakeholders observed that it was "a very big blow to us for the project to end just after three years because for soil health programmes, the impacts come after three years and the closure of the project meant that we could not effectively capture these impacts".[18] He emphasised that the experiments being run by the project needed to be repeated several times before definitive conclusions could be drawn—running them once or twice was insufficient because the alteration of soil structure and texture takes time and experimentation. This flaw in the project design explains the fact that most participating farmers have not sustained the cultivation of pigeon pea beyond the end of the project. The assessment further revealed that few farmers have adopted CA, which had been promoted as an integral part of the soil enhancement measures. Extension workers observed that most farmers are reluctant to adopt CA because they consider it labour intensive. In one of the EPAs, an extension officer observed that "it was only one farmer who seriously adopted CA".[19]

Both key informants and farmers felt that CA was insufficiently emphasised and did not become an integral part of the project. Interviews with extension workers and FGDs with farmers revealed that nothing much was achieved in this regard, apart from encouraging farmers to plant tephrosia and promoting intercropping or crop rotation. This is only one of the three core elements of CA (the other two being no till or minimum till, and permanent ground cover or mulching).

Added to this, CA proved difficult in other ways. Most households were using pigeon pea stalks as wood for fuel, which limited the availability of mulch for moisture retention. Most farmers reported tension between the desire to engage in CA and having to keep livestock. The crop residues that are expected to serve as mulch under CA are also used as feed for livestock. Even when farmers do not keep their own livestock, most of the potential mulch is destroyed by stray livestock. All these factors make the practice of CA very challenging. The

18. Semi-structured interview with an official from ICRISAT, August 2015.
19. Semi-structured interview with a government extension worker in Chiwamba EPA, August 2015.

manner in which the project was introduced—as a top-down initiative hatched by consortium members without the involvement of the farmers themselves—has also contributed to its apparent limited sustainability beyond the project end date. The project perhaps could have been sustainable had it been designed as a participatory research initiative that responded to the priority needs of farmers, while being adjusted as and when necessary in response to changing circumstances.

Seed access and availability

The most striking finding is that the majority of the farmers who were project beneficiaries are no longer cultivating pigeon pea or have substantially scaled down its cultivation. This was attributed to the lack of ready access to seed as they were not empowered to produce their own seed. Some government extension workers claimed that "NASFAM did not reveal to the farmers where they can get the pigeon pea seed in case they require it urgently".[20] Both farmers and government extension workers had no idea about where they could get viable pigeon pea seed other than through NASFAM. The main concern expressed by most farmers was that "the situation has not changed even after the project has phased out; we still have to rely on NASFAM in order to access pigeon pea seed".[21] It is also clear that the varieties and even the crop (pigeon pea, rather than other local legume varieties) were inappropriate for the context.

Pigeon pea seed was made available to farmers only from ICRISAT through NASFAM. Clearly, any diffusion of new varieties will be limited if farmers' access to them is restricted and the varieties that were used were confined to the project. Extension services could play a critical role in promoting the diffusion of new varieties, but this requires a well-functioning extension system. According to Mutegi and Zingore (2014), the diffusion of legume seed through alternative channels is challenging because often private entrepreneurs find the distribution of legume seed unprofitable. The modality of seed access during the life of the project, as well as after its completion date, stipulated that farmers access pigeon pea seed on a yearly basis, but only through NASFAM. The practice was such that farmers received 2 kg of pigeon pea seed from NASFAM and were expected to repay 5 kg of seed to NASFAM after harvest. Most farmers argued that this modality is unfair to farmers, because "we have to repay back more than 100% ... This makes it an unattractive option especially since NASFAM no longer provides a market for pigeon pea".[22] Farmers did not make specific alternative proposals about the modalities of seed access but argued that they felt it would be fair to repay the exact amount of seed they had been given.

Although participating farmers were able to harvest beyond the 2 kg of pigeon pea that was given to them through the project, seed multiplication was not formally an integral part of the project implementation activities. According to NASFAM officials, the pigeon pea that farmers produced was good enough to use but its productivity was lower than that of fresh seed procured directly from ICRISAT. Nevertheless, farmers who have continued to grow pigeon pea have relied on recycling the initial seed given to them by the project. Good practice for the recycling of seed, for both the improved seed of pigeon pea and legumes in general, specifies that seed should be recycled for 3–4 seasons only, before seed stocks must be refreshed (ACB, 2014).

Access to improved pigeon pea seed was difficult for smallholder farmers and became even more so after the end of project. This is a great concern, mainly because pigeon pea was being introduced for the very first time in areas where farmers did not have their own pigeon pea seed systems and were entirely dependent on improved, certified seed from the project through NASFAM.

20. Semi-structured interview with a government extension worker in Mpenu EPA, August 2015.
21. FGD with participants in Lisasadzi EPA, Kasungu District, 6th August 2015.
22. Ibid.

THE MALAWI AGRO-DEALER STRENGTHENING PROGRAMME (MASP)

Project description

Malawi's agro-dealer strengthening programme was designed to improve Green Revolution input supply and output marketing distribution channels, and to make these available to smallholder farmers in remote areas of Malawi, by developing a viable network of rural enterprises known as agro-dealers (Kelly, *et al*., 2003; Crawford, *et al*., 2003). These agro-dealers were expected to become self-sustaining and profitable businesses by the end of the intervention. The motivation for MASP was that a strong agro-dealer system is crucial to the success of farmers. The project intended that these local retailers would serve as primary conduits for farm inputs such as seed and soil nutrients, and also provide information to farmers concerning their safe and efficient use. AGRA supported the implementation of MASP under its PASS programme between 2007 and 2013. The implementation of MASP was led by the US-based international non-profit organisation, Cultivating New Frontiers in Agriculture (CNFA), (formerly the Citizen's Network for Foreign Affairs), and later by the Rural Market Development Trust (RUMARK). AGRA supported CNFA to the tune of US$ 4.28 m between 2007 and 2010, while RUMARK received US$ 350 000 between 2011 and 2013.

The overall objective of this programme was to establish a network of agro-dealers and then strengthen them by providing training in business management and Green Revolution farming methods, in order to provide inputs to smallholder farmers and to promote Green Revolution practices through demonstration plots. The implementation of MASP was preceded by a detailed survey of the existing agro-dealer network, to identify under-served areas where new start-up dealerships could be created. Once this had been concluded, potential and existing agro-dealers were identified and were given training and support for their efforts to establish retail stores or distributorships, in areas that were poorly served with farm supply outlets. MASP targeted all the 28 districts across the country and aimed to train at least 1 500 agro-dealers.

MASP implemented several interventions to promote agro-dealers. First, selected entrepreneurs underwent business management training which included sessions on managing working capital, managing stocks, costing and pricing, selling and marketing, record keeping, and managing business relationships. Secondly, MASP provided credit and financial services by helping agro-dealers to access working capital and trade credit, by linking them with input suppliers and microfinanciers. CNFA backed this commercial credit with a 50% credit guarantee for roughly 299 agro-dealers. Thirdly, MASP worked with input suppliers to develop and deliver technical training to agro-dealers regarding product knowledge, the handling and safe use of pesticides, herbicides and fertilisers, and the use of improved seed. This training was complemented by demonstration plots and farmer field days which increased smallholder farmer awareness of, and demand for, improved inputs.

MASP attempted also to address the issue of output marketing. Through agro-dealers, MASP is reported to have created and strengthened linkages between input and output distribution channels. Agro-dealers were trained to serve as points of market information and to trade in outputs, as well as to engage in primary processing, storage, or handling. In this regard, MASP provided agro-dealers with small matching grants to improve storage facilities, construct small processing facilities, and invest in transportation, packaging and handling equipment for farmer outputs. Approximately 297 agro-dealers were trained in output marketing (RUMARK, 2015). MASP also dealt with institutional and organisational development issues relating to the growth and sustainability of agro-dealerships, and supported the development of nine agricultural associations and 29 agro-dealer associations. MASP strengthened these associations through training on organisational management, membership services, networking, advocacy and capacity building. The expectation was

that this would lead to a sustainable forum for advocacy on behalf of small business agro-dealers throughout Malawi.

Project results

It is estimated that MASP has certified more than 1 500 agro-dealers in business management, which is an increase of 150% above the target set by the programme. It is further estimated that by the end of the project, over 1 million farmers and over 5.4 million Malawians had access to the agro-dealer network. More specifically, 1 507 agro-dealers were trained and certified in business management skills; 533 farmer field days were held—featuring 16 supply companies and being attended by over 88 000 farmers; 118 technical training sessions were held—offering information on product handling and safe use and being attended by 1 072 farmers; and 29 associations advocating for agro-dealer interests were created and supported institutionally (RUMARK, 2015).

While MASP has helped to establish new and support existing agro-dealers during the period of its implementation, and over 1 500 agro-dealers were certified in business management, relatively few were able to benefit from the additional services that were provided by the programme. Only 299 agro-dealers (approximately) benefited from the CNFA-backed commercial credit and linkage to micro-finance institutions; and only 297 agro-dealers participated in the output marketing training (RUMARK, 2015).

The landscape for agro-dealers has changed a great deal since the introduction of FISP in the 2005/06 growing season, and since the end of MASP. As noted earlier, the project intended to encourage local retailers to diversify their business portfolios so as to include the supply of Green Revolution technologies to smallholder farmers in their respective localities. The mix of agro-dealers includes those who were targeted by the project and those who have emerged specifically in response to FISP. In other words, without FISP the latter category of agro-dealers would not have appeared. Agro-dealers who were targeted by MASP also participate in FISP, of course, but are based only in those areas in which they conduct their business. Agro-dealers who emerged in response to FISP are not based in rural areas—they operate in urban areas and function as established businessmen or as white collar employees who revive their agro-dealer businesses as soon as the FISP season begins.

In both cases, agro-dealers are engaged only in the sale of seed and not fertiliser. FISP fertiliser is distributed exclusively by two parastatals, namely: ADMARC and the Smallholder Farmer Fertiliser Revolving Fund of Malawi (SFFRFM). Agro-dealers participate in FISP by securing contracts with seed companies and are paid on a commission basis. The major companies that supply agro-dealers include: Pioneer-Pannar, SeedCo and Monsanto. Some of the local companies include Funuwe, Demeter, Peacock and Panthochi. These companies supply predominantly hybrid maize seed and legumes such as groundnuts, beans and soya beans. Many of the agro-dealers targeted by MASP are marginalised when it comes to securing these contracts, because clinching a contract depends on having social ties with senior executives of seed companies. Also, the social ties that enable participation by agro-dealers in FISP come with an additional advantage—they facilitate participation without having to make any significant capital investment.

Although there are several disincentives associated with agro-dealers—such as their use of defective measurement scales, selling expired products and overcharging for their products—farmers and extension workers generally gave the agro-dealers positive evaluations. They stated that agro-dealers have made it easier for farmers to access improved seed for maize and legumes during the main farming season, although seed for legumes is not always available through FISP. One of the extension workers observed that "the presence of agro-dealers has lessened the problems that the farmers were facing especially walking long distances to Balaka to buy seed and other farm inputs and surely their disappearance will be a big blow to farmers' ability to access inputs within easy reach".[23] Similar sentiments were echoed by a farmer who said "nowadays we are very lucky because we are able to buy our seeds close to our homes, even the FISP seeds and legumes are easily provided by agro-dealers,

helping us to save time and distance we used to cover to find inputs in Balaka"[24] However, this should be understood in context. The policy of the government of Malawi is to promote Green Revolution technologies exclusively; it does not provide for support to reinforce or expand alternative practices of agro-ecology or farmer seed systems. Further, the public sector extension services are denuded. Therefore, agro-dealers have become the only channel through which farmers can acquire inputs of any sort. In this context it is unsurprising that farmers react positively when channels are opened that provide them with otherwise inaccessible inputs, such as new seed varieties or fertilisers, which can bolster production for a time. This does not mean that farmers would not opt for other alternatives if these were available.

Extension support and services

Agro-dealerships were conceived first and foremost to serve as a structured distribution network for Green Revolution technologies. The strategy is based on the logic that profitable economic activity is a more sustainable means for the delivery of inputs than unprofitable or subsidised activities. Of course, there was recognition also of the need for initial subsidies, which was precisely the role played by MASP. The acid test is whether agro-dealers will continue to perform a useful function for farmers after the end of the subsidy period, as profitable private enterprises.

Instead of orienting resources to strengthen denuded public sector extension services, private sector extension advice and demonstration plots were built into the programme, and agro-dealers were trained to provide extension advice and services over-the-counter and through demonstration plots, linked to specific corporate input products. Fieldwork indicated that agro-dealers did in fact offer over-the-counter advice for the use of Green Revolution technologies. One of the farmers interviewed observed that "when we go there [agro-dealers] to buy chemicals like cotton pesticides and other stuff they [agro-dealers] tell us how to use and apply them".[25] Similar sentiments were echoed by the agro-dealers themselves: "I am [also] a farmer, and above that I have good knowledge and understanding of most of the things we sell, be it seeds or chemicals, because we were trained by RUMARK but also at the EPA we are called from time to time to receive training which empowers us to help farmers when they buy from us".[26] This was further corroborated by government extension workers who observed that "due to frequent trainings and good cooperation with the EPA, the agro-dealers have vast knowledge to the extent that they are able to provide extension advice to farmers such as suitable crops for different areas, application of particular chemicals and they even have demonstration plots from where farmers learn and appreciate how specific varieties of crops work and even usefulness of some substances like chemicals".[27]

Demonstration plots were an important feature of agro-dealerships during the project implementation period. In conjunction with seed companies and supported by government extension workers, agro-dealers established demonstration plots as a way of showcasing to farmers the efficacy of various seed varieties and farming practices. Companies involved in the development of these demonstration plots include Monsanto, SeedCo and Pioneer-Pannar. Some local companies, such as Demeter and Peacock, also established demonstration plots but these were on a relatively smaller scale. Demonstration plots were active during the project implementation period "because agro-dealers had contracts with seed companies guaranteed either by CNFA or RUMARK".[28] Most agro-dealers developed demonstration plots because doing so was one of the conditions for having their credit lines with seed companies

23. Interview with a government extension worker, Mpilisi EPA, Balaka District, 14th September 2015.
24. Semi-structured interview with a female farmer, Ulongwe EPA, Balaka District, 15th September 2015.
25. Semi-structured interview with a male farmer, Mpilisi EPA, Balaka District, 13th September 2015.
26. Interview with an agro-dealer, Mpilisi EPA, Balaka District, 12th September 2015.
27. Interview with a government extension worker in Nsanama EPA, Machinga District, 14th September 2015.
28. Interview with a seed company official, Lilongwe, 6th August 2015.

guaranteed and sustained. The quality of advice provided by agro-dealers was enhanced by the apparently strong relationship that existed between agro-dealers and extension workers, which was cultivated during the project implementation period. Agro-dealers were invited to EPAs on a regular basis, to share with them specific developments relating to Green Revolution technologies, which they also shared with farmers who visited their shops.

Although agro-dealers had a good working relationship with the public extension system, at the end of the project their enthusiasm for presenting demonstration plots, as a major avenue for providing extension services to farmers, had waned. Contrary to activities during the project implementation period when they had credit facilities with seed companies, agro-dealers now feel less obliged to showcase inputs for farmers as an unsubsidised service. However, agro-dealers will develop demonstration plots whenever seed companies collaborate with them. Field days are rarely an integral part of the demonstration plots unless the seed companies take a special initiative. Increasingly seed companies are presenting demonstration plots on their own, but this undermines the link between agro-dealerships and efforts to shore up deficiencies in the public extension system. This provides a clear indication that agro-dealers function primarily as a conduit for corporate inputs, and agro-dealer programmes are essentially subsidised programmes for the promotion and dissemination of corporate Green Revolution inputs. It may well be that agro-dealers are simply individuals trying to establish small businesses, but it is clear that they are subordinated to a bigger agenda concerned with the expansion of markets for Green Revolution inputs.

Agro-dealers who were interviewed attributed the decline in demonstration plots to the collapse of credit facilities they had enjoyed during the life of the project. The absence of credit guarantee facilities provides no motivation for agro-dealers to support demonstration plots as a way of providing extension services to farmers. This means that agro-dealers now interact with farmers only within the confines of their shops, providing them with more product advice than extension services.

The main problem with agro-dealers dispensing advice and managing demonstration plots is that these are limited to a corporate-sponsored range of Green Revolution inputs and technologies. While this approach may be useful for introducing new technologies to farmers, it is not flexible enough to respond to diverse technologies and conditions. In reality, agro-dealers are simply marketing agents for seed and synthetic fertiliser corporations.

Synthetic fertilisers

One of the aims of MASP was to stimulate and facilitate involvement by agro-dealers in the distribution of fertiliser to smallholder farmers, as a key element of the Green Revolution technological package. According to RUMARK officials, agro-dealers were involved in the distribution of fertiliser in the first two years of the project through credit facilities which they brokered and guaranteed on their behalf at 50% of the costs.The credit facilities were discontinued due to high default rates, estimated at 70–80%. An alternative approached linked agro-dealers to financing institutions but this too did not work. These institutions still looked to the CNFA to guarantee the financial resources that agro-dealers hoped to secure from them, and most agro-dealers did not have the sort of collateral required by financial institutions for credit facilities of this nature.

The collapse of credit facilities has made it impossible for most agro-dealers to sell large volumes of fertiliser and seed on their own. As a result most agro-dealers have become involved in the sale of seed through FISP. Drawing on their negative experiences during the project implementation period, fertiliser companies are reluctant to enter into similar credit arrangements with agro-dealers. Agro-dealers have attributed the high default rate on the credit facilities (which were brokered and guaranteed by the CNFA and/or financial institutions) to high interest rates, which ranged from 50–60% (Chinsinga, 2011). The burden of servicing credit facilities made it

almost impossible for agro-dealers to grow their businesses. This indicates that the strategy was not viable from the outset. The approach was based on the expectation that the demand for Green Revolution products would be strong enough to sustain thousands of profitable agro-dealer businesses. However, without the subsidies provided through MASP, the demand evaporated and agro-dealer businesses were unable to succeed on the terms defined by the project designers.

By and large agro-dealers are not engaged in the sale of fertiliser because this requires a substantial capital investment which most dealers cannot mobilise on their own. One of the agro-dealers indicated "we cannot manage to sell fertiliser because of capital constraints ... Fertiliser requires a huge amount of money and companies are refusing us to sell fertiliser on their behalf".[29] Some agro-dealers have used their own resources to venture into the sale of fertiliser, but this has been on a very small scale. When agro-dealers manage to acquire fertiliser they often repackage it in packs of 1, 2, 5 or 10 kg, ostensibly to meet the needs of various farmers but actually to maximise their profit.

The majority of farmers are poor and rely almost entirely on FISP for their fertiliser requirements. Farmers must accept the smaller packages of fertiliser sold by agro-dealers or do without it altogether. In very rare cases some farmers have found the 50 kg bags to be too much for their portions of land, making it cost effective for them to purchase the smaller packages. However, extension workers claim that the smaller packages of fertiliser compromise the efficiency of fertiliser use; they say that farmers tend to stretch small amounts of fertiliser over large areas of land, in order to feel they have applied fertiliser to as much of their land as possible.

Agro-dealer business model and markets

Assessment revealed that most agro-dealers are forced to run a diversified business model. They stock not only seed, chemicals, fertilisers and farm implements, but also trade in a variety of groceries. This diversified business model and portfolio is imperative because "demand for farm inputs tumbles a great deal during off season and as such the inputs stay long without being bought, sometimes expiring on the shelves which poses a serious threat to sustainability".[30] The demand for chemicals and herbicides is low because they are not included in FISP and agro-dealers procure them using their own resources. Agro-dealers rarely face the problem of expired seed because most of them operate through FISP and companies that supply seed withdraw their stock as soon as the government announces the closure of the FISP season.

While the problem of expired seed does occasionally occur it is on a very small scale, especially for those agro-dealers who sell seed procured on their own and not through FISP. When seed expires it is because the demand is very low outside the farming season, since most of the country is heavily dependent on rain-fed agriculture. The practice of irrigated agriculture remains very low, despite concerted policy efforts over the last five decades to increase the area under irrigation. Agro-dealers who operate outside FISP frequently face serious supply chain challenges regarding the supply to farmers of Green Revolution technologies.

MASP has also promoted involvement by agro-dealers in the purchase of farm produce, as a strategy to shield farmers from the exploitative tendencies of vendors. (Vendors can be described as an unregulated and fragmented collection of individuals who compete on the open market against one another.) The idea was not only to afford farmers easy access to Green Revolution technologies, but also to enable them to achieve decent returns for their produce. As stated earlier, about 300 agro-dealers were trained and supported with resources to provide markets for farmers. Not many agro-dealers are engaged in buying produce from farmers, citing capital constraints as a major impediment. During the first two years of the project some agro-dealers engaged in produce marketing, using the

29. Semi-structured interview with an agro-dealer in Nsanama EPA, 15th September 2015.
30. Semi-structured interview with an agro-dealer in Mpilisi EPA, 16th September 2015.

credit facilities extended to them by various financial institutions, guaranteed by the CNFA. Few agro-dealers have continued to provide markets for farmers' produce and the prices they offer are not significantly different from those offered by vendors. Most agro-dealers cited several challenges that make it almost impossible for them to provide reliable produce markets for farmers. These include serious financing constraints; higher transportation costs; bogus coupons; delays in processing commissions; the lack of good infrastructure for warehousing; tough conditions for loans; and stiff competition during the harvest season from 'migrant' vendors. Moreover, market prices are low, especially when there is surplus production.

The introduction of agro-dealers has not really undermined farmer driven seed systems except, of course, in relation to maize. Farmers observed that seed for most crops remains outside FISP and stated that "local maize varieties are somewhat threatened because of the dominance of improved maize varieties through FISP, such that the longer FISP persists the more likely local maize varieties are to get out of existence".[31] However, most farmers are optimistic that local maize varieties cannot become completely extinct, thanks to some of their treasured key attributes. This particular point was stressed by a farmer who said "there is no way local maize varieties can get out of existence, they provide us with tastier green maize, flour that lasts longer and well flavoured *nsima*".[32] (*Nsima* is cooked, ground, white maize flour, a staple food in Malawi.)

CONCLUSION

The research has highlighted a number of issues for consideration. These include the following:

It is important to take into account market demand for a product and the link to seed varieties. Farmers tend not to want to adopt new varieties if there is no market for the output. There are two main potential markets: industrial and local. Industrial markets (agro-processing and food manufacture) look for standardised and uniform produce in high and consistent volumes. In most cases an external agent is responsible for facilitating/coordinating market access. The demand in local markets will be more varied, requiring more diverse varieties and more localised experimentation to develop context-specific adaptations to meet changing local demands. Research and development (R&D) will be shaped by these different needs and will depend on the focus of the intervention. Industrial markets will focus on standardised products with high yields. Local markets will focus on local adaptation and diversity, which are more amenable to direct producer control. While the promise of lucrative markets for introduced varieties often convinces farmers to try new varieties, widespread experience demonstrates that these markets often do not materialise and farmers are left with excess product they cannot use or sell.

The pigeon pea project distributed certified varieties, only, which was true also for agro-dealers, due to seed laws that prohibit the sale of non-certified varieties. The project did not allow for farmer seed production so farmers became the passive recipients of crops and varieties which had been decided without their involvement. An alternative approach could be to include farmers in the R&D and production processes, as well as to define the crops and varieties they would prefer to use. These might be certified varieties from the public sector or locally enhanced varieties with farmer-based

31. Semi-structured interview with a male farmer, Nyambi EPA, Machinga District, 6th September 2015.
32. Semi-structured interview with a female farmer, Nsanama EPA, Machinga District, 8th September 2015.

quality controls. The latter option makes more sense because it is cheaper and the seed is more easily adapted to local conditions. Farmer varieties will also have a longer history of local consumption.

Pigeon pea has additional value in that it improves soil fertility, adds nutritional diversity and could provide an economic benefit for producers, if markets can be secured. However, the pigeon pea project emphasised formal, commercial markets for products that are not consumed locally. From a soil improvement point of view, the project set unrealistic goals of complete self-sustainability after three years. Since the benefits of soil fertility enhancement take time, farmers were unable to incorporate these benefits into their assessment of whether or not it would be useful to continue planting pigeon pea beyond the life of the project. Introducing pigeon pea without first having discussed with farmers and consumers which legumes they favoured (in at least some of these areas, pigeon pea was not consumed historically) has resulted in an inappropriate intervention. A better starting point would have been to look at what diversity—in this case legumes—already existed, or not, in a given area. Based on farmer priorities support could have been oriented towards re-establishing or strengthening the presence of these legumes. As it happened, pigeon pea was identified and developed at a national level and was the only option offered to farmers. Legume use also needs to be integrated with other agro-ecological practices for soil fertility; it cannot enhance soil fertility on its own.

Agro-dealers are primarily a conduit for Green Revolution technology and associated advice, and are sponsored by government or private companies who wish to support their own technologies. Agro-dealers cannot replace the role of public sector extension services, which engage with farmers in the fields, are ideally responsive to context-specific priorities, and should tailor their responses to these priorities. This is not to say that public sector extension services are not also subordinated to a Green Revolution agenda, but agro-dealers are structured on a private for-profit basis and as such it will be difficult for them to serve a public purpose. Agro-dealers have no backward links to R&D that facilitate direct farmer engagement with the R&D system. Agro-dealers do not play a facilitative role, but rather offer narrow advice for specific, mostly corporate products. Research reveals that the small-scale private enterprise model is not widely viable because of the seasonal demand, unequal competition with corporate outlets, limited demand when subsidies are not present, and challenges regarding stock and supply chain management and control. In many cases agro-dealers are the passive recipients of stock and when the supplier stops supplying, the agro-dealers disappear. There is direct evidence of this from the NASFAM experience on pigeon pea seed provision.

Research has demonstrated the need to integrate public sector and farmer association/ civil society organisation (CSO) extension services, and for these to work together where possible.

Findings suggest also that there may be value in exploring the decentralisation, to the farmer level, of seed R&D to serve local markets and own use for farming communities.

Cross-learning could enable localised activities to reach other practitioners in other places, and not be caught in a local trap. The facilitation of cross-learning is a role for extension services: sharing and learning could be coordinated at various levels, from local all the way to global (e.g. through farmer exchanges with critical reflection). The facilitation of farmer exchanges would enable direct interactions between local players in different settings and their discussion of key issues, priorities and various ways forward.

Research has again revealed the heavy dependence on synthetic fertiliser by Malawi's small-scale farmers. This was evident also in our 2014 study.

RECOMMENDATIONS

- Participatory R&D on seed needs for local markets;
- Individual three-year projects should be integrated into longer-term processes of multi-stakeholder cooperation, to promote and support seed systems with the active involvement of farmers;
- Integration of legume use or rotations based on appropriate varieties into a wider set of agro-ecological practices for soil fertility;
- Strengthening of public sector and farmer association extension services to strengthen on-the-ground interactions with farmers and backwards linkages to R&D;
- Cross-learning and farmer exchanges to bring farmers into contact with one another, with a key role for extension services regarding facilitation and coordination;
- Investment of resources in alternatives such as the above, to reduce the dependence of small-scale farmers on costly and inefficient synthetic fertilisers and hybrid maize seed in particular.

APPENDIX 1: LIST OF PEOPLE CONSULTED

Name	Position	Organisation
B. Makwenda	Head of Policy and Planning	NASFAM
D. Phiri	Project Officer	NASFAM
R. Musopole	Chief M&E Officer	MoAFS
D. Kachikho	Sales Manager (South)	Monsanto
A. Maulawo	Technology Development Officer	Monsanto
H. Madeira	Marketing Manager	SeedCo
F. Nthambala	Grants Officer	RUMARK
B. Ntambo	Project Officer	RUMARK
S. Kananji	Country Director	AGRA
N. Songole	Deputy Country Director	AGRA
A. Ngwira	Senior Scientist (Legumes)	DARS
O. Mazonga	Senior Scientist	ICRISAT
F. Sichali	Project Manager	ICRISAT
S. Chisi	Business Development Officer	STAM
R. Rita	Agricultural Extension Development Coordinator (AEDC)	Chipala EPA
B. Lumwira	AEDC	Chipala EPA
S. Chiomowa	Chairman	Chipala FA
J. Msaya	Extension Officer	NASFAM
M. Mkandawire	AEDC	Lisasadzi EPA
M. Nyirenda	Agricultural Extension Development Officer (AEDO)	Lisasadzi EPA
G. Zidana	AEDO	Lisasadzi EPA
J. Binton	Extension Officer	NASFAM
F. Kawale	AEDC	Chiwamba EPA
E. Chapsinja	AEDO	Chiwamba EPA
B. Mphatso	Extension Officer	NASFAM
E. Mandala	Extension Officer	NASFAM
M. Kawamba	AEDC	Mpenu EPA
M. Phangamu	AEDO	Mpenu EPA
M. London	Extension Officer	Mpenu FA
E. Chiwaula	AEDC	Mpilisi EPA
K. Bayani	AEDO	Mpilisi EPA
C. Mbalika	Agro-dealer	Mpilisi EPA
K. Limbe	Agro-dealer	Mpilisi EPA
R. Naula	Agro-dealer	Mpilisi EPA
E. Sagawa	AEDC	Ulongwe EPA
E. Banda	AEDO	Ulongwe EPA
J. Kaiya	Agro-dealer	Ulongwe EPA
F. Matope	Agro-dealer	Ulongwe EPA
S. Sugar	AEDC	Nyambi EPA

Name	Position	Organisation
K. Mandebvu	AEDO	Nyambi EPA
G. Yakiti	Agro-dealer	Nyambi EPA
C. Kaukutu	Agro-dealer	Nyambi EPA
G. Kaduya	AEDC	Nsanama EPA
E. Joe	AEDO	Nsamana EPA
M. Nkhata	Agro-dealer	Nsanama EPA
J. Makawa	Agro-dealer	Nsanama EPA

REFERENCES

ACB (African Centre for Biodiversity). 2014. **Running to stand still: Small-scale farmers and the Green Revolution in Malawi**. African Centre for Biodiversity, Johannesburg.

AGRA (Alliance for a Green Revolution in Africa) 2009 Developing Rural Agricultural Input Supply Systems for Farmers in Africa, www.agra-alliance.org

Chinsinga, B. 2007. **Reclaiming policy space: Lessons from Malawi's Fertiliser Subsidy Programme**. *Future Agricultures Consortium Policy Brief,* Future Agricultures Consortium, Brighton.

Chinsinga, B. 2009. **Integrating the voices of the local people in food security policy debate in Malawi**. *Regional Development Studies*, Vol. 20, pp.1–19

Chinsinga, B. 2011. **Agro-dealers, subsidies and rural market development in Malawi: A political economy enquiry**. *Future Agricultures Working Paper No. 31*, Institute of Development Studies, Brighton.

Chirwa. E. and Chinsinga, B. 2014. **The political economy of food price in Malawi**, in Pinstrup-Andersen, P. (ed.). Food price policy in an era of market instability: A political economy analysis. Oxford University Press, Oxford.

Chinsinga, B. and Chasukwa, M. 2012. **Youth, agriculture and land grabs in Malawi**. *IDS Bulletin*, 43:6, pp.67–77.

Chirwa, E. and Dorward, A. 2013. **Agricultural input subsidies: The recent Malawi experience**. Oxford University Press, Oxford.

Crawford, E., Kelly, V., Jayne, T. and Howard, J. 2003. **Input use and market development in sub-Saharan Africa: An overview**. *Food Policy*, Vol. 28, pp.277–292.

Government of Malawi. 2005. **Agricultural Development Programme**. Ministry of Agriculture and Food Security, Lilongwe.

Kelly, E., Adesina, A. and Gordon, A. 2003. **Expanding access to agricultural inputs in Africa: A review of recent development market influence**. *Food Policy*, Vol. 28, pp.379–404.

Ministry of Agriculture, Irrigation and Water Development (MAIWD). 2014. **Draft National Seed Policy**. MAIWD, Lilongwe.

Mangisoni, J. 2007. **Input voucher study: Malawi and Zambia**. University of Malawi, Bunda College, FANRPAN, Lilongwe.

Mutegi, J., and Zingore, S. 2014. **Pigeon peas could work for smallholder African farmers in multiple ways**. *ISFM Policy Highlight* 2. Soil Health Consortium, Nairobi.

Myaka, F., Sakala, W., Adu-Gymfi, J., Kamalango, D., Ngwira, N., Odgaard, R., Nielsen, N. and High-Jensen, H. 2006. **Yields and accumulation of N and P in farmer managed intercrops of maize-pigeon pea in semi-arid Africa**. *Plant Soil*, 285, pp.207-220.

RUMARK. 2015. **Malawi Agro-dealer Strengthening Programme (MASP)**. *RUMARK Annual Report*, Lilongwe.

PO Box 29170, Melville 2109, South Africa
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