

The Production of Ready to Use Therapeutic Food in Malawi



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The Proposition

In the early years of this century, Valid International and Concern Worldwide, co-funded by Irish Aid, carried out a joint operational research into the diagnosis and treatment of severe acute malnutrition (SAM) in young children. The research results showed that community based approaches are more effective in terms of coverage, cost and sustainability than diagnosis and treatment in in-patient intensive care centres. These findings led to the adoption of Community Management of Acute Malnutrition (CMAM) as the preferred protocol for dealing with SAM by United Nations Organisations and the model has now been adopted by 65 developing country governments.

A major component of CMAM is the use of a peanut-based Ready to Use Therapeutic Food (RUTF). Most of the RUTF used in the research work was produced in France. However, it was shown that it could be produced on a small scale in Malawi. Following the adoption of CMAM in 2007, Valid Nutrition (VN) was established to develop medium to large scale production in Malawi to test the proposition that indigenous production of RUTF could result in a good quality product at equal or lower cost than imported RUTF and lead to enhanced livelihoods for small farmers and profits for local business entrepreneurs. In addition to the developmental and economic impact, there would also be an environmental benefit of reduced transport.

Since 2010, VN has collaborated with Exagris Africa (Exagris) to train smallholders in Malawi to produce high yields of good quality groundnuts for use as an important raw material for RUTF production. In a joint research project with University College Cork, Ireland (UCC) and the Centre for Agricultural Research and Development at Bunda College, Malawi (CARD), VN has carried out a panel study over four years (2010-2013) on the livelihoods of 195 small farm families which participated in the training carried out by Exagris Africa.

Training farmers to produce high volumes of good quality groundnuts

The families selected for this project were from among those working on Exagris Estates. The training intervention was part of a wider outgrowers programme that ExAgris implemented in 8 districts of Malawi. The main objectives were to:

1. Increase availability of and access to, quality certified seed of a number of appropriate groundnut varieties.
2. Increase the average yield and price per kg of groundnuts produced by the target group.
3. Reduce per unit processing, handling and marketing costs for groundnut farmers.
4. Identify the key determinants of yield and price in various farming scenarios.

The training promoted early planting; use of improved seed; increased plant population; scouting for pests and diseases and control where economically viable for the small holder; fertilizer application; and improved harvesting and drying. Farmers were trained in the calculation of gross margins to enable them to estimate the financial benefits of additional costs so as to make comparisons between crops with the aim of being able to make more informed planting decisions in the future.

It was envisaged that the project smallholders would sell their groundnuts graded and in shell to ExAgris. At the buying station, these groundnuts would be bulked, further graded and packaged before being sold onto a newly established processor. This company, AfriNut, is an exciting collaboration involving the National Smallholder Farmers' Association of Malawi (NASFAM) and the UK Fair Trade organisation, Twin. AfriNut would then process the nuts into peanut paste and supply to Valid Nutrition to process into RUTF, thus, in the broadest sense, creating a sustainable value chain. Although the baseline survey for the research project was conducted in 2010, the process of guaranteed groundnut purchasing did not begin until 2013, the final year of data collection.

The Research Project

The overall objective was to identify the food security and livelihood situation of selected households, including agricultural production; physical assets; health; and household food consumption. The specific objectives were to:

1. Identify the current on-farm and off-farm income generating activities of households.
2. Identify constraining factors on the efforts to improve livelihoods.
3. Determine the level of uptake by households of groundnuts as a reliable food and cash crop.

The research took place in three districts in Central Region. In Lilongwe District, 66 households were drawn from 28 different villages surrounding the ExAgris Lisungwi Estate. In Mchinji district, 70 households from 6 villages adjacent to the ExAgris Mchaisi Estate were selected. In Salima District, 59 households were from 12 different villages near the ExAgris Mphatsana Njoka Estate. Among the heads of households, 79 were female and 116 were male.

Households completed a quantitative and qualitative questionnaire each year based on a Livelihoods Framework and Household Economy Approach. The questionnaires were backed by Focus Group Discussions; Semi-structured Interviews of Households and Key Informants; Market Visits and Interviews with Traders; and Direct Observation. All questionnaire data was analysed using SPSS 20.

Research Findings

Households had low asset endowment and low returns on their assets at the start and end of the research and so remain highly vulnerable to shocks. They are 'hanging on'.

Human Assets

Health status was used as a measure. The number of household members experiencing some form of illness in the past month was similar for all four years. The number of days of labour per capita missed due to illness showed a significant increase in 2012 but had dropped off again by 2013. There was a fifteen percent increase in the number of families using mosquito nets, although there was a decrease in the regularity of treating nets with insecticide.

Social Assets

The main social asset for farmers at the outset of the research was membership of Farmer Associations organised by various NGOs. There was a 17.82% decrease in membership over the study period. The distribution of association membership by wealth groups shows decreases in the low and middle wealth groups, but not the high group. The decrease may be due to farmers' frustration with the failure of associations to find buyers offering fair prices for their produce. Other frustrations of leadership, cooperation, and poor organisation were identified in focus group discussions.

Financial Assets

There was a marked increase in savings and access to credit through village level Women's Associations stimulated by a Presidential initiative. This was a positive development of social capital but the sums of money involved were too low to be significant for agricultural purposes. Over the study period there was no significant increase in the supply of agricultural credit which is often offered at rates in excess of 60% per annum.

Physical Assets

There was no significant change in land owned. There was less renting out of land and less renting in. More land was left uncultivated due to lack of labour.

Natural Resources

Livestock ownership is the main natural resource asset other than rainfed land. Ownership levels of chickens, goats and pigs fell slightly over the period, although incomes from animal sales increased. There was a small increase in the ownership of cattle which are usually owned by the wealthiest families.

Food Security

Household Food Insecurity over the years from 2011-2013 showed little change but low wealth group households had consistently low security. Similar results were found when analysing household dietary diversity. There was an increase in the number of families not experiencing any months of food insecurity and in those with more than three months of food insecurity. This led to a decrease in the number of families with up to three months of food insecurity.

Income patterns

Crop production remained the main source of income. Farmers are prepared to diversify to raise incomes. Groundnut is rapidly becoming the favoured cash crop as it is a dual food and cash source and requires lower financial investment than other cash crops. Paid labour, mostly in agriculture, is the second largest earner. There has been a trend of less labour in agriculture due to a decline in tobacco growing and processing. Some of this has been made up by increased labour in building work. Annual off-farm incomes showed major variations from year to year with no clear pattern emerging but even in a good year, were low with a maximum of MK 78,939 per person. Micro-business is becoming more popular especially with poorer families but returns are very low.

Overall

In terms of overall livelihood and food security, the results showed little change in household welfare. This is despite the majority of the households benefitting from FISP, government extension support and the Exagris groundnut intervention.

However, results for groundnut production and the sale of groundnuts showed quite positive outcomes at household level. The highest yields obtained by small farmers growing well managed groundnuts gave an enhanced gross margin of MK 500,000 per hectare, equivalent to MK 150,000 for the areas grown by small farmers. This is equivalent to 1,500 kg of maize at a price of MK 100 per kg. This volume of maize is of the order that farmers harvest per hectare. The main obstacle to farmers achieving this sort of groundnut output is the need for some MK 200,000 per hectare in costs.

Farmers showed that they are prepared to take on risk and improve farming practices in order to enhance cash crop production but are constrained by factors beyond their individual control.

Aflatoxin

Aflatoxin is an ever present problem in the production and processing of groundnuts, especially with small holder production using mainly manual methods. Farmers have been willing to adopt simple control measures but these showed limited success. Repeated grading and rejection of affected nuts will enable farmers to meet market standards, but is likely to mean higher levels of consumption of

infected nuts by poor people. This public health threat should be addressed in National Health Policy. Buying nuts in shells, and then processing mechanically with commercial outlets for all by-products, offers a means of removing aflatoxin from the food chain.

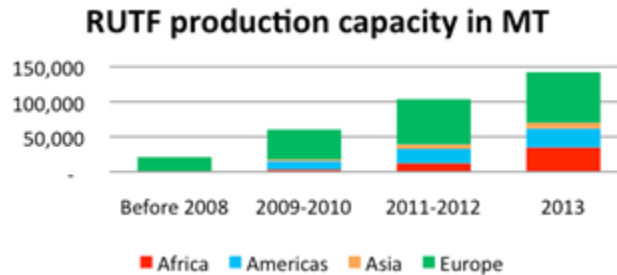
Policy Constraints Affecting Small Holders

The main identified constraints to diversification into groundnut production were access to land and low crop yields; access to inputs, access to credit; poor markets; and aflatoxin. These constraints affect the value chain for small farmers producing groundnuts, for VN producing RUTF and for groundnut exporters. For small farmers, an analysis of the constraints is set out in the following table in relation to farmers' main livelihood factors and their options to increase production. From the analysis, the main enabling policy shifts and implementation changes needed to overcome the constraints can be seen.

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
<p>VULNERABILITY</p> <ul style="list-style-type: none"> Economic Environmental <p>ASSETS (Lack of & low returns)</p> <ol style="list-style-type: none"> Human Social Natural Physical Financial <p>POLICIES, INSTITUTIONS & PROCESSES</p>	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		

RUTF Production in Lilongwe

VN has faced many challenges in attempting to consistently produce high quality RUTF in Lilongwe. Competition has also increased markedly. VN welcomes this as long as it is competition which will enhance overall developmental impact, improve efficiencies and drive down sale prices.



With changing standards and requirements for product quality leading to increased pressure on both margin and overheads, there is a requirement to expand scale of production. This creates problems for small-scale local producers. For RUTF alone, it is difficult to gain the necessary scale in Malawi and so VN must try to export and/or diversify into retail products. Given the scale and complexity of equipment required, the initial cost of investment is very high and much of it is in hard currency. This poses problems for local manufacturers. As a result of the volatility of the Malawian Kwacha, the Risk/Return profile of investment is often unattractive.

For various reasons, requirements for working capital are very high. The long lead time and other complexities involved in importing milk powder, result in purchase of larger batches than needed for immediate production. Difficulties in obtaining high quality locally available ingredients throughout the year also mean holding high stockpiles. The long-time taken for quality testing before invoices can be issued and the unwillingness of most purchasers to provide part payment in advance, exacerbates this situation. This could be avoided as the buyers usually have pre-financed budgets. Donors will not fund working capital and local borrowing normally costs at least 35% p.a. which is obviously extremely unfavourable compared with money costs for external competitors.

Quality requirements and standards for both ingredients and final product are becoming more numerous and complex and inevitably push up actual costs. The actual necessity for some of the standards and control measures is not clear. For international supply of RUTF, there has been an increase in shelf life requirement to two years which is well in excess of that needed if distribution systems are adequate. Furthermore, the amount of mandatory sampling per batch has been increased and testing for *Cronobacter sakazakii* for example has been made compulsory, although the risks associated with it are very low.

Initially aflatoxin limits were set to 20ppb (as in the USA). In 2007, the UN introduced a standard of 5 ppb. This was reviewed by WHO and changed to 10 ppb but UNICEF still insists on 5 ppb. Peanut butter in Malawi supermarkets very often has levels in excess of 35ppb. The low level on both ingredients and product is a major constraint on cost effectiveness.

There is no normative international certification or regulatory body for producers. Thus UNICEF, WFP and MSF validate and accredit suppliers, but each organization follows its own procedures and has its own specifications. UNICEF purchases around 70% of RUTF used worldwide and other purchasers have adopted their accreditation standard and insist upon it. Understandably, UNICEF only engages in certification according to its own procurement requirements. The establishment of an independent certifier would we believe lead to more opportunities for competition and especially production in Africa.

Recommendations

Small farmers have shown willingness to diversify into cash crops and especially groundnut production. If this willingness is to lead to significant sustainable improvements in their livelihoods, several changes are necessary in Malawian Government policies and implementation of same. The enhanced production of high quality groundnuts would improve the competitiveness of VN's RUTF production in Lilongwe and also have far reaching positive implications for the export trade.

The following recommendations for change are set out in more detail in the main papers produced from the research work. It is suggested that donors should support the government in such initiatives.

Agricultural Policy

1. **Land ownership and leasing.** The government should take steps to maximise land use by improving records and redistributing any agricultural land which is not in cultivation. Credit should be made available to farmers at affordable rates so that those wishing to rent land can do so.
2. **Access to inputs.** The policy of high levels of subsidy for inorganic fertiliser has not been shown to significantly improve livelihoods, may discourage diversification and will risk environmental degradation. Farmers get good returns to moderate usage of fertiliser. Government should graduate away from the subsidy and use the money saved to help develop a reliable comprehensive communications network, which would benefit many sectors of the economy and enable the development of effective finance and marketing services for farmers.
3. **Conservation agriculture** should be promoted to improve and stabilise yields while reducing dependence on inorganic fertiliser, maintaining and improving soil fertility, reducing and evening out labour demand per acre and thus minimising non-cultivation of land due to labour shortages.
4. **Investment in extension services** should be made to improve farm extension services to educate farmers about financial management, cooperation, product quality and marketing. This would be in addition to current extension about production methods.
5. **Promotion of MFIs.** Government should promote the development of micro-finance organisations which could provide credit at affordable prices and products geared to farmer cash flows. This would overcome constraints caused by lack of access to land, lack of inputs, distress sales and inefficient marketing. Action is needed on re-financing of institutions at moderate interest rates and hedged against forex swings. The process would be expedited by the rapid development of good e-communications.
6. **Organisation of Farmers** should be encouraged to organise themselves in to producer coops to ensure that they can supply sizeable quantities of product of good quality for long periods.

Other Policy in Malawi

7. Promote public education about the dangers of aflatoxin and take steps to regulate processors and organisations marketing aflatoxin susceptible products.
8. Encourage the practice of trade of Nuts-in Shell between farmers and traders/processors.
9. Encourage processors to remove aflatoxin from the food chain by adopting no waste processing techniques.

10. Streamline importation procedures, reduce/eliminate import duties on milk powder and other necessarily imported materials used for RUTF and where applicable, expedite VAT refunds. Taxing of profits on processing ensures that the production of RUTF is taxed but not double taxed.

Donor and RUTF Purchaser Policies

Changes are required to enable producers in developing countries to compete fairly with other offshore based producers.

1. Bring certification of producers under a single institution, independent of production or purchase.
2. Establish a universal set of specifications / standards for RUTF which are practical in relation to costs and risks while also independent of either major suppliers or purchasers.
3. Facilitate competitiveness by improving terms of business with suppliers so as to reduce the current extremely high cost of working capital.

Conclusions

In spite of the challenges faced, Valid Nutrition has shown many positives to local production. These include the creation of skilled local jobs associated with the factory, better margins for groundnut farmers, business for ingredient suppliers, the development of a specialised food production unit, speedy supply of product to local customers and lower carbon footprint of RUTF. VN estimates that around 66% of the price paid for Lilongwe produced RUTF stays in Africa compared with some 15% for RUTF produced outside Africa.

Subject to the recommendations set out above, it is possible to produce high quality RUTF in Malawi at internationally competitive prices.

If indigenous production is encouraged, it will in due course, minimise the market cost of RUTF - thus ensuring that as many children as possible are treated for a given budget allocation. Furthermore, it will enable a critical developmental “multiplier effect” with major long term economic benefits.

This document summarises the outputs of a research project investigating the benefits to local farmers, indigenous processors, and to purchasers which arise from production of Ready to Use Therapeutic Food in Malawi.

ExAgris Africa, headed by Jim Goodman, trained small farmers in improved methods of groundnut production and purchased some of their produce. ExAgris also provided much valued logistical support to the researchers.

Nick Chisholm and Mike Fitzgibbon of the Department of Food Business and Development in University College Cork (UCC) supervised the work of Mike Magee, Eze Emmanuel and Gretta Fitzgerald who managed the field work in Malawi as part of their postgraduate studies. Gretta carried out most of the data analysis.

Happy Botha, of Valid Nutrition in Lilongwe coordinated the work in Malawi. Steve Collins of Valid Nutrition promoted the idea of the research and Howard Dalzell of Valid Nutrition managed the overall project. Many staff in Valid Nutrition assisted in administration.

Richard Kachule of the Centre for Agricultural Research and Development within the Lilongwe University of Agriculture and Natural Resources provided valuable contextual analysis summarised in a final report.

The results were presented at a dissemination event in Lilongwe in October 2014 and this will be repeated at a similar event to be held in UCC on the 6th of March 2015. In addition to this summary paper there are several research outputs and they are available at www.validnutrition.org and at <http://www.ucc.ie/en/foodbus/research/areas/>

Other research outputs to date:

Smallholder farmers' experience with groundnut production: Results from four year livelihood analysis in Malawi's Central Region. Lead author: Gretta Fitzgerald (GF)

Smallholder farmers' experience with groundnut production. Slide presentation: Gretta Fitzgerald (GF)

Constraints faced by farmers and possible policy remedies. Lead author: Howard Dalzell (HD)

Constraints faced by farmers and possible policy remedies. Slide presentation: Howard Dalzell (HD)

The challenges of "local" production of Ready to Use Foods. Slide presentation: Steve Collins and Paul Murphy of Valid Nutrition

Kachule, R. 2014. "Linkages between Land, Agricultural Finance, Inputs and Markets: A Contextual Analysis of Malawi's Agricultural Sector with a focus on Lilongwe, Mchinji and Salima districts". Lilongwe, Malawi

Fitzgerald, G. et al. 2014 "Impact of Crop production Strategies on Household Food Security and Welfare in Malawi's Central Region" Poster presentation at Tropentag 2014: Bridging the gap between increasing knowledge and decreasing resources, Prague, Czech Republic.

Fitzgerald, G. 2014 "Setting Standards for the Development of a Sustainable Groundnut Value Chain in Malawi". Conference paper presented at Safe Food Integrity and Tractability Conference, Queens University, Belfast.

Fitzgerald, G. and FitzGibbon, M. 2014. "A Comparative Analysis of Traditional and Digital Data Collection Methods in Social Research in LDCs - Case Studies Exploring Implications for Participation, Empowerment, and (mis)Understandings". Conference paper presented at the IFAC World Congress, Cape Town, August, 2014.

Fitzgerald, G. and FitzGibbon, M. 2013. "The Evolution of Digital Data Collection (DDC) in the Monitoring and Evaluation of Projects in Developing Country Contexts". Conference paper presented at EUTIC, Waterford October 2013.

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