Part 2:
The Production of Ready to Use Therapeutic Food in Malawi:

Contextual Constraints Faced by Farmers and Possible Policy Remedies

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Terms and Abbreviations

ACE	Agricultural Commodity Exchange
ADMARC	Agricultural Development and Marketing Corporation
AHLCX	Auction Holdings Limited Commodity Exchange
CARD	Centre for Agricultural Research and Development
CARE	Cooperative for Assistance and Relief Everywhere
CBRLDP	Community Based Rural Land Development Project
CCODE	Centre for Community Organisation and Development
CUMO	Concern Universal Microfinance Operations/Organisation
FCA	Financial Cooperatives Act
GoM	Government of Malawi
LUANAR	Lilongwe University of Agriculture and natural Resources
MAMN	Malawi Microfinance Network
MFA	Microfinance Act
MFI	Microfinance Institutions
MFT	Micro Finance Transparency
MoAFS	Ministry of Agriculture and Food Security
MoIT	Ministry of Industry and Trade
MRFC	Malawi Rural Finance Company Limited
MSE	Malawi Stock Exchange
MUSCCO	Malawi Union of Savings and Credit Co-operatives
OPV	Open Pollinated Variety
RBM	Reserve Bank of Malawi
ROSCA	Rotating Savings and Credit Associations
SACA	Agricultural Credit Administration
SACCO	Savings and Credit Cooperatives
SAMCAF	Southern Africa Microfinance & Enterprise Capacity Enhancement Facility
SAP	Structural Adjustment Program
SAPs	Structural Adjustment Programs
SOAS	School of Oriental and African Studies

UCC	University College of Cork
UNCDF	United Nations Capital Development Fund
VN	Valid Nutrition
VSLA	Village Savings and Loan Associations

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Disclaimer

The opinions and recommendations are those of the author, and do not necessarily reflect the views of the organizations/stakeholders or its individual members.

Howard Dalzell

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[1] Cover Photo: Staff from Exagris Africa and NASFAM at a Groundnut Quality Training Course 2013, taken by Gretta Fitzgerald.

EXECUTIVE SUMMARY

Valid Nutrition (VN) produces Ready to Use food (RUF) in Lilongwe for the treatment of children acutely ill as a result of severe malnutrition. The global annual market for such food is some $200 million and with likely developments in similar foods for moderate malnutrition will rise to some $10 billion.

This paper is the second in a series of three which have been produced following four years of research into the effects on RUF production and prices in Malawi of encouraging small farmers to produce high quality groundnuts for sale to VN. The first paper describes changes in livelihoods of Malawian small farmers producing groundnuts as a cash crop. This paper deals with the in-country constraints faced by the farmers and suggests policy changes which would assist them. The third paper deals with commercial national and international macro-economic constraints faced by groundnut processors and exporters.

Research with farmers identified five major production constraints; lack of access to land and low yields of maize, lack of inputs, lack of finance, inefficient markets and widespread aflatoxin contamination. There are negative interactions between the various factors. Following analysis of each constraint suggestions are made for possible shifts in policy and/or policy implementation to create a more favourable environment for farmers, processors and consumers.

All of the farmers in the study faced problems in producing enough maize for their household consumption. This was due to low land holdings and low maize yields. It has a negative effect on the amount of land they can use for groundnut production. Whereas there is a good policy portfolio on Land Rights in Malawi, it proved very difficult to obtain accurate detailed figures on the amount of agricultural land not used each year although from observation and from focus group discussions with farmers it seems to be quite high. Many of the farmers, and especially the less poor farmers, would like to rent some of this land but cannot as they do not have sufficient cash flow and landlords will not give credit. To address these land related problems it is suggested that all untitled land is distributed and that credit facilities are developed for small farmers.

Low yields of maize are the result of a mix of factors with the main one being perceived as lack of access to inorganic fertiliser and hybrid seed. The main approach to addressing the problem has been a very expensive programme of high subsidy (FISP) to poor farmers for these inputs. Reviews of the effectiveness of this approach have shown that it does a lot of good. However, there are issues with efficiency of implementation as well as strategic questions about long term wider changes to farmer livelihoods and increasingly to environmental consequences. It is suggested that an alternative approach to the supply- led subsidy programme should be explored with a view to improving yields while also addressing other on farm constraints and the issue of environmental sustainability.

Apart from access to fertiliser and seed farmers face problems of not being able to procure other vital inputs such as pesticides and adequate labour at the right time. These difficulties lead to disease and weed problems. If the subsidy approach is broadened to deal with these issues it would be wise to involve farmers and suppliers in a more demand-led approach in which programme management and commercial activity is left to the private sector. A more

radical approach would be to improve access to credit so that farmers could manage their own input needs and cash flows. As the financial return on fertiliser usage is very good there seems no long-term good reason to subsidise it heavily, especially as the opportunity cost for the inputs into FISP is high. The development of good credit facilities is suggested as a viable and more far reaching alternative.

Better access to credit seems appropriate in light of problems of land shortage, low maize yields and input shortage, not least because it would be demand-led and hence tailored to the needs of individuals. Government policy on regulation is comprehensive and reasonable. However, credit services for small scale agriculture are limited in area and scale and tend to be prohibitively expensive. This is in spite of clear demand as evidenced by the recent rapid expansion of Village Savings and Loan Schemes.

Lack of trust from financial institutions allied to problems of high risks such as weather, pests and price volatility have to be overcome in the provision of financial services to farmers. Such problems have been overcome in many developing countries and can be overcome relatively easily by good management.

A major disincentive to credit providers is the high cost of providing loans due to poor physical communications infrastructure and to the very high price of funds to lend. In several countries the cost of providing financial services in rural areas has been successfully addressed by the use of electronic communications. The development in Malawi of a widespread effective mobile phone and internet network is recommended and would have benefits in many other areas, not least in agricultural marketing.

The main factor in high costs of funds for lending institutions is the weakness of the Malawian Kwacha on international markets. This results in high hedging costs and reluctance of international lenders to lend for long periods. For micro-finance to be successful the government must find ways to refinance institutions in the medium term and at reasonable interest rates. The use of donor funds to build up loan capital could be effective in this area. It would build up a capital asset as opposed to the annual outgoing spend on subsidies.

Small farmers face problems in marketing produce. Whereas the government marketing policies are broad and relevant there are difficulties in implementing them. Access to market information is a major problem in spite of relatively recent attempts by the private sector to develop commodity exchanges. Investment in an up to date national electronic communications network would resolve this problem.

From the farmers' side marketing weakness arises from the small quantities and variable quality of produce and the need to sell regardless of price in order to raise cash for food or other household expenses. The main strategies likely to overcome these problems are the organisation of farmers into input and product clubs/coops and the development of credit facilities for them. Both these suggestions are consistent with the National Export Strategy. The LDT could play a major role in addressing many of the marketing problems.

All of the constraints outlined above apply across a wide range of crops. An additional problem faced by groundnut farmers is contamination of the crop by aflatoxin[2]. The Malawian government has set a maximum level of contamination of 15 parts per billion (PPB) and Valid, along with exporters to many countries must achieve levels lower than 4 ppb. These levels are often exceeded, and frequently by a lot, in retail products available in Malawi. This poses a public health problem and should be addressed by enforcement and health education campaigns. The threat to public health is exacerbated by the strong grading pressure put on producers selling for export. This leads to high contamination of nuts retained for consumption in Malawi.

The Malawian Programme for Aflatoxin Control (MAPAC) is addressing the problems caused by aflatoxin and has developed comprehensive and relevant proposals. It is recommended that as immediate steps to lower aflatoxin levels in the food chain farmers are encouraged to sell Nuts in Shell and processors are assisted to develop total utilisation processes whereby all components of the shell and nut are processed for sale and aflatoxin elimination.

The recommended policy shifts and implementation changes needed to address the constraints to farmers were analysed against the generic options open to farmers to improve margins and profits. See table below.

Access to credit was a recurring item which applies to scale of production; access to inputs; and marketing. It could also reduce aflatoxin problems by preventing pre-harvest sales. For both credit and marketing improvements the development of an effective national electronic infrastructure is very important.

Serious consideration should be given to the development of agricultural systems not based primarily on the use of mono-crop maize using hybrid seeds and high levels of highly subsidised hybrid seed. Conservation Agriculture is suggested as one alternative with the additional benefit of better environmental management. This initiative and the development of good credit systems would inevitably mean modification of the FISP and move to demand-driven agricultural economics away for supply-led systems.

If the constraints faced by farmers are realistically addressed then there is nothing in the research which indicates that they cannot produce good yields of good quality groundnuts which will enable Valid to produce RUF in Malawi and compete successfully with producers in developed countries. This will be of considerable value to small farmer livelihoods, public health in Malawi and those suffering from acute malnutrition.

As the groundnut related issues experienced by Valid apply equally to groundnut exporters the need to resolve them is urgent.

2 Aflatoxin also affects maize

Factors Affecting Cash Cropping and Marketing Decision Making	Options for Changes in Production and Trading	Resulting Changes in Economic Terms	Main Current Constraints	Main Enabling Policy Shifts and Implementation Changes Needed
VULNERABILITY • Economic • Environmental	Scale of production	Increased volume of groundnuts for sale	Land ownership No cash for advance rent Low maize yields	Land ownership Credit promotion
ASSETS (Lack of & low returns) 1. Human 2. Social 3. Natural 4. Physical 5. Financial	Input management	Lower costs Better yields	Lack of inputs Lack of money	FISP rethink Credit promotion Communication infrastructure
	New techniques	Better yields Less post-harvest loss	Seed/drying and shelling	Better seed availability Improved extension Conservation Ag
POLICIES, INSTITUTIONS & PROCESSES	Marketing channels	Better prices	Distress sales Info gaps Farmer dis-organisation	Credit promotion Information communication Farmer organisations
	Aflatoxin control	Better prices Lower crop losses	Harvesting/ storage and marketing methods	Health standards enforcement Sell Nuts in Shells No waste processing
	All of the above	Better gross income Better margins		

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BACKGROUND

This paper is part two of a three paper presentation. The first paper deals with the uptake by small farmers in Malawi of groundnut production as a cash crop and consequent changes to their livelihoods. It also identifies the household level micro-economic constraints they face.

This paper[3] considers the main meso/macro-economic constraints to small farmer groundnut production with the aim of suggesting key positive changes in policy and practice open to the Government of Malawi. In several areas there is very little policy deficit but quite a lot of implementation deficit. In part the implementation problems are due to the poor macro-economic environment. The suggestions made recognise this situation and thus changes are suggested which could take place within the current environment.

The third paper in the presentations refers to national and international macro-economic issues which make it difficult in the Malawian context to undertake commercially competitive processing of groundnuts into Ready to Use Foods (RUFs) for the prevention and treatment of moderate and severe acute malnutrition.

The issues raised in the three papers are significant in that they also seriously constrain the production and export of groundnuts as a major foreign exchange earner and a substitute crop for tobacco.

Gender analysis was built into the survey process as it is important at both strategic and implementation levels. It is therefore intended that if any policy shift is to be adopted, detailed gender proofing should be carried out. Policy implementation measures should consider gender issues.

INTRODUCTION

From analysis of the information gathered over the study period it can be concluded that the farmers are very poor as a result of high vulnerability, low assets and the lack of a supportive policy base. In order to improve the quality and security of their livelihoods farmers seem prepared to accept risk and take on commercial groundnut farming involving new technology.

However, in doing so, they face many constraints. This paper gives a contextual overview of the following five main constraints that emerged from the research,

1. Small land holdings and low crop yields per unit area
2. Lack of access to inputs
3. Limited finance
4. Inefficient markets
5. Widespread contamination by aflatoxin

This paper considers each in turn and suggests policy options to relieve them. A synthesis of finding is given in the final section which prioritises the options available.

[3] The background to these constraints and current government policies is set out in paper by Richard Kachule of the Centre for Agricultural Research and Development at Bunda College Malawi.

1. SMALL LAND HOLDINGS AND LOW YIELDS

Malawi's surface area is estimated at 118,000 km^2 with a population of about 15 million people (FAOSTAT, 2010, 2011). The country is considered to be one of the most densely populated in Sub-Saharan Africa. As a result most family land holdings are very small with an average of just over 1 hectare and with female-headed households having less land (National Statistics Office, 2012).

When the low per unit area maize yields on these small holdings are considered it can be seen they very many families produce a lot less maize than they need for their basic diet. Accordingly if they are to diversify their cropping in order to raise cash incomes households must first meet their immediate food needs. Therefore, for households to be able to produce at a profitable level they must either get access to more land and/or be able to produce higher maize yields per unit area. Access can come through title or lease, both of which will be discussed in turn.

1.1 Land Title

The Government of Malawi, through the Ministry of Lands and Housing formulated the Malawi National Land Policy in 2002. The policy provides a sound institutional framework for democratizing the management of land and introduces much needed procedures for protecting land tenure rights, land based investments and management of development at all levels. Furthermore, the land policy aims at ensuring equal opportunities for the acquisition, use and enjoyment of land for all citizens.

The government recognises the specials problems of vulnerable groups and especially women and children. Coupled with the effects of increasing land pressure due to population increases and the devastating effects of the HIV and AIDS pandemic, the government attests to the need for a clear policy on gender access and the rights of children and the disabled.

In implementing this policy average family holding size could be increased by distributing any land to which no-one currently has title. However, it has proved difficult to get precise figures on the amount of land which is without title and thus available for distribution. This is so even after the recent assessment of land resources by the Malawi Government with assistance from the Food and Agriculture Organisation (FAO) and other partners. The main objective of the land cover change mapping component was the preparation of an accurate, up-to-date and reliable land cover change database of Malawi in order to improve effective and focused decision making on landscape dynamics and climate change related issues (FAO, 2012). The assessment report, forms the basis on which the government can institute a nationwide land redistribution programme to alleviate land constraint among smallholder farmers and also to increase their productivity. This could be carried out using the experience gained in the Community Based Rural Land Development Project (CBRLDP) whereby the government bought and redistributed some of the estates in the districts of Machinga, Mulanje, Mangochi and Thyolo in the Southern Region of Malawi (Machira, 2009).

It was noted in the course of compiling land data for the current study districts that there are variations in the data reported at district level in terms of categories of land, average land holding sizes for the different types of households, etc. For example, Lilongwe District has

more detailed data compared with the other districts. More consistent, detailed and recent district level data for different variables for all districts in Malawi would be of great value for the appropriate in planning, budgeting and forecasting land use and redistribution.

Cleary the distribution of untitled land and the redistribution of long-term unused lands, such as in defunct estates, should be a policy priority but in the absence of precise data it is difficult to say what scale of effect it will have.

1.2 Lease of Unused Land

Needless to say, the increase of land holdings through redistribution will be a slow process and have to overcome many cultural and social problems. However, it should be possible for smallholders to rent land to increase the area they cultivate. Observation and discussion with farmers in the Lilongwe, Salima and Mchinji study areas showed that there is a perception that there is a considerable amount of land uncultivated though as discussed earlier, figures on this are not available. Mlamba (2013) quoted a survey by the Ministry of Mines, Natural Resources and Environment from 2002 that estimated that between 30% and 70% of usable land was uncultivated in many districts. When the possibility of leasing such land was raised in focus group discussions it resulted in universal laughter. This was because farmers knew that landlords do not have the confidence/trust to lease land without cash in advance and will not normally consider share cropping. Most smallholders do not have adequate cash flow to pay rent in advance and thus available land which they would like to use is not cultivated while pockets of the country face food shortages year in and year out. It may be that the development of farmer associations could help to build the trust necessary to overcome this problem. Such a development could be facilitated by non-government and community based organisations. Probably an easier solution to the problem would be the development of reliable and affordable credit systems. Access to credit will be considered in more detail later.

1.3 Maize yields per unit area

Maize yields are generally very low. For many years the Government policy to address this situation has primarily been the use of improved seeds and distribution of inorganic fertiliser through a series of subsidy programmes of which the latest is the Fertiliser Input Subsidy Programme (FISP).

However, in relation to the issue of crop diversification the paper *'Cropland Allocation Effects of Agricultural Input Subsidies in Malawi'* looked at the 2008-09 growing season and found that *"…farmers who received coupons for improved maize seed and maize fertilizer allocated 45% more land to improved maize and less land to traditional varieties than farmers who did not receive a coupon"* (Chibwana et al, 2011, p130). Furthermore, *"…the increase in land allocated to improved maize and tobacco occurred at the expense of other crops (groundnuts, soybeans, cassava, and sweet potatoes), which were allocated 17% less land by farmers who received coupons for maize seed and fertilizer. Therefore, our results suggest that agricultural input subsidies are associated with crop simplification, but future research using nationally representative data (the study covers two districts only) is needed to better assess this relationship"* (Chibwana et al, 2011, p131). The subsidy programme at that time did not include legumes.

It is clear that decisions on cropping patterns are complex and that choices influenced by single factor subsidy initiatives may not be optimum for farmers, or indeed the economy, in

the longer term. The impact of the FISP and its predecessors will be considered later. Nonetheless as low maize yields alone are not the only problem facing small farmers perhaps the time has come to devise a policy to stimulate maize yields and crop diversity and at the same time meet peoples' nutritional needs and protect the environment. It may therefore be that any such policy should not be primarily based on subsidised inorganic chemical inputs. Options worth considering include conservation agriculture, permaculture and agro-forestry

From 2006 Concern Worldwide has carried out work on conservation agriculture (CA) with smallholders growing maize in several countries including Malawi. The work was a multi-country programme with trials in DPTRK, Tanzania, Zambia, Zimbabwe, Malawi and the results were published in 2013. (Concern Worldwide 2013). The trials involved more than 11,000 farmers. A summary of the work is shown in Box 1. The programmes have shown very substantial improvement in area yields in spite of very low usage of chemical inputs. Many other benefits are claimed. However, reviews of the effectiveness of conservation agriculture (Giller K., Witter. E., Corbeels. M., Tittonell. P 2009) indicate that there has been insufficient rigorous research done on it to establish the nature and ongoing extent of benefits from conservation agriculture.

Nonetheless, given the pressure on land and external inputs and in light of the recent Concern work, and others, it would seem sensible to carry out a large scale pilot in Malawi with good data collection. If pilots were to prove successful the further adoption of this approach could drastically reduce the need for inputs and hence the cost and scale of the FISP while at the same time enabling farmers to sustainably produce their requirement for maize on a small area and thus be diversify into cash crops. In a more diversified system the nitrogen contribution of a legume such as groundnuts would be valuable.

Box 1: Summary of Concern Worldwide's Programme of Conservation Agriculture in 6 countries

Agricultural production in many of the world's poorest countries, particularly in sub-Saharan Africa, has become increasingly constrained by factors including the rising price of agricultural inputs and fuel, land degradation and depleted soil fertility. The consequent reduction in yields is a major problem, most especially for poor farmers, many of them women, farming small plots of land. In 2006, Concern began promoting Conservation Agriculture as a viable alternative to traditional farming practices. Concern believes Conservation Agriculture can support marginal and smallholder farmers to address their poor production outcomes and prevent environmental degradation, whilst recognising their resource constraints. Conservation Agriculture has three key principles: a) do not disturb the soil; b) keep the soil covered (using crop residues as mulch); and c) and rotate the crops. Together, these simple techniques reduce the energy needed to farm, maintain the natural soil structure, help avoid excessive depletion of nutrients and maximise the benefits (while minimising the cost) of fertiliser.

To date, Concern's Conservation Agriculture programmes have reached in excess of 11,000 farmers in the Democratic People's Republic of Korea, Malawi, Tanzania, Zambia and Zimbabwe. The evidence reveals that marginal and smallholder farmers can increase and stabilise yields, under more extreme climatic conditions, where draught power and landholding sizes are limited due to poverty and inequality and where labour is limited due to old age, ill health or migration.

In Malawi, farmers practicing Conservation Agriculture produced 93 and 96 percent more maize than the national government average maize yield for the 2010/11 and 2011/12 seasons, respectively. Increases in yield have contributed to improved food security and a reduced hunger gap. In the Democratic People's Republic of Korea the number of crops cultivated by Conservation Agriculture farmers increased from an average of 4 to 11 crops. This is likely to have contributed to improved household dietary diversity.

Conservation Agriculture requires much less energy (human or chemical) for field preparation and, as field preparation can occur during the dry season, it reduces the labour demand peak at the onset of the rains. This is particularly meaningful for vulnerable population groups as these groups are typically labour-constrained. In Malawi, farmers practicing Conservation Agriculture experienced an average reduction of 17 days labour when compared to conventional agriculture. In addition to reducing the labour demand, Conservation Agriculture also presented a less intensive labour calendar; enabling farmers to diversity their livelihoods strategy.

Cumulatively, the three key principles of Conservation Agriculture have resulted in enhanced soil fertility. Minimum tillage has been found to protect the natural soil structure and prevent soil erosion, while reducing the speed of decomposition of organic matter and release of mineral nutrients. Soil cover through mulching has protected the soil from erosion, increased organic matter in the soil, reduced evaporation from the soil surface and prevented soil temperatures from rising. Furthermore, the presence of leguminous species within the cropping system, through crop rotation and/or intercropping, promotes nitrogen in the soil, thus boosting soil fertility.

In addition, Concern's approach to Conservation Agriculture has delivered effective extention services which reach the extreme poor, contributed to gender equality and promoted evironmental management, particularly climate change adapation.

Concern concludes that marginal and smallholder farmers must be assisted in finding sustainable agricultural solutions that meet their demands and are relevant to their contexts. Therefore, investing in Conservation Agriculture is an appropriate approach to promoting food security in similar agro-ecological zones. Concern believes Conservation Agriculture holds tremendous potential and that its adoption is perhaps most urgently required by smallholder farmers, especially those facing food insecurity, land and labour-constraints and environmental degradation.

2. LACK OF ACCESS TO INPUTS

Many developing countries are faced with widespread poverty and food insecurity; governments have tried over several decades to boost staple food production by heavy subsidy of agricultural inputs and most usually of inorganic fertiliser. This approach has been adopted in Malawi. The outcomes of such subsidies will be discussed firstly in general and then in Malawi in particular will now be considered so that policy suggestions can be developed.

2.1 Agricultural Input Subsidy Programmes

Chirwa and Dorward (2013) review the experience of such programmes in Ghana, Zambia, Nigeria, Tanzania, Rwanda, Mali, Senegal and the Millennium Villages. There were difficulties in comparing programmes as they had been designed in different ways with slightly different and sometimes not very well defined goals. Monitoring and evaluation methods differed from country to country and were often quite weak. Data from the various countries on crop production improvements and cost benefits was not always readily available and sometimes rather biased towards the programme. Generally speaking it claimed modest benefits but these were rarely compared to benefits from alternative sources if investment.

In this review it is noted that:

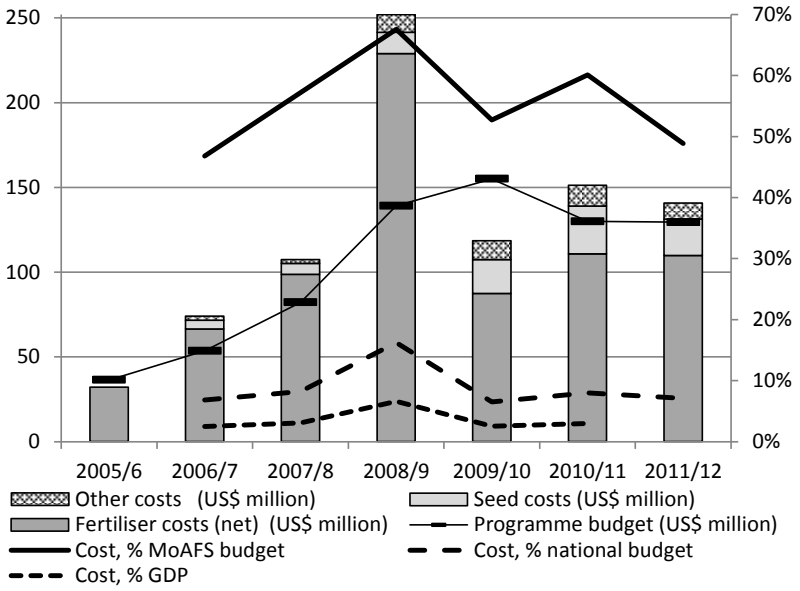
"…a continuing tendency for programmes to focus on production objectives and producer welfare and to ignore the interests of consumers and the processes (and necessary conditions) for subsidy programmes to contribute to wider pro-poor economic growth. This is a critical omission, and is linked to the limited extent that the design and implementation of many programmes are integrated with complementary investments. Such integration is needed first for subsidy programmes to effectively deliver their stated objectives of incremental production, and then for them to contribute to the wider processes of pro-poor growth. Recognition of the importance of consumer price benefits and of the 'price productivity tightrope' is particularly important here. Druilhe and Barreiro-Hurlé (2012) also note the tendency to focus on producers, production objectives, and expansion of input access, and argue that there is insufficient attention paid to improved soil fertility and health, to development of private sector input supply, to complementary investments raising input productivity, to effective programme implementation (with more secure entitlement systems, better targeting, better monitoring and evaluation), and to phasing out and exits for input subsidies. However Druilhe and Barreiro-Hurlé (2012) themselves make little mention of programme benefits for consumers and for wider economic growth, and provide no discussion of farm level (as opposed to input supply) processes whereby subsidy delivery may lead to reduced need for and benefits from subsidies. (Chirwa and Dorward, 2013, p60)

The tendency of most programmes to focus on short term food production and security objectives and not to link with complementary programmes means that there is almost no evidence on changes in soil health and other environmental status indicators. Equally there is little evidence on the effect of fertiliser subsidy on crop diversification.

2.2 Existing policy and practice in Malawi

As noted above lack of inputs such as improved seed, fertilizer and pesticides has long been seen as a major constraint to adequate agricultural production and especially so for smallholders. Accordingly, the Malawian government has implemented subsidy programmes for crop inputs for several decades with an interruption during the Structural Adjustment Programmes of the 1980's. The modalities have been varied in response to monitoring and evaluation and no doubt have been influenced by political expediency. The costs have been enormous and represent large proportions of the Agricultural and National Budget (as shown in Fig. 1) and the outcomes very variable with seasonal food shortages common place.

Figure 1: Costs of the FISP from 2005 to 2012 (Source: Chirwa and Dorward 2013)



The impact of the FISP and its predecessors has been evaluated by many authors with the most recent being Chirwa and Dorward in 2013. In addition to questions about effectiveness in increasing maize yields, the main policy issues raised are poverty targeting, gender imbalance, efficiency of input use, and problems arising from foreign exchange policies which affect the volume of subsidised input available nationally each year. These issues are in addition to the practical operational constraints of timeliness of supply and hence delays in planting; poor administration of the coupon distribution system; time taken by farmers to procure the input, supplier running out of stock, etc. In spite of all the problems Chirwa and Dorward (2013) consider that the extra production per subsidy pack is some Mk 50-70,000 or 500 kg of incremental maize and that the Benefit Cost Ratio for direct inputs is 1.7 and rises to 1.8 when indirect benefits are considered. They consider that the programme over the last six years may have led to average annual savings of maize imports of some 385,000 MT[4] which would offset between 85-110% of programme costs. The actual benefits could of course be much greater if programme efficiency was increased.

Even so and without querying wider benefit issues there are at least two fundamental questions to be considered in relation to the FISP. Firstly is the question of the farmers'

[4] This figure does not take into consideration informal exports of maize

economic need for it. If the response to inorganic fertiliser is economically very viable in terms of crop margins then why farmers should be subsidised to use it at heavy cost to the government? They may well have a problem in not being able to access fertiliser because of deficits in the supply situation or because of difficulties in their cash flows but those are different matters to whether or not they can afford it. The remedy to those problems lies in better supply systems and access to finance.

Secondly, is the question of the effect of FISP on the environment and unfortunately there is little or no evidence on this. There can be little doubt that continued cereal cropping without nitrogen replenishment is harmful to soil health. However, farmers in many countries have practical experience that in a monoculture system, inputs of inorganic fertiliser alone, even if with nitrogen, phosphorus and potassium, lead to a reduction in soil fertility. This soil fertility problem can be avoided to some extent by shifting cultivation but that is constrained by changing population dynamics and social patterns and thus is not a medium to long term solution.

When considering these questions together with the issues of the opportunity costs of the FISP it would seem appropriate to consider policy alternatives.

2.3 Policy Options/Alternatives

A number of policy options are provided in studies on the Malawi FISP. (Chirwa and Doward, 2013; 2011; 2008; Holden and Lunduka, 2010; Chibwana et. al., 2010.) Among the various alternatives are the following suggestions:

- Any subsidy programme should be designed in a way that allows for the involvement of farmers, importers and agro-dealers in its design and implementation.

- The government should consider introducing the process of gradual reduction (graduation) of the level of subsidy to free up some resources that can be invested in other productive sectors, even within the agricultural sector.

- The government should put in place a regulatory framework on the implementation of the subsidy programme and its monitoring process.

- The government should withdraw from direct involvement in the importation and distribution of fertilizers with the private sector assuming an active role in the importation and distribution of the farm inputs.

- Government should facilitate easy access to financial services and loans for smallholder farmers instead of subsidy.

- Any subsidy programme should include complementary services to make subsidized fertilizer accessible and its use more effective. These include extension services, improved seed, irrigation systems and appropriate pesticide support.

- Any attempt to improve input availability must include efforts to strengthen the capacity of the existing private fertilizer market. This can be achieved through provision of support through some of the following measures:

i. Acting as credit guarantee or issuance of letters of credit for importation of fertilizers;
ii. Building up the private import and distribution network by supporting and investing in training, exposure and credit facilities;
iii. Training local importers and linking them with international networks of traders and financial institutions.

- Future policy changes moving towards subsidy reduction would result in the release of very substantial sums of money for alternative investment.

Probably the most far reaching positive long term effect would be through the stimulation of credit and other financial services for farmers including smallholders. Lack of credit facilities hampers smallholder livelihoods in many ways in addition to lack of access to inputs.

3. LIMITED FINANCE

Malawi's financial sector was liberalized in the 1980s as part of the Structural Adjustment Programs (SAP). Before the SAP, the government had control of the banking sector through regulation of credit and interest rates. Prior to the liberalization of Malawi's financial sector, most of the financial institutions operated in urban areas with the exception of commercial banks and credit unions. The commercial banks concentrated on offering working capital, mainly to large-scale business enterprises and the development banks relied more on foreign resources than on domestic resource mobilization to finance their operations. By 1994, the financial sector was completely liberalized (MFT, 2011). MFT observes that the financial sector's access to credit has historically been restricted by both the limited availability of loanable funds and lack of resources to administer an extensive credit network. Furthermore, credit providers have also suffered from controls, inflexibility, and high administrative costs.

Most people live in rural areas and agriculture is the main activity of the rural economy. Microfinance services are critical to businesses and households in the agricultural sector but the microfinance subsector has focused mainly on serving trade and industry in urban, peri-urban and densely populated rural areas. Burritt (2005) noted that millions of poor, vulnerable non-poor and unbanked households want financial services yet financial intermediaries like commercial banks generally do not serve these households for a variety of reasons including the fact that the commercial banks' business models are generally unsuitable for managing microfinance businesses which are characterized by high-volume, low-value transactions. The commercial banks employ traditional lending technologies based on collateral requirements which the poor often cannot afford; and in many cases conventional banks believe, almost certainly unjustly, that the unbanked are unwilling and unable to repay loans and save money.

Over the last five decades a variety of institutional models have emerged globally to serve microfinance markets including specialized microfinance banks, nongovernmental organizations (NGOs), credit unions, credit cooperatives, non-banking financial institutions, and commercial banks that develop new lines of business or specialized subsidiaries focusing on microfinance market segments. Burrit (*ibid*) observed that the spectrum of potential microfinance clients is broad and in Malawi this includes women in the informal sector working at home to produce prepared foods to sell outside the home; vendors selling vegetables or fish in an open-air market and a farming household that seeks access to credit to buy farm inputs or a farming family that establishes a contract with a buyer before the harvest and hence seeks financial assistance to enable the family to produce in compliance to the contractual agreements.

Some details of micro-financing institutions in Malawi as recognised by MIX in 2011 are shown in Table 1.

Table 1: Portfolio Details of the Main Malawian Micro-finance Institutions (MK) (Source: Figures adapted from MIX 2011)

Institution	Gross Loan Portfolio	Number of Active Borrowers	Average loan per borrower
Malawi Rural Finance Company Limited	1,606,853,200	132,000	12,173
Opportunity International Bank of Malawi	4,500,000,000	48,000	93,750
CUMO Microfinance Ltd	185,000,000	40,000	4,625
Finance Cooperative Limited	615,884,079	33,228	18,535
Microloan Foundation	260,000,000	22,690	11,459
FINCA Malawi Ltd	494,319,449	17,413	28,388
Malawi Rural Development Fund	1,020,000,000	11,815	86,331
Pride Malawi	272,000,000	8,528	31,895
Finance Trust For The Self Employed	65,000,000	4,200	15,476
Centre for Community Organization & Dev	110,429,000	2,422	45,594

Due to the regulatory environment provided by the different Acts, there has been an emergence of various rural microfinance institutions in Malawi. According to Agar et. al., (2012) the financial sector has four categories:

1. Those with banking licenses. These are commercial banks including discount houses and leasing companies all regulated by the Banking Act.
2. Non-bank formal service providers, including insurers, pension companies and the Malawi Stock Exchange.
3. Micro-finance providers including, Savings and Credit organisations (SACCOS) and Micro-finance institutions (MFIs). Some of the providers have a specific rural focus, while others focus more on cities and larger towns. For example, SACCOs are less influential in rural areas since they tend to cater more for formal salaried individuals.
4. Informal providers. Lending by these providers can be to individuals or groups. The group based financial providers take various forms including Rotating Savings and Credit Associations (ROSCAs) as well as Village Savings and Loan Associations (VSLAs).

Some of the MFIs target people not generally served by the banking sector but data from the annual households surveys carried out for this study indicate that these loan amounts are usually inadequate for agricultural purposes.

According to FinScope 2008 and FinScope MSME (2012), small informal financial service providers using group methodology are the most important forms of finance in rural areas. The VSLA model which is ideal for rural areas was pioneered and promoted by CARE. Agar, et. al. (2012) noted that the number of VSLA groups increased from 174 in 2006 to 4,478 in June 2011, with an average membership of 19 per group. CARE is targeting to reach 400,000 individuals by the year 2017. This sort of development is borne out by data from the surveys as presented below. However, the loans amounts are small in relation to small farmer needs for cropping.

3.1 Access to Savings and Credit by Study Farmers

In spite of a marked increase in savings and credit activity in 2012 very few smallholders get access to credit at economic rates. Data for householders in the surveys are shown in Table 2.

There was a 3.5 fold increase in the number of households saving in 2013 compared with the 2010 baseline figure. The number of households accessing credit increased by 28% over the four study years although the numbers dropped in the middle years.

Table 2: Households Accessing Financial Services 2010 - 2013

	Savings		Credit	
	n	%	n	%
2010	22	11.28	64	32.82
2011	44	22.56	53	27.18
2012	53	27.18	29	14.87
2013	99	50.77	82	42.05

The increases are linked to the emergence of Village Savings and Loans clubs between the 2012 and 2013 data collection surveys as evident in Tables 3 and 4. During focus group discussions participants referred to the appointment of the first female president Joyce Banda and her political party which encouraged people, in particular women, to set up their own village savings and loans groups. Discussions around this topic often indicated that many women now want to start up their own small business such as mandazi (local deep fried doughnut) production and selling.

Table 3: Location of Households Savings 2010 - 2013

	2010	2011	2012	2013
Bank (commercial)	10	15	17	20
Club/Village Savings & Loans	2	2	15	60
Home	8	19	10	10
Lent-out	1	0	0	0
Micro-finance Institution	0	1	1	1
Women's Club	1	6	9	8
Other	0	1	1	0
Total	22	44	53	99

Table 4: Location of Household Credit 2010 - 2013

	2010	2011	2012	2013
Bank (commercial)	2	4	2	3
Village Savings & Loans	0	0	0	19
CUMO	0	0	0	1
CUUM	1	0	0	1
Employer	2	2	0	2
Farmers Club	2	0	0	0
FITSE	0	0	0	1
Grocery/Local merchant	3	0	1	0
Home bank	0	0	0	10
MADEF	1	0	0	0
Money Lender	14	2	4	20
MRFC	1	0	1	1
Neighbour	17	12	4	8
NGO	2	3	2	1
Relative	5	6	2	12
Religious Institution	13	0	0	0
SACCO	0	0	0	1
Women's Club	2	0	0	2
Other	0	24	13	0
Total	43	53	29	82

The use of loans by households is shown in Table 5.

Table 5: Use of loans by Households 2010 - 2013

	2010	2011	2012	2013
Small Business start-up capital	12	12	3	10
Dwelling construction/renovation	-	-	-	2
Educational costs	6	6	2	13
Funeral costs	4	1	-	1
Invest in enterprise	-	2	2	2
Legal costs	2	-	-	-
Medical costs	11	8	5	7
Pay for maize milling	-	-	1	-
Purchase food for consumption	7	8	7	25
Agriculture				
inputs for cash crop	-	1	1	3
inputs for food & cash crops	-	1	-	4
inputs for food crop	7	8	7	2
inputs for tobacco	2	1	-	-
land	-	3	-	1
Non-farm inputs	-	-	1	9
Non-food household items	7	1	-	2
Transport costs	4	1	-	1
Other	2	-	-	-
Total	64	53	29	82

Loan uses that showed an increase were education costs, which more than doubled over the four years and purchase of food for consumption which showed more than a 250% increase from the baseline, the largest increase across the list. Agricultural inputs across all five categories were never more than 40% of all loans and in three years were less than 25%. This

will be investigated further in relation to agricultural inputs used, market price of inputs and access to the government Farm Input Subsidy Programme (FISP).

3.2 Difficulties in providing farm finance to smallholders

Given the predominance of smallholder farmers in the agricultural sector (80% of production) efficient financial services in the rural areas are critical to support productive activities thereby contributing to economic growth and poverty reduction. The lack of such services leads to difficulties in renting land, timely access to crop inputs; inadequate weeding due to difficulties in paying for labour; and distress sales of crops before harvest when yields are low and prices poor. It also leads to borrowing at very high rates from the informal sector. In relation to groundnut production the early harvesting can exacerbate aflatoxin contamination.

The following are the main problems giving rise to the lack of regulated financial institutions providing products for smallholders.[5]

1. **Little history of formal borrowing and low financial literacy**:
   This leads to fears that lack of social cohesion may result in poor credit discipline.

2. **Special challenges:**
   These include high exposure to systemic risks such as droughts and floods, high transaction costs per loan, seasonality in production, high price volatility and poor health (often lowering earning capacity and increasing cash outlays).

3. **Poor communications infrastructure:**
   This includes a limited and poorly maintained road network, and very limited telephone and internet networks. It results in high transport costs for credit officials and hence high costs per loan.

4. **Very high costs of funds:**
   This includes very unstable and generally devaluating foreign exchange costs which make the cost of international borrowing very high.

On the positive side there is demand and in many areas the high population density should help to reduce administrative costs per loan. Furthermore, most of the problems have been overcome in other contexts.

The first two problems listed above can be overcome by micro-finance institutions as part of their normal operating procedures. The lack of financial literacy will be overcome as an integral part of the process of expanding financial service networks and is very unlikely to be a killer risk. The recent expansion of the number of village savings clubs indicates the emergence of financial literacy. The special challenges call for creativity in product design and flexibility in management of emergencies such as drought. In terms of product design the linkage of loan size and duration to the borrower's cash flow could overcome problems of crop sales before harvest maturity. The introduction of both crop and health insurance would overcome many of the environmental risks. Insurance could be introduced by micro-finance institutions acting as agents for national scale insurance companies.

[5] see Fin Scope 2014 for a detailed SWOT analysis of the situation facing MFIs in Malawi.

In spite of such potential remedies to lack of literacy and the special small scale agriculture challenges, it is highly unlikely that effective rural financial services will develop unless the communications infrastructure and cost of funds issues are meaningfully addressed in the short to medium term.

3.3 Improvement of Communications

Development of a comprehensive network of all-weather roads will inevitably be a slow and very expensive process. Even then the cost of sending credit agents to rural locations will result in high costs per loan and thus high and probably prohibitive interest rates to smallholders. A shorter term alternative is the development of the national telecommunications network.[6] This would enable the development of low unit cost micro-finance services based on mobile phone technology and the use of agents at village level. In turn this would create local revenue generation. The technology has been shown to work in countries such as Kenya and Cambodia and has been effective in some parts of Malawi in cash transfers for food insecure people during drought periods. Indeed when villagers in Dowa District, facing a serious localised food shortage, were provided with cash relief by Concern Worldwide local food traders followed the bank van around villages to seize market opportunities

In the longer term and for the following reasons, investment in this area could well prove to be a better use of funds than ongoing investment in the FISP.

1. It would create a long-term productive asset.
2. The improved internet/mobile phone access would stimulate parallel developments in agricultural marketing and other areas of the private sector.
3. The financial services made possible would be of advantage to a much wider section of the community than just small farmers. Examples are the possibility of fast cheap money transfers which would facilitate businesses in paying bills and placing orders; families in making remittances; and commercial banks in expanding their services while improving efficiency.
4. Outside the agriculture sector opportunities would be created for improvements in government administration and in many training areas such as formal education, health, etc.

3.4 Very high costs of funds

Reported costs of loans from MFIs in Malawi are rarely less than 60% per annum and this is before inflation is considered. This is not surprising considering that the cost of borrowing from the Reserve Bank is currently in excess of 40% per annum.

The declining trend in the value of the Malawi currency translates into high inflation and interest rates which in turn negatively affect the purchasing power including the cost of borrowing. Thus the Reserve Bank lending rate increased from 22.83% p.a. in June 2012 to 31.42% p.a. in July 2012 following the June 2012 devaluation of some seventy percent.

[6] In Cambodia the traditional landline phone infrastructure was almost completely destroyed during the period when the Pol Pot regime was in control. New microwave system was developed from the early 1990's. The e-communications which this has enabled have been largely responsible for the emergence of a large number of viable micro-finance institutions and country wide money transfers. There are similar examples from Kenya and South Africa.

Policy reversals, as shown in Table 6, in relation to the country's currency over the years have caused confusion among economic agents.

Table 6: Monthly Exchange Rates for the Malawi Kwacha

Month	MK per USD Buying
Aug-09	139.9
Feb-10	149.97
Aug-10	150.05
Feb-11	150.05
Aug-11	160.65
Feb-12	165.91
Aug-12	273.93
Feb-13	357.16
Aug-13	323.87
Feb-14	412.96
Aug-14	394.40

The changes in later years reflect the shift in government policy from a fixed rate to devaluation followed by a floating rate in May 2012.

Informal enquiries with an international funder of MFIs indicated a high reluctance to lend in Malawi given the currency volatility. Even if the reluctance could be overcome the minimum rate for lending hard currency to a reputable MFI in Malawi would be at least 23% p.a. net of fees. To calculate the cost of funds one would have to add the cost of fees, commissions on exchange, any charges levied by the central bank and heavy hedging costs so that the gross cost would be at least 30%.[7] While this may be cheaper than local funding it may still result in prohibitive rates for small farmers unless MFIs have large numbers of clients and very efficient operations.

Accordingly without some new macro-economic policy from the central government it is difficult to see significant development of effective micro-finance. Options could include use of donor grants to refinance MFIs long term in local currency at fixed interest rates. This would avoid the difficulties associated with recurring subsidies[8]. It would also avoid the problem of government donating funds to private entities or of trying to operate commercial financial activities itself.

[7] The current gross cost of international funds for an MFI with which the author is associated in Cambodia is under 15% p.a.

[8] It would mean depreciation in the government's financing fund depending on default rates, the interest rate charged and the level of inflation. However it should lead to the establishment of longer term sustainable institutions

4. INEFFICIENT MARKETS

The agricultural input and output marketing system in Malawi was fully liberalized following the Structural Adjustment Programmes implemented in the late 1980s and early 1990s. Prior to liberalization, the agricultural marketing system, particularly for the smallholder sub-sector was regulated by the state through the state institutions ADMARC[9] and the Smallholder Farmers Fertilizer Revolving Fund of Malawi (SFFRFM). Liberalisation of the marketing system was meant to remove state control and allow active participation of the private sector for increased efficiency in the marketing system and also to enhance smallholder farmer's access to both input and output markets.

Despite the liberalization, a number of studies (Minot,, 2010; Kherallah et. al., 2001; Green, 2000; UNDP/UNCTAD, 1999; Devereux,, 1997; Kherallah and Govindan1997) indicate that access to markets by smallholder farmers remains a challenge for reasons including poor macroeconomic performance of the economy which hampers private sector involvement in the markets; poor sequencing of agricultural policy reforms; price interventions by the state; inefficient production systems among smallholder farmers, etc..

Studies have shown that improvement in market access increases agricultural productivity, firstly by facilitating specialisation and exchange transactions in rural areas, and secondly through intensification of input use. Thus improved market access results in increase in farm income which facilitates the purchase of more farm inputs to intensify production and improve farmer's welfare, Kamara 2004.

4.1 Government Policy and Strategies

Having recognized the importance of improved market access on smallholders' welfare and economic development of the country, the Malawian government, has put in place strategies and initiatives to enhance farmers access to markets. Such strategies and initiatives are spelt out in documents such as the Malawi Growth and Development Strategy II 2011-2016 (MGDS II) and the Agriculture Sector Wide Approach (ASWAp) 2011. The MGDS II recognizes that lack of markets and market information, inadequate access to agricultural credit, inefficient input and output market are among the critical constraints in the agricultural sector. Sustainable economic growth is one of the thematic areas in the MGDS II and there are 8 sub-themes under the sustainable economic growth of which agriculture is priority number one.

Within the context of the MGDS II, key strategies towards promoting access to markets for smallholder farmers include; Strengthening linkages of farmers to input and output markets; Promoting contract farming arrangements; Promoting irrigation farming; Improving agricultural production and diversification; Promoting agricultural production for exports; and Strengthening and scaling up market-based risk management initiatives. Likewise, the ASWAp emphasizes the promotion of agro-processing for value addition and import substitution; developing the domestic market for import substitution; and expanding the export market to increase foreign currency earning potential of the country.

[9] ADMARC was responsible for produce buying and selling within the smallholder sector. It also dealt in fertiliser and seeds, while the SFFRFM was wholly responsible for fertilizer imports and sales. Some of SFFRFM's fertilizer was also sold through ADMARC.

In addition to the MGDS II and the ASWAp is the National Export Strategy (NES) developed by the Ministry of Industry and Trade between August 2011 and September 2012. The NES is a five-year strategy aimed with four priority areas of Export Clusters; Conducive Environment; Supportive Economic Institutions to build the Productive Base of the Economy, and; Competencies, skills and knowledge. It includes market access as one of the 'enablers' necessary to develop the export-oriented clusters. It highlights the need for improving the coordination efforts to connect smallholder farmers to processors and to markets. It also promotes access to affordable finance to smallholder farmers, including women.

Other strategies that the Malawi government has put in place to promote smallholder farmers' access to markets are:

Contract Farming Strategy:
The government, through the Ministry of Agriculture and Food Security is also in the process of finalising the contract farming strategy. Once finalised and implemented, it is expected that the contract farming strategy will enhance farmers' access to inputs as well as an assured market for the commodities to be grown under the contract. It is also expected that through the contract arrangements, farmers will be in a position to bargain for better prices while also conforming on the agreed upon grades and standards for presentation of the commodities.

Farmer Organisations:
For effective implementation of its various market initiatives the government promotes the formation of farmer groups. The basic unit is the farmers club which, with appropriate empowerment including gender balance, stands a chance to graduate into an association and a cooperative. To facilitate this progression of farmer organisations, the government has developed a Cooperative Development Policy. The policy aims at enabling cooperatives to become efficient business institutions for mobilising human, financial and material resources.

Market Information Systems:
The government collects various market related information which includes production and price levels for different commodities and in different geographic locations across the country. The information from the various geographic locations is consolidated at the headquarters of the Agro-economic Survey and is available for public consumption. The consolidated information is also supposed to be disseminated through the Agricultural Development Division Structure which goes down to the village level through Section manned by the Agricultural Extension Development Officer. To date the collection of this information has been haphazard and in particular the production data about which many people are sceptical.

In addition to the government initiatives the private sector also makes efforts to enhance market access by farmers. Currently there are two major commodity exchange facilities dealing in agricultural commodities. They the Agricultural Commodity Exchange (ACE) and the Auction Holdings Limited Commodity Exchange (AHLCX). ACE has been on the scene for a longer period than AHLCX which is was established in 2012. The two commodity exchange facilities have some common strategies in terms of facilitating farmers' access to markets even though they differ in the details of operations.

The basic concept of the commodity exchange is to provide a platform where farmers/suppliers of different commodities interact and make transactions to the mutual

benefit of both parties. Various modes of interaction or access information are used including the use of mobile phones, use of print media and the warehousing system. For the mobile and print media, commodity suppliers and prospective buyers exchange information on the commodities available, the quantities, quality, geographic location, price and mode of transaction.

Warehouse Receipt System:
The farmer/commodity supplier deposits the commodity in the warehouse until such a time that they feel it is profitable to sell. Meanwhile the commodity supplier receives a warehouse receipt against which they are able to obtain immediate finance from a bank using the warehouse receipt and there are no defaults in terms of payment which comes through the bank almost immediately after a transaction is made. The system also allows the supplier to obtain better prices, access bridging finance and minimise post-harvest losses. For the buyers, they are able to get the quantities they want in good quality and minimise chances of default. ACE and AHLCX both offer this service to producers.

4.2 Constraints to Smallholder Farmers' Access to Markets

In spite of the developments taking place to improve marketing there are a number of factors that impede farmers access to markets. These include:

Seasonality and Levels of Productivity:
Volumes produced by smallholder farmers are usually too small to attract meaningful demand. The low production is associated with other challenges such as over reliance on rain-fed agriculture which confines farmers to seasonal production resulting in fluctuations in supply, making it impossible for farmers to sustain supply as demanded by most buyers.

Noncompliance to Grades and Standards:
Farmers often do not comply with grades and standards as required by the markets. The non-compliance to grades and standards results in low prices offered to farmers. Poor grades and standards are a bigger problem in relation to formal export markets.

Poor Storage and Transport Infrastructure:
Poor road conditions and networks make it difficult and expensive for farmers to transport their produce from the farm to the market. This confines them to markets within their production zones rather than other markets that would pay higher prices. Poor storage infrastructure contributes to quality deterioration and increased post-harvest losses which in turn limits access to better markets.

Poor Market Information Systems:
The smallholder farmers have very little access to information on what type and quantity of commodities are in demand, where and when they are demanded, grades and standards required, prices offered, terms of delivery and payment. Such information is necessary for the decisions on whether to produce and supply.

Scattered and Unorganised Production and Marketing Arrangements:
With scattered and small landholding sizes, production among smallholder farmers tend to be unorganised and hence contributing to unorganised marketing arrangements resulting in poor access to markets. Some of the existing farmer organisations do not have strong bargaining

power because of weak structures within the organisations but also worsened by low literacy levels.

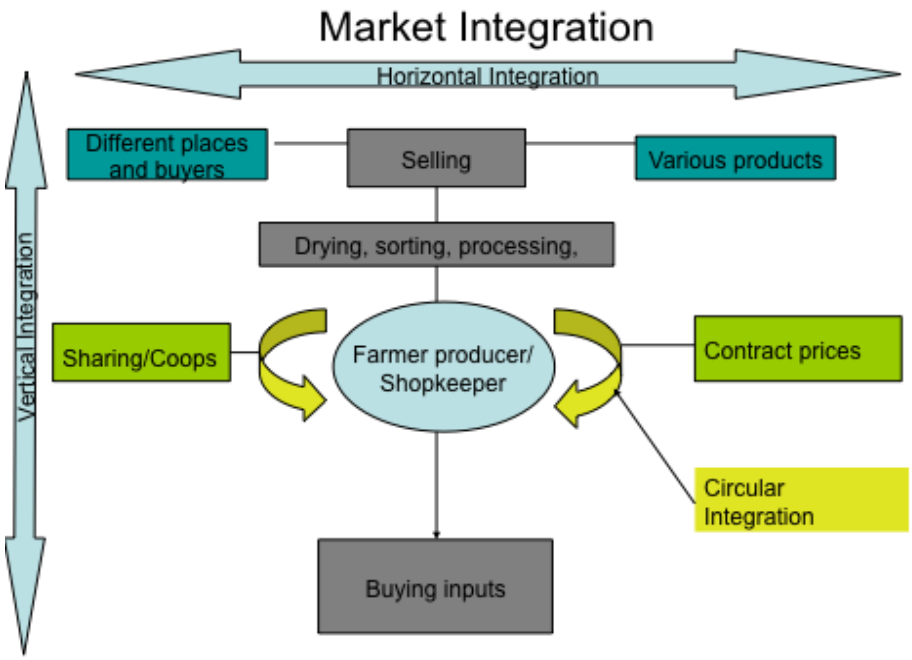
Poor Access to Extension Services:
The public extension services on agriculture have low numbers of extension agents in relation to the number of farmers in need of extension services. With this, the focus of extension services is largely around production and typically does not cover market related topics to detail.

Unregulated Contract Farming:
Contract farming systems if well regulated can enhance farmers' access to markets and also minimise negative effects of price volatility. However some of the contracts that smallholder farmers have been subjected to seem to not to have mutual benefits with the smallholder farmers often falling victims by being offered lower prices and sometimes the buying partner rescinding on the whole contract.

On the other hand, buying partners in some contracts have expressed concerns about the behaviour of the smallholder farmers who sometimes do not deliver the quantities as agreed because of side selling which is influenced by better prices outside the contract and the farmers' need for an early cash income.

In summary the marketing of groundnuts by small farmers is currently very immature and lacks integration as shown in Figure 2

Figure 2: Schematic of a Mature Market
(Developed by H. Dalzell from concepts in Chou Panith 2011_



There is opportunity for the members in the Legume Platform to work together to develop greater integration in each of the three dimensions. In doing so it must be recognised that there are conflicts of interest between different stakeholders at various stages and thus development can only come through negotiation.

The horizontal integration of farmers through clubs/coops should ensure that they have adequate good access to inputs at lower prices and hence higher yields. Together with higher joint quantities of good quality produce for most of the year they should be able to reduce wastage and increase margins.

4.3 Market policy implementation

There is sometimes inefficiency in policy implementation within and across related sectors. For example issuing of export licences is a responsibility of both the Ministry of Agriculture and Ministry of Industry and Trade (MoIT). The Ministry of Agriculture first scrutinizes every application for export licence on a case-by-case basis and refers them to the MoIT which issues the license. This can lead to delays as the documents change hands between the two ministries. Stakeholders feel that there should be streamlining of the process

The government sometimes imposes export bans if groundnut shortages seem likely in the domestic market. However, in some instances the government's estimates of production upon which the bans are based do not reflect reality thereby causing disequilibrium in demand and supply and hence distorting the markets. There is need for thorough consultations between the government and the private sector before any ban on exports or imports is imposed. The methodology on national agricultural production estimates should be reviewed and improved including the use of modern satellite technology.

5. WIDESPREAD CONTAMINATION BY AFLATOXIN[10]

Aflatoxin, resulting from contamination by aspergillus sp., is a global public health issue with some 4.5 billion people at risk of chronic aflatoxin exposure (Centre for Disease Control Atlanta). According to the Partnership for Aflatoxin Control in Africa (PACA) it is a class 1 carcinogen which contributes to 28% of all new liver cancers; suppresses the immune system; increases TB when linked with HIV; and reinforces stunting in children (stunted children have 30-40% more aflatoxin in their blood than children with normal body weight) (Diaz Rios, 2013).

Aflatoxin contamination is a barrier to trade, with most African countries finding it difficult to meet the EU maximum permissible levels of <4ppb. Informal traders don't check for aflatoxin but still manage to compete with the formal trade in Malawi and some surrounding countries Aflatoxin affects 25% of the world's crops, (FAO) but is not only a developing country issue, However, the more industrialised countries with more favourable climatic conditions are less affected. There are many entry points' pre and post-harvest (e.g. hand shelling groundnuts and storage). Soaking shells to ease hand shelling creates ideal conditions for infection by Aspergillus sp. Poor drying and storage compound the problem as do distress sales pre-harvest maturity.

The government of Malawi has set a maximum level of 15 ppb for aflatoxin in traded groundnuts but the incidence in country tends to be much higher as evidenced by data in Table 7 from ICRISAT 2011.

Table 7: Aflatoxin Contamination by Location (Source: ICRISAT 2011)

Location	Percentage of groundnuts with aflatoxin > 4ppb
Farm households	43
Warehouses	41
Local markets	49
Shops and supermarkets	58

In addition to this, tests carried out by Valid Nutrition in its laboratory in Lilongwe have shown high levels of contamination in samples of groundnut paste purchased in the retail sector in Lilongwe.

Controls in formal value chains should protect consumers in export and local retail markets. As an example Valid Nutrition has to conform to the UN standard in producing safe RUTF's for severely malnourished children. While Valid has no problem with the fixing and monitoring of standards it is important that, in the interest of global public health, they are realistic universal standards and are adhered to/enforced consistently. Currently the standard for RUTF is much stricter than the standard set by the US Government for consumption of groundnut products in America while the Malawian Government has set an intermediate standard.

Although improving groundnut quality should have a positive impact on all consumers, there is little awareness of the problem among farmers or the community at large and there are few

[10] Much of the material in this section been drawn from a publication in January 2014 for the John Lewis Partnership 30th January 2014 Andrew Emmott (Neno Macadamia Trust) Jem Woods (Imperial College)

incentives to reduce levels in the informal market. Export standards do present incentives to reduce contamination but this can exacerbate health risks in Malawi. In order to meet export standards traders can insist on more severe grading by farmers so that only high quality nuts enter the export trade. This can result in rejection of more than 40% of the crop. The rejected nuts invariably end up in the local market or are eaten at home and thus exposing farm families to very high levels of contamination. Valid Nutrition considers it is vitally important that the government moves to reduce this problem by ensuring that there is more rigorous monitoring of aflatoxin levels in the local retail food chain, by the widespread promotion of education about aflatoxin and by creating incentives to markedly reduce contamination. Some good progress on thinking about Aflatoxin has been made in the development of the Malawian Programme for Aflatoxin Control (MAPAC).

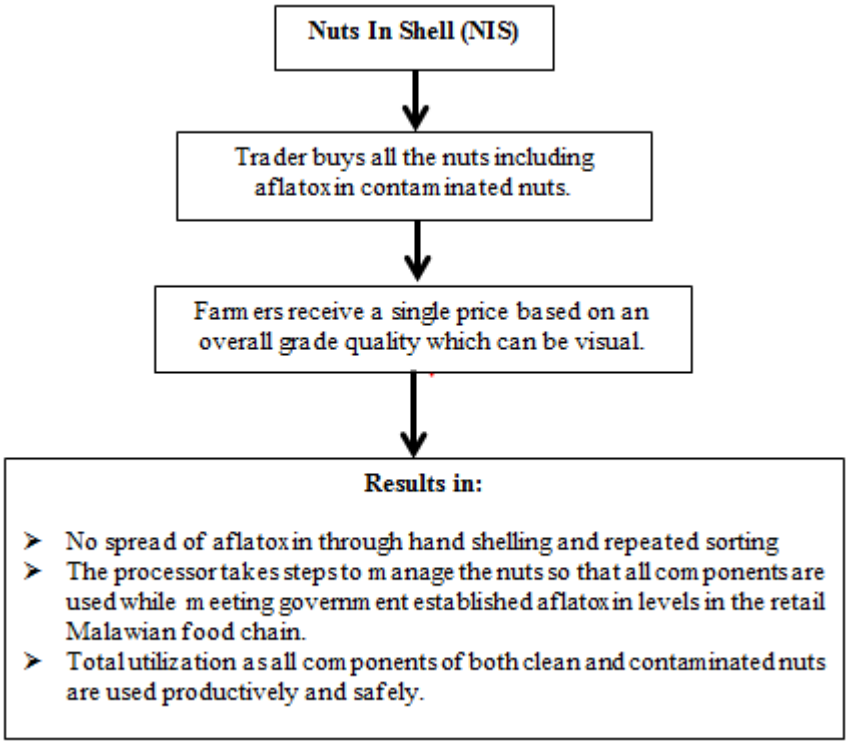
5.1 Immediate practical steps to reduce aflatoxin contamination

As indicated in the MAPAC report on Advancing Collaboration for Effective Aflatoxin Control in Malawi (Diaz Rois, et al., 2013) phased action is required on a range of fronts. However resource limits may mean that progress is slower than needed. From Valid Nutrition's point of view there are two areas that would yield a rapid reduction of the problem and improve the competitiveness of locally produced RUTF:

Farmer Level:
Farmers trained by Exagris Africa in the Valid/UCC project have shown willingness to take on the technology to reduce the aflatoxin problem. Their main approaches have been to use better seed and to adopt the Mandela Cock method of drying. Whereas irrigation is probably beyond the reach of most small farmers they are open to other improvements such as mechanical harvesting and shelling and better storage. However, for such developments they are constrained by lack of finance and by the small volume each farmer manages. Accordingly access to credit is important as is horizontal market integration. As mentioned above access to credit could also minimize the practice of distress crop sales before the crop is mature and has low moisture levels which will discourage aflatoxin development and spread.

Processor Level:
In the short to medium term it is inevitable that there will be quite high levels of aflatoxin in harvested groundnuts. A paradigm shift in how to minimize the further build-up of contamination and to offset the costs of dealing with the consequences has been conceived by Emmott and Woods (2014). This holistic approach looks at managing aflatoxin and is based on the key principles of buying contaminated and clean nuts in shells (NIS) from producers and of finding efficient ways to use all components of all the nuts for economic purposes. Figure 3 gives a brief overview of the proposed process flow.

Figure 3: Nuts In Shell Buying Process



The process can reduce costs of processing and increase income. By reducing manual handling and by decontamination processes it takes aflatoxin out of the food chain. Decontamination is a two stage process of producing and filtering groundnut oil which is aflatoxin free but leaves a high protein meal which can be chemically decontaminated and made suitable for animal feed. The products of the processing can contribute to improved soil productivity, alternative energy strategies and improved food security. Direct economic benefits by way of better prices for farmers and good margins for processors/traders will arise in the domestic and export markets. There should also be indirect improvements in health, incomes and hence food/livelihood security for farmers. The overall approach is set out in Table 8.

Table 8: Schematic of total utilisation of groundnuts bought in shells.

Component	Process	Immediate products	End usage
Shells	Pyrolise	Gas	Fuel as gas
		Biochar	Soil ameliorant
	Distribute	Litter for animal housing	Soil ameliorant
Contaminated nuts	Extraction, expressing	Aflatoxin free oil	Food
			Fuel
		Contaminated meal to be decontaminated	Animal feed
Edible nuts	Grade	Raw nuts	Human Food
	Value added processing	Confectionary, snack foods, RUTF, etc	Food

5.2 Policy Implications

This analysis underlines many of the recommendations in the MAPAC proposals and nothing runs counter to them. It focuses on possible immediate shifts which could be facilitated by government policy additions and implementation assistance. Some of the changes are consistent with earlier recommendations.

- Information about aflatoxin through agricultural extension and public health campaigns
- Health Policy monitoring and enforcement
- Credit facilities for farmers
- Farmer organisation for market integration
- Grants for processing/value adding

Apart from the internal benefits to farmers and consumers noted above, the benefits to Valid Nutrition in the production of competitively priced RUTF would be very considerable as would the benefits to exporters.

SYNTHESIS OF FINDINGS

Valid Nutrition's prime aim is to demonstrate that there are substantial benefits to Malawian farmers and processors from producing high yields of high quality groundnuts at smallholder levels and processing them to competitively priced RUTF meeting international standards. This is to provide an advocacy base on which to lobby international donors to procure RUTF in Africa for Africa and to ensure that African farmers and entrepreneurs can progressively and successfully manage both their food needs and livelihood security.

The full market demand for RUTF is of the order of hundreds of millions of dollars per annum and the soon to develop market for nutriceutic foods for the prevention and treatment of moderate malnutrition is probably of the order of US10 billion dollars annually. The production in Malawi of groundnut based RUTF faces exactly the same challenges as the groundnut export trade and thus the policy environment for each is very similar. The large scale export of groundnuts would enable Malawi to successfully move to foreign exchange earnings based on a nutritious food rather than on tobacco. A pre-requisite of successful RUTF production and of food export competitiveness is the removal of aflatoxin from the food chain.

The constraints to successful groundnut production identified by smallholders have been assessed in order to define any deficits in policy and/or policy implementation which could be addressed. The constraints vary in scale and in the ease with which they might be overcome. The time and money required to implement changes vary between different constraints as does the benefit which might occur. Inevitably there are some interactions between the constraints and hence in the remedies suggested. In seeking to find ways forward short term gains must be considered alongside long term implications. When thinking of livelihoods, attention must be given to not only economic advantages but to risk, vulnerability, social factors and environmental stability.

POLICY RECOMMENDATIONS

The policy suggestions outlined in this paper can be summed up as:

1. Small Land Holdings & Low Crop Yields per unit area

Policy:

No deficit in land policy, inadequate and unstainable crop, in particular staple crop, production policy

Implementation:

i. Distribution of untitled land and the redistribution of long-term unused lands
ii. Develop credit systems to enable farmers to rent land
iii. Maize Yield Policy (FISP) Pilot at large scale alternative systems, such as conservation agriculture, to high inorganic input maize production so as to reduce mono-crop farming and limit dependency on agrochemicals while improving soil health and reducing labour demands.

2. Lack of Access to Inputs

Policy: Current policy is too dependent on subsidy and inorganic fertiliser.

Implementation:

i. Involvement of farmers, importers and agro-dealers in design and implementation of subsidy programme
ii. Start the process of gradual reduction of subsidy to free up some resources for other productive investment
iii. Create a regulatory framework on the implementation of the subsidy programme and its monitoring process
iv. Government withdrawal from direct involvement in the importation and distribution of fertilizers
v. Government facilitation of easy access to financial services and loans for smallholder farmers instead of subsidy
vi. Any subsidy programme should include complementary services to make subsidized fertilizer accessible and its use more effective. These include extension services, improved seed, irrigation support and pesticide support.

3. Limited finance

Policy: No serious deficit in financial policies

Implementation:

i. Credit facilities appropriate to smallholders urgently needed
ii. Create telecommunications network for mobile banking
iii. Create mechanism for MFIs to access loan funds at affordable and stable interest rates

4. Inefficient markets

Policy: No serious deficit with input and output policies.

Implementation:

i. Streamline interactions between government departments
ii. Greater stakeholder consultation before export bans are implemented
iii. More organisation of smallholders into clubs/coops
iv. Greater integration of stakeholders vertically and more cooperation
v. Build telecommunications network for easier access to credit and for real time transmission of market information

5. Widespread occurrence of aflatoxin

Policy: Complex and developing policy environment

Implementation:

i. Adopt main recommendations of MACAP
ii. Widespread Education about health aspects of Aflatoxin and implementation of health standard
iii. Follow MACAP phasing as far as resources allow but promote Nuts in Shell (NIS) selling by farmers
iv. Total Utilisation policy by processors

OVERALL SUMMARY

The above policy suggestions are rationalised in Table 9, whereby, the right hand column sets out the three main components of a sustainable livelihoods framework (i.e. vulnerability, assets and policies institutions and processes. These factors influence farmers' decision making in relation to cropping. The next column lists all the options open to farmers for improvements in production and trading while the third column shows the benefits to be gained from each change. For each production and trading option the main current constraints are set out in the fourth column with the main remedy in the final column.

Table 9: Economic Constraints and Remedies
(Developed by H. Dalzell from concepts in Chou Panith 2011)

Factors Affecting Cash Cropping and Marketing Decision Making	Options for Changes in Production and Trading	Resulting Changes in Economic Terms	Main Current Constraints	Main Enabling Policy Shifts and Implementation Changes Needed
VULNERABILITY • Economic • Environmental **ASSETS** (Lack of & low returns) 6. Human 7. Social 8. Natural 9. Physical 10. Financial **POLICIES, INSTITUTIONS & PROCESSES**	Scale of production	Increased volume of groundnuts for sale	Land ownership No cash for advance rent Low maize yields	Land ownership Credit promotion
	Input management	Lower costs Better yields	Lack of inputs Lack of money	FISP rethink Credit promotion Communication infrastructure
	New techniques	Better yields Less post-harvest loss	Seed/drying and shelling	Better seed availability Improved extension Conservation Ag
	Marketing channels	Better prices	Distress sales Info gaps Farmer dis-organisation	Credit promotion Information communication Farmer organisations
	Aflatoxin control	Better prices Lower crop losses	Harvesting/ storage and marketing methods	Health standards enforcement Sell Nuts in Shells No waste processing
	All of the above	Better gross income Better margins		

From Table 9 it can be seen that some remedies occur more than once as they affect more than one production and/or trading option.

Given the findings shown in the table the main conclusions from the overall analysis are to move away from widespread heavy subsidy of maize fertiliser and enable farmers to access affordable credit so that they make decisions about diversified farming and pay for those inputs which make a meaningful return for them across a wide spectrum of parameters such as labour demand and food security, at an acceptable level of risk. Affordable credit systems could be facilitated by investment in electronic telecommunications infrastructure which would bring benefits to the national agricultural input and output marketing systems as also to many aspects of government administration and to education and health promotion.

A graduation out of FISP could be aided by the testing and probable promotion of conservation agriculture. A more environmentally friendly alternative to high inorganic fertiliser mono-crop maize farming is needed to bring more widespread benefits than those intended, or indeed achievable, through FISP. The development and promotion of such alternatives would require a more efficient and effective agricultural extension system.

Any downward investment in FISP would release funds for the promotion of many of the policy changes and policy implementation shifts suggested. Even without any resources from FISP the government could probably easily raise funds for widespread telecommunications development from several sources including private sector investment.

The overall market process is very immature and would benefit enormously from the stimulation of small farmer organisations to enable the farmers to have more influence in the value chain and to be able to access market information more easily.

The entire groundnut value chain is bedevilled by the widespread occurrence of aflatoxin. The promotion of the nuts in shell trading by smallholders would reduce the problem substantially and the minimisation of the toxin in the food chain could be brought about by total utilisation/processing of the shells and kernels including those contaminated by aflatoxin. Apart from any production or processing changes to limit aflatoxin it is important to educate the public about it and to enforce the prescribed market standards. This is a major health issue.

Finally the redistribution of land to those with very small holdings would benefit many smallholders and enable them to diversify their livelihoods.

All of these changes are within the reach of the Government of Malawi and many could be achieved within available resources given sufficient political will.

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