

**THE ROLE OF FARMERS' GROUPS NETWORKS IN THE ADOPTION AND  
DIFFUSION OF SELECTED AGRICULTURAL TECHNOLOGIES IN UPPER  
MGETA, MOROGORO RURAL DISTRICT**

**BY**

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The study established that farmers find the local network to be important as a technology dissemination tool, for mutual support as well as for material support.

The local network influences group members to adopt different innovations at a higher level than non-group members. This has been achieved through effective communication of extension messages between farmers and change agents and among farmers themselves. Farmers who are group members are highly aware of received messages concerning the innovations.

It is recommended that not only group representatives should participate in network meetings but also the other group members should be involved so that they can participate fully in the sharing and exchanging of information.

**DECLARATION**

I, ASINA ALI SHENDULI, do hereby declare to the Senate of Sokoine University of Agriculture that the work presented here is my own creation, and has not been submitted for a degree award in any other University.

Signature.....*Ali*.....

Date.....26.5.1998.....

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**DEDICATION**

This dissertation is dedicated to my parents, Athman Ali Shenduli and Amina Bakari Shenduli who laid the foundation of my education.

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**LIST OF ABBREVIATIONS**

ALIN	Arid Lands Information Network.
CAME	Andean Council of Ecological Management.
FAM-Africa	Farmers' Agriculture and Modernization in Africa.
NGDO	Non Governmental Development Organization.
UMADEP	Uluguru Mountains Agricultural Development Project.
VEO	Village Extension Officer.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 BACKGROUND**

Extension communication involves the transfer of technical information from its source to the farmer. Effective communication takes place when a message given out is received or understood on the other end. Extension communication to farmers is an important service in agricultural production. Farmers need information for their day to day activities. Information helps them to become aware of new ideas and practices and to decide whether to adopt or reject them (Maunder, 1973).

Effective extension communication requires farmers to be active in developing and adapting information and in asking for the kinds of information which they find useful. Benor and Baxter (1984) revealed that without an effective system of communication within the extension service and between it and farmers, agricultural extension can achieve little impact. In addition, Rogers and Kincaid (1981) as cited by Rogers (1983) pointed out that, the ability to communicate effectively is very crucial to extension workers' performance, because it is through communication that the extension workers give information to the farmers and judge how effective it is, by seeing how farmers respond to the messages being communicated. This has been the traditional assumption of extension communication.

It is generally accepted that extension communication, if properly designed and executed, may bring about advancement in agricultural production. Agriculture is the backbone of Tanzania's economy. About 90% of the population in Tanzania depend on agriculture for their livelihood, and agriculture contributes to about 40% of the country's economy and to about 75% of the total national exports (Ministry of Agriculture and Livestock Development, 1987)

The agricultural sector in Tanzania is dominated by subsistence farming. Eighty percent of the total land holdings are occupied by smallholder farmers. Thus the agricultural extension service has been entrusted with an important task of helping farmers in the adoption and diffusion of agricultural technologies. It is therefore necessary to ask whether: (i) the extension service has really been able to effect improvement of adoption and diffusion of technologies in the farming population, and (ii) the extension service by itself and with its present approach is capable of answering the diverse development problems facing the farming community and thus effect their improvement. Doubtless, many will agree that there has been little achievement if any which can be attributed to the official extension service and are skeptical whether much can be done now under the same system. It is not a secret that the performance of extension communication in Tanzania has been far below expectations. It is unlikely that one can come out with a concrete evidence to suggest the success resulting from extension communication (Marche and Ruvuga, 1994).

Engel (1990a) has labelled one of the most overriding biases that have characterized extension communication thinking and practice for about the last 20 years, the "source syndrome". This is the systematic overrating of technical, scientific and research-based knowledge, compared to other types of knowledge that are relevant to agricultural production. As many others have also pointed out, this bias causes agricultural development to deny itself the benefit of other sources of relevant knowledge, particularly the knowledge that farmers possess.

To overcome the source syndrome, the function of extension can no longer be conceptualized as aiming at the transfer of knowledge, technology, practices or information. It is to be seen as facilitating the identification, retrieval and integration of such elements so that new, locally embedded and sustainable practices may emerge. This implies mobilizing a variety of social actors as sources of relevant knowledge, experiences and information, and helping them focus upon specific problems in particular situations. In other words, the extension function would then be to help facilitate an effective fusion of horizons (Long, 1989 as cited in Alders *et al.*, 1993) and practices among stakeholder in rural development.

Due to the fact that conventional assumptions of extension communication have resulted in low adoption and diffusion of extension messages, farmers' networking, in recent years has been used as a tool for communication. In Tanzania, following new policies

about co-operatives and the disengagement of the state in production-oriented activities, the idea of networking for small scale farmers was seen as an alternative in the process of self development in the rural environment. Networking is a powerful and cost-effective way of sharing information and achieving various other goals that individuals cannot achieve alone. Alders *et al.* (1993) defined a network as any group of individuals and/or organizations who, on a voluntary basis, exchange information or goods or implement joint activities and who organize themselves for that purpose in such a way that individual autonomy remains intact. They revealed that, in addition to generating and exchanging knowledge based on farmers' experiences, networking can serve as a link not only between extension workers and farmers but also between farmers themselves.

Networking has been recognized by research and development institutions as well as funding agencies as an important way of improving the effectiveness of extension communication and agricultural research (Plucknett *et al.*, 1990; Box, 1989; Compton and Joseffson, 1993 as cited in Alders *et al.*, 1993). For example McCorkle *et al.* (1988 as cited in Alders *et al.*, 1993), describe some 20 case studies of successful farmers' innovations through networking in Niger. These include the introduction of short-cycle millet varieties, new land preparation methods, the construction of mini-catchments, seed pocket manuring, dry-season gardening, forage utilization, biological pest control, and a range of ethnoveterinary medicines. He also found that farmers can

plan, implement and evaluate on-farm research trials, and demonstrate a sophisticated understanding of the complex interactions among the many variables they manage.

Emphasis on networking may help shift attention in extension communication to facilitation, social learning and building "platforms" for sustainable agriculture. It may help VEOs to better understand their role as one among many relevant stakeholder, and sources of knowledge, practices and information. It may also help redefine the role of (former) government agencies in light of privatization, reduced government funding and shifting policy objectives. If extension students and VEOs can be trained as networkers, they may have less difficulty shedding the "source syndrome", and may be helped to look at the contribution of scientific knowledge and technology in a more realistic manner.

One of the projects that uses the networking approach is the Uluguru Mountains Agricultural Development Project (UMADEP). This project started in 1993 and operates in Mgeta and Mkuyuni Divisions. It is based at Sokoine University of Agriculture (SUA) with main collaborators as the District Agricultural and Livestock Development Office and the District Co-operative Office in Morogoro Rural District.

The main purpose of UMADEP is to increase household incomes of the small scale farmers in a sustainable way. However, the project does not advocate ready-made

solutions or technical innovations to farmers, rather it relies on constant dialogue amongst farmers themselves and with various researchers and extension agents, through which it can provoke endogenous technologies. It assumes that adoption and diffusion of extension messages is faster if communication exists amongst farmers. So in this area, a communication process was initiated to respect the global interest of all groups. By confronting various interests and experiences, each farmer is influenced in the same way that she/he can influence the others for the community's interest (Mattee and Lassalle, 1995)

In Mgeta Division, UMADEP facilitates the formation of farmers' groups and networking. Groups are formed based on locality and type of enterprise (e.g fruits and vegetable growers, dairy goat keepers etc). These groups are used as first avenues to disseminate technological packages.

Burkey (1992) has defined group members as a composition of men and/or women who come together to pursue a common interest related to individual or group improvement in the spheres of economic, political and/or social development. In this context, Garforth (1993) defined a group leader as key individual often the person who took the first step in the formation of a group, a personality which conveys enthusiasm and confidence, a willingness to devote time and energy to the group and the wider community, a vision which sees a possible solution to a long acknowledged problem or recognises an opportunity which no one has yet exploited and an ability to share that vision with others.

Mgeta network has 15 farmers' groups and, in each group, members usually visit each other to see exactly what they are doing if there is any problem they give advise for improvement. For new groups to be members of the network, they have to write a request letter to the local network. In this letter they indicate the name of the group, the number of group members, their activities and their goals. Membership is voluntary and there is no entry fee. Group representatives meet once every month in every ward on a rotational basis in the local network, and if a leader is not in a position to participate then any group member can represent the group in the network meeting. Since group leaders are members of a network, automatically other group members become members of a network so every group member is also a member of a network. The technical staff (the UMADEP staff, government extension workers, cooperative officers, etc ) attend these meetings. The UMADEP technical staff use the local network as entry point where they can disseminate extension messages to farmers, concerning any new innovation. The group representatives can discuss and decide whether to adopt or reject them. When there is a need, group representatives conduct meetings with group members to decide on the issue and give feedback to the local network. On the other hand when any group needs any technical assistance which can not be provided in the local network, the group representative writes a letter on the need so that UMADEP can assist in looking for the solution.

However, these meetings belong to farmers themselves. Each representative reports briefly on the activity of the group presented. Some leaders seek advice from the meeting. A common concern that had not yet been identified can provoke an endogenous innovation, as was the case with the savings and credit groups where the network decided to promote the creation of such groups in the four Wards of the Division. Some months later, the newly elected leaders of the savings and credit groups became members of the network. UMADEP facilitates the development of these groups by providing technical advice and also financial assistance to run the activities.

The network also welcomes exogenous innovations introduced through projects, institutions or companies. Sugar cane production, dairy goat keeping, road and bridge maintenance are examples of such projects that were discussed by the network before being introduced in the area. Training programmes have also been conducted through the network. Such training has included proper management of fruit tree nurseries, and proper soil and water conservation practices.

Finally the network elects different members to represent the local network in the national Farmers' Groups Network in Tanzania (MVIWATA), in various workshops and seminars as well as in the UMADEP Technical Committee, where the representatives participate in decision making in the project circle.

The local network acts as a link on dissemination of information and materials to the group members. This information can be a message package to the rest of farmers. Furthermore, UMADEP facilitates meetings of group leaders once a month and occasional farmer exchange visits. Extension workers and researchers are actively involved in group meetings and exchange programmes. This yields an important dialogue and creates a favourable research-extension-farmer linkage.

## **1.2 JUSTIFICATION FOR THE STUDY**

Due to the fact that the conventional approach of extension communication between extension workers and farmers has not been very effective in stimulating the adoption and diffusion of extension messages, farmers networking has, in recent years been used as a tool for extension communication. This is based on the assumption that not only farmers communicate with extension workers but also amongst themselves. Despite the wide recognition that networking can be effective in adoption and diffusion of extension messages, no research has been done to test this assumption under Tanzanian conditions. This study therefore was an attempt to assess the effectiveness of networking in facilitating the adoption and diffusion of selected technologies in Mgeta Division. The selected technologies include tomato production during the rainy season, private farmer-managed fruit tree nurseries, mountain agriculture with emphasis on soil conservation measures and dairy goat keeping.

By assessing the effectiveness of networking in facilitating the adoption and diffusion of selected technologies, it will be possible for agricultural extension agencies to adopt this strategy when implementing extension programmes. Also the information provided by this study will be useful to farmers and farmers' networks and policy makers in understanding the role of farmers' networks in the adoption and diffusion of technologies.

### **1.3 OBJECTIVES OF THE STUDY**

The general objective of this study was to examine the role of farmers' networks in the adoption and diffusion of selected technologies in the Upper Mgeta area. The specific objectives were:

- i) To determine farmers' perceptions of the importance of networks.
- ii) To determine the difference in the extent of adoption of selected technologies between members, and non-members of the local network.
- iii) To determine farmers' awareness of messages received from group members, non-group members and group representative in the local network.
- iv) To examine farmers' sources of information with regard to the selected technologies.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 INTRODUCTION

The conventional extension approach has been based on the sender or source, message, channel and receiver model (S-M-C-R). In this approach the extension worker plays a key role. However in many places this method has achieved below expectations. For that matter networking is thought to improve extension communication process. In this section literature on conventional extension communication and networking are critically reviewed.

#### 2.2 EXTENSION COMMUNICATION

According to Maunder, (1973), it is useful to conceptualize communication processes in terms of the S-M-C-R Model. The letters, in order, stand for Sender or source, Message, Channel and Receiver. For purposes of explication one can use the extension worker as a prime example of sender, the source of some communications. The extension worker as a teacher must know his or her audience. An extension worker must, of course, rely on others for information to initiate communication with the audience. One could take such a chain of origin for information as not necessary, but for practical purposes it is useful to view extension personnel not only as one of many initiators of communication with farmers but also, in a tactical sense, as key senders in the development process (Maunder, 1973).

The message prepared by an extension worker must be clear as to its purpose. Objectives must be specified, the content of the message must be relevant to the audience and directly linked to the intent of communication. Complex ideas are not easily encoded in such a way that intended audience can, in turn, decode and derive the information contained in a message. The training of extension workers is a critical factor here. Preparation of a message which can be understood by an audience requires a considerable depth of understanding of the content of the message. Such depth of understanding ideally includes critical experience with the implementation of ideas involved in the message, and also assumes considerable knowledge of how particular message elements fit into the aggregate agricultural production process of farmer clients (Swanson and Claar, 1984).

Channels of communication are the various methods available to any communicator in reaching an audience with a message. Written communication has obvious limitations in the Third World settings where literacy levels are low, but cannot be rejected out-of-hand in view of the considerable evidence that print messages are read to non-literate in areas of low literacy (Deutschman, 1963). Direct, face to face interaction via the spoken word is preferable in that it allows for questions to be raised and, in general, two way communication to be easily and successfully accomplished. Face-to-face interaction is expensive, however, in that extension workers are commonly expected to serve rather large farmer audiences. It is for that reason that mass media methods,

radio, and more recently television, have come into increasingly wider use to reach the audience with the spoken word. Visual means include slides, films and television, plus the many variants of field demonstrations which are probably the most effective method of communication available to extension personnel. In less industrialized countries like Tanzania, many farmers have had little or no experience of films, video, slides and other modern extension aids. Their initial attention will be very great, but it would be incorrect to believe that attention will be maintained at such a high level (Van Den Ban and Hawkins, 1988).

One of the least appreciated contrasts between farmers in industrialized settings and less developed settings is that there is an enormous amount of redundancy in both messages and channel usage in industrial societies. Farmers are exposed to similar information from a variety of senders in both the public and private sectors. Those senders use a range of channels to reach audiences and consciously use message repetition to make an impact on their audiences. In third world settings, it is not uncommon for extension workers to be almost literally the only sources of information about modern production technology. That places an awesome burden on the individuals involved, and emphasizes the need to use combinations of methods, and variations in messages, to reach farm audiences effectively (Fliegel, 1984).

The receiver of main interest here is the farmer, where the intention is to specify the farmer's mental and physical responses, evoked by effective communication. This can be thought of as stages in the process of adoption of improved agricultural technology, which are the preferred outcomes of the communication process. Finally, farmers who adopt a new idea continue to seek information about the merits of their adoption decision, to assess whether the intended improvement performs as expected (Rogers, 1983).

From the communicator's point of view it is clear that confirmation of the farmer's decision is the desired goal, but it should be equally clear that farmers may well not proceed from step to step, they may opt against trials, for example, or reverse a decision if expectations are not confirmed. Farmers also may or may not proceed through the stages of decision-making in the precise manner outlined; for example, any one stage might be left out. Part of the utility of conceptualizing the decision-making process in terms of stages is that the stages imply different kinds of information needs and different messages. This, therefore implies a continuing process of communication if success is to be achieved. Effective communication is not a once-only matter but a goal-oriented and continuing process.

The process of information feedback is also important in effective communication which, ideally at least, makes the communication process two way rather than one way only. If the farmer is viewed as the receiver, then she or he must also be given the opportunity to function as a sender, with the extension worker, in this case, as receiver. In the absence of any reactions from the farmer (feedback), it is virtually impossible to gauge the appropriateness of the message content, or channel selection, for example, in the implementation of an information campaign (Fliegel, 1984).

According to Fliegel (1984) the role of extension is far wider than the mere communication of knowledge. It is further expected to comprehend the socio-economic and technical environment of the producers, and their objectives, resources, existing methods and difficulties. Extension also is expected to represent producer needs to the administrative apparatus as well as to the rest of the knowledge system; and to help convey the product of that system and options derived from them to the producers. The extension worker then becomes an active participant, close to the front line, in a process of change in agriculture and rural space. This suggests that for effective performance of the extension workers, it is imperative that they should be conversant with the communities at both ends, that is, the research and the farming communities.

The extension workers do not, however operate in a vacuum. They can be positively or negatively affected by the prevailing social, political and economic climate. More specifically, factors such as quality of agricultural research, the degree to which the policy supports the use of technological adoption, and the effectiveness of the supporting infrastructure, among others, have a decisive influence on the performance of the extension system. This has been the conventional assumption of extension communication which has achieved far below expectations.

There are several problems with the conventional extension communication model. The method entirely relies on the sender who is at the centre. He communicates with the professionals (the researchers) and the farmer. The subject matter preparation, presentation and feedback from farmers is communicated by the sender. If he is inefficient or professionally substandard the whole system collapses. In contrast, the networking approach places the farmer at the centre, he communicates with the professionals, extension workers and fellow farmers. This allows for a multisource system. Anybody in a network may be a source of extension message at one point or another, and at the same time, the receiver. In this way, farmers are motivated to adopt messages, because they take part in developing these messages.

Since it is necessary in developing economies to use face to face extension communication method, the conventional model fails because the extension worker can

reach only few farmers while visits are very infrequent due to lack of facilities. But with the networking approach, extension messages can be communicated up to remotely located areas through well established channels in the network. Frequent group discussions can be used as extension message communication media.

The conventional extension communication method treats the farmer as ignorant with nothing to contribute, which is not true. Farmers have knowledge so need to participate as sources of messages, through the channel up to the receiving end. In this way, messages will be passed to farmers after they have been adjusted to their local situation. This is contrary to what has been the case so far.

In the conventional system, feedback from farmers has been very inefficient. This is because feedback is dependent on the visits by the sender to the farmers which are not so frequent. This inadequate feedback is detrimental because messages are never modified and so they are taken back to the farmer now and then in an endless loop, without adoption. This suggests that the model must be somehow modified so that the sender or source acts as an initiator of action to brew up an extension message together with farmers which is suited to farmers' circumstances. In this way both farmers and the professionals will act as sources and receivers, which is what networking is trying to portray.

## **2.3 NETWORKING IN EXTENSION**

In recent years farmers' networking has been used as a tool for communication in extension. This is due to the fact that conventional assumptions of extension communication achieved little impact. In this section types and definitions of networking, how networking evolves, the role of networking in extension and importance of networking have been reviewed

### ***2.3.1 Types and definitions of networking***

There are several definitions of networking depending on the perspective taken. Alders *et al.* (1993) have defined networking as any group of individuals and/or organizations who, on voluntary basis, exchange information or goods or implement joint activities and who organize themselves for that purpose in such a way that individual autonomy remains intact. Farrington and Nelson (1994) have defined networking as the motor of the work of groups with a common goal or need; it exists solely to provide organizational structure in addition to providing information and inciting groups to act.

There are several types of networks according to different perspectives. Haverkort *et al.* (1991) classified networks according to the pattern of flow of information. For example in a hierarchy type of network information flow is controlled by the top while in a horizontal network information flows directly between members. They also classified networks according to membership composition and activities involved. In this case

networks can be formed by farmers organizations, researchers and extension workers, with a variety of activities (e.g. information exchange, training, awareness rising etc.). Pluknett *et al.* (1993) give a classification based on operational styles. Other network classifications are based on scope of geographical coverage and subject matter focus (Pluknett *et al.*, 1993).

Analyzing the different forms and types of networks that have evolved or have been chosen by members reveals certain patterns. Alders *et al.* (1993) gave advantages and disadvantages of different network types as shown below. This may help people define the most appropriate networking model for their situation.

## Advantages and Disadvantages of Different Network Types

Type	Advantages	Disadvantages
Local level	Allows fact to face contact, Eco-specific, Informal.	Limited scope and means
National level	Represent large number of people, Allows stronger policy voice, Acquire more resources for large tasks	Require formalization and core funding, Limited interaction between members
Specialized	Well focused	Too narrow a focus
General focus on LEISA	Holistic	Too dispersed
Horizontal membership	Deeper contact	
Vertical membership	Allows contact between levels	
Centralized organization	Executive power Easy for donors to deal with	Allienation from grassroots
Decentralized organization	Democratic Commitment	Difficult to maintain cohesion

Source: Alders *et al.* (1993)

### 2.3.2 How Networking Evolves

Every individual and organization builds relationships with others, in networking. Most of these activities remain informal and rather incidental. Some, however, become so relevant to the life and/or work of these individuals and organizations that they decide to institutionalize them in order to guarantee a more permanent facility. According to Engel (1990b), claiming that networks should always remain informal is like saying that people should eat, but never build a kitchen.

There seems to be a common denominator with which all networks start. All seem to begin with a phase of planned activism (Manrique *et al.*, 1993). This is a phase in which the first exchange of ideas takes place, when concrete activities facilitate the recognition of the value of sharing and support, one or a small group of enthusiastic prime movers (Padron, 1991 as cited in Alders *et al.*, 1993) promotes the idea of networking and a meeting with prospective network members is prepared. A lot is done during this phase, but often in a rather unplanned fashion. The result is generally a workshop or a meeting where the idea of forming a network is discussed and evaluated, together with other more immediate interests (Korten, 1990).

A number of recurrent issues emerge during the phase of planned activism. The first to emerge is the importance of communication and participatory methods. These must be allowed to play a major role in the formulation of its objectives, approach and organization in order for the network to be carried by a wide group of Non Governmental Development Organizations (NGDOs) and their staff. This is easier said than done: for those working in often isolated rural areas, it is not automatic to take time and develop a custom for sharing ideas and experiences with others from elsewhere, as enriching as it may be. Also, the time and energy required for doing this often competes with already overloaded agendas.

However, the more difficult yet essential task seems to be the development of shared conceptual framework that facilitates the exchange of ideas, experiences, and knowledge. Kolman (1993) describes the experience, and notes the unrealistic goal-

setting and the extensive theoretical discussions during the first year of preparations. But he also indicates why they were necessary: to overcome ignorance and the lack of information on the topic of interest amongst prospective members; to integrate social ways of thinking with insight into technical processes; and, last but not least, to explain to donors and other supporters the actual needs of rural people.

Kolman (1993) seems to be referring to a process of making sense out of the idea of setting up a network to stimulate sustainable development, checking the actual need for it, and defining its potential in supporting its members in doing their work better. It takes a lot of time, yet it seems to be an essential ingredient of networking. In a way, it helps to transform a diverse set of people and organizations with an "ill-defined" sense of purpose, into a "like-minded" group with many interlocking relationships and a shared perspective, thus enabling them to effectively learn from each other.

This process of achieving a common understanding and shared purpose is in all cases linked closely to concrete activities that the members of the network are already performing in their respective areas. The immediate needs arising from the fieldwork of each of the institutions are the basis and reason for being a network (Manrique *et al.*, 1993).

### ***2.3.3 The Role of Networking in Extension***

Networking is an activity in which people positively indulge in dialogue, encouraged to exchange ideas and experiences, urged to take the time to listen to each other and to work towards a new way of understanding old problems. This actually provides opportunity for reflection, for breaking down barriers and stimulating creativity (Engel, 1990a). In agricultural development, farmers networking plays the following roles in the adoption and diffusion of innovations:

#### ***(i) Risk sharing***

A basic function of farmers' networking is to build confidence among member farmers and to provide support and encouragement. Compton and Joseffson (1993 as cited in Alders *et al.*, 1993) contend that new farmers can learn from older farmers and inexperienced farmers can learn from experienced ones and so avoid the unnecessary repetition of mistakes.

#### ***(ii) Experimentation and demonstration***

Experiments conducted by farmers' networks can effectively and efficiently serve to develop farming practices that respond to local conditions. This avoids duplication of practices and enables farmers to investigate a proposed new practice more completely and more quickly. Also they take into consideration the risk, labour requirement and community values, which are rarely considered by extension workers. Networks allow participating farmers to discuss and analyse each other's observations and experiences.

This process results in valuable research questions. When forwarded to agricultural research organizations, these questions and requests should presumably, carry more weight, because they are put forward by a network rather than individual farmers (Compton and Joseffson, 1993 as cited in Alders *et al.*, 1993).

*(iii) Empowerment*

Farmers networking can focus around many areas of common interests and needs. As farmers join together and begin to support and learn from each other, a network develops strength. It becomes increasingly able to promote the common interests of its members and of the larger community. Practical outcomes can be cooperative purchasing of supplies, cooperative selling and marketing of produce. Well established networks can become effective advocates of policy change, claim improved access to public services for their member, and help to enlist public services for, or at least interest in, the issues of environment and development which affects farmers' lives (Alders *et al.*, 1993).

During a workshop on networking for low-external-input agriculture held in Philippines in 1992, it was generally agreed that the most essential ingredient for the promotion of low external input and sustainable agriculture is the existence of strong farmer-based networks in the rural community (Alders *et al.* 1993). Development support networks, such as those of NGOs or of research institutions, should therefore aim to cooperate with and/or support the needs of farmer-based networks. Recent research has provided important insights in this area, which is one that is frequently overlooked by development organizations (Alders *et al.*, 1993).

*(iv) Extension and communication*

Farmers' networking can obtain and disseminate agricultural information from outside the network. Networks have often emerged in response to absence of an adequate extension service. Yet the existence of such networks can facilitate the work of extension workers and researchers provided that these accept the network for what it is (Compton and Joseffson, 1993 as cited in Alders *et al.*, 1993).

**2.3.4 Importance of Networking**

At first sight, Non governmental Development Organization (NGDO) networks seem to surge from situations where the NGDOs themselves, or members of their staff, perceive a critical lack of access to relevant knowledge and experiences from others. Yet, at the same time, this lack is not looked upon as absolute or irrevocable. On the contrary, it is perceived as being surmountable when ideas, experiences, and information are shared among relevant parties, in other words, if information sharing and learning among relevant NGDOs is improved. In India, NGOs and farmers agreed that there are many sound traditional practices that need to be brought to light and are worth disseminating (Quintal, 1993).

Another case in point is CAME, Peru where severe drought, and inundations convinced NGDOs of their inability to adequately respond to the Andean peasants' needs. They attributed this failure to a lack of inter-institutional coordination (Manrique *et al.*, 1993). Another example is the recognition of the participants at the OXFAM Contonou workshop of the isolated conditions in which local project staff had to work, which gave rise to the formation of the ALIN network (Graham, 1993).

In India, the ecological breakdown due to modern agricultural techniques, the ensuing crisis, and the lack of appropriate and sustainable alternatives raised awareness that a local network would enhance the adoption and diffusion of innovations and motivate others who are interested (Quintal, 1993).

### *2.3.5 Motivation to Networking*

It may be suggested that networking efforts are triggered when three types of perception gain sufficient momentum amongst NGDO leaders, staff and clientele. In one way or another, they reflect a genuine concern with improving the quality and impact of NGDO work, and their contribution to grassroots development. However, each network as such clearly reflects a very particular brand, or combination of the foregoing, from the local network of science-oriented NGDOs, which are mostly interested in upgrading their performance vis-a-vis their clients, to the global strategic networks (Korten, 1990) which almost entirely embrace advocacy and upstreaming, focusing their efforts on a very particular case or issue. The following seem to be major motivations to networking among the NGDOs:

#### *(i) Desire to upgrade*

The desire to upgrade encourages networks to place a great deal of emphasis on documenting and sharing ideas, experiences and knowledge from such people, NGDO or otherwise, as are deemed relevant to the purpose of the network. Its main concern is with improving collective learning and the quality of NGDO work (Engel, 1990a). Likewise farmers networks follow the same reason.

*(ii) The wish to upstream*

This involves the wish to upstream analysis and action. It takes on the relevance or efficacy of the field operations themselves within the prevailing social and political context in a country or region. It goes beyond the evident consequences of the problem at hand to address its source (Korten, 1990). It emphasizes shared diagnosis, reflection, clarification and coordination at a strategic level. Its main concern is achieving a better understanding of complex development situations, an achievement that is seen as being beyond the power and scope of any one of the single agencies alone.

*(iii) An upshift amongst NGDOs*

This leads to what may be labelled an upshift amongst NGDOs. It emphasizes the need for articulating and advocating alternative development proposals. It leads networkers to engage in communication activities to reach a broader public, and to influence governmental and private actors in the society at large (Korten, 1990). So is the case with MVIWATA which stands for Farmers' Group Network in Tanzania. It was formed during a workshop organized at Sokoine University of Agriculture, where farmers' representatives decided to institutionalize the exchange of information between farmers, farmers' groups and research and extension, throughout the country. Farmers' representatives held a meeting where they agreed on a constitution, elected leaders and chose the name MVIWATA. The following principles guide its functioning.

- i) The network enrol members on their own free will.
- ii) A member is free and he/she is entitled to protect this freedom.

- iii) A network cannot force another organization to do something and cannot be forced by another organization to do something.

According to Mattee and Lassalle (1995) the network limits its role to the transfer of knowledge and information. International ties have also been created with the pan-African network 'Farmers' Agriculture and Modernization in Africa' (FAM-Africa). Twice, the Tanzanian network has been represented in FAM-Africa meetings.

It is evident from the proceeding discussion that extension communication is a complex process which requires a well established system. A system that firmly links senders of extension messages to research and to farmers through efficient communication channels. A system which is active, reciprocative and efficient in conveying message to and from farmers. However the conventional extension communication setup has failed to deliver extension messages, due to inefficiency and lack of links at some points in its totality. To date many extension communication expertise think that networking can improve on the conventional extension communication system. That is why many government, NGOs and development programmes have ventured into promoting farmers' local networks. In the same spirit, UMADEP initiated a farmers' groups network in Mgeta, which is the subject of the study.

## **CHAPTER THREE**

### **METHODOLOGY OF THE STUDY**

#### **3.1 INTRODUCTION**

In this chapter the methodology for the study is briefly but explicitly described. The sampling frame, data collecting and data analysis procedures are defined. The procedures presented have been structured to suit the objectives of the study.

#### **3.2 POPULATION**

Population for the study consisted of 30 group members, 30 non-group members and 15 group representatives in the local network who are farmers. Extension workers were also interviewed so as to get more information relevant to the objectives. From the identified survey population, a representative sample was drawn.

#### **3.3 SAMPLING**

Stratified sampling was used to obtain different strata of respondents, that is group members, non-group members and group representatives in the local network. The sampling frame for group members was members of all groups in the study area. A total of 30 group members were selected from all 15 groups by randomly selecting two ordinary members from membership lists of each group. For non-group members, the sampling frame was all farmers in the study area who did not belong to any group. A total of 30 non-group members were selected from all 5 Wards. Six villagers from one village in the Ward were randomly selected from the village lists. The sampling frame for group representatives was all group leaders who represent groups in the local

network. A total of 15 group representatives were sampled. The table of random numbers was used to randomly select individuals for the sample.

### **3.4 TYPE AND SOURCES OF DATA AND INSTRUMENTATION**

The data collected for this study were those which relate to farmers perception about the importance of networking, the extent of adoption of selected technologies, farmers awareness of messages received as well as the possible sources of information with regard to selected technologies. Data on general characteristics of the respondents including age, marital status and education levels were also collected.

Data were collected through personal interviews with randomly selected respondents from the study area. The instrument for the interview was questionnaire with both closed and open ended questions. Open-ended questions were used to tap different comments and opinions of respondents. The questionnaire was reviewed by the staff of the Department of Agricultural Education and Extension before being administered for pre-testing. Pre-testing was done using a random sample of 10 farmers, 4 group members, 4 non-group members and 2 group representatives in the local network. Each interview was accompanied by an introductory remark pertaining to the purpose of the study. Additional information was collected through minutes of network meetings to know exactly what issues were being discussed in these meetings. Literature was obtained from Sokoine University of Agriculture library, UMADEP offices and the Morogoro District Agricultural Office.

### **3.5 MEASUREMENT OF VARIABLES**

The main variables for the study were measured as follows:

- a) Farmers perceptions of the importance of networking were determined by asking each respondent how networks are important to him or her.
- b) The extent of adoption of selected technologies amongst group members, non-group members and group representatives was determined by asking the respondents if they used any of the selected technologies. Diffusion was measured by asking the respondents if they gave any information concerning the technology to other farmers.
- c) The possible sources of information with regard to the selected technologies were obtained by asking the respondents where they got the knowledge about the selected technologies.
- d) The farmers awareness of messages received were determined by asking the respondents to mention the actual messages received.

### **3.6 DATA COLLECTION**

Data were collected using a questionnaire written in English. The questionnaire was administered to respondents in Kiswahili, and therefore understandable to the respondents. Informal interviews and discussions were done in Kiswahili and this was guided by a separate set of questions written in English.

### **3.7 DATA ANALYSIS**

Data collected from the primary sources were coded and analysed using the Statistical Package for Social Sciences (SPSS) Computer programme. In this statistical package descriptive statistics such as frequencies, percentages and means were determined.

### **3.8 LOCATION AND DURATION**

The study area was Mgeta Division, Morogoro Rural District. The Mgeta area lies on the eastern slopes of the Uluguru Mountains, at an altitude of between 1500 and 2000 meters above sea level. The climate is therefore temperate, with an annual rainfall of between 1000mm and 2000mm, and an average temperature of 20.5°C. The climatic pattern is characterized by bimodal rainfall, with the short rains starting in November tapering off around the end of January or early February, and the long rains falling between March and May. The dry season (and the coldest period of the year) is between June and October. The area is also characterised by very steep slopes and deep river valleys, as a result of which farmers have adopted terracing and furrow irrigation as a way of maximizing the land under cultivation (Mattee and Lassalle, 1995).

The project area is inhabited by the Luguru tribe, who are settled along the slopes of the entire Uluguru Mountain range. The economic mainstay of the area is smallholder agriculture which consists of production of vegetables for commercial purposes, maize for subsistence purposes and keeping of livestock (mainly pigs, goats, and chickens) for manure, sale and, occasionally, home consumption.

The choice of the study area was based on the fact that farmers' networking is commonly used as a tool for extension communication by the UMADEP Project in this area. The project covers four Wards that is Tchenzema, Langali, Kikeo and Bunduki which have five villages each. A period of two months was used in data collection in the selected area.

## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.1 INTRODUCTION

The prime objective of the extension process is to find the message sent being adopted quickly and in undistorted form. The extension process is therefore successful if the message is rightly perceived and highly adopted. In the case of networking, the members, that is, the farmers must be well aware and highly involved in the network activities. The effectiveness of networking has therefore been appraised in this line. However the socio-economic characteristics of the respondents were first examined.

#### 4.2 RESPONDENTS' SOCIO-ECONOMIC CHARACTERISTICS

This section discusses the socio-economic characteristics of the respondents, including group members, non-group members and group representatives in the local network. The socio-economic characteristics examined were age, marital status and level of education. These were chosen so as to determine whether membership is dependent on any of them.

##### *4.2.1 Age*

Table 1 presents age distribution of members, non-group members and group representatives in the local network. Majority (60%) of group members were found in the age category of 21 to 40 years, while 23.3% were between 41 and 60 years and 10% were above 60 years. Similarly majority (50%) of non-group members were between 21 and 40 years of age, while 43.3% were between 41 and 60 years; and only

6.7% were above 60 years of age. Furthermore, the majority (53.4%) of group representatives were in the age group of 21 to 40 years, while 33.3% were between 41 and 60 years, and only 13.3% were above 60 years old.

**Table 1: Distribution of respondents by socio-economic characteristics**

	Group Members		Non-Group		Group	
	No	%	Members		Representatives	
			No	%	No	%
<b>Age Category</b>						
Below 20	2	6.7	-	-	-	-
21 - 40	18	60	15	50	8	53.4
41 - 60	7	23.3	13	43.3	5	33.3
Above 60	3	10	2	6.7	2	13.3
Total	30	100	30	100	15	100
<b>Marital Status</b>						
Single	4	13.3	7	23.3	4	26.7
Married	22	73.3	22	73.3	10	66.7
Divorced/separated	2	6.7	-	-	-	-
Widowed	2	6.7	1	3.3	1	6.7
Total	30	100	30	100	15	100
<b>Educational Level</b>						
Adult education	2	6.7	2	6.7	-	-
Primary education	28	93.3	25	83.3	14	93.3
Secondary education	-	-	3	10.0	1	6.7
Total	30	100	30	100	15	100

These results show that there is little difference in age composition amongst group members, non-group members and group representatives in the local network. Majority of the respondents were found in the age category of 21 to 40 years. Most possible reason is that this is the most active group in farming in the rural areas.

#### ***4.2.2 Marital status***

The summary in Table 1 also shows that 73.3% of the group members were married, 13.3% were single, 6.7% were divorced and 6.7% were widowed. Majority (73.3%) of non-group members were married; 23.3% were single and 3.3% were widowed. At the same time 66.7% of group representatives were married; 26.7% were single and 6.7% were widowed. These results reveal little difference among group-members, non-group members and group representatives in the local network, with regard to marital status. Majority of respondents in all three categories were married.

#### ***4.2.3 Education level***

The results reveal that about 93.3% of group members had primary education and 6.7% had adult education. Eighty three percent of non-group members had primary education, 10% secondary and 6.7% adult education. Also, 93.3% of group representatives had primary and 6.7% secondary education. Again, there was no significant difference in levels of education for the three categories.

The results show that there is a reasonably high literacy rate. Granted that some of those who have attended formal schools know how to read and write. Such high literacy rate among the respondents has a number of implications for rural development. Key among them is that change agents are able to communicate agricultural innovations easily through posters, extension leaflets, newsletters and other written materials.

Overall there seems to be little difference in socio-economic characteristics between the three categories.

#### **4.3 FARMERS PERCEPTIONS OF THE IMPORTANCE OF NETWORKING**

Farmers perceptions of the importance of networking were determined by asking the respondents how networks are important to them. The study examined perceptions on the importance of networking for the three different categories, that is, group members, non-group members and group representatives. Local network respondents were interviewed on their functions, understanding of farmers groups network, methods used to educate farmers and perceived benefits of becoming network members. Non-group members were asked to give reasons as to why they were not members of the network, if they would like to be members and why, together with respondents' frequency in attending network meetings.

According to Haverkort *et al.* (1991), group representatives have power by virtue of their position as leaders and have been able to solve many problems faced by fellow farmers. The leaders have influence on a wide range of group activities. They also have considerable power over collective decisions among the group members. Many networks

need leaders in management of information. These leaders must strike a balance between taking sufficient control to make the network more than a sum of its constituent parts and allowing sufficient flexibility so that the group members feel the relevance of activities to their own situation. In Mgeta network the link in the network is both with group representatives and group members. Group representatives are supposed to run day to day activities in the network. They have the responsibility of monitoring group activities and write a report for the group to be presented in the network meeting reports which mainly contain problems encountered by the group and group achievements. Also group representatives have the task of advising and disseminating information to other group members on important issues that have been raised in the network. However 46% of group members claimed that group representatives sometimes retained information which has direct benefit to the group member. In this study, 93.3% of the group representatives indicated periodical presentation of group reports and leading other group representatives as their major responsibilities in the local network, and 46.7% indicated giving other group members advise as their major responsibility (Table 2). Effective functioning of group representatives help other group members get feedback on major issues of concern presented in the network meeting.

Table 2: Distribution of group representatives by their functions in the network  
(N = 15)

Function	Number	Percent
Leading other group representatives in the local network	9	60
Representing the network in workshops and seminars	6	40
Preparing the network newsletter	4	26.7
Presenting group reports	14	93.3
Giving other group members advice	7	46.7

The network acts as a link in disseminating extension messages concerning the innovations used by farmers, including reminding group members what networking is so that they can know how exactly it functions. Majority (80%) of group members know what the farmers' groups network is all about. Table 3 shows that amongst non-group members interviewed, 53.3% were able to give different definitions of the network while 46.7% did not know what the farmers' groups network was all about. For those who were able to explain the meaning of a farmers groups network, 30% understood farmers groups network as a meeting which joins group members together to discuss issues of common concern; 16.7% as people joining together to discuss different issues, that means every farmer whether a member or non-member could participate, and 6.7% understood farmers groups network as education among farmers. This means farmers were educated by extension agents on the use of different innovations.

**Table 3: Distribution of non-group members according to their understanding of farmers' groups network**

Definition	Number	Percent
People joined together to discuss different issues	5	16.7
Is a meeting which joins group member together	9	30.0
Education among farmers	2	6.7
Don't know	14	46.7
<b>Total</b>	<b>30</b>	<b>100</b>

However networking occurs if regular communication exists between the various groups, even and especially if their activities differ. By confronting the various interests and experiences, each group is influenced in the same way that it can influence the other groups for the global interest of the community

In the Mgeta network, representatives from different farmers' groups share experiences and exchange technical information in the network meetings. After each of these meetings group representatives usually give feedback from the local network to the individual group members using different methods of education. Table 4 shows that a significant proportion (46.7%) of group representatives used verbal methods of educating farmers; 33.3% used the network newsletter and 20% used booklets. Verbal methods are commonly used because the network is informal and personal, and speaking directly to another person, is the quickest and most efficient way of sharing information.

Table 4: Distribution of group representatives by the methods used to educate farmers in their group

Method	Number	Percent
Verbal	7	46.7
Local network newsletters	5	33.3
Booklets	3	20.0
Total	15	100

According to Sauquet (1990) in Mattee and Lassalle (1995), farmers are at the centre of the communication process. They are the ones who need to communicate with other farmers within their groups, with other farmers groups and with professionals. This is well supported by results of this study where 76.7% of group members and 100% of group representatives were aware of other groups' activities. Thus amongst the respondents, 43.3% and 33.3% of group members and group representatives respectively found the networking beneficial in solving farmers problems. This may have been facilitated by easy communication amongst farmers and with extension agents as justified by 40% of the group member respondents (Table 5). Opportunity to attend seminars was another benefit pointed out by group members (16.7%) and their representatives (46.7%). It is common for people who conduct seminars to invite farmers who have specific activities so in groups it becomes easier to recognize those farmers. Also farmers' representatives can easily pass extension messages obtained from

such seminars to other farmers. There is a difference between network members and non-network members in realizing the benefits of becoming network members, because in the network, members provoke ideas and find solutions and advises to the issues of common concern. It is also encouraging that only 20% of the member respondents claimed not to realize benefits from the local network. Most members however have heard of the network but they have little or no information about the network hence failed to recognize its benefits. It is an interesting situation and probably a challenge to UMADEP to make farmers who are currently confined in their groups to know that they also belong to a network. Though the number is small, one would expect all group members to be aware of the network activities and its benefits.

**Table 5: Distribution of respondents by perceived benefits of belonging to the local network (N = 45)**

Benefit	Group members		Group Representatives	
	No.	%	No.	%
To know what other groups are doing	23	76.7	15	100
To help each other in solving problems	13	43.3	5	33.3
To have easy communication with other farmers and extension agents	12	40.0	-	-
To attend seminars/workshops	5	16.7	7	46.7
Don't know	6	20.0	-	-

The role of the network secretariat (which is made up of network chairperson, network secretary, two group representatives and two technicians and elected after every six months), is to visit individual groups to seek information on various successes and problems encountered. Belonging in the network could have enabled non-group members to realize the solution to their problems. However the following reasons were indicated as having prevented them from becoming group members (Table 6): lack of encouragement from network members (40%), occupation with family responsibilities (16.6%), still looking for a suitable group to join (13.3%), engaging in business (13.3%), and lack of knowledge on the meaning of farmers groups network (16.6%).

Despite these reasons, majority (86.7%) of non-group members indicated an interest to join the network.

**Table 6: Distribution of non-group members by the reasons why are they not members of the network**

Reason	Number	Percent
Lack of encouragement from network members	12	40.0
Still looking for a suitable group to join	4	13.3
Occupied with family responsibilities	5	16.6
Engaging in business	4	13.3
Don't know its meaning	5	16.6
<b>Total</b>	<b>30</b>	<b>100</b>

This study further examined the reasons why non-group members would like to be members. Several reasons were given, namely to develop themselves (40%), to get education in different innovations (26.7%), to obtain solutions to their problems from their fellow farmers (13.3%), and to host guests from other areas (6.7%). This has been attributed to seeing the network members with better results in adopting different technologies through effective means of communication. Only 13.3% of non-group members were not interested in becoming members and they gave reasons like family responsibilities and lack of information on its advantages (Table 7).

Table 7: Distribution of non-group members by the reasons why they would like to be network members

Reason	Number	Percent
To develop themselves	12	40.0
Being educated in deferent innovations	8	26.7
To obtain solutions to their problems from fellow farmers	4	13.3
To host guests from other areas	2	6.7
Not interested	4	13.3
<b>Total</b>	<b>30</b>	<b>100</b>

In addition to generating and exchanging knowledge based on farmers' experiences, farmers networks can obtain and disseminate agricultural information from outside the network. They can serve as a link not only between individual farmers but also between farming communities and the agricultural extension system (Farrington and Nelson, 1994).

The results show that group representatives (33.3%) attended network meetings more than eight times last year. In the case of group members, majority (73.3%) did not attend any network meeting (Table 8). There is a significant difference in attending network meetings between group members, non-group members and group representatives in the local network. This is because only group representatives participate in these meetings. Members participate only when group representatives are not able to participate. The possible consequence of this arrangement is that since the same people participate in these meetings, sometimes they don't see the reasons for

holding monthly meetings with group members as a result they withhold important information to farmers.

Some leaders seek advice and suggestions from the meetings on possible solutions to existing problems in certain groups, as was the case of the savings and credit group in Tchenzema where the secretary misused funds of the group. The issue was presented in the network meeting and the members decided to take action against the secretary, so that he could repay the money. Fortunately his employer agreed to deduct a certain amount of money from his monthly salary to pay the group.

Table 8: Distribution of respondents by network meetings attended last year

Number of Meetings	Group members		Group Representatives	
	No	%	No	%
None	22	73.3	3	20.0
1 - 3	6	20.0	4	26.7
4 - 7	1	3.3	3	20.0
8 - 12	1	3.3	5	33.3
<b>Total</b>	<b>30</b>	<b>100</b>	<b>15</b>	<b>100</b>

Group representatives play the major role of presenting group reports in the network meetings. In giving feedback group representatives use verbal methods of educating farmers.

#### **4.4 EXTENT OF ADOPTION OF SELECTED TECHNOLOGIES**

Extent of adoption was measured by asking the respondents if they were using any of the selected technologies. The extent of adoption of innovation differs from one individual to another. One of the measures of extent of adoption of innovations is how fast the extension messages reach the farmer and how fast the innovations are adopted as well as the reasons for adoption. The selected technologies include tomato production during the rainy season, private fruit tree nurseries, mountain terracing agriculture and dairy goat keeping.

##### ***4.4.1 How fast the extension messages concerning the innovations reach the farmer***

The speed of extension messages in reaching farmers depends on the sources of information and the type of information which is communicated to farmers. To measure the speed the following technologies were considered:

##### ***(i) Tomato production during rainy season***

Tomato production during the rainy season was introduced in the area to avoid a total dependence on cabbages all the year long. One of the Upper Mgeta agricultural

extension officers, a native of another region of Tanzania, noted that in his home region (which is characterised by similar ecological conditions), farmers successfully grew tomatoes during the short rains. In Upper Mgeta, it was believed that tomatoes could not survive the rainy climate. He personally planted tomatoes on a small plot situated along the road. Thanks to regular application of copper oxide, he controlled the late blight disease and harvested a lot of tomatoes that he distributed to farmers. But although they became very interested no farmer really wanted to risk growing tomatoes. Therefore, the horticulturalist from the project bought the idea and tried to grow tomatoes on the demonstration plot and to identify the right agronomic practices. At various stages, seminars were organized then farmers were given theoretical courses and practical demonstrations in the plot. However, still very few farmers took the risk of growing tomatoes. The following season, a multi-locational trial was conducted in Upper Mgeta whereby more than two tons of tomatoes were harvested. Every market day, farmers could see the project staff selling the produce to local merchants at a very high price. The following season, six farmers volunteered to be part of a tomato trial on farmer-managed plots. Farmers, extension officers and researchers worked together during seminars and visits. The six farmers obtained a good harvest. This encouraged other farmers to adopt the innovation.

The results in Table 9 show that the majority of group members (53.3%) knew of possibilities of effective tomato production during rainy season 2-4 years ago. It is only 30% of group members who were aware of this 5-7 years ago and 13.4% did not remember when they first heard of the innovation. In the case of non-group members, 50% of respondents heard about the innovation 2-4 years; 30% 5-7 years and 10% one year ago, while the other 10% did not remember when they first heard of the innovation. On the other hand, majority of the group representatives heard about the innovation 5-7 years ago and 40% heard about the innovation 2-4 years ago. In all three groups majority of respondents became aware of the innovation 2-4 years ago.

Table 9: Distribution of the respondents by when first heard of innovations

Innovation	Group Members		Non-Group Members		Group Representatives	
	No	%	No	%	No	%
<b>Tomato production during rainy season</b>						
90 - 92	9	30.0	9	30.0	9	60.0
93- 95	16	53.3	15	50.0	6	40.0
96 - 97	1	3.3	3	10.0	-	-
Don't remember	4	13.4	3	10.0	-	-
Total	30	100.0	30	100.0	15	100.0
<b>Private fruit tree nursery</b>						
90 - 92	5	16.7	3	10.0	2	13.3
93- 95	18	60.6	14	46.7	13	86.7
96 - 97	1	3.3	6	20.0	-	-
Don't remember	6	20.0	7	23.3	-	-
Total	30	100.0	30.0	100.0	15	100.0
<b>Mountain terracing agriculture</b>						
87 - 89	3	10.0	2	6.7	1	6.7
90 - 92	4	13.3	1	3.3	2	13.3
93 - 95	4	13.3	6	20.0	5	33.3
Don't remember	19	63.3	21	70.0	7	46.7
Total	30	100.0	30	100.0	15	100.0
<b>Dairy goat keeping</b>						
88 - 90	20	66.7	16	53.3	7	46.7
91 - 93	10	33.3	11	76.7	7	46.7
94 - 96	-	-	1	3.3	1	6.7
96 - 97	-	-	2	6.7	-	-
Total	30	100.0	30	100.0	15	100.0

*(ii) Private fruit tree nursery*

Concerning the fruit tree nurseries, many farmers were willing to get or even to buy good seedlings but they were not willing to enter the nursery business. Moreover, a central nursery had been functioning in the early seventies under the government extension services when farmers were provided with seedlings, but when the project closed, the only source of seedlings collapsed and nobody was in a position to renew the orchard (Delobel *et al.*, 1989) The project made use of the horticulturalist from Sokoine University of Agriculture to train a limited number of farmers on grafting techniques. The idea was to promote farmers' own nurseries. Farmers were presented with the idea and six of them were selected after a small feasibility study to see if they could integrate the nursery into their farming system and make this new activity sustainable through sales of good quality grafted seedlings to the neighbouring farmers.

Nursery owners were attentive to the progress made by their colleagues and very eager to show the best nursery to the group. Every three months a special seminar was organized in the demonstration nursery where farmers tried difficult techniques before practicing them in their own nurseries. To avoid unfair competition, the project avoided distribution of seedlings to farmers and rather sold the seedlings at a fifty per cent higher price than the farmers' seedlings. Four of the nurseries have reached the stage of sustainability and receive regular orders. However, the monthly visits are maintained and the group now welcomes other farmers to become new nursery owners (Maerere and Lassalle, 1993)

The results in Table 9 reveal that majority of the respondents from all three groups i.e. group members (60%); non-group members (46.7%) and group representatives (86.7%) heard of the innovation 2-4 years ago.

*(iii) Mountain terracing agriculture*

Since there has been continued emphasis on soil conservation measures in mountain agriculture many respondents showed extensive awareness of this. Majority of the respondents (Table 9) in all three groups i.e. non-group members (70%); group members (63.3%); and group representatives (46.7%) indicated that they have been terracing their plots since a long time ago so they don't remember when they first heard about the innovation.

*(iv) Dairy goat keeping*

Dairy goats were introduced to Mgeta Division in 1988 by the Department of Animal Science and Production. The purpose of the project was to develop dairy husbandry systems sustainable for small scale farmers and improve farmers' standard of living.

When the project started, only five contact farmers were selected. In 1990 five more farmers joined the project. As was envisaged, the innovation spread fast to other farmers through the crossbreeding of local goats with the projects Norwegian dairy goat bucks and through farmer to farmer education where the contact project farmers educated the

rest of the farmers. In addition, the contact farmers learned more about goat keeping from Arumeru, Arusha farmers in 1993 and 1994 through farmer-to-farmer exchange programmes. Due to successful farmer-to-farmer interactions in Mgeta, the project has achieved a great deal of developing dairy husbandry systems sustainable for small scale farmers and improve farmers' standard of living. Many farmers are keeping dairy goats (Muhikambebe *et al* 1995).

The results in Table 9 reveal that for group members majority (66.7%) first heard of the innovation 7-9 years ago and 33.3%, 4-6 years ago. For non-group members, 53.3% first heard about the innovation 7-9 years ago; 36.7% 4-6 years ago; 6.7% one year ago and 3.3% 1-3 years ago. On the other hand, 46.7% of group representatives first heard of the innovation 7-9 years ago; 46.7% 4-6 years and 6.7% 1-3 years ago.

Generally there has been little difference in when first heard of innovations for the three categories as most farmers tend to remember things that happened for the last three years together with the fact that the network started more recently.

#### ***4.4.2 How fast the innovations are adopted***

Some innovations are adopted more rapidly than others because the farmers perceive them to be better than the conventional methods. It is not the objective characteristics of the innovations that are important, but how the farmers perceive them. However what

really matters are the changes this innovation will require in the management of the farm and behaviour of the farm family. In this study the following innovations were selected:

*(i) Tomato production during the rainy season*

The results (Table 10) show that 23.3% of the group members reported to have adopted the innovation immediately after getting the information, 13.3% adopted the innovation a year later. For non-group members, 16.7% adopted the innovation immediately after getting the information and 3.3% two years after getting the information. In the case of group representatives, 6.7% adopted immediately, 6.7% one year later and also 6.7% two years after getting the information. The results show reluctance of farmers to grow tomatoes in rainy season for they have long been aware of the risks involved. Probably higher financial as well as management commitments required may have scared farmers. Higher returns realized by early adopters might have convinced farmers to adopt at a later stage. The results show that there is no big difference between group members, non-group members and group representatives in the network in when tomato production was first adopted.

Table 10: Distribution of respondents by when first adopted the innovation

Innovation	Group Members(n=30)		Non-Group Members (n=30)		Group Representatives (n=15)	
	No	%	No	%	No	%
<b>Tomato production during the rainy season</b>						
Immediately after getting the information	7	23.3	5	16.7	1	6.7
One month later	1	3.3	1	3.3	-	--
One year later	4	13.3	-	-	1	6.7
Two years later	2	6.7	1	3.3	1	6.7
Three years later	3	10.0	-	-	-	-
<b>Private Fruit tree nursery</b>						
Immediately after getting the information	1	3.3	1	3.3	4	26.7
One month later	1	3.3	-	-	-	-
Six months later	2	6.7	-	-	-	-
One year later	2	6.7	1	3.3	-	-
Two years later	-	-	1	3.3	-	-
Three years later	-	-	1	3.3	-	-
<b>Mountain terracing agriculture</b>						
Immediately after getting the information	27	90.0	27	90.0	15	100
One month later	2	6.7	1	3.3	-	-
One year late	-	-	1	3.3	-	-
<b>Dairy goat keeping</b>						
Immediately after getting the information	2	6.7	1	3.3	-	6.7
One year later	4	13.3	1	3.3	1	13.3
Two years later	-	-	2	6.7	2	20.0
Three years later	2	6.7	1	3.3	3	6.7
More than three years	-	-	-	-	1	3.3

**(ii) Private fruit tree nursery**

The data in Table 10 show that 6.7% of group members adopted the innovation six months after getting the information and also 6.7% of members adopted the innovation one year after getting the information and 3.3% adopted the innovation immediately after getting the information. For group representatives, 26.7% reported to have adopted immediately. The results show that a small percentage of respondents adopted private fruit tree nursery and they are the ones who adopted the innovation immediately. This is because only limited number of respondents were trained to own fruit tree nurseries, and they are mainly group members and group representatives. It is only those few farmers who were trained and given material support, that took up fruit tree nurseries.

**(iii) Mountain terracing agriculture**

The results show that the majority of respondents (90% group members, 90% non-group members and 100% group representatives) adopted the innovation immediately after getting the information (Table 10). The possible explanation for this is that most farmers started mountain terracing agriculture since long time ago. The innovation has been promoted since colonial times, so when the project started advocating mountain terracing it was actually a revival of an old practice which was quickly taken up.

*(iv) Dairy goat keeping*

The study found that 6.7% of group members adopted the innovation immediately; 13.3% adopted the innovation one year later and 6.7% three years after getting the information. In the case of non-group members, 6.7% adopted dairy goat keeping two years later; 3.3% immediately and 3.3% three years later after getting the information (Table 10). On the other hand, 20% of group representatives adopted 3 years, 13.3% 2 years, 6.7% more than three years after getting the information. Farmers received the information about the dairy goats with deep interest, but the unavailability of the dairy goats reduced the extent of adoption. Many farmers had to wait to buy from their fellow farmers. However group members and group representatives adopted the innovation first.

The economic mainstay of the area is smallholder agriculture which includes production of horticultural crops and livestock keeping. The livestock, mainly pigs, goats and chicken are used for manure, for sale and, occasionally, for home consumption. The major vegetables grown for the market are cabbage, cauliflower, peas, carrots and tomatoes which are grown in significant amounts. According to the farmers, tomato production is about to become the second most important cash crop in Mgeta after cabbage.

The results in Table 11 show that 96.7%; 60%; 26.7% and 23.3% of group members adopted mountain terracing agriculture, tomato production in the rain season, dairy goat keeping and private fruit tree nursery respectively. For non-group members 96.7% adopted mountain terracing agriculture; 46.7% tomato production during the rain season; 16.7% dairy goat keeping and 13.3% private fruit tree nursery. For group representatives 100% adopted mountain terracing agriculture 46.7% dairy goat keeping; 26.7% fruit tree nursery and 20% tomato production during the rain season.

More group members and group representatives than non-group members have adopted the innovations, although the results show little difference in the levels of adoption of the innovations. This demonstrates the role of farmers' groups network in advising group members to take responsibility to improve economic activities for future development. Exchange of ideas amongst farmers and between farmers and extension agents also played major role in influencing group members to adopt different innovations.

Table 11: Distribution of respondents by type of innovation adopted currently

Innovation	Members (n=30)		Non-Members (n=30)		Group representatives (n=15)	
	No.	%	No.	%	No.	%
Tomato production during rainy season	18	60	14	46.7	3	20
Fruit tree nursery	7	23.3	4	13.3	4	26.7
Mountain terracing agriculture	29	96.7	29	96.7	15	100
Dairy goat keeping	8	26.7	5	16.7	7	46.7

#### *4.4.3 Reasons for adopting the innovations*

Farmers adopt a new innovation mainly if it is better in terms of income generation, efficiency, and cost. Farmers tend to adopt a certain innovation if it will enable them to achieve their goals better or at lower cost than they could previously. In this study the motive to adoption of various technologies were probed and results summarised in Table 12.

##### *(i) Tomato production during the rainy season*

Many (100%) group representatives and non-group members (92.6%) interviewed adopted tomato production mainly as a source of income, while group members (72.2%) attributed their adoption of tomato production to home consumption (Table 12).

*(ii) Private fruit tree nursery*

Results in Table 12 show that (71.4%) of the group members mentioned income as a major reason for adopting private fruit tree nursery. Amongst the non-group members, 75% found it easier to increase fruit tree area if they established own nurseries. This is probably because it is less expensive to manage a nursery than to purchase seedlings. For group representatives, 75% mentioned income as a major reason for adopting the innovation.

*(iii) Mountain terracing agriculture*

Devastating consequences of erosion are quite obvious in mountainous areas. This facilitates easy adoption of soil conservation methods in the areas in question. Such is the case in this study where 89.7% of group members adopted mountain terracing agriculture because of existence of soil erosion and 72.4% of group members adopted terracing agriculture due to loss of soil fertility. Similarly, 89.7% of non-group members attributed existence of soil erosion as major reason for adopting the innovation and 58.6% adopted the innovation because of loss of soil fertility (Table 12).

*(iv) Dairy goat keeping*

Income source and food again emerged as major reasons for adopting dairy goat keeping. Thus majority (87.5%) of group members and group representatives (100%) and 60% of non-group members adopted dairy goat keeping for food. Whereas 100% of group representatives; 100% of non-group members and 50% of group members adopted dairy goat keeping as a source of income (Table 12). Generally there seems to be no difference in the reasons for adopting the innovations for all three categories.

Table 12: Distribution of respondents by the reasons for adopting the innovation

Reason	Group-Members		Non-Members		Representatives	
	No.	%	No.	%	No.	%
<b>Tomato production during rainy season</b>						
Total adopted	18	100.0	14	100.0	3	100.0
As a source of income	16	88.9	13	92.6	3	100.0
For home consumption	13	72.2	12	85.7	1	33.3
<b>Private fruit tree nursery</b>						
Total adopted	7	100.0	4	100.0	4	100.0
As a source of income	5	71.4	1	25.0	3	75.0
For my field /increase the area	2	28.6	3	75.0	1	25.0
<b>Mountain terracing Agriculture</b>						
Total adopted	29	100.0	29	100.0	15	100.0
Due to existence of soil erosion	26	89.7	26	89.7	15	100.0
Due to loss of soil fertility	21	72.4	17	58.6	11	73.3
Due to poor production	6	20.7	1	3.4	1	6.7
<b>Dairy goat keeping</b>						
Total adopted	8	100.0	5	100.0	7	100.0
Source of income	4	50.0	5	100.0	7	100.0
For food	7	87.5	3	60.0	7	100.0

In summary it was found that it took some time for the majority of farmers to be aware of existence of certain innovations. Similarly in adopting the innovations. However, network members showed a higher level of adopting the innovations. Apart from other innovations adopted, tomato production during the rainy season is highly adopted due to its high economic returns. Most innovations have been adopted mainly for food and income.

#### **4.5 FARMERS AWARENESS OF MESSAGES RECEIVED**

Perception of messages received was measured by asking respondents to describe the actual messages received. Farmers perceptions are influenced by their feelings towards themselves as well as towards the objects and messages they receive. Communication processes are influenced by the senders' and receivers' feelings towards each other, towards the message, the channel and themselves. Farmers learn from their own experiences in this way, but they also learn from communicating with others and experts about their experiences. This is why other farmers are very influential as information sources in the diffusion process. Whether they perceive their environment and the message they receive from others correctly depends, amongst other things, on how clear this information is.

Mgeta network helps farmers create a fundamentally new quality of human cooperation by focusing on mind rather than matter. On farmers' awareness of messages received, members, non-group members and group representatives were interviewed.

Results in Table 13 show that for the respondents who were interviewed, 30% of the group members; and 20% of the group representatives knew or practiced pruning in tomato production during the rainy season, while none of the respondents amongst non-group members was aware of this message. For the non-group members who were ignorant of some extension messages they attributed their ignorance to lack of contact with extension agents.

In the case of private fruit tree nursery, 16.7% group members and 6.7% non-group members and 20% group representatives interviewed were aware of the methods recommended for preparation of seeds for planting. Also non-group members were unaware of use of manuring, irrigation and pruning of leaves in fruit tree nurseries.

However for the respondents interviewed on dairy goat keeping, 26.7% group members, 6.7% non-group members, and 40% group representatives were aware of the need to keep goat housing clean. It is a pity that non-group members were even not aware of the need to contact a veterinary officer in case of a problem with dairy goats.

Table 13: Distribution of respondents by awareness of messages received

Message Received	Members (n=30)		Non-Members (n=30)		Group Representatives (n=15)	
	No.	%	No.	%	No.	%
<b>Tomato production during rain season</b>						
Spraying insect pests	12	40.0	11	36.7	3	20.0
Pruning of leaves	9	30.0	-	-	2	13.3
Supporting the plant with sticks	3	10.0	5	16.7	2	13.3
Supply with manure	6	20.0	1	3.3	1	6.7
Spacing	3	10.0	-	-	-	-
<b>Fruit tree nursery</b>						
Preparation of seeds for planting	5	16.7	2	6.7	3	20.0
Mixing of soil with manure	4	13.3	-	-	2	13.3
Irrigation	2	6.7	-	-	2	13.3
Pruning	4	13.3	-	-	1	6.7
<b>Dairy goat keeping</b>						
Cleanliness of the house	8	26.7	2	6.7	6	40
Giving them drugs	6	20.0	4	13.3	7	46.7
Contacting veterinary officer	5	16.7	-	-	4	-
Feeding them properly	3	10.0	4	13.3	5	33.3

Overall it has been observed that most non-group members were not aware of some extension messages received due lack of frequent communication through the network, where members usually remind each other concerning the extension messages received.

#### **4.6 SOURCES OF INFORMATION**

Sources of information were measured by asking respondents about where they obtained knowledge about the selected technologies. Numbers of contacts with extension agents were also investigated. Group representatives have the responsibilities of giving other group members information from the network. In order to circulate information amongst members, the network publishes a newsletter which contains useful information gathered from the network meetings. The results in Table 14 show that almost half (46.7%) of group members were getting information concerning the adopted innovations through group representatives, and 28.7% were getting information from their fellow members. Only 3.3% of group members received information through the local network newsletter. The possible explanation for the small percent of group members receiving information through the network newsletter is that there are very few copies and sometimes group representatives keep them instead of distributing them to group members. Extension research has shown that different sources of information are important for the first hearing of an innovation and for making a final decision to adopt or reject the innovation. Most of extension messages are obtained through extension seminars, visits to and from other farmers, contacts with extension agents, extension

newsletters and the like. However, farmers belonging to the network have higher contact with extension agents than those who do not belong to the network, as the major role of networking is to make members have easier access to extension workers. This study found that a large proportion of respondents (i.e. 86.7% of group members; 93.3% of group representatives and 56.7% non-group members) received information concerning the innovation through extension agents.

The major role of the network is to disseminate extension messages to farmers through group representatives. Majority of group members were receiving information concerning the innovation they are using through group representatives.

**Table 14: Distribution of respondents by sources of getting information concerning the innovation they are using**

Sources	Members (n=30)		Non-Members (n=30)		Group Representatives (n=15)	
	No.	%	No.	%	No.	%
Extension agents	26	87.7	17	56.7	14	93.3
Seminars organized by UMADEP	6	20.0	1	3.3	1	6.7
Group representative	14	46.7	-	-	-	-
Radio	2	6.7	3	10.0	1	6.7
Network newsletter	1	3.3	-	-	7	46.7

Seminars conducted by extension workers are important avenues in channeling extension messages. These are places where farmers can exchange ideas with professionals. This plays an important role in helping farmers identify and prioritise their problems. Farmers can receive knowledge from experts and among themselves. In this study, group members who attended extension seminars were 46.6% while 43.4% of group members interviewed had not attended any extension seminar (Table 15). For group representatives, 93.3% attended seminars while 6.7% had never attended any extension seminar. Those who did not attend complained that the same farmers were always given opportunity to attend seminars while others never participated in any seminar. Out of those who attended seminars, 53.3% group representatives and 16.7% group members attended seminars outside the District, 13.3% group members and 13.3% group representatives attended seminars outside the village but within the Division, and 13.3% group representatives and 6.7% group members attended seminars in the village.

The results show that group members and group representatives attended more seminars than non-group members.

Table 15: Distribution of members by their attendance to seminars

Attendance	Members (n=30)		Non-group members (n=30)		Representatives (n=15)	
	No	%	No	%	No	%
	In Village	2	6.7	1	3.3	2
Outside village but within Ward	-	-	-	-	2	13.3
Outside village but within Division	4	13.3	2	6.7	2	13.3
Outside village but within District	3	10.0	-	-	-	-
Outside District	5	16.7	-	-	8	52.3

The major task of extension agents is to diffuse research findings to the farmers, help farmers clarify exactly what their problems are and to find or develop the transformation required for solving them and to teach farmers new knowledge. Extension agents facilitate communication of extension messages among and between members. In this study, 93.1% of the group members interviewed had contact with extension agents, while another 6.7% had no contact (Table 16). Of non-group members interviewed, 60% had contact with extension agents while 40% had no contact at all. Among group members interviewed, 73% admitted to have had extension workers from the project. Some of the non-group members who had contact with extension complained that extension workers gave priority to group members virtually neglecting non-group

members. However, farmer-extension workers contacts were fairly frequent such that 40% of group members and 33.3% non-group members had contact with extension agents once a month, while 40% group members and 13.3% non group members had contact whenever they had problems or whenever there was a need.

Usually extension agents participate in the local network by advising and giving opinions and working with the secretariat where matters concerning the network are forwarded and implemented, and helping in analyzing situations and work out for possible solution. This results in change agents having more contacts with group members than with non-group members.

Table 16: Distribution of respondents by numbers of contacts with extension agents

Number of Contacts	Group members		Non-group members	
	No.	%	No.	%
Once/month	12	40	10	33.3
Twice/month	3	10	4	13.3
Thrice/month	1	3.3	-	-
When having problems/ when there is a need	12	40	4	13.3
None	2	6.7	12	40
<b>Total</b>	<b>30</b>	<b>100</b>	<b>30</b>	<b>100</b>

Generally, the results show that group representatives, other group members, network newsletters and extension agents were considered as major sources of information concerning the adopted innovations for group members. However non-group members complained that they don't normally receive information from group representatives and other members claiming that they are biased towards group members.

**CHAPTER FIVE****CONCLUSION AND RECOMMENDATIONS****5.1 CONCLUSIONS**

On the basis of the findings of the study, the following conclusions can be made:

- i) Farmer to farmer communication of agricultural knowledge offers more opportunities and incentives for farmers to experiment for themselves and strengthens farmer feedback loops in research and extension. This influences farmers to perceive the importance of networking through participating in networking activities such as attending meetings and extension seminars. Generally farmers find the local network to be important as a means for technology dissemination, for mutual support, as well as for material support.
- ii) Group representatives play major roles in existence of the network. They allow members to make decisions, take them in the local network and give them feedback. However they are sometimes criticised for retaining information which has direct benefit to the group members.
- iii) Although it took some time for the majority of farmers to be aware of the existence of certain innovations, similarly in adopting them, the farmers' groups network played a major role in the adoption of the innovations, through giving information concerning the innovations and provision of technical advice to members. Those farmers who belong to the local network showed a higher level of adopting the innovations.

- iv) Belonging to groups enhances the level of communication amongst farmers belonging to the groups and also between group members and change agents. The enhanced communication can facilitate awareness of extension messages received. As such, the study showed a difference in awareness of extension messages between group members, non-group members and group representatives in the network. Most non-group members were not aware of some extension messages disseminated.
- v) The sources of information is a critical factor in adoption and diffusion of technologies. Farmers belonging to the network have more access to different sources information compared to those who do not belong in the network. Although most information originates from change agents, the farmers groups act as main distributors of information amongst farmers themselves.

## **5.2 RECOMMENDATIONS**

This section provides recommendations derived from conclusions of this study. In order to increase the adoption of different technologies through farmers groups network, it is recommended that:

- i) Not only group representatives should participate in network meetings but also the group members should be involved so that they can participate more fully in the sharing and exchanging of information.
- ii) Change agents should regularly monitor group activities and due benefits. This will enhance increased adoption amongst group members and non-group members.

- iii) In working with farmers' groups, change agents and group representatives should also consider the need of non-group members who do not belong in groups. They can assist and give them information concerning the innovations. They should develop a programme to visit, talk to them, get their opinions and advise them to join groups.
- iv) There should be a regular monitoring by change agents of whether those who participate in local network meetings deliver the message to other members, and if they distribute the documents from the network such as the network newsletter. Farmers should be trained and encouraged to look for new information by themselves instead of waiting to receive it from change agents.
- v) Further research should be carried out to determine the extent of distortion of messages as they are passed from one farmer to another through the local network.

## REFERENCES

- Alders, C.; Haverkort, B. and Velhuizen, L. (1993) *Linking with Farmers. Networking for Low External Input and Sustainable Agriculture*. Intermediate Technology Publications, London. pp 298.
- Benor, D. and Baxter, M. (1984) *Training and Visit Extension*. The World Bank. Washington, D. C. pp 202.
- Burkey, S. (1992) *People First: A Guide to Self Reliant Participatory Rural Development*. Zed Books Ltd, London and New Jersey. pp 244.
- Delobel, T. C., Evers, G. R. and Maerere, A. P. (1989) Position and functions of deciduous fruit tree in the Farming systems at Upper Mgeta, Uluguru Mountains, Tanzania, *Acta Horticulturae*, 270, 91-102.
- Deutschman, P. J. (1963) The mass media in an underdeveloped village. *Journalism Quarterly*. 5, 27 - 35.
- Engel, P. G. H. (1990a) Two ears, one mouth... Participatory Extension or why people have two ears and only one mouth. In: *AT Source*. 18 (4), 2-5.
- Engel, P. G. H. (1990b) Knowledge management in agriculture: Building upon diversity. *Knowledge in Society: The International Journal of Knowledge Transfer*. 3 (3) 25 - 35.

- Farrington, J. and Nelson, J. (1994) *Information Exchange, Networking for Agricultural Development: A Review of Concepts and Practices*, CTA, Wageningen. pp 86.
- Fliegel, F. C. (1984) Extension communication and the adoption process. In Swanson, B. E. (Ed). *Agricultural Extension. A Reference Manual*. Second Ed. FAO, Rome. pp 77 - 88.
- Garforth, C. (1993) Rural people's organisations and extension communication in Northern Thailand. *Journal of Extension Systems*. 9, (2) 33-64.
- Graham, O. (1993). Networking as a development activity: The Arid Lands Information Network. In: C. Alders, B. Haverkort and L. Van Velhuizen (Eds.), *Linking with Farmers: Networking for Low-External-Input and Sustainable Agriculture*. Intermediate Technology Publications, London. pp 271-281.
- Haverkort, B. van de Kamp, J and Waters-Bayer, A. (1991) *Joining Farmers' Experiment*. In: C. Alders, B. Haverkort and L. Van Velhuizen (Eds.), *Linking with Farmers: Networking for Low-External-Input and Sustainable Agriculture*. Intermediate Technology Publications, London. pp 3 - 23
- Kolman, E. (1993) Networking for sustainable agriculture in Peru: Experiences of the Red de Agricultura Ecológica (RAE). In: C. Alders, B. Haverkort and L. Van Velhuizen (Eds.), *Linking with Farmers: Networking for Low-External-Input and Sustainable Agriculture*. Intermediate Technology Publications, London. pp 151 - 159.

- Korten, D. C. (1990) NGO Strategic networking: From community projects to global transformation. In: C. Alders, B. Haverkort and L. Van Velhuizen (Eds.), *Linking with Farmers: Networking for Low-External-Input and Sustainable Agriculture*. Intermediate Technology Publications, London. pp 25-35.
- Manrique, J., Paolao, J. A. and Bueon de Mesquita, M. (1993) Andeans Unite: The birth and growth of the Andean Council of Ecological Management. In: C. Alders, B Haverkort and L. Van Velhuizen. (Eds.), *Linking With Farmers: Networking for Low External-Input and Sustainable Agriculture*. Intermediate Technology Publications, London. pp 167-177.
- Marche, Y. and Ruvuga, S.A (1994) The contribution of NGOs in rural development with example from INADES-Formation. In: Mattee, A. Z. and Ngetti, M. S. (Eds), *Proceedings of Tanzania Society of Agricultural Education and Extension (TSAEE) workshop on The Role of Non Governmental Organizations (NGOs) in Agricultural Extension*. Tanzania Society of Agricultural Education and Extension, Morogoro. pp 58-66.
- Maerere, A. P. and Lassalle, T. (1993) Training through a development project to link higher education in Horticulture to small farmers' conditions, *Acta Horticulturae*, 350, 217-224.
- Mattee, A. Z. and Lassalle, T. (1995) Towards sustainable rural development using the participatory approach In: Foster, G. P. and Maghimbi, S. (Eds), *The Tanzanian Peasantry: Further Studies*. Avebury Publishing Limited, Ashgate. pp 170 - 197.

- Maunder, H. (1973) *Agricultural Extension. A Reference Manual*. FAO, Rome. pp 270.
- Ministry of Agriculture and Livestock Development (1987) The Tanzania national agriculture extension rehabilitation programme: First Draft Report. pp 127.
- Muhikambele, V. R. M., Mtenga, L. A. and Kifaro, G. C. (1995) Farmer to farmer extension approach: The Mgeta experience. In: Lugeye, C. S. and Ishuza, I. L. (Eds.), *Proceedings of Tanzania Society of Agricultural Education and Extension (TSAEE) workshop on The Future of Agricultural Education and Extension in Tanzania*. Tanzania Society of Agricultural Education and Extension, Morogoro. pp 29-33.
- Pluknett, D. L. ; Smith, N. J. and Ozgediz, Z. S. (1990) Networking in international agricultural research In: *Food Systems and Agrarian Change*. Cornell University, pp 4 - 22.
- Quintal, O. G. (1993) Networking for Low-External-Input and Sustainable Agriculture. In: Engel, G. H. (Ed.), *Proceedings of an International workshop on Networking for Sustainability: Towards a new Paradigm for Extension*. CTA, Wageningen. pp 133 - 150.
- Rogers, E. M. (1983) *Communication of Innovations*. The Free Press, New York. pp 475.
- Rolling, N. (1994) Agricultural Knowledge and Information Systems. In: D. Blackburn (Ed.) *Extension Handbook: Processes and Practices for Change Professionals*. University of Guelph, Ontario, Canada. pp 57-67.

- Swanson, B. E. and Claar, J. B. (1984) The History and Development of Agricultural Extension In: Swanson, B. E (Ed.) *Agricultural Extension: A Reference Manual*. Second Edition, Rome, FAO. pp 1 - 20.
- Van den Ban, A. W. and Hawkins, H. S (1988) *Agricultural Extension*. John Wiley and Sons Inc., New York. pp 294.

**Appendix 1**

**THE ROLE OF FARMERS' GROUPS NETWORK IN THE ADOPTION AND  
DIFFUSION OF SELECTED AGRICULTURAL TECHNOLOGIES IN UPPER  
MGETA, MOROGORO RURAL DISTRICT.**

**QUESTIONNAIRE FOR GROUP MEMBERS**

DIVISION..... VILLAGE.....

RESPONDENTS NAME..... DATE OF INTERVIEW.....

NAME OF INTERVIEWER..... DATE OF INTERVIEW.....

**A. SOCIO-ECONOMIC CHARACTERISTICS**

1. Age.....

2. Gender

1. Male.....

2. Female.....

3. Marital status

1. single...

2. married...

3. divorce...

4. widowed...

## 4. Level of education by years of attendance

1. None .....
2. Adult literacy.....
3. Primary education.....
4. Secondary education.....
5. Post secondary education.....
6. Others (specify).....

**B. EXTENT OF ADOPTION.**

5. Have you heard any of these innovations,
  1. Tomato production during the rain season.....
  2. Private fruit tree nurseries....
  3. Mountain terracing agriculture....
  4. Dairy goat keeping....
6. When did you first hear about tomato production during the rainy season?  
.....
7. When did you start practicing it?
  1. Immediately after getting the information.....
  2. One month later after getting the information.....
  3. Six months later after getting the information.....
  4. One year later after getting the information.....

- 5. Two years later after getting the information.....
- 6. Three years later after getting the information....
- 7. More than three years (specify).....
- 8. What were the reasons for practicing such innovation?
  - 1. As a source of income.....
  - 2. For home consumption.....
  - 3. Others (specify).....
- 9. Did you engage yourself in this innovation last season?
  - 1. Yes....
  - 2. No.....
- 10. If yes what was your total production and area under tomato production last season?

Production	Area
.....	.....

- 11. When did you first hear about private tree nurseries?  
.....
- 12. When did you start practicing it?
  - 1. Immediately after getting the information.....
  - 2. One month later after getting the information....
  - 3. Six months later after getting the information....
  - 4. One year later after getting the information.....

- 5. Two years later after getting the information.....
- 6. Three years later after getting the information.....
- 7. More than three years (specify).....
- 13. What were the reasons for using such innovation?
  - 1. As a source of income.....
  - 2. others(specify).....
- 14. Do you engage yourself in this innovation in all seasons?
  - 1. Yes.....
  - 2. No.....
- 15. If not why?
  - 1. ....
  - 2. ....
  - 3. ....
- 16. Did you engage yourself in this innovation last season (1995/96)?
  - 1. Yes.....
  - 2. No.....
- 17. If yes how many tree seedlings did you plant? .....
- 18. When did you first hear about mountain terracing agriculture? .....
- 19. When did you start practicing it?
  - 1. Immediately after getting the information.....
  - 2. One month later after getting the information.....
  - 3. Six months later after getting the information.....

- 4. One year latter after getting the information.....
- 5. Two years latter after getting the information.....
- 6. Three years latter after getting the information.....
- 7. More than three years (specify)

20. What were the reasons for adopting such innovation?

.....  
.....

21. When did you first hear about dairy goat keeping?

.....

22. If yes when did you start practicing it?

- 1. Immediately after getting the information.....
- 2. One month later after getting the information.....
- 3. Six months latter after getting the information.....
- 4. One year latter after getting the information.....
- 5. Two years latter after getting the information.....
- 6. Three years latter after getting the information.....
- 7. More than three years (specify).....

23. What were the reasons for adopting such innovation?

- 1. As a source of income.....
- 2. For food.....
- 3. Others (specify).....

24. How many goats were you having last year (1995/96)?.....

**C.SOURCES OF INFORMATION**

25. What are the major day to day agricultural activities which you engage yourself in collaboration with other farmers?

1. ....

2. ....

3. ....

26. On average, how many times in a week do you contact other farmers?.....

27. On average, how many times in a week do you contact group representative in the local network?.....

28. On average, how many times in a week do you contacting extension workers?.....

29. Who initiate those contacts?

1. Self initiated.....

2. Other farmer.....

3. Group representative.....

4. Extension agent.....

30. What benefits do you get belonging to local network?

1.....

2.....

3.....

- 31. What kind of information do you expect from local network? .....
- 32. Do you receive the information?
  - 1. Yes.....
  - 2. No.....
- 33. How do you get to know about the important decision concerning the network?.....

**D. THE FARMERS AWARENESS OF MESSAGES RECEIVED**

- 34. In which ways do you get information (in order of importance)concerning the innovation(s) you are using?  
.....
- 35. When did you start receiving the extension messages about tomato production during the rain season?  
.....
- 36. What are the reasons which made you to adopt those messages?  
.....
- 37. What benefits have you got so far from those messages?  
.....
- 38. Are you satisfied with the messages you have received?
  - 1. Yes.....
  - 2. No.....

- 39. If no, why not? .....
- 40. Please mention the extension messages received concerning tomato production in the rain season  
.....
- 41. When did you start receiving the extension messages about private tree nurseries? .....
- 42. What were the reasons which made you to accept those messages?  
.....
- 43. What benefits have you got so far from those messages?  
.....
- 44. Are you satisfied with the messages you have received?
  - 1. Yes.....
  - 2. No.....
- 45. If no, why not? .....
- 46. Please mention the extension messages received concerning private tree nurseries  
.....
- 47. When did you start receiving the extension messages about mountain terracing agriculture? .....
- 48. What were the reasons which made you to accept those messages?  
.....
- 49. What benefits have you got so far from those messages?  
.....

- 50. Are you satisfied with the messages you have received?
  - 1. Yes.....
  - 2. No.....
- 51. If no why not? .....
- 52. Please mention the extension messages received concerning mountain terracing agriculture  
.....
- 53. When did you start receiving the extension messages about dairy goat keeping?  
.....
- 54. What were the reasons which made you to accept those messages?  
.....
- 55. What benefits have you got so far from those messages?  
.....
- 56. Are you satisfied with the messages you have received?
  - 1. Yes.....
  - 2. No.....
- 57. If no why not? .....
- 58. Please mention the extension messages received concerning dairy goat keeping  
.....

**E. FARMERS PERCEPTION ABOUT THE IMPORTANCE OF NETWORKING**

59. How many times have you interacted with other group members in the division(every month)?.....

60. What were the issues discussed in these joint meetings?  
.....

61. How many network meetings did you attend last year?  
.....

62. Give your opinion concerning the existence of farmers network in your division  
.....

**Appendix 2**

**THE ROLE OF FARMERS' GROUPS NETWORK IN THE ADOPTION AND  
DIFFUSION OF SELECTED AGRICULTURAL TECHNOLOGIES IN UPPER  
MGETA, MOROGORO RURAL DISTRICT.**

**QUESTIONNAIRE FOR NON GROUP MEMBERS.**

DIVISION..... VILLAGE.....

RESPONDENTS NAME.....

DATE OF INTERVIEW.....

NAME OF INTERVIEWER.....

**A. SOCIO-ECONOMIC CHARACTERISTICS**

1. Age.....

2. Gender

1. Male.....

2. Female.....

3. Marital status

1. Single.....

2. married.....

3. Divorce.....

4. Widowed.....

5. Separated...

4. Level of education by years of attendance
  1. None.....
  2. Adult literacy.....
  3. Primary education.....
  4. Secondary education...
  5. Post secondary education....
  6. Others (specify)

#### **B. EXTENT OF ADOPTION**

5. Do you practice any of following innovations
  1. Tomato production during the rain season.....
  2. Private fruit tree nurseries.....
  3. Mountain terracing agriculture .....
  4. Dairy goat keeping.....
6. When did you first hear about tomato production during the rain season.....
7. When did you start practicing tomato production during the rain season?
  1. Immediately after getting the information.....
  2. One month latter after getting the information....
  3. Six months latter after getting the information....
  4. One year latter after getting the information.....

5. Two years latter after getting the information.....
6. Three years latter after getting the information...
7. More than three years (specify).....
8. What were the reasons for adopting this innovation?
  1. As a source of income.....      2. For food.....
  3. Others (specify).....
9. What was your total production and area under tomato production last season?
 

Production	Area
.....	.....
10. When did you first hear about private tree nurseries
 

.....
11. When did you start practicing private tree nurseries?
  1. Immediately after getting the information.....
  2. One month latter after getting the information....
  3. Six months latter after getting the information....
  4. One year latter after getting the information.....
  5. Two years latter after getting the information.....
  6. Three years latter after getting the information....
  7. More than three years (specify).....

12. What were the reasons for adopting this innovation?
  1. As a source of income.....
  2. Others (specify).....
13. Do you engage yourself in this innovation in all seasons?
  1. Yes.....
  2. No.....
14. If no, why not? .....
15. Did you engage yourself in this innovation last season (1995/96)?
  1. Yes.....
  2. No.....
16. How many tree seedling did you plant? .....
17. When did you first hear about mountain terracing agriculture?  
.....
18. When did you start practicing it?
  1. Immediately after getting the information.....
  2. One month latter after getting the information....
  3. Six months latter after getting the information...
  4. One year latter after getting the information.....
  5. Two years latter after getting the information....
  6. Three years latter after getting the information...
  7. More than three years (specify).....
19. What were the reasons for adopting such innovation?  
.....

- 20. When did you first hear about dairy goat keeping?  
.....
- 21. When did you start practicing dairy goat keeping?
  - 1. Immediately after getting the information.....
  - 2. One month latter after getting the information.....
  - 3. Six month latter after getting the information.....
  - 4. One year latter after getting the information.....
  - 5. Two years latter after getting the information.....
  - 6. Three years latter after getting the information...
- 22. What were the reasons for adopting this innovation
  - 1. As a source of income.....
  - 2. For food.....
  - 3. Others specify.....
- 23. How many goats were you having last year (1995/96)?  
.....

**C. SOURCES OF INFORMATION.**

- 24. Are you aware of the existence of farmers' network in this division?
  - 1. Yes.....
  - 2. No.....
- 25. If yes how do you understand farmer's network?  
.....

26. Why are not a member of a network?

.....  
.. ..

27. Would you like to be a member?

1. Yes..... 2. No.....

28. If yes, why? .....

.....

29. If no, why not? .....

.....

.....

30. Do you think you can get any benefit by becoming a network member?

1. Yes..... 2. No.....

31. If yes, what benefits.....

32. If no, why not?

.....

33. What are the major day to day agricultural activities which you engage yourself  
in collaboration with other farmers?

1. ....

2. ....

3. ....

- 34. On average, how many times in a week do you spend contacting other farmers?.....
- 35. On average, how many times in a week do you spend contacting extension workers?.....
- 36. Who initiate those contacts?
  - 1. Self initiated.....
  - 2. Other farmer.....
  - 3. Extension agent.....
  - 4. Others (specify).....

**D. FARMERS' AWARENESS OF MESSAGES RECEIVED**

- 37. In which ways do you get information (in order of importance) concerning the innovation(s) you are using  
.....
- 38. When did you start receiving the extension messages about tomato production during the rain season?  
.....
- 39. What were the reasons which made you to accept those messages?  
.....
- 40. What benefits have you got so far from those messages  
.....

41. Are you satisfied with the messages you have received?

1. Yes.....

2. No.....

42. If no, why not? .....

43. Please mention the extension messages received concerning tomato production during the rain season

.....

44. When did you start receiving the extension messages about private tree nurseries? .....

45. What were the reasons which made you to accept those messages?

.....

46. What benefits have you got so far from those messages?

.....

47. Are you satisfied with the messages you have received?

1. Yes.....

2. No.....

48. If no, why not? .....

49. Please mention the extension messages received concerning private tree nurseries

.....

50. When did you start receiving the extension messages about mountain terracing agriculture?

.....

51. What were the reasons which made you to accept those messages?  
.....
52. What benefits have you got so far from those messages?  
.....
53. Are you satisfied with the messages you have received?  
1. Yes.....  
    married...           2. No.....
54. If no, why not? .....
55. Please mention the extension messages received concerning mountain terracing agriculture  
.....
56. When did you start receiving the extension messages about dairy goat keeping?  
.....
57. What were the reasons which made you to accept those messages?  
.....
58. What benefits have you got so far from those messages?  
.....
59. Are you satisfied with the messages you have received?  
1. Yes.....  
2. No.....
60. If no why not? .....
61. Please mention the extension messages received concerning dairy goat keeping  
.....

**Appendix 3**

**THE ROLE OF FARMERS' GROUPS NETWORK IN THE ADOPTION AND  
DIFFUSION OF SELECTED AGRICULTURAL TECHNOLOGIES IN UPPER,  
MGETA MOROGORO RURAL DISTRICT.**

**QUESTIONNAIRE FOR GROUP REPRESENTATIVES IN THE LOCAL  
NETWORK**

DIVISION ..... VILLAGE .....

GROUP .....RESPONDENTS NAME .....

DATEOFINTERVIEW.....NAMEOFINTERVIEWER.....

**A. SOCIO-ECONOMIC CHARACTERISTICS**

1. Age.....
2. Gender
  1. Male.....
  2. Female.....
3. Marital status
  1. Single.....
  2. Married....
  3. Divorce....
  4. Widowed....

4. Level of education by years of attendance

- 1. None.....
- 2. Adult literacy.....
- 3. Primary education.....
- 4. Secondary education.....
- 5. Post secondary education....
- 6. Others (specify).....

**B. EXTENT OF ADOPTION**

5. Do you practice any of the following innovations

- 1. Tomato production during the rain season.....
- 2. Private fruit tree nurseries.....
- 3. mountain terracing agriculture
- 4. Dairy goat keeping.....

6. When did you first hear about tomato production during the rain season?

.....

7. When did you start practicing tomato production during the rain season?

- 1. Immediately after getting the information.....
- 2. One month latter after getting the information.....
- 3. Six months latter after getting the information.....
- 4. One year latter after getting the information.....

- 5. Two years latter after getting the information.....
- 6. Three years latter after getting the information....
- 7. More than three years (specify).....
- 8. What were the reasons for adopting this innovation?
  - 1. As a source of income.....
  - 2. For food.....
  - 3. Others (specify).....
- 9. What was your total production and area under tomato production last season (1995/96)/

Production	Area
.....	.....

- 10. When did you first hear about private fruit tree nursery?  
.....
- 11. When did you start practicing private fruit tree nurseries?
  - 1. Immediately after getting the information.....
  - 2. One month latter after getting the information.....
  - 3. Six months latter after getting the information.....
  - 4. One year latter after getting the information.....
  - 5. Two years latter after getting the information.....
  - 6. Three years latter after getting the information.....
  - 7. More than three years (specify).....

12. What were the reasons for adopting such innovation?
1. As a source of income.....
  2. Others (specify).....
13. Do you engage yourself in this innovation in all seasons?
1. Yes.....
  2. No.....
14. If no, why not? .....
15. Did you engage yourself in this innovation last season 1995/96)?
1. Yes.....
  2. No.....
16. How many tree seedlings did you plant?
- .....
17. When did you first hear about mountain terracing agriculture?
- .....
18. When did you start practicing mountain terracing agriculture?
1. Immediately after getting the information.....
  2. One month latter after getting the information.....
  3. Six months latter after getting the information.....
  4. One year latter after getting the information.....
  5. Two years latter after getting the information.....
  6. Three years latter after getting the information....
  7. More than three years (specify).....

19. What were the reason for adopting such innovation?  
.....
20. When did you first hear about dairy goat keeping?  
.....
21. When did you start practicing dairy goat keeping?
1. Immediately after getting the information.....
  2. One month latter after getting the information....
  3. Six months latter after getting the information...
  4. One year latter after getting the information.....
  5. Two years latter after getting the information....
  6. Three years latter after getting the information...
  7. More than three years (specify).....
22. What were the reasons for adopting this innovation?
1. As a source of income.....
  2. For food.....
  3. Others (specify).....
23. How many goats were you having last year (1995/96)?  
.....

**C. SOURCES OF INFORMATION**

- 24. What are your functions in the day to day operations of your group  
.....
- 25. Would you please indicate below how you came to represent your group in the  
local network?  
.....
- 26. For how long have you been a group representative?  
.....
- 27. Have you attended any network meeting?
  - 1. Yes.....
  - 2. No.....
- 28. If no, why not? .....
- 29. Have you attended any seminar/workshop?
  - 1. Yes.....
  - 2. No.....
- 30. If yes where?..... For how long? .....
- 31. On average, how many times a week do you spend advising other farmers group  
members and non group members in the use of different innovations?  
.....

- 32. Who initiates those contacts?
  - 1. Group members.....
  - 2. Extension officer.....
  - 3. Self initiated.....
  - 4. Other farmers.....
  
- 33. What methods do you use to pass information to farmers on the use of innovation?
  - 1. Verbal.....
  - 2. leaflets.....
  - 3. handouts.....
  - 4. books.....
  - 5. Local network newsletters.....
  
- 34. What benefits do you get being a member of in the local network?
  - 1. ....
  - 2. ....
  - 3. ....
  
- 35. What kind of information do members expect from the local network?  
.....
  
- 36. How do members get to know about important decisions concerning the network?  
.....

**D. FARMERS' AWARENESS OF MESSAGES RECEIVED**

37. In which ways do you get information (in order of importance) concerning the innovation(s) you are using?

1. ....

2. ....

3. ....

4. ....

38. When did you start receiving the extension messages about tomato production during the rain season?

.....

39. What were the reasons which made you to accept those messages?

.....

40. What benefits have you got so far from those messages

.....

41. Are you satisfied with the messages you have received?

1. Yes.....

2. No.....

42. If no why not? .....

43. When did you start receiving the extension messages about private tree nurseries?

44. What were the reasons which made you to accept those messages?  
.....
45. What benefits have you got so far from those messages?  
.....
46. Are you satisfied with the messages you have received?
1. Yes.....
  2. No.....
47. If no, why not? .....
48. When did you start receiving the extension messages about mountain terracing agriculture?  
.....
49. What were the reasons which made you to accept those messages?  
.....
50. What benefits have you got so far from those messages?  
.....
51. Are you satisfied with the messages you have received?
1. Yes.....
  2. No.....
52. If no why not? .....
53. When did you start receiving the extension messages about dairy goat keeping?  
.....

- 54. What were the reasons which made you to accept those messages?  
.....
- 55. What benefits have you got so far from those messages?  
.....
- 56. Are satisfied with the messages you have received?
  - 1. Yes.....
  - 2. No.....
- 57. If no why not? .....

**E. FARMERS PERCEPTION ABOUT THE IMPORTANCE OF NETWORKING**

- 58. Constitutionally how many meetings are supposed to be held in a month/year?.....
- 59. How many meetings did you attend last year?  
.....
- 60. If none, Why? .....
- 61. How many times (for last season) have you interacted with other groups in the division? .....
- 62. What were the issues discussed in these joint meetings?  
.....
- 63. Have you ever participated in any farmers' exchange programme?
  - 1. Yes.....
  - 2. No.....
- 64. If yes which other farmers did you visit or visited you?  
.....

65. If no, why not? .....
66. Can you rank the activities you have participated in the network in order of perceived importance?  
.....
67. What are your duties as a group representative in the local network?  
.....
68. Are there extension worker(s) in your division?  
1. Yes..... 2. No..... 3. Don't know.....
69. If yes mention their names  
1. ....  
2. .... 3. ....
70. State the number of times you have interacted with the extension agent during the last six months
- a. Home visits  
1. Once..... 2. Twice.....  
3. Three times..... 4. Four times and above....
- b. Meetings  
1. Once..... 2. Twice.....  
3. Three times..... 4. Four times and above..
- c. Demonstrations  
1. Once..... 2. Twice.....  
3. Three times..... 4. Four times and above..
- d. Others (specify) .....