Improving information and communication for the smallholder farmers in Kenya (R2555)

Funded By DFID, Livestock Production Programme

Impact Assessment and Long term Sustainability of the FARM-Africa's Farmer-to-Farmer Extension Model

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Acronyms

AHA	Animal Health Assistants
CAHW	Community Animal Health Worker

CBO	Community Based Organization
CSS	Culture and Social Services
DFID	Department of Foreign Investment and Development
DGM	Dairy Goat Management
DLEO	Divisional Livestock Extension Officer
FEW	Farmer Extension Workers
GOK	Government of Kenya
KARI	Kenya Agricultural Research Institute
KIOF	Kenya Institute of Organic Farming
LAPA	Location animal production assistants
LPO	Livestock Production Officer
MAHWG	Meru Health Workers Group
MGBA	Meru Goat Breeders Association
MOA	Ministry of Agriculture
MOL	Ministry of Livestock
NALEP	National Agriculture and Livestock Extension Programme
NARS	National Agricultural Research Service
NGO	Nongovernmental Organization

Preface

The Research project has been testing pro-poor mechanisms of communication. The mechanism has three elements namely use of groups, training community resource persons and using locally used channels of communication. The mechanism was developed through

studies conducted on the FARM-Africa Dairy goat and animal health project. The extension model has been on trials for the last one and half years and was geared towards dissemination of the Dairy goat technology both within and outside the project area. The model was meant to improve the information and communication among small stock keepers in Meru. The project trained Farmer Extension Workers drawn from 16 Dairy goat groups (consisting women and mixed groups) in Meru central and south districts and in both upper and lower Agro-Ecological Zones (AEZs) on Dairy Goat Management practices and communication. The purpose of this particular study was

- Conduct impact assessment of the extension model, F-F Communication model
- Study the changes the farmers may have introduced to the model and the motivation for such adaptations
- To document and communicate experiences and lessons learnt in the research process with other stakeholders including farmers within and beyond the project area
- Engage policy makers in discussion on the future of extension service provision.

To meet the above objectives the research utilized both qualitative and quantitative techniques to complement each other in the collection of data; Survey questionnaire, Focus Group Discussions and Key Informant interviews were used.

This research report presents findings of the evaluation of the FARM-Africa's farmer to farmer approach. The evaluation was to finding outlines impact and the sustainability of the model.
There research tools were used in the study namely the questionnaire which was targeting the various farmer extension workers, the key informant interviews and the focus group discussions
The findings are presented under the three headings below. In each presentation an attempt has been done to address similar issues to help the reader in comparing the findings under each tool.

Executive Summary

This report presents findings of 56 Farmer Extension Workers' (FEWs) interviews, 16 key informant interviews and focused group discussion held in 16 villages in the project site regarding the promotion of farmer-to-farmer extension through the use of an institutional structure, the Meru Goat Breeders Association. This strategy has been supported and encouraged to complement existing public and private sector services, which are increasingly demanded for livestock information and peri-urban production. This role of the

FF model underscores the purpose of this study in assessing the efficacy of the model in terms of its impact, sustainability, factors influencing performance of the farmer extension workers, and changes/modifications in the model. The Farmer Extension Workers (FEWs) were trained in human relation skills and channels of communication for the purpose of sensitizing and training smallholder farmers to advance dairy goat management practice. Their participation in the programme/project is mainly voluntary- based suggesting that some basic motivating conditions must be put in place. Attainment of these ends, however, is subject to knowledgeable, committed, honest, and transparent farmer extension workers.

The farmer-to-farmer model has enabled farmers volunteering to work as extension workers to complement the efforts of public and private extension providers. The motivating factors influencing their participation in undertaking their expected roles include interest to learn skills and knowledge to boost their agricultural production, expected benefits from dairy goat production (milk, income, manure), upgrading their local goats to maximize on benefits, markets for goats and milk products, social standing in the community, moral support to other farmers and equity considerations in benefits from rearing goats. The motivations result in similar benefits accruing to the FEWS and farmers in general. They include increased income, manure for soil fertility improvement, and knowledge on dairy goat management and applying some to other areas, improved nutrition through high quality milk, improved farming skills, access to markets, and providing employment.

The farmer to farmer model has proven successful due to different kinds of support from fellow FEWs and local administration in the community. Local leaders' involvement in the project by enabling their public meetings is used as channels of communication to create and sustain common knowledge has been critical. Being exemplary in dairy goat technology has helped in technology dissemination. Fellow FEWs and the institutional structure of MGBA contribute significantly to the success of the project. Church leaders and group members have equally supported the spread of dairy technology. The dairy project has received more support from different extension service providers including the public sector, private sector and civil society organizations (NGOs). Support has been provided through training of FEWs, facilitating farmer learning forums (such as farm shows, farm demonstrations, field days), providing market information, supporting farmer groups with resources for building their capacity for innovations, working in collaboration with MGBA and MAHWGs. These kinds of support are crucial because FEWs tend to drop out of their voluntary extension work due to group conflicts and leadership wrangles, not being adequately prepared to deal with market issues, heavy work load that increases the opportunity cost of their time, non-payment for services delivered, insufficient training leading to less competence, and lack of support from groups.

As a result of the project there is high demand for information that relates to other areas that include different crop varieties, tree nursery establishment, conflict resolution, fodder establishment for goats and other livestock, dairy cattle management, business entrepreneurial skills, marketing, high value crops, and formation of groups form community development. The model therefore requires relevant information to address the demand for services by farmers, the information demonstrating benefits to the potential user, availability of resources to utilize the information, and a supportive cultural and policy environment.

The FF model is considered replicable but subject to some conditions. These include high demand for information or technology, providing the relevant information or technology to address the demand, the information/technology demonstrating benefits to the user, availability of resources to utilize the information/technology, proper project/programme design that involves the FEWs from inception, transparency and accountability by the FEWs and other extension actors, and a supportive cultural and policy environment. These enabling conditions can be met partly through support from other extension actors, from the private sector, public sector and civil society (NGOs). The support can be provided through training of FEWs, facilitating farmer learning forums (such as farm shows, farm demonstrations, field days), providing market information, supporting farmer groups with resources for building their capacity for innovations, working in collaboration with MGBA and MAHWGs and influencing policy design that supports the farmer-to-farmer model of communication. Thus, the effectiveness of the farmer-to-farmer model will depend on how well a coordinating institutional structure delivers on key demanded services by the farmers.

On the hand, if FEWs are not supported they lose the morale of continued participation in the programme/project. The analysis shows that this can be attributed to FEWs to group conflicts and leadership wrangles, not being adequately prepared to deal with market issues, heavy work load that increases their opportunity cost of their time, non-payment for services delivered, insufficient or inappropriate training leading to less competence and confidence, and lack of support from groups.

The analysis the focus discussions shows that MGBA provides an important institutional structure for expanding both horizontal and vertical links for tapping required information and resources. MGBA supports farmers and their groups in sourcing for markets and marketing of their goats, negotiate for good prices, coordinate farmers' activities such as buck movement, protect farmers against exploitation by middlemen, respond to issues related to dairy goat management, facilitate information exchange through the FEWs, network farmers to all possible sources of information, and act as a pillar for all the farmers with common interest in dairy goat management. Farmers liken MGBA to an engine and its removal can mean total collapse of the goat development enterprise in Meru. In spite of these valuable functions, the MGBA institutional structure suffers from malpractices by some of its officers. Such behavior includes dishonesty, lack of transparency and accountability, less focus on farmers' priorities, particularly market information, and make them less effective in their roles. In general, the farmers evaluate the model as having worked well as shown by about 60% of the focus discussions that did not indicate any changes to have been made to the model. Thus they perceive the MGBA as being a major player in preparing and delivering inputs and sorting out all market-related problems and issues. The effectiveness of the farmer-to-farmer model thus depends on how well a coordinating institutional structure delivers on key demanded services by farmers.

This project is an example of capacity building in which the participants benefit in several ways. Such arrangement enables risk sharing in production and/or marketing livestock and their products and enhances the access of poor farmers to technology and other inputs and services at lower cost. This illustrates how supported dairy goat production can improve the income of smallholders, with significant spill-over effects in the form of farm productivity and the ability to engage in non-farm activities with an overall goal of improving standards of living. On the basis of the analysis made the study proposes for future discussion (i) program strategies that enhance financial resources for MGBA to support FEWs and utilize adequately vertical links, (2) designing a structure that ensures continuous, regular, and

relevant training that uplifts the competence and confidence of FEWs, (3) establishing constructive rules and regulations to check on the conduct of the farmer extension workers, (4) involving the farmer extension workers in a project/programme right from its inception, (5) the coordinating structure needs to consider a micro-credit system particularly for the FEWs and farmers, (6) monitoring performance of FEWs with a view of enhancing it, (7) planning activities that improve and maintain commitment by the institutional supportive officials, and (8) proactively addressing market needs of farmers and FEWs. Attention paid to these suggestions may improve the role of FEWs upon whom the FF model of extension increasingly depend.

Methods and Data

Information on the long term sustainability and impact of the model was gathered via interviews with farmer extension workers (FEWs) and key informants. Eight categories of key informants were considered with two interviews per category. The key informant include; Locational animal production assistants (LAPAs); Divisional livestock extension officers (DLEOs); MGBA regional official; Local administration officials; Private veterinarian/Animal Health Assistants; NGOs; Research institutions, and Drug shops.

Both interviews utilized a flexible semi-structured questionnaire with closed and open-ended questions. The questionnaire targeting FEWs asked questions addressing four main areas:

(i) Characteristics of the participants (location, role, gender, age, year of membership in the project, education level attained, whether or not received training and topics covered, and proximity to the nearest road infrastructure);

(ii) Impact of the model (scale of awareness, access to information from extension, vets and business sources; initial incentives for participating in the project; information and information seeking tendency by farmers; self seeking of information from pluralistic sources of information; and constraints to working as a FEW;

(iii) Factors influencing the performance of the Communication Model (motivations and benefits of participating as FEWs; social interaction with other farmers; facilitation support; persistence in and reasons for involvement in the extension work), and

(iv) Changes to the model (payment for services offered, farmers' willingness to pay for services rendered by FEWs, other information demanded by farmers, FEWs perceptions on efficacy of the original structure and reasons for any modifications).

Only farmers who had the opportunity to participate as farmer extension workers were interviewed. Having demonstrated a tendency to promote the dairy goat management technology across a large group of other farmers, the sample farmers in the survey group most closely represent the segment of the smallholder farmers known as the "farmer extension workers." Their willingness to test well-researched, progressive practices is a result of their management philosophy, economic situation, or a combination of the two.

Because the farmers interviewed are not a representative cross-section of farmers we acknowledge that we have to apply our discussion to the general farming population in the two districts with caution. Specifically, we assume that the interviewees' first-hand

experience in promoting the dairy goat technology is an accurate representation of the experience the general farming population will face in the future.

The key informant questionnaire raised questions in three main areas:

(a) Impact of the model through two items: Have the farmers within the last one-year had access to the existing sources (vertical sources) of information, especially on DGM? (Examples from the Communication model) How has the horizontal information flow among the community members been doing within the last one year compared to other years?

(b) Sustainability of the Farmer-to-Farmer (FF) communication model through five items: In your own opinion is the Farmer-to-Farmer communication model replicable? What role can your sector play to make the model sustainable? Does F-F communication model need external resources to keep it going/working? Are there modifications/improvements to be made to make the model work better as per the original structure? Do extension actors recognize the FEWs (Breeders, Buck-keepers, CAHWs and Farmer Extension Workers) as dissemination/Communication resource persons?

(c) Factors influencing the performance of the FEWs through three items: In your opinion is the status of the FEWs valued and do they get support from village leaders, local institutions such as churches, schools and other social networks during their work? Why do you think some FEWs have stopped working as breeders, buck keepers, CAHWs or FEWs within the last one year? How important do you think the FEWs are?

The focused group discussions involved meeting both members of the groups and non-members in 16 villages. This was done for easy comparisons of the discussions. In both cases members and non-members were interviewed separately. The groups visited are from the villages where FEWs who were interviewed come from except those FEWs who were interviewed from outside the village. The research team did logistics a week earlier before visiting groups. This was done with the assistance of the area local chief and Divisional Livestock Extension Officers (DLEOs) or Location Animal Production Assistants (LAPAs). They also assisted in climate setting and occasional facilitation during the discussions.

Because of the complexity of the issue a flexible semi-structured questionnaire using some closed and open-ended questions was used. The focus discussions raised questions in four main areas:

(a) Impact of the model through four items: What is the level of awareness on the messages given on dairy goat management practices by the FEWs in the last one-year compared to other years? How is the adoption of the dairy goat management practices in this area in the last one-year compared to other years? Is it on the increase or on the decrease? At what level, high, medium or low? How has the Farmer's access to the dairy goats' markets performing in the last one year? Are the middlemen still a hindrance to access correct market information? Has standard of living been changing in this area in the last one year in your own opinion? E.g. income from livestock, crops etc. Is it improving or deteriorating? How has been the flow and exchange of information (especially on farming) within the community among the farmers especially within the last one year compared to other years?

(b) Sustainability of the Farmer-to-Farmer communication model through six items: From your experience are the linkages showing two a way-communication in this area? In your opinion does this model reliably exchange the information in question? Why do you say so? Is this model capable of replication elsewhere and do the same function it is doing here? Does the model need external resource(s) to keep it going? Is this model dependent on MGBA institutional structure in its operation? Can the resources for running the model be generated locally?

(c) Factors influencing the performance of the FEWs through two items: How would you rate the performance of the area FEW? Why and what is the difference between the high and low performers among the FEWs?

(d) Changes to the model (payment for services offered, farmers' willingness to pay for services rendered by FEWs, other information demanded by farmers, FEWs perceptions on efficacy of the original structure and reasons for any modifications) through four items: Are there any changes to the model e.g. the local administrators taking the role of the FEW or being active than the FEW himself or herself? Do farmers make the payments to the FEWs for their time/services/travel? Any evidence to show this? What are the new actors that have come since the inception of the model in the last one year? In your own opinion how is the exchange and flow of information in your community working?

In each session, the meetings started with a word of prayer from the farmers. This was followed by introductions of all participants present. After introductions the research team outlined the objectives of the meeting, the research and the importance of everyone participating in the process. Farmers' consequent was sought in using the audio recorder for purposes of report writing. In all the 16 groups, consequent was given. 'Snack bite' breaks were also agreed at the start of the meetings, as when it was necessary to take a drink (soda) and bread as an energizer during the discussions. The language of communication was Kimeru and occasionally Kiswahili, where necessary.

Table 1: Farmer Groups Interviewed and their Location

Group Name	No. of participants	Division	District
Kaugi group	7	Abothuguchi Central	Meru Central
Kaminugu group	9		Meru Central
Gakumbo	7	Miriga Mieru East	Meru Central
Murithi group	23	Abothuguchi East	Meru Central
Kathigau goat group	14	Abothuguchi East	Meru Central
Kagwiria goat group	12	Abothuguchi East	Meru Central
Kamenchu group	10		Meru Central
Gakenia group	20	Muthambi	Meru South
Kamwe group	5	Chuka	Meru South
Nguchia group	11		Meru South
Wazee Hukumbuka group	18		Meru South
Muungano group	12		Meru South

Kanguu dairy goat self help group	22	Chuka	Meru South
Kageni group	11	Mitheru	Meru South
Gaitethia dairy goat self help group	10		Meru South
Gitije self help group	12	Muthambi	Meru South

All the meetings in the 16 villages centered on four main issues; Impact of the model, sustainability of the model, factors influencing the performance of the model and the changes on the model. Most of the groups interviewed consisted of men and women. The process lasted between 2-3 hours depending on the level of participation and new issues, which were coming up (expectations). Farmers' expectations were discussed at the end of every session. Each meeting ended with vote of thanks from one of the research team members and farmers too. As at the beginning each meeting was closed with a prayer. The audiotapes were transcribed as 16 cases. Table 33 presents the groups that were interviewed and where they are located.

Farmer- to-Farmer Extension (FF) Approach

The FF concept originated as an imaginative response to overcome the frequent shortage of skilled extension personnel and to hasten the process of communication of innovations across a broad range of farmers. The premise of FF extension is the belief that extension can be made more relevant and its scope be upscaled if farmers can be involved as extension agents themselves in the overall goal of increasing agricultural production and household incomes. The farmers come and discuss how to best conduct their own trials and how they can share this information. The FF approach is an opportunity for farmers and other experts to learn from each other. In Meru, farmer-to-farmer networks are thriving as a way of farmers to pool ideas, exchange perspectives, and learn from each other. This helps farmers get organized around specific production activities where there is market demand and if they are appropriate for the agroecological conditions and resources of different farmer groups.

The project "Improving information and communication for smallholders" explored the efficacy of the FF approach by promoting dissemination of improved dairy goat technology through the use of lateral institutional structure, the Meru Goat Breeders Association (MGBA) as a vehicle of farmer-to-farmer extension. The aim of this intervention was to complement public and private sectors and civil society organizations, which are under increasing demand for livestock information due to changes in livestock production such as intensification, crop-livestock integration and increasing peri-urban production. The resulting monitoring and evaluation reveal that these institutional and operational measures have led to a remarkably large number of farmers accessing information through the project trained FEWs in two Meru districts.

Meru Central and Meru South Case Study

The organization, Farm-Africa, with support from DFID and other donors, ran a project of Farmer-to-Farmer extension in promoting dairy goat technology among small stock keepers within and outside the project area of Meru from 1996 to 2002 that included the use of Farmer Extension Workers (FEWs). As part of the research project trials to find out the

role of farmers in scaling up impact, the project trained 18 FEWs drawn from 16 women and mixed groups distributed within two districts, Meru Central and Meru South and located in three ecological zones. These farmers were drawn from 16 locations as shown in Figure 1. The involvement of women was a deliberate effort to ensure participation of rural women in extension as they form a high proportion of rural farmers. Successful cases by some women participating in this project lead to horizontal linkages reaching more farmers within the neighbourhoods and establishment of vertical linkages with organizations and institutions external to the community. Consequently, this has stimulated the need to understand the processes and factors behind the achievements. Therefore this study embarked on selecting successful FEWs for an impact assessment to study their work and the sustainability of such extension services. It was designed to understand the outcomes of this project in the two districts, partly with respect to the type of FEW participants, impact of the Farmer-to-Farmer model of extension, incentives and motivations for participation in training and technology transfer, and payoffs and flexibility of the model. Not equal numbers of FEWs were selected from each location

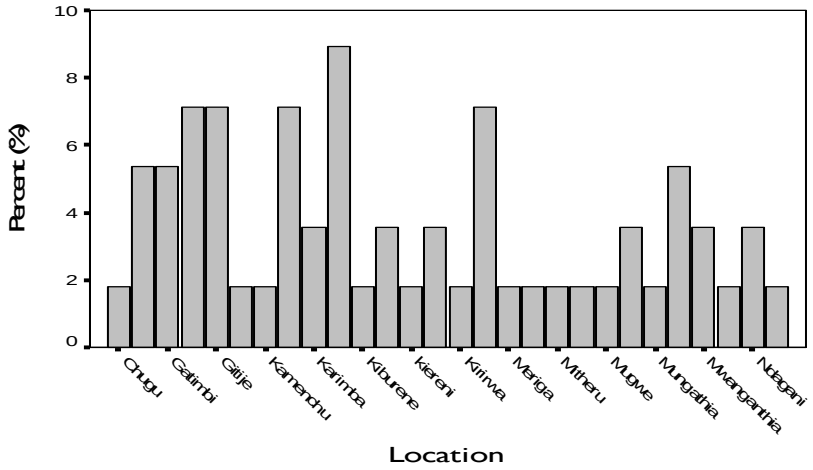

Figure 1: Locations for FEWs used in the study

The sites for the study were chosen because they had well managed MGBA program. It is, however, important to note that the sites were chosen because they had not received special attention, and there are many areas in the two districts of Meru that could have yielded equivalent results. However, it is important to examine this apparent success in the context of other evidence of impact from MGBA programs in Meru, as well as to examine the diffusion of information, the experience with various types of subject matter, and the subsequent experience of participating FEWs.

Farmer Extension Workers' questionnaire Report

1 Introduction

Many agricultural development programs of the past several decades have recognized that uniform technologies and a linear process of technology transfer (with standard messages delivered to farmers by an extension service) are not necessarily a panacea to the problems facing majority of the resource-poor farmers. Challenges to such simple models have come from several angles, including recognition of farmers' roles and responsibilities in technology generation, understanding the variation in farm household assets and strategies, and appreciation of the need for better farmer organization. The result is a much broader range

of methods and techniques directed toward improving smallholder productivity and welfare. However, there may be a danger that innovative strategies could be compromised when they are advocated for widespread replication without understanding the salient features that enhance sustainability of technology adoption and diffusion. This realization underscores the purpose of this study in assessing the efficacy of the Farmer-to-Farmer model of extension as supported by the Meru Goat Breeders Association (MGBA) in terms of the impact of the model, sustainability of the model, factors influencing performance of the Farmer Extension Workers (FEWs), and changes or modifications made to the mode during implementation. Understanding these issues is important for effective project/programme design and implementation.

The MGBA demonstrates that a wide range of farmers can be reached through the farmer-to-farmer extension strategy. This is in response to the challenge of supporting farmers, particularly smallholders, to develop their agriculture through appropriate technologies, new skills, changed attitudes and practices, and new ways to collaborate with other extension actors. The extent of the MGBA coverage depends in part on the way that rural communities are targeted and in part on the type of farmer involvement; the former is a function of priority setting and farmer selection and the latter is a function of the way the program is designed and organized as well as farmers' perceptions of the costs and benefits of participation in the programme.

In most programs developed in the name of improving technology transfer and the wellbeing of the resource-poor farmers, the greatest concern has been on the relevance of the outcomes and the sustainability of the intervention. This report examines how MGBA, an extension institutional structure, could be an alternative mechanism for long-term impact. It seeks to understand past success and how this knowledge might be relevant to further applications. In particular, the report focuses on assessing factors affecting performance of farmer extension promoters in dissemination of dairy technology and related demanded services, the type of farmers participating as change agents, the incentives and benefits driving the farmers' participation in technology dissemination, and assessment of constraints limiting their role and potential in technology promotion. The main purpose is to generate information and insights that can be used to improve the ability of researchers, community of farmers, government extension providers, policy makers, NGOs and donors to support the most effective rural and agricultural development initiatives that stand to significantly improve rural welfare.

The report is organized in the following manner: Section 2 briefly reviews the concepts of Farmer-to-Farmer Extension (FFE). This is followed by section 3, an introduction to a study of FEWs in Meru Central and Meru South and an examination of the participants. In section 4 the methods and data used are outlined. Section 5 presents the results of the FEWs in dairy goat technology dissemination. Section 6 concludes with some thoughts on how the impact of such innovative extension strategy can be sustained and enhanced. There is a particular focus on the farmer extension workers and how they can be assisted to develop a manageable communication strategy with fellow farmers.

2 Results and Discussion

2.1 Descriptive Characteristics

Table 1 shows that most of the FEWs interviewed are, on average, about 50 years old. The youngest were about 32 years and the oldest 78 years. In Meru South, men interviewed

were 54% while in Meru Central they were 66%. About half of the FEWs in Meru South, 46%, have primary education, followed by 37% with secondary education, and 3.6% with higher education. About 14% of them are without any formal education. On the other hand, 38% of those in Meru Central have primary education, 32% secondary education and 11% no formal education. This suggests that comparatively more FEWs in Meru South have higher levels of education than those in Meru Central. More than 90% of the FEWs indicated that they had received training from the project.

Table 2: Characteristics of respondents (FEWs) (N=56)

Characteristic		Meru South	Meru Central
Age in years		49 (12.2)	52.2 (10.4)
Gender (%)	(a) Male=1	53.6	66.1
	(b) Female=2	46.4	33.9
Education (%)	(a) No schooling	14.3	10.7
	(b) Primary	46.3	37.1
	(c) Secondary	37.5	32.1
	(d) High	3.6	0
Training (%)	(a) Yes = 1	92.9	100
	(b) No = 0	7.1	0
Distance to the nearest road (km)		3.4 (3.2)	7.7 (6.4)

Note: Numbers in parentheses represent standard deviations

In Meru Central, where the MGBA office is located, all the FEWs have received training in dairy goat technology. On average, the FEWs in Meru Central live 7.7 kilometres away from the nearest road. Those in Meru South live about 3.4 km away from the nearest road. This suggests that farmer extension workers have to walk long distance to the nearest road to link up with information and market centres.

2.2 **Farmer Extension Worker Roles**

The number of FEWs for each category was the same in the two districts with 29% being for FEWs, buck keepers, breeders and 14% being for CAHWs (see Figure 2). The FEWs, selected through their goat groups, operate either as buck keepers, breeders, community animal health workers (CAHWs), or general farmer extension workers (FEWs). Buck keepers are provided by Meru Goat Breeders Association genetically proven bucks of the Toggenberg breed which are used to upgrade the local goats through either a private service or a communal service. The service is provided at a small fee, generally Kshs 30 for members and Kshs 50 for non-members per buck service. From this amount the buck keeper keeps Kshs 30 and the other Ksh 20 used in the general maintenance and treatment of the buck. In some groups, the group members are not charged for the service. The private buck keepers are responsible entirely for the general management of the buck while communal buck keepers are in charge of the buck but feeding, especially fodder may be provided by group members on a rotational system.

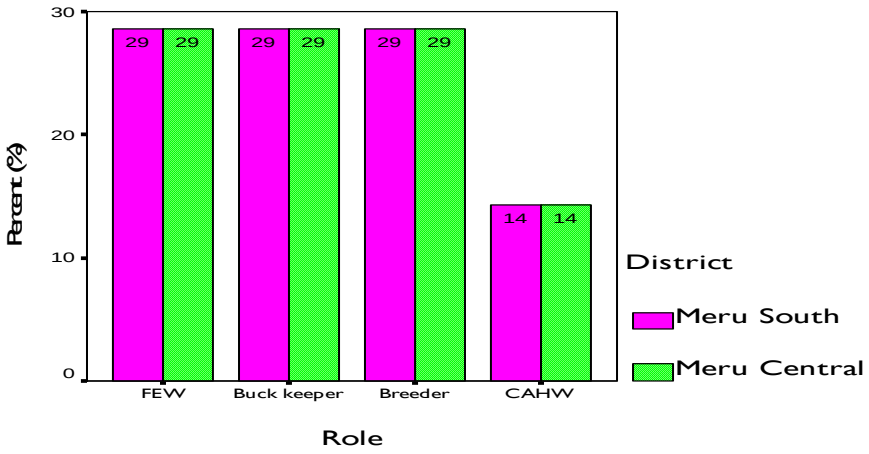

Figure 2: Distribution of roles of different categories of FEWs

The breeders, on the other hand, are provided with pure breeds consisting of four does (females) and one buck. They manage the breeding flock, multiply pure lines while avoiding inbreeding and sell the kids to other farmers for improving their stock. They also upgrade their own local goats. They receive 65-75 per cent of the total sales made on all the animals and also the manure collected from the goat shed. The CAHWs are charged with the responsibility of treating the animals, carrying out routine practices such as deworming and hoof trimming, and selling animal drugs to all the farmers. The general FEWs are instrumental in extension outreach via numerous communication channels. They are demanded by individual farmers and new groups to provide training in dairy goat management practices. They are sometimes contracted in by extension actors to provide training to other groups outside their residence.

2.2.1. Experience in working with the project

Majority of the members started working with the project in 1996, the year the project was introduced by Farm Africa (see Figure 3). There is a consistent decline in farmers volunteering to play the role of farmer extension workers, but this picked up slightly from 2001 and continued to increase in 2002. The decline of the FEWs volunteering to join the project can be attributed to the exit of Farm Africa in 1998. The institutional structure for facilitating farmer-to-farmer extension, the MGBA, was in place to coordinate the activities of the farmers' project.

Although the number of FEWs started to decline with the institutional change, the proportion of farmers adopting the dairy goat technology continued to increase as more farmers became aware of the benefits gained from keeping goats. The multiplier effect in the adoption trend may be associated with the training component of the project.

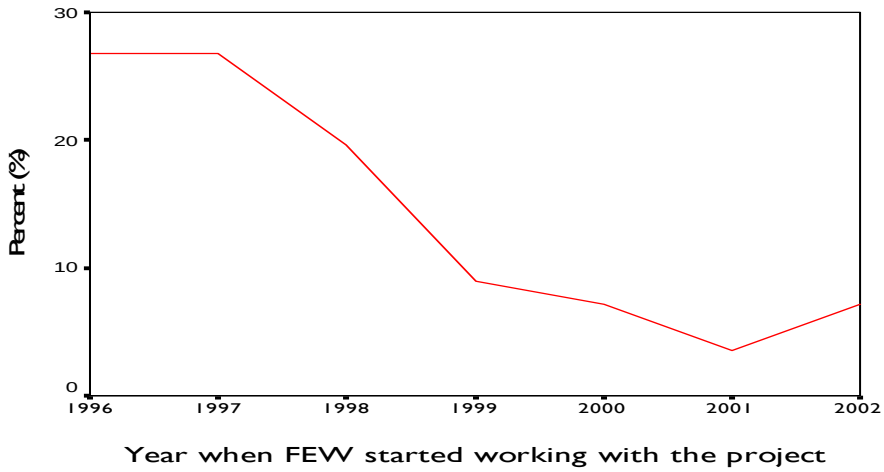

Figure 3: Trend of FEWs participation in MDGA, 1996-2002.

2.2.2 Received training from the project

Although the principal goal of MBGA was to promote dairy goat technology, a number of topics were also covered. Table 2 shows that majority of farmers in Meru South, about 93%, have received trained in farmer-to-farmer extension and communication skills while in Meru Central only 79% have been trained. Disease control and treatment has been taught to 46% of the FEWs in Meru south compared to 36% in Meru Central. This training is very important as it can have a direct effect on mortality rates of the livestock. Other topics that were covered by average size of participants include building the improved goat shed, fodder establishment and conservation, and goat feeding programme. The topic that has been learnt by few FEWs in spite of its critical importance is financial management. This suggests a weakness in this important area for effective management of dairy goats.

Table 3: Topics covered during training of FEWs

Training topic	Meru South	Meru Central	Total
• Milk quality control	35.8	32.2	34.0
• Building improved goat shed	46.4	24.9	35.7
• Goat judging and inspection	35.7	39.2	37.5
• F-F Extension and communication	92.8	78.5	85.7
• Fodder establishment and conservation	42.8	46.4	44.6
• Cross breeding programme	32.1	53.7	42.9
• Goat diseases control and management	46.4	35.7	41.1
• Goat feeding programme	42.8	57.2	50.0
• Management of bucks, manure, and records keeping	14.4	18.0	16.2
• Markets and market requirements of goats	14.3	18.0	16.2
• Financial management – micro financing, business skills	10.8	7.2	9.0

The results also suggest that relatively few farmers have received best management practices such as management of bucks, manure and farm records. Also, few farmers have received training on effective use of markets and market linkages. These issues have a bearing on the impact of the model in promoting technology transfer and upscaling.

2.3 Impact of the Farmer-to-Farmer Extension Model

2.3.1 Current trend of farmers' awareness on dairy goat management

Awareness is an important process that partly influences adoption of a technology or practice. Figure 4 shows that Meru Central has the highest level of dairy goat technology awareness with 32% indicating excellent compared with Meru South with 21%. About the same proportion, 45%, of the FEWs indicated the level of awareness to be best. About a quarter of each group rates the level of awareness as average. However, respondents in Meru South rated highest the lowest level of awareness, with 7% compared to 3.6% of Meru Central. These results suggest that whereas the level of awareness is good and promising, there are still many people whose awareness about dairy goat management is still low. In general, this problem is more prevalent in Meru South than Meru Central.

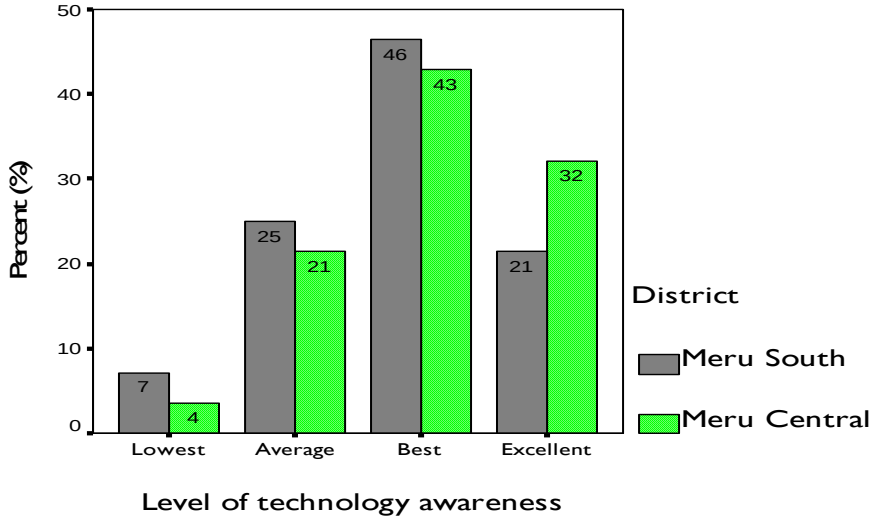

Figure 4: Farmers' level of technology in the last one year

Several reasons presented in Table 3 were identified and linked to the increased technology awareness. It indicates that awareness has remarkably increased with level of adoption in the two districts as most of the farmers in the area, on average 65% have adopted dairy goats and constructed improved sheds for housing the stock. In terms of benefits accrued from dairy goat production, more farmers in Meru Central (32%) enjoy goat benefits thereby developing greater propensity for taking on the enterprise than does those in Meru South (25%). This suggests a low level of technology uptake in Meru South, in spite of the positive market effects through good prices. Group formation is increasingly encouraged in Meru Central (29%) compared to Meru South with 14%. This reflects the effect of groups in promoting improved dairy goats enabling farmers make a transition from keeping local goats that are low producing to upgrading them to high producing stock. These results suggest that awareness has continued to increase as farmers see others adopting the technology, forming groups and enhancing communication through the use of local channels of communication to campaign for widespread adoption of dairy goat keeping.

Table 4: FEWs' opinion on technology awareness

Reasons for increased level of awareness	Meru South	Meru Central	Total
• Interested farmers- interested in keeping dairy goats	7.2	3.6	5.4
• Increased adoption - most of the farmers in the area have started adopting DG and construction of sheds	64.5	71.4	68.0
• Increased goat production for the growing market	14.3	7.2	10.8
• Increased benefits/propensity of adopting DGP	25.1	32.2	28.7
• Group formation – increased new dairy goat groups	14.3	28.6	21.5
• Market effects through good prices have stimulated adoption and popularity of dairy goats	25.0	3.6	14.3
• Increased communication through campaigns	21.4	35.6	28.5
• Have started getting buck services recently	3.6	0	1.8
• Farmers no longer interested in local goats	0	10.7	5.4
• Farmers appreciate the value of keeping good records	0	3.6	1.8
• Many farmers in the area have built improved goat shed	3.6	0	1.8

However, some constraints were identified to as limiting technology awareness among some farmers. Table 4 shows that lack of markets is a common issue across the two districts with 3.6% of the people feeling that this discourages dissemination of knowledge. Lack of information on dairy goats was observed by 3.6% of the farmers in Meru South while farmers in Meru Central did not view it as a constraint. Group conflicts and wrangles were equally observed to be deterrent to awareness of improved goats across the two districts. This hampers the flow of information and, consequently, reduces the level of technology awareness. All group members in Meru South seem to have trust in their leadership as opposed to those in Meru Central (3.6%) who disapproves of the groups' leadership. But in general, there are no serious concerns across the two districts that hamper awareness of dairy goat management.

Table 5: Constraints to awareness of dairy goat management (DGM)

Reasons for low awareness of DGM	Meru South	Meru Central	Total
• Most farmers in the area don't attend barazas	3.6	0	1.8
• Discouragement due to lack of markets	3.6	3.6	3.6
• Some farmers want to be private breeders	3.6	0	1.8
• No regular meetings to monitor group performance	3.6	0	1.8
• Poor leadership of MGBA lowered farmers' morale	0	3.6	1.8
• Lack of information on DGM	3.6	0	1.8
• Long distance to the main road	3.6	0	1.8
• Group conflicts affect information flow	3.6	3.6	3.6
• Poor milk price and poor market demand	3.6	0	1.8

2.3.2 Farmers' access to information from extension, vets and business

Access to extension staff is critical in technology or practice adoption for enhancing learning about the technology as shown in Figure 5. Only in Meru Central did about 11% indicate that farmers' access to the extension service providers was best. Over 40% the FEWs in Meru South compared to about 30% indicated that farmers' access to information from extension, vets and business sources had increased above average in the last one year. About the same proportion, 28%, for each district farmers' access to the three extension actors was considered best. However, in Meru South the respondents rated the level of access to extension as average. In general, over 70% were optimistic that access to information from the three sources had been achieved by the farmers within their area of working. These results suggest that whereas the level of access to extension staff is promising, there are still people whose level of access to extension staff is still low. In general, this is more in Meru Central compared to Meru South.

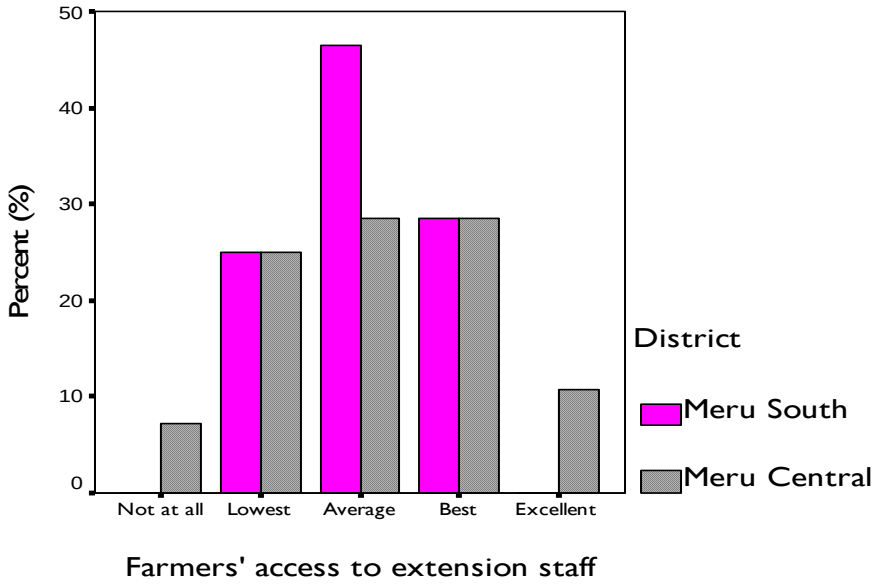

Figure 5: FEWs' opinion on farmers' level of access to pluralistic extension actors

Table 5 indicates the main reasons as to why farmers in the project area have high access to information from extension services by crosscutting through both public and private sectors. The results show that in Meru South, more FEWs (25%) are instrumental in making contacts for the farmers compared to those in Meru Central (14.3%). On the other hand, in Meru Central there is a higher farmer-to-farmer communication with 29% contact rate and greater NALEP influence as indicated by 22% of the FEWs while in Meru South it is only 18% and 14% respectively. Availability of local channels and proximity to government extension workers in Meru South and Meru Central respectively play some role in influencing high access to extension service providers.

On the other hand, the role of private vets is currently minimal in both districts as shown by the low respondent percentage of 3.6%. These findings suggest that farmers themselves play a significant role in enhancing access to dairy technology among farmers themselves. The findings also suggest that farmers in Meru Central may be more willing to assist their fellow farmers through development of social networks and linkages. Thus, the results point to the need for developing stronger linkages between private vets and the local farmers.

Table 6: Reasons for farmers' high access to information from extension services

Explanations for high access to extension actors	Meru South	Meru Central	Total
• Available local channels of communication - chief's barazas to pass information	14.3	7.1	10.7
• Availability of private vets/AHAs	3.6	3.6	3.6
• Proximity to GOK extension office due to good road	3.6	14.2	12.6
• Influence of NALEP programme – access to GOK extension, and development partners e.g. FARM-Africa	14.4	21.5	18.0
• Instrumental in making contacts for the farmers	25.0	14.3	19.7
• Farmer-to-farmer communication encouraged	17.9	28.6	23.3

As shown in Figure 4 about 25% of the FEWs interviewed observed the level of access to be low. This is attributed to very few government and private vets that make the service expensive and discouraging to others, poor road infrastructure, lack of motivation to tap on other sources of information (see Table 6). The proportions expressing these opinions were about the same for the two districts. This suggests that shortage of vets and inaccessible areas inhibit access to multiple extension service providers.

Table 7: Reasons for low access to extension actors

Reasons	Meru South	Meru Central	Total
• Few Government and private vets making services expensive	32.2	25.0	28.6
• The GOK or private sector – occasionally active	3.6	0	1.8
• Poor road network and long distance to main road limits access to extension actors	42.9	21.3	32.1
• The local people view GOK extension to be more qualified than FEWs hence limiting the use of FEWs	3.6	0	1.8
• Farmers rely on information obtained from other farmers and are poorly motivated to search for information	21.5	21.4	21.4
• Negative publicity on DGM practices and poor communication among groups	7.2	0	3.6

2.3.4 Impact of FEWs in Extension Outreach

Figure 6 shows that FEWs in Meru Central enabled an average of 3.7 (SD= 1.2) contacts to be established by farmers compared to Meru South with 3.2 (SD=1.5). This suggests that FEWs in Meru Central have created more extension contacts for their farmers than they have done among farmers in Meru South.

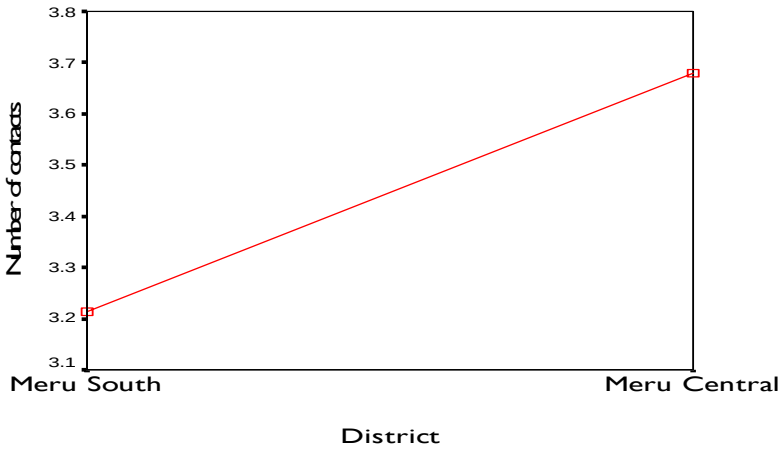

Figure 6: Number of contacts enabled by FEWs for farmers to access

The FEWs have enabled farmers to be reached by an average of three contacts in the last one year (Table 7). FEWs in both districts have majority of the contacts established between farmers and MGBA project officers, other farmers perhaps due to the promotion of the farmer-to-farmer communication model, and Ministry of Agriculture extension staff. The results show that whereas FEWs have enhanced farmers' linkages with the Vets in Meru South, in Meru Central they have increased the linkages with markets. Also more farmer contacts with livestock officers are evident in Meru South compared Meru Central.

Table 8: Types of information contacts

Information contact	Meru South		Meru Central		Total	
	Frequency	%	Frequency	%	Frequency	%
Buck keeper	5	17.8	4	14.2	9	16.0
CAHW	6	21.4	3	21.4	9	21.4
Local coffee society	1	3.6	0	0	1	1.8
Veterinary	12	42.8	6	21.4	18	32.1
Other farmers	9	32.2	11	39.2	20	35.7
MGBA	10	35.6	24	85.8	34	60.7
MOA extension	11	39.2	19	67.8	30	53.5
Market	5	17.8	8	28.6	13	23.2
Research-KARI	4	14.2	3	10.8	7	12.5
Animal Health Assistant	5	17.8	5	17.8	10	17.8
Micro finance institutions	2	14.2	1	3.6	3	5.4
Livestock officer	6	21.4	1	3.6	7	12.5
Local administration	3	10.8	1	3.6	4	7.2
Farm Africa	2	7.2	0	0	2	3.6
Private sector	5	17.8	0	0	5	9.0
Field days and goat shows	2	7.2	0	0	2	1.8
Farmer Training Center	0	0	2	7.2	2	3.6
NGOs	3	10.8	2	7.2	5	9.0
FEWs	0	0	1	3.6	1	1.8
ICRAF	1	3.6	1	3.6	2	3.6
Ministry of CSS	0	0	1	3.6	1	1.8

In general, the results suggest that more contacts have been established between farmers and various extension actors in Meru South compared to Meru Central which has the highest average farmer-extension actor contacts established. The results also suggest that the FEWs have been instrumental in promoting pluralism in provision of extension service. The high contacts with MGBA and Ministry of Agriculture extension staff suggest that the FEWs have contributed to the institutionalization of MGBA in the two districts and complemented the public extension services.

2.3.5 Incentives for initial involvement as a farmer extension worker

Motivation is intrinsically linked with volunteering to work on behalf of others. Table 8 shows the factors that lead to motivation of farmer extension workers and may have a bearing on their performance. It can be observed that motivational factors are not the same in the two regions. Whereas relatively high, farmer-to-farmer initiatives that help in broadening access to information and enhancing extension outreach are about the same in both Meru Central and Meru South, in the former group initiative is more highly regarded (68%) than in the later with 39% of the respondents indicating group initiative as a motivational factor. By considering the farmers' interests to acquire and increase knowledge on dairy goat management, Meru South leads with about twice (43%) the proportion of Meru Central (21%) that considers knowledge of DGM to be important factor.

Table 9: Motivations for being a FEW

Motivational factors	Meru South	Meru Central	Total
• Farmers' initiative - to help fellow farmers have access to information and reduce poverty	21.4	21.5	21.5
• Soil fertility improvement - collect manure	7.1	7.1	7.1
• Interest to increase knowledge on DGM	42.9	21.4	32.2
• To save the goats from dying after being neglected	7.1	7.1	7.1
• Experience - was a breeder even before FARM-Africa started the project, shares successful experiences	7.2	3.6	5.4
• Group initiative - group decision to take up the responsibility and moral support	39.4	67.8	53.6
• To reduce mortality of goats in the area	3.6	3.6	3.6
• Create income generation opportunities	21.5	17.9	19.7
• Source of employment	21.4	14.3	17.9
• Enhance extension outreach - assist community to upgrade local goats through buck stations	35.7	35.8	35.8
• To support the success and sustainability of the project	7.2	10.8	9.0
• To increase the productivity of DG in the area	7.1	10.7	8.9

Other relatively important motivational factors include income generation opportunities, source of employment, increasing goat production, supporting the success and sustainability of the dairy goat project and soil fertility improvement. The findings clearly show that mortality of goats in the two areas is not prevalent, reflecting proper goat management. These results suggest that farmers have an almost equal access to information through

farmer-to-farmer interactions. The higher difference in knowledge of goat management suggests the effect of extension actors and experience of the farmers themselves.

2.3.6 Continued participation in the project as a FEW

Majority of the FEWs indicated that they were still working as farmer extension workers at the time of this study. However, as shown in Figure 7 Meru Central had the highest, 96% indicating that they were still FEWs, compared to Meru South where 79% were still FEWs. These results suggest that there are factors behind the continued involvement of these farmer promoters as extension workers.

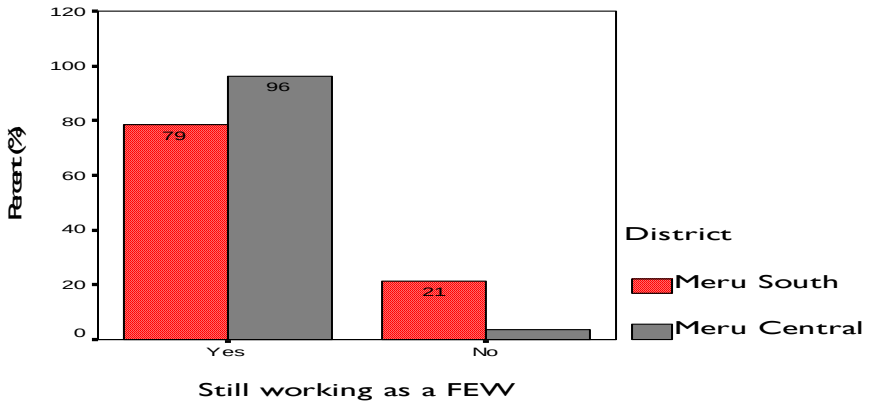

Figure 7: Proportion of farmers working as FEWs

Table 9 presents reasons cited for the continued participation of the FEWs in the promotion of the dairy goat enterprise. In Meru South, the main reasons identified were outreach extension for improving horizontal communication among farmers (29%), income generation through services rendered (e.g. deworming by the CAHW, buck serving by the buck keeper, training by the FEW, and increasing exotic stock through a breeder), and employment opportunities (21%).

Table 10: Reasons for continued participation as a FEW

Reasons	Meru South	Meru Central	Total
• To improve standard of living through more goats, income	7.2	7.1	7.2
• Outreach extension - due lack of contact with MGBA, improve information and communication, and development	28.7	10.7	19.7
• Income from charges on services rendered	21.5	14.3	17.9
• Role model for others	7.2	14.3	10.8
• DG creates employment opportunities	21.4	14.3	17.9
• Market demand for DG goats and milk	10.8	14.3	12.6
• The group members not willing play the role	3.6	7.1	5.4
• To increase the productivity of DG in the area	10.7	25.0	17.9
• Experiences of DG successes	7.2	32.0	19.6
• To support the success and sustainability of DG project	17.9	10.7	14.3
• Attend clinical cases and reduce mortality	7.1	3.6	5.4
• Soil fertility improvement through manure collection	3.6	7.1	5.4
• Group encouragement to continue with the responsibility	3.6	7.1	5.4

In Meru Central, two main reasons are increasing productivity of goats in the area (25%) and encouraging previous experience (32%). These results suggest that there are differences in the factors motivating the FEWs to continue participating in dairy goat promotion. The differences suggest opportunities for information comparison and sharing and consequently the possibilities for continuation or discontinuation of being a farmers' extension agent.

2.3.7 Discontinuation in working as a FEW

Some FEWS indicated that they were no longer participating in their extension roles. Their concerns for not continuing, as presented in Table 10, include: extension work being a time consuming task given their domestic activities, poor farmer attendance at meetings, group decision-making required but sometimes not forthcoming, death or poor health of the buck ultimately losing the morale to continue participating; and social problems like death of a relative. Thus, while economics is a key constraint facing the FEWs, the primary impediments to participation in the FFE project seem to be cultural and practical. However, it is noteworthy that a very small proportion of the respondents indicated these as serious constraints.

Table 11: Reasons for no longer working as a FEW

Explanations for continued FEW participation	Meru South	Meru Central	Total
• It's laborious and time-consuming to combine with other domestic activities	7.1	0	3.6
• Poor farmer attendance at meetings	3.6	0	1.8
• Group decision to move the goats to another member	7.1	3.6	5.4
• Death/sickness of bucks	0	3.6	1.8
• Death of relative and lack of group support	3.6	0	1.8

2.3.8 Farmers' propensity for Information on dairy goat management

Farmers' propensity for information on dairy goat management in the two districts seems to be quite high. All the interviewed FEWs in Meru Central farmers on their own initiative seek information from the FEWs (see Figure 8). Only 4% of the FEWs interviewed in Meru South felt that farmers do not seek information about DGM on their own accord. This suggests that the farmers recognize the importance of dairy goats as a livelihood strategy through tapping several benefits from goats. They have hence created for extension service a demand for different kinds of information related to goat keeping.

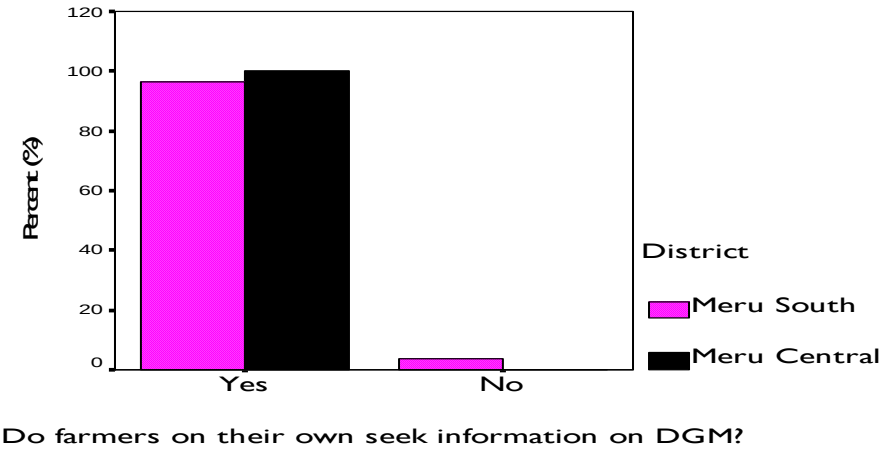

Figure 8: FEWs opinion on farmers' propensity for information on DGM

Table 11 presents a summary of the kinds of information they seek. From the FEWs' experience, information sought most by farmers in Meru South include information on the crossbreeding programme, marketing of goats and milk and how to access credit to buy local goats for upgrading, control and treatment of parasites and diseases, and goat feeding programme. In Meru Central, the most frequently sought information include information on marketing and credit services, feeding and breeding programme, milk quality control, processing and marketing and general information on dairy goat management, and particularly how to get ear tags cheaply, how to effectively manage F2 buck stations, buck movement, and type of goats.

Table 12: Information sought from Extension Sources

Information sought	Meru South	Meru Central	Total
• Information on cross-breeding program and setting up breeding station- accessing buck services	78.6	46.4	62.5
• Marketing and breeding value, credit	50.0	57.3	53.7
• Control and treatment of parasites and diseases	53.6	35.6	44.6
• Group conflicts resolution	3.6	3.6	3.6
• Goat milk quality control, processing and market prices	14.3	35.7	25.0
• Fodder nursery establishment	28.6	3.6	16.1
• Information on dairy goat management - on ear tags, F2 buck stations, buck movement, types of goats	21.5	39.3	30.4
• Goat feeding programme	39.3	35.7	37.5
• Information on building improved goat shed	25.1	25.0	25.0
• How to detect heat signs in does	7.2	10.7	9.0
• Benefits of keeping Dairy Goats and proper management- integration into other economic activities, milk, income, manure	7.2	32.2	19.7
• How to establish dairy goat group	7.2	0	3.6
• Information on record keeping	3.6	0	1.8

Information regarding benefits of dairy goats is also sought largely in Meru Central regarding how goats can be integrated into other economic activities, importance of drinking goat milk and the use and value of goat manure. About 25% of each of the interviewed FEWs observed that farmers are able to seek information on how to build improved goat sheds. Other issues for which information is sought, but on a less scale of demand, include detecting heat signs in does and resolving conflicts in groups.

2.3.9 Frequency of information seeking from extension sources

Table 12 shows the frequency with which the respondents seek information from extension services available. Some respondents virtually do not contact any extension sources for information. Research and NGOs are the least sought sources for information. Most of the respondents seek information from different extension contacts once a month. Twenty nine percent seek information from Vets, 45% from GOK extension, 38% from private extension providers, 66% from NGOs, and 57% from research institutions. In a week, all the extension sources are least contacted by the farmers. The frequency for consultation at least twice a year is highest for NGOs and research institutions.

Table 13: Frequency of information search from extension service providers

Frequency	Veterinary	GOK	Private Extension	NGOs	Research Institutions
Not at all	14.3	12.5	26.8	57.1	50.0
once a week	3.6	3.6	0	0	0
once a month	28.6	44.6	37.5	66.1	57.1
once after 3 months	23.2	19.6	8.9	69.6	62.5
twice a year	19.6	5.4	10.7	75.0	67.9
once a year	10.7	14.3	16.1	100	100.0

The low frequency of contact with extension sources may be related to either the transaction costs involved or the availability of the services. Different constraints may present different circumstances to farmers affecting their participation in extension as service providers.

2.3.10 Constraints faced by farmers extension workers

Asked whether they faced difficulties in their roles as FEWs, majority of them 89% in Meru South and 93% in Meru Central concurred that they did (see Figure 9). Although FEWs are enthusiastic about their work, there has been a continuous decline in their performance as a result of conditions of acute uncertainty associated with several problems. In Meru South, poor farmer cooperation (farmers attend very few meetings, do not cooperate to supply fodder, don't pay the expected dues), long distance to provide clinical services and farmers' inability to pay for services are the main problems cited by the respondents. On the other hand, in Meru Central the main difficulties faced by the FEWs include difficulties in organizing farmer meetings due to lack of funds to organize for the meetings, limited public forums to educate people on dairy goat management, domestic chores and disease and parasites which kill the breeding bucks and kids.

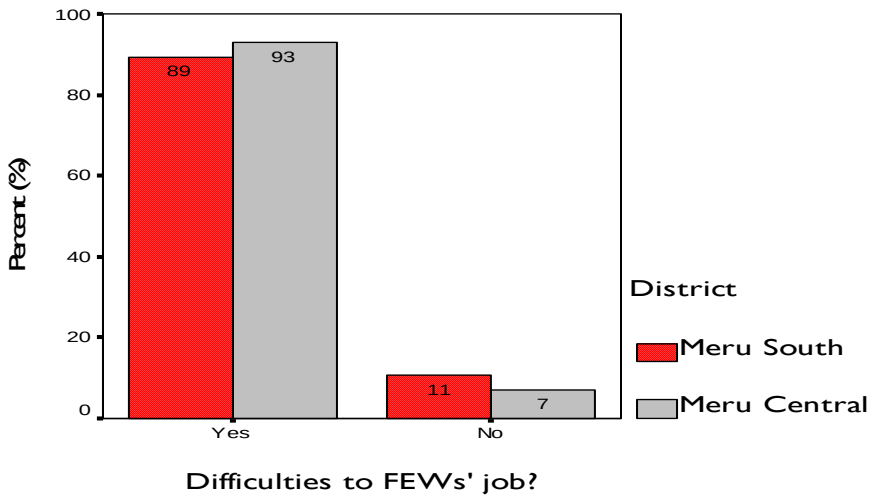

Figure 9: Opinion on whether or not FEWs face difficulties

Table 14: Difficulties faced by FEWs

Difficulties encountered	Meru South	Meru Central	Total
• Poor cooperation from farmers - Very few attend meetings, do not supply fodder, don't pay, not committed	32.2	14.3	23.3
• Long distance trekking on foot to attend clinical cases	28.7	14.3	21.5
• Lack of proper communication and support from MGBA	3.6	3.6	3.6
• Lack of market for the goat milk and fast growing kids	3.6	3.6	3.6
• Goats stopped kidding a year ago due to old age	3.6	0	1.8
• Difficult to organize meetings – e.g. hard to get a chance to speak in public forums, too costly, domestic chores	17.9	32.2	25.1
• Farmers not able to pay for services to cover inputs cost	21.4	14.2	17.8
• Lack of fodder, and expensive to treat and build good sheds for the goats	0	7.2	3.6
• Lack of reliable and good quality buck services	7.2	14.3	10.8
• Poor group leadership, politics and conflicts	17.9	10.7	14.3
• The death of kids in the breeding station , loses benefit	0	3.6	1.8
• Lack of knowledge on heat detection makes farmers bring goats not on heat increasing the cost of feeding	3.6	0	1.8
• Competition from animal health attendants	3.6	3.6	3.6
• Disease and parasites-killing breeding stock and kids	14.2	21.5	17.7
• Training farmers is time consuming	3.6	3.6	3.6
• Ear tags are a big problem to access	0	3.6	1.8
• The goats feed a lot without immediate returns	0	3.6	1.8
• The trainings FEWs give are outdated and monotonous	0	3.6	1.8
• Hermaphrodite cases which cant be sold for value	0	3.6	1.8

2.4 Factors influencing the performance of the Communication Model

2.4.1 Motivational factors for farmer extension workers

When asked "what motivates you to do this work as a FEW/Buck keeper/Breeder/CAHW" the participants gave several factors which are summarized in Table 14. The expected benefits from goat keeping- income, milk, and manure - is the main factor motivating FEWs to carry out their roles. At least over 50% of the farmer extension workers from either Meru South or Meru Central anticipate these three main benefits from keeping goats. The next two factors are the possibility of upgrading the local goats at a minimal cost and learning how to treat them and farmers' interest. About 35% of the FEWs in each district are enthusiastic about upgrading their local goats and treating them. Farmers look upon the FEWs as knowledgeable people in dairy goat technology and recognize them as repositories of this knowledge. However, the respondents in Meru South indicating this motivational factor were twice those of Meru Central. Other factors though differing across the two districts include: maintaining the reputation of the extension workers, the love for exotic goat breeds, feeling of general good of the community, moral support to other farmers and also from the government and the feeling of being popular among farmers.

Table 15: Factors motivating some farmers to work as extension agents

Motivational factors	Meru South	Meru Central	Total
• Farmers are interested to learn and recognized as a source of information	35.8%	17.9	53.7
• Expected benefits from DGP - income, milk, manure	75.2	53.6	64.4
• To retain the reputation of CAHWs in the area	3.6%	0	1.8%
• Loves the Toggenberg goats, feels good to talk about them and keep them	14.2	21.4	17.8
• Big market especially in milk and goat sales	7.1	0	3.6
• Popularity among farmers	10.7	7.2	9.0
• Skills for application in other business enterprises	0	7.1	3.6
• General good of the community	7.1	17.9	12.5
• Upgrade and treat farmers' goats easily	35.7	35.2	35.8
• Goats grow very fast and can attract good prices	7.1	0	3.6
• Moral support to other farmers and from GOK	3.6	3.6	3.6
• Self-satisfaction from other farmers benefiting	7.1	7.1	7.1

2.4.2 Benefits accrued to farmer extension workers (FEWs)

Table 15 presents results to the question: What benefits do you get when you work as a FEW/Buck keeper/Breeder. The benefits enjoyed most by FEWs (Buck keeper, breeder, CAHW) across the two districts are increased incomes from the sale of goats and milk, and services rendered; and collection of manure to boost crop production. In Meru Central, FEWS enjoy popularity as teachers/educators of other farmers compared to those in Meru Central. On the other hand, FEWs in Meru South value the knowledge and experience they

get on dairy goat management through training other farmers. Some get self satisfaction in seeing other benefit from dairy goats and having healthy livestock in the community.

Table 16: Benefits enjoyed by the FEWs (Buck keeper, breeder, CAHW)

Benefits	Meru South	Meru Central	Total
• Manure collection to boost crop production	39.3	53.6	46.5
• Knowledge on DGM through training other farmers	39.3	14.3	26.8
• Increased income	71.5	67.8	64.3
• Popularity in the area as 'mwalimu wa mbuzi' meaning teacher of goats, many contacts and networks, increased social status.	10.7	39.3	25.0
• Self satisfaction - seeing other farmers benefit from dairy goats, increased health of animals	14.3	10.7	12.5
• Milk for drinking and sale	17.8	21.5	20.0
• Livestock stock (goats) increased	3.6	0	1.8
• Upgrading improved	7.1	3.6	5.4
• Own business expanded	0	3.6	1.8
• Access to market	3.6	3.6	3.6
• Employment	3.6	3.6	3.6
• Receive payment in kind e.g. lunch	0	7.2	3.6
• Merry-go-round (revolving group) benefits	3.6	0	1.8
• Improved farming skills	10.7	3.6	14.3

Others, but less important benefits include access to markets, employment, improved farming skills and investing in other business proceeds from keeping of goats. The outcomes of the FEWs' work provide a basis for the community to rate their social standing.

2.4.3 Status of the FEWs in the community

When asked why people treated them differently since they became FEWs/Buck keepers/Breeders/CAHWs, almost all the FEWs from the two districts confirmed that they were treated differently. Only 3% in Meru South indicated that they were not treated differently. Table 16 presents the various reasons showing how differently the FEWs felt they were currently treated. The results show that majority of the FEWs in both districts are given opportunities in public places to educate and inform the public about the importance of dairy goats, receive many visitors because of being role models, and are members or officials of many village social or development committees. In Meru South, they are taken more seriously than before, while in Meru Central people greatly appreciate the services they render to farmers. Also in the latter, they are directly connected with MGBA, compared to Meru South where no respondent associated them with MGBA.

Table 17: Treatment of Farmer Extension Workers (FEWs) by other Farmers

Treatment of FEWs	Meru South	Meru Central	Total
Always given a chance to speak in public places- respected	32.2%	46.4%	39.3%
Taken seriously by the community unlike before	14.3%	3.6%	9.0%
Receives many visitors and is regarded as 'mwalimu' (meaning teacher) and model farmer	64.2%	60.8%	62.5%
Visited regularly unlike before by people interested in DG	10.7%	7.2%	9.0%
Member of many village committees	21.4%	10.7%	7.1%
Called 'daktari' (meaning doctor) as a assign of trust in him	3.6%	0	16.0%
Called a 'goat' in the village - talks about it always	0	3.6%	1.8%
People appreciate very much services rendered	3.6%	17.9%	12.6%
Entrusted by the community with goats without fear of lose and encouraged to keep good standards of cross-breeding	3.6%	10.7%	7.2%
Called advisor of MGBA- managed to form many dairy groups	0	7.1%	3.6%

2.4.4 Any support for FEWs from fellow FEWs and local administration

The majority of respondents in both Meru South and Meru Central concurred that FEWs receive support from other farmer extension agents, for example, breeders, CAHWs or and Buck keepers and the local administration (divisional officers, chiefs, assistant chiefs). Only a small proportion, 14% from Meru South and 7% from Meru Central, indicated that no support was received from fellow FEWs and local leaders (see Figure 10).

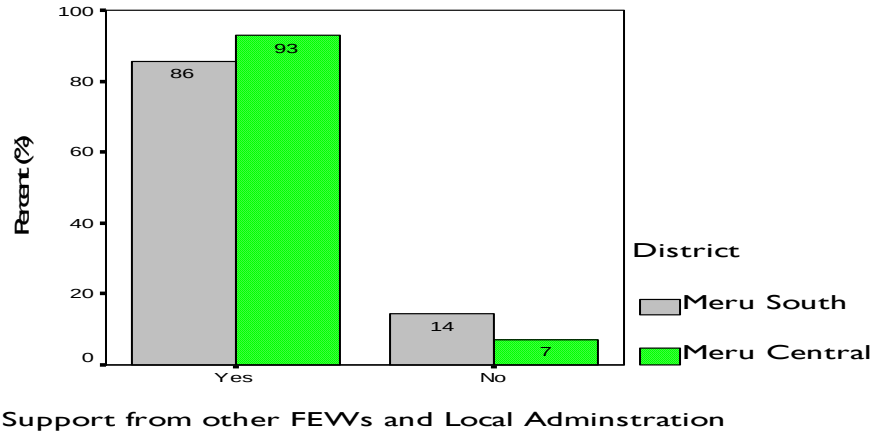

Figure 10: Supplementary support from other FEWs and Local Administration

When asked what kind of support they received the FEWs identified three main kinds (see Table 17). First, active local leadership provides support through involving FEWs in their meetings and programmes. In almost all local leaders' meetings FEWs are usually invited to talk about the dairy goat programme. This is more active in Meru South where 54% of the respondents mentioned this support, compared to Meru Central where 32% mentioned it. Second, group members in both two districts provide support by supplying fodder for the

buck and carrying out maintenance of the buck station. Third, moral support comes from the community indicating that the FEWs are undertaking an important role in the community. Other kinds of support received FEWs in Meru South include complementary credit services provided by the CAHW, encouragement from the local chief for people to keep dairy goats, and government extension support. In Meru Central the other main support comes from the MGBA office.

Table 18: Kinds of support provided through other FEWs and local administration (N=56)

Support	Meru South	Meru Central	Total
• Local leaders involve the FEWs in their program	53.5	32.1	42.8
• Most local leaders are dairy goats farmers and therefore are very supportive of FEWs' work	0	17.9	9.0
• Local chiefs assist in recovery of assets from members who default in payment	3.6	0	1.8
• FEWs collaborate with other FEWs, for example the CAHW gives credit, handles referral cases.	10.8	0	5.4
• The local chief encourages farmers to upgrade goats	3.6	0	1.8
• GOK extension provides support after giving plot for demonstration	3.6	0	1.8
• MGBA officials very supportive of goat related issues	0	14.4	7.2
• Church leaders provide opportunity to FEWs to pass information to people on goats	3.6	3.6	3.6
• Group members are supportive through supplying fodder and maintaining buck station	17.8	21.4	19.6
• Community gives moral support to FEWs' work	14.3	35.7	25.0

2.5 Changes to the Model

2.5.1 Payments for the services to other farmers

When asked**, "**Do you receive any payments from farmers for your services?" Results to this question presented in Table 18 indicate that majority of the farmers in Meru Central (68%) pay for the services FEWs provide, while majority of those in Meru South (61%) do not pay for the services.

Table 19: Any payments for the services to other farmers?

Any payments for the services to other farmers?	District		Total
	Meru South	Meru Central	
Yes	39.3	67.9	53.6
No	60.7	32.1	46.4

(Chi-square = 4.6, df=1, p<.05)

The differences are statistically significant suggesting that Farmers' in Meru Central, where Farm Africa that has wound up is based, have established a higher level of ownership in the dairy goat project management and recognize that for the programme to be sustainable, some minimum costs have to be met.

Figure 11 shows the forms of payment made to FEWs by farmers in the two districts. In Meru South, the FEWs are paid through buck service fee, clinical services offered to livestock and sale of drugs. The differences are significantly different from Meru Central where FEWs are paid through fees levied on buck service, livestock clinical services, 65-75% of the proceeds from the buck breeding station, fees charged on training groups, and also paid in kind through food (lunches) (Chi-square=10.6, df=5, p<0.05).

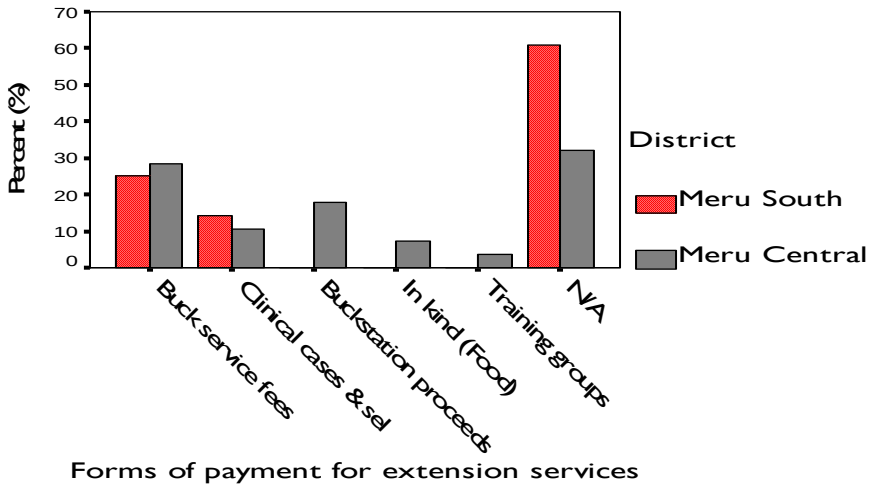

Figure 11: Forms of payment for extension services

For those who indicated that they did not pay for the services, they were asked why they did not. A relatively big proportion of those not paying in Meru South (29%) indicated that they did not have to pay because they believed Farm-Africa was paying the FEWs. The greatest among the Meru Central farmers (11%) gave the same reason and a similar percentage believed that farmers' extension work being a voluntary activity to provide information to the community it did not require to be paid for.

Table 20: Reasons for not paying for services provided by FEWs (%)

Reasons for nonpayment	Meru South	Meru Central	Total
• Farmers believe FARM pays the FEWs	28.6	10.7	19.6
• Group laws restrict FEWs to get extra pay	10.7	7.1	8.9
• Farmers come on their own- it is hard to charge them	3.6	0	1.8
• Most farmers are poor hence need free information to change their lives	3.6	0	1.8
• Fear of farmers quitting the project if asked to pay	0	3.6	1.8
• Stopped working as a breeder	3.6	0	1.8
• Not sold any kid to be paid by the group	7.1	0	3.6
• Give voluntary work for the community	3.6	10.7	7.1

Farm Africa office is located in Meru Central and the FEWs hence it is possible that the FEWs have come to stark realization that Farm Africa has wound up its direct role in the project. The project now belongs to the community. Other reasons cited included group laws restricts FEWs from being paid extra for information provided, poverty limiting farmers' capacity to pay for services, farmers' choice to come for information makes it hard to charge, and fear of farmers quitting the project if asked to pay.

These results suggest that those who do not pay for the services either have no capacity to pay or do not believe that farmer extension should be paid for. They also suggest that not all farmers understand the scope of Farm Africa in supporting extension activities in dairy goat management. The rules and regulations of farmer groups also seem to stifle rather than facilitate the work of farmer extension agents. The reason of fear of losing farmers' participation in the project suggests lack of ownership of the project activities by the concerned members. Such action works against enhancing the willingness and capacity of the farmers to pay for extension services.

2.5.2 Farmers' willingness to pay for FEWs offered services

Figure 12 demonstrates that farmers in Meru Central are more willing than farmers in Meru South to pay for services provided by the FEWs. According to the FEWs opinions about 68% of the Meru Central farmers are willing to pay for services demanded (Chi-square=4.5, df=1, p<.05). This compares to 61% of the farmers in Meru South who are not willing to pay for services provided by the FEWs.

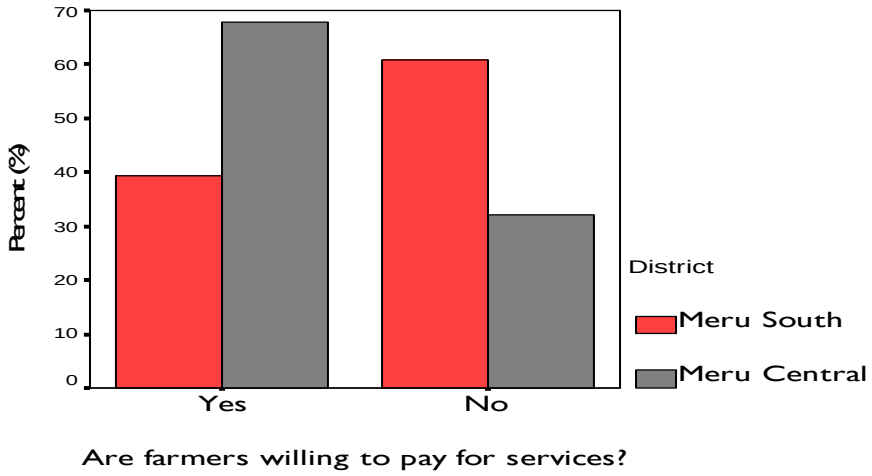

Figure 12: Opinion on farmers' willingness to pay

2.5.3 Farmers' propensity to seek for other extension information

Over 73% of the interviewed farmers, with majority of them from Meru Central, ask for information apart from dairy goat management practices (Figure 13). A majority of 82% farmers in Meru Central ask for other information not limited to DGM, compared to 64% of farmers in Meru South who ask for information unrelated to DGM practices (chi-square = 2.7, df=1, p<0.1). These suggest that farmers in Meru Central look upon FEWs as possible sources of information or possible actors for linking them to relevant sources of information.

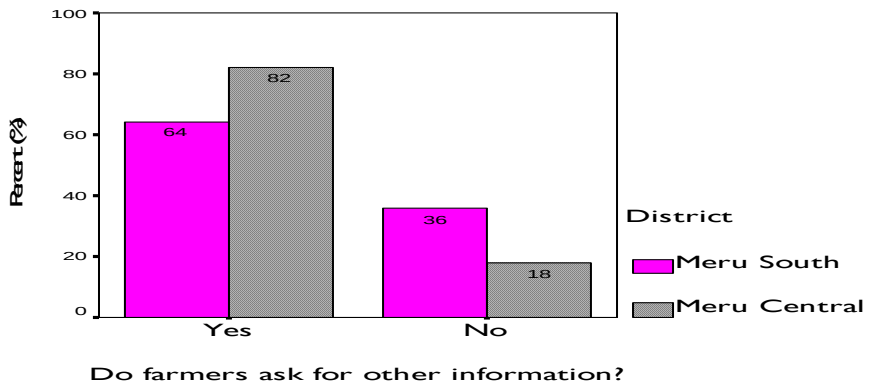

Figure 13: Proportion of FEWs' opinions on whether farmers search for other information

Table 20 shows the most frequently sought for information in both districts. It includes: crop varieties for planting during wet seasons; how to increase crop diversification and crop yields to overcome famine and market risks, marketing and market prices of crops and other livestock and which crops to plant for food and sale.

Table 21: Other information apart from dairy goat management

Information sought apart from DGM	Meru South	Meru Central	Total
• Artificial Insemination and Vaccination	7.1	0	3.6
• Crop varieties for planting during wet seasons	10.7	10.7	10.7
• Tree nursery establishment	7.1	3.6	5.4
• How to increase crop diversification and crop yields to overcome famine and market risks	17.9	28.5	23.2
• Land demarcation and resolving land disputes	3.6	3.6	3.6
• Planting fodder for other livestock	3.6	7.1	5.4
• Dairy cattle management	3.6	10.7	5.4
• How to deal with HIV/AIDS and orphans	3.6	7.2	5.4
• Developing business skills and entrepreneurship	3.6	3.6	3.6
• Marketing and prices of crops and other livestock	7.2	7.1	1.8
• Land management issues to increase production by application of goat manure	3.6	14.3	9.0
• High value crops e.g. Amaranthus, French beans	7.1	0	3.6
• Bee keeping and training on bees management	3.6	3.6	3.6
• Formation and registration of social groups for community development	3.6	10.7	7.2
• How to access credit facilities	0	3.6	1.8
• How to deal with social issues e.g. church matter.	7.1	3.6	5.4
• Water harvesting and conservation techniques	0	7.1	3.6
• Poultry farming	0	3.6	1.8
• Planting crops for food and sale	17.9	17.9	17.9

Other information/service specifically asked in Meru Central is artificial insemination, venturing into export crops e.g. Amaranthus, French beans, and how to deal with social issues e.g. church matters, politics. In Meru South, farmers seek information on planting fodder for other livestock, dairy cattle management, how to deal with HIV/AIDS and orphans, land management issues to increase production by application of goat manure, formation and registration of social groups for community development, and water harvesting and conservation techniques.

2.5.5 Stability of the Farmer-to-Farmer communication model

In your opinion, is the F-F communication model still working as per the original structure or it has changed? All the 56 FEWs sampled across the two districts indicated that the FF-communication model was still working as per the original structure. No changes had been introduced to change or modify. This suggests that in the FEWs' opinion and experience the model is stable and seems to be yielding benefits.

It is important to understand the motivations for FEWs (Buck keepers/general FEWs/Breeders/CAHWs) to participate in community projects as this reflects their perceptions of the likely impacts on their agricultural activities. The intent is the development of modes of activities that address these motivations in a manner that brings about the long-term sustainability of the project. The use of dairy goats is increasingly common across the two districts of Meru as part of ongoing processes of agricultural intensification.

From the perspective of the FEWs, the motivation to participate in dairy goat management project varies, for example, according to prevailing agrarian and market structures or policy frameworks. It may emanate as a response to insufficient extension services, inability to tap on relevant markets, incomplete information or information asymmetry, the need to access credit to overcome input supply problems, potential enhancements in access to extension service, and increased market integration. These conditions, if addressed by farmers, practitioners, researchers and policy makers may lead to varying outcomes for the FEW or the farmer participating in the project; this is at the heart of debates over the conditions under which contracts are likely to benefit smalls-scale producers, for example in terms of cash income, risk, etc.

Key Informant Interviews Report

1.0 Introduction

Many agricultural development programs of the past several decades have recognized that uniform technologies and a linear process of technology transfer (with standard messages delivered to farmers by an extension service) are not necessarily a panacea to the problems facing majority of the resource-poor farmers. Challenges to such simple models have come from several angles, including recognition of farmers' roles and responsibilities in technology generation, understanding the variation in farm household assets and strategies, and appreciation of the need for better farmer organization. The result is a much broader range of methods and techniques directed toward improving smallholder productivity and welfare. However, there may be a danger that innovative strategies could be compromised when they are advocated for widespread replication without understanding the salient features

that enhance sustainability of technology adoption and diffusion. This realization underscores the purpose of this study in assessing the efficacy of the Farmer-to-Farmer model of extension as supported by the Meru Goat Breeders Association (MGBA) in terms of the impact of the model, sustainability of the model, factors influencing performance of the Farmer Extension Workers (FEWS), and changes or modifications in the model. Understanding these issues is important for effective project/programme design and implementation.

The MGBA demonstrates that a wide range of farmers can be reached through the farmer-to-farmer extension strategy. This is in response to the challenge of supporting farmers, particularly smallholders, to develop their agriculture through appropriate technologies, new skills, changed attitudes and practices, and new ways to collaborate with other actors. The extent of the MGBA coverage depends in part on the way that rural communities are targeted and in part on the type of farmer involvement; the later is a function of the way the program is designed and organized as well as farmers' perceptions of the costs and benefits of participation in the programme.

In most programs developed in the name of improving technology transfer and the wellbeing of the resource-poor farmers, the greatest concern has been on the relevance of the outcomes and the sustainability of the intervention. This report examines how MGBA, an extension institutional structure, could be an alternative mechanism for long-term impact. It seeks to understand past success and how this knowledge might be relevant to further applications. In particular, the report focuses on assessing factors affecting performance of farmer extension promoters in dissemination of dairy technology and related demanded services, the type of farmers participating as change agents, the incentives and benefits driving the farmers' participation in technology dissemination, and assessment of constraints limiting their role and potential in technology promotion. The main purpose is to generate information and insights that can be used to improve the ability of researchers, community of research, government extension providers, policy makers, NGOs and donors to support the most effective rural and agricultural development initiatives that stand to significantly improve rural welfare.

The report is organized in the following manner: Section 2 briefly reviews the concepts of Farmer-to-Farmer Extension (FFE). This is followed by section 3, an introduction to a study of FEWs in Meru Central and Meru South and an examination of the participants. In section 4 the methods and data used are outlined. Section 5 presents the results of the FEWs in dairy goat technology dissemination. Section 6 concludes with some thoughts on how the impact of such innovative extension strategy can be sustained and enhanced. There is a particular focus on the farmer extension workers and how they can be assisted to develop a manageable communication strategy.

2.0 Results and Discussion

2.1 Impact of the Model

The study sought to determine key informants' perception on farmers' access to sources of information through the question "Have the farmers within the last one-year had access to

the existing sources (vertical sources) of information, especially on DGM?" 16 of the key informants (94%) responded in affirmative (Figure 14).

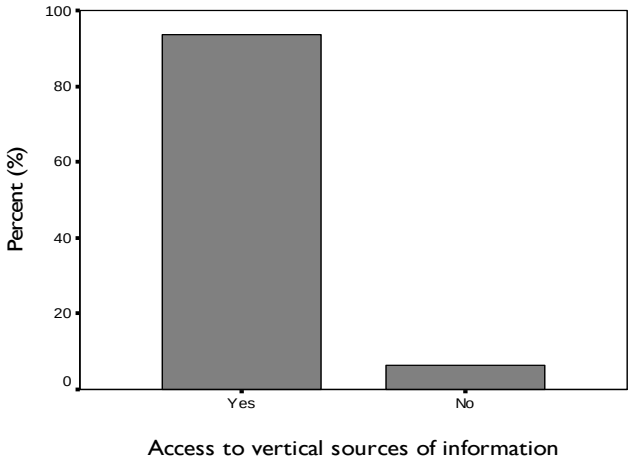

Figure 14: Key informants opinion farmers' access to vertical information sources

The key informants gave various reasons accounting for the access to vertical sources of information. The reasons as shown in Table 21 include: holding and attending public meetings; visiting research and extension sites and offices; heightened individual propensity for seeking information; influence of the National Agriculture and Livestock Extension Programme (NALEP); partnership with government, research, and extension.

Table 22: Reasons for how farmers' access vertical sources of information

Reasons for information access	Frequency	Percent
• Use public barazas (meetings) for market information and new technologies	3	18.8
• Farmers seek information on their own from GOK extension, research, and private sector	7	48.8
• Work closely through NALEP that has vertical links	3	18.8
• The GOK/Research/NGO involved in delivery of information to farmers	2	12.5
• Extension agents are active and have registered and trained many groups	5	31.3
• The farmers have always been doing using F-F model	1	6.3
• Lack of enough field staff	1	6.3
• Lack of resources	1	6.3

Others include urgency and need for the information; sensitization through training and formation of new groups; and farmers' own previous initiative of seeking information; lack of field staff calling for farmers to reach out on external sources, and lack of resources. These reasons suggest that the significance of networks and partnerships are important in tapping resources and information through vertical links.

Some three informants indicated that farmers had not accessed any of the existing sources of information, particularly those relating to DGM. Table 22 presents the reasons advanced for this failure. The informants felt that most farmers are poor and cannot afford linking up

with vertical sources and moreover, MGBA is not financially stable to carry out the workload demanded by the model. According to these views for farmers to benefit from the communication model through networking they require some upfront costs to be met. Secondly, the MGBA model requires some funding for it to enable farmers to enjoy benefits accruable through vertical linkages.

Table 23: Explanation why farmers do not access vertical sources of information

Reasons for inaccessibility to information sources	Frequency	Percent
Most farmers are poor and can not afford to link up	2	12.5
MGBA not financially stable to carry out the model workload	1	6.3
N/A	13	81.3
Total	16	100.0

2.1.1 Farmers' horizontal information flow

Fifteen of the key informants, over 90%, indicated that there had been horizontal information flow on a monthly basis among the community members within the last one year compared to the previous years (Figure 15). This suggests that information flow was regular and consistent providing opportunity for farmers to exchange and share ideas.

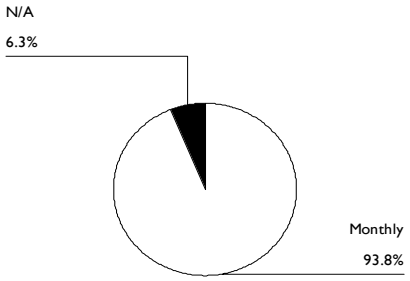

Figure 15: Opinion of key informants on farmer horizontal information flow

Table 23 indicated the distribution of the key informants' opinions regarding the frequency, reliability and level of accessibility of information flow among farmers in the last one year compared to the previous years. Most of the informants (94%) indicated that information passes to farmers on monthly basis. Only one informant was not sure of the frequency of information flow. On the other hand, seven (44%) of them indicated that the reliability of the information shared was very high while eight (50%) opined that it was moderately reliable. One did not offer an opinion.

Table 24: Frequency, reliability and accessibility of horizontal information flow

Aspect of information flow	Level	Frequency	Percent
Frequency	Monthly	15	93.8
	N/A	1	6.3
Reliability	Very reliable	7	43.8
	Moderately reliable	8	50.0
	N/A	1	6.3
Accessibility	High	11	68.8
	Medium	4	25.0
	N/A	1	6.3

Eleven of the informants (69%) indicated that accessibility to the vertical sources of information by the farmers within the community was high and four indicated that it was average. One informant did not rate the access. In general, these observations suggest that the level of access is reasonably high and reliable. With monthly opportunities of sharing information this suggests that the farmers have opportunities to learn, reflect, countercheck information and ask questions arising out of their farm practices. Under such conditions quality and effectiveness of learning is likely to increase.

The key informants gave various comments regarding the quality of the communication model (Table 24). They observed that information exchanged through the model was based on need and that the farmer extension workers are accessible to respond to fellow farmers' requests and needs. They provide service or information either at affordable low cost or for free. However, the FEWs main limitation is that they are not equipped to handle referral cases. Further, the liberalization and decentralization of the communication media has opened up more sources of information, making the model more effective in serving farmers' needs. One informant observed that the farmers trust each other and live in a community of social connectedness. However, it was observed that some farmers do not have interest in utilizing various media available for agricultural information. This suggests that the quality of horizontal information flow could be enhanced by interest among farmers, relevant information, availability of competent FEWs, variety of sources of information and trust among farmers.

Table 25: Comment on the accessibility of horizontal information flow

	Frequency	Percent
• Information sought is based on need	1	6.3
• Practicing farmers /FEWs are accessible	3	18.8
• Media liberation and decentralization has opened up information sources/channels	2	12.5
• Farmers trust each other and stay together	6	37.5
• Some farmers lack interest to source for information	1	6.3
• FEWs provide cheap/free services	1	6.3
• FEWs can't manage referral cases	2	12.5

2.2 *Sustainability of the Model*

2.2.1 Model replicability and role of extension actors

With increasing desire for expanding the use of proven models of extension, opinions of key informants on whether the Farmer-to-Farmer communication model is replicable were sought. Fifteen of the informants observed that the model was replicable (Figure 16). This suggests that the informants have some experience of the model and that they have understood well its application.

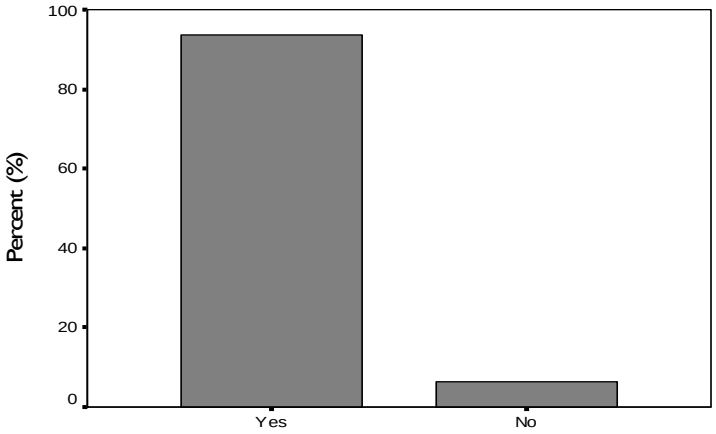

Figure 16: Opinion on replicability of the F-F communication model

When probed to explain how the model could be replicated in other areas or sectors several explanations were given as presented in Table 25. The most common ones are: farmers everywhere are always keen on sharing new information or technology and more so, if the benefits are practical and immediate. Communication, perceived as a universal process, is made more effective if the policy environment in which it operates is conducive. Such an environment should also ensure transparency and accountability on the part of those involved. Some informants added that smallholders engage in similar enterprises. Further views are that the model can be replicated if it is introduced at the beginning of a project and if there are supportive resources, trust among the community members, and members with a specific interest. These views are consistent with the requirement for projects and programme to foster ownership among the beneficiaries if they are to be operational and sustainable.

Table 26: Explanations for the replication of the F-F communication model to other areas

Reasons for model replication	Frequency	Percent
• Smallholder farmers are universal and do similar enterprises	2	12.5
• Farmers everywhere are always keen on sharing new	3	18.8

information or technology		
• If benefits are practical and immediate e.g., on markets	4	25.1
• Dependent on supportive enabling government policy/culture environment	3	18.8
• Already working in new areas except at the municipality	1	6.3
• Communication is universal and can also work in Meru	1	6.3
• Depends on the population of an area for easy Farmer-to-Farmer exchange	1	6.3
• If implemented at the start of the project	1	6.3
• Transparency and accountability	1	6.3
• Already working with NALEP	1	6.3
• Interest and demand	1	12.5
• Experience and trust	2	6.3
• Availability of resources	4	25.0

Several suggestions were given on what other extension sectors could do to make the model sustainable. Table 26 indicates that the most common were: continuously identifying resource persons and upgrading their skills, supporting breeding high value livestock and creating market incentives to encourage farmers, working in collaboration with MGBA or MAHWG and other institutions doing similar work, and allocating more time to advice FEWs in implementing the model. The work of the FEWs can be made known to a large community of farmers through various communication channels that include agricultural shows, farm visits, local leaders' meetings and NALEP field days. Non-performing FEWs can be replaced or alternatively attend to their training needs.

Other suggestions include, being exemplary in adoption of best practices, supporting training of FEWs to acquire skills, knowledge and attitudes necessary for their extension tasks, monitoring and evaluation of the FEWs. Training of the FEWs on new technology and communication skills are important in equipping the extension workers with what to offer to farmers to generate benefits. Monitoring is important in checking on the work progress by the farm extension workers. Supporting farmer groups to acquire resources, particularly financial resources and how to use them effectively is an important suggestion. Equally important is supporting the groups participating in programmes/projects utilizing the F-F model, to address market needs of the group members. The informants also recognized the significance of having a conducive and enabling environment in which these measures can have payoffs.

Table 27: The role of other sectors in the sustainability of the F-F communication model

Supportive roles of other sectors	Frequency	Percent
• Continuously identify resource persons and upgrade skills	3	18.8
• Holding frequent field shows, farm visits, and demonstrations, NALEP field days	4	25.1
• Hold frequent barazas for dissemination of information	1	6.3

• Breed high value livestock and market incentives	2	12.5
• Lead by example in adoption of best practices	1	6.3
• Work closely with institutions who do similar work	1	6.3
• Support training of FEWs to be competent and confident in disseminating information and technologies	5	31.3
• Have a regular monitoring and evaluation scheme of FEWs	1	6.3
• Work in collaboration with MGBA/MAHWG	2	12.5
• Be pro-active to source for new information for farmers particularly market information	1	6.3
• Allocate sufficient time to follow-ups and advising FEWs	2	12.5
• Empower farmers to keep good record for traceability	1	6.3
• Support farmer groups to acquire assets and manage credit	1	6.3
• Support policy formulation that enhances the model	1	6.3

For any model to succeed in what it is intended to do it requires resources, either internally generated within a system or externally provided from somewhere or a combination of both. On being asked whether the F-F communication model needed external resources to keep it working 11 (69%) of the informants responded in affirmative (Figure 17). This suggests that most informants believe that the model can work if there is infusion of external resources.

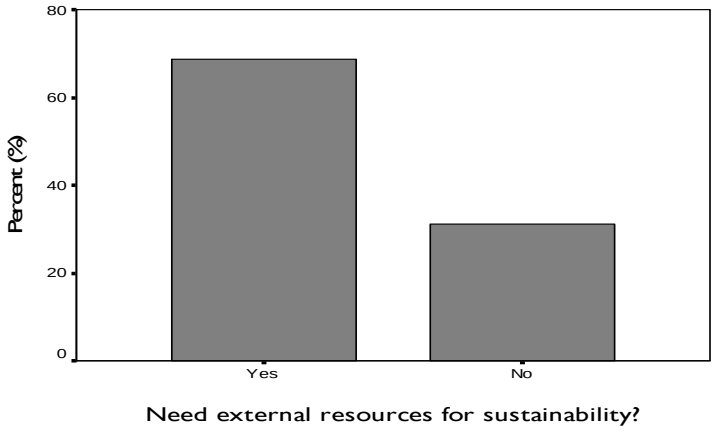

Figure 17: Informants' opinion on whether the model dependent on external resources

Two reasons were advanced by two informants why this was necessary. First, because FEWs are voluntary farmers providing external resources gives them the needed incentives to continue serving other farmers. Second, external resources are necessary to upgrade the FEWs' skills to respond to ever changing natural and socioeconomic environmental circumstances. This suggests in part that the informants feel that the farmers themselves are not capable of using their own resources to bring about these conditions in the FEWs. These reasons also suggest that though there is need for self-reliance in such arrangements, informants acknowledge the value of external resources in sustaining the model. Nevertheless, about a third of the informants indicated that external resources were not necessary in sustaining the F-F model (Table 27).

Table 28: Reasons for F-F Communication model to require external resources

Reasons for need for external resources	Frequency	Percent
• There are no resources required for face to face interaction	1	6.3
• Local channels of dissemination are cheap to use and to access	1	6.3
• Farmers should run their activities as a business	7	43.8
• FF extension is a voluntary venture and participating farmers should work for no extra charge	1	6.3
• Information is demand-based and so individual should pay	1	6.3
• Technology spreads by itself if demonstrates immediate benefits	1	6.3
• Benefits from market links can meet overhead costs	1	6.3
• Empower farmers through trainings and market linkages to enhance ownership	1	6.3
• Training of farmers on proper reporting reduces costs	1	6.3

Majority of the informants (7 out of 16) argued that farmers should run their activities as a business hence meeting all the conceivable costs. Others argued that there are no resources required for face-to-face interaction, local channels of dissemination are cheap to use and to access, and that model presents a voluntary venture in which farmers should work for free. Still others felt that since information is based on demand the concerned individuals should pay for the services provided by FEWs. Under such conditions, if the technology demonstrates benefits to the adopter then it undergoes diffusion without the need for external resources. Finally, it was observed that market links and effective farmer training should reduce dependence on external resources.

2.2.2 Modifications/Improvements to the FF model

The value of a model may increase as improvements are made to the model. The key informants were asked, "Are there modifications/improvements to be made to make the model work better as per the original structure? Several suggestions shown in Table 28 were provided. They include: external fundraising for MGBA to make it utilize vertical links fully, developing a structure for continuous training, adopting a farming business ethic in the model, establishing a credit system, ensuring a clear monitoring and reporting structure, emphasis on practical learning, cultivating synergy among all FEWs, and improve the commitment level of MBGA officials.

Table 29: Improvements on the model to make it perform better

Model improvements	Frequency	Percent
• External fundraising for MGBA to utilize vertical links	2	12.5
• Structure for continuous training for new skills to match environment	4	18.8
• The structure should have a business orientation	1	6.3
• The structure should have micro-credit institution	1	6.3

• Clear monitoring and reporting	1	6.3
• The model to emphasize practical learning	1	6.3
• Improve commitment level of MBGA officials	2	12.5

When informants were asked if extension actors recognized the FEWs (Breeders, Buck-keepers, CAHWs and Farmer Extension Workers) as dissemination/Communication resource persons? 13 of them responded in affirmative. Table 29 shows the reasons they gave for the recognition. The FEWs are trained by the government extension staff and also supported with transport. The FEWs receive certificates for recognition of their service in the community giving them credibility. They are socially recognized in the community and bridge the community to external sources of resource, information and influence. Consequently, they are known in the community as opinion leaders. They are also used as contact farmers by the national extension programme and this legitimizes more their role as communication resource people.

Table 30: Reasons why extension agents recognize FEWs as dissemination agents

Why FEWs are dissemination agents	Frequency	Percent
• They are socially recognized in the community as lead farmers and act as link to external sources	1	6.3
• They have been trained by the same extension staff from the Ministry of Livestock or Ministry of Agriculture	4	25.0
• MGBA officials are always supported by GOK extension with means of transport	1	6.3
• When well introduced, they are known and recognized	2	12.5
• NALEP use FEWs as contact farmers in the focal areas	1	6.3
• FEWs supplement GOK extension services and work as technology disseminators	4	25

Three of the informants felt that the FEWs are not recognized as dissemination agents. They view them as their subjects and are sceptical about the competition they may present. Some extension actors therefore view them as competitors, for example the Vets and CAHWs. They are also viewed as recipients of knowledge and not necessarily generators. Although they receive training from extension actors they are still considered as farmers and not communication resource persons. Basically their role as farmers' extension workers is underestimated.

2.3 Factors Influencing the Performance of the FEWs

2.3.1 Status of FEWs and local level institutional support

Most extension actors work with local institutions. All the 16 informants opined that the status of the FEWs was valued and that they get support from village leaders, local institutions such as churches, schools and other social networks during their work. Reasons cited for this recognition are: FEWs are promoted in public places to create confidence and

win trust, they are used in information collection and delivery to fellow farmers, they are always given forums in public places to pass information to fellow farmers, they are popularly elected by the community and hence supported by the same, they are reliable, sociable and practical hence they have a higher social standing and are taken seriously, and they are respected by those they have trained. The local leaders also promote FEWs who deliver on their roles.

These findings suggest that local leaders have an important role to play in sustaining the program and upscaling its influence to wider farming communities. The support also helps to engender ownership of the activities undertaken by FEWs. The support helps to motivate the FEWs given the social standing of the local leaders in the community.

Table 31: Support FEWs receive from local leaders

Type of Support	Frequency	Percent
• Promoted in public to create confidence and win trust	3	18.8
• They are used in information collection and delivery to fellow farmers	1	6.3
• They are always given forums in public places to pass information	8	50.0
• They are popularly elected by the community so they get support from the local leaders and the community	3	18.8
• They are reliable, sociable and practical - appreciated	5	31.3
• They have a higher social standing and are taken seriously	1	6.3
• They are respected by those they have trained	1	6.3
• They are elected and are also opinion shapers	2	12.5
• The local leaders promote FEWs who deliver on their tasks	1	6.3
• Local leaders assist in enforcing standards and by laws	1	6.3

Although the FEWs are considered to e support and enhance extension functions, 13 of the 16 key informants observed that some FEWs have stopped working as breeders, buck keepers, CAHWs or FEWs within the last one year. Table 31 summarizes the reasons they attributed this to. Group conflicts and leadership wrangles rank high.

Table 32: Why some FEWs have stopped working

Causes of stopping working as farmer extension worker	Frequency	Percent
• Group conflicts and leadership wrangles	4	25.0
• Marketing problems, no possibility of a sustainable market	2	12.6
• Too demanding workload than expected when combined with domestic chores	3	18.8
• Non-payment for services rendered to farmers	2	12.5
• Competition from others in the same area	2	12.5
• Death of bucks which discourages farmers	2	12.6

• Lack of confidence or qualification to train farmers of higher social economic status	2	12.5
• Not recognized by leaders and the community due to undesirable behaviour such as drunkenness	4	25.1
• Lack of moral support or cooperation from group members in buck feeding and general maintenance	2	12.5
• Lack of trust, transparency and dishonesty	1	6.3
• Unfulfilled high expectations such as high income	2	12.6

Other factors contributing to FEWs' withdrawal from extension work include marketing problems, heavy workload when combined with personal domestic chores, non-payment for services, competition from other FEWs particularly CAHWs and Vets, deaths of bucks affecting the breeding programme, lack of good background as a base for training others, socially unacceptable behaviour, lack of transparency in dealing with fellow farmers hence losing farmers' trust in them, and high expectations from the voluntary extension work.

2.3.2 The Importance of Farmer Extension Workers (FEWs)

The key informants were finally asked "How important do you think the FEWs are?" The informants acknowledged that FEWs play an important role in spite of their non-professional training. Table 32 identifies eight main roles carried out by the FEWs:

- Practice what they learn and encourage others to adopt the same by organizing demonstrations on their farms or designated areas, for example at local leaders' offices.
- Are instrumental in providing information about new technology to fellow farmers and help to upscale the technology to more farmers on a wider level.
- Support the dairy project by sharing information and resources related to goat keeping enterprise.
- Are learning resources/centres for other farmers and can be consulted whenever need arises.
- Are marketing channels and outlets that receive and share information.
- Are entry points for new initiatives and provide a link between research, development and extension.
- Understand fellow farmers' problems and are approachable to hold discussions with them on their needs and interests and communicate the same to MGBA officials or other extension actors.
- Complement Government activities in the villages hence contributing to the development agenda of rural areas.

These observations suggest that FEWs form an important component of the extension organization. In particular they provide a necessary link between the farmers, researchers, rural extension and development partners. In situations where extension continues to suffer from insufficient resources both human and financial, FEWs provide a partial solution to providing extension services to farmers.

In summary, the analyses of the key informant interviews suggest that the Farmer-to-Farmer communication model has increased smallholders awareness to the technology of dairy goat management. The analysis also reveals that communication between farmers has been

regular and the information shared is reliable with accessible sources of information and resources. The model is replicable and can be sustained by the farmers themselves but its effect is likely to be higher if some external resources are accessed.

Table 33: Importance of FEWs in the community

Role of FEWs	Frequency	Percent
• They practice what they are trained on and encourage others to adopt hence provide direction of the project	5	31.3
• They are used in disseminating new technology far and wide within the community	3	18.8
• They are the life of the project, sharing information and resources	4	25.1
• They are learning resources/centres for other farmers	3	18.8
• They provide cheap and essential services at the local level	1	6.3
• They assist in information dissemination to large targets	1	6.3
• The are marketing channel and outlets, send and receive information	1	6.3
• They are the entry points for new initiatives	1	6.3
• They understand fellow farmers' problems and are approachable	2	12.5
• They complement Government activities in the villages	4	25.1
• They provide monitoring reports to the project for assessment	1	6.3

The continuity of the FEWs to work under this model depends largely on the incentives they receive and the extension actors that support their tasks and responsibilities. With active support from the local institutions the FF model can have an enhanced role in promoting new technologies and practices among smallholder farmers.

Focus Group Discussions report

1.0 Introduction

Many agricultural development programs of the past several decades have recognized that uniform technologies and a linear process of technology transfer (with standard messages delivered to farmers by an extension service) are not necessarily a panacea to the problems facing majority of the resource-poor farmers. Challenges to such simple models have come from several angles, including recognition of farmers' roles and responsibilities in technology generation, understanding the variation in farm household assets and strategies, and appreciation of the need for better farmer organization. The result is a much broader range of methods and techniques directed toward improving smallholder productivity and household welfare. However, there may be a danger that innovative strategies could be compromised when they are advocated for widespread replication without understanding the salient features that enhance sustainability of technology adoption and diffusion. This realization underscores the purpose of this study in assessing the efficacy of the Farmer-to-Farmer model of extension as supported by the Meru Goat Breeders Association (MGBA) in terms of the impact of the model, sustainability of the model, factors influencing

performance of the Farmer Extension Workers (FEWS), and changes or modifications in the model. Understanding these issues is important for effective project/programme design and implementation.

The MGBA demonstrates that a wide range of farmers can be reached through the farmer-to-farmer extension strategy. This is in response to the challenge of supporting farmers, particularly smallholders, to develop their agriculture through appropriate technologies, new skills, changed attitudes and practices, and new ways to collaborate with other actors. The extent of the MGBA coverage depends in part on the way that rural communities are targeted and in part on the type of farmer involvement; the former is a function of needs assessment while the later is a function of the way the program is designed and organized as well as farmers' perceptions of the costs and benefits of participation in the programme.

In most programs developed in the name of improving technology transfer and the wellbeing of the resource-poor farmers, the greatest concern has been on the relevance of the outcomes and the sustainability of the intervention. This report examines how MGBA, and extension institutional structure, could be an alternative mechanism for long-term impact. It seeks to understand the past success and how this knowledge might be relevant to further applications. In particular the report focuses on assessing factors affecting performance of farmer extension workers in dissemination of dairy technology and related demanded services, the type of farmers participating as change agents, the incentives and benefits driving the FEWs' and farmers' participation in technology dissemination, and assessment of constraints limiting their role and potential in technology promotion. The aim is to generate information and insights that can be used to improve the ability of researchers, community of research, government extension providers, policy makers, NGOs and donors to support the most effective rural and agricultural development initiatives that stand to significantly improve rural welfare.

The report is organized in the following manner: Section 2 briefly reviews the concepts of Farmer-to-Farmer Extension (FFE). This is followed by section 3, an introduction to a study of FEWs in Meru Central and Meru South and an examination of the participants. In section 4 the methods and data used are outlined. Section 5 presents the results of the FEWs in dairy goat technology dissemination. Section 6 concludes with some thoughts on how the impact of such innovative extension strategy can be sustained and enhanced. There is a particular focus on the farmer extension workers and how they can be assisted to develop a manageable communication strategy.

2.0 Results of Focus Group Discussions

Sixteen focus group discussions were held in different places that included church compounds, local administrators' centres and group members' homes. The average number of participants per focus discussion was 13 with six men and seven women.

2.1 Impact of the Model

2.1.1 Awareness of messages on dairy goat management practices

Most of the focus group discussions acknowledged that majority of the farmers were aware of the messages given on dairy goat management practices and this awareness was mainly average (see Figure 18). The discussions revealed that level of awareness was not high because keeping dairy goat was still in its infancy stage and so could not be compared to other areas where the project had started several years ago. The slow rate of awareness was also attributed to the fact that the whole area is served by only one buck. This makes it expensive and practically difficult to serve all the farmers interested of upgrading their local goats.

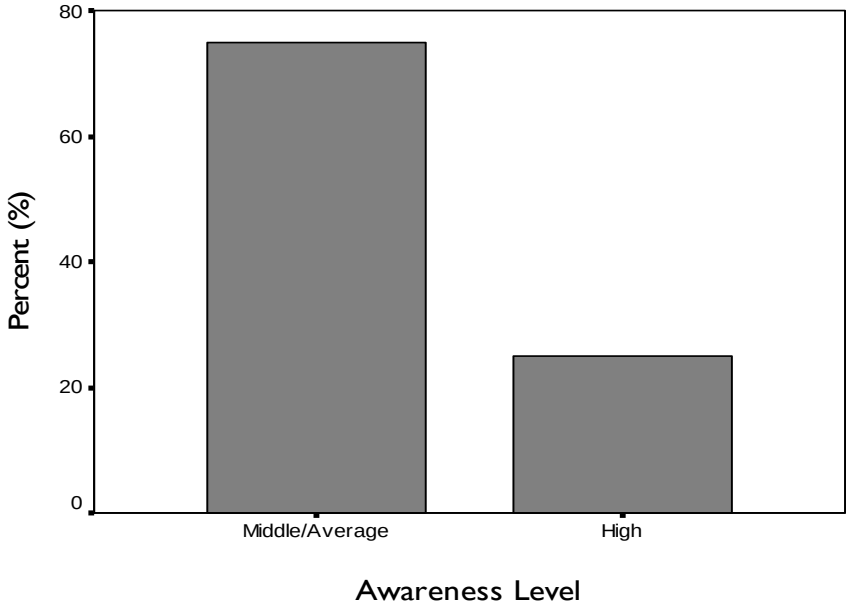

Figure 18: Assessment of community dairy goat management awareness

Indicators of awareness cited included: introduction of the milking plant, selling of the upgrades to others, dairy goat keeping spreading to non FARM Africa areas, and majority of people (75%) indicating that they were aware of dairy goat enterprise. This increased awareness was attributed to increased interest in dairy goat keeping among the non-group members. This, in turn, has stimulated increased formation of new groups and especially ones formed with the help of the area FEW. Additionally, majority of the people in the area recognize the importance of goat milk.

2.1.2 Adoption of the dairy goat management practices

To find out whether adoption is on increase or decrease, farmers were asked to compare adoption rates of eleven dairy goat management practices in the past with the last one year. The results in Table 34 indicate that high adoption was observed for three practices: crossbreeding (75% or 11 out of 16 focus group discussions), drinking goat milk (56%) and deworming (69%). Medium or average level of adoption was mainly associated with mineral supplementation (53%), improved goat shed (44%) and selling of goat milk (44%) while the lowest adopted practices included keeping records (94%), ear tagging (87%), fodder conservation (69%), selling goat milk (50), and planting fodder (44).

Table 34: Adoption level of dairy goat management (DGM) practices

DGM practice	Low	Medium	High
Crossbreeding	0%	25%	75%
Improved goat shed	43.8%	43.8%	12.5%
Drinking goat milk	0%	43.8%	56.2%
Planting fodder	43.8%	26.7%	26.7%
Ear tagging	86.7%	6.7%	6.7%
Mineral supplementation	33.3%	53.3%	13.4%
Deworming	0%	31.3%	68.7%
Record keeping	93.8%	6.3%	0%
Selling goats by weight	62.5%	12.5%	25%
Selling goat milk	50%	43.8%	6.3%
Fodder conservation	68.8%	18.8%	12.5%

The reasons associated with *high adoption* rates of DGM practices were cited as:

- Promotion through extension worker's demonstrations and farmer encouragement of planting improved fodder for higher productivity in the entire farm livestock system.
- Improved prices due to high demand for goat milk
- Relevant information encourage crossbreeding of local goats with proven bucks to increase milk productivity.
- Knowledge and promotion of better milking hygiene thereby making farmers to appreciate goat milk.
- High value placed on upgrades and their requirements, for example mineral supplements and deworming to increase production and prevent ill health respectively.
- Payable services, e.g., deworming provided on credit.
- Advice/knowledge provided by the buck keeper on maximizing benefits from goats.
- Mandatory requirements/practices particularly ear tagging for upgrades on sale.
- High value multipurpose milk – better quality drinking milk, also used for medicinal purposes, etc.

The reasons associated with average/medium *adoption* of DGM practices were cited as:

- Alternative uses of some of the practices. For example, fodder is not conserved as it is fed to cattle.
- Low level of community sensitization on the importance of dairy goats.
- Low production for subsistence only.
- Selective practices, e.g. ear tags are only for those with upgrades.

- Limited knowledge on some of the practices, for example record keeping.
- Prohibitive costs that stifle some farmers not to move beyond the awareness stage on some practices, e.g., in constructing improved goat shed and feeding mineral supplements.
- Lack of access to outside markets.
- Lack of distribution channel for the goat milk.

The reasons cited to contribute to *low adoption* were:

- Many have not moved beyond the awareness stage of various dairy management practices. However, some group members are buying goats through merry go round (i.e., rotating savings arrangements) activity as a source of raising funds.
- Lacks of enough bucks in groups' buck stations – farmers walk long distance to the nearest buck station. Long distance forces farmers to revert to use of local buck.
- Labour-intensive especially for practices such as fodder conservation.
- Lack of access to sufficient markets for the goats and the milk produced.
- Non-availability of materials and seed, for example fodder seed and ear tags in spite of the high demand for them.
- Lack of appropriate knowledge on the value of record keeping.
- Cultural preferences against consuming goat milk.
- Planting fodder for goats is still a new practice not yet appreciated.
- Prohibitive cost for some of the practices, e.g., ear tags, mineral supplements.

Thus, from the results above it seems that constraints to adoption of dairy goat include lack of money to purchase the crossbreed or upgrade the local goats, failure of relevant information to reach all the farmers due to selective procedure of the participating farmers, lack of knowledge on the importance of dairy goats, lack of market access for goats and milk, non-availability of requisite of requisite materials and socio-cultural factors.

2.1.3 Farmer's access to the Dairy Goats' Markets

To the question of access to dairy goats' markets, 8 out of 16 focus group discussions (56%) mentioned that access to information on dairy goat market in the area is at a low level Figure 19. But 6 out of 16 (38%) indicated that the market information access was high. It was indicated that both members and non-members are equally aware of the right prices for various breeds. The farmers attributed this to massive campaign by the FEWs and group members to pass correct information to discourage brokers' activities. However, there is low access to market for their goats and they suspect that they are isolated due to the long distance from market sources and allege some biases by buyers (MGBA).

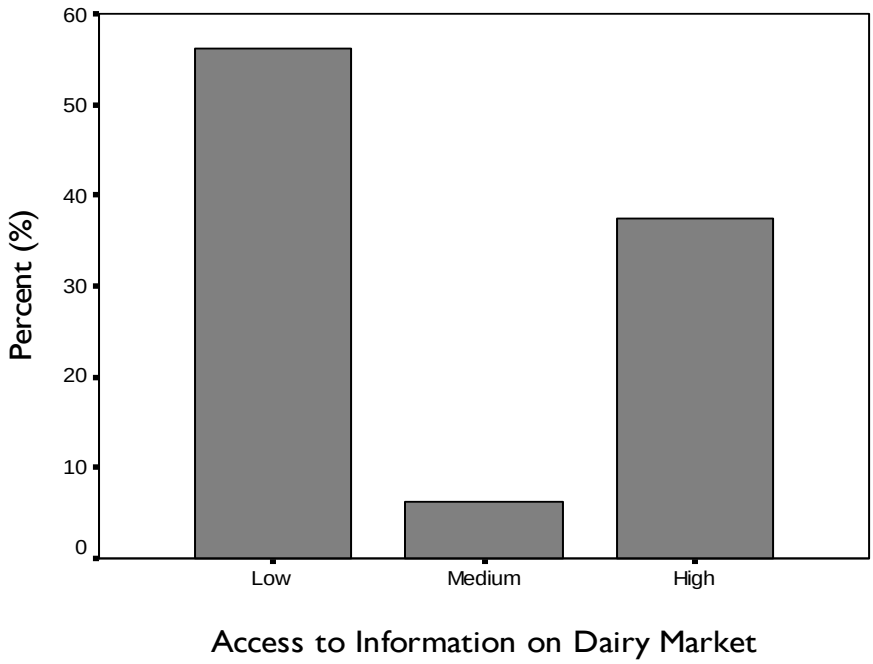

Figure 19: Access by Farmers to Information on Dairy Market

Reasons cited for high market access were:

- Increased access to market information. Awareness about markets has gone up.
- Timely access to information about demand for goats through MGBA. Information is passed through the area MGBA representative.
- FEWs and CAHWs collect information from farmers about goats to be sold and pass it onto MGBA. Timely communication between FEWs and MGBA through mobile phones helps facilitate this process.
- Increased consensual agreement between buyers and sellers (farmers). No one is forced to sell at low prices.
- Farmer resistance to exploitation by middlemen by getting proper information about prices and refusing to sell goats at low prices.

Reasons cited for low market access were:

- Exploitation by middlemen, making farmers to lose morale.
- Lack of sufficient market for upgrades, particularly for the ¾ crossbreeds.
- Lack of transparency by officers buying goats. They are also blamed for buyers illegally making deductions from farmers' sales. No explanations are made for the deductions.
- Group members do not pass on information effectively. This leads to failure for relevant and useful information to reach non-members. Hence, majority of farmers do not know the actual prices of different goat breeds.
- Buyers' preference for brown crossbreds discourages farmers raising white crossbreeds.
- Requirement of ear tagging upgrades before sale disadvantages farmers who cannot afford the ear tags.

- MGBA is sometimes interested more in selling ear tags than passing on market information. This makes farmers sell their upgrades at very low prices.
- Failure by farmers to distinguish between middlemen and genuine buyers.

With better access to markets, farmers are able to raise goats and sell to get an income. Such an income enables families purchase other necessities, pay school fees, invest further on their farm and consequently improve their standard of living.

2.1.4 Changes to Standard of Living

Half (50%) of the focus group discussions indicated that the standard of living in the study area has generally improved over the last one year (Figure 20). This is considered to be influenced by the attractive prices fetched by crops and livestock as well as improved road network that facilitate easy access to markets. The farmers are currently realizing improved agricultural productivity due to favourable rains and support by new government development efforts and increased incomes from sale of goats and milk. Consequently, people seem to be better off than in the previous year as quipped by one participant from Kathigau group, "people nowadays look better dressed than before, they don't look hungry, an indication of improving standard of living." Another member from Murithi group remarked that 'Road network is maintained enabling transportation of our produce to the market."

Focus discussions also revealed that there has been improved information flow on better farming technologies. This is particularly so in dairy goat management. One member from Kamenchu group remarked that, 'we have managed to assist in introducing dairy goat activities in a group actively involved in tea production. So far, the group has been assisted to buy local goats ready for crossbreeding'. The participants also observed that with the coming of new entrants, especially agro-based companies training farmers on banana management exploitation by middlemen has reduced. The diversification of crop and livestock enterprises has in general improved food security and rural incomes. This is captured by a participant from Kathigau group who opined that "those with diversified farming activities stand a better position in their standard of living."

However, most of the nongroup members felt that the standard of living had deteriorated. This is attributed to exploitation by a cartel of middlemen that offer low prices for farmers' produce and products, crop failure and lack of market for livestock, poor road infrastructure from the remotely located areas, poor local leadership failing to promote better infrastructure, failure to follow all the requirements for sale of goats. One participant remarked that, "Whenever information on goat markets reaches nongroup members. They are unable to sell due to lack of ear tags and proper records; hence members have advantage over nonmembers." These forces make them experience shortfalls in incomes generated.

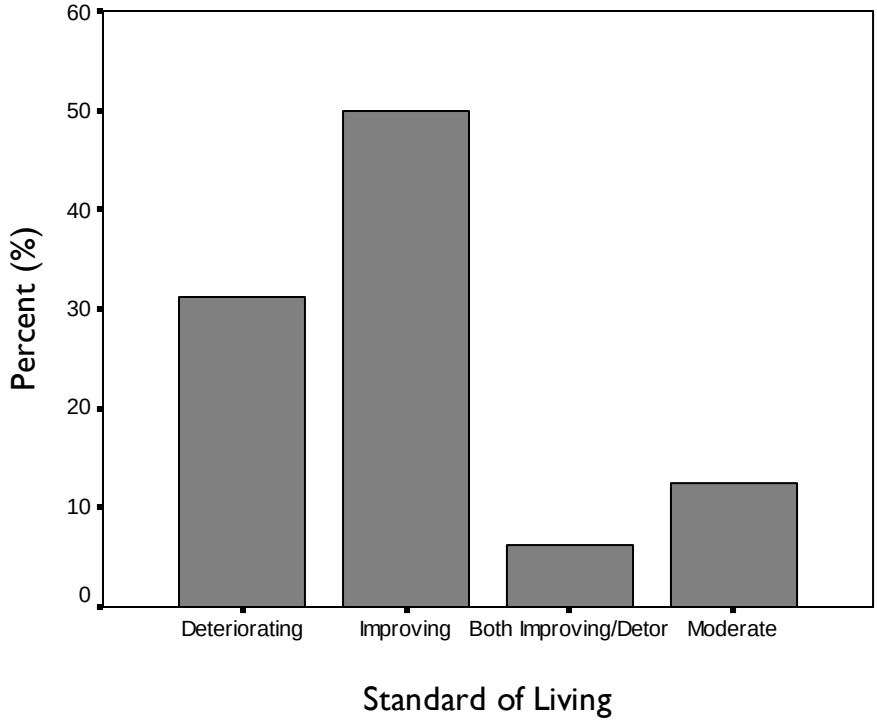

Figure 20: Changes in the Standard of Living

2.1.5 Flow and Exchange of Information

In response to the question: How has been the flow and exchange of information (especially on farming) within the community among the farmers in the last one year compared to other years 10 out of the 16 focus group discussions (63%) indicated that the process was average/medium (Figure 21). Four of them agreed that information flow and sharing had been excellent. Several reasons were cited for this average information flow. First, though communication among farmers themselves is good the participants observed that vertical link through farmers' representatives, however, is lacking. This is attributed to the area being isolated by the people from the upper region (where the MGBA representatives come from). But the information flow is facilitated through various forums as observed by a participant from Kamwe group, "these days there exist forums e.g. chief barazas, church meetings where we usually talk about farming and any new information especially market and changes in prices is easily communicated to other farmers." Most information from other sources does not reach the people residing from lower areas. Second, few meetings for community sensitization are organized at Chiefs' barazas. Third, some people do not open up to share information particularly on the sale of goats. Finally, restrictions through requirements for active memberships limit some join groups.

Meanwhile reasons cited for high information flow are: willingness of farmers to learn new information and check information with fellow farmers, expanding benefits of new knowledge among other farmers, learning tours to information centres such as research institutions (e.g., KARI), and organized groups passing on information to other members in a timely manner. To underscore the importance of information sharing, one participant commented that "nowadays people are aware that keeping knowledge by oneself is not beneficial hence the need to share information. For example, farmers in the area actively growing French beans share information and have set up stations to conduct their activities

productively." Timely delivery of market information is enhanced by a good communication network through use of mobile phones between MGBA and FEWs. However, some participants observed that whereas access to information on routine management practices was encouraging access to information on marketing of goats was limited to just a few people. One participant from Gaitethia group connected this to "existence of individualism among some villagers." A participant in another group remarked that "information on dairy goat management is readily available but selling of dairy goats is still secretive." Another participant quipped that "very few people pass on information to others because there still exist selfish tendencies among some local people." This suggests that low social capital can be an obstacle to the sharing of valuable information.

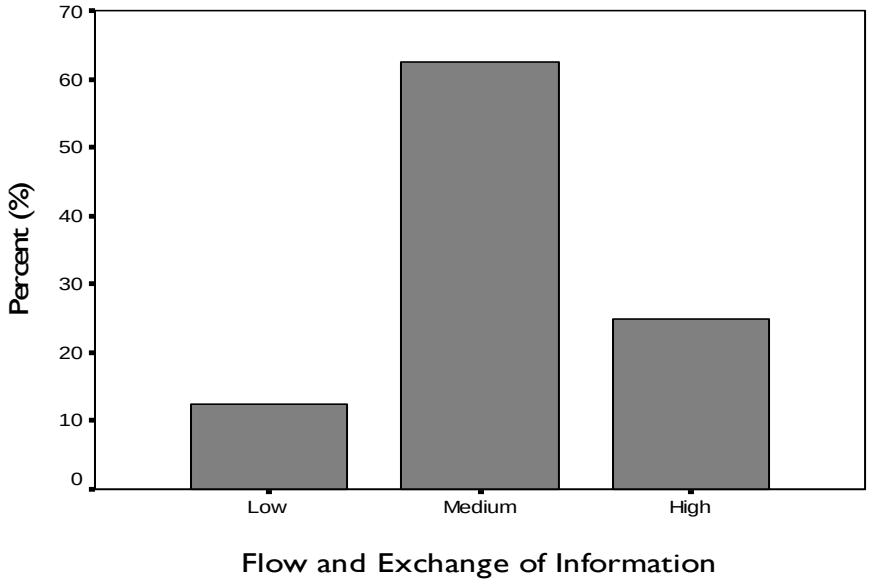

Figure 21: Flow and Exchange of Information among Farmers

Low access to information was attributed to exploitation by middlemen, lack of transparency by some MGBA officials organizing sale of goats, lack of market for the upgrades, lack of relevant information on goat markets, long distance to possible markets making them vulnerable to middlemen, failure by MGBA officials to utilize community channels of communication such as barazas and churches, and levels of individualism preventing information sharing.

2.2 Sustainability of the Farmer to Farmer Communication Model

2.2.1 Two-way communication

In responding to the question of whether linkages in the model show two-way communication 13 of the 16 focus discussions indicated that linkages in information flow under the farmer-to-farmer model promote two-way communication. Most of the discussions observed that there was two-way communication between FEWs/Buck keepers and farmers, farmers and researchers, extension staff, veterinary staff and local administrators. In this process questions are asked and answered in different forums such as field days and seminars to the satisfaction of the farmers. The communication is only two-way where those working with farmers are active and focused.

However, communication between farmers and local administrators and extension staff tends to be top down with delayed feedback. This is attributed to public extension staff lacking resources and heavily dependent on others as observed by one participant in Kamwe group that "extension staff still suffers from dependency hangover from FARM and with the pulling out of FARM Africa, there is no support especially on transport as used to be." On the other hand, communication between MGBA and farmers has enabled farmers to tap on vertical linkages for different information and resources. Fore example, through networking with other organizations the farmers attend training sessions organized by Kenya Institute of Organic Farming (KIOF) and Bayer Agro Company advancing organic farming and farm inputs respectively. Nevertheless, one participant observed that although there are systems laid down by MGBA on information flow from group level to MGBA, lack of resources for farmers and lack of commitment by the MGBA officials hinder the information flow.

Two focus discussions observed that two-way communication was occasionally experienced while another group did not see linkages under the model showing two-way communication. Some participants observed that whereas there is two-way communication among farmers themselves, there was no two-way communication between the farmers and those involved in marketing issues. This was attributed to presence of brokers who act as middlemen. Two-way communication was also not evident in new groups suggesting the role of social capital in communication. New groups are likely to have less developed social capital necessary for free exchange and sharing of information. The discussions also revealed that if farmers do not ask questions there is likely to be less possibility for a two-way communication. This was observed to be the case among nongroup members who believed, without checking for relevant information that dairy goats belonged to group members only. Lack of initiative to seek information from FEWs or participating groups therefore hinders two-way communication in the farmer-to-farmer extension model.

2.2.2 Model reliability in information exchange

Eleven of the 16 focus group discussions (70%) affirmed that the FF model reliably promotes information exchange among farmers. Three of them felt that it was moderately reliable while two opined that it was not reliable. This suggests that in general, the model reliably facilitates information exchange by offering opportunities for two-way communication among farming communities as well as support agencies. Table 35 presents conditions cited through focus discussions as necessary for the farmer to farmer model reliability.

Table 35: Conditions necessary for model reliability

- Trust in buck keepers and other extension staff. This calls for honest extension agents.
- People having a common interest, such as to improve livestock productivity.
- Farmers' trust in those having received training though such farmers tend to be ill-equipped on clear procedures of registration with the association.
- Easy access to and interaction with farmer extension workers. This is considered a cost effective means of training other farmers.
- FEWs voluntarily passing on information through local channels such as posters, churches, and local barazas.
- The enterprise should yield benefits and be profitable
- There should be an accessible market.
- Should be able to serve the poor farmers.
- Hold regular local meetings such as chiefs' barazas which are held in all rural areas.
- Various service providers to organize farmer result/method demonstrations.

Two focus group discussions felt that the model could not be reliable in exchange information flow. Five reasons were cited for this failure:

- Inactive FEWs not reaching as many farmers as possible.
- Death of the bucks without replacement.
- Non-members not being aware of the existence and functions of MGBA.
- Ineffective information between Ministry of Agriculture extension staff and farmers.
- Lack of trust in some of the MGBA officials who occasionally exploit the farmers. Such officials are considered dishonest and not transparent in their dealings with the farmers.

A reliable model, if well understood for its strengths and weaknesses, is likely to be replicated in other areas.

2.2.3 Model replicability in carrying out designated functions

All the 16 focus group discussions responded in affirmative to the question "Is this model capable of replication elsewhere and do the same function it is doing here? However, model replicability was considered possible subject to some modifications, which include proper selection of FEWs who have renowned community mobilizing and organizing skills and who can be trusted by the other farmers. In response to the question of model replicability, one participant from Kageni group remarked that "'Yes but those identified to train other farmers are not as effective because it is difficult to bring people together unlike the chief. Also sometimes some FEWs are not trustworthy."

Moreover, participants added that such farmer extension workers should be those willing to work with the rest of the farmers voluntarily. To encourage such caliber of farmers to participate in the programme as change agents, focus group participants suggested that there should be incentives for building motivation to enhance the morale of the FEWs. Another modification is that commissions or fees charged on services should be used to remunerate

the FEWs, but with member education on the need and importance of this measure. Lastly, increased government extension support is required to supplement the program services.

The focus discussions indicated that the FF model is replicable for several reasons. These include equity considerations in which participating members felt that other needy members of the community needed to benefit from the programme. They also indicated that participating members shared in the benefits of wider participation in the program by selling goats and bucks to the new members thereby raising their incomes. Such an arrangement provides a win-win kind of scenario hence an initiative to be expanded to other farmers. Equally important, by replicating the model opportunities are created where farmers learn and share new information from other farmers. This is possible whether or not the model builds self-reliance or requires some degree of dependence for support.

2.2.4 Independence of the farmer-to-farmer model

Thirteen of the 16 focus discussions (87%) indicated that the model requires external funding for it to function effectively. This was considered necessary in order to offset costs incurred by FEWS. Such costs include transport costs, subsistence costs and compensation costs for FEWs' time in training other farmers. The participants felt that even if FEWs may be working as volunteers some minimal costs to facilitate their work were inevitable, hence the need for external funding. One participant from Kamwe group remarked that volunteer activity only succeeds in the initial stages but wears out with time hence it cannot be sustained over a long period. Another participant from Kaugi group observed that "It is not a must that resources come from outside as long as members are clearly made aware of reasons as to why deductions are made from their income accruing from goat sale." This suggests that to keep the volunteers in providing extension services some funds should be allocated to the frontline extension staff.

A general observation in the discussions is that though external funding may be desirable particularly in the initial stages, it is self-determination by the members themselves that can make the program sustainable. This can be achieved through groups being responsible for meeting the costs of the FEW. Funds for this can be obtained through subscriptions to group membership, specific member contributions for training purposes, borrowing from financial lending institutions, and charging commissions on income from sale of goats. To make these effective, participants recommended that transparency and accountability in the whole process were extremely vital.

The few focus discussions that indicated that the model did not require external funding based their opinion on the issue of 'ownership.' It was observed that the project belonged to the local community hence the community was to run it once the donor exited. They also emphasized the element of self-reliance which helps avoid dependence on a source that may not be permanent. Local administrators such as chiefs were considered to be possible relevant sources to assist in information flow. But they acknowledged that some funding support was necessary in the initial stages of the project to cover costs by the FEW in serving farmers, and before farmers take over this responsibility.

2.2.5 Model dependence on MGBA institutional structure

All the 16 focus group discussions responded in affirmative to the question, "Is this model dependent on MGBA institutional structure in its operation? The relevance of MGBA is acknowledged by all the farmers, both the participating and nonparticipating, as necessary for smooth running of group activities. MGBA is perceived to be important in several functions that include sourcing for far and better markets and marketing of farmers' goats, negotiating for good prices on behalf of the farmers, coordinating farmers' activities such as buck movement, protecting farmers against exploitation by middlemen, responding to issues related to dairy goat management, facilitating information exchange through selected FEWs, networking farmers to all possible sources of information, and providing a pillar for all the farmers with common interest of dairy goat management. Farmers likened MGBA to an engine and its removal would mean total collapse of goat development process in the area. One farmer from Kamwe group recommended that MGBA should coordinate their activities to attain their full potential. This suggests that pulling out of MGBA could lead to disruption of the crossbreeding programme, which is critical to farmers' livelihoods.

Although MGBA's role is appreciated and encouraged, the participants suggested measures to improve its efficacy. Ensuring transparency and honesty by MGBA officials through open communication, showing farmers audited reports of funds raised through registration, replacement of officials not ready to change for the common good of all the farmers, and improving leadership within MGBA. Farmer resources lost through malpractices could be instrumental in building farmers' dependence and self-reliance.

2.2.6 Potential for Local Resource Generation

Asked whether resources for running the model can be generated locally all the 16 focus group discussions confirmed that it was a possibility. One participant from Gakenia group said that "people are self-reliant and group members in the past have been able to fundraise and get some money to send somebody to MGBA representative." However, the focus discussions pointed out that dependence on external funding may not be feasible hence alternative ways of meeting the transactional costs by the FEWs should be sought. They cited such ways as: raising funds through member and group registration, groups raising funds specifically for paying FEWs, fundraising, charging a small fee on visits organized through MGBA to visit groups for training purposes, and commissions levied on all goats sold. One member from Nguchia group remarked that "the over 100 groups under MGBA are enough to maintain/sustain MGBA effectively."

It was also observed that for farmers to be involved in meeting costs of services by FEWs they should be informed in advance during the implementation. In addition accountability by the leaders should be maintained. In this regard a member of Murithi group quipped that "'resources can be locally generated by providing proper information or resources on intended reasons for deductions unlike the dips which collapsed." Previous experience had shown the import of providing clear information on which crucial decisions are based. To stress the importance of transparency in this transaction a participant from Kaugi group advised that "If accountability among farmers' leaders is ensured, people can contribute to support our activities as long as the procedure is made clear to us." The results suggest that accountability and transparency on the part of the FEWs is critical their effective performance.

2.3 Factors Influencing the Performance of the FEWs

The participants examined the factors influencing performance of FEWs by first comparing and ranking the five agents, namely FEWS, buck keeper, breeder, CAHW and MGBA in terms of their performance in carrying out their responsibilities. The agents were ranked on a five-point scale with 1 representing the highest performance relative to all the others and 5 the lowest. The results are summarized in Table 36. The buck keepers and FEWs were ranked by almost half of the focus groups to be high performing agents relative to the others. This suggests that these two categories of agents are seen as carrying out their duties to the relative satisfaction of the farmers in the project areas. This translates to suggest that buck keepers and FEWs have received useful technical training within the farmer-to-farmer model that enables them to serve farmers in their areas of jurisdiction.

Table 36: Ranking of the Performance of FEWs by Sixteen Focus Groups

Extension Agent	Focus Group Ranking*of Agent Performance				
	1	2	3	4	5
FEW	6	1	3	4	N/A
Buck keeper	7	5	1	1	N/A
Breeder	2	5	4	2	2
CAHW	4	2	1	2	1
MGBA	1	2	5	2	5

Note: *1=Highest performer……5=Lowest performer

N/A- Not applicable and represents cases where bucks had died, agent not known to participants, agent stopped working with the farming community or relocated elsewhere or dishonest agent.

However, whereas almost half of the focus groups ranked FEWs as not performing as well as they should, only two ranked buck keepers as underperforming. On the other hand, breeders and community animal health assistants were ranked favorably as moderately performing. The MGBA representatives or officials were ranked by majority of the focus groups to be the least performing agents. This suggests that whereas MGBA institutional structure may have the potential to facilitate both horizontal and vertical communication for information and resources necessary for enhancing production and incomes, the minimalist performance by the relevant officials is worth investigating.

Table 37 presents the results of the focus groups on the forces behind the differences between the high and low performing FEWs. For high performing agents, the agents are willing to be trained and to train others voluntarily; they are committed to work and readily available when needed. They also respond promptly to demanded services, for example ear tagging and hoof trimming. This seems to be achieved where there is proper management of the buck station and farmers visit it to learn more about dairy goats. A key element of high performance by the extension agents is also making follow-ups after training to ensure that good results are obtained.

Table 37: Conditions affecting performance various community extension agents

Category	Active/high performers	Low performers	Why services stopped

FEW	• The agents are willing to be trained and to train others voluntarily with or without payment • Visit and train farmers • Passes on information • Making follow-ups after training • Prompt in responding to demanded services- e.g., ear tagging, hoof trimming.	• Become inactive • Wide farmer coverage • Community does not know his/her role • Engaged in other activities • No direct payments for his services unlike the employed FEWs • Prohibitive travel costs	• Not trusted by the community • Corruption • Sold breeding station without providing notice to the group • Lack of commitment • Bogged down with other commitments • Not passing on information
Breeder	• Knowledgeable in other enterprises • Regular visits by visitors interested in learning about the breeding programme. • Interacts with many farmers bringing local goats for upgrading. • Trains farmers on various DGM practices • Proper management of the breeding station	• Lack of performing buck • Few seek services from neighbouring buck stations • Not visited by non-members • Long distance • Participants not aware about his role/activities • Illiteracy and old age • Receive few visitors	• Few people visit buck station • Doesn't follow up on records
CAHW	• Readily available and Committed • Trains farmers • Prompt in responding to demanded services- e.g., ear tagging, hoof trimming • Regular social interaction with farmers bringing goats for upgrading • Treats sick goats	• Competition from the private and public employed animal health assistants (AHAs) • Long distance • Not known by farmers • Farmers taking on more responsibilities, especially in the treatment of the animals	• Community extension agents withdrawing from group • No trained CAHW
Buck keeper	• Availability of healthy prolific buck • Visited by many farmers and visitors on study tours • Heavily dependent upon for the success of the programme • Buck service fee helps cover some costs • Regular social interaction with farmers bringing goats for upgrading • Provide satisfactory solutions to questions raised by farmers. • Proper management of the buck station • Farmers visit buck station	• Lack of commitment • Lack of performing buck due to old age • Farmers don't ask questions • Farmers are not aware that the FEW provides training • Mushrooming of illegal buck stations • Occasionally dishonest • Frequent relocations of buck stations	• Buck died ending the programme. • Some reverted to using local buck

	to learn more about DGM. • Trains farmers		
MGBA	• Representative is a group member • Active ear tagging and selling goats • Commitment to work	• Dishonesty • Corruption • Act as middlemen • Farmers unaware of their role • Not well equipped for their work • Not fair to all (partial) • Leadership selected rather than elected • Not know by the people in the area • Usually expect payment for services offered. • Lack of resources to carry out activities	• Stopped • Relocated elsewhere

The observations suggest that Buck keepers are highly successful because they are heavily dependent upon for the success of the crossbreeding programme. Regular social interaction with farmers bringing goats for upgrading motivates the agents to be more effective in providing appropriate and timely training on various diary goat management practices. This seems, in turn, to depend upon availability of a healthy and prolific buck. The programme gets momentum to continue successfully from the formation of new groups and individual farmers interested in new technological package. They push up demand for services and training. An important element sustaining the process also seems to relate to the ability of the community extension agents to provide satisfactory answers/solutions to questions raised by farmers.

Low performance by the farmer extension agents can be attributed to several factors raised by the focus groups. As indicated in the table such include: few people visiting the buck station, farmer extension workers withdrawing from their groups**,** lack of healthy breeding buck, long distance, lack of enough volunteer FEWs, lack of follow-ups after training, farming not feeling free to ask questions, corrupt and dishonest MGBA officials, mushrooming of illegal buck stations, suggesting lack of monitoring, regulation and protection of the program. Other issues contributing to poor performance are poorly selected FEWs, middlemen, lack of commitment by FEWs due to other commitments and failure to meet minimum costs incurred by FEWs. Yet, FEWs are very important in providing information to fellow livestock keepers, linking the farmers with extension and research for information and new technologies, carrying out demonstrations on their farms for their colleagues, and providing information and assistance related to marketing of the livestock.

2.4 Changes on the Farmer-to-Farmer Extension Model

2.4.1 Model modifications

When the focus participants were asked whether there were any changes to the model e.g. the local administrators taking the role of the FEW or being active than the FEW himself or herself, Figure 22 shows that nine of the focus groups (56%) mentioned that there were no changes. However, seven indicated that there were changes brought about mainly by the active involvement of local administrators. The local administration, particulars chiefs, and local government through area councillors have taken promotion of dairy goat management as one of the rural development agendas. They are therefore actively involved in sensitizing people through local meetings and in working in collaboration with area FEWs to disseminate messages on rearing of dairy goats as an alternative strategy to guarantee food security, increase incomes and improve standard of living.

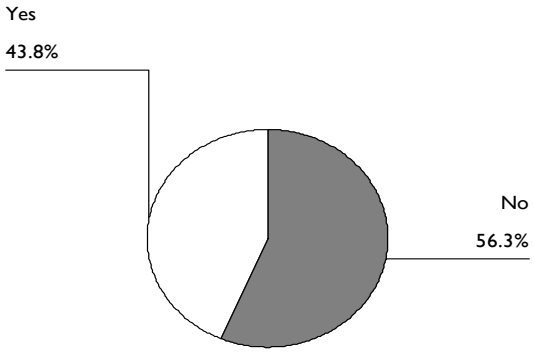

Figure 22: Proportion of focus groups indicating whether there are changes to the model

The relatively high proportion of focus groups indicating that there are changes to the model compared to the original one suggests that some changes may be desirable for the sustainability of the model. As the analysis informs, the active involvement by the local leaders adopt the activities of the model as part of the communities' development agenda is a strategy of developing ownership of the development activities. It is also a strategy of using internal resources, particularly the human resource, for community sensitization and encouraging people to take on the identified activities. Such a strategy can bear on farmers' willingness and ability to pay for services promoted by FEWs.

2.4.2 Farmers' payments for compensating FEWs

To determine whether farmers compensated FEWs for their work, they were asked 'Do farmers make the payments to the FEWs for their time/services/travel been determined? Table 38 shows that the FEWs among the farmer promoters are the least compensated for their services and time. Rather it is the buck keepers that everyone knows are paid through fees charged on buck service. The buck keepers also enjoy the use of manure for soil fertility improvement from the buck station. The FEWs are occasionally paid for the ear tags and on some of the training sessions conducted, otherwise payment is mainly in terms of food (lunch). Participants in the focus groups were almost equivocal on whether breeders and MGBA officials are paid or not. The breeders are paid from sale of kids, milk and

manure while MGBA officials are remunerated through travel and subsistence allowance and commission on sales of goats.

Table 38: Distribution of focus groups according to whether FEWs are given payments

Category	Frequency of focus groups indicating whether payment is made			Form of Payment
	Yes	No	Don't know	
FEW	3	12	1	Food, sometimes ear tag sales and training fees
Breeder	9	4	3	Sale of kids, milk and manure
CAHW	10	6	0	Sale of drugs and clinical services
Buck keeper	16	0	0	Buck service fee and manure
MGBA	9	3	4	Travel and subsistence allowance, commission from sale of upgrades and sale of ear tags

These results can partly explain the differences observed among the different types of farmer extension workers. In fact comparing the results about the performance of the five categories of farmer extension workers provides information about the likely effect of incentives given to the workers. The buck keepers were rated by the focus groups as being the best performing agents compared to the other farmer extension agents. The relatively assured direct payment from farmers for the fees charged on the buck services and the manure collected daily could be important motivating factors contributing to the high performance by the buck keepers. On the other hand, FEWs who are mainly the extension workers for the other farmers are not remunerated as well hence majority of them are not high performers. The MGBA focus is perceived to be on ways of generating individual incomes and, perhaps, less on openly supporting the farmers are the least performing according to the focus discussion participants. These findings suggest that farmers are more willing to pay for services provided by the buck keepers as opposed to those provided by other farmer extension workers. The capacity to do so can be improved with entry of other extension actors that serve to diversify information and service provision.

2.4.3 Expanding horizon to new actors

Having various players contributing to the needs and welfare of rural farmers in different ways is currently encouraged. The new actors that have come since the inception of the model in the last one year at the time of this study include**:**

- Research institutions under the umbrella of KARI. This has promoted the adoption of soil fertility management technologies such as the use of tithonia in phosphorus addition and promotion of improved fodder.
- Kenya Institute of Organic Farming (KIOF) conduct field days to promote conservation agriculture.
- Civil society organizations, particularly local NGOs catalyze formation of farmer groups to engage in poultry keeping for broilers and layers. Some train farmers on establishment and use of irrigation methods to promote new varieties of banana.

- Home-grown and agrochemical companies are examples of private sector promoting French bean production and passion fruits. The private sector is working through farmer groups to promote good agricultural practices.
- Dairy Societies providing training on livestock management practices such as feeding, disease control through farmer-to-farmer interaction.
- International NGOs such as Ripples International that utilizes Farmer-to-Farmer model to foster farmer learning.

From these results it appears that more actors have come into the area where MGBA has been operating. The pool of actors is contributing to active research on soil fertility management is key to enhancing agricultural productivity and stemming degradation of natural resources in rural areas of Meru. The contribution by other actors is also important in ensuring enterprise diversification that promises food security and increased income generation. As demonstrated by the critical presence of an effective institutional structure, the exchange, sharing and flow of information in such networks should be well understood.

2.4.4 The exchange and flow of information

The focus group discussions identified several sources and channels of information graphically represented in Figure 23. There is a strong link between the sources of information and channels used to reach groups and their members. Group leaders and representatives play an important role of linking up the groups to the various sources of information. The focus discussions suggest sources of information are varied and they require varied channels through which information can be passed on to the farmers. The focus discussions identified several sources of information currently in use. Such include MGBA, farmer groups, government ministries (e.g., education, health, and water), extension staff of ministries of agriculture and livestock, researchers, breeders and local administrators.

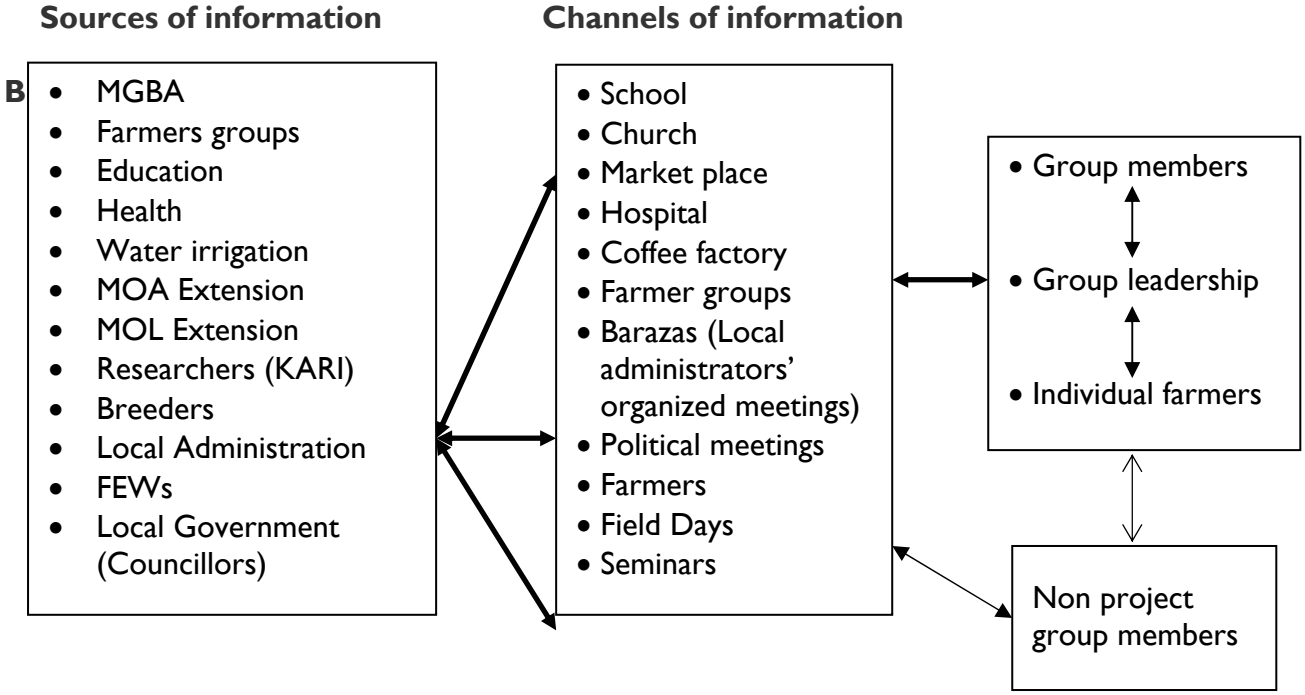

Figure 23: Sources and Channels of Information in the MGBA Project

Note: The arrows indicate how sources and channels of information and the beneficiaries of the information interact. Thick arrows indicate strong and direct relationship for information exchange and thin arrows indicate. Thin arrows indicate less strong relationship.

The focus discussions also identified several channels of communication that include schools, churches, market places, farmer groups, local administrators' and political meetings, and seminars and field days. The information seems to reach more farmers through their groups and facilitated by their leadership. The benefits also spread on to non-project participating members through farmer-to-farmer information sharing.
In summary, several actors are required to address different needs of the smallholders. To make the networking meaningful to the farmers' coordination of the different actors spelling out their respective responsibilities and avoiding duplication of tasks may require attention.

Conclusions and Recommendations

This research work has assessed the farmer-to-farmer extension model with a view of exploring its impact, factors influencing the performance of farmer extension workers and changes or modifications made to the model during implementation. Meru Central has the highest level of access to extension contacts compared to Meru South. This has been facilitated by various channels of information, collaboration between farmers, government, researchers, government extension workers, and NGOs under the NALEP programme with the FEWs as the link. The study results suggest that farmers' access to alternative extension service providers has remarkably increased since Farm Africa initiated an institutional structure to advance and promote dairy goat technology in the two districts of Meru. The increased access is attributed to use of local channels of communication such as chiefs' meetings at virtually no much cost, influence of the NALEP programme that encourages focal area development through partnerships with other players, farmers' own initiative and farmer-to-farmer communication.

The farmer-to-farmer model has enabled farmers volunteering to work as extension workers to complement the efforts of public and private extension providers. The motivating factors influencing their participation in undertaking their expected roles include interest to learn skills and knowledge to boost their agricultural production, expected benefits from dairy goat production (milk, income, manure), upgrading their local goats to maximize on benefits, markets for goats and milk products, social standing in the community, moral support to other farmers and equity considerations in benefits from rearing goats. The motivations result in similar benefits accruing to the FEWS and farmers in general. They include increased income, manure for soil fertility improvement, and knowledge on dairy goat management and applying some to other areas, improved nutrition through high quality milk, improved farming skills, access to markets, and providing employment.

The farmer to farmer model has proven successful due to different kinds of support from fellow FEWs and local administration in the community. Local leaders' involvement in the project by enabling their public meetings is used as channels of communication to create and sustain common knowledge has been critical. Being exemplary in dairy goat technology has helped in technology dissemination. Fellow FEWs and the institutional structure of MGBA contribute significantly to the success of the project. Church leaders and group members have equally supported the spread of dairy technology. The dairy project has received more

support from different extension service providers including the public sector, private sector and civil society organizations (NGOs). Support has been provided through training of FEWs, facilitating farmer learning forums (such as farm shows, farm demonstrations, field days), providing market information, supporting farmer groups with resources for building their capacity for innovations, working in collaboration with MGBA and MAHWGs. These kinds of support are crucial because FEWs tend to drop out of their voluntary extension work due to group conflicts and leadership wrangles, not being adequately prepared to deal with market issues, heavy work load that increases the opportunity cost of their time, nonpayment for services delivered, insufficient training leading to less competence, and lack of support from groups.

As a result of the project there is high demand for information that relates to other areas that include different crop varieties, tree nursery establishment, conflict resolution, fodder establishment for goats and other livestock, dairy cattle management, business entrepreneurial skills, marketing, high value crops, and formation of groups form community development. The model therefore requires relevant information to address the demand for services by farmers, the information demonstrating benefits to the potential user, availability of resources to utilize the information, and a supportive cultural and policy environment.

This project is an example of capacity building in which the participants benefit in several ways. Such arrangement enables risk sharing in production and/or marketing livestock and their products and enhances the access of poor farmers to technology and other inputs and services at lower cost. This illustrates how supported dairy goat production can improve the income of smallholders, with significant spill-over effects in the form of farm productivity and the ability to engage in non-farm activities with an overall goal of improving standards of living.

Recommendations

On the basis of the analysis made the study proposes for future action (i) program strategies that enhance financial resources for MGBA to support FEWs and utilize adequately vertical links, (2) designing a structure that ensures continuous, regular, and relevant training that uplifts the competence and confidence of FEWs, (3) establishing constructive rules and regulations to check on the conduct of the farmer extension workers, (4) involving the farmer extension workers in a project/programme right from its inception, (5) the coordinating structure needs to consider a micro-credit system particularly for the FEWs and farmers, (6) monitoring performance of FEWs with a view of enhancing it, (7) planning activities that improve and maintain commitment by the institutional supportive officials, and (8) proactively addressing market needs of farmers and FEWs. Attention paid to these suggestions may improve the role of FEWs upon whom the FF model of extension increasingly depend.