



Legumes Platform Baseline Study

Research into Use Programme - Malawi

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Contents

CONTENTS	1
INTRODUCTION	3
1. RESEARCH DOMAIN	3
1.1 <i>Relevant RNRSS Research Outputs</i>	3
1.2 <i>National Research Outputs</i>	4
1.3 <i>Innovation Context</i>	5
2. DEMAND DOMAIN	6
3. INTERMEDIARY DOMAIN	8
3.1 <i>Farmers' Organisations</i>	8
3.2 <i>Role of NGOs</i>	8
3.2 <i>Role of Agro-traders</i>	8
4. ENTERPRISE DOMAIN	9
REFERENCES	12

Acronyms

ACE	Agricultural Commodity Exchange
ASSMAG	Association of Smallholder Seed Multiplication Action Group
CG	Consultative Group
CIAT	International Centre for Tropical Agriculture
CRS	Catholic Relief Services
DARS	Department of Agricultural Research Services
FUM	Farmers' Union of Malawi
GALA	Grain and Legumes Association
ICRISAT	International Crop Research Institute for Semi-Arid Tropics
MoA&FS	Ministry of Agriculture and Food Security
MRFC	Malawi Rural Finance Company
MRIU	Malawi Research Into Use
NASFAM	National Smallholder Farmers Association of Malawi
NGO	Non-Governmental Organisations
RNRRS	Renewable Natural Resource Research Strategy
SMAGS	Seed Growers and Marketing Association of Malawi
USAID	United States Agency for International Development
WVI	World Vision International

Introduction

Legumes are extremely important crops for Malawi and are a vital supplement to the staple crop, maize. Therefore the original MRIU Country Strategy document proposed that the MRIUP should include a number of *'Seed platforms providing opportunity to improve seed systems and ensure greater use of improved varieties. Priority would be given to legume crops (groundnuts, beans and soybeans) with initial priority given to groundnuts. Platform members would include SMAGS, ASSMAG, seed companies and agri-input dealers as well as research organisations.'* A Legumes Platform was established at the start of the RIU Programme

This baseline document has the following objectives:

- to provide an understanding of the innovations context as it affects legumes in Malawi.
- to assist the Legumes Platform of the MRIUP to assess its progress;
- to offer a basis for future evaluation of the platform.

This document is a synthesis that draws heavily on the RIU Country Assessment and later reports listed in Appendix 1.

1. Research Domain

1.1 Relevant RNRSS Research Outputs

The table below shows a few of the relevant RNRSS Research Outputs which will be promoted by the Legumes platform:

RNRRS title	Use of outputs	Constraints to uptake	Opportunities
Improved technologies for groundnut production <ul style="list-style-type: none"> • Disease resistant varieties • Production manual (CPP03)	<ul style="list-style-type: none"> • More in Uganda than Malawi but some resistant lines released 	<ul style="list-style-type: none"> • Poor transport & communications • Poor market information • Lack of capacity FOs. • Lack of appreciation of seed value by farmers 	<ul style="list-style-type: none"> • An important food and cash crop. • Higher producing varieties been adopted. Need high yielding variety with chalimbana characteristics,
Making the Most of Seed-Good Seed Initiative (CPP69)	<ul style="list-style-type: none"> • Mainly in E. Africa, but also in Malawi, through SDC. 	<ul style="list-style-type: none"> • Drought, Pests, etc • Lack of appreciation of seed value by farmers 	<ul style="list-style-type: none"> • To build on lessons of previous DFID-funded projects through CABl in E.Africa

1.2 National Research Outputs

The Department of Agricultural Research and Services (DARS) and Bunda College of Agriculture have in the past two decades, developed a number of technologies targeted at improved bean, soybean, groundnut and pigeon pea production in Malawi. Some examples are:

Bean

Since the early 1990s Malawi has released 14 improved bean varieties: 1) Bunda 93 (a local accession), 2) Chimbamba, 3) Kalima, 4) Napilira, 5) Maluwa, 6) Nagaga, 7) Sapatsika, 8) Mkhalira, 9) Kambidzi, 10) Kholopethe, 11) Kabalabala, 12) BCMV-B2, 13) BCMV-B4 and 14) BC-D/O (19) with various attributes: tolerance to major diseases and insect/pests, low soil fertility and for seed quality (mainly seed colour and size), and consumer including market preferences.

Groundnut

Several high-yielding groundnut varieties have been developed. To date, twelve varieties have been released for production: Chalimbana, Chitembana, Mawanga, Mani Pintar, RG 1, CG7, Malimba, Nsinjiro ICGV-SM 90704) Baka, Chitala, Chalimbana 2005 and Kakoma (JL 24). The medium-duration Nsinjiro (ICGV-SM 90704), and Chalimbana 2005; and short-duration Baka ICG 12991) and Chitala bunch groundnut varieties with resistance to rosette disease have been released. Short-duration groundnut varieties (ICGV-SM 93553, ICGV-SM 93555, ICG 9991, ICG 9995) with resistance to early leaf spot have also been developed. A package of recommendations for groundnut production in Malawi (Chiyembekeza et al., 1998) has been published and is available to farmers and extension staff.

Pigeonpea

A new improved pigeonpea variety such as ICP9145, which is late-maturing and resistant to Fusarium wilt disease is available. In addition, three late maturing varieties (ICEAP00020,

ICEAP00040 and ICEAP00053), two medium maturing varieties (Royes and QP 38) and three early maturing varieties (ICPL 87105, ICPL 86012 and ICPL 87091) have also been developed.

Soybean

Suitable high-yielding soybean varieties have been developed and recommended for production in Malawi. These include: Davis, Kudu, Bossier and Impala, Santarosa, Ocepara-4, Duocrop, 501/6/12, 427/5/7, 491/6/7 and Geduld. In addition an ex-Zambian variety, Magoye, is also widely used by farmers owing to the large leaf biomass production, and its ability to fix nitrogen using natural soil rhizobium. Other varieties, Ocepara-4 and Duocrop are resistant to root knot nematode, hence more suitable for rotation in tobacco growing areas¹.

1.3 Innovation Context

Grain legumes are an important component of Malawi's maize-based farming systems. In particular, grain legumes are important to Malawi's economy in three ways. Firstly, legumes are a cheap source of vegetable protein and vitamins. Bean, in particular, is the most widely grown legume and is eaten alongside the staple food crop, maize, by all Malawians in both rural and urban areas, and institutions such as schools, hospitals and prisons, where animal protein is not only scarce but also expensive. Therefore, grain legumes have an important role to play in maintaining household food security. Secondly, grain legumes enhance soil fertility because of their ability to fix atmospheric nitrogen into the soil. Symbiotic systems, such as those of legumes and rhizobium, can be a major source of nitrogen in most cropping systems. Most African countries, including Malawi, can reduce expenditures on inorganic fertilizers through exploitation of atmospheric biological nitrogen fixation. Thirdly, most grain legumes are relatively high value crops compared to most cereals, such as maize and rice. Thus, households that incorporate legumes in their cropping systems can generate more cash income from sales of legumes. Further, there are potential markets in the region and beyond for most grain legumes. Therefore, these crops can greatly contribute to the economy's narrow foreign exchange earning base if their production can be increased, especially under smallholder farm conditions.

Despite the benefits that grain legumes provide, the total land area grown to these crops is quite small compared to that grown to maize. In addition, the grain legume sub-sector is characterized by very low productivity. Some of the issues leading to low productivity are: 1) generally most farmers experience serious problems in accessing seed of legume crops at planting time, as a result the little seed is sparsely planted over a wider area under the maize crop, or in pure stand, 2) most farmers use farm saved seed, and often of local varieties, except for soybean where there are no indigenous local varieties, 3) poor soil fertility, 4) poor cultural practices, and 5) diseases and arthropod pests and 6) limited and inconsistent domestic and international marketing opportunities which have at times discouraged increased legume production in Malawi.

Rowland Chirwa, Chairperson, Legumes Platform, RIU.

¹ From R. Chirwa - *Establishing a functional Legumes Seed Supply Systems in Malawi (draft proposal for Irish Aid 2007)*

2. Demand Domain

The figures below show that both production and yields of legumes have been increasing slowly in the last decade.

Table 1 Grain legumes production data in Malawi from 1997-2007

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Beans										
Area (ha)	171663	135489	167522	214643	227993	232762	204514	233845	242568	260306
Prod (tones)	60039	55870	73333	106924	99828	101842	76964	85759	117808	128632
Yield kg ha ⁻¹	350	412	438	498	438	438	376	367	486	494
Groundnut										
Area (ha)	140747	170004	169078	181337	198306	218760	207786	248276	244567	258111
Prod (tones)	97228	124604	116551	147729	150604	179326	153414	141078	203071	261810
Yield kg ha ⁻¹	691	733	689	815	759	820	738	568	830	1014.33
Soybean										
Area (ha)	40829	64284	72083	52635	45428	50981	47128	68524	71652	75475
Prod (tones)	28482	39675	46915	35900	29568	38745	33758	40396	55248	67332
Yield kg ha ⁻¹	698	617	651	682	651	760	716	590	771	892
Pigeonpea										
Area (ha)	123088	126240	137057	135608	139652	147659	138585	155990	150173	161508
Prod (tones)	79368	118199	99036	105518	105105	116892	93084	63883	130987	159365
Yield kg ha ⁻¹	645	936	723	778	753	792	672	410	872	987

However there is common agreement that there is considerable potential for expanding the production levels much further and that in particular there is an unmet demand for good quality seeds for all legume crops. An evaluation of a joint project on Bean Seed Multiplication between Plan International, CIAT, & DARS suggested that one way of improving seed availability at community level might be to identify and support a few innovative farmers who have adequate land resources to multiply breeders' seed on a sustainable basis for sale to community members as a business.²

However at present there is a delay in the supply of information to farmers about many of these new seed varieties, and few farmers have sufficient information either about the varieties available, or the potential market for legumes, both international and local.

A further problem in relation to the demand for seeds, is that, apart from hybrids, farmers are not prepared to pay much of a premium for high quality seed as opposed to 'grain that can be used as seed'. However even if they were better informed about the different varieties, the majority of smallholder farmers would not have sufficient resources to purchase seed, due to lack of capital and lack of access to affordable credit.

In relation to the international market for groundnuts Malawi used to be a major exporter of confectionery chalimbana groundnuts (circa 120,000 MT per year). This market was lost as the kernel shape was less suitable for processing than varieties from China and difficulties presented by strict aflatoxin standards in Europe. ICRISAT originally concentrated on breeding for rosette resistance, but also worked with support from NGOs to test higher yielding varieties and NASFAM, which had a donor providing 'partnership funding' to work with third parties like ICRISAT. CG-7 was developed as higher yielding – but was not preferred for taste for local consumption, being the wrong colour and too high in oil. However CG-7 has spread rapidly as a cash crop with the help of NGO seed loans and seed bank projects. Chalimbana has remained the variety of choice for home consumption and on the local market for snacks, despite the lower yield.

The groundnut experience shows how a massive market can be lost by not keeping up with competitors and how different varieties, suitable for home consumption or for sale can co-exist, even on the same farm. It also shows the potential for pro-active innovation on issues like aflatoxin, but that sustainable incentives need to be negotiated to persuade farmers to maintain improved quality standards
(Whiteside M. 2007)

Beyond this export demand is constrained by high transport costs, given Malawi's landlocked position, and long distance from markets in the same region. This means that local prices charged for by traders tend to exceed world prices. For instance South Africa is currently importing sugar beans from China at \$0.60 per kg, while in Malawi the same beans are sold for no less than \$1.00 per kg.

² See End of Project Evaluation: Plan Malawi, CIAT, & DARS joint project on Rural Innovation & Bean Seed Multiplication (2005)

3. Intermediary Domain

3.1 Farmers' Organisations

Many intermediary organisations now exist, with a broad division between local farmers groups and farmers' clubs, and apex bodies like NASFAM which aim to link up and support these local bodies. The Association of Smallholder Seed Multiplication Action Group (ASSMAG) and the Grain & Legumes Association (GALA) have a special interest both in improving the supply of legumes seeds and improving information flows to farmers. These intermediaries face many challenges – both in securing sufficient funding for their own long term survival, and in trying to persuade farmers to delay sales so that they can seek out the best prices for their crops. Currently Chitedze as a research station is unable to meet all the demands for legumes seeds, and (as indicated above) there is an urgent need for a wider range of actors to take on seed production and multiplication.

3.2 Role of NGOs

NGOs are important intermediaries in the Legumes Innovation System in Malawi, and are involved at a number of different levels. As noted by Martin Whiteside, *Many NGOs have tried to set-up groups of farmers as 'commercial seed producers' – generally producing and selling seed that the private sector considers unprofitable to sell - not surprisingly it often also proves to be unprofitable for the farmers' group as well!* A further problem is that only a very few local or INGOs have a long term commitment to improving the supply of, or demand for, high quality legume seeds: many only get involved when there is a perceived crisis, and donor funding suddenly becomes available: they are then frustrated when they find that the national research stations are unable to meet their sudden demand for seed. While some have a longer term interest in the legumes sector, the degree of interest can alter as senior staff change. Research institutes like Chitedze are key suppliers of new varieties of legume seeds, but they need to get commitments from intermediaries like NGOs at the start of the growing season so that they can plant accordingly – and most NGOs do not have sufficient long term secure funding to make this kind of commitment.

In addition NGOs' access to research information is very opportunistic, and there are no proper information channels between research institutions and the NGOs. In most cases, NGOs are promoting what they know, without regard to how it complements, duplicates, or contradicts efforts of others.

3.2 Role of Agro-traders

One area requiring further research by the legumes platform and MRIUP is the potential for making greater use of agro-traders. There is the potential for traders to distribute and market certified seed for farmers to produce grain or approved seed, and the same traders could become an important source of information for farmers about the different seed varieties available.

4. Enterprise Domain

A critical constraint is that farmers tend to sell both seeds and food crops to individual traders for cash at harvest time at a very low price. These buyers have no incentive to offer farmers more information about the true value of these products, nor are they able to offer advice about key technical issues like reducing aflatoxins in groundnuts, and the low prices paid tend both to perpetuate poverty and reduce the incentive to improve production quality. Farmers organisations and the 'umbrella' group NASFAM have tried to provide farmers with more information about marketing, but the critical constraint is the lack of a viable credit system for farmers: between planting in November and harvest in March, most small farmers are very short of cash, and feel no choice but to sell at these lower prices. However these traders offer cash and, as part of their margin, both organise and finance transport, which is expensive when buying small amounts in a wide area.

However it is likely far more market information will come available in the near future through the work of the RIU Legumes Platform and the USAID-funded Agricultural Commodities Exchange (ACE) which provides market information to both sellers and buyers on-line.

The private sector is involved in legumes both as a buyer, and as a supplier of inputs. Credit appears to be a major constraint in legumes as the main agricultural financing institution, the Malawi Rural Finance Company (MRFC) works mainly with tobacco and a few cotton producers, and the growing number of micro-finance institutions tend to avoid making loans to farmers in view of their poor repayment record. Contract farming would be one way in which farmers could secure credit, but while such arrangements work well in the case of tobacco, this approach is unpopular with private sector dealers in other commodities as they have found that farmers do not stick to contracts, but divert crops to other traders for higher prices.³

Private sector processors like RAB Processors still need a more reliable source of local groundnuts for their processing business than they are able to access through current arrangements. In general the major private sector companies involved in trading and processing legume crops have a degree of scepticism about the ability of a programme like RIU to deliver any benefits for them, either short-term or long-term, and this will be a major challenge for the Legumes Platform to overcome.

The diagram below illustrates the overall innovation system in relation to the production and marketing of legumes.

³ The same issue was raised in the Zomba RIU baseline study.

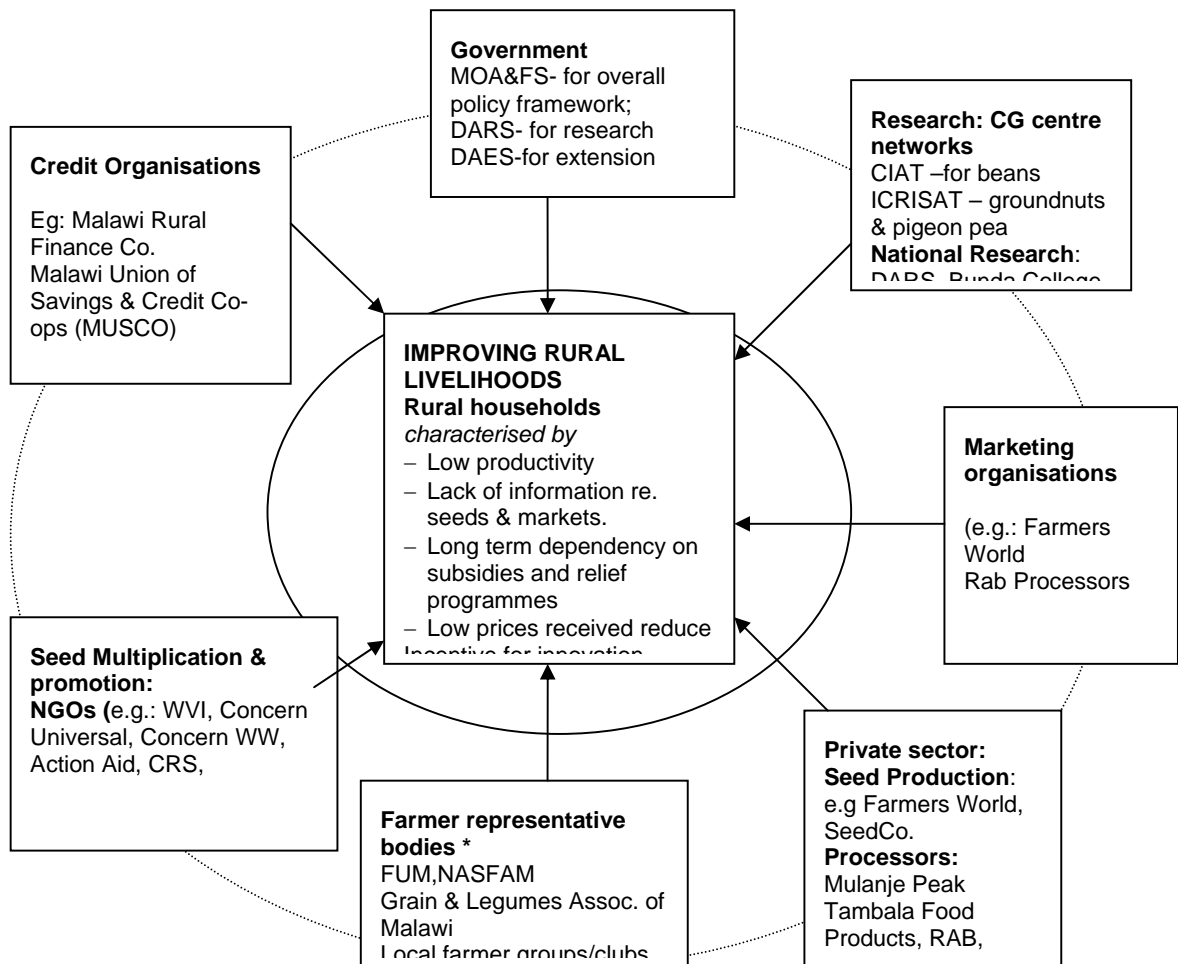


Figure 1: Legumes Production & Marketing System.

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