

Assessing Adoption of Gross Margin Analysis Technique by Farmer Business School Lead Farmers in Mzuzu and Karonga Agriculture Development Divisions of Malawi

Beatrice Mbakaya¹, D. Kambewa² and Isaac Mambo³

Abstract

Gross margin analysis technique is among the tools that farmers are taught in farmer business schools to enable them to plan for profitable enterprises. This study was aimed at assessing the adoption of this technique being promoted among lead farmers.

It was observed that 60 per cent of the respondents did not prepare gross margins, indicating low adoption of this technique. Among the users of gross margin technique, this was used in selection of profitable enterprises only. Most of the respondents (60%) had an average knowledge on gross margin technique. Most respondents (82%) however indicated that it is easy to do gross margin analysis. Moreover, farmers complained that they do not sell their products at calculated sale prices. Use of gross margin technique was found to be associated with availability of farm records, extension follow-up visits on gross margin analysis and farmers' knowledge on gross margin analysis ($p < 0.05$).

Keywords: Adoption, Gross margin analysis technique.

Introduction

Malawi's economy remains predominantly agro-based despite development of other economic sectors (GoM, 2012a). The agriculture sector is divided into two: the small-scale and the estate sub-sector (GoM, 2012a). The smallholder sub-sector contributes around 70 per cent of the total agricultural output (GoM, 2012c). Despite the fact that the smallholder sub-sector contributes a significant amount to Malawi's GDP, farming by these smallholder farmers has in general not been approached as a profit making undertaking (GoM, 2012b). However,

¹District Agriculture Development Officer, Mzimba North, Malawi; E-mail: temwaluhanga@yahoo.co.uk.

²Associate Professor of Agrarian Studies, Lilongwe University of Agriculture, Extension Department, Bunda College, Lilongwe, Malawi

³Lecturer, Lilongwe University of Agriculture, Extension Department, Bunda College, Lilongwe, Malawi

Article received on : 14-01-2017; Article accepted on 23-01-2017

most capacity building programmes earmarked for the farmers in Malawi have been focusing on technical issues that include agronomic and production aspects. Little has been accomplished in imparting knowledge and skills in agribusiness and marketing, and more so in a structured format (GoM, 2012b). In an effort to provide technical back-up services, in 2008, the Ministry of Agriculture and Food Security initiated Farm Business Schools (FBSs) with the aim of strengthening the capacity of selected lead farmers to plan and orient their production activities towards the market to promote farm commercialization. Other countries where the FBS concept was piloted include Zambia, Pakistan and Ethiopia (Kahan, 2007).

The training of farmers in farm business management in Malawi dates back to 1969 when it was noted that it was not enough for farmers to produce good crops and animal products and leave the profit to look after itself (Tolani, 2002). However, these farm business management trainings among farmers were criticised for their unstructured format and little emphasis on marketing in an era of liberalised markets (GoM, 2012b). This necessitated putting in strategies to empower smallholder farmers to be conscious and aware of the challenges and opportunities that exist in a liberalised market economy and more so in a structured format. Farm business school is one strategy which the Government of Malawi piloted in eight districts in 2008, with assistance from Food and Agriculture Organisation (FAO). These districts are Karonga, Rumphi, Mchinji, Dedza, Salima, Mangochi, Mwanza and Nsanje.

A farm business school is a programme of business-oriented learning designed to help smallholder farmers who are getting involved in producing for the market and need help in making it work profitably (GoM, 2012a). Taking place at the village level, a FBS brings selected lead farmers together to carry out collective and collaborative enquiry with the purpose of motivating them to address business and marketing problems and opportunities (GoM, 2012a). According to GoM (2012a), an FBS has four distinctive characteristics: firstly, focus is on the content not training facility, secondly, participants learn by doing, it also promotes farmer to farmer learning where participants share experiences and lastly, the programme is organised to match the activities of the farm season with three terms *viz.*, pre-season, in-season and post-season (GoM, 2012a).

According to the Government of Malawi, (2011), the training of farmers in FBS can take one of the following models: in the first model, lead farmers are called

to a residential training centre where they undergo complete season training for 4-5 months for annual crops and eight months for livestock. On completion, graduates facilitate their own FBS in their local communities. The second model is an abridged residential training of lead farmers. Focusing on essential concepts, it approximately takes 30 days. On completion, graduates facilitate their own FBS in their local communities. As regards the third model, lead farmers are trained at residential training centres as well but at key times during the season. The fourth model is also an abridged residential training of lead farmers which takes 30 days but split into stages. The residential training centre in this case is closer to the field to test exercises in the field. The fifth model is a localized field school that takes place in the field. A Core Team of Trainers come down to the field level and work with extension workers in setting up schools directly on the ground.

Implementation of FBS under study took model number five. Apart from being cost effective (GoM, 2011), it is argued that field based training used in this model, is also more effective in building skills as it is done at the pace of the farmers with more time to explain issues and offer more technical support (GoM, 2009). Lead farmers selected to participate in these FBS, came from farmer groups who were already involved in income generating enterprises. Each FBS had fifteen lead farmers. On completion, the participants graduate as FBS lead farmers. By definition, a lead farmer is described as a farmer who has mastered a specific technology and is willing to support fellow farmers in the learning and implementation of that particular technology (GoM, 2012a). The essence of using lead farmers is to reach out to most farming population which is not reached due to inadequate front line agriculture extension staff. Using facts and figures, gross margin analysis is one of the instructional technologies FBS lead farmers learn and for those lead farmers who are not good at figures, symbols are used to represent figures in calculation of enterprise gross margins. The objective of capacity building programmes among farmers is to enable farmers to use the knowledge in decision making processes regarding their farm business. However, studies have shown that after going through trainings, farmers do not apply the knowledge in decision support services (Kahan, 2007). This was a follow-up study to assess adoption of Gross Margin Analysis (GMA) technique being promoted among lead farmers in farm business schools in Karonga and Mzuzu Agriculture Development Divisions (ADDs) of Malawi.

Objectives of the study

The overall objective was to assess whether lead farmers who were in farm business school had adopted gross margin technique. The specific objectives of the study were:

- i. To assess the level of knowledge of FBS lead farmers on GMA.
- ii. To assess the level of use of GMA technique by FBS lead farmers.
- iii. To assess the FBS lead farmers' perceptions towards GMA technique.

Research Methodology

Description of the Study Areas

Eight FBS were piloted in Malawi in eight districts in 2008. These districts are Karonga, Rumphi, Mchinji, Dedza, Salima, Mangochi, Mwanza and Nsanje. Due to financial constraints, FBS in the northern part of Malawi were sampled. The study was conducted in Mhujū and Bolero Extension Planning Areas (EPA) in Rumphi district and Nyungwe Extension Planning Area in Karonga district. These Extension Planning Areas are among a number of Extension Planning Areas in the country where farmers were trained in gross margin technique under Farmer Business School (FBS).

Sampled Participants and Sampling Method

Through the District Agriculture offices in Karonga and Rumphi districts, names of Farmer Business Schools which were piloted were collected and this included a list of farmers who were recruited. It was found out that some farmers did not attend some lessons due to a number of reasons, *e.g.* attended funeral at the time; some were sick and some dropped out on the way. According to the selection criteria, farmers who did not attend gross margin lessons were left out. In total, 50 farmers were purposively sampled, with the aim of having lead farmers with information on gross margin analysis to allow for an in-depth case study.

Data Collection Methods and Tools

To document FBS lead farmer knowledge in gross margin analysis, an oral test was administered through face to face interviews which allowed for more in-depth assessment of farmers' knowledge. The test was developed based on the key recommendations on how to prepare enterprise gross margins outlined in the market oriented farm planning and management training manual for training staff

(GoM, 2012). To determine the farmers practice, farmer's record books were reviewed. Review of farmer's record book offered evidence that lead farmers were using knowledge gained from the gross analysis lesson. Through face to face interviews using a checklist, farmer's perceptions towards gross margin analysis were captured.

Analysis of the Data

The initial steps of data analysis were achieved by computing frequencies, means and percentages of all variables of interest. Further, to determine relationship between categorical variables, cross tabulations were computed. To test whether the association between two categorical variables under consideration was significant, a chi-square test for association was examined where an observed frequency associated with a class is compared to an expected frequency. In order to test differences in mean knowledge scores between farmer groups, an independent 2- sample t-test was used. The F-test was performed to check for equality of variances as described by Armitage *et al.*, (2002). In an attempt to determine farmer knowledge of gross margin technique, a marking scheme was developed for scoring each farmer. The percentage scores were graded as follows to determine the knowledge levels of farmers in gross margin analysis: 70% - 100% (High), 40% - 69% (Average), 0% - 39% (Low), as adapted from Nekesa (2012).

Results and Discussion

Socio-economic Characteristics of the Study Population

The respondents comprised of 24 (48%) men and 26 (52%) women with a mean age of 42.24 years (SD 11.3). Majority of participants were within the productive age group (26-60) years old. The mean income was MK202,280.00/year, which is US\$282 (@ 716.713 Malawian Kwacha=1 UD \$) with farming as a major source. This is above the average annual income per household among smallholder farmers in Malawi which is reported to be MK50,000.00 (National Statistical Office, 2005). The type of farmers selected were not mere subsistence smallholder farmers; they were selected from farmer groups who were already involved in income generating enterprises hence the difference in income levels. Forty-four per cent, completed primary school education, furthermore, 56 per cent completed their secondary school education.

Farmers' Knowledge on GMA

The findings of the study revealed that most lead farmers (60%) were in the

category of an average knowledge level (40% - 69%). The mean knowledge score of participants was 43.52 per cent. This indicates that knowledge gaps in gross margin technique still exist among most FBS lead farmers. An analysis of the distribution of scores for each type of knowledge which comprise of awareness and how-to knowledge are displayed in Table 1.

Table 1. Percentage Score for each examined area on GMA

Type of knowledge	Possible Marks	Mean percentage score
Awareness knowledge		
Definition of gross margin	15	66.4
Definition of variable costs	10	56.0
Definition of gross income	10	60.0
Importance of gross margin analysis	10	83.0
How-to knowledge		
Procedure for gross margin preparation	55	27.0
Overall score	100	

Higher mean percentage scores were on awareness knowledge compared to how-to knowledge. This implies that respondents were more knowledgeable on awareness knowledge (what gross margin analysis is, what are variable costs, what are fixed costs and importance of gross margin analysis) compared to how-to knowledge (procedure for gross margin preparation). When it came to describing the procedure for gross margin preparation almost all farmers mentioned the need to establish value of production; however, some steps in establishing value of production were not mentioned. For example, need for establishing value of units of produce still possessed, eaten, given away, battered and that of any by-products. Despite attending lessons on GMA, it was noted that most lead farmers had an average knowledge on GMA technique hence this study assessed the relationship between farmers' associated characteristics of the study participants and how they relate to their knowledge level in GMA.

Influence of Farmers' associated Characteristics on Knowledge of GMA

Influence of Education on Knowledge of GMA

The mean knowledge score of lead farmers who attended primary education was 44.5 (SD 24.8) and that of lead farmers who attended secondary education was 46.1 (SD 24.2). An independent 2 sample t-test performed to test the relationship between knowledge scores of lead farmers and their education levels revealed that

there were no significant differences in the mean score of knowledge between participants who attended primary and secondary education with respect to gross margin analysis ($t=-0.22$, $p=0.8$). This is contrary to the belief that more years spent in formal education increases understanding of concepts. The training methodology used by FBS increased the chances of impacting knowledge on gross margin knowledge by lead farmers irrespective of their educational background *e.g.*, those who are not good at figures, symbols are used to represent figures to come up with gross margins.

Influence of Availability of Records on Knowledge of GMA

The mean knowledge score of lead farmers who kept farm records was 54.4 (SD25.7) and that of lead farmers without farm records was 27.9 (SD 25.7). An independent 2 sample t-test performed to the means of knowledge scores of farmers who kept records and those who did not keep records, revealed that there were significant differences in the mean score of knowledge of gross margin analysis between these two farmer groups ($t=- 4.24$, $p=0.0001$). This indicates that farmers who maintained records had a better understanding of gross margin analysis than those who did not. This finding is in line with Griffith (1984) who reported that in the teaching of farm management and record keeping, the most effective learning experience involves the use of each farmer's own records as a basis for discussion and the explanation of alternatives. He continues to say that the use of other hypothetical cases does not make as much impact on the learner as does the use of records the farmer keeps. The current results suggest that availability of farm records contributed to better understanding of gross margin analysis among those who kept records.

Use of GMA Technique by Lead Farmers

Only 34 per cent of the respondents adopted gross margin analysis technique. The results indicate that there is low adoption of gross margin technique among FBS lead farmers. All the farmers who adopted gross margin technique used it in assessing profitability of enterprises. Enterprises selected include: tobacco, maize, ground nuts, paprika, beans, onions, soya and green maize in Rumphu; rice, maize, tobacco in Karonga. Among the reasons farmers gave as regards their choice of these crops includes the fact that market for these crops is readily available. As reviewed in literature, use of GMA technique is also affected by a number of factors as discussed below.

Influence of Farmer Characteristics on Use of GMA Technique

Influence of Extension - Farmer Contact on Use of GMA Technique

A Pearson Chi-square test revealed a significant relationship between extension-farmer contact on GMA and use of GMA ($\chi^2=10.1901$, $p=0.001$). The results suggest that extension-farmer contact on gross margin analysis promotes use of gross margin analysis. Follow up visits to farmer business school participants are part of the farmer business school learning processes which help to individualize knowledge gained by farmers to different farm settings.

Influence of Availability of Records on Use of GMA

Maintenance of proper farm records as is done in all other commercial entities is key to monitoring and evaluating the financial viability of the farm enterprises (GOM 2008). Realizing the key role farm records play in farming business, this study analyzed the relationship between use of gross margin analysis technique and ability of lead farmers to keep records. A Pearson Chi-square test revealed a significant relationship between use of GMA and availability of records ($\chi^2=9.0749$, $p=0.003$). Most lead farmers (94.1%) who used gross margin analysis technique, kept records. Gross margin analysis technique is data dependent and availability of records facilitates compilation of gross margin without which it is difficult to prepare gross margins.

Influence of Knowledge of GMA by use of GMA technique

The mean knowledge score of lead farmers who used gross margin analysis was 56.2 (SD 20.6) and that of lead farmers who did not use gross margin technique was 39.8 (SD 24.4). A Wilcoxon rank-sum (Mann-Whitney) test was performed to the means of knowledge scores of farmers who adopted gross margin technique and those who did not adopt gross margin technique. The mean score on knowledge on gross margin analysis among adopters and non-adopters was significantly different ($z=-2.25$, $p=0.02$). This implies that adopters were more knowledgeable than non-adopters on gross margin analysis. The inadequacy of this knowledge may have affected adoption of this technique among non-adopters as noticed by their low mean knowledge scores on gross margin analysis. This is in line with International Labour Organization on World Agriculture in 1981 which reported that the degree of completeness or adequacy of knowledge will affect the manner in which a technology is applied.

Influence of Education level of Respondent on Use of GMA technique

A Pearson Chi-square test revealed no significant relationship between adoption of gross margin analysis and education level ($\chi^2 = 0.0006, p = 0.981$). The finding suggests that there is no relationship between education level and adoption of gross margin analysis. This is contrary to the belief that more years spent in formal education makes one respond much faster to new information. The training methodology used by FBS increased the chances of impacting on adoption of gross margin technique among lead farmers irrespective of their educational background *e.g.*, for those who are not good at figures, symbols are used to represent figures to come up with gross margins.

Use of GMA Technique by Income of Respondent

An independent 2 sample t-test performed to the means of income of adopters and non-adopters revealed that the mean incomes were not significantly different ($t = -0.77, p = 0.44$). This suggests that farmer income levels have no effect on adoption of gross margin analysis.

Farmers Perception towards GMA Technique

Lead farmers first learnt about gross margin analysis technique from the farmer business school. This suggests that gross margin analysis is a new concept to these graduates hence it was necessary to determine the farmers' perception towards the technique. In this study, lead farmers' perceptions towards the technique were captured in terms of the relevance and usability of gross margin analysis in their farm business.

On importance of gross margin analysis, all the farmers indicated that it was important as it helps one to know which enterprise is profitable. Fifteen FBS lead farmers mentioned that gross margin analysis helps one to know what inputs will be needed in a particular enterprise and twelve FBS lead farmers mentioned that gross margin analysis helps one to know what expenditure will be incurred.

On the ease of use of gross margin analysis, most farmers 82 per cent (n=50), reported that it is easy to use gross margin analysis. With most of farmers 82 per cent (n=50), reporting that it is easy to use gross margin analysis, one would expect that most graduates would be able to use gross margins but this was not the case as noticed by the low percentage of respondents who used gross margin analysis technique.

Farmers' Reasons for not using Gross Margins

The majority of farmers (69.7%) indicated that even if they prepare gross margins and venture into enterprises which seem to be profitable, when it comes to marketing the products, the prices of their products are not based on the prices they set. An example of tobacco and cotton prices was cited in Rumphu and Karonga districts respectively, and this demoralizes them. Among the reasons given by the farmers for not practicing gross margin analysis was that they had forgotten how to prepare gross margins (24.2%) and 3.0 per cent indicated that they did not have time to prepare gross margins because it required them to be keeping detailed records which is time consuming. This finding is in line with what Harding (1982) and Dorward (1991) reported that many of the conventional farm management techniques have been criticized as too complex, erudite and data- dependent and time consuming. Another 3 per cent indicated that they did not prepare gross margins because they did not have enough inputs which were required in viable enterprises. This is in line with a report by Malawi Government (2005) that lack of cash dominates the choices available to the typical Malawi farmer.

Conclusion and Recommendations

From this study it may be concluded that the adoption of gross margin analysis was associated with availability of farm records, knowledge in gross margin analysis and contact between extension workers and farmers on gross margin analysis. Apart from attending fortnightly training sessions where FBS lead farmers can be refreshed on the concept of gross margin analysis, this study proposes introduction of farmer awards on farm record keeping thereby promoting the culture of maintaining records which facilitate compilation of gross margins.

It was found that knowledge gaps among FBS lead farmers on gross margin analysis still exist. Higher knowledge scores on awareness knowledge on gross margin analysis technique were observed compared to how-to knowledge on gross margin analysis technique. This study proposes that FBS lead farmers must attend some Fortnightly Training Sessions (FTSs) with front line extension staff where lessons on how to prepare gross margin can be demonstrated in detail.

Among a number of uses of gross margin technique in farm business, findings of this study indicate that all lead farmers who adopted gross margin technique used it only in selection of profitable enterprises. This indicates low level of use of this technique among FBS lead farmers. This study recommends refresher courses on the other uses of gross margin technique among FBS lead farmers.

Farmers further indicated that they get demoralized because they do not sell their products at expected prices and are often price takers at the market. This study proposes that the setting of minimum produce support prices as practiced in several countries such as India must be done in a participatory manner.

References

- Armitage, P., Berry, G. and Matthews, J.N.S. (2002). *Statistical Methods in Medical Research*. 4th ed. Oxford: Blackwell Scientific Publications.
- Government of Malawi (2005). *Promoting a Green Revolution in Malawi: A proposal on a comprehensive programme to address hunger*. Lilongwe, Malawi: Ministry of Agriculture.
- Government of Malawi (2009). *Capacity building in farm planning and management for extension workers and farmers*. End of Mission report. Lilongwe, Malawi: Ministry of Agriculture and Food Security.
- Government of Malawi (2011). *Farmer Business School. Training of facilitators guide*. Lilongwe, Malawi: Ministry of Agriculture and Food Security.
- Government of Malawi (2012a). *Guide to Agricultural Production and Natural Resource Management in Malawi*. Lilongwe, Malawi: Ministry of Agriculture and Food Security.
- Government of Malawi (2012b). *Market oriented farm planning and management: Participant hand-outs*. Lilongwe, Malawi: Ministry of Agriculture and Food Security.
- Government of Malawi (2012c). *Agriculture Sector Gender, HIV and AIDS Strategy: 2012-2017*. Lilongwe, Malawi: Ministry of Agriculture and Food Security.
- Griffith, W.S. (1984). Learning theory. In Donald J. Blackburn Loyd, (Ed.), *Extension handbook* (pp. 11-20). Canada: University of Guelph.
- Hair, J., Andersen, R. Tatham, R and Black, W. (1995). *Multivariate data analysis with readings*. 4th ed. Upper Saddle River, New Jersey: Prentice-Hall.
- Kahan, D.G. (2007). *Farm management extension services: A review of global experience*. Agricultural Management, Marketing and Finance Occasional Paper 21. Rome: Food and Agriculture Organization of the United Nations.
- Nekesa, M.D. (2012). *Nutrition knowledge, attitudes and practices of primary caregivers of home grown school feeding programme: A case study of pupils at Sauri millennium village, Siaya-Kenya*. Available at: <http://ir-library.ku.ac.ke/bitstream/handle/123456789/6861/Mundia%20Daisy%20Nekesa.pdf?sequence=1> [Accessed on 15 October 2015].
- Tolani, R.J.S. (2002). *Introduction and History of Farm Business Management in Malawi*. Paper Presented at the induction course for newly recruited professional officers, Lunzu, Blantyre.