

Impact of Supervised Enterprise Projects Component of Sokoine University of Agriculture BSc. Applied Agricultural Extension Programme on Farmers in Tanzania

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Abstract

In response to inadequate knowledge, skills and attitudes by agricultural extension staff, the Midcareer BSc. Applied Agricultural extension was developed and implemented in 1998 by the Sokoine University of agriculture (SUA), in collaboration with Sasakawa Africa Fund for Extension Education (SAFE). The Supervised Enterprise Project (SEP) is an innovative component of the programme that employs experiential and action research principles. Since the implementation of the midcareer programme and its SEPs component in Tanzania, the programme impact on farmers has not been established and therefore the paper intends to fill the gap. Data were collected from 100 graduates and 105 farmers from selected regions in Tanzania. Focus group discussion and observations were used to supplement the collected information. The quantitative and qualitative data were analyzed by using the Statistical Package for Social Sciences (SPSS) and content analysis, respectively. The findings show that SEP introduced practices mainly related to livestock and crop production, post-harvest handling and agricultural marketing. Generally, SEP was identified as the strongest component within the BSc. AEE programme that has impact on farmers. This has been justified by the fact that farmers had positive perception and high expectations from practices implemented by SEP, which resulted to diffusion of implemented practices and their adoption by farmers. Farmers were assisted to improve their yield, food security, income and livelihood. Challenges that affected implementation of SEP include inadequate funds and time, low involvement of stakeholders and inadequate follow up by students after their graduation. This calls the need for allocation of adequate resources to the program, involving of important stakeholders as well as smooth hand over of the implemented SEP to the field extension staff for its sustainability.

Keywords: Impact, Supervised Enterprise Projects, Sokoine University of Agriculture, BSc. Applied Agricultural Extension, Tanzania

Introduction

Extension system has a great role to play in improving the agricultural sector in Tanzania. A number of efforts have been taken by the government in order to improve the performance of extension system. This include establishment of training institutions like Sokoine University of Agriculture (SUA), which is the main agricultural institution in the country. Among others, the university is mandated to impart knowledge, skills and attitudes to extension staff with diploma qualifications. To

achieve this goal the government of Tanzania through Ministry of Agriculture (formally known as the Ministry of Agriculture and Cooperatives (MAC)) directed SUA through the Department of Agricultural Extension and Community Development (DAECD) (previous called the Department of Agricultural Education and Extension) to develop a bachelor degree programme. The programme was developed by SUA in close collaboration with the Sasakawa Africa Association (SAA) under its human resource development arm namely, Sasakawa

Africa Fund for Extension Education. The developed BSc. Agricultural Education and Extension (BSc. AEE) programme was launched in 1998 as an innovative in-service programme for mid-career extension professionals. In 2011 the programme was reviewed and implemented as BSc. in Applied Agricultural extension (BSc. AAE) (Msuya, 2012).

One of the innovative aspects of the mid-career program is the independent field-based project called the Supervised Enterprise Project (SEP), which is an in-situ approach for capacity building and technology transfer. The mid-career students develop capacity on the specific technology in question and simultaneously transfer technology to the community. This is achieved through working with various categories of farmers and promoting different technologies along agriculture value chain to enable the farmers improve their production and productivity and subsequently improve their income and livelihood. The SEP is underpinned by action research principles and theory which employs experiential learning principles and an action research with a development objective and a learning objective. Students are required to plan and execute the SEP as a requirement for the completion of their study. This is based on prioritization of location specific problems after going through a sound SEP theory course offered at the University (Mutimba, 2017; Msolla *et al.*, 2003). Students then go back to their work areas to prepare an agricultural value chain-oriented extension needs assessment plan. There after prepare a proposal at the University and then go back again to their work areas to implement the extension and research projects (Mutimba, 2017). The principal objective of the SEP is to narrow the gap between theory and practice and to develop the students' ability to identify community problems and explore practical ways to solve them (SAFE, 2019). Since the implementation of SEP in Tanzania, its impact on farmers in Tanzania has not been established. The objective of this paper is therefore to assess the impact of SEP among farmers in Tanzania and the key challenges associated with its implementation and offer solutions to these challenges.

Methodology

The study was conducted across the country where the alumni are employed and formerly conducted their SEP. Effort was made to cover various agro-ecological zones and regions with higher concentration of the alumni who graduated from year 2001 to 2013. This was considered as an adequate duration for the program to have impact. Therefore farmer respondents came from 15 different villages in various Districts where SEPs were conducted as can be seen in Table 1. The sampling frame was developed by researchers in collaboration with the Ministry of Agriculture (MOA), Ministry of Livestock and Fisheries (MLF) and President's Office-Regional Administration and Local Government (PO-RALG). From a developed sampling frame a total of 100 alumni and 105 farmers were selected by using simple random sampling technique. According to Wooldridge (2008), a sample of 30 respondents is bare minimum for statistical analysis. A snowball sampling technique was used to replace the respondents who were selected randomly but could not be reached for interview. Other

Table 1: Distribution of Districts and Villages of farmer respondents

District Council	Village	Number of selected farmers
Mkinga	Bantu	9
	Mapatano	9
	Maramba B	8
Chamwino	Chinangali II	5
Mvomero	Dibamba	10
	Mongola	8
	Secondary School	
Kilosa	Kimamba	9
	Kitete	8
Morogoro	Lubungo	8
	Chamwino	3
	Lukobe	7
	Pangawe	4
Bahi	Mindola	6
Tanga	Tongoni	11
Total		105

stakeholders who were selected for interview were 30 employers and 23 SUA staff.

Questionnaire and checklist were developed and administered to selected graduates, farmers, employers, DAECD and other SUA staff. Focus Group Discussion (FGD) and observations were used to supplement the collected information. Collected data were entered in the Statistical Package for Social Sciences (SPSS) version 20 computer programme. Thereafter data were cleaned and analyzed where frequencies and percentages were calculated for description of the study variables. Tables and figures were used to summarize and present the study findings. Content analysis was used to analyze the collected qualitative information.

Results and discussion

Results discussed in this paper focus on the implementation of SEP and its impact on farmers. Specifically this section explores the nature of implemented SEP, practices introduced to farmers through SEP, the impact of SEP to farmers and challenges of SEP.

Implementation of SEP

The nature of implemented SEP

As stated above, the SEP approach requires students to prepare an agricultural value chain-oriented extension needs assessment plan (SAFE, 2019). Results regarding the nature of

SEPs implemented by students to farmers are presented in Table 2. The findings show that many of the SEPs were aimed at improving farmers’ agronomic practices (29%) and livestock husbandry practices (13%). However, attention was also paid to other areas such as improving household food security and income (7%), farmers’ organizational empowerment (6%), and improving farmers’ access to extension credit and inputs services (13%). This implies that the students implemented SEPs that of diverse nature ranging from livestock and crop production and covered other aspects of value chain like post-harvest handling and marketing, which is in-line with SEP requirements (SAFE, 2019), their job description (URT, 2011) and roles expected to be performed by any extension officer elsewhere (Mkuki and Msuya, 2020), Suvedi and Kaplowitz (2016); Agricultural for Impact (2015). The high number of SEPs which are production oriented and less projects that covered other aspects of value chain is attributed by the fact that the group of alumni interviewed to assess the impact of the program graduated from year 2001 to 2013, the time when the curriculum was production oriented. It is also important to note that this group composed of in-service extension staff and teachers. Therefore those who were working as secondary school teachers naturally were engaged in school projects (13%) as indicated in Table 2.

Table 2: The nature of SEPs implemented

Field	Frequency	Percent
Agronomic practices	29	29
Livestock husbandry	13	13
Natural resource management	1	1
Post-harvest handling	3	3
Agro-mechanization	1	1
Agricultural marketing	2	2
Household food security and income increase	7	7
Farmers’ empowerment	6	6
Farmers’ access to extension, credit and inputs services	13	13
Secondary school students projects	13	13
Not mentioned	12	12
Total	100	100

Source: Field Survey (2018)

Participants of implemented SEPs

The study went further to investigate the group of people targeted during SEP implementation. The SEP participants constituted of men, women and youth, which is in-line with the ASDP (2007). The findings further show that youth were slightly under-represented as shown in Figure 1. Less representation of youth in SEP is in-line with Adekunle *et al.*, (2009) who reported low representation of youth in agricultural related projects. It was interesting to find out that one SEP constituted of women participants only, which is contrary to other studies who reported less representation of women in extension programmes (Doss, 2011). This implies that the approach employed in SEP implementation has all the potential of bringing in women who for many years have been less involved in extension although are highly participating in agricultural production. In terms of numbers of participants, about half of the respondents worked with a maximum of 30 participants. However, about a third of the SEP worked with more than 120 participants (Fig. 1). During the focus group discussion it was reported that the main factor determining the number of participants which students could involve in their SEP was availability of resources to purchase inputs and other requirements for implementing the SEP.

Practices introduced to farmers through SEP

The respondents were requested to indicate the specific practices that were introduced through SEP. As can be seen in Table 3, many SEPs introduced practices related to primary production. That is, appropriate agronomic practices (38%) and improved livestock husbandry practices (19%). Only few SEPs attempted to introduce practices on crop storage, processing and value addition (5%), farming as a business (2%) or record keeping (1%). As explained above, this is probably due to the fact that the impact assessment focused on the period that midcareer extension program curriculum was not focusing more on the value chain aspects. Interestingly, other SEPs attempted to introduce participatory extension methods (10%), and formation of farmer organizations (5%).

Farmers' expectations from the SEP

Farmers had various expectations in participating in the SEP as shown in Table 4. However, the main expectations of the farmers were to increase the yield of their crops (42.3%), to improve their agricultural knowledge and skills (19.2%), and to increase their income (16.3%). Yield increase was regarded as the main expectation probably due to the fact that all agricultural activities performed by farmers

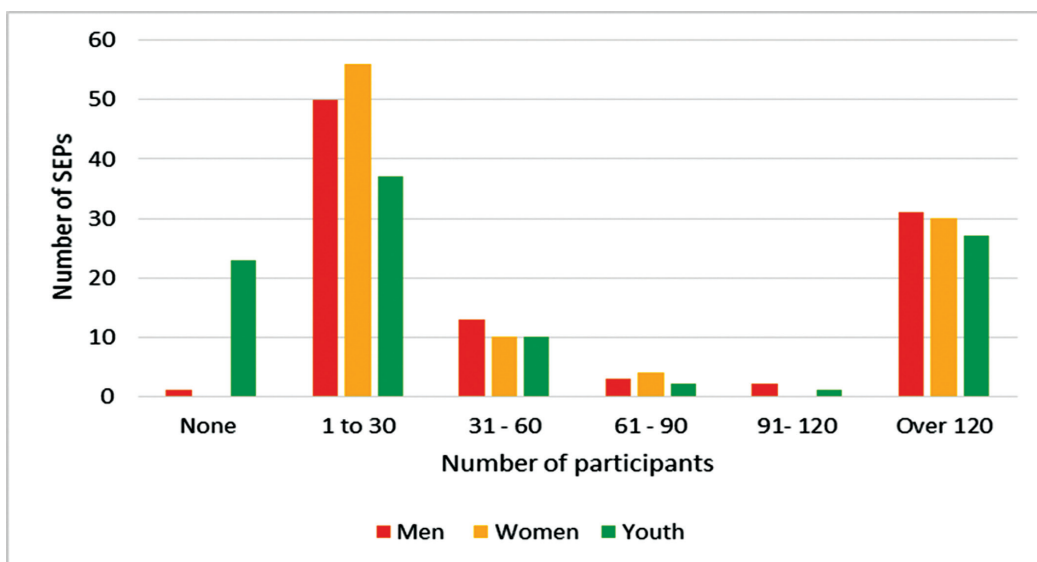


Figure 1: Number of participants in SEP

Source: Field survey (2018)

Table 3: Practices introduced during SEP

Practice	Frequency	Percent
Appropriate agronomic practices	38	38
Improved livestock husbandry practices	19	19
Participatory extension approaches and methods	10	10
Crop storage, processing and value addition	5	5
Formation of farmer organizations	5	5
Land use management and tree planting	3	3
Farming as business	2	2
Innovative teaching techniques	4	4
Record keeping	1	1

Source: Field Survey (2018)

aimed at improving the yield that ultimately improve their food security, income and farmers' livelihood in general. This is in-line with Duvel's model of behavior analysis (Duvel, 1991; Duvel, 2007; Duvel and Habtemariam, 2003). The authors contend that the consequence of farmers' adoption of recommended technologies is to improve yield. Apart from expectations they had from SEP, during the FGDs farmers showed positive perception towards SEP as reflected in section 3.3 where farmers indicated the impact of implemented SEP.

Impact of SEP

Respondents were asked to indicate the impact of implemented SEP to farmers. Their

responses focused on the rate of diffusion and adoption of introduced practices during SEP as well as the consequences of adopting the implemented practices. These include improving farmers yield, food security and purchasing power.

Diffusion of introduced practices through SEP

Only few (11%) of the alumni indicated that diffusion of the introduced practices diffused fast to other farmers who were not directly involved in the SEP. Many thought that diffusion was either moderate (48%) or slow (13%) or even absent (6%). However, about a quarter (22%) of the alumni did not know the

Table 4: Farmers' expected benefits from SEP

Expected benefit	Frequency	Percent
Access to loan, support in ploughing	1	1.0
Improve knowledge and skills	20	19.2
Improve livelihood	1	1.0
Increase income	17	16.3
Increase income and knowledge	2	1.9
Increase yield	44	42.3
Increase yield and income	12	11.5
Lunch to be provided at school	4	3.8
Maize production practices	1	1.0
To learn entrepreneurship skills	1	1.0
Train other farmers	1	1.0
Total	104	100

Source: Field Survey (2018)

possible rate of diffusion of the introduced practices (Fig. 2). This is a realistic observation since typically it will take quite some time for a new practice to diffuse in a particular community as contended by Rogers (2003). At any rate a faster diffusion of the introduced practices will need a close follow up either by the alumni or a government extension agent resident in the particular community who is fully aware of the introduced practice and is in a position to continue promoting the practice.

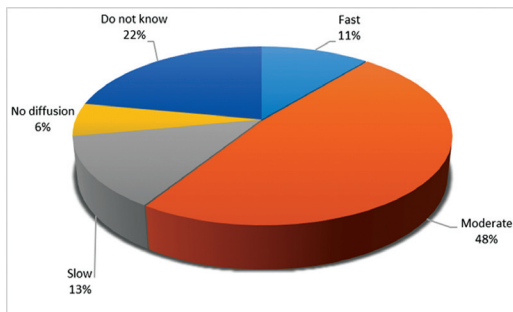


Figure 2: Rate of diffusion of introduced practices

Source: Field Survey (2018)

However, not all the students were able to make follow ups after completion of their SEP. As shown in Figure 3, about 48% did make a follow up after completion of their SEP.

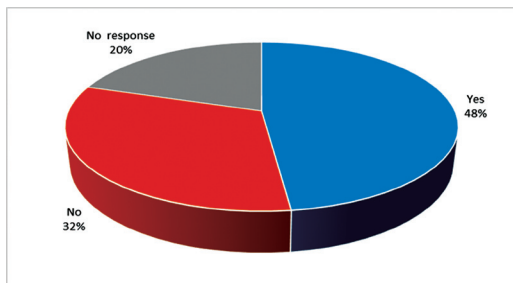


Figure 3: Follow up after completion of SEP

Source: Field Survey (2018)

Where follow ups were made, these took a variety of forms, the most common (64.6%) being through regular visits to the community where the SEP was conducted (Table 5). Other modes used less frequently were through making use of the Village Extension Officer of the area (6.2%), organizing follow up training for the farmers (6.2%) and conducting participatory evaluation (10.4%).

Several reasons as shown in Table 6 prevented the students from making follow ups after graduation. These included being transferred to another area or being assigned other more demanding responsibilities after graduation (62.5%) and lack of financial resources to cover the cost of transportation (18.7%). After graduation many of the alumni were given new responsibilities which prevented them from having a direct contact with farmers, put more demand on their time and even required relocation to another geographical location.

Adoption of introduced practices through SEP

The alumni indicated that the practices and technologies introduced through SEP were adopted by farmers. These helped them increase yield of the produce and consequently improved food availability to the household. For commodities that were food products and for non-food items it increased their purchasing power to acquire food commodities out of the revenue generated by the SEP enterprise. This was confirmed by farmers during FGDs where it was observed by one participant that...

“Increased income due to local chicken enabled me to construct a house. I was able to buy other livestock example dairy goat and payment of school fees”
Participant from Pangawe village, Morogoro District.

Another farmer added that...

“I used to harvest 6-8 bags of maize per acre but after adoption of introduced improved maize production practices through SEP, yields have increased to 20-25 bags/acre. However, frequent conflicts between farmers and pastoralists, and lack of reliable supply of improved maize seed varieties has reduced adoption rate” (Participant from Dibamba village, Mvomero District).

Generally, the graduates observed increased household income and improved livelihoods among farmers that participated in the SEP projects (Table 7).

Table 5: Mode of follow up used (n=48)

Mode of follow up used	Frequency	Percent
Through regular visits	31	64.6
Through the village extension staff in the area	3	6.2
Through follow up training of the farmers	3	6.2
Requested for written implementation report	2	4.2
Observation of attendance	2	4.2
Conducted participatory evaluation of the SEP project	5	10.4
Conducted research for my MA studies	2	4.2
Total	48	100

Source: Field Survey (2018)

Table 6: Reasons for not making follow up (n=32)

Reason	Frequency	Percent
Transferred to another working area after studies	20	62.5
Lack of funds	6	18.7
Lack of time	2	6.3
Farmers not interested	1	3.1
No reason given	3	9.5
Total	32	100.0

Source: Field Survey (2018)

Table 7: How the introduced practices helped farmers during SEP implementation

Benefit	Frequency	Percent
Helped farmers to adopt and improve technology along the value chain	60	60
Helped farmers increase yield	67	67
Improved food availability	68	68
Increased household income	65	65
Improved livelihoods	68	68

Source: Field Survey (2018)

Challenges to SEP implementation

Challenges for SEP implementation were raised during the FGDs with DAECD staff, employers, students and farmers. The main challenges that were pointed include inadequate resources like funds and time set aside for SEPs training component. Others were inadequate follow up of implemented SEPs and low involvement of important stakeholders.

It was pointed that inadequate funds affect effective implementation of SEP and its supervision. This is due to the fact that SEP requires students to go back to their work areas for conducting SEP including its implementation. These stations are scattered all over the country

and the supervisors (instructors from the University) are required to visit and supervise each student from the stage of identification of farmers' problems along the agricultural value chain during the situation analysis. On the other hand SEP requires enough time that will allow students to work with farmers since after identification of agricultural problems, students are also required to implement planned projects for solving farmers problems.

As explained above, inadequate follow up of implemented SEP by students after their graduation was cited as one of challenges. After graduation many of the alumni were given new responsibilities that put more demand on their

time. Other responsibilities required relocation to another geographical location, which prevented them from having a direct contact with farmers involved in SEP implementation. For those who went back to their work areas, they indicated lack of financial resources to cover the cost of transportation for making follow ups, which is in-line with what was reported in Table 6 of this paper.

Other challenges were inadequate involvement of important stakeholders like Ministry of Agriculture; Ministry of livestock and fisheries and the Ministry responsible with Local government authorities. SEP design and implementation-including farmers' problems identification, developing SEP proposals and their implementation require University (lecturers) and local supervision (students' employers). Also SEP proposals and reports used to be subjected to peer and other types of reviews for purposes of quality enhancement and control but with time the reviews with employers diminished.

Conclusion and recommendations

The strategies for involving farmers in the SEP and after graduation through participatory planning and team work building, capacity building among farmers to handle the technologies, have proved to assist farmers to adopt the practices and technologies as well as sustain them. In other words SEP has a positive impact among farming communities. Along with that it has empowered and facilitated farmers to innovate by themselves. The establishment of farmers groups and associations for production and credit not only provided capacity to invest in the practices and technologies but also compelled them to continue with the efforts together and thus, fostering sustainability. Generally, SEP was identified as the strongest component within the BSc AEE programme that has impact on farmers. However, the implementation of SEP face a number of challenges like inadequate resources like funds and time set aside for this training component, inadequate follow up of implemented SEP by students after their graduation as well as inadequate involvement of stakeholders.

Based on the findings of this study it is

recommended that the SEP approach within the mid-career programme should be strengthened by allocating more funds and time because it has proved to be extremely useful. There is a need to involve important stakeholders for effective performance of the SEP and the BSc. midcareer programme in general. To address the problem of low follow up of implemented SEPs after graduation, it is recommended that field extension staff should be highly involved during the implementation of SEP to allow close follow up of what was implemented by the students. Since SEP was identified as the strongest component within the BSc AEE programme, it is recommended that this approach should be mainstreamed into other programmes within the University and other training institutions in general.

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