Journal of Continuing Education and Extension (JCEE)

A Journal of the Institute of Continuing Education, Sokoine University of Agriculture, Morogoro, Tanzania

Vol. 4 No. 1 **June 2013**

Journal of Continuing Education and Extension (JCEE)

A Journal of the Institute of Continuing Education, Sokoine University of Agriculture, Morogoro, Tanzania

Vol. 4 No. 1 **June 2013**

Editorial Board

Objective and Scope:
The objective of the JCEE is to provide a forum for intellectual discourse on issues that are relevant co continuing education, extension services and development in general.

Subscriptions:
JCEE is published twice a year. The two issues for each year will constitute one volume. The Journal is operating within an initial circulation of 400 copies per issue, subject to review from time to time. Annual subscription is US dollars 10.00 or Tanzania shillings 10,000.00 per issue. This includes postage by surface mail. All subscriptions should be sent to:

The Chief Editor,
Journal of Continuing Education and Extension,
Sokoine University of Agriculture,
P.O. Box 3044,
Morogoro, Tanzania
Tel: 255-23-26044549
Fax: 255-23-2603718
E-mail address: jcee@suanet.ac.tz,
jceesua@yahoo.com

Table of Contents

Editorial

We are delighted to bring to you the fourth volume of the Journal of Continuing Education and Extension (JCEE). The editorial Board has been reconstituted and a new section has been added.

Continuing education entails regular updating of knowledge and skills in order to improve future service delivery. The founders of this journal intended it to be a forum where intellectuals and stakeholders in agriculture and rural development in general would share experiences for the purpose of learning from each other. Such sharing may not necessarily involve presentation of articles that meet the analytical rigor, normally expected of academic articles. Rather, the information for sharing may contain a simple but clear description of field experiences in relation to; models for delivery of extension services, models for stakeholders empowerment and inclusion in development processes as well as negative experiences to be avoided by others who may pursue similar approaches in future. Sharing and learning is currently used by many organizations as an important strategy for scaling up their positive experiences.

In the case of agricultural extension and education, relevant experiences exist among many organization that are actively engaged in providing extension services to farmers and other stakeholders in agriculture. The service providers mainly include Local Government Authorities, Non-governmental organizations (NGOs). This journal has created space for stakeholders to share their experiences so that others can learn from them. The second part of this issue; "**From the Field**," presents the experience of RECODA and Rockwool Foundation to develop a model which has attempted to solve the paradox hindering livelihoods improvement among smallholder farmers in Tanzania. The Rural Initiatives for Participatory Agricultural Transformation (RIPAT) provides an alternative extension model for technology transfer to small scale farmers so that poverty reduction and food security is attained in Tanzania. We invite more similar empirical examples to be shared in future volumes of this journal. We look forward to more pragmatic sharing and learning through this forum.

Chief Editor
Aida C. Isinika
June 2013

ARTICLES

Nature and cost of participation in farmers field School: Case study from North Wollo administration zone, Ethiopia

M.G. Gebreyes[1] & A.Z. Mattee[2]

[1]Mekelle University, Ethiopia.
[2]Sokoine University of Agriculture

Abstract

This research was conducted on Integrated Pest Management (IPM) Farmers Field School (FFS) project of Save the Children - UK in North Wollo Administration Zone, Ethiopia. The objectives of the study were to assess the nature and quality of farmers' participation in development projects and to analyze the cost of participation for different categories of farmers. Data were collected using focus group discussions, observation and interviews with 120 respondents. Simple descriptive statistics were used to analyze the quantitative data using SPSS software. The qualitative data were coded in two categories using constant comparison and asking question techniques. The nature of participation evolved from lower consultative form of participation to higher levels involving self-mobilization. The cost to farmers in terms of time spent on project activities was found to be high. The financial and material cost of participation, however, were affordable to the farmers. It is recommended that the members be facilitated to gain adequate benefits from their involvement by linking the schools to other stakeholders and service providers and that expansion and growth of each school should be encouraged by increasing the number of members of the school to also include the disadvantaged, and by diversifying activities of the school.

Keywords: Farmer Field School, farmers' participation, participation cost

Introduction

The Transfer of Technology (TOT) model for development led to a dramatic increase in agricultural production and productivity in mid 1980s. Third world agriculture, however, benefited little from this model. The fundamental causes of this failure were the absence of physical and economic conditions ideal for TOT, and the exclusion of important stakeholders from development decisions (Chambers and Toulmin, 1991; Karl, 2000; Heck, 2003). This led to a considerable gap between the change agents as outsiders and the target group as insiders whereby the outsiders monopolized development (Reason, 1998) and the insiders rejected even well-developed recommendations (Pretty and Hine, 1999).

The above failure led some development specialists to question the philosophies of the TOT model of development and generally the power relation between the poor, illiterate and disadvantaged rural people and the rich, educated, urban and advantaged people. Hence, they proposed a development approach, which would reverse the above situation (Chambers, 1983; Chambers, 1991). The reversal called for farmers' own analysis to be the basis of research and development priorities, for farmers to experiment and evaluate, for scientists to learn from and with them, and for research and extension services to farmers to be decentralized, differentiated, and versatile (Chambers, 1993; Chambers and Toulmin, 1991). The result of the above movement was a boom of participatory methodologies. The pressure from donors and international agencies made most local projects to pretend as much as possible to be participatory. Hence the words 'participation' and 'participatory' came to be the daily languages of development practitioners. However, participation has come to be a catch-all concept which means different things for different people. It can also be attained at different levels. Projects which merely inform what has happened or what is going to happen and projects which mobilize farmers to solve their own problem using locally available resources equally claim to be participatory. Moreover, participation has been found to create more problems than it can solve when not handled with care. It can disturb the local power relations, it can force local people to shoulder the responsibility of development and it can initiate unmet expectations and many other problems (Arnstein, 1969, Pijnenburg, 2004). Because of these facts, participation is not something which can be taken as a solution for all problems of development, rather it should be critically considered to ensure that its advantages are more pronounced than its disadvantages (Turnhout *et al*., 2010).

Another important concern with regard to participatory approaches is the cost they involve. There is empirical evidence for the cost of participation for implementing agencies. It was found that generally, participatory projects tend to be costly at initial stages but become less costly at later stages as stakeholders begin to take their own initiatives and cover their own cost (Heck, 2003). However, the evidence on cost of participation for primary stakeholders especially farmers is elusive. It is generally agreed that participation costs time, money and other resources (FAO, 1997). Specifically concerning the Farmers Field School (FFS) approach, farmers must attend a 3 - 4 hour meeting once every week for one whole growing season. The length of a season varies depending on the type of enterprise chosen (Scarborough *et al.,* 1997). Participatory projects with instrumental purposes would also require labour and local material contribution as the main form of farmers' participation (Gonslaves*et al.,* 2005). Besides,

participation in empowering activities would risk farmers' relation with local political leaders or other sections of the society since the relatively stable power relation has to be disturbed (Pijnenburg, 2004; FAO, 1997).

Accordingly, evaluation of the process involved in participatory approaches is considered important to ascertain its advantages and such evaluation would focus on, among others, the nature of participation and costs involved in the process aspects which are commonly less understood in the existing participation literature. This study was conducted to assess the nature of farmers' participation and cost they incur through their involvement in participatory projects, specifically in Farmers Field School. By taking the case of Save the Children (UK), the study attempted to examine the nature of participation by considering seven dimensions of participation which were adopted from the work of Simpson and Cala (2001) and UNDP (1996). The dimensions considered were:

(a) *Whose agenda*: Whatever the purpose or ultimate goal of the project, people's interests, their needs and their wishes must be allowed to underpin the key decisions and actions relating to the project;

(b) *Who participates:* Participatory development should seek to improve gender inequalities through providing a means by which women can take part in decision making. Apart from women, participatory projects should deliberately target other disadvantaged sections of the society like the youth, the ethnic minorities, the poor etc;

(c) *Institutional arrangement for participation:* Formation of institutions is part and parcel of participatory projects. It is usually encouraged to work with existing local institutions. However, whenever this is not appropriate for any reasons, new institutions could be established.

(d) *Autonomy vs control:* as far as it is realistic to do so, participatory projects should seek to invest as much responsibility as possible with the local people, and thus avoid leaving absolute control in the hands of project staff;

(e) *Timing of participation:* Participation which is initiated early in a community development project cycle is preferable, and enhances the opportunities for capacity building, empowerment and community ownership;

(f) *Role and role transformation:* Participating farmers could have different roles in the project. Some could have specific roles, others non-specific or still others peripheral roles. However, participatory projects must facilitate development or empowerment of individuals

in their roles as participants which would allow participants to take increasing responsibility for more decision-making, planning, organizing and implementation over time;

(g) *Self-reliance:* A participatory project should seek every possibility to base its activities upon local resources, to avoid situations of dependence on external resources and also to help develop local capabilities, which will be important if development is to be sustained.

The history of Save the Children (UK) in Ethiopia dates back to 1972, when it delivered its first food aid. In 1973, it established a country office and a country program, and has maintained a presence ever since. In its early stages in Ethiopia in general and Wollo in particular, this non-governmental organization (NGO) focused on relief assistance.

However, since 1984 it has run several agriculture-related programs in the region including the Emergency Seed and Tool Support in North and South Wollo; and the Integrated Pest Management Project. Others are the Household Economy Analysis Project for Amhara Region; Farmer-led Extension and Research Project and Community Livestock Development Project. In northern Wollo, the organization's interventions focused mainly on the control of crop pests, one of the identified constraints to agricultural production in the area. The approach that was used to combat the problem evolved over time. Eventually, the organization focused on an integrated pest management (IPM) through the Farmer Field School (FFS) approach.

Since 2000 Save the Children (UK) has implemented a full-fledged project on IPM/FFS. The project had six areas of focus which include capacity building at different levels by providing training on issues of IPM and FFS, provision of material support for partner organizations, and establishment and running of FFSs. A total 126 FFSs were established in the North Wollo and Wag Hemra Administrative Zones. Each school was planned to have 24 members and each school was supposed to attract 12 follower farmers.

Methodology

This study was based on a cross-sectional design using a combination of quantitative and qualitative approaches. It was conducted in three Districts which were purposively selected from the North Wollo Administrative Zone. From each District three Farmers' Field Schools were selected purposively. The criterion of selection was accessibility. Schools which were along the main road or within walking distance from the main road were chosen. The population for the study was all the members of the FFS. The sampling frame was the list of members found in each school. From

each school, 15 members were selected. These consisted of five members in leadership position (one leader, two facilitators, one treasurer and one secretary), and ten ordinary members selected using a simple random sampling technique. With this technique, 120 respondents were obtained.

Several methods were used for data collection so as to increase the validity and reliability of the data collected. Personal interviews were used to collect data from respondents using a structured questionnaire. A checklist of questions were used to collect data from senior experts and Development Agents (DAs) and six focus group discussions, which were held with members of Farmer Field Schools. Participant observation was used to assess the condition of the farm plots of the schools and the participation of different categories of members of the schools during different occasions such as regular weekly meetings and graduation ceremonies of the schools. Constant comparison and questioning techniques were used to analyze the qualitative data. With these techniques, data unitization and categorization were made. The quantitative data were entered into SPSS and descriptive statistics such as means, media, standard deviations and chi-square values and t-test were computed.

Results and Discussion

Nature of Farmers Participation in the Project

As indicated earlier, the type and quality of participation could take different forms depending on the objective of the project. However, well beyond the objective of the project, participation could also take different forms depending on the difference between the project discourse and practice. The study attempted to look at the nature of participation by considering seven dimensions of participation which are adopted from Simpson and Cala (2001).

(a) Whose Agenda?

Participatory projects are supposed to reflect farmers' agendas (UNDP, 1996). One way of looking at whose agenda the project was promoting is to look at the project initiation process. The secondary data review revealed that the NGO undertook helicopter survey in 1993 and found that pests were a major production constraint. Since then it experimented on IPM in different parts of the two Administrative Zones. Hence, when the project was initiated it was with the assumption that the problem was common to all farmers in the area.

As an initial exercise, the project staff conducted series of PRA activities for different stakeholders and meetings with local communities. The

agenda for the PRA exercise and the meetings with the farmers was already set by the organization. The PRA was done to familiarize the stakeholders with local conditions and the project modalities. The meetings with the farmers were to convince farmers to join FFS. There was little chance for farmers to change the focus of the project. But, did the project objective and the farmers' objectives coincide? The results of the survey and focus group discussions indicate that farmers also felt that pests were their most serious concern. Hence, even though the project beneficiaries had no say on the focus of the project, the project agenda was still their concern.

(b) Who Participates?

Participatory approaches are also expected to benefit women and other disadvantaged section of the society (UNDP, 2006). On this issue, the project documents revealed that 14.8% of the members of the FFSs in both Zones were women. Specifically in the study area the proportion of women farmers was 20.8%, 15.0%, and 15.6% for Gobalafto, Kobo and Habru Districts respectively. This proportion was lower than the project's plan to make the proportion of women at least 20%. With regard to the social status, the school members demographic characteristics of the respondents revealed that most of the members were above 31 years, married, and had some form of formal education. More than half (61.9%) of the members had some form of leadership role in their community. The wealth ranking done during the focus group discussions revealed that the proportion of poor, middle and rich members was 21.7%, 55.7%, and 22.6% respectively. Hence, one can easily see that the project was biased towards better-off farmers and that the poor farmers were under-represented.

(c) Institutional Arrangement for Participation

Formation of local groups or institutions is one of the important features of participatory approaches (Rudqvist and Wood-Berger, 1996; FAO, 1997). The very concept of FFS also requires formation of farmer groups of 20-30 members each. The size of the schools was set to be 24 by the project staff. The members were divided into four sub groups of six members each. This is the standardized approach for FFS. The number of dropouts was minimal for all the schools under study. The reasons, as expressed during focus group discussions, seemed to be two fold. The first is that the members had seen the benefits of their participation. They asserted that they were able to save their produce from pest attack using the technologies and practices they developed themselves. The schools also boosted the farmers' confidence since they helped them to be seen as researchers in the community. The positive social relations they enjoyed were also mentioned as an important motivational factor for their staying with the schools.

The second reason is related to the commitment they made when the community selected them to participate in the FFSs. The community selected them so that they would learn and help others to learn the same. Considering this fact, the constitutions of each school stipulated the penalty for those who were inclined to dropout. In some of the schools, the penalty amounted to 50 birr (5.7 US dollars) and returning of all property of the school like overcoats, boots, gloves, and any other item provided by the school. If the person failed to pay the penalty willingly, the constitution demanded that he/she would be sued in the local social court. The only option is to stay with the school irrespective of their satisfaction or otherwise. The survey results reflected the members commitment since majority of the respondents (65.8%) felt that the school belongs to them.

Indicators on institutional arrangement include the frequency of meetings, the rate of attendance to meetings and the linkage between project groups. In principle FFS does not require members to meet more than once in a week. However, the schools had been meeting continuously for the last two and half to five years, which could be taken as an important strength and development of the schools. A serious problem, however, was found in the absence of linkages between the schools. Linkages were meant to lead to the formation of associations or federations in order to horizontally spread project activities. Hence, after withdrawal of Save the Children from the project area, there are less chances for the schools to organize experience-sharing programmes.

There was no increase in the number of members because of the project policy, which did not allow membership to exceed 24 per school. Growth and expansion could be possible either by increasing the number of members in each school or by forming new schools, which could invite other interested farmers. The approach of expansion adopted by the project was to form follower farmers who, as the name implies, follow the prescriptions made by FFS members. However, this would make the followers to be users rather than generators of the technologies. Growth would have also been possible in terms of the focus of the school. Based on experience from other countries, the focus of the FFS can be expanded from pest control to marketing, soil erosion control and any other constraint (Braun, and Duveskog, 2008). The schools under study, however, focused only on pest control for all the years of their operation.

(d) Autonomy Vs Control

During the implementation period of the project, different decisions pertaining to the activities of the schools had to be made. Hence, the

respondents were asked to rank the five major stakeholders in the project. The most powerful was reported to be leaders of the school followed by members of the school as the second most important, the local Development Agent as third most important, the staff of Save the Children-UK as fourth most important and finally the local administration as the least important. Almost all (98%) respondents agreed that farmers were vested with responsibilities in the school. Besides, 99.2% of the respondents agreed that farmers were autonomous in their decision regarding the school. Hence, it is safe to conclude that farmers had considerable autonomy in deciding their regular activities in the school.

There were vivid local initiatives by the schools, which the project did not initially envisage. For example, although the project was intended to tackle the problem of crop pests, the schools expanded this objective to include livestock and household pests. Furthermore, most of the schools had an arrangement to help orphans and there were schools which involved themselves in sensitizing the community about HIV/AIDS. At least one of the schools was providing credit to its members as an additional service. All these were local actions, showing that the schools were autonomous in what they intended to do.

(e) Timing of Participation

The nature of participation was determined by examining how, farmers or project officials, made major decisions pertinent to a given cycle and in doing so, whether or not the interest of the other party was taken into consideration (Gonsalves *et al*., 2005). As indicated in Table 1, the nature of members' participation evolved at different phases of the project from merely being informed which is considered to be the lowest form of participation to self-mobilization which is the highest level of participation.

Table 1: Nature of participation by FFS members (N =120)

Nature of participation	Informing		Consulting		Collaborative		Collegial		Self-mobilization	
Project phases	No	%	No	%	No	%	No	%	No	%
Problem/need assessment	7	5.9	56	47.5	18	15.3	27	22.9	10	8.5
Planning and designing	26	21.8	20	16.8	38	31.9	22	18.5	13	10.9
Implementation	6	5.0	0	0.0	20	16.8	43	36.1	50	42.0
Evaluation	30	25.2	0	0.0	32	26.9	18	15.1	39	32.8

(f) Role and role transformation

The schools were designed to have a consistent structure throughout the project area. Hence, each school had one leader, two facilitators, one secretary and one treasurer. The election of those in leadership position was made during the early stages of the school. There was almost no complaint about the election procedure, since 88.2% of the respondents felt that the elections were transparent. Besides, 97.5% of the respondents reported that their leaders were capable of what they were doing. What was lacking was role transformation. There was no institutional mechanism for role transformation. Accordingly, 90.5% of the respondents said that there was no change in their role since the beginning of their participation. Whatever little role transformation that took place it was made in situations where one of the leaders was not able to accomplish his/her task for some reason.

(g) Self-Reliance

One of the very positive aspects of this project was its complete reliance on the knowledge and skills of farmers. The only materials provided for the schools were working gears like overcoats and gloves. Otherwise, the fundamental resources were the indigenous wisdom and strong social relation among members of the schools. The grassroots Development Agents and the senior officials were asked about evidence of the level of self-reliance. The evidence for reduced reliance on the project staff was the farmers' attendance at meetings without external pressure, the schools making important decisions without waiting for instructions from the organization, the schools developing the capacity to solve their problems using locally available materials and their own knowledge, the schools generating their own funds, and members working hard without expecting any compensation.

Evidence which shows reduced reliance on project inputs was also solicited and this included the schools using locally available materials for experimentation, members using their own farming tools and equipment and the experimental plots, and covering their stationery costs from their school accounts. Another evidence for self-reliance was whether the schools had self-initiated activities. In this regard, previously the NGO used to provide schools with seedlings of botanicals for use as pesticides; however, later the members began raising the seedlings on their own. They also expanded the project objective from tackling only crop pests to including livestock and homestead pests as well. Some of the schools also launched a program to help orphans in the community.

Cost of participation for farmers

The cost of participating can be in terms of the time, finances and materials spent on the project, which could have been used for other purposes. Participants may also incur social cost depending on how the rest of the community views the project. These were assessed in this study.

(a) Cost in terms of time

One of the challenges of farmers to participate in development projects is that it consumes considerable amount of their time. The study showed that at least five major activities namely; weekly meetings, collection of botanicals, taking part in the school farm plot, participating in experience sharing activities, and coordinating members are common for all the schools.

During weekly meetings members prepare plans, discuss their execution and monitor and evaluate their progress. The number of meetings varies from a minimum of two to a maximum of eight with an average of four per month. The duration of meetings varies from a minimum of one hour to a maximum of 8 hours, the average being 2.74 hours per meeting. The frequency of botanical collection varies from once to 12 times per a month with an average of 3.62 days per month. The average time taken for collection was recorded to be 2.56 hours per trip.

Participating in the school farm plot took different forms. Usually the whole group should be divided into six sub-groups and each sub-group would be responsible for a specific task, which is to be accomplished during the week. The task to be done varied according to the type of enterprise and the season, and usually was to be done during a time in which farmers were also busy in their own farms. The frequency of the task is reported to vary from one up to eight times per month with an average of 3.5 days and the amount of time required during each working day varying from 1 to 12 hours with a mean of 4 hours per task.

Besides the above tasks which were common for all schools, about 58% of the respondents participated in experience sharing activities of the schools organized by the project. The experience sharing activities were both intra and inter District. On average, 58% of the respondents used 1.3 days per month for such activities which took a mean of 9.3 hours. Coordinating other members was also a task for about 62% of the respondents. Coordination is required during weekly meetings, farming days, or collection of botanicals. On average, those who were in charge of coordination would be involved in this task for about 3.2 days each month.

The respondents were asked to rank the above roles according to their difficulty. Interestingly, 20.3% of the respondents said that none of the tasks was difficult. The most difficult task mentioned was collecting botanicals followed by preparing the chemicals, coordinating members, the farming practices and participating in experience sharing activities respectively.

Independent t-test was used to see if there was significant difference between those in the leadership position and the ordinary members in the level of attendance and the amount of time spent on each activity. Accordingly, only the level of participation in experience sharing activities shows significant difference (t value 2.17, df 68, p 95%). This means that those in leadership position were more involved in attending experience-sharing activities compared to ordinary members. This also means that in most respects the difference in the level of participation between FFS members was minimal. The same test was conducted to see if there was a difference between male and female members of the schools. Accordingly, only the number of times that members play a coordination role shows a significant difference between the two sexes (t value -2.23, df 73, p 95%), with women playing a more active role in coordinating other members than their male counterparts.

(b) Financial and material costs

The financial cost of farmers' participation is relatively low. Generally the financial contributions were fo;r regular subscription to the school fund, helping out members during calamities such as death or sickness, helping out orphans in the area, organizing social functions, and for purchasing equipment. At times, the schools cover the above expenses from their financial account. Some of the schools had regular monthly subscriptions. This was considered affordable since members could do it in several small installments. Some of the schools have an arrangement to help orphans using their school fund. However, most of such contributions were made during death in the family of the school members. There was no difference among members in the above contributions, as the leaders and the members contributed equally.

The material contributions were also affordable. Members had to contribute a few stands of trees for preparing pegs to be used on the experimental plots. In a few schools, members contributed a few kilograms of seed for experimentation. In a few schools, members also contributed household utensils like buckets, cups, and mortars at the beginning of the school.

Overall, however, the contributions were regarded as insignificant by most farmers as it was revealed during the focus group discussion.

(c) The Social cost

Participating in an empowering activity could disrupt the local power relations and could be disputed by different sections of the society. The following section describes the reactions of three important sections of the society; family, non-FFS farmers and the local administration in relation to members' participation in the schools. The reactions are categorized based on two periods; reactions at the beginning of the school activity and reactions during the research period.

i) Family members

The reaction of family members was quite negative during the initial stages of the project. The weekly meetings of the school coupled with their consistent engagement in the school farm made the family members irritated. About 68% of the respondents said that they were subjected to family mockery. They were given derogatory nicknames like '*bichalebas*" after the yellow overcoat supplied by the project organization, or '*checkchaki*' after the traditional chemical preparation. Sixty six percent (66%) said that their family members used to tell them that they were engaged in a useless activity. On the other hand, the fact that they were part of a project regarded as 'foreign', 37% of the respondents said that they were suspected of getting monetary benefits. For this reason, their spouses required them to share what they got, which became a source of serious family conflict for some of the members.

However, the majority of the respondents said that the oppositions from the family members were not serious in nature; only 32% of them reported serious opposition. Moreover, not all family members had negative reaction towards participation of members in the IPM/FFS project. Accordingly, 33.6% of the respondents reported that their family members supported their activity and another 31.1% said that their family members considered their activity as effective.

The respondents were asked about the situation during the implementation period. Only 16.8% of the respondents said that they experienced family mockery and 17.5% said that their family members regarded their activity as useless. The percentage of serious opposition was also reduced to 10.3%. During this phase, support from family members increased. About 96.6% of the respondents said that they were getting full support and 94.1% said that their family members considered their project activity to be effective.

The reason for such a change, as reported by respondents during focus group discussions, was the proven effectiveness of the project activity. Some of the families saw their crops being saved from pest attack. Their livestock also benefited from the traditional chemicals produced by the FFS group.

The chi square test showed that there was statistically significant difference in the family members mockery against members of the school at the beginning of the schools and during the implementation period ($X^2 = 10.85$, df = 1, p>95%). This means a smaller proportion of farmers was facing mockery from their family members during the implementation period when compared to the time when the schools began. Family members' feelings that the school members were getting monetary payment from the NGO also showed statistically significant difference between the beginning of the schools and during the implementation period ($X^2 = 4.29$, df=1, p>95%). This means that a smaller proportion of farmers felt that their family members were being paid by the NGO during the research period when compared to the period at which the schools began their operation.

ii) Non - FFS Farmers

Members of the FFS experienced much more pressure from their neighbours than they did from their family members. This was evident from the fact that 86.7% of the respondents reported that they were subjected to mockery from their neighbours. They were given negative and degrading names. Likewise, 80% of the members were persistently told that they were engaged in a useless activity.

Over 60% of the respondents were suspected of getting monetary payments for their participation. The opposition was much more serious than that from family since 54.2% of the respondents reported that they experienced serious opposition. This opposition took different forms. In some cases when there were communal activities to be done such as the repair of irrigation canals which coincided with the famers' field school activity, members of the FFS were not excused since their project was regarded as useless. Furthermore, some farmers felt that the traditional pesticide preparation by the FFS members may prevent the government from providing industrial pesticides to farmers. As a result, they opposed the project activities. Accordingly, only 17.5% of the respondents reported that they got support from their neighbours and 15.1% of them said that their neighbours appreciated their efforts.

During the focus group discussions, discussants confirmed that, as in the case of the family members, the proved effectiveness of the project activity during the implementation phase reduced the negative pressures. In some of the project areas members of the FFS were seen as pest control experts. The FFS members were the first to arrive and help whenever there was a pest outbreak at the village. Some schools were also giving regular pest spraying service for their neighbours' livestock. Nonetheless, discussants confirmed also that the changes in these reactions were not pronounced. The chi-square test showed insignificant difference at p>95% for all reactions of non-FFS farmers.

iii) Local Administration

Another source of pressure for members of the FFS was the local administration which was critical for the survival of the field school because of its power to effect strong decisions. However, because the local administration was ready to support local initiatives it was more supportive of the FFSs when compared to family members and non-FFS neighbouring farmers.

Accordingly, during the initial stages of the project, 42.5% of the respondents reported to experience mockery from local administration. Another 42.5% felt that the local administration considered their work as useless and 45% said that the local administration had believed members were being paid. Only 35% of the respondents experienced serious opposition from local leaders. This took many forms. In some cases the work schedule of the field school and that of the local communal work collided. In such cases members were penalized for not availing themselves for the communal work. In some cases the schools were not able to secure their own experimental plots due to lack of support from the local leadership. Even though the above analysis showed that pressure from the local leaders was relatively less but they were not cooperative enough. This was evident by the fact that only 35.5% of the respondents said that the local leaders supported their work and only 38.3% considered the work of FFS members as effective.

Here again the proved effectiveness of the FFS project activities during implementation impacted on the perception of the local administration. Their mockery, attitude of project being useless, their feeling that members were being paid and their serious opposition to the project dropped from initial high level (over 40%) to 16.7%, 15.1%, 210.8% and 12.5% respectively. On top of that, their support and feeling that the project activities are effective rose to 93.3% and 95.0% respectively. The chi-

square test showed that there was a significant difference in local administrators' perception during the implementation phase compared to the beginning of the project.

Conclusion and Recommendations

The nature of participation by farmers in the IPM/FFS project varied depending on the project cycle. It evolved through time from lower levels to higher levels of participation. However, both extremes of participation proved to have their own problems. When the level of participation was low, it led to narrow project focus and when it was higher it led to avoidance of the necessary follow-ups by project staff. The structure of the schools in terms of roles was uniform. But, the structure faced one serious defect observed - lack of role transformation. The roles assigned during the establishment of the schools remained the same throughout the project period with few exceptions. The level of self-reliance among schools was considerably high. The schools were running using locally available material and based on indigenous knowledge. The income generating schemes adopted by the schools enabled them to cover their financial expenses. The only problem in this regard was lack of linkage between the schools and the other important stakeholders like researchers, credit organizations, and input supply organizations which impeded the schools' ability to secure resources without the involvement of a third party.

Regarding the cost of participation among the three types of costs considered, time, social relations, and the financial cost of materials, the first two were found to be significant. The time that farmers invest to participate in the project activity was considerable and the fact that most of the schools activities should be done during the peak working seasons made it more demanding. However, most of the schools managed to run effectively for several years. The members of the schools faced a hard time in dealing with the social pressures from family members and neighbours. Nonetheless, the concrete benefits that they were realizing following project implementation helped them to patiently deal with pressure from others, but also reduced the negative stigma, especially from family members and local leaders. Finally, most of the schools' activities required locally available materials but most farmers could afford the financial costs.

Based on the above findings the following recommendations can be made. Since the time cost of participation was considerable, it is important that the members are facilitated to gain adequate benefits from their involvement in the schools by linking the schools to other important stakeholders and service providers like researchers, credit and inputs supply organizations

and output markets. Expansion and growth of each school should be encouraged in terms of increasing the number of members of the school to also include the disadvantaged, and to diversify activities of the school. Regular elections should be institutionalized to give all members of the schools the opportunity to develop leadership skills. The community at large also must be briefed on the importance of the project, its objective, outcomes and potential benefits even if they are not direct participants in the project. Efforts should also be made to involve the community more directly by organizing field days whereby community members are invited to come, observe and learn from the FFS plots.

References

Arnstein, S. R. (1969) *A ladder of citizen participation*. Journal of the American Planning Association 35:216–224.

Braun, A. & Duveskog, D. (2008) *The Farmer Field School Approach – History, Global Assessment and Success Stories*. Background Paper for the IFAD Rural Poverty Report 2011

Chambers, R. (1983). *Rural Development: Putting the Last First.* Longman Group, Hong Kong. 245 pp.

Chambers, R. (1989). Reversals, Institutions and Change. In: Chambers, R., Pacey, A. and Thrupp, L. (Editors). *Farmer First.Farmers Innovation in Agricultural Research.* Intermediate Technology Publications Ltd, United Kingdom. Pp. 181-195.

Chambers, R. (1993). *Challenging the Professions. Frontiers for Rural Development.* Intermediate Technology Publications Ltd, UK. 143pp.

Chambers, R. & Toulmin, C. (1991). Farmers-First: Achieving Sustainable Dry Land Development in Africa. In: Haswell, M. and Hunt, D. (Editors). *Rural Households in Emerging Societies. Technology and Change in Sub-Saharan Africa.* Berg Publisher Ltd, USA. Pp 23-48.

Gonsalves, J., Becker, A., Braun, D. Campilan, H., De Canves, E., Fajber, M., Kapiriri, J., Rivaca-Caminade & Vernooy, R. (Eds). (2005). *Participatory Research and Development for Sustainable Agriculture and Natural Resource Management: A Sourcebook. Volume 1: Doing Participatory Research and Development.* International Potato Center-Users' Perspectives with Agricultural Research and Development (CIP-UPWARD), Laguna, Philippines and International Development Research Center, Ottawa, Canada. 248pp.

Heck, B. (2003). Participatory Development. Guidelines on Beneficiary Participation in Agriculture and Rural Development, 2nd Edition. Available at: ftp://ftp.fao.org/docrep/fao/007/AD817E/AD817E00.pd site visited on 2/2/2006.

Karl, M. (2000). Monitoring and Evaluating Stakeholders' Participation in Agriculture and Rural Development Projects: a Literature Review. Available at: http://www.fao.org/sd/PPdirect/PPre0074.htm site visited on 2/2/2006.

Pijnenburg, B. (2004). Keeping it vague. Discourses and practices of participation in rural Mozambique. Dissertation for Award of PhD at Wageningen University, The Netherlands. 238pp.

Pretty, J. & Hine, R. (1999). Participatory Appraisal for Community Assessment: Principlesand methods. Available at: http://www2.essex.ac.uk/ces/CommParticiaption.CompartPrinciplesnmethods.htm site visited on 5/2/2006.

Reason, P. (1998). Political, Epistemological, and Spiritual Dimensions of Participation: Studies in Cultures, Organizations and Societies. Available at: http://www.scu.edu.au/schools/gem/ar/w/Reasonl.pdf site visited on 25/2/2006.

Rudqvist, A. & Wood-Berger, P. (1996).Evaluation and Participation – Some Lessons, SIDA Studies in Evaluation 96/1, Stockholm. Available at: http://www/sida.se./shared/jsp/download.jsp?f=STUD96-1.pdf site visited on 25/2/2006.

Scarborough, V., Killough, S., Johnson, D. & Farrington, J. (Eds). (1997). *Farmers-Led Extension: Concepts and Practices.* Intermediate Technology Publications Ltd, UK. 228pp.

Simpson, B. & Cala, C. (2001).Measuring the Results in Community Development.An Exploration of Participation and Network Capacity Domains. http://www.thealex.ca/publications/Measuring_Results_In_Community_Development.pdf. site visited on 5/2/2006.

Turnhout, E., S. Van Bommel, and N. Aarts. (2010) *How participation creates citizens: participatory governance as performative practice*. Ecology and Society. 15(4): 26. Available at: http://www.ecologyandsociety.org/vol15/iss4/art26/

UNDP (1996). Empowering People: A Guide to Participation. Available at: www.undp.org/cso/resource/toolkits/ewmpoering/ch6.htl site visited on 5/2/2006.

The impact of microfinance on rural China women's lives: A case study of the Pucheng County Women's Sustainable Development Association

J.S. Kahamba[1] & A.S. Sife[2]

[1]A graduate from Beijing Normal University. Email: jdekayz@yahoo.com
[2]Senior Librarian at Sokoine University of Agriculture. Email: asife@suanet.ac.tz

Abstract

In rural China, women have remained vulnerable to poverty and gender inequality is still widespread. Women's Non-Governmental Organizations (NGOs) including NGO-microfinance institutions have been established with the goal of helping women improve their socio-economic status both inside the household and in the wider community. This study took a case of the Pucheng County Women's Sustainable Development Association (PCWSDA) to explore the impact of microfinance on local women's lives. The study employed qualitative methods including interviews, focus group discussion and observations. A total of 15 women borrowers, five loan officers and one leader from PCWSDA were interviewed, and 13 women borrowers participated in a focus group discussion. Data were analyzed qualitatively by deriving categories to code the data directly and inductively. The results revealed that microfinance services have positively impacted women's lives through increased household income, improved living standards, increased capacity of sending their children to school, participation in entrepreneurial activities, and improved decision making power. Lessons learnt from this study include the need to involve male partners and considering other gender characteristics in providing the loans, as well as providing microcredit along with technical services such as training and expert backup support.

Keywords: Microfinance, empowerment, women, China

Introduction

Improving rural women's living conditions, promoting women's participation in decision-making, and reducing poverty among women have been recognized as important goals of sustainable development in many countries. Microfinance has increasingly become one of the key methods for reducing poverty, improving wellbeing, and empowering poor women. Since the 1970s, many organizations world-wide have used microfinance as a way to increase women's incomes and to bring women together to address wider gender issues (Mayoux, 2006). In 1983, Prof. Yunus created the Grameen Bank, which to date has lent more than $6 billion and has become the basic model for modern microfinance that includes group and women-focused lending. In the 1990s, a combination of factors, including evidence of high repayment rates and the rising influence

of gender lobbies within donor agencies and non-government organizations (NGOs), led to an increased emphasis on targeting women in micro-finance programs (About Microfinance, 2012).

While China has experienced rapid overall development, the gap between the rich and the poor continues to grow. The gap between the economic and social status of urban and rural women continues to widen as well (Jacka and Sargeson, 2011). There is evidence that women's participation in China is concentrated in informal unpaid sectors and they are more likely than men to occupy low-wage sectors. In rural areas, women have remained vulnerable to poverty and gender inequalities. In other words, rural women suffer the double disadvantage of being both "rural" and "women". The majority of women in rural China are restricted to unpaid labour in the agricultural sector and in domestic activities such as childcare. Women's financial dependence on male family members has exposed them to male rules and gender discrimination (Wang and Wening, 2006). Consequently, most civil society-based microfinance service providers target women in poor villages with the goal of enabling them to establish income generating activities and access agricultural inputs.

The United Nations' Fourth World Conference on Women, held in 1995 in Beijing, brought to China not only the development of Chinese domestic women's NGOs but also increased gender consciousness. Besides the All China Women's Federation (ACWF)[1], local women's NGOs have played an active role in promoting rural women's development and gender equality. Indeed, Chinese women's NGOs are making numerous efforts to improve rural women's socio-economic and political status. They focus on various sectors such as supporting disadvantaged groups of women to fight against domestic violence, improving women's political participation by encouraging them to participate in elections and take leadership positions as well as enhancing women's economic conditions by providing them with material assistance, microloans, and training on survival skills (Shen, 2011).

Therefore, empowering women by improving their economic status has been widely discussed globally. Such discussions have largely focused on assessing implications of microfinance in women's empowerment (Majoor and Manders, 2009); approaches, challenges and strategies in women's

[1] ACWF is an organization of women established in March 1949 to present and safeguard the rights and interests of women and promote the equality between man and women (http://www.china.org.cn/)

microfinance; innovative financing for gender equality (Arunachalam, 2007); and analysis of women's empowerment through sustainable microfinance (Mayoux, 2006). Despite this attention however, there is scarcity of empirical studies on how women's economic status is linked with their general status at home and at the community level in China.

Statement of the problem

Despite rapid growth of the microfinance industry in China, studies that explore the contribution of microfinance services on the improvement of women's lives are scarce. Most of the available literature (Nichols, 2004; Hofmockel, 2005; Li, 2011) focuses on the financial sustainability of microfinance institutions and the impacts of microfinance on the entire community where microfinance institutions operate. Although many NGO-microfinance services usually target women, there is a dearth of studies on how the loans accessed by women are channeled into the households' income generating activities and how such services bring desirable changes to women's lives. This study therefore assessed the impacts of a microfinance project run by a local women's NGO on women's lives. Specifically, this study sought to understand whether and how such impacts may be empowering rural Chinese women. It also sought to understand other lesser known efforts of microfinance institutions in promoting women's empowerment. This study contributes to the debate on the role of microfinance in social capital formation, economic development, and political empowerment as far as the lives of Chinese women is concerned. However, findings from this study could have wider application.

Literature review

Many studies conducted around the globe indicate that microfinance is an important method for enhancing the lives of poor women. Goetz and Gupta (1996) and Kabeer (1999) call our attention to the role of credit in enhancing women's economic independence, which leads to improvements in women's self-esteem and status in the households and in the wider community. Microfinance is also claimed to reduce poverty among women by increasing consumption among microcredit programme participants and their families, which has in turn been linked to improvements in children's schooling and nutrition, as well as increased income and rates of self-employment (Pitt *et al.,* 2006). Mayoux (2006) stresses that credit enhances poorer women's socio-economic conditions, thereby altering gender relations to the benefit of the subordinated.

Studies from India show that activities linked to microcredit programs such as the Self Employed Women Association (SEWA) and Working Women

Forum have drawn women out of their homes, given them opportunities to be part of larger social processes, helped them to overcome restrictive socio-cultural barriers, widening their opportunities to get information and the possibilities to develop other social roles (Hoffmann and Marius-Gnanou, 2003; ADA, 2007). A study conducted to assess the impact of micro-credit schemes on the socio-economic conditions of female community members in Pakistan found that the income of many females had increased after receiving credit and most were able to purchase better food items (Javed *et al.*, 2006). A recent study conducted in Balkh Province in Afghanistan indicates that all women respondents had improved their economic conditions through access to microfinance services. The women had used their loans to fund embroidery or tailoring business and were able to pay the installments on time (Echavez *et al.*, 2012). In Bangladesh, a survey of a credit programme involving 1300 women participants exhibited higher levels of empowerment. These results were linked to higher rates of physical mobility, ownership and control of assets, greater involvement in decision making, and heightened political and legal awareness (Hashemi and Rojas-Garcia, 2004).

Studies conducted in Africa have also shown positive impacts of microfinance on the lives of poor women. In a study conducted in Ghana, many women confirmed the positive contribution of microfinance to their businesses. They experienced increased household income, improved standard of living, and expansion of the physical asset base of their businesses (Ferka, 2011). Similarly, a quantitative study on economic well-being and empowerment in South Africa revealed that microfinance had improved women's lives such as having increased assets and expenditures. Women borrowers reported higher levels of autonomy in decision making, greater valuation of their household contribution by their partners, improved household communication, better relationships with their partners as well as higher levels of participation in social groups and collective action (Kim *et al.*, 2007). Likewise, studies conducted in Ethiopia have shown that most women clients of microfinance experienced increased household income and smoothing household consumption, improved living standard conditions, improved household diet and medical services, and increased savings. Microfinance had also contributed to better position of women in terms of improved attitude and respect from their spouses as well as increased self-confidence (Aregawi, 2003; Tsehay and Mengistu, 2002 and Meehan, 2001).

It should be noted that the impact of microfinance on the poor may in fact be negative. A survey conducted on "successful" microcredit programs in

seven countries discovered that the wealthier the borrower, the greater the income derived from credit. The study argued that the poor may use the loans for consumption or to invest in lower risk and less remunerative activities whereas the better-off borrowers tend to invest in riskier and more productive ventures (Mosley and Hulme, 1996). Consequently, poorer borrowers tend to drop out earlier than relatively wealthier borrowers (Montgomery, 1996). Studies also show that the pressure exerted on women for loan repayment can lead to conflicts, misappropriation, exclusion, disappointment and frustration among women themselves, resulting in the breakdown of groups (Guerin and Palier, 2007). Additionally, the pressure of repayment and fear of social sanctioning from other members are factors that weaken women's courage and desire to accept loans and risk starting businesses themselves (Chowdhury, 2008). Failure to repay a loan is considered a serious shame for women and may result in their social ostracization and expulsion from the village (Harper, 2007). Chowdhury concludes that access to credit in this sense is not likely to empower women.

In many cases, economic indicators such as the repayment rate or loan totals do not constitute reliable indicator for the success of women's income generating activities. For example, a repayment rate of 95% for women does not reveal the difficulties they may encounter in making those repayments. In making repayments from the time the loan is granted and prior to even gaining any income, most women borrowers often have to draw on other sources of income (Hoffmann and Marius-Gnanou, 2003). This situation often results in women falling deeper into debt, increasing tensions among themselves, and leading to the exclusion of the most disadvantaged women who may then become further alienated from markets and their own communities (Mayoux, 2006).

Generally, the literature review indicates that microfinance can improve the lives of poor women by increasing their incomes and empowering them in many other aspects. However, there is also evidence of negative impacts of microfinance on poor women. While the literature review has revealed that most of the existing studies were quantitative in nature, it is sometimes difficult to measure such impacts through economic indicators. This study therefore employed a qualitative approach to assess the impact of microfinance on the lives of poor women in rural China.

Methods

This study used qualitative methods to gain a deeper understanding of the impacts of microfinance on rural households in Pucheng County. Collected

information was grounded in the participants' experiences and perceptions. The study was conducted in Pucheng County using the experience from Pucheng County Women's Sustainable Development Association (PCWSDA), which is an NGO-type microfinance provider. Pucheng County is primarily an agricultural region with an arid climate. In 2011, Pucheng County had a population of approximately 760,000 in 24 townships and 365 villages (The 1990 Institute, 2011). The PCWSDA was chosen because it is one of the most influential NGO-type microfinance targeting poor people in rural China. Its central goal is to empower women and lift them out of poverty.

Data were collected through interviews; focus group discussion (FGD), and unstructured observations. Six villages (*Yuexing*, *Liuhe*, *Hancun*, *Xicao*, *Chenzhuang* and *Wujia)* were randomly selected for this study. The sampling frame of the villages was compiled on the basis that microfinance services introduced by PCWSDA were operational for at least one year. This requirement was necessary in order to obtain data from respondents who had received loans for a relatively longer period of time; thereby determine the impact of loans on their lives. Since this was a qualitative study, the sample size comprised of only 21 respondents for interviews and 13 respondents for FGD. Of the 21 respondents, 15 were loan recipients, five were loan officers and one respondent was a manager from PCWSDA. Three different interview guides were developed, one for each of the three groups. Data were analyzed qualitatively by deriving categories to code the data directly and inductively. All recorded interviews were transcribed and coding was done by identifying prominent themes related to the research questions. Many codes were inductively developed from the data and classified into categories related to different themes. Finally, identification of relationships among the coded themes was done in order to answer the research question; what impacts have microfinance institutions had on women in rural China? Are there any other lesser known efforts of microfinance institutions for promoting women's empowerment?

Results and Discussions

The PCWSDA microfinance delivery model

The umbrella organization - PCWSDA provided microcredit and training to women borrowers. The organization provided training to new women borrowers about the process of securing and repaying the loans with the aim of increasing awareness about services they offer. Apart from the training sessions on microcredit, the organization often brought agricultural experts to train local women about growing various crops such as peas,

apples, cotton and wheat, as well as how to raise livestock such as pigs, sheep and poultry. The PCWSDA also provided basic educational manuals with instructions on how to care for livestock, and disease prevention. In addition, PCWSDA provided training sessions for women who aspire to be entrepreneurs, providing them with skills related to running small factories such as assembling boxes/packages for peas and apples.

Loan officers ensured that women applying for the loans met the required criteria. The criteria were based on the credibility and personality of the applicant and her family. This study revealed that men played a significant role on women's access to the loans. When loan officers approve the loans for borrowers, they considered the family's property including land, house, and any other family investment and whether household members (male or female) were physically and mentally fit and capable of earning income. Nevertheless, it was not obligatory for applicants to indicate in their application that they would use the loan strictly for income generating activities. Some loan officers had even specified paying for the education of children as the priority. This condition has provided many opportunities for women to access the loans for sending their children to school. The PCWSDA loan was delivered by the loan officers to the women's groups (composed of 3 to 5 people) and each member of the group received the same amount. During this study, the smallest loan amount available to each borrower was 1000 Yuan, while the maximum available amount was 5000 Yuan. This study revealed that due to inflation pressures, most women took a 5000 Yuan loan from the project.

The borrowers were required to repay the loan in four installments. Each installment was due at three month intervals and must be repaid in full within the maximum of 12 months. For example if the borrower received a 3000Yuan loan, she would be expected to pay back 750 Yuan per installment, including 81Yuan in interest (see figure 1). The loan officers were responsible for collecting repayment from the borrowers. PCWSDA had already extended loans to groups of women in five towns (out of the 17 towns that exist in Pucheng County). Furthermore, the number of women borrowers had increased from year-to-year since the establishment of PCWSDA in 2005 (Table 1).

Table 1: L**oan outstanding and active clients per year**

Time (year)	2005	2006	2007	2008	2009	2010	2011
Members	311	720	1572	1293	1663	2099	2256
Loan outstanding (10000Yuan)	29.1	81.7	187.3	209.9	259.7	419.2	576.3

Source: Pucheng Funxie data (2011)

The relatively high demand for microcredit service available at PCWSDA was mainly due to the fact that there were no similar organizations providing microcredit to poor women in the area. The only organization which provided such loans was the Shaanxi Rural Credit Cooperatives (RCCs) but the procedure for obtaining loans was complicated and the loans required collateral. Women could turn to private lenders, but their interest rates were very high such that most of the poor women could not afford the loans. Only males were able to borrow from private lenders.

Impacts of microfinance on the lives of women in rural China

The respondents in this study felt that microcredit and training opportunities offered by PCWSDA had positive impacts on their lives in terms of increased household income as well as improved income generating activities, families' living standards, children attendance to school, and women's decision making. Unlike the experiences reported from other developing countries where women borrowers had experienced both positive and negative impacts, the findings in this study revealed only positive impacts. This might be attributed to a number of reasons including the fact that women borrowers received support from other family members in repaying the loans; involvement of male partners in getting loans as shown in prior discussions were held between couples and loan officers; grouping the women borrowers based on their ability to repay the loans; and empowering the borrowers by providing them with technical services such as training.

Increased households' income

All women borrower participants invested their loans or part of their loans on income generating activities including agriculture and small factories. Those who invested in agriculture grew fruits and wheat for sale. The markets for these products were quite reliable and hence enabled them to earn consistent income from their farm produce. In addition, trainings received from PCWSDA on how grow the fruits and protect them from diseases contributed to the high yields they had obtained. At their farms, researchers observed the peas and apple fruits covered by bags, which protect these fruits from bad weather, diseases and pests. The women's earnings from their agricultural products during the previous season reflected doubling of their gross earnings compared to the money that they had invested. For instance, some respondents said:

"I invested 8,000 yuan in agriculture for buying fertilizer and seeds for corn, wheat and peas and I have earned 20,000 Yuan" (woman borrower #4)

"I invested 10000 Yuan in agriculture and I was able to earn 22,000 Yuan" (woman borrower # 5).

Some respondents invested their loans in raising livestock including pigs, sheep and chickens while some became involved in other temporary works in town. Just as was the case for agricultural commodities, reliable markets were available for livestock in and out Pucheng County. The market of course enabled the women to make money from selling animals. As was the case for crops, women borrowers had received training and educational literature from PCWSDA as well as advice from experts on animal nutrition, health and husbandry. Although a few respondents reported problems such as livestock diseases or commodity price fluctuations, no farmers suffered losses from their investments. In all cases, they earned more than they invested. Some indicated that they did not sell their animals until the market was good. *"I have 100 pigs and on average I get 40,000-50,000 Yuan per year"* Said woman borrower #1. These findings are consistent with a study conducted in Pakistan which revealed that majority of women invested their money in agriculture and livestock keeping (Javed *et al.,* 2006).

Involvement in other income generating activities

Some respondents invested their loans in activities other than those related to crops and livestock production. Such activities include opening small factories for making boxes and packaging material for produce. These products were in high demand by the farmers in the villages, thus the women entrepreneurs had a sufficient market for their products. Others loan recipients opened shops in the village to sell food and other items required by community members. Since all the villages visited during this study were located far from Pucheng, the County town (about 10 -20 kilometers) and lacked public transport, the shops established by the women entrepreneurs saved the villagers' time and costs of going to the town to buy household items. This may be one of the reasons for the success of the respondents' shop businesses. Woman borrower # 8 said;

"I invest the loan in agriculture and in the shop; my family is kind of special. My husband's father is ill, so I and my husband can't work outside; we have relied on agriculture and the shop to make a living. From agriculture and the shop I can earn about 10,000-20,000 Yuan per year as profit. I am grateful to Pucheng organization for this service".

These findings are in agreement with those reported by Echavez *et al.* (2012) in Afghanistan where women used their loans to establish income generating activities such as embroidery or tailoring business which in turn helped them to pay the installments on time.

Improvement of living standards of the families

Apart from increased household income, the living standards for the respondents' families were also reported to have improved in terms of better nutrition, being able to purchase house furniture, and having the means to renovate and/or build new houses. When asked to explain how access to microcredit from PCWSDA has improved the living standards of their families, the respondents mentioned several livelihood aspects.

> *"I feel so happy, now furniture in the house is better; our house was not good before getting the loans but now as you can see, it is good"* (woman borrower #5)

> *" I have only one kid, my living standard has improved, before taking the loans we used to leave with my husband's parents but now we have been able to build our own house using the income gained from agricultural investment and my husband's business, which have benefited from the loan"* (woman borrower # 2).

Based on these examples, it is apparent that the additional income earned from enterprises that benefited from the loan had been used to fulfill household expenditure needs. This phenomenon of transferring women's income directly to household income was also revealed by Pitt *et al.* (2006) and Javed *et al.* (2006).

Sending children to school

Women's access to microcredit had also enabled them to send their children to school. Many respondents had children attending school at primary, junior/senior secondary, college or University level. Sending children to school had been given priority by the loan officers and was an important criterion when the women apply to receive the loans. This is different from other countries where the women applying for the loans are often expected to present a viable business plan to demonstrate how their income generating activity would enable them to repay the loan. As noted above, apart from considering trustworthiness (based on the appraisals of the applicant by neighbours), health status, and the like, some of PCWSDA's loan officers gave children's education first priority.

> *"…most of the expenditure in this family is for kids; we spend about 40,000 yuan per year for kids to school" responded woman borrower"* (woman borrower # 17)

This respondent invested her loans in poultry and earns more than 50,000 Yuan per year on average. Her husband did not work outside but he participated in agriculture where they had 5mu for growing peas and apples.

Improvement of women's decision making/bargaining power

All respondents declared that access to loans has improved their decision making power in the household. *"In this family, I make decision because money comes from these investments"* said the woman borrower #10. The impact of microfinance on improving decision making/bargaining power was also reported in studies conducted elsewhere (Hoffmann and Marius-Gnanou, 2003; ctd ADA 11; Hashemi and Rojas-Garcia, 2004).

Conclusion and Recommendations

The findings in this study indicate that access to microcredit services provided by PCWSDA have had a demonstrably positive impact on the lives of rural women and their families in the villages of Pucheng County. The positive impacts include increased household income, improved life standards of families, increased capacity of sending children to good schools, involvement in entrepreneurial activities, and improved decision making power. Surprisingly, this study did not find any negative impacts of microfinance services to women borrowers as experienced elsewhere around the world. This is perhaps because women borrowers in the Pucheng County received support from other family members in repaying the loans; male partners were involved in the process of getting loans; women borrowers were grouped based on their ability to repay the loans; and the fact that women borrowers were provided with technical services such as training. Key lessons learnt from this study include the need to involve male partners and considering other gender characteristics in providing loans to poor women. It is also important to provide microcredits along with other services such as training and expert support in order to build the borrowers' capacities to run their income generating activities. Future research can make comparisons between poor women who have not received any loans with those who received. Studies can also compare the impacts of microcredit services provided to poor women by different microcredit institutions.

References

About Microfinance, (2012). History of Microfinance. Available at: http://www.aboutmicrofinance.com/topics/history-of-microfinance (Retrieved 3rd March, 2012).

ADA (2007). Microfinance and Gender: New contributions to an old issue, Dialogue No. 37. Grand-Duchy of Luxembourg.

Aregawi, T. (2003). The impact of microfinance on poor women: A case study of Dedebit Credit and Saving Institution (DECSI) in the Eastern Zone of Tigray. Master Thesis, Addis Ababa University.

Arunachalam, R. S. (2007). "Microfinance and Innovative Financing for Gender equality: Approaches, Challenges and Strategies". Background paper presented for the 8th Commonwealth Women's Affairs Ministers' meeting, London, Commonwealth Secretariat.

Chowdhury, T. and Al-Amin, M.D. (2008). Women, poverty and empowerment: An investigation into the dark side of Microfinance. *Asian Affairs*. 30 (2): 16-29.

Echavez, C.R., Zand, S. & Bagaporo, J.L.L. (2012). The impact of microfinance programmes on women's lives: A Case Study in Balkh Province. Afghanistan Research and Evaluation Unit, Case Study Series.

Ferka, A. (2011). The impact of microfinance on the livelihoods of women in rural communities: A case study of Jaman South district, Ghana. Master thesis, Kwame Nkrumah University of Science and Technology.

Goetz, A. M. & Gupta, R.S. (1996). Who takes the credit? Gender power and control over loan use in Rural Credit Programs in Bangladesh. *World Development*. 24 (1).

Guerin, I, & Palier, J, (2007), Microfinance and the Empowerment of Women: Will the Silent Revolution Take Place? *ADA Dialog*. (37): 27-35.

Harper, M (2007). "What's wrong with group?" In T. Ditcher and Harper (Eds). What's wrong with microfinance (35-48)? Warwickshire: Practical action Publishing.

Hashemi, S. M. & Rojas-Garcia, E. (2004). "Microfinance and Domestic Violence". CGAP.

Hoffmann, E & Marius-Gnanou, K, (2003). "*Micro Credit* for *Poor Women* – Miraculous *Solution* or *Trojan* Horse of *Globalization*? State of the debate on women in Regards to globalization, critical approaches, Karthala.

Hofmockel, E. (2005). Microcredit in the Rural Areas of Northwest Yunnan Province, China: Investigating the operation of, results of, and obstacles to micro financial institutions. Paper 419. ISP Collection.

Jacka, T. & Sargeson, S. (2011). Women, Gender and Rural Development in China. Edward Elgar Publishing limited, UK.

Javed, A., Luqman, M., Khan, A.S. & Farah, A.A. (2006). Impact of Micro Credit Scheme of NRSP on the Socio Economic Conditions of Female Community in District Rawalakot, Azad Jamu and Kashmir, Pakistan. *JASS*. 2 (3):142-144.

Kabeer, N. (1999). The Conditions and Consequences of Choice: Reflections on the Measurement of Women's Empowerment. Geneva: UNRISD.

Kim, J.C., Watts, H.C., Hargreaves, J.R., Ndhlovu, L.X., Phetla, G., Morison, L.A., Busza, J., Porter, J.D.H. & Pronyk, P., (2007). Understanding the Impact of a Microfinance-Based Intervention on Women's Empowerment and the Reduction of Intimate Partner Violence in South Africa. *AJPH.* 97 (10).

Li, X. (2011). The impact of Microcredit on Chinese Rural Welfare. New Zealand, Global Focus.

Majoor, H. & Manders, J. (2009). "Women Empowerment: Comparing concepts & Assessment Implications for microfinance." Commissioned by Oikocredit, Amersfoort, Netherlands.

Mayoux, L. (2006). Women's empowerment through sustainable microfinance:

Rethinking best practice. Discussion Paper, Gender and Micro-finance. http://www.genfinance.info/Documents/Mayoux_Backgroundpaper.pdf (Retrieved 5th April, 2012)

Meehan, F. (2001). Usage and Impact of Microcredit Provision: A case study based on the credit operations of Debit, Credit and Saving Institution, Tigray, Ethiopia". International Workshop on Dimensions of Microfinance Institutions in SSA, Mekelle University.

Montgomery, R. (1996). Disciplining or protecting the poor: avoiding the social costs of peer pressure in microcredit schemes, *Journal of International Development*, 8(2): 289-305

Mosley, P. and Hulme, D. (1996). *Finance against poverty*. London: Routledge

Nichols, S. (2004). A case study analysis of the impacts of microfinance upon the lives of the poor in rural China. RMIT University, Melbourne.

Pitt, M. M., Khandker, S. R. and Cartwright, J. (2006). Empowering women with micro finance: evidence from Bangladesh. *Economic Development and Cultural Change*, 54 (4): 791-831.

Shen, G. (2011). Development of Women's Non-Governmental Organizations in China. England, Ashgate Publishing Limited.

The 1990 Institute (2011). Profiles of Recent Borrowers: Borrowers stories. http://1990institute.org/en/microfinance/profiles (Retrieved 5th April, 2012).

Tsehay T. & Mengistu, B. (2002), Impact of Microfinance Services among the Poor Women in Ethiopia. AEMFI, Addis Ababa.

Wang, C. & Wening, (2006). China: Research Report on Gender Gaps and Poverty Reduction. http://wwwwds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2008/04/07/000334955_20080407110001/Rendered/PDF/431080WP0Box327349B01PUBLIC1.pdf Retrieved March 7th, 2012.

The role of agro-dealers in influencing farmers' use of agricultural inputs

J. K. Urassa[1] & R. Johannes[2]

[1]Corresponding Author J. K. Urassa, Development Studies Institute, P. O. Box 3024, Morogoro, e-mail address : jksurassa@yahoo.co.uk/urassa@suanet.ac.tz

[2]Graduate, Masters of Arts in Rural Development (MARD), Sokoine University of Agriculture

Abstract

Agro-dealers, the retail distributors of agricultural inputs such as seeds, tools, pesticides, and fertilizers have an important role in raising agricultural productivity of rural households. This paper examines the role of agro-dealers in influencing farmers' use of improved agricultural inputs. Specifically, the study aimed at identifying methods used by agro-dealers in stimulating input use among farmers, examining the effectiveness of agro-dealers in service provision to farmers in the study area, and determining factors influencing farmers' use of inputs in Kilombero district. Data for the study were collected from 100 respondents randomly selected from Ifakara, Kiberege and Kisawasawa villages using structured questionnaires. The villages were purposively selected due to having a high concentration of agro-dealers compared to other villages in the district. In addition to the household interviews, some in-depth interviews were also conducted with agro-dealers to determine how they were influencing households' use of improved inputs. Quantitative data were analyzed using SPSS whereby descriptive statistics were determined. In addition, a logistic regression model was used to determine factors responsible for a farm households' use of improved inputs. Results show that provision of credit by agro-dealers, the number of agro-dealers and provision of extension services by the same had a likelihood of influencing a household's purchase and use of improved inputs. The time required to reach the agro-shop also influenced use of inputs (fertilizer). Based on these and other findings, it is suggested that for effective uptake by farmers, agro-dealers need to be well equipped with knowledge of the agro-inputs they sell to farm households.

Background information

Tanzania's economy has for a long time relied on agriculture as the leading sector in the economy, but the contribution of agriculture has been declining. The Economic Survey report for 2008 shows that the sector's contribution to the Gross Domestic Product (GDP) had declined to 26% (URT, 2011) compared to almost half (50%) in 2002 (Keenja, 2004).

The decline is however partly attributed to revision in the computation of National Account statistic.[2]

Nonetheless, the agricultural Sector remains an important employer of more than 70% of nearly 45 million Tanzanians. The decline in the sector's contribution to the country's GDP is a result of a multitude of factors. Whereas the changing economic landscape could be one of the reasons, others reasons include globalization, which has led to an inflow of Foreign Direct Investment (FDIs) that has in turn enabled growth of other sectors such as mining, fish industry, and tourism. In addition, the performance of agriculture has not been good in recent years due to various reasons. The sector continues to rely on outdated technologies such as the hand hoe, low yielding seed varieties, poor spacing, poor storage techniques to mention but a few. The latest National Agriculture Sample Census (2007/08) has shown that 14.4% of households use ox-plough compared to only 0.8 who use tractors in land preparation.

The 2007/08 National Agriculture Sample Census has further shown that inorganic fertilizer was applied in only 7.2% of the total area planted with annual crops during long rainy season (URT, 2011). Moreover, the proportion of crop farming households using improved seeds increased only marginally from 18% in 2002/03 to 24% in 2007/08. This proportion is still too low to facilitate meaningful transformation of the Agricultural sector and hence more contribution to the GDP and households well-being. The report also shows that irrigated farming dropped by one percent between 2002/03 and 2007/08, despite continuing unreliable rains in most parts of Tanzania.

It is common knowledge that high yielding seed varieties, use of chemical fertilizers, pesticides, irrigation, improved planting, and weeding practices provide higher yields than conventional technologies (UNCTAD, 2010). The use of improved technologies was expected to have improved following the economic liberalization of input and output markets since the mid-1980s, based on the assumption that efficient markets would entice more farmers to emulate the success of early adopters of using improved farm technologies. Before market liberalization, the import and distribution of inputs were both state controlled by the government, whereby prices of fertilizers and other inputs were highly subsidized (Minot, 2009). However,

[2] In 2006 the government of Tanzania revised statistics of the National Account estimates adopting the National Sytem of National Account (NSA) of 1993. Based on this revision, the GDP for 2002 was revised from 47.5% to 28.6% (NBS, 2006).

following market liberalization, input prices were decontrolled and subsidies were phased out (World Bank, 2003; Isinika *et al*., 2003, cited by Isinika and Msuya, 2011). The removal of input subsidies significantly increased the price of inputs and consequently led to reduced use of fertilizers, particularly on food crops (Minot and Delgado, 2000). Over time, the government has employed various means to stimulate demand for inputs, including distributing subsidized inputs to rural based agro-dealers.

It is expected that, the availability of inputs close to farmers would influence them to demand such inputs and hence raise input use and agricultural productivity. According to the World Bank (2003), demonstration plots and inputs promotion through agro-dealers (stockists) stimulates demand for inputs because Agro-dealers' services are critical to guide farmers' access to appropriate farm inputs (Chianu *et al.*, 2008; AATF, 2008). The presence of agro-dealers also reflects the demand for different agricultural inputs. In Tanzania, agro-dealers are currently important actors in distributing agricultural inputs to farmers through the National Agricultural Input Voucher Scheme (NAIVS) (Minot, 2009; Cagley, 2009). This has led to a rapid increase in the number of agro-dealers in different parts of the country. However, there is still low usage of improved agricultural inputs in many parts of Tanzania.

Tanzania uses about 9 kg of fertilizer per hectare on average, which is far below corresponding figures for other countries such as Malawi (27 kg), South Africa (50 kg), Latin America (73 kg), South Asia (100 kg) and South East Asia (135 kg) (Policy Forum, 2009). In addition, only 10% of Tanzanian farmers use improved seeds (URT, 2010). The importance of agro-dealers in providing agricultural inputs is crucial for farmers living in rural villages (Douwe, 2009). Yet, the extent to which agro-dealers influence farmers to use improved agricultural inputs remains unknown. Available literature (Douwe, 2009; Okado, 2001; Krausova and Banful, 2010; Kibaara, 2006) concentrates on the importance of agro-dealers in supplying inputs while neglecting how they influence input use among farmers. This evoked interest to conduct a study assessing the role of agro-dealers in stimulating farmer to use improved farm inputs in Kilombero district, Morogoro region. This paper utilizes results of the study to assess the role agro-dealers may be playing to influence farmers' use of agricultural inputs in order to improve agricultural productivity.

Methodology

Kilombero district was selected for this study because of its high potential for growing grains (rice and maize), which is the national focus for the inputs subsidy programme (NAIVS). Moreover, Kilombero is one of the areas prioritized by the Government as a National Granary for Food Production. Kilombero distict also falls within the target area for the Southern Agricultural Growth Corridor of Tanzania (SAGCOT), whose aim is to foster inclusive commercially successful agribusiness that will benefit the region's small scale farmers and in so doing improve food security, reduce poverty and ensure environment sustainability. The district is one among five rural districts in Morogoro Region. It is located between S 8° 15' 0" and E 36° 25' 0.12". Other districts include Kilosa, Morogoro rural, Mvomero and Ulanga. Kilombero district lies west of Morogoro Municipality, which is the regional headquarters. Ifakara, the district headquarters is located 230 km from Morogoro municipality. Kilombero district boarders Kilosa and Morogoro district to the North, Ulanga, Songea rural and Njombe districts to the south, Liwale district to the East and Iringa district to the West . Kilombero district comprises of 19 wards with a population of 321 611 people (URT, 2007).

The climate of Kilombero district is considered tropical sub humid, with bimodal annual rainfall between 1200 to 1400 mm and average daily temperature in the range of 26°C to 32°C. The air humidity is high and relatively constant during the wet season in the range of 70% to 90% but it may drop to 25% during the dry season. Agriculture is the main economic activity having all the advantages for future agricultural development – fertile land, adequate rainfall, and rivers with potential for irrigation. Rice and maize are the main food crops produced in the district, but the land is also suitable for growing sugarcane, coffee and oil seeds. Kilombero district has a large potential for rice production and many people in Kilombero depend on rice for food and cash income. Rice is planted from December to February and average paddy production per acre ranges between 15 and 30 bags (URT, 2007).

The study used a cross-sectional research design, which allows data to be collected at one point in time for descriptive purposes and for determining relationships between and among variables (Saunders, 2007). Purposive sampling was used to select four villages of Kisawasawa, Kiberege, Mwaya and Ifakara, based on the criteria of having a higher concentration of agro-dealers. Simple random sampling was used to select 97 respondents among farmers because the farmers were assumed to be homogenous in as far as use of improved inputs were concerned. In addition, 15 agro-dealers were

interviewed as key informants. Information from the key informants was used to verify what was reported by the farmers involved in the survey.

The study's conceptual framework (Figure 1) assumes that the presence of agro-dealers directly stimulates smallholder famers to use improved agricultural inputs such as improved seed, fertilizer and pesticides. The agro-dealers' provision of inputs credit and advice on how to apply the inputs can encourage more farmers to use the inputs. Background information such as age, sex, level of education, marital status and the level of income are expected to influence the level of use. Nonetheless, some of these characteristics (e.g. age, sex, education level) could also be an obstacle, limiting the agro-dealers' ability to influence input use among farmers (Figure 1). Similarly, issues related to policies on agriculture, marketing and microfinance policies can also affect farmers' access to agro-inputs favorably or unfavorably. The same could be true for agro-dealers service provision. Generally, easy access to credit and low input prices can encourage more farmers to use more improved agro-inputs.

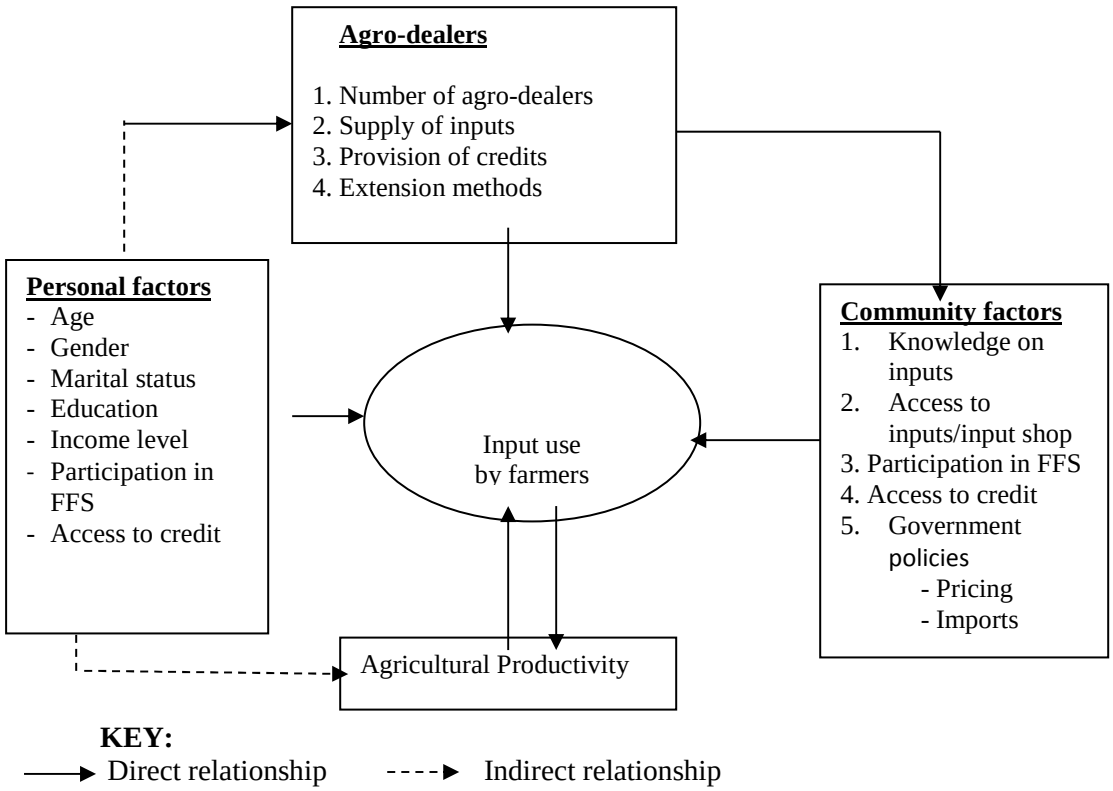

Figure 1: Conceptual framework for farm household agricultural input use for higher agricultural productivity

Data Collection and analysis

A structured questionnaire with closed and open-ended questions was designed and used to collect primary data from the respondents in relation to the methods used by agro-dealers to influence more input use among farmers. Additional information was sought in relation to factors influencing farmers' input use, effectiveness of agro-dealers in providing services to farmers and other basic information from the respondents. In-depth interviews were also conducted using a checklist of questions and issues in order to collect information from agro-dealers. Primary data were analyzed using the Statistical Product and Service Solutions (SPSS), covering descriptive analysis to obtain means, percentages and frequencies. These were used to identify methods used by agro-dealers in stimulating input use among farmers. The effectiveness of agro-dealers was assessed based on their frequency of providing services such as training and advice to farmers as they supply farm inputs to farmers. A logistic regression model (equation 1) was used to determine factors influencing individual farmer's purchase and use of improved farm inputs.

$$P_i /1\text{-}P_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where, P_i = Probability of the i^{th} farmer using fertilizers, improved seeds or pesticides

$1- P_i$ = Probability of the i^{th} farmer not using fertilizers or improved seeds or pesticides

B_0= constant (Y-intercept),

$\beta 1, \beta_2, \beta_3 \ldots \beta_7$ = coefficients of independent variables; $X_i = X_1, X_2, X_3 \ldots\ldots X_8$. Where;

X_I = Marital status; X_2= Sex of Household head; X_3 = Amount of land cultivated by household; X_4 = Provision of extension services by agro-dealers; X_5 = Availability of credit from agro-dealers; X_6 = Number of Agro-dealers in area covered, X_7 = Time required by households to reach agro-dealer's shop and X_8= Household past experience having bought fake/below standard inputs, and ε= Error term. Equation (1) was estimated using SSPS.

Results and Discussion

Socio-demographic characteristics of respondents

The demographic structure of the respondents was such that in Ifakara and Kiberege villages, more male (52.6%) than female (47.4%) respondents were interviewed as shown in Table 1. The Table also shows that about three quarters (75.3%) of the surveyed households were headed by men, which is quite in line with the national demographic figures. According to the World Bank (2012) cited by Trading Economics (2013), female headed households constitute 24.4% of all households in Tanzania. However, the literature shows that the sex of a household does not necessarily influence the use of improved agricultural inputs. For example, Freeman and Omiti (2003) found that the sex of respondents had no significant effect on use of fertilizer. Horrell and Krishnan (2007) also found no significant difference in improved fertilizer usage by female and male household heads in Zimbabwe. Generally, when both men and women have equal opportunities, inputs utilization would be the same regardless of one's sex.

Table 1 further shows that most (68%) of the respondents were married. According to Uttaro (2002), married individuals are more likely to access fertilizers relative to those who are not married. Moreover, Dessalegn (2008) showed that married respondents, as did those with many relatives and friends had relatively more networks, better access to, and used new technologies than unmarried, divorced or widowed farmers. The implication here is that married respondents could easily influence each other with regard to accessing improved inputs more than unmarried respondents. The marital status of respondents represents some level of family responsibility; the need to grow more crops to feed more members of the family would influence them to use more inputs, hence raising factor demand.

As regards education level, results in Table 1 show that, three quarters (75.4%) of the respondents only had primary school level education, which could be a limiting factor in their understanding of technical information on improved inputs use, leading to low usage. According to Ukeje (2004), small-scale farmers' low level of education is a major constraint towards the adoption of improved farming techniques and the farmers' ability to access other inputs necessary for increasing productivity. Teferi (2003) and Mijena (2011) also show that age is an important determinant of the improved fertilizer use because active age groups of farmers are eager to adopt and learn new technologies compared to older age groups of farmers.

Table 1: Socio-economic characteristics of households (n=97)

Characteristic		Ifakara	Kiberege	Kisawasawa	Mwaya	Total
Respondents' Sex	Male	14(58.3)*	17(73.9)	11(44.0)	9(36.0)	51(52.6)
	Female	12 (41.7)	6 (26.1)	14 (56.0)	16 (64.0)	46 (47.4)
Household heads' sex	Male	19 (79.2)	21 (91.3)	13 (52.0)	20 (80.0)	73 (75.3)
	Female	5 (20.8)	2 (8.7)	12(48.0)	5 (20.0)	24 (24.7)
Marital status	Not married	6 (25.0)	2 (8.7)	14 (56.0)	9 (36.0)	31(32)
	Married	17(70.0)	21(91.3)	11(44.0)	16 (64.0)	65 (67)
	Missing	1(4.2)	0(0)	0(0)	0(0)	0(0)
Respondents' education level	Primary	19 (79.2)	22 (95.7)	21(84.0)	19 (76.0)	81 (83.5)
	Secondary and above	5 (20.8)	1(4.3)	3 (12.0)	4(16.0)	13(13.4)
	Missing	0 (0)	0 (0)	1(4.0)	2 (8.0)	3 (3.1)
Respondents' age	Mean	43.7	48.4	40.9	44.0	44.2
	Minimum	29	32	27	31	27
	Maximum	73	72	60	63	73
Respondents' source of income	Crop production only	20(83.3)	20(87.0)	20(80.0)	25(100)	85(87.6)
	Crop production and other sources[3]	4(46.7)	3(13.0)	5(20.0)	0(0)	12(12.4)

***** Numbers in brackets indicate percentage

Majority (87.6%) of households surveyed relied on crop production as their main source of income. The remaining households also earned some income from other activities such as livestock keeping, carpentry, employment, petty trade, bicycle repair and pension. This reflects what has been reported to be the norm in many areas of the developing world. For example both Chambers (1997) and Barret *et al*., (2001:1) have argued that diversification is the norm in most developing countries. They observe that; "….. Very few people collect all their income from any one source, hold all their wealth in the form of any single asset or use their assets in just one activity''. Multiple motives prompt households and individuals to diversify assets, incomes and activities. Diversification is sought for food security, cash income and risk aversion. For these reasons, some households grew a number of crops, dominated by paddy and maize. Paddy is a high value

[3] These include; livestock, off farm employment, petty trade, bicycle repair.

crop and households producing the crop commercially may stand to earn substantial income relative to other crops, maize included.

Socio-economic characteristics of agro-dealers in the study area

The socio-economic characteristics of agro-dealers in the study area are shown in Table 2. Their average age was 32.2 years. Being relatively young and therefore more active and energetic, they are able to run agricultural input business more easily. They can use modern information and communication technologies (ICT). They can also be involved in more networks, which is necessary for agro-business operations.

Education is an important factor for running agricultural input business. Results from the study (Table 2) show that less than half (46.7%) of agro-dealers had secondary level education while the rest (over 50%) had primary level education, which might limit their ability to understand some technical aspects of the products they are selling as most products are labeled in English. Although Tanzanian laws do not limit the level of education for a person to qualify as an ago-dealer, the guidelines from the Ministry of Agriculture, nonetheless, require a person to undergo some training, which normally comprises of technical terminologies that may be difficult for someone with a low level of education. According to Nkonya and Kato (2001), formal education is an important requirement in the agricultural input business because agro-dealers have to read and understand labels and provide directions on usage and application of the agricultural inputs.

Results in Table 2 also show that most (87%) of the agro-dealers sell inputs all year round, which suggests that inputs are available to farmers throughout the year. Agro-dealers are key actors on supplying and ensuring the availability of inputs to farmers. It is in the agro-dealers' interest to promote usage of inputs in their stock. Ownership of the input business in all villages was found to be (80%) sole proprietorship, but less than half (40%) of agro-dealers owned the premises where their business were located, mostly at trading centres and markets. A study conducted by Nkonya *et al.* (2001) in Uganda found that 12% of the retailers used their permanent residence for trading purchased inputs because rent was very high.

Table 2: Socio-economic Characteristics of Agro-dealers (n=15)

Characteristic	Response	Ifakara	Kiberege	Kisawasawa	Mwaya	Total
Nature of business	permanent	4(80)*	3(100)	3(75)	2(67)	12(87)
	Seasonal	1(20)	0(0)	1(25)	1(33)	3(13)
Ownership of business	Personal	4(80)	3(100)	3(75)	2(67)	12(80)
	Company	1(20)	0(0)	0(0)	1(33)	2(13)
	Agent	0(0)	0(0)	1(25)	0(0)	1(7)
Business premises	Own	2(40)	2(67)	1(25)	1(33)	6(40)
	Rent	3(60)	1(33)	3(75)	2(67)	9(60)
Age of respondent	Mean	30.6	33.2	31.9	34.5	32.2
	SD	9.0	7.3	5.04.96	2.9	8.1
Education level	Primary	3(60)	2(66)	2(50)	1(33)	8(53)
	Secondary	2(40)	1(33)	2(50)	2(67)	7(47)
Sex of respondents	Male	4(80)	3(100)	4(100)	2(67)	13(87)
	Female	1(20)	0(0)	0(0)	1(33)	2(13)
Trained on input use and application	Yes	3(60)	2(67)	2(50)	2(67)	9(60)
	No	2(40)	1(33)	2(50)	1(33)	6(40)

***** Numbers in brackets indicate percentage

Methods used by Agro-dealers in stimulating input use among farmers

In addition to supplying farm inputs, Agro-dealers are considered providers of basic extension services to farmers, creating an important source of knowledge and advice (AGRA, 2009). Agro-dealers also play a key role in linking smallholder farmers to input and output markets (Krausova and Banful 2010. The effectiveness of the extension approach used by agro-dealers to enhance adoption of improved agricultural technologies and ultimately improved agricultural output depends on a number of key factors related to; the extension method used, institutional governance, and the capacity and management structures of the extension approach (MOFA, 2011).

Comparing the study's findings in Table 3 and 4 provides some interesting observations. First, whereas most (66.7%) of the agro-dealers reported to be offering training to farmers, Table 4 shows less than 33% of the farmers had received technical advice or information on input use (18.6%). According to Table 4, majority of agro-dealers are more concerned with supplying farm inputs without making any efforts to create opportunities for expanding the demand for inputs they sell, which increase usage, hence

expand their business. While some of the agro-dealers reported using various methods (field days, demonstration plots and promotional materials) to attract more farmers to use improved input, the effectiveness of such efforts seems questionable. Results presented in Table 4 show that none of the Agro-dealers who were interviewed for this study had used demonstrations or field days to create product demand or awareness. The observation and lack of efforts to create demand through extension methods may in some way be explained by Chinsinga (2011) who observed that in western Kenya some agro-dealers object to the idea of providing extension services to farmers, arguing that "farmers are already knowledgeable about farming; we simply handle issues on the marketing side of things." It has been observed however that the lack of knowledge about inputs and their application leads to inappropriate utilization among many farmers (Dorward, 2009).

Table 3: Methods used by agro-dealers in stimulating inputs use (n=15)

Characteristic		Ifakara	Kiberege	Kisawasawa	Mwaya	Total
Method used	Exhibition	2(33.3)*	1(50.0)	3(75.0)	1(33.3)	7(46.7)
	Demonstration plots	1(16.7)	0(0)	1(25.0)	0(0)	2(13.3)
	Field days	2(33.3)	0(0)	0(0)	0(0)	3(20.0)
	Brochures	1(16.7)	0(0)	0(0)	0(0)	1(6.7)
	None	0(0)	1(50.0)	0(0)	2(66.7)	3(20.0)
Does Agro-dealer train farmers on input use	Yes	4(66.7)	1(50.0)	4(100.0)	3(100)	10(66.7)
	No	2(33.3)	1(50.0)	0(0)	0(0)	5(33.3)
Availability of Input credit	Yes	3(50.0)	2(100)	3(75.0)	1(33.3)	9(60.0)
	No	3(50.0)	0(0)	1(25.0)	2(66.7)	6(40.0)

*Numbers in brackets indicate percentage

Services provided by Agro-dealers

In addition to supplying inputs as reported by 48% of the respondents, 31% of the respondents also recognized the agro-dealers for providing information on input use (18.6%) and technical advice (12.4%). This suggests that if they had adequate knowledge and extension skills, agro-dealers could be very instrumental in facilitating better use of improved inputs and other technologies among farmers thereby contributing to improve agricultural productivity. This in turn would encourage more

farmers to demand inputs for application in their farms. Proper engagement between farmers and agro-dealers may therefore contribute to transforming agricultural production thereby reducing income and food poverty. Similar findings have been established in Kenya where Chianu *et al.* (2008) reported that information on inputs was among the services provided by agro-dealers in Western Kenya.

Table 4: Services provided by agro-dealers according to the respondents (n=97)

Characteristic	Ifakara	Kiberege	Kisawasawa	Mwaya	Total
Technical advice	2(8.3)*	5(21.7)	3 (12.0)	2(8.0)	12(12.4)
Information on input use	10(41.7)	2(8.7)	4(16.0)	2(8.0)	18(18.6)
Distribution of inputs	11(45.8)	9(39.1)	13(52.0)	14(56.0)	47(48.5)
Sharing experience	0(0)	0(0)	1(4.0)	0(0)	1(1.0)
Provides input use information and distribution of agro-inputs	0(0)	0(0)	1(4.0)	0(0)	1(1.0)
None	1(4.2)	5(21.7)	1(4.0)	6(24.0)	13(13.4)
Missing	0(0)	2(8.7)	2(8.0)	1(4.0)	5(5.2)

***** Numbers in brackets indicate percentage

The importance of farmers getting the right information regarding inputs cannot be overstated. Agro-dealers are more likely to provide the right information regarding input application if they have the right knowledge and experience. Efforts should be directed at improving their knowledge and skills in this regard. Misinformed sellers of agro-inputs could mislead farmers with dire consequences. It was observed during this study that in some cases agro-dealers' shops were managed by employees (counter sellers) who had no technical proficiency on utilization and safety aspects of the agro inputs. This is alarming because farmers may be misled by such employees, exposing farmers to improper application and subsequent unwarranted losses.

The influence of agro-dealers on use of farm inputs

As discussed earlier, although 66.7%% of the agro-dealers interviewed reported that they train farmers on the proper usage of agricultural inputs. However, findings in Table 3 show that very few agro-dealers used extension approaches to stimulate demand for input demand, which suggests that agro-dealers in the study area are lacking entrepreneurial knowledge and skills in this business. Less than half of the dealers reported using demand-pull methods such as demonstration plots (13.3%),

exhibition (46.7%) and farmer's field days (20%) for influencing the use of improved inputs.

Apart from selling inputs and providing information as alluded to earlier, agro-dealers also provide credit to farmers (Chianu *et al.,* 2008). Increasing farmers' access to credit should be considered an important strategy to improve factor demand. Findings from this study (Table 5) show that only 6.2% the respondents received credit from the agro-dealers for purchasing agricultural inputs. Meanwhile, about 77% of the farmers mentioned lack of credit for inputs to be an important factor that limited their ability to improve and expand farm production. High interest rates on inputs acquired on credit is another limiting factor. For this reason, Dorward (2009) and other researchers recommend that the governments should invest in developing and facilitating options that enable more farmers to use agricultural inputs by expanding their opportunities to secure inputs on credit and at affordable interest rates.

Table 5: Respondents' access to credit from agro-dealers (n=97)

Characteristic		Ifakara	Kiberege	Kisawasawa	Mwaya	Total
Availability of inputs on credit	Yes	6(25)*	1(4.3)	2(8.0)	1(4.0)	10(10.3)
	No	18(75)	23(95.7)	23(92.0)	24(96)	87(89.7)
Households acquisition of input credit from agro-dealers	Yes	1(4.0)	1(4.3)	4(16.70	0(0)	6(6.2)
	No	24(96.0)	22(95.7)	20(83.3)	25(100)	91(93.8)

***** Numbers in brackets indicate percentage

Results in Table 5 show further that some respondents (8%) lacked information on credit availability for acquiring inputs. Upon probing, agro-dealers pointed out that, in most cases they do not offer farm inputs on credit due to dishonesty of some farmers and the risk associated with agricultural production. ''*When there is a drought and farmers are unable to service their loans, then we incur losses as there is no insurance to cover the risk''* (Cyprian Haule, an agro-dealer from Mwaya, 22/12/2011). Dorward (2009) argues that the farmers' inability to obtain the necessary funding (credit) limits their ability to make an otherwise profitable investment in agricultural inputs, which could transform their production and possibly their living standards. Dorwad's argument, which is also supported by observations from this study, suggests the need for credit provision in order to encourage farmers to apply more improved agro-inputs. However, credit conditions should be such that the providers are shielded from the risks of none payment by borrowers.

Factors influencing use of improved inputs

To assess further the interaction between input use among farmers and the role of agro-dealers, a binary logistic regression model (equation 1) was used to determine factors that influence farm households to use or not use improved inputs or technologies, focusing on fertilizers, improved seeds and pesticides. Use of herbicides was dropped since only three farmers had used this type of input. The findings are reported in Table 6.

Table 6: Binary logistic regression results for Households purchase of fertilizers, improved seeds and pesticides (n=97)

Characteristic	Households purchase of fertilizers B (S.E.)	Households purchase of improved seeds B (S.E.)	Households Use of pesticides B (S.E.)
Intercept	-1.061(0.721)	-	-
Marital Status	-1.249(0.918)	0.045(0.822)	-0.779(0.860)
Household head's sex	0.888(0.980)	0.475(0.913)	0.902(0.960)
Area cultivated by household	0.124(0.104)	-	0.085(0.117)
Availability of credit from agro-dealers	1.408(0.887)	1.122(0.785)	0.740(0.771)
Number of Agro-dealers in area covered	**0.325*(0.192)**	0.132(0.133)	**0.247*(0.144)**
Distance to agro-dealer's shop	0.406(0.493)	0.273(0.472)	-0.546(0.505)
Past experience of buying fake/below	0.362(0.493)	0.143(0.473)	0.338(0.499)
Nagelkerke R^2	0.156	0.078	0.104
Cox & Snell R^2	0.117	0.058	0.076
Model X^2 (7)	10.654	5.135	6.730

NB: ** Significant at the 5% (0.05) level, * Significant at 10% (0.1) level

Results from the binary logistic regression analysis present three models (for fertilizer, seed and pesticides) showing that, all the intercepts were negative, but only the intercept for pesticide use was significantly different from zero. The coefficient for the respondents' marital status was also negative in relation to fertilizer and pesticide purchase and use, implying that unmarried respondents were less likely than their married counterparts to purchase fertilizer and pesticides. This is consistent with findings discussed earlier (Section 3.1) showing that married individuals were more likely to access fertilizer (Uttaro, 2002), have more networks (Dessalegn, 2008), and influence each other to use improved inputs to fulfill their joint responsibility to grow enough crops to feed their family.

The coefficient for the distance from the farmer's house to the Agro-dealer's shop was also negative as expected in relation to pesticide use, but positive for fertilizer and pesticides. The coefficient for the amount of land cultivated in relation to purchase of improved seed as also negative, implying that farmers who cultivate small areas are more likely to use improved seed. The remaining coefficients were positive as expected. The model's degree of determination was relatively weak since none of the measures for the degree of association between a farmer's decision to use improved agricultural inputs and selected independent variables were significantly different from zero. According to these results, only the coefficient for the number of agro-dealers in the study areas was slightly significantly (at $\alpha = 0.1$) in relation to using fertilizers and pesticides.

Despite an insignificant coefficient of determination, the farmers' probability of purchasing fertilizer was positively influenced by; sex of the household head (being male), area cultivated, availability of credit from agro-dealers, and the past experience of having purchased fake or below standard inputs. Availability of inputs on credit though not significantly associated with a household's use of improved inputs usage results show households were more likely to use these inputs when they were available on credit. The coefficient for the distance to the Agro-dealer's shop was positive, but this was contrary to expectations. Purchase of improved seeds was similarly positively influenced by; the marital status, sex of household head, availability of credit, number of agro-dealers in the area, distance to the Agro-dealer's shop, and past experience of purchasing fake or below standard inputs. The coefficient for area cultivated was negative indicating that farmers with smaller farmers were more likely to use improved seed. As the area under paddy increases, a farmer is less likely to depend on purchased improved seed. Generally, farmers who have large areas of land are likely to settle for low yield while farmers who face a land constraint are forced to adopt land productivity improving technologies such as improved seed and fertilizer.

Most the surveyed households were involved in paddy production for which use of improved seed is very low. Paddy producers in the study area often recycle paddy harvested from the previous season, therefore not requiring purchased seed from agro-dealers. Findings by Isinika and Msuya (2011) show that the number of households using improved seeds in Morogoro region and Kilombero district was less than 5%. Similarly, the Sample Census of Agriculture shows that the use of improved seeds in the region increased only slightly from 15% in the 2002/03 to 16% in the 2007/08. Government records also show that the proportion of crop farming

households using improved seeds increased only marginally from 18% in 2002/03 to 24% in 2007/08 URT (2010:18).

The use of pesticides was positively influenced by; the sex of the household head, area cultivated credit from Agro-dealers, number of Agro-dealers, and past experience of buying fake or sub-standard inputs. As pointed out earlier, the coefficient for distance to the Agro-dealer was negative, implying famers who are close to the source of inputs are more likely to use them. The study had earlier aimed at determining the relationship between provision of agricultural advice by agro-dealers and households use of improved agro-inputs; this was dropped due to only a few of the surveyed agro-dealers pointing out they did offer such services.

These results reflect the low level of using improved inputs in the study area such that a clear trend and association may not be clearly discernible. A study of this nature would in future require seeking for additional relevant variables that underlie the probability of a farmer to purchase and use improved agricultural inputs.

Conclusion and Recommendations

Based on the findings as presented above, it can be concluded that agro-dealers are important actors in supplying inputs to smallholder farmers and their number can have a significant positive effect to induce farmers to apply improved agricultural inputs. It has also been demonstrated that the availability of inputs on credit is important in encouraging farm households to use improved agricultural technologies such as fertilizers that may then help them to transform agricultural production. Reducing the distance to Agro-dealers' shops would also have a similar effect. The potential of extension methods such as demonstrations and participation in field days could not be clearly discerned because very few of the agro-dealers used such methods.

Based on the study findings and the conclusion above, a number of recommendations are made. First, agro-dealers require technical and entrepreneurial training in order to raise the farmers' use of improved technologies they (agro-dealers) stock. Such a move has the potential of raising farm households' agricultural productivity and ensuring food security in the rural areas especially for those growing food crops. Second, the low level of improved inputs application in the study area is very low, which calls for the need to train farmers regarding the importance of using the whole range of improved agricultural technologies in order to raise productivity hence, food security and increased household income for other

uses. Third, further research is required to establish why despite many efforts by the government to provide extension services to farmers, this has not improved the farmers' level of using improved technologies such as seed and herbicides, as it has been demonstrated in this study.

References

African Agricultural Technology Foundation (AATF) (2008). A bio-monthly progress update by the African Agricultural Technology Foundation for Stakeholders in the Striga Project. [www.aatif-africa.org] site visited on 16/12/2010.

AGRA (2009). Developing Rural Agricultural Input Supply Systems for Farmers in Africa. [www.agra-alliance.org] site visited on 18/10/2010.

Cagley, J.H. (2009). *Political Economy of Fertilizer Policy in Sub-Saharan Africa*. Executive Summary. Prepared for the Farmer Productivity Team of the Bill and Belinda Gates Foundation, Washington DC. 8pp.

Chambers, R. (1997). *Whose reality counts: Putting the first last* Intermediate Technology Publication, London.

Chianu, J. N., Mairura, K. & Ekise, I. (2008). Farm Input marketing in Western Kenya: Challenges and Opportunities. *Africa Journal of Agricultural Research* 3(3): 167 – 173.

Chinsinga, B. (2011). Agro-dealers, Subsidies and Rural Market Development. In. A Political Economy Enquiry Paper. No. 031. Malawi. 23pp.

Delgado, C. & Minot, N. (2000). Agriculture in Tanzania since 1986: *Follower or Leader of Growth*. World Bank Country Study. The World Bank and IFPRI. Washington, DC.

Dessalegn M. K. (2008). Social Networks and diffusion of Agricultural technology. The case of sorghum in Metema Woreda. Dissertation for Award of MSc Degree at North Gondar, Ethiopia, 146pp.

Douwe, J. (2009). ICRA Learning Materials Sukumaland case study-Economic Data- Shinyanga, Tanzania. 9pp.

Dorward, A. (2009). Rethinking agricultural input subsidy programmes in a changing world. *Paper prepared for the Trade and Markets Division,*

Food and Agriculture Organization of the United Nations[http://eprints.soas.ac.uk/8853/1/Dorward_FAO_Subsidy_Paper_FINAL.pdf] site visited on 12/5/2012.

Freeman, A. H. & Omiti, J. M. (2003). Fertilizer use in semi-arid areas of Kenya. Analysis of smallholder farmers' adoption behavior under liberalized markets. *Nutrient Cycling in Agro-ecosystems* 66(1): 23-31.

Keenja, C. P. (2004). Agriculture as the Backbone of the Economy of Tanzania. *A Paper Presented at The Convocation General Meeting of The Open University of Tanzania by The Minister of Agriculture and Food Security,* Dar es Salaam.

Krausova, M. and Banful, A. B. (2010). Overview of the Agricultural input Sector in Ghana. IFPRI Discussion Paper No. 01024.

Minot, N. (2009). Fertilizer Policy and use in Tanzania. Paper presented at the Fertilizer Policy Symposium of the COMESA African Agricultural markets Program, Livingstone, Zambia. Available at: http://www.aec.msu.edu/fs2/aamp/eminar_2/seminar_ 3_tanzania.pdf Retrieved on 18th April 2011.

Ministry of Food and Agriculture (MOFA) (2011). Agricultural Extension Approaches Being Implemented in Ghana. Directorate of agricultural extension services. Available at: http://mofa.gov.gh/sit /wp-content/uploads/2011/03/Extension-approaches-in-Ghana-.pdf Retrieved on 15th April 2012.

National Bureau of Statistics (NBS) (2006). National Account of Tanzania Mainland: 1992 – 2004. Central Printing Works Ltd.

Isinika, A. C. & Msuya, E. E. (2011): Addressing food self-sufficiency in Tanzania: a Balancing Act of Policy Coordination. In. *African Smallholders* (eds G. Djurfeldt, E. Aryeetey and A.C. Isinika). CAB International, pp. 281-316.

Nkonya, E. & Kato, E. (2001). Agricultural Input Marketing in Uganda. A paper Presented at the IFPRI Policy Workshop, June 25-26, 2001, Kampala Uganda. Available at: http://ussp.ifpri.info/files/2011/10/agricultural-input-mar keti ng- n-uganda-nkonya-and-kato-200.pdf Retrieved on 12th April 2012.

Policy Forum (2009). Accelerating Pro-poor Growth in the Context of Kilimo Kwanza. Paper Presented to the Annual National Dialogue. Available at: http://www.policyforu m-tz.org/files/ KILIMOKWANZA.pdf Retrieved on 23rd November 2011.

Saunders, M. (2007). Methodological Considerations in a Quantitative Study Examining, Vision Publisher, Dar es Salaam, Tanzania. 35pp.

Teferi, W. (2003). Trends in and Determinants of Fertilizer Use in Gozamin Woreda, Amhara Region. Dissertation for Award of MSc Degree at Alemaya University, Ethiopia. 69pp.

Trading Economics (2013). Female headed households (% of households with a female head) in Tanzania. Available at: http://www.tradingeconomics.com/tanzania/female-headed-households-percent-of-households-with-a-female-head-wb-data.html Retrieved on 31st May 2013.

Ukeje, E. (2004). Modernizing Small Holder Agriculture to Ensure Food Security and Gender Empowerment. Issues and Policy. Available at: http://www.g24.org/Workshops/ukeje.pdf Retrieved on 15th April 2012.

UNCTAD (2010). Technology and Innovation Report: Enhancing food security in Africa through science, technology and innovation. New York, US. 124pp.

URT (2007). National Irrigation Policy and Strategy draft. Ministry of Water and Livestock Development. Dar es Salaam, Tanzania. 67pp.

URT (2011).National Sample Census of Agriculture 2007/2008 Volume 1: Technical and Operation Report. Available at: http://www.nbs.go.tz/takwimu/Agr2007-08/Technical_And _Operation_Report.pdf Retrieved on 7th February 2013.

Uttaro, P. (2002). Diminishing choices: Gender, small bags of fertilizer, and household food security decisions in Malawi. *African Studies Quarterly* 6(1).

World Bank (2003). Fertilizer Tool kit. Promoting Effective and Sustainable Use of Fertilizer in Africa. 4pp.

Dual function national libraries: A SWOT analysis of the Sokoine National Agricultural Library, Tanzania

Alfred S. Sife[1], Esther Ernest[2] & Ronald Bernard [3]
Sokoine National Agricultural Library
P.O. Box 3022, Morogoro, Tanzania
[1]Senior Librarian, Email: asife@suanet.ac.tz
[2]Assistant Librarian, Email: esterrnst@suanet.ac.tz
[3] Assistant Librarian, Email: berota@suanet.ac.tz

Abstract
A SWOT analysis was conducted for the Sokoine National Agricultural Library (SNAL) in order to understand its strengths, weaknesses, threats and opportunities and how these affect its performance as a dual function library. This SWOT analysis was achieved through authors' experience and review of existing documents. The analysis revealed that the strength of the library was on its staff, collection, ICT services and training programmes. SNAL's weaknesses include limited financial resources, lack of user education programme, inadequate library security, insufficient library facilities and space, underutilization of e-resources and dysfunctional printing unit. A serious weakness is the low attention given to the library's national mandate, implying that SNAL has not adequately played its role as a national agricultural library. Available opportunities for SNAL include ICT development, legal deposit legislation, joining library consortia, funding opportunities, and outreach activities whereas budgetary constraints and changes in technology are the library's threats. The library could build on these strengths and opportunities to overcome its weaknesses and threats. Several recommendations have been made based on the SWOT analysis.

Keywords: National library, SWOT analysis, Sokoine National Agricultural Library

Introduction

National libraries are government institutions that are established to serve as preeminent repositories of information in their respective countries. These libraries vary widely in respect of their origins, functions, and status depending on the historical and economic background of the country. Nevertheless, national libraries share some common characteristics such as being publicly funded and open to the general public. The functions of national libraries can be grouped into those concerned with the preservation of nation's literary production; coordination of the country's libraries; and the delivery of library and information services. National libraries are also responsible for acquiring and conserving collections of the national and foreign literature, receiving materials through legal deposit legislation, producing national bibliographies, acting as national

bibliographic centers, compiling union catalogues, providing national referral services, and coordinating research in library and information services (Line and Line, 1979; Cornish, 1991; Lor and Sonnekus, 1997).

National libraries can be categorized into those holding all kinds of collections and those with collections of specific subjects such as a science, medicine, law and agriculture. As a result of such categorization, many countries tend to have multiple national libraries including those with general collections as well as subject-specific libraries. The collections of subject-specific libraries are often narrow in scope but have depth within the field they cover. On the other hand, some national libraries have been accorded dual functions such as serving as national libraries and academic libraries at the same time. This duality implies that apart from fulfilling their mandates as national libraries, these types of libraries are also responsible for meeting the information needs of their parent institutions. In other words, for these types of library to fulfill their mandates, the national and institutional responsibilities should be achieved simultaneously.

The Sokoine National Agricultural Library (SNAL) in Tanzania is a dual function national library because it also serves as a university library for Sokoine University of Agriculture (SUA). The history of SNAL dates back to 1964 when it was established as a library for the College of Agriculture in Morogoro. In 1972, it became the library for the then Faculty of Agriculture, Forest and Veterinary Science of the University of Dar es Salaam until 1984 when it became a university library for SUA. In 1991, the university library was elevated to a national agricultural library through an Act of Parliament No. 21 of the same year. This means that SNAL became both a university library for SUA as well as a national agricultural library for Tanzania. The library is therefore open to the university community and to other people in need of agricultural information in the country and beyond. The Library (SNAL) is located at the SUA's main campus and with a branch library at the Solomon Mahlangu Campus of SUA, both in Morogoro.

The primary object of SNAL is to develop and maintain library and information services in agricultural sciences and related disciplines so as to support the core functions of SUA and provide information to other categories of users. Specifically, the library is responsible for serving the information needs of various agricultural actors; coordinating and offering advisory and liaison services to other agricultural libraries in the country; and providing reference and library loans services. The library is a national bibliographic and documentation centre and a repository of information on

agriculture and related fields. It is a legal depository of materials published in the country; it also collects materials published elsewhere about Tanzania. Furthermore, SNAL is responsible for establishing and maintaining the union catalogue as well as providing current awareness and delivery of documents. The library is also responsible for establishing, maintaining and promoting cooperation with similar libraries at the national and international levels (URT, 1992).

There have been concerns that for more than twenty years since its establishment as a national agricultural library, SNAL has hardly accomplished its national obligations. Anecdotal evidence suggests that the library has largely focused on fulfilling its university roles; but, this has also been done unsatisfactorily. Such low performance has been attributed to several factors, some of which are external to SNAL. However, there is paucity of clear analysis of the factors responsible for the present performance of SNAL. As such, analysis of the library's strengths, weaknesses, threats and opportunities (SWOT) was conducted to understand SNAL's internal and external environments and how these affect its performance as a dual function library. This SWOT analysis was achieved based on the authors' experience and review of existing documents such as library and university reports, the library's Collection Development Policy, library statistics, SNAL's website and other relevant documents.

Organizational assessment based on the SWOT framework is commonly used for analyzing organizations' internal (strengths and weaknesses) and external (threats and opportunities) factors. A strength is a resource or capability that an organization possesses for successful achievement of its objectives whereas a weakness is a debility, fault, defect or limitation in the organization that prevents achievement of its objectives. An opportunity is any conducive or favourable situation in the organization's external environment whereas a threat is an unfavourable situation, a barrier or constraint in the organization's external environment that may pose problems in the smooth working of an organization. The SWOT analysis is an important tool for planning strategies that can utilize strengths and opportunities to overcome threats and weakness facing a particular organization (Kumar, 2012).

Literature Review

There is existing literature on SWOT analysis for various types of libraries around the world. Lali and Vijayakumar (2002) analyzed the strengths, weaknesses, opportunities and threats of the Kerala University Central

Library in India and they worked out a strategy for effective marketing of information services and products. Their analysis showed that the strengths outweighed the weaknesses. Although the threats were quite strong, there were ample opportunities that stood as silver lines. Another SWOT analysis of four university libraries in Kerala showed that the libraries could overcome their threats and weaknesses with appropriate positioning and marketing strategies (Kumar, 2012). In Nigeria, Ugah (2007) conducted a SWOT analysis of the Michael Okpara University of Agriculture Library and found out that the strength of the library was on its staff, collections and equipment while lack of proper and functional library catalogue presented a major weakness. Opportunities for the library's improvement included training, research, publication of journals as well as indexing and abstracting services whereas a major threat of the library was safety and security problems.

A SWOT analysis of Razi University Libraries in Iran showed that the strength and weaknesses of the libraries were related to the physical facilities, ICT infrastructure, human resource, financial state, collaboration, and collection. The threats included lack of quality hardware and software, unavailability of consortium purchases, outsourcing, and inadequate budget. Opportunities for the library include the move from printed to electronic resources, support for innovation, a positive attitude of the student body towards the library, and the relatively young human resource having the required skill (Sohel, 2011). Another SWOT analysis of the Pellissippi State Community College Library in USA showed that availability of group study rooms, up to date websites and computers were the main strengths while lack of comfortable study areas and underutilization of existing resources were the major weaknesses. Opportunities for this library included availability of current technologies and dedicated librarians whereas major threats were the rising college enrollment and increased cost of electronic resources (Duby, 2011). A recent study at the University of Malaya found that the library's strength of included the vast amount of collections, the library's strategic location and possession of new technologies, whereas its weaknesses included outdated structures and limited parking areas at the library. Opportunities existed in relation to training and research, the inter-library loan system and document delivery services, and collaboration with other documentation facilities. Major threats were listed as the indifferent perceptions of customers towards other users who do not act responsibly, alternative information providers, restrictive copyright and licensing agreements, and changes in the information environment (Hazidah, 2012).

Generally, the literature review shows that different factors play a role as strengths, weaknesses, opportunities or threats for different libraries. In many libraries, strengths and weaknesses are often related to the collections, human resources, infrastructural facilities and financial resources. Opportunities and threats are mainly those related to technological developments and collaborations with other stakeholders. There is however, a dearth of literature on SWOT analysis of libraries in Tanzania. Globally, there is scarce literature on SWOT analysis of national libraries particularly those with dual roles.

SNAL's internal and external environments

Analysis of SNAL's internal and external environments indicates that the library's strength were mainly related to its staff, collections, ICTs services and training programmes. Major weaknesses were related to financial resources, user education, national roles, library security, library facilities and space, e-resources usage and its printing unit. Available opportunities include ICT developments, legal deposit legislation, library consortia, funding opportunities, and outreach activities. Budgetary constraints and changes in technology were the major threats. These factors are explained in the following sections.

Strengths of SNAL

Library staff

Availability of library staff with the right qualifications and competencies is of paramount importance for effective functioning of any library. Having multi-skilled library staff with sound subject knowledge is particularly necessary for a university and subject-specific library. At present, SNAL has a total of 50 staff of which 33 are administrative and 17 are academic. The staff comprise of 43 professionals with more than half (51.2%) having a minimum of bachelor degree. Nine academic members of staff have master degrees and seven possess doctoral degrees (Table 1). While library standards usually prescribe a ratio of 1:2 for professional to non-professional staff in a university library, the ratio at SNAL is 6:1. This suggests that the library is rich in terms of the number of professional staff. In addition, having 16 library staff with postgraduate degrees is strength because it is recommended that qualifications of library staff should be at par with those of academicians within the institution for better library services (Kumar, 2012).

Table 1: Qualifications of the library professionals at SNAL

Qualifications	Number of staff
PhD	7
Masters	9
Bachelor	6
Diploma	14
Certificate	7
Total	**43**

Source: Library reports

Most of the staff at SNAL have specialized in library and information science, and information technology. In addition, majority of the academic staff possess bachelor degrees in agriculture and related fields (Table 2), which is a real strength for the library. Ugah (2007) and Sohel (2011) have also cited human resource as strength in Michael Okpara University of Agriculture Library and the Razi University Libraries respectively. In addition, Ugonna (1977) argues that subject librarians who are conversant with the terminology and have expertise in particular subjects would offer effective search and current awareness services.

Table 2: Bachelor degree qualifications of SNAL academic staff

Bachelor degree	No of academic staff
Agriculture	3
Agricultural economics	1
Animal science	1
Aquaculture	2
Education	2
Environmental sciences	1
Food Science and Technology	1
Forestry	1
Home Economics and Human Nutrition	4
Wildlife	1
Total	**17**

Source: SUA (2013)

Collection

The size, quality and diversity of library collection determine the library's ability to meet information needs of its user population. The process of developing collections includes acquisition, selection, evaluation, preservation and weeding out obsolete library materials. These functions are often guided by policy documents which establish priorities and

facilitate decision making. Fortunately, SNAL has a written collection development policy since 2011. The library has within its collection diverse printed and electronic information resources in agriculture-related fields, acquired since 1964 when it was a library for the College of Agriculture. Print resources include books, journals, theses and dissertations, research reports, newspapers and other materials. The print book collection is estimated to be 120,000 volumes. The library has several types of electronic information resources including online databases, CD-ROMs and the TEEAL[4] collection. The scope of coverage of the collection include agricultural sciences with emphasis on crop production, animal and veterinary sciences, forestry, environmental sciences, food science, rural development and related disciplines (SUA, 2011). Previous studies (Ugah, 2007; Sohel, 2011; Hazidah, 2012) have also indicated availability of vast amounts of collections as library strength.

ICT Services

The use of information and communication technologies (ICTs) in libraries has greatly improved the acquisition, organization, storage, retrieval, and provision of information resources. These technologies have particularly improved the provision of library and information services by overcoming time, distance and other barriers. The Sokoine National Agricultural Library has made some notable developments in terms of integrating ICTs in library services. The development of ICTs can be traced back to 1989 when the library acquired its first computer that was mainly used for periodicals' data storage. Computerization of library services began in 1998 with the automation of the book card catalogue using [5]CDS/ISIS software. In 2005, SNAL migrated to web-based library automation software known as [6]WEBLIS, which was again replaced by [7]ABCD software in 2011. The library started providing Internet and CD-ROM services including TEEAL in 1999. In 2001, a library website was developed and SNAL started subscribing to electronic journals in agriculture and allied fields. Observations indicate that currently there are 41 computers for library users, 600 CD-ROMs, two servers, three scanners and three photocopiers. Available computers may be inadequate for the user population but they

[4] TEEAL stand for The Essential Electronic Agricultural Library which is an annually updated full-text digital library of scientific journals in agricultural sciences.

[5] CDS-ISIS stands for Computerized Documentation System-Integrated Set for Information Systems

[6] *WEBLIS* is the Web based Library Integrated System.

[7] ABCD stands for Automation of libraries and Centres of Documentation.

have greatly enhanced the provision of information services. The library subscribes to a total of 29 e-journal databases and a number library services are computerized. Other researchers (Sohel, 2011; Duby, 2011; Hazidah, 2012) have also cited availability of up to date technologies as strength for any library. Furthermore, SNAL uses open source software in computerizing many of its operations for sustainability purposes including cutting down costs. The library is also in the process of establishing an institutional repository that would increase access to research outputs and other information resources emanating from SUA.

Training programmes

Besides the provision of library and information services, SNAL offers two diploma programmes namely; Diploma in Information and Library Science as well as Diploma in Records, Archives and Information Management. These programmes started in 2010 to produce professionals in the fields of library, information, records and archive sciences and management. The first batch of 61 diploma students graduated in 2012, and currently there are 150 students for both programmes. In addition to teaching in these programmes, SNAL academic staff are involved in teaching a number of courses for the Bachelor of Science in Informatics which is hosted at the Faculty of Science. Library staff also offer information literacy courses to the entire university community (students and staff) and they are involved in the supervision of postgraduate students from different departments in the university who undertake research in fields related to information as part of their studies

Weaknesses of SNAL

Limited financial resources

Libraries require sufficient funds for collection development, acquisition of equipment, and staff development, among many other requirements. Available evidence shows that SNAL has been receiving meager and diminishing funds from government allocations through the University. Available evidence indicates that SNAL has been receiving less than five percent of its approved budget since 2001. Insufficient funds have severely affected library services particularly the acquisition of information resources as well as improvement of facilities and software to meet the information needs of a growing user population. Significant print journal subscriptions have not been done since 1995, and the acquisition of books has been inadequate and unreliable. Expansion of the branch library at Solomon Mahlangu Campus in recent years implies that more library material and facilities should be acquired. Most of the available library

developments have depended heavily on donor support. There is therefore a need to continually press for more funds from the government and diversifying the sources of funds.

User education

Teaching users on how to access and retrieve materials via library and information systems, whether manual or electronic, has long been undertaken by libraries. User education programmes have become very important in recent years when library and information systems became ICT-based. User education takes different forms such as library orientation sessions, bibliographic instructions, and information literacy training (Kamar, 2008). The Sokoine National Agricultural Library has been making efforts to mainstream information literacy into the university's curricula since 1990s but in vain. Instead, the library has only been able to conduct informal and inconsistent information literacy sessions to different groups of users in the form of seminars, workshops, class instructions and orientation sessions. During the academic year 1999/2000, some information literacy topics were integrated in the communication skills course for all first year students. However, teaching of these topics was stopped two years later following the introduction of semester system (Dulle and Lwehabura, 2004). Information literacy topics were introduced again during the academic year 2010/2011 for all second year students as part of computer applications course but teaching the topics was stopped one year later following the university-wide curricula review. In addition, teaching information literacy to master students was successfully conducted during the academic year 2010/2011 before it was stopped due to lack of time slot in the timetable. Failure to mainstream information literacy into the University curricula implies that the subject is not accorded any official status; hence it does not receive the support of students and staff. Nevertheless, lack of information literacy skills hinders students from effectively accessing available information resources, which in turn constrains their academic performance and lifelong learning competencies. Experiences at SNAL show that most library users often fail to use even the basic search interface of the library OPAC. In addition, many e-resources such e-journals remain underutilized, which could be due to the users' limited competence on library search.

A major reason behind the abandonment of information literacy training at SUA could be insufficient awareness about information literacy among stakeholders including the management, academicians and students. Lwehabura and Stilwell (2008) have also identified lack of information literacy policies, inadequate ICT facilities, and insufficient collaboration

between librarians and teaching staff as challenges facing information literacy programmes in Tanzanian universities. A paradigm shift is therefore necessary among stakeholders particularly the University management, in order to integrate information literacy into the University curricula. It is important for SNAL to increase advocacy and to devise strategies, which will enhance stakeholders' awareness on information literacy. This is particularly important because the evolution of ICT based library services is so fast such that it requires periodic continuing education for staff and users.

Less attention on the library's national role

As a national agricultural library, SNAL is required, among other things, to provide information services to the university community and other users in the country and beyond. As pointed out earlier, SNAL has not adequately carried out its national responsibilities since its establishment. While insufficient financial resources have been repeatedly cited as a major constraint, there could be policy-related problems as well. For instance, the Parliament Act that established SNAL does not provide a clear connection between the library, the Ministry responsible for agriculture and other agricultural actors with respect to the implementation of SNAL's stipulated responsibilities. In addition, despite SNAL's national mandate, the establishing Act does not clearly stipulate funding for this role. This is a serious weakness considering the financial constraints currently facing the University, which is bound to prioritize the allocation of funds to support its core activities. Furthermore, the Act does not provide mechanisms for monitoring and evaluating the implementation of SNAL's national roles. This calls for the revision the Parliament Act that established SNAL in order to overhaul the responsibilities of the library, r**e**define the responsibility of the government and other stakeholders towards the library, and formulate mechanisms for funding as well as monitoring the library's performance as a national repository. Parallel to this, SNAL should develop and implement plans, which clearly distinguish the national obligations from those of the University.

Inadequate library security

The problem of theft, mutilation and other forms of abuse of books and other library material is common in many libraries. There is evidence that incidents of theft, non-return of materials and mutilation of library in stock are on the increase in many libraries (Jackson, 1991; Somam and Shyla, 1997; Ajegbomgun, 2004). The main causes of book theft and mutilation include selfishness, scarcity of required books, inadequate number of library staff, especially at night and during weekends, lack of multiple

copies of library materials, and inadequate photocopying facilities (Senyah, 2004). Available evidence at SNAL reveal that there have been serious incidences of theft as well as loss and mutilation of library materials particularly theses and dissertations. Criminal activities at the library are not limited to information materials alone. There has also been theft of other properties such as staff and students' laptops, handbags, computer accessories and other valuable items. Other disappointing behaviours include hiding of materials by misplacing them from their original shelves. Furthermore, the absence of regular stocktaking or inventories makes it difficult for SNAL to quantify the extent of losses. For a long time, SNAL has not implemented any comprehensive stocktaking in order to physically verify the actual holdings it has in place (SUA, 2011). It is therefore important for the library to formulate appropriate security mechanisms such as developing library security plans, conducting user awareness campaigns, training library staff on collection security, installing security facilities, implementing disciplinary actions to offenders, and conducting regular stocktaking.

Insufficient library facilities and space

Students' enrolment at SUA has been increasing every year. Available data show that the population of undergraduate students at SUA has grown from 1830 in 2000/2001 to 6377 in 2012/2013. The total population of postgraduate students at present is 1689and there are 1322 employees of which 508 are academicians. Unfortunately, there has not been significant increase in the quantity and quality of library facilities such as computers, tables and chairs as well as the library seating space. The total seating capacity for the main and branch library is about 800 people (SUA, 2012), which is inadequate for the growing user population. Although no specific library seating standards have been set for academic libraries in Tanzania, recommended standards around the world range between 1:3 to 1:5 (i.e. one seat for every three users to one seat for every five users) (Organ and Jantti, 1997). In addition, Computing and other facilities within the library are also inadequate; much of the furniture is worn out; and the main library building shows signs of wear. Furthermore, library buildings and facilities are not easily accessible to persons with different kinds of disabilities. Cassner *et al.* (2011) argue that a person in a wheelchair should be able to reach all library departments; a blind person with a stick should also be able to enter without encountering difficulties; and a deaf person should be able to communicate with library staff. In its present form, SNAL is incapable of providing such library services.

Underutilization of e-resources

Available evidence indicates that there is underutilization of e-resources at SUA. Very few downloads are being made from online databases such as [8] AGORA, [9] OARE, [10] HINARI and many other databases subscribed through the Consortium for Tanzania University and Research Libraries (COTUL). For instance, country wide e-resources usage statistics from the International Network for the Availability of Scientific Publications (INASP) indicate that there were an average of 977 full text downloads per Tanzanian registered institution in the year 2012 (INASP, 2013). For SUA, these statistics imply that there were an average of two downloads for each academician for the whole year (excluding students and other users). Similarly, available library statistics indicate that there has been low usage of available CD-ROMs and the TEEAL database. Such low usage of e-resources in Tanzania has been attributed to several factors including low awareness, poor internet connectivity, insufficient computer and information literacy skills, and limited access to computers (Manda, 2005; Manda and Nawe, 2008). Increased availability of free web resources that can be accessed through search engines such as Google could also contribute to underutilization of subscribed resources. Considering that most e-resources are being paid for either by the University or through donor support; this situation raises many questions regarding the value for money and the quality of academic accomplishments such as research outputs. It is therefore inevitable to devise new promotion mechanisms and intensify existing ones with regard to the use of e-resources. Such mechanisms include user education, awareness campaigns through traditional and new media, improving ICT services, integrating e-resources into OPAC, and designing interfaces that enable users to search several resources simultaneously.

Dysfunctional Printing Unit

SNAL possesses a Printing Unit with basic infrastructural facilities for printing and binding. However, this Unit has remained dormant for several

[8] AGORA stands for Access to Global Online Research in Agriculture. It is a digital library collection in the fields of food, agriculture, environmental science and related social sciences.

[9] Online Access to Research in the Environment (OARE) is a large collection of environmental science research coordinated by UNEP, Yale University, and leading science and technology publishers.

[10] HINARI is a programme set up by WHO together with major publishers to enable developing countries to gain access to one of the world's largest collections of biomedical and health literature.

years mainly due to lack of funds, accessories and materials. The Unit could be used for printing and binding informational material from the university and the surrounding community. It could also be used for re-binding and repairing worn out or damaged books, journals, theses, dissertations and other library material. Hence, the Printing Unit could be a source of income for the library since the demand for printing and binding services at the University are quite high. Evidence shows that students have been searching for printing and binding services outside the University for their theses, dissertations and final year projects. There is also high demand for printing and binding of University documents such as examination books, prospectuses, journals, books, newsletters, certificates and other informational materials. The performance of the Printing Unit could be improved by developing an effective business plan and injecting the required funds to support its implementation. Alternatively, the Unit could be outsourced to private operator.

Opportunities of SNAL

ICT developments

Rapid developments in ICTs are providing libraries with a plethora of opportunities to improve their services. Accelerating the shift from paper to e-resources leads to easy access and less requirement for library space. Sokoine National Agricultural Library could use opportunities provided by ICT to improve services to and reach a wider audience, especially users from outside the University. Information and communication technologies also provide opportunities for digitizing print resources such as theses, dissertations and research reports to make them accessible online. Technologies such as closed-circuit television (CCTV) could be used to minimize theft and mutilation of library material. Furthermore, SNAL could utilize emerging social media such as Facebook and blogs to promote and share library services and resources. Cloud computing is another emerging technology that could be used to build digital libraries and automate library operations using third party services, software and hardware. Cloud computing refers to both applications delivered as a service over the internet and the systems software in the data centers that provides services. Cloud computing is important because applications are hosted by another company which can handle the costs of servers and manage the software updates on the basis of contractual pay services (Bhanti, 2011).

Legal deposit legislation

One responsibility of any national library is to acquire and preserve the country's publications through legal deposit. SNAL is no exception to this respect. Legal deposit is a "requirement, enforceable by law, to deposit with one or more specified agencies copies of publications of all kinds reproduced in any medium or with any process for public distribution, lease or sale" (Lunn 1981:1). Legal deposit legislation is important to national libraries as it provides a basis for collecting and conserving information materials published in the country. This also assists national libraries to compile statistics of publications produced in the country. In principle, all types of material published in Tanzania are subject to legal deposit at SNAL. However, there have been weaknesses in enforcing the legal deposit legislation in Tanzania such that many publishers and authors do not deposit their publications at the national libraries including SNAL. Serious enforcement of the legal deposit legislation would not only increase SNAL's collection but also increase the visibility and accessibility of books and other materials published in Tanzania. With ICT developments, there is a need to revise existing legal deposit legislation to extend its scope to electronic resources so that publishers allow free access to their online publications.

Library consortia

The limitation of financial resources coupled with the proliferation of information resources has forced many libraries throughout the world to look for collective resource sharing through consortia (Jalloh, 1999). Library consortia refer to cooperation, coordination and collaboration between and amongst libraries for the purpose of sharing information resources and exploring cost saving opportunities, mostly through electronic systems and networks (Islam and Mezbah-ul-Islam, 2008). Currently, SNAL is a member COTUL, which has enabled member libraries in Tanzania to jointly subscribe to e-resources. In order to achieve some of its national obligations, SNAL can utilize this kind of approach to acquire, share and provide information services in collaboration with other agricultural libraries in the country and around the world.

Funding opportunities

Funding opportunities are often available from international organizations and the donor community, and SNAL has captured some of these resources in the past. There is room to benefit from this source of funding if SNAL staff are more organized and strategic. Given the strength of its human resource, SNAL can benefit from various funding opportunities by attracting resources for research and development. In particular, SNAL

could benefit from research projects that address dissemination and accessibility of agricultural information. Since research on information services cuts across all disciplines, SNAL could attract research grants by preparing multidisciplinary research projects in collaboration with researchers from a wide range of agriculture-related fields. The library could also benefit from the donor community to increase the stock of reading materials, ICTs and other infrastructural facilities.

Outreach activities

Library outreach services are an important activity for providing information to people who may not have access to particular library services (Alokun, 2003; Aina, 2004). Outreach services can be used to reach out to local communities, especially those who are unable or unwilling to visit the library physically (Edzan and Hazidah, 2012). There are several outreach events in Tanzania that SNAL could utilize to reach out to communities. These include the Agricultural Shows (*Nane Nane),* International Trade Fair *(Saba Saba),* Higher Education Exhibitions, and Book shows that are being organized every year. While the library has been participating in the farmers' shows, it could intensify its participation by improving its outreach material and the activities conducted during the exhibitions. This may include provision of free information, search services to various groups of users during the shows. The library can also look for more opportunities to enable them to participate in other outreach events. The library can itself organize exhibitions in collaboration with publishers and other information providers as it was a case in 2011 when the library organized book shows in collaboration with publishers and book sellers.

Threats of SNAL

Budgetary constraints

Public universities in Tanzania have increasingly faced serious budgetary constraints in recent years despite the growing population of students and staff. This implies that university libraries including SNAL increasingly receive inadequate financial resources from their parent institutions. Such budget cuts have affected subscriptions to electronic and print resources, acquisition of hardware and software, and staff development, which in turn have effect provision of quality services. As alluded to earlier, the library should continuously push for more funds from government allocations and look for more sources of funds. It is also important to revise the existing Parliament Act in order to redefine government obligations towards funding SNAL's activities.

Changes in technology

Technological obsolescence resulting from rapid changes in software and hardware applications as well as emerging innovations in computer technology have effects on the provision of ICT-based library services. Technological obsolescence is further compounded by unfavourable environmental conditions that affect ICT facilities. For SNAL to provide quality and sustainable ICT-based services, it has to catch up with technological changes by constantly acquiring new technologies or updating old ones. It also means that library staff should be re-trained from time to time in order to cope up with new ICT developments.

SWOT Matrix for SNAL

A summary of SWOT analysis of SNAL's internal (strengths and weaknesses) and external (threats and opportunities) environments is presented in Table 3.

Table 3: SWOT Matrix for SNAL

	Helpful to achieve SNAL objectives	**Harmful to achieve SNAL objectives**
Internal Factors	**Strengths** • Library staff • Collection • ICT Services • Training programmes	**Weaknesses** • Limited financial resources • Lack of user education programme • Less attention on the national role • Inadequate library security • Insufficient library facilities and space • Underutilization of e-resources • Dysfunctional Printing Unit
External Factors	**Opportunities** • ICT developments • Legal deposit legislation • Library consortia • Funding opportunities • Outreach activities	**Threats** • Budgetary constraints • Changes in technology

Conclusion and Recommendations

A SWOT analysis of SNAL reveals that the library's strength derives from its staff, collection, ICT services and the presence of training programmes. The library's internal environment is constrained by limited financial resources, unreliable user education programme, insufficient library security, inadequate library facilities and space, underutilization of e-

resources, and the low attention given to the library's national role. Considering the number and magnitude of these weaknesses, it is safe to conclude that they outweigh the strengths. This calls for serious efforts to improve the performance of SNAL. Available opportunities include ICT developments, legal deposit legislation, library consortia, funding opportunities, and outreach activities. Budgetary constraints and rapid technological changes are the library's threats. This suggests that SNAL could capitalize on its strengths and opportunities to overcome the weaknesses and threats.

Improving the performance of SNAL as a dual function library requires concerted efforts to continuously push for more funds from the government, revising the Parliament Act that established the library, developing and implementing effective strategic plan, and look for more sources of funds. Mainstreaming information literacy into the University curricula as well as devising new promotion mechanisms and strengthening existing ones could increase utilization of e-resources and other library material. Library security could be improved by developing and implementing library security plans, conducting user awareness campaigns, training library staff on collection security, installing security facilities, implementing disciplinary actions to offenders, and conducting regular stocktaking. Amendment and serious enforcement of the legal deposit legislation is necessary in order to improve the library collection and increase visibility of information materials published in Tanzania. Frequent acquisition of new ICT applications, updating existing ones and training library staff are important strategies for SNAL to catch up with technological changes. This would also entail re-training library staff from time to time. Furthermore, SNAL management could carry out SWOT analysis from time to time in order to utilize available strengths and opportunities to overcome existing weakness and threats.

References

Aina, L.O. (2004). Library and information science text for Africa. Ibadan: Third World Information Services Limited, p. 58.

Ajegbomgun, F.O. (2004). Users assessment of library security: a Nigerian University case study. *Library Management*, 25 (8/9), 386-390.

Alokun, N.A.T. (2003). Planning and executing library outreach services in Nigeria. *Nigerian Libraries* 37 (1), 31-41.

Bhanti, P., Lehri, S. & Kumar, N. (2011). Cloud computing: a new paradigm for data storage in Indian universities. *Indian Journal of Computer Science and Engineering.* 2 (5). Available at: http://www.ijcse.com/docs/INDJCSE11-02-05-018.pdf Retrieved on 23rd February 2013.

Cassner, M., Harris, C. M. & Anaya, T. (2011). Differently Able: a review of academic library websites for people with disabilities. Available at: http://www.ifla.org/files/assets/hq/publications/ professional-report/89.pd Retrieved on 13th March 2013.

Cornish, G.P. (1991). The role of national libraries in the new information environment. Paris: United Nations Educational, Scientific and Cultural Organization.

Duby, H.R. (2011) SWOT Analysis of Pellissippi State Community College Library. Available from: www.sis.utk.edu/sites/default/files/is590_duby_swotanalysis.pd Retrieved on 3rd February 2013.

Dulle, F.W. & Lwehabura, M.J.F. (2004). "User information literacy: Challenges facing university libraries towards effective implementation". In: Proceedings of the 6th Standing Conference of African National and University Libraries, 30th June 2004 –5th July 2004, Kampala.

Hazidah, N.A. & Edzan, N.N. (2012). The SWOT analysis: marketing and promotional strategies used at the University of Malaya Library. In: International Conference on GenNEXT Libraries, 8-10 October 2012, Universiti Brunei Darussalam. Available at: http://eprints.um.edu.my /4006/1/GenNEXT-Final.pdf Retrieved on 23rd February 2013.

Islam, M. Anwarul & Mezbah-ul-Islam, M. (2008). Concept issues and importance of library consortium: problems and prospects of university library consortium in Bangladesh. ÜNAK 08 Information: Diversity and Awareness, 9-11 October, Izmir. Available at: http://www.unak.org.tr/unak08/ sunum/AnwarulIslam.pdf Retrieved on 11th March 2013.

International Network for the Availability of Scientific Publications (INASP) (2013). The 2012 Electronic Resource Usage Report. Oxford, United Kingdom.

Jackson, M. (1991). Library security: facts and figures. *Library association record*, 93, 380-384.

Jalloh, B. (1999). Library networking and consortia initiatives in Africa. *African Journal of Library, Archives and Information Science.* 9 (1).

Kamar, N. (2008). Marketing of electronic information resources: A case of The J.D. Rockefeller Research Library, Egerton University. *Journal of Library and Information Science*, 34 (1), 89-93. Available at: http://ir.lib.ntnu.edu.tw/retrieve/28705/ntnulib_jaA1201_3401_089.pdf Retrieved on 2nd February 2013.

Kumar, S. (2012). University libraries in Krela: A SWOT analysis for marketing. *Library Philosophy and Practice.* Available at: http://digitalcommons.unl.edu/cgi/viewcontent.cgi? article=1900&context=libphilprac Retrieved on 22nd January 2013.

Lali, S.L & Vijayakumar, K.P. (2002). Kerala University Library : A SWOT analysis is a proposal for the marketing of information services. Kelpro Bulletin. 8 (1 & 2), p 64.

Line, M. B.; Line, J. (1979) Concluding notes. National libraries, *Aslib*, 317–318.

Lor, P. J. & Sonnekus, E. A. S. (1997). Guidelines for Legislation for National Library Services. Available at: http://archive.ifla.org/VII/s1/gnl/ Retrieved on 3rd March 2013

Lunn, J. (1981). Guidelines for legal deposit legislation. Available at: http://unesdoc.unesco.org/images /0004/000468/046869Eo.pdf Retrieved on 23rd February 2013.

Manda, P.A. (2005). Electronic resource usage in academic and research institutions in Tanzania. *Information Development*, 21 (4).

Manda, P. & Nawe, J. (2008). The impact of electronic information resource use on research output: experiences from Universities in Tanzania. *University of Dar es Salaam Library Journal*, 10 (1 & 2).

Organ, M.K & Jantti, M.H. (1997). Academic Library Seating: A Survey of Usage, with Implications for Space Utilization. *Australian Academic and Research Libraries*, 28 (3): 205-216. Available from

http://archive.alia.org.au/sections/ucrls/aarl/28.3/usage.html Retrieved on 12th June 2013.

Senyah, Y. (2004). Library security, book theft and mutilation: A case study of the University library system of Kwame Nkrumah University of Science and Technology. *Ghana Library*, 16, 9-27.

Soheli, F. (2011). SWOT Analysis of Razi University Libraries: Proposed Suitable Strategic Plan Journal of Academic librarianship and Information Research. 45(1).

Sokoine University of Agriculture (SUA) (2011) Sokoine National Agricultural Library Collection Development Policy.

Sokoine University of Agriculture (SUA) (2013) Facts and Figures. Sokoine University of Agriculture.

Somam, S.A. and Shyla, A. (1997). Students attitudes towards the theft and of library reading materials. *Library Science with a Slant to Documentation and Information Studies*, 34 (4), 203-207.

Ugah, A. D. (2007) A SWOT Analysis of the University library of Michael Okpara University of Agriculture Library, Umudike, Nigeria. *Library Philosophy and Practice.* Available at: http://www.webpages.uidaho.edu/~mbolin/ugah1.htm Retrieved on 5th February 2013.

Ugonna, J. A. (1977). Developing reference services for university faculties: a study of reference usage needs in a Nigerian university library", *Libri*, 27 (4), 305-325.

United Republic of Tanzania (URT) (1992) The Sokoine National Agricultural Library Act, 1991.

Community perception on male circumcision for HIV/AIDS Prevention in Makete District

A.N. Sikira[1] & A.P. Sanga[2]

[1]Senior Lecturer, Sokoine University of Agriculture
[2]Community Development Officer, Makete District Council,

Abstract

A study was conducted to assess community perception towards male circumcision and HIV prevention in Makete District. A cross-sectional research design was used employing quantitative and qualitative for data collection. Quantitative data were collected using a questionnaire administered to 420 respondents, while qualitative data were collected using a cheklist with questions administerd to key informants and focus group discussants. The prevalence rate for HIV/AIDS was found to be 11% determined using secondary data from Makete district Hospital. It was noted that 59.7% *of the respondents had a negative perception towards male circumcision while* 32.7% *had a positive perception. Positive perceptions of men and women were found to be an important aspect towards male circumcision. It was also noted that cultural factors hinder men to opt for male circumcision. The need for including women in the campaign towards male circumcision was found to influence male circumcision of their sexual partner. These findings lead to the conclusion that in order to have an effective HIV/AIDS prevention programs, a combination of approches is required. Nonetheless, male circumcision should never replace other known methods such as use of condom for HIV prevention.*

Keywords: Community perception, male circumcision, HIV/AIDS prevention

Introduction

The HIV/AIDS pandemic poses the greatest health challenge in Tanzania during these times, particularly in Makete district. The overall prevalence rate of HIV for Makete District in 2008 was 16.9% compared to National average, which was 7% (MDC, 2008). There are many factors leading to high prevalence of HIV in Makete district including economic factors such as low income among people in the district leading to transactional sex; these are encouraged by social-cultural factors that tolerate multiple concurrent partners, substance abuse, gender inequalities, widow inheritance, polygamy and low level of male circumcision (MC) practices (TACAIDS *et al.*, 2008[a]). Male circumcision has recently been proved to be a preventive measure towards the spread of HIV/AIDS worldwide (Auvert *et al.*, 2005). Evidence from research has indicated that the spread of HIV/AIDS was higher in communities where

non-circumcision was common compared to other communities where circumcision was commonly practices (Bailey *et al*., 2007; Gray *et al*., 2007; TACAIDS, 2008[b]). There is convincing evidence from three randomized clinical trials conducted in South Africa, which indicate that circumcision reduced men's risk of becoming infected with the HIV virus (Auvert *et al.,* 2005; Bailey *et al*., 2007; Gray *et al*., 2007). One of the randomized controlled trial indicated that male circumcision reduces sexual transmission of HIV from women to men by 60%, offering an intervention of proven efficacy for reducing the spread of HIV through sex (Williams *et al., 2006*).

On the other hand, circumcision has not been shown to directly protect females from acquiring HIV from an infected male partners (Wawer *et al*., 2009). There are also biological studies of men's foreskin of their sexual organ, which show a high concentration of cells very susceptible to HIV infection (Patterson *et al*., 2002). Studies have indicated that routine circumcision across sub-Saharan Africa could prevent up to six million new HIV infections and three million deaths in the next two decades (Williams *et al., 2006*). Given such strong evidence, the World Health Organization (WHO) and the Joint United Nations Programme on HIV/AIDS (UNAIDS) recommended that male circumcision should be considered as imperative and additional intervention for HIV prevention (WHO, 2007). In this regard, Tanzania is at its initial stages of introducing and scaling-up male circumcision services (MDC, 2011).

In Tanzania, male circumcision is largely done as a cultural or religious practice. About 75% of the men are circumcised in regions where this practice is prevalent including; Mara, Arusha, Manyara, Singida, Dodoma, Morogoro, Tanga and Coast regions (TACAIDS, 2008). In the remaining regions of mainland the prevalence of male circumcision is much lower; for instance, the prevalence of male circumcision is lowest in Shinyanga (21%), Mwanza (21%), Kagera (26%) and Iringa (29%) (TACAIDS, 2008).

A national high profile campaigns to promote male circumcision was introduced in 2010. The Ministry of Health, with support from President's Emergency Plan for AIDS Relief (PEPFAR) through USAID's Maternal and Child Health Integrated Program, launched the campaign in Iringa region (MDC, 2011). During six weeks of Voluntary Male Circumcision Campaign (VMMC) under medical care, 10,352 adolescent and adult males were circumcised. Statistics from the exercise indicate that over three quarters of the beneficiaries of the campaign were young male adults; only 24% of circumcised communities were older than 20 years indicating less

demand of VMMC by male adults (MDC, 2011). Regardless of the campaign initiatives, male circumcision in the region is still low (Mahle *et al.*, 2011), and community response on male circumcision in the district is still low (MDC, 2011). Individual perceptions towards male circumcision have been said to contribute to low prevalence of male circumcision. Apart from the number of circumcised male, very few studies have been conducted to assess male circumcision in Makete district in a wider context. For instance, there is no information regarding other achievements of the circumcision campaign in relation to attitudes, practices and beliefs about sex, in relation to male circumcision. The purpose of this paper is to assess the perceptions prevailing among male and female members of the community in Makete district regarding male circumcision as a strategy for preventing new infections of the HIV virus.

Conceptually, this paper borrowed some ideas from the cognitive dissonance theory, which holds that contradicting cognition serve as driving forces that compels the mind to acquire or invent thoughts or belief, or to modify existing beliefs (Festinger, 1957). Similarly, inadequate knowledge (conflicting cognition) towards male circumcision might influence the perception of men and women in the area. Positive perception and the correct information regarding male circumcision is required for behavioral change, which would in turn enhance prevention of HIV.

Methodology

A cross-sectional study was conducted in Makete District, which is located at the extreme Western end of Njombe Region[11] about 110 km from the regional headquarters. Makete district was chosen because it has high prevalence of HIV/AIDS (16.9%) with low prevalence of male circumcision (MDC, 2011). The District has a population of 97,266, being 45,300 male (46.6%) and 51,966 female (53.4%) as per 2012 census.

Makete District was purposively selected, followed by simple random sampling to select one ward from each of the six divisions and one village from each of the selected wards. Qualitative data were collected from elders, traditional healers, influential community members including youths and religious leaders using Focus Group Discussion (FDG) methods. Five to seven men and women participants from each village were involved in the focus group discussion. Two focus group discussions were convened in each village (one for women and another for men alone grosparately).

[11] Until 2011 Makete district was part of Iringa region. Following the establishment of Njombe region, Makete district is now one among four districts in Njombe region

Respondents for quantitative data collection were determined using Fisher's formula as indicated in appendix 1. A total of 70 men and women respondents were randomly selected from each village making a total of 420 respondents. Quantitative data were collected using a structured questionnaire administered to men and women in the study area. Qualitative data were gathered through FGD and key informant using a checklist. Issues related to knowledge and perception of communities towards male circumcision was included in the checklist.

Determination of community's perception

Perception was measured using a bipolar Likert scale. The format of a typical five-level Likert was used in which the respondent was asked to; strongly disagree, disagree, neither agree nor disagree (uncertain), agree or strongly agree against the statements. Statements that were used to construct the Likert scale included assumptions that; (i) male circumcision leads to infidelity among men, (ii) circumcision makes the male sexual organ firm, not easily prone to cuts and bruises thus reducing the chances of contracting other sexually transmitted diseases, (iii) the belief that men who practice male circumcision were Muslim, Christian and (iv) that male circumcision improves hygiene for men.

Fourteen (14) statements (represented in Table 2) were developed to assess the respondents' attitudes in relation to different aspects of male circumcision. Positive and Negative statements towards male circumcision were developed and included in the questionnaire A numerical score was given by each respondent for each question indicating their negative, neutral or positive attitude towards male circumcision. The score for each respondent for each question was recorded, and their total score was computed. The proportion of respondents falling under each of the five categories (scoring 1 to 5) was then determined, and the findings are presented in Table 2 below.

Study findings

Social economic characteristics

The age distribution of respondents indicates that the youngest respondent was 17 years old and the oldest was 73 years old. Slightly more than one third (34%) of respondents were between 25 and 35 years old and nearly a third (29.3%) fell in between 36 and 45 years old. This implies that majority of the respondents were in the reproductive age, which is also sexually active, therefore at high risk of acquiring HIV infection (TACAIDS, NBS and Macro, 2005). Religious affiliation was dominated

by Christians. Majority (65.5%) of the respondents were protestants (Lutherans, Assemblies of God and the Seventh Day Adventist), followed by Roman Catholics (29%). Followers of traditional beliefs and Muslims constituted a minority, being 4% and 1.2% respectively (Table 1). About 52.1% of respondents were male while 47.9% were females.

Majority (80.2%) of the respondents had standard seven level of education, which is regarded to be too low for influencing the respondents' knowledge and perception towards male circumcision for HIV prevention. This is inline with what was reported by Wolfe and Behrman (1987) who pointed out that education is a key determinant of the lifestyle and the status an individual will attain in society. Education attainment has a positive effect on health – seeking behavior and attitudes. Education attainment is also strongly related to awareness, knowledge, perception and behavior towards prevention of HIV, care and support regarding HIV/AIDS.

Results in Table 1 also show that about 89% of the respondents were small scale farmers; followed by those who were employed (6%), while 5% were engaged in petty business. Farmers in Makete district face many challenges including low productivity and poor access to markets, which means most of the farmers earn low income levels. Such low income increases the likelihood of the affected persons engaging in risky behavior, such as young women engaging in sexual transactions with older men, hence increased their vulnerability to HIV infection (Gupta *et al.*, 2003).

Table 1: Social economic characteristics of study respondents (n= 420)

Characteristics	Frequency in %
Age in years	
25 -35	34.0
36 – 45	29.3
46 -60	20.2
18 – 24	10.5
60>	5.0
<18	1.0
Religion	
Protestant	65.7
Roman Catholic	29.0
Traditional	4.0

Characteristics	Frequency in %
Muslim	1.2
Sex	
Female	48
Male	52
Education level	
Standard seven	80.2
No formal education	9.3
Secondary education	6.0
Certificate level	2.6
Diploma	1.4
Undergraduate	0.5
Occupation	
Small scale farming	89
Petty business	6
Salaried employment	5

HIV prevalence in Makete district

Information sources from the district indicate that HIV/AIDs prevalence was 18.9% during 2006. The National HIV testing campaign in 2008 revealed the HIV prevalence rate of 16.9% for Makete district (Tanzania HIV/AIDS Malaria Indicator Survey (THMIS*)* for 2007/2008). Secondary data from Makete District hospital was used to calculate the HIV prevalence rate for the year 2011 which was found to be 11% as indicated in Fig. 1. This figure is lower than the overall prevalence for Iringa region, estimated at 15.7%, being the highest in the country during 2007/2008 (TACAIDS *et al.*, 2008). These findings suggest a declining trend of HIV/AIDs infection rates in Makete district (Figure 1).

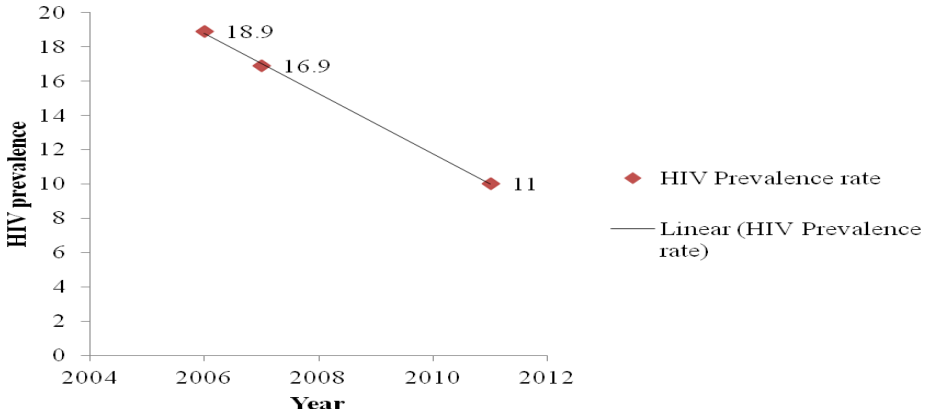

Figure 1: Prevalence of HIV/AIDS in Makete District.

The decreasing trend in prevalence rate of HIV in Makete District is attributed to various initiatives including increased HIV/AIDS prevention awareness programes such as; Voluntary Counselling and Testing (VCT), Prevention of Mother To Child Testing provided to the community members as well as the initiation of new HIV prevention services like male circumcission, just to mention a few. The district high volume campaign towards male circumcision started in early 2010 (MDC, 2011).

Perception of community towards male circumcision for HIV prevention

The five levels of the Likert scale were reduced into three (Table 2) to bring more meaningful results. From the findings, it is commonly believed that male circumcision leads to high sexual desire among men (MDC, 2011). Research findings as presented in Table 2 indicated that 61.9% of respondents strongly disagreed with the statement that male circumcision leads to infidelity among men. Nearly a third (27.8%) of the respondents agreed with the statement whereas 10% were uncertain. Male circumcision was linked to religious beliefs. About 70% respondents strongly disagreed that male circumcision is for Muslim only and not for Christians, which means more than half of the respondents associated the practice with the Muslim faith. Similarly, many (65%) respondents strongly disagreed with the statement that practicing male circumcision amounted to abusing Gods' creation because the fore skin is meant for protection of the male reproductive organ (Table 2). Such perceptions are likely to reduce the rate of practicing male circumcision. Providing the correct information on male circumcision is necessary to reverse such perceptions.

In relation to hygiene, majority (81.9%) of respondents disagreed that male circumcision improves hygiene of male sexual organ and hence, reducing incidences of infections to the sex partners. This contradicts with Patterson *et al*. (2002) who supports the statement that improved hygiene of the male's sexual organ (mainly the fore skin) would lead to prevention of STIs among men. In addition, a good proportion (53.1%) of respondents contended that male circumcision reduces chances for cervical cancer in female sexual partners consistent with findings by (Williams *et al.,* 2006*).* These findings reflect awareness within the community in relation to male circumcision for disease prevention.

Table 2: Attitude towards male circumcision for HIV prevention (n = 420)

No	Statements	Scores (%)		
		(1)	**(2)**	**(3)**
1.	Male circumcision leads to infidelity among men.	61.9	10.2	27.8
2.	Men who practice male circumcision are Muslim not Christian	70	3.3	26.7
3.	Male circumcision reduce the size and strength of the male sexual organ	58.8	21.0	20.2
4.	Circumcision is not a new fashion so it should not be practiced	67.3	11.2	21.4
5.	Circumcised men fail to satisfy women during sex	57.9	22.1	20
6.	Male circumcision is for young boys only and not older men	71.4	1.4	27.1
7.	Male circumcision is like abusing God's creation because the foreskin is meant to protect the male sexual organ	65	6.4	28.5
8.	Male circumcision improves male's hygiene	81.9	12.4	5.8
9.	Male circumcision makes the male sexual organ firm and therefore not easily prone to cuts	83.6	11.0	5.4
10.	Male circumcision helps to reduce the risk of cervical cancer for the female sex partners	45.5	1.4	53.1
11.	Male circumcision reduces the risk of getting STI through the male organ.	53.8	1.0	45.2
12.	Uncircumcised male partner cause vagina infection in women	36.7	1.4	61.9
13.	Uncircumcised male partner increase a woman's risk of breast malignancy	47.4	1.0	49.7
14.	Male circumcision reduce the risk of urinary tract contamination in children	35.3	1.0	63.8
	Average score	**59.7**	**7.5**	**32.7**

Key; 1= Disagree, 2 = Uncertain, 3= Agree

Average scores indicated more than a half (59.7%) of the respondents had negative perceptions towards male circumcision, only 32.7% had positive perception and 7.5% were neutral (Table 2). This is in contrast with findings by WHO (2007), which has suggested that male circumcision can reduce HIV/AIDS infection among men. This calls for strategies to change prevailing negative perceptions so that communities can embrace male circumcision. This will happen if concerted efforts are made to raise awareness and provide the correct information

Negative perceptions towards male circumcision were also reflected during FGD where participants had this to say; "*God created our body parts which are not supposed to be tempered with; there are other parts that can be removed like hair in the armpits, but not the fore skin of the male sex organ. Male circumcision is like abusing God's creation because the foreskin is meant for shielding the organs."* (a male participant, in Ilolo Village). Another female participant in Ikuwo Village said "*I reject male circumcision because it is the same as turning my partner into Muslim.*"

Such negative views however were in contrast to the scores of female respondent to questions for the Likert scale. Out of 201 female respondents, nearly three quarters (74.1%) preferred circumcised male sexual partners while 26% of the respondents preferred uncircumcised partners. Such a positive perception could help to promote more male circumcision. But there are a significant proportion of female respondents who preferred uncircumcised partners, representing a part of the population whose negative attitudes need to be addressed through various means in order to overcome the persistent high prevalence of HIV and AIDs in Makete district.

Female respondents were asked to give reasons for preferring circumcised men relative to uncircumcised sexual partner. The majority (72.5%) of respondents contended that they prefer circumcised male partners for HIV and other STDs' prevention (Table 3). About 22.8% of female respondents opted for circumcised male partner due to hygiene. These results indicate that majority of women are aware that it is important for men to be circumcised for HIV prevention and hygiene. Consequently, females may influence their male partners to practice male circumcision. During FGD with women discussants, one of the participants was quoted saying "*You enjoy a circumcised man as he is hygienically clean; however, there are risks of infection with uncircumcised male partner"* (Female participant, Mahanji Village). Another female participant in the same village added that *"Some men take a week without taking shower, in such circumstances; the*

uncircumcised men would lead to high risk of infection to their partners." Another female participant in Ilolo Village added *"... when uncircumcised men have affairs out of their wedlock, they may contract HIV/AIDS, hence infecting their wives."* (Female, Ilolo Village). *Similarly, a man in Ukwama village was quoted saying "male circumcision not only prevent an individual from acquiring STIs but also improves men's hygien. A man who is not circumcised has a bad smell just like a male buck"*

Table 3: Reasons for not preferring uncircumcised male partner (n=149)

Reasons	Frequency	Percent
For hygiene	34	22.8
For HIV and other STI prevention	108	72.5
For cultural reasons	7	4.7

Table 4: Reasons for preferring uncircumcised male partner (n=52)

Reasons	Frequency	Percent
Norm/culture	25	48.1
Moral reasons	16	30.8
Personal interest	7	13.5
To maintain body temperature	4	7.7

A minority of female respondents however wanted culture and their traditional moral values to be preserved. Out of 52 female respondents 26% preferred uncircumcised male partners; of these, 48.1% made this choice to preserve their culture, while 30.8% were driven by moral beliefs. During FGD, one of the female discussants was quoted saying; *"I thought people who circumcise get changed into another religion. For me because I am a Christian I don't prefer a circumcised man*" (Female participant, Ilolo Village).Such perception indicates lack of knowledge about the importance of male circumcision towards HIV/AIDS prevention as it was conceptualized by the cognitive dissonance theory. Both men and women had contradicting cognition towards male circumcision. Another woman from Mwakavuta Village also added that "*I used to think that male circumcision is for Muslims only, it is very recently, I started hearing people saying circumcision is for all men, this is not clear to me*." Similarly a woman from Utweve Village was quoted saying that "*I usually hear that a circumcised man is not sexually energetic. I would not be able handle his*

inflexibility and coldness." Another female from Mwakavuta village added that "*There is no way we can compare the two [circumcised and uncircumcised men] because we are already married to only one partner.* Such comments show that the level of awareness regarding male circumcision should also target female members of the community

Conclusion and Recommendations

Based on the findings discussed above, the study concluded that majority of men and women had negative perception towards male circumcision. Such poor perceptions were attributed to inaccurate or lack of information (conflicting cognition). Cultural factors and beliefs served as a big barrier for not practicing male circumcision. Nonetheless, a good proportion of women preferred circumcised male partner in order to minimize the risk of contracting HIV. This means, awareness creation is necessary in order to improve people's knowledge, which would in turn change the perception of men and women towards male circumcision as an important factor for HIV/AIDS prevention in Makete District.

Based on the findings, it is recommended that it is important to use different people within communities including; traditional leaders, women's and men's groups as well as religious leaders to promote the practice of male circumcision. However, male circumcision should not replace other known methods of preventing HIV infections. Prevention should always be considered as part of a comprehensive HIV prevention package. Stakeholders advocating for male circumcision should also target women in their work because women can influence their male partners to change perceptions and embrace male circumcision as caring partners. Religious leaders can be used to change the prevailing perception that male circumcision is practiced by Muslims only. Further research is recommended to comprehensively assess factors that hinder wider adoption of male circumcision in Makete district. Operational research should be conducted to assess the adoption and sustainability of the campaign for voluntary circumcision of men.

Reference

Auvert, B. D., Taljaard, E., Lagarde, J. & Sobngwi-Tambekou, R. (2005). Randomized, controlled Intervention trial of male circumcision for reduction of HIV Infection risk. The ANRS 1265 *PLoS Med*. 2 (11)

Bailey, R. C., Moses, S., Parker, C.B., Agot, K., Maclean, I., Krieger, J.N., Williams, C. F., Campbell, R.T. & Ndinya- Achola, J.O. (2007). Male

circumcision for HIV Prevention in Young men in Kisumu, Kenya: a randomised controlled trial. *The Lancet*. 369 (643): 56.

Fisher, A. A., Laing, J.E., Stoekel, J.E. & Town Send, J.W. (1991). *Hand book for Family Planning Operations Research Design.* Population Council. New York. 52 -53 pp.

Festiger, L. & Calsmith, J.M. (1959). Cognitive consequences of forced compliance. *Journal of Abnormal and Social Psychology*. 203: 58.

Gupta, G.R., Whelan, D. & Allendorf, K. (2003). *Intergrating Gender into HIV/AIDS Programme.* WHO, Geneva. 65 pp.

Gray, R. H., G., Kigozi, D., Serwadda, F., Makumbi, S., Watya, F., Nalugoda, N., Kiwanuka, L.H., Moulton, M. A., Chaudhary, M. Z., Chen, N. K., Sewankambo, F., Mangen, M.C., Bacon, C. F., Williams, P., Opendi, S. J., Reynolds, O., Laeyendecker, T. C. & Quinn. J. (2007). Male circumcision for HIV prevention in men in Rakai, Uganda: a Randomized trial. *The Lancet*. 369: 657 - 666.

Makete District Council (MDC) (2008). *Makete District Council HIV&ADS Operational Plan (2007).* District HIV/AIDS control Section. 12pp.

Makete District Council (MDC) (2011). Makete District Council Annual report (2010). District Council Planning Department. 17pp.

TACAIDS, NBS & ORC Macro (2005). Tanzania HIV/AIDS Indicator Survey 2003-04 Report, Dar es Salaam, Tanzania. pp 125 - 131.

TACAIDS, ZAC, NBS & MEASRE DHS (2008[a]). *Tanzania HIV/AIDS and Malaria indicator Survey 2007 - 08, Report*. Dar es Salaam, Tanzania. 35pp.

TACAIDS (2008b). *HIV Prevention Strategy for Tanzania Mainland*, Dar es Salaam, pp 9 - 28.

Wawer, M. J., Makumbi, F., Kigozi, G., Serwadda, D., Watya, S., Nalugoda, F., Buwembo, D., Ssempijja, V., Kiwanuka, N., Moulton, L. H., Sewankambo N. K., Reynolds, S.J., Quinn, T. C., , Opendi, P., Iga B.,, Ridzon, R., Laeyendecker, O. & Gray R. H. (2009). Circumcision in HIV-infected men and its effect on HIV transmission

to female partners in Rakai, Uganda: a randomised controlled trial. *The Lancet*. 374:229 - 37.

WHO (2007). *New data on male circumcision and HIV prevention*: Policy and Programme Implications. World Health Organization, pp 4 -12.

Williams, B. G., Lloyd-Smith, J. O., Gouws, E., Hankins C., Getz W. M., Hargrove, J., Zoysa, I., Dye, C. & Auvert, B. (2006). *The potential impact of male circumcision on HIV in Sub-Saharan Africa*. 262pp.

Wolfe, B.L. & J.B. Behrman. (1987). Women's schooling and children's health; Are the effects robust with adult sibling control for women's background? *Journal of health economics*. 6(3) 239 - 254.

Appendix 1: Sample size determination using Fisher's formula

Since the total population of Makete District was 120,818 which are more than 10,000, Fisher formula was used to determine the sample size. The total sample size for the study was 420 respondents. The sample size which was needed to measure a given proposition with a given degree of accuracy at a given level of statistical significance was calculated by using a simple Fisher formula, provided that the total population size was greater than 10,000 (Fisher *et al.*, 1991).

$$n = \frac{z^2 pq}{d^2}$$

Where:

n = the desired sample size (when p**o**pulation is greater than 10,000).

z = the standard normal deviate, usually set at 1.96 (or simply more than 2), which corresponds to the 95 percent confidence level.

p = the proportion in the target population estimated to have a particular characteristic. If there is no reasonable estimate, then use 50 percent (0.50).

q= 1.0 – *p*.

d = degree of accuracy desired, usually set at 0.05 or occasionally at 0.02.

$$n = \frac{(2.05)^2 (0.5)\ (0.5)}{(0.05)^2}$$

n= 420.25; n= 420

A sub sample of about 70 respondents from each village was obtained. The study also involved 72 participants for focus group discussion, each village had two (one for men and another for women) focus group discussion with almost 5-7 participants per group.

Decentralization of forest management and the livelihoods of rural communities in Babati, Tanzania

I. H. Babili
Institute of Continuing Education, Sokoine University of Agriculture,
P. O. Box 3044, Morogoro, Tanzania, e-mail: babhili@yahoo.com

Abstract
Since the 1980s, scholars have increased their attention on studies linking livelihoods and conservation objectives. To date, debates regarding the contribution of decentralized forest management (DFM) on the livelihoods of local communities are inconclusive. Some literature show that DFM has negative consequences on the livelihoods of the rural poor whereas others show that the approach can improve livelihoods of the rural people. In some cases, DFM has been reported to have little effect on livelihoods of the rural poor. In Tanzania, community based forest management (CBFM) and joint forest management (JFM) are most common forms of DFM promoted by the National Forest Policy. This study aimed at improving our knowledge on the contribution of CBFM and JFM on the livelihoods of rural people with a focus on activities, access and income. The study was conducted in four villages in Babati District, two implementing CBFM and the other two practising JFM. Quantitative and qualitative methods were used for data collection and analysis. Findings indicated no major differences on income generation between CBFM and JFM. Access to forest resources by the local people was restricted mainly to non-timber forest products. In both regimes, wealthier groups had a slightly more access to timber forest products than poor groups.

Keywords: Decentralization, livelihoods, rural community, community based forest management, joint forest management, Babati

Introduction

Since the 1980s, scholars have focused their attention on decentralized forest management (DFM). Such a focus has been justified on the basis of efficiency, equity, good governance, resource conservation and improving rural livelihoods (Paul and Chakrabarti, 2010; Webster 1992; Arnold, 1998; Sundar, 2001; Arnold, 2002; Havnevik, 2006; Zahabu, 2008). In Tanzania, DFM has been in practice since 1994 (Wily, 1999). The DFM practices were formalized by the National Forestry Policy of 1998 and the Forest Act of 2002 (URT, 1998; 2002). Community based forest management (CBFM) and joint forest management (JFM) are the most common forms of DFM promoted by the National Forest Policy. Community Based Forest Management is practiced by village community while JFM is jointly executed by local communities and the government;

the guidelines for DFM also provide room for JFM between private owner and local people (Katani and Babili, 2012).

Despite increased adoption of DFM by most developing countries, the debate regarding the contribution of DFM on the livelihoods of local communities is still inconclusive. According to some literature (Springate-Baginski *et al*., 1999;Wunder, 2001; Kumar, 2002; Blaikie, 2006), DFM may have some negative consequences on the livelihoods of the rural poor. Some other literature (Nygren, 2005; Lund, 2007) however show that the approach can improve the livelihoods of the rural poor. Yet other studies have reported that DFM have had little effect on the livelihoods of the rural poor (Topp-Jørgensen, *et al.*, 2005).

Meanwhile, Arnold (2002) reported that various kinds of forests including natural and farm forests contribute to enhancing livelihoods of the poor. Furthermore, the contribution of forest resources to livelihoods of the rural people is reported to vary across CBFM and JFM (Kumar, 2002; Nygren, 2005; Havnevik, 2006). It has been reported that local people have more access to forest products under CBFM than JFM (Havnevik, 2006). However, other findings indicate that the local people's access to forest products under the two management approaches is similar and confined to forest products of limited economic value because forest protection receives more priority than use of the forest resources (Ylhäisi, 2003; Babili and Wiersum, 2012). These contradicting findings suggest that decentralization is still an evolving paradigm (Tacconi, 2007) whose effects on livelihoods need further attention.

The general objective of this study was to assess the impact of CBFM and JFM on the livelihoods of local people in Babati District, Tanzania. The study's specific objectives were to identify socio-economic, ecological and general livelihood characteristics of the study villages; to assess how CBFM and JFM regulate local forest use in Babati, and to determine the contribution of CBFM and JFM to livelihoods of the local people.

Conceptual framework

The framework governing DFM draws from two main concepts; decentralization and livelihoods. Decentralization is defined as a transfer of powers from the central government to actors and organizations at the lower level (Agrawal and Ribot, 1999). At the general level, decentralization is often differentiated into bureaucratic or administrative decentralization and political or democratic decentralization. Bureaucratic

decentralization (de-concentration) concerns ceding power previously held by Central Government Agencies to appointee of the Central Government within government administrative authorities. Political decentralization (devolution) occurs when powers are transferred from the Central Government to actors or organizations that are accountable to local population within their jurisdiction, usually through electoral process of actors who are accountable to the community (Agrawal and Ribot, 1999).

In practice, DFM involves three approaches, namely community based forest management (CBFM), joint forest management (JFM) and community forest user groups (Bhattacharya and Basnyat, 2005; Blomley and Ramadhani, 2006; Babili and Wiersum 2012). In Tanzania, CBFM and JFM are the most common DFM approaches (Blomley and Ramadhani, 2006; Babili and Wiersum, 2012). CBFM concerns management of forest commons by community as manager and owner of forests while JFM involves co-management of government-owned forests by community and government agency. Usually, CBFM and JFM are adopted to improve the livelihoods of local people as an incentive for them to participate and improve forest management.

Livelihood can be defined as activities, assets and access to resources that jointly determine the living gained by individual or household (IDS, 2000). The definition can also include capabilities, required as a means of living. A livelihood is said to be sustainable when the people affected can cope with and recover from stress and shocks, and maintain or enhance their capacities and assets for the present and in future without undermining the natural resources base (Chambers and Conway, 1991). The sustainable livelihood framework developed by the Department for International Development (DFID) has been proposed for assessing people's livelihoods. The framework constitutes five capital assets; human, social, natural, financial and physical capitals (DFID, 2001). However, it has been shown that the notion of capital have a materialistic connotation that can conceal social aspects of livelihoods (Hebinck, 2007). Furthermore, close examination of findings by Vyamana (2009) reveals that the notion of capital may not sufficiently show the impact of DFM at the household level. Meanwhile, activities, access and income have been used to assess the contribution of DFM on the livelihoods of rural people (Lund and Treue, 2008; Nygren, 2005). This study, adopts the same approach, defining livelihoods to include activities, access, and forest based household income under CBFM and JFM.

Methodology

This study was conducted in Babati District which is located in the Northern part of Tanzania along latitude $4^0$15'S and longitude $35^0$45'E (URT, 2006). The district is the headquarters of Manyara region located about 167 km from Arusha town. Babati district has a population of about 312,000 (URT, 2013). The district is divided into four divisions namely Gorowa, Babati, Bashneti and Mbugwe. The study was conducted in Gorowa division, where Ayasanda and Endanachan villages in Ayasanda ward were selected for CBFM while Haraa village in Bonga ward and Boay in Gidas ward were selected for JFM. Basic information about the villages selected for this study is given in Table 1.

Table1: Social economic characteristics of the study villages

District	Division	Ward	Village	Human population	Main livelihood activities	Total land owned (Ha)	Total cattle owned	Distance from Babati town
Babati	Gorowa		Ayasanda	2187	Agro-pastoralist	1610	1405	18.5
		Ayasanda	Endanachan	2700	Agro-pastoralist	6000	1742	21
		Bonga	Haraa	1170	Agro-pastoralist	1040	433	23
		Gidas	Boay	1900	Agro-pastoralist	1300	970	32

Babati District was selected because both CBFM and JFM management approaches a practiced in a number of villages. Villages selected for this study had already spent a minimum of five years practising these approaches, which provided enough time for the DFM to have some impact on the livelihoods of local communities. By the time fieldwork for this study was conducte, Ayasanda and Endanachan had already practised CBFM for 13 years while Boay and Haraa had practised JFM for about 5 years. Other selection criteria were homogeneity in ecological characteristics across the villages and differences in the level of success in conserving the forests. A case study and structured survey were used for data collection. The survey aimed at describing information related to livelihood while the case study helped to provide an in-depth understanding

of forest related activities of the local people under CBFM and JFM regimes (Tashakkori and Teddie, 2003; Punch, 2005).

Data were collected during 2007 and 2008 using a combination of quantitative and qualitative methods. The methods included participatory rural appraisal (PRA) meetings comprising a group of 15-20 participants in each village. The PRA groups constituted people from poor, rich, and middle wealth categories. Participatory wealth ranking was used to identify the three wealth strata in order to gain an understanding of how and to what extent forest related livelihoods under CBFM and JFM differ across wealth categories. Local people identified forest products which they accessed under both forest management regimes. Access to forest resources was also revealed through informal interviews, in-depth interviews with key informants (forest officers, village chairpersons and village executive officers), and observation during the two months stay in the villages. Data on income were collected using a household questionnaire administered to at least 90 respondents per village, making a total sample size of 384. Analysis of qualitative data was done through abstraction of information collected while quantitative survey data were analysed using descriptive statistics, t- test, ANOVA and cross tabulation using the SPSS programme.

Findings

Livelihood context in the study area

Inhabitants of Babati District are agro-silvo-pastoralist, combining crops, forestry and livestock keeping as the most important activity (URT 2006). Traditionally people in Babati are not tree growers (Kahurananga, 1999). Tree planting activities were introduced through forest extension, learning from practices outside the district and from immigrants to the district. Currently, forest related activities contribute in in various ways to local people's livelihoods.

Through wealth ranking, people in the study area were grouped into three categories of poor, middle and rich based on local criteria. The types of activities undertaken were among the criteria used by local people to define household wealth status. Poor people in all study villages undertook casual labour activities throughout the year to earn income for their livelihoods. Middle category conducted such activity occasionally within a year to earn income for their livelihoods. People in rich the category did not engage in any casual labour activities for earning income throughout the year.

Ecologically, the villages had quite similar characteristics, comprising of Miombo forest type and dark brown volcanic soils. Ecological

characteristics of the study villages are presented in Table 2. To assess the impact of DFM regimes on livelihood activities, access to forest resources and forest related income was compared across the three household categories.

Table 2: Forest management types and ecological characteristics of the study villages

Village	Type of DFM Regime	Year PFM started	Name of the forest (s) covered	Forest type**	Forest area	Soil type*
Ayasanda	CBFM	1994	Haitemba and Wairimb	Miombo wood land	550*	dark brown volcanic soils
Endanachan	CBFM	1994	Endanachan	Miombo wood land	400	dark brown volcanic soils
Haraa	JFM	2002	Bereku	Miombo wood land	469.6	dark brown volcanic soils
Boay	JFM	2002	Bereku	Miombo wood land	1491	dark brown volcanic soils

*= Johansson (1991), **= Malimbwi (2003)

Forest related livelihoods

At Ayasanda village where CBFM was adopted, natural forest, woodlots and farm trees provided fuel wood, poles, and timber from dead wood (big and small poles). The forests also protected water sources. The fuel woods were used for various purposes including cooking, making local brew and burning bricks. Big poles were used for building while small poles were used for supporting climbing crops such as tomatoes. Villagers could get permits to fell dying trees from which they produced timber to make furniture such as wood chairs and beds. The timber was also used for making doors, and window frames for house and school buildings. In additional, natural forests provided grass for free range grazing and for cattle kept indoors. Natural forests were also a source of roofing and thatching material for houses. The local people occasionally gathered honey from the forests while some used natural forests for beekeeping. In addition, two households at Ayasanda village had tapped water from the forests for domestic use, irrigating banana home gardens and for livestock.

Forests at Endanachan village provided similar livelihood products as reported for Ayasanda village.

Natural forests, woodlots and farm trees in Haraa and Boay villages which practice JFM provided various products including fuel wood for domestic use and burning bricks, roofing materials and grass for various uses, especially for thatching houses. The forests also provided grass for free grazing cattle mostly at Boay village and for stall fed livestock, mostly at Haraa village. Local people in Haraa and Boay villages also used adjacent Bereku forest for beekeeping and for occasional access to forest honey from tree trunks. Similar to forests under CBFM, Bereku forest under JFM also protected water sources. In addition, inhabitants in Haraa village, consider forests as important in supporting coffee agro-forestry system, protecting the coffee crop against strong wind.

Forest related livelihoods under CBFM and JFM

Access to forest products under CBFM and JFM

Under both forest management regimes (CBFM and JFM), local people had free access to firewood, medicinal plants, wild fruits, mushrooms, tree branches for making cooking utensils and handles for agricultural tools such as hand hoes, axes and scythe as well as yoke for draft power. The forests were also used for beekeeping, as sources of forest soil for tree nurseries. Women also accessed clay soil for making clay pots, which were sold. Dry logs were used as building poles, roofing materials and for burning bricks. Harvesting timber and charcoal making from growing trees were prohibited both regimes. Other legally allowable uses of forest related products under the two regimes included collecting stones and grass for constructing houses as well as grass for grazing and feeding cattle kept indoors. The forests also had foot pathways used by the people to get to various points in the village; it also provided venues for holding traditional meetings.

Collecting timber from dead wood was allowed after obtaining permits from village environmental committees, but people had more legal access to tree products (e.g. building poles and timber from dead trees) under CBFM than from JFM. Under JFM, timber from dead trees was available for constructing public buildings such as schools while under CBFM the timber was accessible for use by both public organization and households.

Comparing access to different products by different household wealth categories, all wealth categories had equal access to non-timber forest

products. However, timber harvesting was mainly conducted by people in the rich category because they possessed pit saws and could provide food for hired labourers to carry out pit-sawing. In contrast, people from the poor category were directly engaged in charcoal burning because this activity did not require high investment or running cost. In particular, tools required for cutting trees to make charcoal were simple and affordable by poor people. Access to grass for grazing cattle was important to people in all categories because some poor people were kept livestock that were obtained from rich people through trustee arrangements, where the poor provided labour while obtaining manure and the service of oxen in return.

Contribution of forest resources to household income

Overall contribution of forest to household income

Several activities contributed to household income. Figures 1 and Table 3 report the relative contribution of different sources to household income. Overall, crops contributed 51% followed by livestock (16%), business (14%) and forest (12%) to overall household income in the study area (Figure 1). Lower ranking sources included livestock (6%), casual labour (1%) and land rent (less than 1%). Table 3 indicates that forest contributed TZS 115, 258 on average, out of total average of about TZS 949,000 accrued from crop production, livestock keeping, forestry, activities, petty business, selling labour, remittance together and land rent.

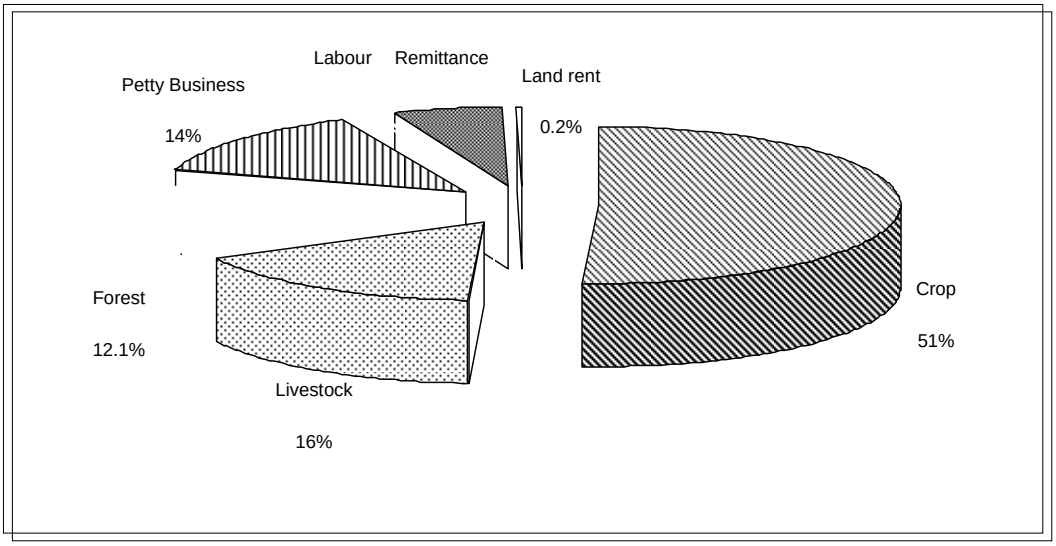

Figure 1: Percentage contribution of livelihoods activities to household income during 2007 (N=384)

Table 3: Household mean income for various livelihood activities (N=384)

Livelihood activity	Village				Overall Mean
	Ayasanda	Endanachan	Haraa	Boay	
Crop	515,991	692,968	567,336	152,383	482,170
Livestock	161,746	205,958	160,635	95,529	155,967
Forest	94,492	16,358	142,918	207,266	115,258
Petty business	63,463	93,411	190,408	182,402	132,421
Labour	5,926	11,095	4,489	6,137	6,912
Remittance	57,758	84,758	65,815	11,578	54,977
Land rent	2,368	1,105	3,098	392	1,741
Mean	**901,744**	**1,105,653**	**1,134,699**	**655,688**	**949,446**

Forest related income under DFM (CBFM and JFM)

Table 4 shows the mean income for forest related products before and after adoption of DFM (CBFM and JFM). The data shows that, direct household mean income from sale of forest related products after adopting DFM intervention (25,143 Tshs.) was higher than before adoption of the intervention (21,123 Tshs.). However, the paired t test indicated that the mean income before and after adopting DFM were not significantly different from each other ($t(382) = 0.291$, $p>0.05$). However, there is a significant difference between indirect income from forest sources before DFM in 1993 (Tshs 1,013) and after adopting DFM (Tshs. 13,551) ($t(384) = 0.046$, $p<0.05$) even when the income is normalized to account for inflation.

Table 4: Comparison of income from forest related activities before and after DFM (estimates of income by respondents) (N=384)

Household income of respective year	Mean (Tsh.)	Minimum (Tsh.)	Maximum (Tsh.)	Std. deviation	Std. Error
Direct household's income from forests before adopting DFM (1993)	21,123	0	3, 240,000	193,477	9,873
Direct household's income from forests under DFM in 2007 after adopting the approach	25,143	0	4, 100,000	248,475	12,680
Indirect household income before adopting DFM (1993)	1,013	0	200,000	12,140	620
Indirect household's income under DFM in 2007 after adopting the approach	13,551	0	1, 900,000	125,136	6,386

Comparing CBFM and JFM separately (Table 5) after the two approaches had been adopted, direct and indirect forest related household income in 2007 was higher under CBFM (Tsh. 35,315) than under JFM (Tsh. 15,180). Direct forest related income is obtained by selling forest products while indirect income is obtained by selling non- forest products such as cow milk following access to grass from the forests. The indirect household mean income was Tsh. 16,597 for CBFM and Tsh. 10,567 for JFM. Similar to direct income from forests, access to forest resources was restricted by bylaws and hence majority of people did not earn income from the resources. Only a few respondents sneaked into the forest earn income indirectly by grazing their animals, collecting vegetables and drawing water for domestic use and for animals. Table 5 shows that household income under CBFM had higher standard deviation and standard error of the mean than under JFM indicating that individual household incomes under CBFM was located far from income mean than those under JFM.

Table 5: Mean income from forest related activities under CBFM and JFM in 2007

Statistics	Mean income CBFM		Mean income JFM	
	Direct	Indirect	Direct	Indirect
Mean	35,315	16,597	15,180	10,567
Minimum	0	0	0	0
Maximum	4,100,000	1,900,000	2,100,000	1,350,000
Std Error	22,953.52	10,318	11,189	7,614
Std deviation	316,392	142,224	155,849	106,055

Analysis of variance (ANOVA) to compare household categories indicated that forest related household income of people in the poor, middle and rich wealth categories was which implies the three wealth categories did not influence household income from forest under CBFM and JFM.

Discussion of findings

Overall contribution of forests to the livelihoods of the local people

The results of the study indicated that forests were in general important to the livelihoods of the local people, providing a wide range of products and uses. The products included timber and non-timber forest products. Villagers obtained fuel wood, building materials, food, medicine, fodder and grazing areas for livestock. Forests also protected water sources. Forests were also used to obtain water for domestic and livestock uses. Babili and Wiersum (2012) found that Babati district had multiple forest management regimes which supported livelihood of the local communities

as it has been established in other parts of the developing world where forests are important for livelihoods (Arnold, 2002; Lund, 2007; Nygren, 2005).

Access to forest products under the two management regimes in Babati district was similar because it was mostly limited to non-timber forest products, especially for low income households, which is similar to findings by Lund and Treue (2008) who observed that access to non-timber and timber forest products was the most important aspect affecting directly the livelihoods of the local people. Ylhäisi, (2003) similarly argued that access to forest products under CBFM and JFM was limited to products of limited economic value. Access to harvesting trees for acquiring valuable products such as timber and charcoal was prohibited in both regimes. However, a slight difference was observed between the two regimes because access to timber from dead wood for domestic use was allowed under CBFM but prohibited under JFM. Some studies have established that local people can have more livelihood benefits under CBFM than JFM (Blomley and Ramadhan, 2006; Havnevik, 2006; Topp-Jørgensen, *et al*., 2005; Wily and Dewees, 2001).

Contribution of CBFM and JFM to household income

Analysis of forest related household income indicated no significant difference between income which was obtained before the adoption of DFM and that realized after the adoption of DFM. Similarly, there was no significant difference in income of households under CBFM and JFM, implying that the management regime had no impact on the level of income derived from forest sources.

Lack of statistical evidence for improved of household income after adopting DFM, and the similarity in household income between CBFM and JFM can be explained by the fact that villagers under both regimes had limited access to valuable forest products such as timber. Under both regimes village bylaws prohibited the use of such forest product, in conformity with the National Forest Policy and the Forest Act, which prioritise protection of trees than their use. In contrast, Lund and Treue (2008) showed that in Iringa region, CBFM had improved forest related household income because access to valuable products was allowed. The duration over which the impacts were assessed in Babati district may have been too short for impact differences to be discerned.

Conclusions and Recommendations

Three conclusions can be drawn from this study. First, the forests in the study area contributed to the livelihoods of the local people by providing cash income and various non-timber forest products. Second, the forest related activities and access to forests under CBFM and JFM were similar for non-timber forest products because access to non timber forest products was allowed in both regimes. However, access to forests in the two regimes was slightly because timber harvesting from growing trees was prohibited in both regimes while access to timber from dying trees for house hold use was allowed under CBFM but in practise prohibited under JFM. Third, forest related household income of the local people did not improve after adoption of CBFM and JFM. This implies that although forest resources under CBFM and JFM contributed to the villagers' livelihoods in various ways, household income did not increase significantly between 1993 and 2007 (14 years). To increase the contribution of CBFM and JFM to household income, there is a need to support regulated access to timber products including those from dying trees because timber harvesting from growing trees was prohibited in both regimes. Under JFM, the government have in practise prohibited access to timber from dead wood for household use although the village bylaws allow such access. Considering crop production and livestock keeping as the main livelihood activities in the study area, and the need to conserve forest resources, the synergies between improvement of forest related livelihoods and conservation of forest resources can be enhanced through the indirect support to coffee agro-forestry system and increased access to forests for grazing livestock. The synergy between the two can also be enhanced by increasing household water supply from conserved water sources in forests under CBFM and JFM because installation of main water lines near households was currently limited. These options can at the same time contribute to effective management of forest resources.

References

Agrawal, A., Ribot, J. (1999). Accountability in decentralization: A framework with South Asian and West African cases. *Journal of Developing Areas* 33(4): 473-502.

Arnold, J.E.M. (1998). *Managing forests as common property*. FAO Forestry Paper No. 136. FAO, Rome.

Arnold, M. (2002). Clarifying the links between forest and poverty reduction *International Forestry Review* 4, 231-233.

Babili, I.H.& Wiersum, F. (2012). Evolution and diversification of community forestry regimes in Babati district, Tanzania. *Small Scale Forestry 11* (4). DOI: DOI 10.1007/s11842-012-9228-9.

Bhattacharya, A.K. & Basnyat, B. (2005). Decentralisation and community forestry programmes in Nepal: Issues and challenges. *International Forestry Review 7*, 147-155.

Blaikie, P. (2006). Is Small Really Beautiful? Community-based Natural Resource Management in Malawi and Botswana. *World Development 34*, 1942-1957.

Blomley, T., Ramadhani, H. (2006). Going to scale with Participatory Forest Management: early lessons from Tanzania. *International Forestry Review 8*, 93-100.

Chambers, R. & Conway, G.(1991). *Sustainable rural livelihoods: Practical Concepts for the 21st Century*. IDS Discussion Paper, no. 296. Institute of Development Studies.

DFID (Department for International Development), (2001). *Sustainable livelihoods guidance sheets*,Section 2. Department for International Development, London. http://www.livelihoods.org/info/guidance_sheets_pdfs/section2.pdf>.

Havnevik, K. (2006). Successful community based forest management in Northern Tanzania: Reflections and theoretical implications.In: Havnevik, K., Negash, T., Beyene, A. (Eds.), *Of Global Concern: Rural lural livelihood dynamics and natural resource governance*. SIDA, Stockholm, pp. 165-190

Hebinck, P. (2007). Investigating rural livelihoods and landscapes in Guquka and Koloni: An introduction. In: Hebinck, P. and Lent, P.C. (Eds.), *Livelihoods and Landscapes*: The people of Guqukaand Koloni and their resources. Boston, Brill Academic Publi, pp. 1-32

IDS (2000). *Livelihood connect*. IDS. www.livelihood.org. Accessed on 20th July 2012.

Katani, J. & Babili, I.H. (2012). Exploring forest governance in Tanzania. In B. Arts, S. van Bommel and M. Ros-Tonen (Eds.),*Forest-people interfaces*. DO: 10.3920/978-90-8686-749-3. Wageningen Academic Publishers. pp 259-275.

Kumar, S. (2002). "Does "participation" in common pool resource management help the poor? A social cost-benefit analysis of joint forest management in Jharkhand, India." *World Development* 30(5), 763-782.

Lund, J.F. (2007). Is small beautiful? Village level taxation of natural resources in Tanzania. *Public Administration and Development 27*, 307-318.

Lund, J.F. & Treue, T.(2008). Are We Getting There? Evidence of Decentralized Forest Management from the Tanzanian Miombo Woodlands. *World Development 36*, 2780-2800.

Nygren, A.(2005). Community-based forest management within the context of institutional decentralization in Honduras. *World Development 33*, 639-655.

Paul, S. & Chakrabarti, S. (2010). Socio-economic issues in forest management in India. *Forest Policy and Economics* 13:55-60.

Punch, K.F. (2005). *Introduction to social research: quantitative and qualitative approaches.* SAGE Publications, London, pp. 320.

Springate-Baginski, O., Soussan, J.G., Dev, O.P., Yadiv, N.P. & Kiff, E. (1999). *Community forestry in Nepal: Impacts on common property resource management.* School of Environment and Development, Series No. 3. University of Leeds, UK.

Sundar, N. (2001). Is devolution democratization? *World Development 29*, 2007-2023.

Tacconi, L. (2007). Decentralization, forests and livelihoods: Theory and narrative. *Global Environmental Change 17*, 338-348.

Tashakkori, A. & Teddie, C. (2003). *Handbook of mixed methods in social and behavioural research.* Sage Publ., Thousands Oakes, pp. 784.

Topp-Jørgensen, E., Poulsen, M.K., Lund, J.F., & Massao, J.F. (2005). Community-based Monitoring of Natural Resource Use and Forest Quality in Montane Forests and Miombo Woodlands of Tanzania. *Biodiversity and Conservation 14, 2653-2677.*

URT (1998). *National Forest Policy*. Ministry of Natural Resources and Tourism. Forestry and Beekeeping Division. Government Printer, Dar es Salaam, p. 59.

URT (2002). *Forest Act*. Ministry of Natural Resources and Tourism, Government Printer, Dar es Salaam.

URT (2006). *Socio-economic profile, Manyara Region*. National Bureau of Statistics, Manyara Commissioner's Office. United Republic of Tanzania (URT), pp.186.

URT (2013). 2012 Population and housing census: Brief Results. National Bureau of Statistics (NBS). Tanzania National Website. United Republic of Tanzania (URT).

Vyamana, V.G. (2009). Participatory forest management in the Eastern Arc Mountains of Tanzania: who benefits? .*International Forest Reviews 11*, 239-253.

Webster, N. (1992). Panchayati-raj in West-bengal - popular participation for the people or the party? *Development and Change 23*, 129-163.

Wily, L.A. (1999). Moving Forward in African Community Forestry: Trading Power, Not Use Rights. *Society & Natural Resources 12*, 49-61.

Wily, A.L., & Dewees, P. (2001). From users to custodian: Changing relations between people and the state in forest management in Tanzania. The World Bank, Africa Technical Families, Environmenttal Unit, World Bank Research Working Paper, pp 2569.

Wunder, S. (2001). Poverty alleviation and tropical forests - What scope for synergies? *World Development 29*, 1817-1833.

Ylhäisi, J. (2003). Forest privatisation and the role of community in forests and nature protection in Tanzania. Environmental Science & Policy 6, 279-290.

Zahabu, E. (2008). *Sinks and sources : a strategy to involve forest communities in Tanzania in global climate policy*. University of Twente, Enschede, pp. 235.

A gendered analysis of climate change impacts and adaptations in semi arid area farming systems of Tanzania

C.I. Nombo[1], J.K. Urassa[1], J.S. Mbwambo[1], A.Z. Mattee[1,] D.P. Mamiro[1], S.J. Kabote[1,] L. Matata[2], & G. Synnevåg[3]

[1] Sokoine University of Agriculture, (SUA),
[2] Tumbi Agricultural Research Institute (ARI)
[3] Norwegian University of Life Sciences (UMB)

Abstract

Climate change and climate variability is increasingly threatening the livelihoods of many Tanzanians especially those living in semi-arid rural areas. The most affected are those with low incomes, less food, poor access to health services, unstable energy supplies, and living in fragile natural ecosystems. Generally, women and men contribute differently to climate change; likewise, they are affected differently and react differently to its impact. The overall objective of this study is to assess gendered impacts and adaptation of climate change and other stresses on rural livelihoods in semi-arid areas of Tanzania. The study was conducted in Iramba and Meatu Districts. The study adopted a Sustainable livelihoods Approach (SLA) developed by DFID (1992) in the analysis of climate change impacts and households adaptation. Data were collected using qualitative methods such as focus group discussions and key informant interviews, unstructured interviews and observations. Findings from the study show that, climate change impacts affect almost everybody in the studied communities; however, there are gender differences. These findings thus suggest that adaptation to climate change impacts vary across gender groups due to differences in roles and responsibilities. It is recommended that different stakeholders responsible for supporting rural communities to adapt to climate change impacts should focus on the different needs of men and women and avoid the notion that "one size fits all".

Keywords: Climate change impacts and adaptation, gender, livelihood

Introduction

Livelihoods and living conditions of the poor in the global south including Tanzania are affected by both, short term and long term impacts of climate change. In fact all over the world natural climatic variability exacerbated by human-induced climate change is putting societies, particularly women, the poor and vulnerable, at greater risk (IPCC, 2001). Tanzania, in its National Adaptation Programme of Action (NAPA) of 2007, identified climate change and variability as one of the pressing issues threatening everyone and national development in general (URT, 2007). Nonetheless, different socio-economic groups including women are impacted differently by the phenomenon. Women constitute 70 - 80% of the world's farmers and those living below the poverty line (FAO,

2007). Therefore, women and other vulnerable groups are most likely to bear the heaviest burdens of climate change impacts and are often the first to suffer whenever there is an external shock that affects livelihoods.

Changes in the climate usually affect sectors that are traditionally associated with women. For instance, many women depend on natural resources that are currently threatened by climate change. According to FAO (2007), the profound impact of climate change on agriculture and other livelihood options combined with the low resilience and high vulnerability of this population to shocks could severely alter their ability to manage natural resources, affecting their livelihoods, food security, and well-being in the medium and long run. Climate change in Tanzania, as is the case in other developing countries, is threatening rural populations and those living in fragile natural ecosystems particularly those with low income, food insecurity, inadequate health services, and unstable energy supplies. The most vulnerable sectors in the country include agriculture, water, energy, health and forestry (URT, 2007). Climate change therefore has a strong linkage to the livelihoods of the rural poor.

Although women and men are victims of climate change, they are also effective agents of change in relation to both mitigation and adaptation. According to WEDO (2007), women can be key agents of adaptation and mitigation to climate change. Their responsibilities within households and communities, and as stewards of natural resources provide them a better position to develop adaptation strategies to the changing environmental realities. This means, it is crucial to facilitate resilience for both men and women in order to build their adaptive capacity.

All over the world, shocks and risks such as climatic variability exacerbated by human-induced climate change are putting societies, particularly women, the poor and other vulnerable groups, at greater risk. However, climate change has largely been conceived as a scientific and environmental issue, with limited analysis of human aspects including gender implications. While most research covers issues like frameworks for decision making, cost-benefit analysis, uncertainties, scenarios, ecological dimension and carbon sinks, gender and other social aspects are largely understudied (Denton and Parikh, 2003; IPCC, 2001). Climate change is not just an environmental, political and economic issue but also a human issue, whereby the livelihoods of numerous communities are threatened and their security being at stake. Barrow *et al.* (2003) argue that semi-arid conditions and the agro-pastoral land-use system exacerbate challenges

faced by households in such agricultural production systems, consequently threatening the areas' ability to sustain future livelihoods.

People's livelihoods in semi-arid conditions such as those in Meatu and Iramba Districts face several challenges in relation to meeting their household needs, especially food. Most of these areas receive low and unreliable rainfall (500 - 800 mm. per annum), which is inadequate for some of the common food crops (e.g. maize) grown in this area. For example, in the case of Meatu, González-Brenes (2003) has shown that the district was last in Shinyanga Region in relation to production of adequate starchy foods between 1996/97 and 2004/05; only 6% of the households in the district had adequate food supplies compared to other districts in the region such as Bukombe (31%), Kahama (23%), Shinyanga District including Kishapu (18.5%), Maswa (11%) and Bariadi (10%).

Iramba District also faces challenges in relation to enabling households to have livelihood security. The semi-arid conditions experienced in the district, coupled with increasing population, further aggravates this condition. According to Kangalawe and Majule (2006), sustaining the people's livelihoods in Iramba on the basis of existing dynamics requires an integrated approach in managing available resources. Moreover, there is a need to ensure that people adhere to environmentally sound agricultural practices. This paper addresses the specific questions; what are the impacts of climate variability on households' livelihoods and how do both men and women in Meatu and Iramba districts adapt to climate variability and change while facing other vulnerabilities?

Study Justification

Experience (see for example, Bapna *et al.*, 2009, Denton and Parikh, 2003) shows that interventions to strengthen livelihoods and food security in response to external shocks are more efficient and effective when gender differences are properly understood and addressed. Yet, research and policy-making have so far failed to examine extensively gender aspects of vulnerability and adaptation to climate change (Nelson, 2005; Denton and Parikh 2003; Wendy, undated). Such analysis is important because in agricultural and natural resource-dependent communities, men and women have distinct roles and responsibilities, which give rise to differences in vulnerability and the ability to cope with changes. These differences need to be acknowledged during the adaptation process to avoid further widening of the existing gender inequality, and to ensure the success of adaptation policies and strategies. A gendered analysis facilitates a deeper understanding of how climate change threatens the livelihoods of men and

women and other vulnerable groups. In addition, such an analysis may inform initiatives to mitigate negative gendered impacts while enhancing positive gendered capacities for adaptation to climate change. This study provides important insights on household livelihood responses and adaptation of agricultural production methods and practices to climate change and other stressors by farmers in the studied semi-arid areas.

Methodology

This study was carried out in selected villages of Mwamanimba and Mwashata in Meatu District and Kidaru village in Iramba District. Despite both districts being semi-arid, there are slight differences in terms of climatic conditions depending on agro-ecological factors and the landscape (Figures 1 and 2).

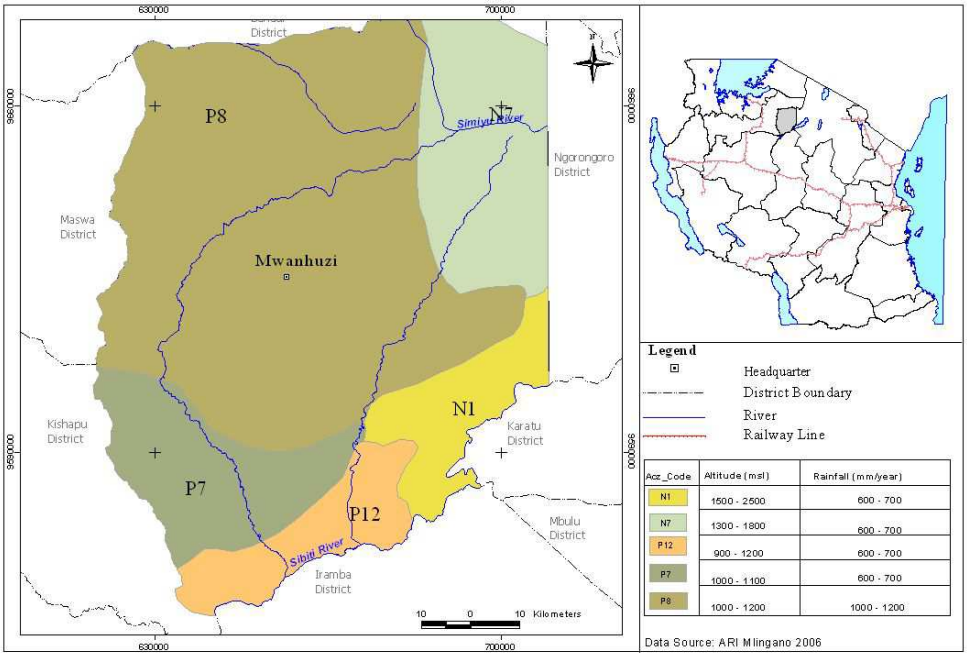

Figure 1: Agro-ecological zones in Meatu District

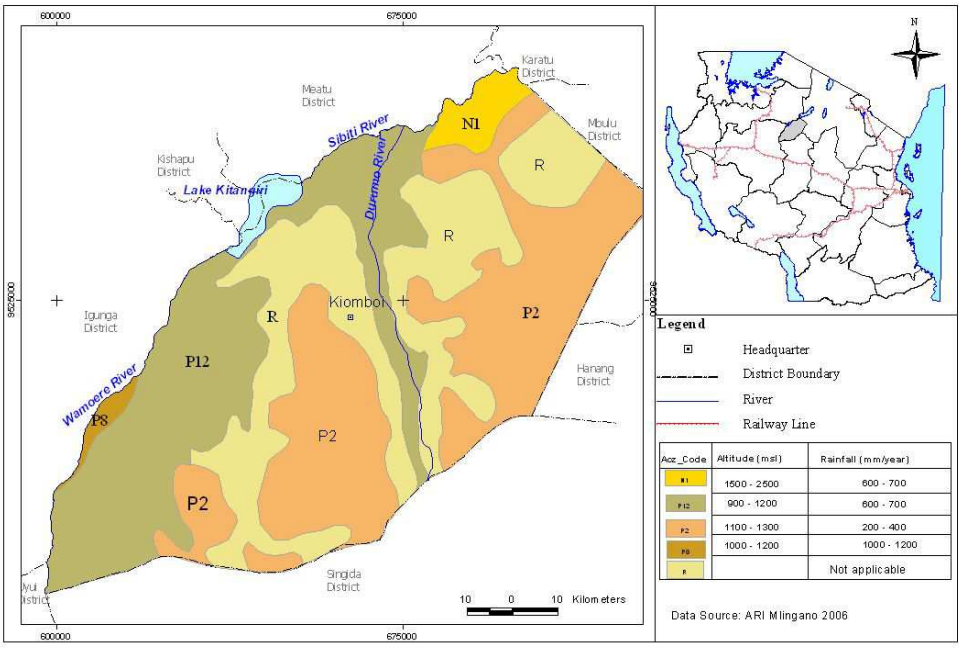

Figure 2: Agro-ecological zones in Iramba District

The study employed qualitative methods. Data were collected using a checklist of questions to guide unstructured interviews with key informants and focused group discussions (FGDs) with community members. Direct observation was also used. Participatory wealth ranking was done to establish local perceptions of wealth and poverty, and the relative wealth levels in each village. The study used resource mapping and FGDs to collect information on gender based vulnerabilities. Examining gendered dynamics and changes within the household or community required individual-level as well as community-level information on various socio-economic variables. At the community level, data were collected from village leaders and key informants, as well as focus group discussions for women and men.

In addition, the Harvard Framework and Gender Analysis Matrix were used to collect sex and gender disaggregated data. The Harvard Framework provided a detailed analysis of gender roles in relation to access to and control of resources and information on factors affecting the genders by disaggregating their roles, access and control over resources. Moreover, activities undertaken by males (men and boys) and females (women and girls) on livelihood activities and natural resources management were

identified. Daily activity tools were used to determine the use of time during the rainy and dry season in relation to agriculture and natural resource management. This information aimed at establishing variations between males and females at the busiest and the quietest times of the year. Changes in gender roles, resource access and control due to climate variability, and the impact of other vulnerabilities were also explored for men and women through FGDs. All these data were analysed using content analysis.

Results and Discussion

Wealth Ranking

Wealth inequalities affect access to resources and ability to respond to changes brought about by climate variability and other stresses. It is therefore important to ensure that the situation and concerns of all community members from different socio-economic groups with respect to climate change impacts and adaptations are known. Majority of people in the southern part of Meatu District are agro-pastoralists. In both Mwamanimba and Mwashata villages, ownership of big tracts of land and large herds of cattle is an indication of wealth as was the ability to hire labour. Mwamanimba village is located in the southern part of Meatu District; it seems to be more affected by climate related factors than Mwashata as reflected in the poverty statistics (Table 1). Mwamanimba village had more than half of the households falling in the poor group (59.7%) relative to Mwashata (43%). Conversely, Mwashata village had close to half of the households (49.6%) being classified as not so poor compared to only 22.8% for Mwamanimba. But, the proportion of rich households was higher in Mwamanimba (17.5%) compared to only 7.4% in Mwashata. Kidaru village in Iramba District on the other hand had 48.4% of the poor category and 36.6% of the not so poor and only 15% constituted the rich category.

Table 1: Wealth Status in the Study Villages in Meatu and Iramba Districts (percentage)

Wealth Status	**Location**		
	Mwamanimba	Mwashata	Kidaru
Poor households	59.7	43.0	48.4
Not so poor households	22.8	49.6	36.6
Rich households	17.5	7.4	15.0

Source: Participatory Wealth Ranking exercise in study villages

Regarding wealth ranking in Iramba and Meatu Districts, the definition of wealth and poverty was almost similar in the two districts. Based on wealth ranking results, the incidence of poverty was high in both districts. However, the incidence varies slightly between villages. The common feature across the villages under study is that the combined incidence of poor and not so poor households exceeded 80% in all three villages. The observed percentages of poor households at 48.4% (Kidaru), 59.7% (Mwamanimba) and 43% (Mwashata) are quite high when compared to levels reported for rural areas of Tanzania. According to URT (2009), about 37.6% of Tanzanians were below the basic needs poverty line and 18% were below the food poverty line. Respondents in the study area used their local classification of being rich or poor, taking into consideration issues such as a household's food security, ownership of assets in particular livestock and land, ability to hire labour, and a household's general ability to manage day-to-day affairs.

Changes in gender relations and farming practices

Focus group discussions revealed that the farming systems in the study area comprise of livestock keeping and crop production. A few households practiced agro-pastoralism, combining crops and livestock keeping but, some differences exist between villages. For example, in Mwamanimba, the majority are agro-pastoralists while in Mwashata and Kidaru most villagers grow crops only. In Meatu District, cotton is the main cash crop while sunflower is an emerging cash crop in Iramba District. Other cash crops are green gram, lentils, finger millet and sunflower. Food crops include sorghum, pearl millet and sweet potatoes. Maize is a preferred staple but it requires 500-15000 mm of rainfall to reach maturity. Using local varieties, the crop is mainly grown in Kidaru village (Iramba) and in Mwashata in northern Meatu District, which receive relatively more rain. Sweet potatoes used to be cultivated by women only as a food reserve; it has now been embraced by men due to its rising importance as a cash crop.

During FGDs, it was revealed that there has been a big increase in the population of Meatu District relative to 1974 when Mwamanimba and Mwashata villages were established. This increase has been associated with migrants in search of land for crop cultivation and pasture for livestock. During the 1970s, both villages were dominated by villagers belonging to the Sukuma tribe. Following migration, other tribes including the Taturu, Barbaig and Nyiramba have moved in at increasing proportions. In the case of Kidaru village in Iramba District, the dominant tribe is Nyiramba and

Nyaturu. Immigrants have been from the neighbouring districts including Sukuma and Barbaig.

It was observed for example that households were currently cultivating larger farms (up to 3 acres on average), compared to 30 years ago when enough food for subsistence and for sale could be produced from a smaller area. Farm area expansion has become necessary to compensate for declining soil fertility (hence productivity) and the use of low yielding local varieties. Larger farms are also cultivated as mitigation against drought. Nonetheless, increased farm size has implication on women's workload as women perform many activities on farms. Moreover, because of declining soil fertility, farmers reported using animal manure to enhance soil fertility.

Striga and birds were pointed out as the leading pests. Participants in FGDs further reported that the intensity of insects, diseases and birds attacking farm crops has increased over time. It was reported that farmers in Meatu District started using pesticides and insecticides in 1972 but many could not afford to purchase the same. Consequently, the use of local or indigenous pesticides remains prevalent. For example, farmers are using a local insecticide known as '*mtundwa'* for sorghum production. The use of ox plough has seen an increasing trend since 1968 in Meatu. Use of tractors has also been increasing in recent years, mostly for land preparation. Nonetheless, participants in all three villages admitted that the hand hoe still dominates for land preparation and weeding. It was further noted from FGDs that a few farmers in Mwamanimba and Kidaru village had started practicing irrigated farming along river valleys using generator driven water pumps, following the continuing trend of unreliable rainfall.

Availability of water and pastures

Three types of water sources were mentioned in the study villages; water taps, wells and rivers. In Meatu District water levels in these sources drop during the dry season (August – October) every year, creating a serious water shortage for both human and livestock. Women are then forced to dig wells along seasonal river courses to get water for domestic use. In Kidaru village, households get water from taps; others are using rain-harvested water. Due to water shortages for human consumption and livestock, women and girls walk very long distances in search of water for domestic consumption. Meanwhile, men and boys search for pastures and water for livestock, trekking far from their villages, at times moving to other districts and or regions. Normally they stay away for 3 to 5 months coming back during the wet season.

In Meatu District, this practice is locally known as '*lubaga'***.** Participants in the FGDs pointed out that, in the past, *lubaga* areas were readily available in neighboring villages such that wives had the opportunity to visit their husbands. Currently, wives are unable to visit their spouses because *lubaga* is very far away from the villages. Women and children who are left behind face a number of problems in making ends meet. Sometimes men who migrate stay away permanently. It was noted in all three villages that it was not feasible to set aside areas for pasture close the villages, as demand for land is very high. Whereas it was possible during the 1990s to graze livestock freely, things have now changed. It was also reported that some livestock keepers graze their animals in Maswa Game Reserve which is against national conservation policies. Currently, livestock keepers have to pay for animal feeds in the form of crop residues (maize stover, sorghum and millet remains, and beans straws etc.) found in other people's crop fields. Lack of pastures and death of animals sometimes necessitates animals to be sold at a very low price during the dry season. This practice destabilizes households' savings, since wealth is often stored in the form of livestock (sheep, goats and cattle).

Food storage and food security situation

In-depth interviews show that villagers store their staples (cereals and pulses) using traditional and modern storage techniques. The traditional methods were more popular, being used by about three quarters of the farmers. Some of the traditional methods commonly used include ground Neem leaves (*muarobaini*) mixed with ashes and manure. Respondents acknowledged that in most cases industrial chemicals were more effective for preserving cereals, but most villagers cannot afford them. According to Mukani (2003), post-harvest crop losses in Tanzania amount to 30% of the harvest. IFAD (2011) also points out that Tanzania has high post-harvest losses (40% for perishable crops and 20% for grains). Whereas the traditional methods generally work, but when they fail households are at higher risk and in particular those in semi-arid areas such as Meatu and Iramba Districts. High post-harvest losses of food, coupled with inefficient distribution systems raise food prices in deficit areas, contributing to food insecurity among poor households that depend on purchased food from local and urban markets.

Normally, food deficits are experienced during the interval from November to April, when more than half of the households face food shortage. At this time, prices go up and most households are not able to afford buying food from the market due to their low incomes. Such food shortage becomes worse when drought is more severe. It was noted that during the 1980's

and 1990's there was unreliable and insufficient rainfall in the study areas, leading to prevalent food shortage within many households.

Besides changes in weather condition (rain in particular), FGD participants reported that the farmers' tendency to concentrate on cash crops relative to food crops is another cause of food insecurity in the studied villages. For example, most households in Meatu District cultivate cotton at the expense of sorghum or maize. The emphasis on cash crops such as cotton, makes households vulnerable to food insecurity. Women who are responsible to ensure food availability are mostly affected. Often, it is only older members of the community who continue to grow crops such as sorghum that are better suited for the semi arid environment of the study area. However, the low productivity of cotton due to various factors, and low prices offered to farmers suggest that, in many cases income from cotton is not enough to buy food from other farmers within the village or from distant markets when necessary.

Both men and women felt that for the past 20 years households in the study areas had plenty of food because there were enough rains. Since the mid-1990s, the frequency of families facing food shortage has increased due to drought and land scarcity. Both men and women members in the FGDs indicated that casual labour is the most common strategy used by villagers to overcome food and income shortages. Those in need are usually hired to work on richer households' farms within the village at the wage of 5,000 TZS per acre. Other households may sell livestock at a very low price (TZS 120,000 for cattle and TZS 10,000 for goats). Others cope during lean months of the year through crop borrowing; to be paid with interest after harvest at the rate of one sack borrowed to be paid by 2 to 3 sacks depending on agreements. Some households lease out land for TZS 5,000 per season.

Food aid by the Government and other organizations is another coping mechanism used to overcome food insecurity in the study villages. Another strategy involves out-migration of male members to places where they can get work for up to 6 months as reported by both women and men. However, this often has negative effects on remaining family members. Some of the men who migrate do not remit money to their families, hence women experience difficulties in making ends meet on their own.

During food shortage households may reduce the number of meals per day, and in extreme cases they may have no meals at all. Consequently, children miss or drop out of school, some search for casual jobs to earn income and

meet their short term needs. Engaging in non-agricultural activities has become a popular way of coping with low production from agriculture. Men are engaged in brick making and selling cash crops such as sunflower seeds. Women were reported to engage in petty trade such as selling food (*mama lishe*) and vegetables from their own gardens; others sell fish, porridge, and local brew. Currently, women do not entirely depend on men for family needs as they have other source for generating income. This change is attributed to awareness created on gender equality but also due to interaction with people from different areas.

Fuel wood collection

In Meatu, women and children (boys and girls) are mainly responsible for collecting fuel wood. This is normally collected far from the village, about a 10 hours walking distance, because trees are no longer available around the villages. Until the 1990s (20 years ago), women used to collect fuel wood near their homes (about ½ to 2 hours walking distance). Moreover, there was no need to store fuel wood for future use, because there was plenty of firewood close to the villages. The current scarcity of firewood is attributed to expanding residential areas to accommodate immigrants and expansion of farms. Currently, due to fuel wood shortage, especially during dry season (September to October), fuel wood collectors have to stay in the forest for one week in order to collect enough fuel wood to be used during wet season. Ox-carts are used to transport the fuel wood at a cost of TZS 10, 000 per trip; in the past most of the fuel wood was transported by women on their head. During the FGDs, it was reported that some women encounter sexual harassment while searching for fuel wood far away from home.

Some men also engage in searching got and collecting firewood but, for different reasons. In most cases firewood collected by women is for domestic use while participating men collect the firewood for sale. Currently, women spend more time fetching firewood compared to the past. Currently they spend more than 5 hours daily collecting fuel wood, which they store for use during the farming season (approximately 6 months). This trend has changed since the 1980's when women used to spend only about 3 hours in a day collecting firewood. Based on the daily activity schedules compiled for Kidaru village, it was observed that during the rainy season men have four hours of rest compared to only one hour for women. During dry season, men have five hours of rest compared to only two hours for women.

To cope with the shortage of fuel wood, energy serving stoves have been introduced. During the 1990's women in Meatu were trained to make energy saving stoves (*Majiko banifu*) using clay. The stoves are able to preserve heat and use less firewood. It was also reported that there are appropriate technologies that can be used to reduce heavy workload in performing day-to-day activities in the households especially for women; for example, carrying water from the river using ox-carts. Since 1986, there have been various efforts under HASHI [12] programe to support land conservation and trees planting in Meatu and other neighbouring Districts.

There are also tree planting initiatives supported by an organization called Investment on Children and their Society (ICS). These programmes which were supported by the government, donors and NGOs, partly explain why currently, some few trees can be seen in the Mwashata and Mwamanimba villages. Table 2 shows a summary of climate change related events and adaptation strategies used by men and women in the study villages.

[12] HASHI stands for Hifadhi Ardhi Shinyanga (Conserve land in Shinyanga)

Table 2: Climate change related events and adaptation strategies

Event	Gender Mostly Affected	Coping/Adaptation Mechanisms	Strategy Mostly Used By
No food due to crop failure	Women	Exchange of cows and food	Men
		Selling cattle at lowest prices	Men
		Feeding only on wild vegetables	Women
		Eating only one meal a day (sometimes, porridge or *ugali*)	Women
		Eating dried sweet potatoes (*matobolwa*)	Women
		Crop borrowing to be paid at harvest with some interest	All
		Diversification to off farm activities	All
		Out migration to other regions such as Rukwa, Mbeya, Morogoro, Singida and Dodoma	Men
		Farm lease	All
		Selling labour	All
		School dropout	Girls/boys
		Food aid (LGAs, churches and NGOs)	All
		Forming self help groups	Women
Drought		Use of small scale irrigation using generator driven water pumps – gardening	Men
		Use of improved varieties which are drought resistant	All
Shortage of pasture/ Loss of '*ngitiri*'	Men/Women	Grazing in game reserve	Men
		Men out migration	Men
		Sale of animals at low prices	Men
Occurrences of crop diseases	Women	Use of local disease resistant varieties	Women
Shortage of water	Women/girls/boys	Use of ox-carts to reduce workload	Women
Death of animals	All	Sale of animals at low price	Men
Shortage of fuel wood	Women/girls	Introduction of energy saving stoves technology and solar power	Women
		Utilization of crop straws (cotton, maize, sorghum) for energy	Women
		Use of ox-carts to reduce workload	Women
		Introduction of forest reserves	All
		Afforestation activities	All
Shortage of pasture	Men	Grazing in game reserve and out migration	Men
		Searching for new lands	Men
		Buying hay for animal feeds	Men
Loss of soil fertility	All	Use of animal manure	All
Loss of forests	Women	Introduction of forest reserve	All
		Limited use of forest resources	All

Conclusion and Recommendations

Based on the study findings, it is concluded that poverty is high in the study area and that the incidence is over 80% in Meatu and Iramba Districts. Climate change is becoming a threat to the farming systems and to the people's livelihood in general. Both men and women in all study villages are vulnerable to a multiple factors including drought, loss of soil fertility, scarcity of grazing land, outmigration, crop pests, human and livestock diseases. Interestingly, changes in the farming system and other activities that are fundamental for the livelihoods have gender implications. For example, the production of cash crops disadvantages women because cash crops are men's crops in the study districts. In addition, increasing distance for collecting firewood and water is affecting women more than men. As a result, the workload is increasing, not only for women but also for the girl child. The impacts of climate change are also changing gender roles, as some of the female roles are now being performed by men and vice versa. The study recommends that, when analyzing climate change impacts it is important to assess how those impacts have affected the roles and responsibilities of both men and women. Because of differences in roles and responsibilities, men and women are impacted differently and use different adaptation strategies to climate change. It is therefore important to focus on different needs of men and women when supporting them to adapt to climate change and avoid the notion that "one size fits all".

References

Bapna, M., McGray, H. & Mock, G., Mithey, L. (2009). Enabling adaptation: priorities for supporting rural poor in changing climate. World Resource Institute Issue Brief, Washington DC. 12pp

Barrow, E., Kaale, B. & Mlenge, W. (2003). Forest Landscape Restoration in Shinyanga, the United Republic of Tanzania. www.fao.org/DOCREP/ARTICLE/WFC/XII/0164-B3.HTM [12/08/2011]

Denton, F. & Parikh, J. (2003) Gender – A forgotten element. Tiempo_Global Warming and the Third World. Issue 47, March 2003. http://www.cru.uea.ac.uk/ tiempo/floor0/recent/issue47/ t47a6. htm. (Accessed on 20/6/2011).

FAO (2007). People-Centred climate Change Adaptation: Integrating Gender Issues. ftp://ftp.fao.org/docrep/fao/010/a1395e/a1395e00.pdf *[*01/09/2011]

González-Brenes, M. (2003). Domestic Violence, Bargaining and Fertility in Rural Tanzania. http://www.sscnet.ucla.edu/polisci/wgape/papers/4_Gonzalez.pdf [12/08/2011]

IFAD (2011). Enabling Poor Rural People to Overcome Poverty in the United Republic of Tanzania. http://www.ifad.org/operations/projects/regions/pf/factsheets/tanzania.pdf [03/03/2013]

Intergovernmental Panel on Climate Change (IPCC) (2001). Climate Change 2001. Synthesis of the Third Assessment Report. Intergovernmental Panel on Climate Change (IPCC). Cambridge University Press. Cambridge.

Kangalawe, R. Y. M. and Majule, A. (2006). Land-Use Dynamics and Land Degradation in Iramba District http://www.africanbookscollective.com/books/land-use-dynamics-and-land-degradation-in-iramba-district-central-tanazania [11/08/2011]

Mukani, P. (2003). Review of the Agriculture Sector: Recommendations on Major Problems and Bottlenecks Impending Investments in the Sector. mada (Management and Development Associates), Dar es Salaam.*www.tnbctz.com/.../39-Report-on-Agriculture.ht...* [03/03/2013]

Nelson, S. (2005). People-Centred climate Change Adaptation: Integrating Gender Issues. Gender, Equity and Rural Employment Division (ESW), FAO

URT (2007). National Adaptation Programme of Action (NAPA). Vice President's Office, Division of Environment. Dar es Salaam. 52pp.

URT (2009). Poverty and Human Development Report. United Republic of Tanzania. 190 pp

WEDO (2007). Changing the climate: why women's perspectives matter? Available on-line in

http://www.wedo.org/files/climatechange-orng2ebook.pdf [01/09/2011]

Wendy, A. (Undated) Gender and Climate change adaptation. Lessons learned from the community based adaptation in Africa (CBAA). Indigo development and change Nieuwoudtville, South Africa.essons learnt from the Community Based Adaptation in Africa. http://www.indigo-dc.org/documents/Adaptationandbeyond04small .pdf[22/02/2013]

FROM THE FIELD

An alternative extension approach for technologies transfer to small scale farmers for poverty reduction and food security in Tanzania

D. Ringo, C. Maguzu & J. Ng'ang'a
Research, Community and Organizational Development Associates, NaneNane Themi Ground – Njiro Arusha

Introduction

Agriculture is the main source of livelihood for eight out of ten Tanzanians - most of them living in rural areas in severe poverty. With the growing population, and increasing demand for food, the agricultural sector continues to be of great importance for food security and rural economic development. It is well-documented that growth in the agricultural sector is twice as effective in reducing poverty as growth in other areas. It is further known that Tanzania has the knowledge, technologies, and the resources to end hunger and poverty, but productivity among smallholder farmers continue to be far below obtainable levels. One of the biggest challenges is to get new technologies which are available from the research stations, to reach the farmers in an efficient way and to get the new technologies adopted by the farmers. It has been a general tendency to conclude that small scale farmers are still poor and their yields very low due to poor research – extension linkages. Usually, it is wise to do two things if things are not working; either to abandon it or to look on how to do it in a different (better) way. Based on the fact that it is impossible to abandon the development of small scale farmers who are about 70-80% of the Tanzanians, RECODA and Rockwool Foundation thought they have to find a solution for the paradox hindering livelihoods improvement for small scale farmers in Tanzania by developing an extension approach called Rural Initiatives for Participatory Agricultural Transformation (RIPAT).

Genesis and objectives of RIPAT

The genesis of RIPAT approach is based on two questions i.e. why have so many agricultural development projects generated so little impact among rural farmers, and why are many improved agricultural technologies that have been developed not been adopted by farmers? So, RIPAT has been developed as an extension approach for rural development where the key objective is to bridge agriculture technologies gap and to ensure farmers take full charge of their own development. The approach was initiated in

2006 through collaboration between Rockwool Foundation, District Councils, and RECODA with strong reference to the wise saying of the late Mwalimu Nyerere that *"people cannot be developed – they can only develop themselves"*. This led to the conclusion that projects should facilitate communities to take self-initiative/desire of hardworking through utilizing locally available resources and opportunities to bring about their own development. To-date, four RIPAT projects of 3-4 years lifespan have been implemented in three districts (Arumeru, Karatu and Korogwe), involving 34 villages and 68 groups (2,200 direct farmers).

The goal of RIPAT has been to ensure improvement of living standards of Tanzanians through reducing poverty and food insecurity among small scale farmers by developing a model for ensuring adoption and diffusion of agricultural technologies. The RIPAT approach has observed key issues which are sustainable, low-cost solutions to the challenges faced by small-scale farmers by providing proper tools, techniques, and information in a participatory 'help to self-help' approach.

The RIPAT concept and its core components

RIPAT attempts to promote self-confidence and to create in the target communities a vision of, and a belief in, a better future - a 'yes we can' spirit because if poverty and donor dependency becomes a part of a community's identity, it can be difficult to change the situation for the better. RIPAT focuses on providing solutions to immediate and long term needs as well as facilitating an understanding of help-to self-help for the long lasting solutions. Generally, RIPAT is implemented with the focus of offering proven skills and practices for poverty reduction, food security, and environmental conservation to small scale farmers through community mobilization, sensitization, counselling and capacity building to utilize locally available resources and opportunities for livelihoods improvements leading to self-support and reliance. Such focus creates a perception that 'development' has not to be brought from outside but farmers should concentrate on their own capacities and locally-available resources to bring about their development.

A typical RIPAT cycle involves a three year project targeting 8-10 villages, where two groups are established in each village, each group consisting of 30–35 farmers. Through the RIPAT project, farmers are offered a range of improved farming methods and technologies - a 'basket of options'. These are explained and demonstrated in a participatory manner at the group field, which is used as a training and demonstration plot, and on individual farmers' fields. Farmers evaluate the ideas and decide for themselves which

technologies and methods they want to implement on their own farms. The groups meet weekly in the first year of the project, in second year meet after a week while for the third year is once per month. With guidance from group facilitators, the farmers learn about, and try out the new ideas, and fine-tune the methods to suit local conditions. The aim is that the project concept and technologies should spread from farmer to farmer in the targeted villages, and also to other villages through the government agricultural extension system and trained 'super-farmers' – farmers who have been members of RIPAT groups themselves and who have subsequently received additional training.

The following are the characteristics of RIPAT approach that are necessary in implementing robust and group based agricultural development projects:

- A vision of a better future - see the end/destination (super household) from the beginning so as to know how to set strategies and the required costs/resources.
- Community mobilization and sensitization for participants to take real ownership and build a *'Yes we can spirit'*. When people stay in poverty for a long time, they tend to think that is the way of life and desire for development, creativity, commitment and ownership dies away. The mindset should be dealt with so as to awaken them – come back to them (self-actualization).
- 'Help to self-help' to avoid donor dependency – the direct recipient of the project support should pay back the cost in cash or kind i.e. be responsible to support other three non-project members in terms of materials and knowledge; or solidarity chain for the animals (Heifer-in-trust approach).
- The use of group demonstration field, where RIPAT basket of options takes the best from bottom-up and top-down extension approaches. The basket of options is formed after thorough situation analysis.
- Formalized cooperation with local government authorities and extension services for continuation and up-scaling. This is an effective and an in-built mechanism for ensuring spreading to the wider community.
- Giving farmers choice regarding agricultural technologies (basket of options) and a voice regarding how they want to organize their group and work together. Working in the groups – not only for cost-effective training, but also to promote togetherness and cooperation to sustain the project. Effective training in group organization and leadership are given upper hand.
- Mitigation of severities of climate change through *insitu* rainwater harvesting, crop diversification and intensification, water use

efficiency under irrigations and crop-livestock integration. This also ensures that farmers are employed all year round.

- Value chain – linking farmers with different stakeholders along the value chain including proper handling and marketing of the agricultural produce.

Impact of RIPAT projects

The systematic documentation from the completed RIPAT projects verifies that the approach provides a key for unlocking the so far largely untapped agricultural potential among smallholder farmers, and shows:

- Increased levels of food security among participating farmers.
- Improved levels of nutrition among adults and children
- Sustained adoption of most of the agricultural technologies promoted
- Diffusion of the most popular technologies to non-participant farmers in the local communities.

Some reasons behind the positive results

Apart from the element of free choice from a 'basket of options' the fact that each farmer belongs to a strong farmers' group contribute to an increased sense of empowerment among the farmers – especially among female farmers. It also increases the farmers' bargaining power with more knowledge about, and a say in, agricultural matters. The vast majority of established RIPAT groups continue to work together after project completion. Finally, the research repeatedly stresses that the organizational management structure around RIPAT is another reason for these achievements. That is, a management structure which entails both joint experimental learning in groups, a pragmatic combination of traditional and participatory extension approaches, and a strong focus on integrating both local needs, resources and conditions of small-scale farmers as well as involving local governmental authorities into the intervention design.

Conclusion

This approach should facilitate communities to take self-initiative/desire for hard work through utilizing locally available resources and opportunities to bring their own development. We need to believe that anything with a beginning has an end; i.e. poverty and food insecurity can end in Tanzania through ending a slogging of poor research extension linkage. Unlike other extension approaches used in Tanzania after being adapted from other countries; RIPAT approach has been designed based on the environment of our country. Visit our websites for more information: www.recodatz.org and www.ripat.org

BOOK REVIEW

Putting heads together: Agricultural innovation platforms in practice. ***Nederlof, S., Wongtschoski, M. and F. Van Der Lee (Eds),*** **2011. KIT Publishers, 192 pp.**

This book has two parts. Part 1 that is based on analysis, has five chapters on the areas of: agricultural innovation platforms, designing innovation platforms, brokering innovation, impact and sustainability, and lessons learned and lessons needed respectively. Part II is on case studies on various agricultural practices carried out in some African countries. The overall concrete aim of the innovation platforms was to improve the livelihoods of the stakeholders.

A lot of knowledge, inspiration and experiences have been accumulated from extension and outreach programs and other participatory methods in Sub-Saharan Africa. The editors of this book have therefore sat back and studied innovation platforms in order to gain in good understanding of what has worked where, how and why. The book as a whole is a revelation of practical experiences working with innovation platforms; deriving lessons from practitioners for fellow practitioners.

Further to that, the writers stated of the need on a switch of focus from technology to innovation. Innovation includes the elements of technical, organizational and institutional. In order to have stronger linkages between the different stakeholders in agriculture, agricultural innovation platforms are to be used. Such platforms are to provide room for platforms joint work and interaction thus improving practices through that cohesion or linkage. In support of this point, the writeshop contributors of this book cited innovation platform cases such as soybean cluster in Ghana, maize platform in Nigeria, vegetable platform in Malawi, oil palm in Ghana, poultry network in Tanzania, cowpea and soybean platform in Nigeria, maize platform in Rwanda; and others. The contributors furthermore, cited some lessons learnt from the above cases under three thematic areas namely designing an innovation platform, brokering; and impact and sustainability. Designing is understood as a dynamic process of drawing or planning made prior to the construction of an object, and that a good design will in the end bring about a well - functioning platform amongst the platform members. This also involves good governance which includes proper management processes, decision - making rights and responsibilities and accountability mechanisms. Here, governance relates directly to the management of the platform, and the relationships between platform members are formalized.

The formalization can be done by scoping - that's the initial effort to narrow down the platform's which often takes place through meetings and workshops of the platform members. These members take the roles and responsibilities of brokering, facilitating, coordinating or representing the platform. On top of coordination, agriculture innovation platforms also need "catalyst of interaction" that is provided by innovation brokers. These play the role of building appropriate linkages and multi-stakeholder interaction. These brokers can be either organizations or individuals specialized in brokering. As stated by Winch and Courtney (2007) brokers can act as members of a network of actors focused neither on the organization nor the implementation of innovations, but on enabling other organizations to innovate. Brokering functions include: facilitation, linking and strategic networking, technical backstopping, mediation, advocacy capacity building, management, documenting learning and champions. Additionally, writeshop members found out that it is hard to measure the impact from an innovation platform because the process of innovation is by its nature unpredictable, dynamic and flexible.

The writeshop contributors very strongly argued that innovation, or doing something in a new way results from interaction between many actors. These actors, being directed by their common evolving purpose(s), may get involved in negotiation, joint planning, working and learning. However, caution should always be taken due to the impossibility of designing detailed innovation platforms as well as platforms so dynamic, and flexible by nature.

Platforms initial success may hook and therefore keep the members together for longer. On top of the initial success, the case writers identified both ground rules as well as formalization as extra binding factors to the members. These ensure harmony for effective performances of the innovation platforms. Further to initial success, ground rules and formalization, having a critical choice for a platform and building it together contribute meaningfully to the effectiveness of platforms. Participation of members and involvement of brokers in the interactive process are among the sources of bringing positive changes to the duties of the agricultural innovation platforms. Similarly, platform members have to be willing to learn how they themselves function, interact and perform. It is through learning collaboration and joint work can a platform promote innovation and make changes in peoples' lives.

Common featured objectives for initiating innovation platform projects included: protecting the environment, increased crop production, and coping with demand and supply for the cash crop in the national and international markets, solving envisioned crop competitive and sustainable demand and supply as well as access of new markets that are to benefit farmers, by adding value to their products. The platforms have been housed at different Universities in respective countries, for example the soybean cluster in Ghana is under the Methodist University College. Regular meetings, collaborative research projects by Universities and farmers, facilitation of skills to the platform activities, provision of needed materials and building of network around commodity – focused innovation, field activities, farmers' loans and subsides provision to platform members are some identified potential incentives to platform members especially among farmers in the reported case studies.

Innovation platforms in the case studied were reported to face challenges. These include meetings been too expensive to be maintained and lack of commitment and financial reward to some members. Also, there existed in the innovation platforms lack of proper coordination and poor linkage between platforms and policy makers. Additionally, lack of feeling of ownership of research agenda, communication gaps and lack of mainstreaming platform work into the formed research and extension system were observed to be challenges hindering development of these innovation platforms to achieve their set initial goals and objectives. Looking critically across the case studies, however, one also finds out that some agricultural innovation platforms in Africa have been successful in achieving set goals specifically the attempt to fight against poverty. The book sheds light and provides useful knowledge on how different agricultural stakeholders can work in a team spirit to solve agricultural problems at their respective areas.

Lastly, the book has come up at the right time when African farmers and extension workers are struggling harder to work more closely and practically in burning issues related to Value Chain education so as to realize more profit in agricultural business. Thus, different agricultural stakeholders including farmers, extension workers, university academic staffs, planners, policy makers and others will find reading this book not only interesting but also enlightening.

Gabriel K. Nzalayaimisi
Department of Agricultural Education and Extension
Sokoine University of Agriculture

Information for Contributors

About JCEE

The Journal of Continuing Education and Extension (JCEE) is an official publication of the Institute of Continuing Education (ICE), approved and recognised by the SENATE of Sokoine University of Agriculture (SUA). It provides a professional medium of communication for creative and innovative action oriented discourse based on research, theory and practice.

The Journal's audience (contributors and readers) comprises of researchers, practitioners, scholars and educators in various fields such as; extension, continuing professional education (literacy, distance education, vocational education, adult education), experiential learning for different aspects of development, practical implications of cross-cutting issues such as gender, ICT, HIV/AIDS, environment and globalization. Multidisciplinary contributions that cut across professional boundaries are highly encouraged.

The Journal now has three sections. Section one contains original journal articles, section two covers experiences from the field, which present case studies of various practical aspects of extension service delivery and continuing education. Such articles should represent best practices and other experiences that are presented for learning, sharing and scaling up. Section three is intended for book reviews.

Notes for Contributors

Articles

- Manuscript submitted to JCEE should not have been submitted to any other journal for publication.
- Manuscript should be submitted in electronic form only.
- Manuscript should be typed for printing on A4 paper, in Times Roman, font 12, using 1.5 spacing, with margins at the sides, top and bottom of at least one inch.
- Articles should not exceed 20 pages
- Manuscript should contain an abstract of 100 – 300 words

- The authors' name(s) and affiliation(s) should appear on a separate first page, also containing the abstract.
- Sub-titles should be bold and begin from the margin
- Figures and Tables should be presented clearly and precisely to permit reproduction
- Authors should use the Harvard Citation style. Cited works should appear on a separate page of "References". For example: Sife, A. S, Kiondo, E. and Lyimo-Macha, J. G. (2010). Influence of mobile phones and broadcast media on rural communicative ecologies in Kilosa and Mvomero District, Tanzania. *JCEE*. 3(2): 1 – 12. Within text such citation would appear as (Sife *et al.,* 2010)
- Submitted manuscript should be written in a standard and consistent manner, free of typographic errors.
- Manuscripts should be in UK English.

Field Experiences

- Manuscripts of the field experiences will not require the academic rigour expected of journal articles in terms of conceptualization and analysis. The articles are however expected to present good case studies of experienced providing lessons for others to learn from. Such experiences could be best practices to be adapted or replicated. There could also be examples of bad experiences to be avoided in relation to technical and institutional aspects of development
- Their content should contain a description of (i) the experience (ii) lessons (positive and negative as appropriate)
- Submitted manuscript should be written in a standard and consistent manner, free of typographic errors

Book review

- Book review are expected to be of interest and relevant to the field of extension and continuing education
- Book reviews should be concise, not exceeding one page of A4 with spacing 1.5.

The manuscript should be submitted electronically to:

The Chief Editor
Journal of Continuing Education and Extension
Sokoine University of Agriculture
Email: jceesua@yahoo.com
jcee@suanet.ac.tz

Journal of Continuing Education and Extension

ARTICLES

FROM THE FIELD

ISSN 0856-4094