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Full Length Research Paper

Monitoring and evaluation report of "the impact of information and communication technology service (ICTs) among end users in the ministry of agriculture and cooperatives in Zambia"

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Agriculture constitutes a key livelihood source for over 75% of the rural households in Zambia. A total of 1,305, 783 households in Zambia are totally dependent on agriculture for their livelihood and are classified as agricultural households (CSO, 2000). Most (81.8%) of the population in agricultural households is based in rural areas of the country. Of the 1,305,783 agricultural households, 99.2% is engaged in crop production as a major agricultural activity. At national level, the sector's contribution to the gross domestic product (GDP) averaged over 18% in the past decade. The real growth rate in the sector has fluctuated significantly mainly due to heavy dependence on seasonal rain-fed crops, poor communication network and low farmer access to improved technologies that are resilient to some of the natural shocks such as drought, pests and diseases. Despite the evidence of the important contribution the sector makes to household food and nutrition security and the national economy, the sector faces a number of challenges to increased productivity. Other than the natural calamities and socio-economic factors such as access to agricultural inputs, credit facilities and markets, poor access to agricultural information remains a decisive challenge to increased agricultural productivity at household level. The prevailing low crop and livestock productivity among small-scale farmers could greatly be attributed to low farmer access to and utilization of agricultural technologies that are meant to enhance productivity. Utilization of such technologies has been poor among the illiterate farming community because such information is not available to such target groups in the right formats as some of the publications are either presented in a highly technical format which makes them too difficult to be understood by illiterate farmers. This situation is further worsened by the poor, inadequate and weak communication links between research, extension and farmers.

Key words: Information and communication technology service (ICT), agriculture, Zambia.

INTRODUCTION

SAIFADIS (Strengthening the Agricultural Information Flow and Dissemination System for the National Agricultural Information Services) and INFORNET (Information Flow Network for the Zambia Agriculture Research Institute) are two sister projects in the Ministry of Agriculture and Cooperatives funded by IICD. National Agricultural Information Services (NAIS) is a specialized information department of the Ministry of Agriculture and Cooperatives (MACO). Its main role is that of supporting the extension service of the Ministry.

National Agricultural Information Services (NAIS) has the mandate to promote the adoption of proven agricultural technologies and provide information services to small scale farmers in order to enhance their productivity. Information is gathered from various sources, packaged and disseminated to farmers using radio, television and various publications.

NAIS has the responsibility to gather this information from various information producers, package it, store and disseminate it to the end-users and obtain feedback from the farmers.

The main activity of the department is to disseminate

proven agricultural technologies to the farming community and other stakeholders through the use of mass media.

The department reaches out to the audiences through two (2) sections:

1. Broadcasting: Radio and television (TV) programmes.
2. Publications and press: News paper articles and features, booklets, magazines, pamphlets, etc.

Through this livelihoods project aimed at enhancing efficiency and effectiveness in its information collection, processing, packaging, storing and dissemination system, NAIS has built capacity of selected project staff and other members of staff in usage of ICTs, established a LAN at headquarter (HQ), create an ICT based link (internet/email) between HQ and the satellite station of Kasama, and built formal linkages with information sources and strategic stakeholders.

The project started in 2005, following the Siavonga roundtable meeting that was held in 2002. The overall objective of this project is to improve information flow within NAIS and the flow of agricultural information between sources and end users by increasing the efficiency of NAIS to gather, process, package, and store and disseminate information in order to increase small-scale farmers' productivity.

Specific objectives of Siavonga roundtable meeting

1. Improve information flow within NAIS;
2. Strengthen linkages between agricultural research, extension, farmers and other stakeholders;
3. Increase the capacity of NAIS to collect, process; package, store and disseminate agricultural information;
4. Increase the capacity of NAIS to publish in more accurate and appropriate formats.

NAIS has over the years been gathering agricultural information from different sources for on-ward delivery to the farming community. The department has also over the years been packaging the information in form of radio and TV programmes and print materials.

These information products have been made available to farmers and extension officers in the remote parts of the country. NAIS has continued to receive feed-back from farmers on the programmes aired.

Despite its mandate, NAIS was faced with difficulties in efficiently collecting and delivering agricultural information from sources to the end users, gathering of information is done by travelling to the sources by the responsible officers or passed on via third party in hard copy.

NAIS officers have had difficulties in accessing information from agricultural researchers, either responsible researcher is too busy or the new technology research is still on-going.

Information products such as audio cassettes, question and answer feedback forms, publications etc, have been delivered from districts to HQ through ordinary postal services and staffs travelling between the two points; these methods have proved costly and longer delivery periods.

There has been no systemic storage and retrieval of the information NAIS has gathered over these years. There has been no centralised information access point for farmers and other stakeholders such as extension offices in form of information resource centres. These short comings in NAIS have led to farmers not receiving the information they require at the right time and in the right format.

Through the use of ICTs, NAIS will be able to gather, process, package, store and disseminate information between research, extension, farmers and other stake-holders, strengthening linkages. Information products will be collected and delivered online from sources to the end users, in or on time and in appropriate formats.

Through this project, NAIS will ensure that information products are processed and stored using appropriate ICTs (for example, CD-ROM, Database, etc). Using ICTs, NAIS members of staff are now able to research for agricultural information technologies that are or may not be locally available.

Achieved results so far

1. Improved information sharing through an operational and easily usable local area network at HQ;
2. Improved NAIS efficiency in gathering of information products from Zambia Agricultural Research Institute (ZARI), Ministry of Agriculture and Cooperative (MACO) subject matter specialists and other stakeholders;
3. Strengthened linkages between NAIS, ZARI and extension;
4. NAIS staff trained in ITCs use;
5. Project incorporated in GRZ budget.

Expected results of the project

1. Production of information products and services based on a common media plan;
2. Number of national and international organisations with which partnerships are established and information materials sourced and shared;
3. Established formal linkages between NAIS, ZARI, extension and farmers;
4. Efficient ICTs use by staff;
5. Sustainability of the project.

Challenges encountered

Most challenges were encountered during the initial

implementation stages of the project, where the project documents had to move to and from IICD and NAIS because of government procedures.

Making subject matter specialists appreciate, the existence of the project is one challenge and bringing all NAIS staff on-board and makes them contribute to achievement of the project goals and the sustainable Internet use among NAIS staff another.

The other project that was reviewed during this focus group meeting is the Information Flow Network for the Zambia Agriculture Research Institute (IFORNET), under ZARI.

The project “Development of an effective information flow network for the Zambia Agriculture Research Institute” is a collaborative project between the Zambia Agriculture Research Institute (ZARI) and the International Institute for Communication and Development (IICD). ZARI is one of the eleven departments in the Ministry of Agriculture and Cooperatives (MACO). There are three core functions of ZARI namely development of agricultural technologies, crop germplasm resource base management, and provision of regulatory and advisory services. While ZARI has generated a lot of technologies through soils and crops research over the years, the agricultural sector continues to experience low levels of productivity at small scale farmer level. One of the recurring reasons for this has been attributed to the agricultural technologies developed by ZARI not being easily accessible to farmers. This project was introduced mainly to increase farmers' uptake of agricultural technologies generated by ZARI through use of information and communication technologies (ICTs). Through this greater uptake of agricultural technologies, farmers would increase their food production resulting in improved livelihoods. In the second place, the project was developed to improve communication among agricultural research scientists and with external stakeholders.

Specific objectives of ZARI and IICD project

1. Improving the accessibility of agricultural technologies developed by ZARI to farmers directly and also through extension agents such as the National Agricultural Information Services (NAIS), Agricultural Support Project (ASP) and Zambia National Farmers Union (ZNFU), collaborating institutions such Agriculture Consultative Forum (ACF), Organic Producers Association of Zambia (OPAZ) and Food Security Research Project (FSRP) and NGO’s including PLAN and World Vision International;
2. Enhancing the relevance of ZARI's research results and information products to the needs of extension agents such as the National Agricultural Information Services (NAIS), Agricultural Support Project (ASP) and Zambia National Farmers Union (ZNFU), collaborating institutions such Agriculture Consultative Forum (ACF), Organic Producers Association of Zambia (OPAZ) and Food Security Research Project (FSRP) and NGO’s including PLAN and World Vision International;
3. Catalyzing internal knowledge creation and management through the networking and sharing of specialist information among ZARI researchers;
4. Upgrading appropriate skills of researchers required for ICT-based information management.

Services offered by the project through ZARI

The major service being offered by the project is the provision of internet facility to the Zambia Agriculture Research Institute (ZARI) thereby, making communication between ZARI and its collaborators and stakeholders easy. The provision of information products is another service anticipated to have a lot of impact on the extension service providers, farmers and other stakeholders. The project has provided valuable training to ZARI staff to enable them manage information and knowledge for development of information products.

Constraints

Although, the project has made good progress towards the achievement of project objectives, there are constraints that have slowed down the implementation of the project to achieve all the desired objectives. The constraints include the following:

1. The project experienced delays in procuring project equipment through the government system;
2. Malfunction and subsequent replacement of some project equipment delayed implementation;
3. The training programme for the project implementation team (PIT) took a lot of time to implement, thereby constraining implementation of other equally important project activities;
4. Omission of a budget line for needs assessment during formulation brought about variation in the budget and caused delay in the implementation of this and other related activities;
5. Time limitations of staff at the peak of experimental work during the rainy season also made it difficult to devote sufficient time to developing information products; the period following the harvest from experimental fields is also focused on data entry, analysis and interpretation of results;
6. Difficulties faced by ZARI in recruitment and retention of the content manager who is the main player in development of information products adversely affected implementation of the project;
7. Lack of experience within ZARI in development of information products for end-users slowed down production of information products by researchers.

The vision of ZARI is to be a centre of excellence providing scientific leadership in generation and transfer of improved and appropriate agriculture technologies through partnership involving stakeholders and beneficiaries.

ZARI's mission statement is to contribute to the improvement of the welfare of the Zambian people through the provision of technologies and services that enhance household food security and equitable income generating opportunities for the farming community and agricultural enterprises.

The overall objective of the ZARI is to generate and adapt crop and soil technologies in order to increase agricultural productivity and diversify production. This includes the development of low cost sustainable farming systems for all major agro-ecological zones and farm sizes through participation of both the public and private sectors in research activities.

This would ensure the provision of a high quality, appropriate and cost effective service to farmers. The following are the specific objectives of the Institute:

1. To breed for stable and high yielding varieties of both food and cash crops;
2. To breed food crops for high nutritional value, storability and acceptability;
3. To breed for resistance and/or tolerance to pests, diseases and adverse soil conditions such as soil acidity and salinity;
4. To develop appropriate agronomic packages and technologies for sustained agricultural production;
5. To develop and maintain an inventory of soil and agricultural land that can be used for planning purposes.
6. To develop and adapt disease and pest control technologies and provide specialist advisory services;
7. To develop post harvest technologies that minimizes crop losses in storage and enhance utilization;
8. To develop strategies and provide services that prevents the introduction of pests and diseases into the country and facilitates trade;
9. To strengthen research/extension/farmer linkages in order to have more farmer participation in research;
10. To ensure that the specific constraints of small scale and resource poor farmers are addressed by agricultural research.

The implementation strategy of the ZARI follows the agro-ecological approach, which divides the country into three regions mainly based on rainfall. The broad implementation strategies, in order to achieve the above objectives, are as follows:

1. Devise mechanisms for cost sharing of research by, for example, contracting project financing and management to relevant commercial agricultural and international institutions.
2. Improve the management of the national research programme through appropriate planning, priority setting, programming and budgeting;
3. Encourage farmer participation in research planning, implementation, monitoring and evaluation;
4. Enhance the use of a computer based management information system which leads to more efficient utilization of available resources and facilitates greater responsiveness to the needs of farmers;
5. Strengthen and integrate economic and other sociological and nutritional input into agricultural research both at national and regional levels;
6. Improve the quality of research through the provision of adequate facilities and training;
7. Strengthen linkages with extension providers to effectively transfer research results to farmers, particularly smallholders;
8. Adapt technologies from regional and international research institutions;
9. Improve linkages with regional research institutions and data banks.

Since the establishment of the two sister projects, members of staff who are the end-users have not fully embraced the projects into their day to day operations to improve their performance as expected.

It was therefore necessary that a rigorous monitoring and evaluation (M and E) exercise be carried out to develop frameworks or guidelines for measuring impact of the two projects at institutional level.

It is important to stress that the impact of ICTs will not be understood through peoples' access to technology alone but on the impact of ICTs on the social, political and economic structures of communities, that is, on peoples' livelihoods and on their perceptions of the role that technology can play in their lives.

Objectives of the survey

The objective of this undertaking was to assess whether NAIS and ZARI have moved significantly towards institutional appreciation of ICTs and find grey areas that need to be worked on to improve the flow of agricultural information to the farming community. This focus group meeting for the two projects was undertaken to:

1. Monitor and evaluate the projects and develop frameworks for measuring impact;
2. To make the end-users understand that the M and E process is vital when developing interventions;
3. To make the two institutions see the need to focus on the benefits of the new technologies rather than the quantity of the technologies available;
4. Find out problems faced by the two projects and find solutions;
5. The need for strategic content development to ensure that ICTs can be locally appropriated and affect development.

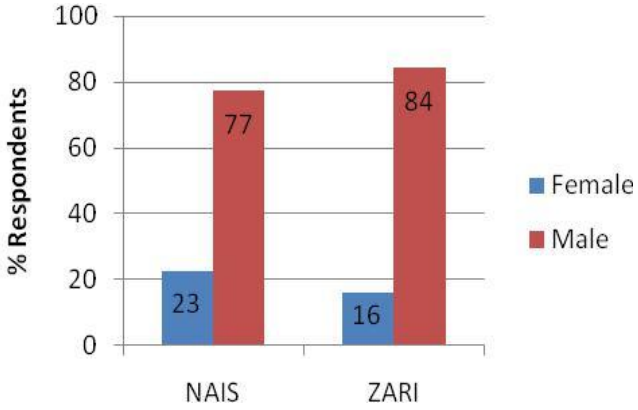

Figure 1. Gender distribution in NAIS and ZARI projects.

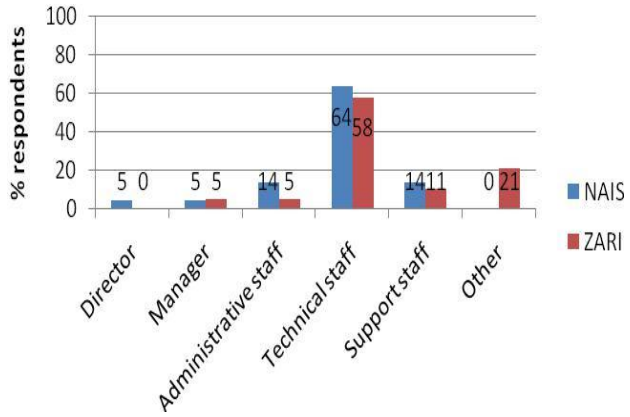

Figure 2. Participation by position.

METHODOLOGY

Before the focus group meeting for the two projects was held, IICD, M and E end-user questionnaires were filled online by the members of staff in the two institutions at Headquarters and Kasama offices. Thereafter, the M and E contact persons in the two projects with the help of Travaillant Vers Une Economie Liberale Limited (TEL), the M and E partner in Zambia analyzed the data. The online questionnaires were used to get quantitative data. The FGM was then held to add qualitative data to the study.

RESULTS

A total 100 end-user questionnaires were expected to have been filled, 50 from NAIS and the other 50 from ZARI. Unfortunately, out of the total expected questionnaires, only 41 questionnaires were filled. 22 questionnaires were filled online by NAIS while 19 were filled online by ZARI. This number of questionnaires was found to be too little to give us good statistical data.

However, despite the poor response by members of staff in filling the questionnaires online, the 41 questionnaires were analyzed and the following were the results.

Gender distribution

From the 41 questionnaires collected, very few women participated in the filling of the questionnaires (Figure 1). This showed that few women participated in the two projects.

This low women participation in the two projects is a concern. What people do not know is whether women are deliberately left out of the projects or it is negative attitude of women towards ICTs or it is caused by the organizational structures in the two institutions.

Positions in the institution

This study showed that most participants in both projects were actually technical members of staff. 64% of respondents in NAIS were technical members of staff, while ZARI had 58% of its respondents as technical staff (Figure 2). No director from ZARI participated in this survey.

Participation by age

The survey revealed that most members of staff in both NAIS and ZARI are between 31 and 50 years of age. 21% of respondents in ZARI indicated that they were in other positions (Figure 3). This could be attributed to the fact most of the officers in ZARI are agricultural research officers, a position which was not indicated in the questionnaire.

Frequency of use

The study also found out how often members of staff in the two institutions use the project facilities. All members of staff indicated that they use the facilities on daily basis. Usage was even very high in ZARI as all of the respondents indicated that they use the facilities daily. However, there was a great variation in the frequency of usage for NAIS where 5% of the respondents indicated that they use the facility monthly ((Figure 4). This could be attributed to poor access to computers or lack of interest in ICTs.

Overall satisfaction

Overall, the satisfaction rate for both projects was high but higher for ZARI. 84% of the respondents in ZARI indicated that they were satisfied with the project while

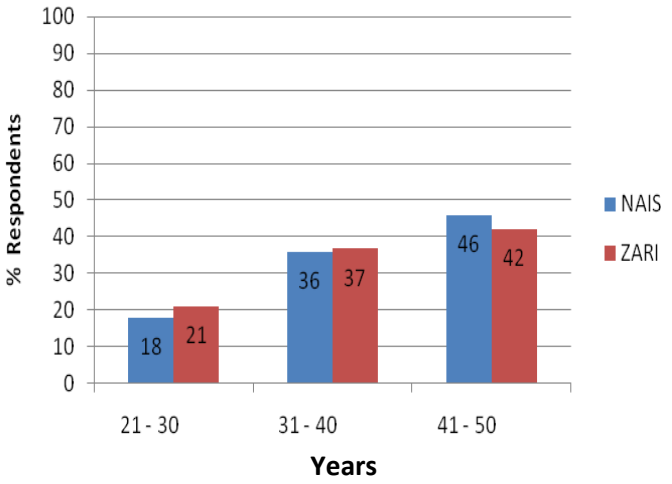

Figure 3. Participation in the project by age.

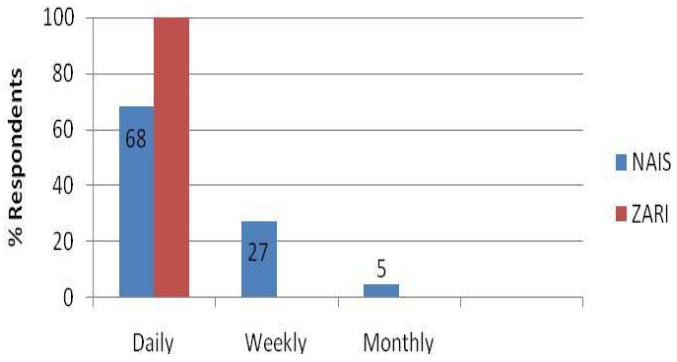

Figure 4. Frequency of facility usage.

73% of the respondents were satisfied with the project in NAIS (Figure 5). This slightly lower satisfaction rate among members of staff in NAIS could be attributed to less frequent use of the project facilities by members of staff.

Satisfaction with various factors

The survey also wanted to measure the levels of satisfaction among members of staff in NAIS and ZARI towards various factors in the projects. Among other factors, the study measured satisfaction in training and seminars, quality of the service, cost of information and services, quality of information, technical support, and access to information by women and suitability of the facilities for women. Results showed that more respondents were least satisfied with indicators attributed to women. More so, for ZARI, 36% of the respondents were satisfied with access to information by women with 42% being dissatisfied with suitability of the facility for women. There was also a big disparity between NAIS and ZARI on the cost of the information and services (63 and 91%, respectively) . However, all the members of staff at ZARI are satisfied with the quality of information, 100% satisfaction was recorded compared to 77% satisfaction at NAIS (Figure 6). All directors, managers and administrative staff were generally satisfied at both NAIS and ZARI. However, technical members of staff were dissatisfied (2 officers from Kasama and 4 officers at NAIS headquarters; 2 officers at Kasama and 1 officer at ZARI headquarters).

Reasons for joining the project - NAIS

There were several reasons that were given by members of staff for joining the projects. Most of the respondents in NAIS indicated that they joined the project to improve the extension system of the ministry of agriculture (36%). The same number of respondents joined the project for the sake of improving their personal lives.

There were fewer members of staff who joined the project to abreast themselves with new technical information to help farmers use improved methods of production to improve their livelihoods (5%). The same percentage of respondents says they joined the project because of their positions in the institution. Some of the respondents in NAIS say they joined the project to built capacity to perform their daily duties through the use of ICTs and exchange information (27 and 5%) (Table 1).

Reasons for joining the project- ZARI

Results of this study showed that most researchers at ZARI did not join the project with the farmers' interests at heart as most respondents had less focus at farmer level. Only 16% of the researchers joined the project to research for activities that would help generate information for farmers. Most of them joined for the purpose of communicating with their colleagues and access information for research purposes (47 and 42%). Others say they joined the project in order to get opportunities to learn more important global issues and be exposed to the outside world in terms of training (5%), while the same number said they wanted to benefit from the IICD supported project. 26% of the respondents say they joined the project to improve their IT skills (Table 2).

Development impact

The study revealed that the project had low economic impact on NAIS (5%), although, there was no negative impact in the same institution. There was very high sector and gender impact in ZARI (83 and 60%, respectively). Awareness was very high in the two projects (81 and 83%) (Figure 7). Generally, there was lower development impact in NAIS as compared to ZARI.

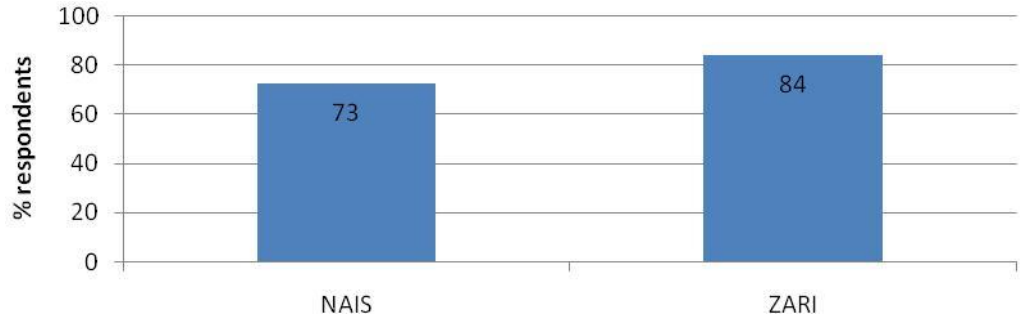

Figure 5. Staff satisfaction rate.

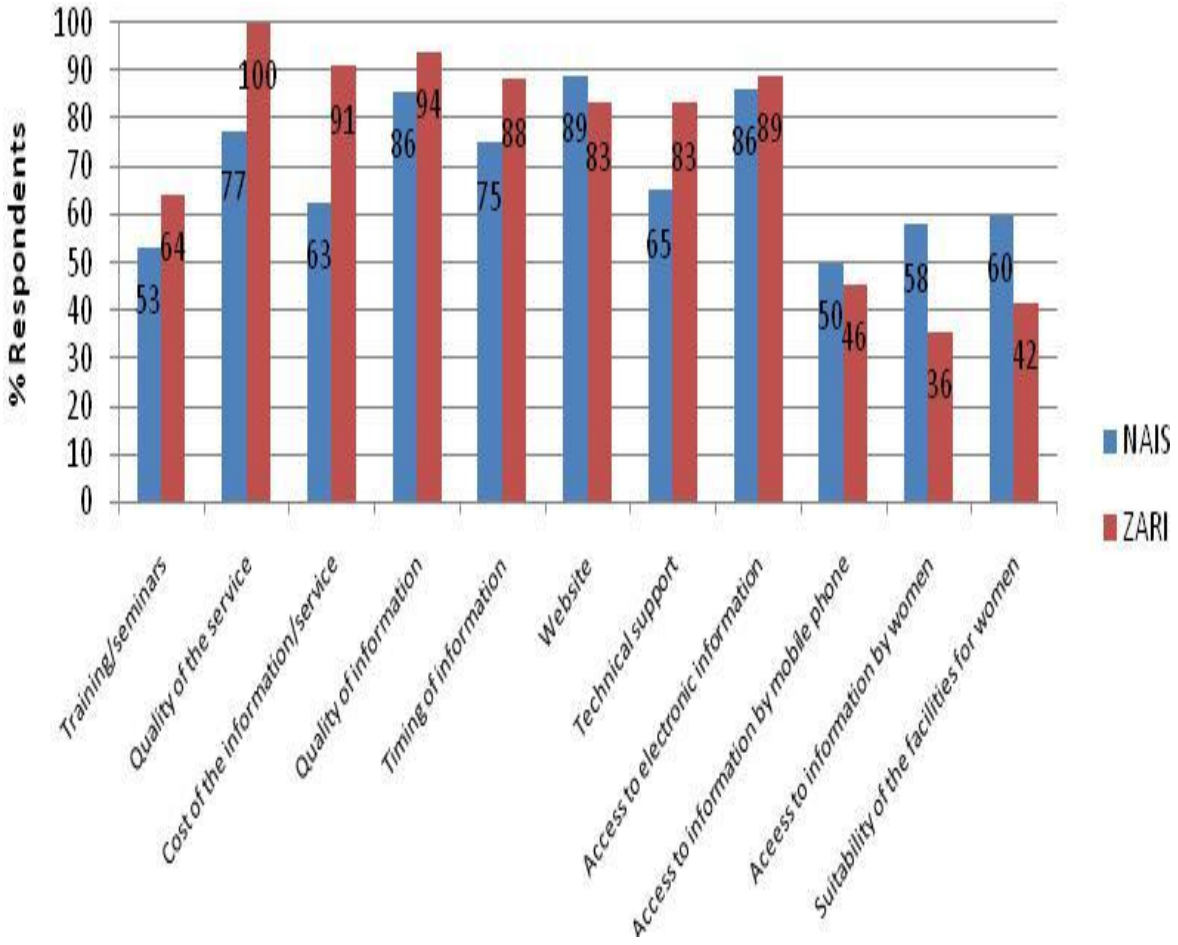

Figure 6. Satisfaction for various factors.

Conclusion

Before undertaking any development intervention, good practice suggest that the projects should first access what had already worked, or not worked, and why. This is of course difficult to do when undertaking pilot projects in an emerging area such as ICTs, however it is precisely for this reason that pilot projects in NAIS and ZARI had to monitor and evaluate the changes brought about by the pilot interventions.

One of the key observations made during the FGM was that the study paid attention to monitoring and evaluation of ICT outcomes, with the result that there was little data to assess the actual impact of these technologies on the rural poor and that there was need to undertake more rigorous monitoring and evaluation of the projects and

Table 1. Reasons for joining NAIS project.

Main reasons to participate in this project? NAIS	% Respondent
Liase with researchers on the field information	14
Facilitate flow of information between farmers, extension and MACO	36
To broaden my knowledge in agriculture and related fields	5
Because of position held in NAIS	5
Communication, research and study	36
Improve capacity to perform my duties using ICTs	27
Exchange data	5
Keep abreast with new technologies	5
To facilitate farmers access information on improved farming techniques, marketing and other related information to enhance productivity	5
To improve the livelihood of the rural population through the dissemination of proven technology to ensure food security and economic empowerment	5

Table 2. Reasons for joining ZARI project.

Main reasons to participate in this project - ZARI	% Respondents
Accessing information for research purposes	42
For communicating with colleagues and networking	47
To access tolls or information that I can use in my work like analytical tools I	5
use this tool in research for activities that help generate data for farmers	16
The internet system facilitates the work that am involved in. I am abreast in the latest technology	5
Get opportunity to learn more important global issues and be exposed to outside world in terms training	5
Improve on my IT skills	26
It is due to the fact that ZARI Headquarters and our research station is one of the beneficiaries of the project	5
Benefit from the IICD project	5

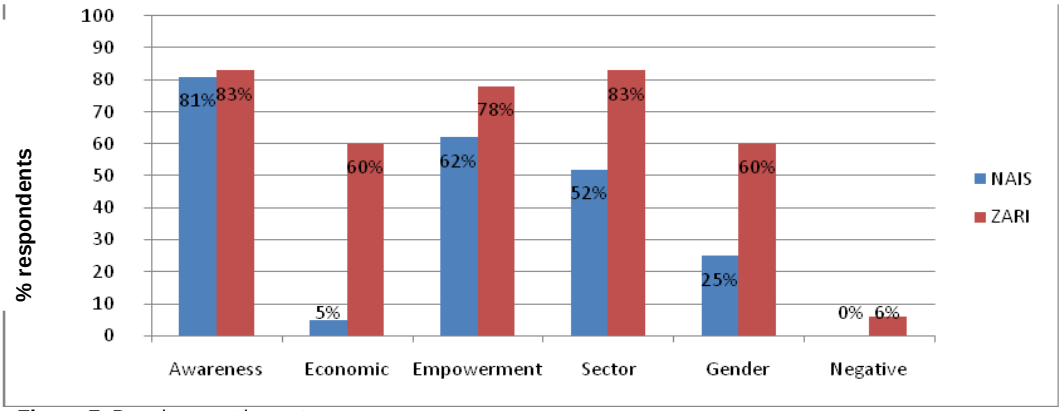

Figure 7. Development impact.

develop frameworks and guidelines for measuring impact.

Since applications of ICTs in community-based development projects are still relatively new and experimental, future initiatives should build on “what works and what does not work” and “why.”

There is also need for the two projects to engage in ongoing dialogue with members of staff within NAIS and ZARI and the local people in Kasama district, where the pilot projects are located, about the role and impact of ICTs and the context in which ICTs should be introduced, especially in terms of their information needs, attitudes towards the technologies themselves, applications and products, and possible impacts, both positive and negative.

For the NAIS project, the FGM also identified the need to have farmers and extension camp officers fill in the end-user questionnaires so that we engage local people in the validation of the various communication tools and let them identify the most useful medium to meet their needs. This requires acknowledging that people should be active creators and not just passive users of the new ICTs.

Generally, there was low women participation in the two projects. Was this a reflection of the establishment of the two institutions? To tackle this problem, there is need to hold a workshop for women in all IICD supported projects to in Zambia to establish why there is low women participation in the projects as this would help reshape the gender imbalances in the projects. The two projects should provide needs-sensitive ICTs skills training at all levels, especially to youths, women and marginalized groups. Individual, group and organizational ICT capacities need to be strengthened to ensure effective use of ICTs for exchange of information, in particular knowledge building for productive activities that lead to wealth generation and improved livelihoods.

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Welcome to Zambia Agriculture Research Institute, Researching Soils, Crops and Water in Zambia. http://www.zari.gov.zm

Millennium Development Goals http://www.developmentgoals.org/index.html

APPENDIX

Appendix 1. List of participants.

Name	Designation	Department	Station
M. Mwale	Deputy director	ZARI	HQ
A. B. Mvula	PARO	ZARI	Kasama
Samuel Phiri (Dr.)	PARO-Programmes	ZARI	Kasama
Jonathan Mwamba	Ag/DAIO	NAIS	Kasama
Jones Malama	TRA	ZARI	Kasama
Mwenge Yamanda	Ag/DACO	AGRIC.	Kasama
Machona Kasambala	Video Editor	NAIS	HQ
Muki M. B. Phiri	Ag/SAIO - publications	NAIS	HQ
Tina Jere	Ag/Senior producer – TV	NAIS	HQ
Patricia Kahongo	Secretary	NAIS	HQ
Elizabeth Ntumwa	Secretary	NAIS	HQ
Lukwesa Musonda	Graphic artist	NAIS	HQ
Malikopo A. C.	ARO	ZARI	HQ
Andrew Phiri	ARO	ZARI	HQ
Songolo Akakandelwa	Producer	NAIS	HQ
Milimo Chibola Sakala	SARO	ZARI	HQ
Tembo Harward	SARO	ZARI	HQ
Kayama Hamainda	Translator	NAIS	HQ
Susan Musukuma	Ag/Senior reporter	NAIS	HQ
Stubb Malambo	Ag/CAIO - Broadcasting	NAIS	HQ
Joseph Sianyeuka	Technician	NAIS	HQ
Judith Lembela	Producer	NAIS	HQ
Peggy M. Kamelu	Producer	NAIS	HQ
Margret Sondashi	Sound technician	NAIS	HQ
Modester Nkhoma	Sound technician	NAIS	HQ
Nicholas Mwale	Reporter	NAIS	HQ
Christopher Chingobe	Translator	NAIS	HQ
Lillian Mumba	Producer	NAIS	HQ
Ms J. Namangala	Librarian	ZARI	HQ
Juliet C. Mataa	ARO	ZARI	HQ
Chanda Mulenga	Office orderly	NAIS	HQ
Mukolo Taguma	PARO	ZARI	HQ
John Musanya	CARO	ZARI	HQ
Christopher Mbewe	Ag/SAIO - Broadcasting	NAIS	HQ
Chikoti Patrick	PARO	ZARI	HQ
David Chilufya	Graphic artist	NAIS	HQ
Patience Siambele	Accountant	MACO	HQ
Darlington Kahilu	Producer	NAIS	HQ