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# Influence of Organizational Job Goal Setting on Work-Life Balance: Experience from Public Service Social Security Fund in Tanzania

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***Abstract***

*The study examined the influence of job goal setting on employee work-life balance using experience from Public Service Social Security Fund. Specifically, the study intended to investigate how job planning, job monitoring and appraisal feedback influence employees' work-life balance in terms of working hours using a sample size of 109 employees. The study applied cross-sectional design and quantitative approach, where, data were collected and analysed quantitatively to establish the relationships between variables. Data were analysed using Multiple Liner Regression model. The results show that job planning through job specificity and task deadlines negatively influence work-life balance. Monitoring through supervisors' availability negatively influences work-life balance. Appraisal feedback in terms of its timeliness negatively influences work-life balance, while clarity of appraisal feedback positive influence work-life balance. Therefore, the study concludes that job planning, job monitoring and appraisal feedback influence employee work-life balance. The study recommends that supervisors should set specific job objectives and realistic deadlines. Also, supervisors should be available to their subordinates. Supervisors should also provide timely appraisal feedback, while refraining themselves from overemphasizing on clarification of appraisal feedback. On the other hand, employees should emphasise on specificity of job objectives and require tasks to have realistic deadlines. Further, the study recommends that, employees should focus on requiring timely feedback from their supervisors, but they should not focus much on seeking for clarification of appraisal feedback unless it is necessary.*

**Keywords:** Job goal setting**,** work-life balance, working hours.

## 1.0 Introduction

Work intensity has been on the rise in recent years as a result of competition among organizations for the desire of being the best service/product providers (Askenazy

et al., 2013). in addition, employees accept big workloads and work for longer hours as an attempt of increasing their earnings and impress their employers due to the nature of current labour market, where, job security is increasingly becoming a concern (Mokomane, 2011). Regarding the length of working hours, countries such as Peru, South Korea, Thailand, Pakistan, United States of America and the United Kingdom are the leading. In developing countries, the leading sectors include agriculture, industry, banking, self-employment and healthcare (International Labour Organization -ILO Report 2006; Chin et al, 2011). In the context of Tanzania, studies show that big workloads and long working hours in most sectors are a result of ineffective team building practices, intimidating policies and regulations which make the boundary between voluntary and forced long working hours blurred (Justus 2016; Human Rights and Business Report, 2013; Chitenje, 2017).

Generally, the current work environment is one of the major challenges facing work-life balance. This is because employees find it difficult to split their time and energy between work-related matters and aspects of their personal life; as result, they use more time in undertaking work roles and less time on their personal roles (Decenzo et al., 2016). Striking a balance between work and life is vital because an average person needs both work and life (Robbins, 2000). Therefore, attaining work-life balance among employees is a concern to modern days managers because it reduces discomfort in general life. thus, work-life balance is an important determinant of employee satisfaction, absenteeism, productivity, stress, job engagement and labour turnover (Luthans, 2011).

Several measures have been taken by different countries to foster work-life balance. For example, Australia introduced paid paternity and maternity leave (Pabayo et al, 2013). Moreover, China, took steps to prolong maternity leave to 98 days from 90 (China daily, 2011). On the other hand, European Union promotes flexibility in job design by embracing job sharing, working part-time, compressed workweek, flexi-time and telecommuting (Koopmans & Schiffers, 2003). In this regard, several measures have been taken by different organizations in Tanzania in trying to improve work-life imbalance among employees. These measures include improving team work design and coordination, and establishing reward schemes that encourage workers to accomplish their tasks timely (ILO, 2010). Generally, these attempts focus on providing employees with time in a given period to deal with their personal issues and giving them room to accomplish their work activities in time. In this respect, previous studies associated the challenges of work-life balance with the size of workload, the length of working hours, the nature of team building practices, policies and regulations at workplaces, and the increasing tendency of having dual-career households (Mokomane, 2011; Justus 2016; Chitenje, 2017; Jaffu, 2018).

Previous studies on work-life balance put less emphasis on the influence of setting of job objectives. Setting of job objectives is not only a factor for employee motivation and satisfaction, but it is also fundamental for timely work accomplishment (Robbins, 2000). This is because apart from being a tool for time management, setting of job objectives also makes an employee exert more effort on the job. According to Dodd (1996), job goal setting through planning, monitoring and appraisal feedback helps employees to estimate the amount of efforts required to attain job targets against the available amount of time. Therefore, in a way to adequately address issues pertaining to assisting employees to have time for personal matters and manage to accomplish their work activities, this study intended to examine the influence of goal setting on employee work-life balance. Particularly, it intended to seek for answers to these questions, how job planning influence employee work-life balance, how job monitoring influence employee work-life balance and how appraisal feedback influence employee work-life balance.

This study is founded on two theories, namely, Resource Drain theory and Goal Setting theory. On the one hand, Resource Drain theory principally explains the nature of work-life balance. The theory states that resources required by people to fulfil roles in particular domains tend to be scarce. People therefore transfer resources from one domain to another in order to be able to effectively execute roles in that particular domain that they choose to prioritize at a given moment. These resources include money, time, attention and energy (Morris and Madsen, 2007). On the basis of this theory, if an employee is forced by the environment to spend more time on work related matters; he/she will have to cut the time they spend on personal matters and vice versa. Thus, according to this theory, if one aspect of life (personal or work) puts more demand on an employee in terms of usage of time, he/she will be in a dilemma of choices. however, he/she will eventually choose according to his/her values. Despite its contribution in describing the centrality of working hours (with respect to time, attention and energy) in determining work-life balance and its related work-life conflicts, the theory does not explain how goal setting can assist employees to manage their time attention and energy, hence, attain work-life balance.

On the other hand, Goal setting theory explains how setting of job goals is associated with employee time management. Generally, goal setting is featured with three interconnected processes, that is, planning, monitoring and feedback. Planning is the process of setting job targets to be attained. The theory suggests good job targets need to be specific, measurable, attainable, relevant and time bound (Gupta, 2001). Moreover, monitoring involves frequency of job plans adjustments, direct supervision time, amount of directives, supervisor's availability and usefulness of directives; while, feedback tells the job doer about

how well he/she is working towards the prior set job targets (Robbins, 2000). A good feedback needs to be timely and clear.

Principally, according to Locke and Latham (2002), job goal setting has two major mechanisms. Firstly, it has a directive mechanism; this mechanism guides the attention and effort of the job doer towards goal relevant activities and away from goal irrelevant activities. In this sense, goal setting acts as a means of assisting employees to effectively use their time at workplace in such a way that they will not need additional time for work related matters. Secondly, goal setting has energizing mechanism. It makes the doer to put more effort on the job as he/she knows exactly what is expected of him/her, how far she/has gone and what remains to be done. In this way, goal setting acts as a mechanism of offsetting the effect of big workloads and it allows employees to have control on time they spend on a job.

## 2.0 Methodology

This study employed cross sectional design in order to provide description and explanation of the phenomenon at one point in time. The study adopted quantitative approach with the aim of quantifying attributes and revealing patterns in statistical data. The approach was found appropriate because it is more objective and leaves less room for bias (Kothari, 2014). Moreover, it emphasizes on the particular scope of research subject matter and the data gathered are easily replicable. Furthermore, the approach increases reliability and whose findings are generalizable.

The study was conducted in Dodoma region in Tanzania. Particularly, it was conducted at the headquarters of Public Service Social Security Fund (PSSSF). PSSSF was selected because its employees face challenges related to increased working hours due to the recent restructuring caused by mergers. Hence, it is a good representation of workers' situation in relation to work-life balance and working hours in particular in Tanzania. The target population of this study was all 109 employees of PSSSF at headquarters, Dodoma. These employees are more directly experiencing expansion of operations, changes in rules and procedures of work and work team members which affect their work-life balance. The sample size of the study was 109, which was determined using censuses sampling technique, thus, the whole target population was involved in the study. The method is appropriate for obtaining data in great detail, especially when the population is small (Kish, 1979). Data were collected using questionnaire. Specifically, the questionnaire was employed to collect data on

personal particulars of the respondents, job planning, monitoring, appraisal feedback and work-life balance with reference to working hours.

Data in this study were analysed using Multiple Linear Regression model on SPSS. The model was appropriate in this study because firstly, all explanatory variables involve a number of predictors. Secondly, the dependent variable is a continuous variable measured in terms of number of working hours (Field, 2009). The following is Multiple Linear Regression equation that was applied in the study:

$$Yi = B_0 + \beta_1 X1_i + \beta_2 X2_i + \beta_3 X3_i + \beta_4 X4_i + \varepsilon_i$$

Where;

Yi – Work-life balance i.e., number of working hours

$B_0$ – Constant of regression

$\beta_1$ – Slope coefficient for job planning

$X1_i$ – job planning

$\beta_2$ – Slope coefficient for monitoring

$X2_i$ – Job monitoring

$\beta_3$ – Slope coefficient for appraisal feedback

$X3_i$ – Appraisal feedback

$\varepsilon_i$ – Error term

In testing for consistence of measurements in this study Cronbach's Alpha, where, all the constructs (job planning, job monitoring and appraisal feedback) were observed to be consistent. Specifically, the Cronbach index for job planning -to achieve validity, the content of questions of the questionnaire was carefully analysed to make sure that they are relevant in answering the research questions.

## 3.0 Results and Discussion

### 3.1 Characteristics of the Respondents

Characteristics of the respondents formed part of this study, where, data on sex, age, marital status, and length of service were descriptively analysed. The results show that 67.3percent of the respondents were males, while 32.7percent were

females. This is a reflection of the global proportion of males in the active labour market (International Labour Organization -ILO Report, 2018). In terms of age, the dominant age group was 20- 30 years (33.7%) followed by 31- 40 years (32.7%). These age groups form the most active segment of the population in many parts of the world (Kunze et al., 2011). Regarding marital status, the results indicate that majority of the respondents (45.2%) are married. Again, this is a reflection of the dominant age groups i.e. 20-30 years and 31-40 years. On the side of length of service, most of the respondents (37.5%) had experience of 3 years. This represents the number of years since when the case of this study (PSSSF) was established. Table 1 summarizes the characteristics of the respondents.

**Table 1: Characteristics of the Respondents**

| Variables | Frequency | Percentage |
|---|---|---|
| **Sex** | | |
| Male | 70 | 67.3 |
| Female | 34 | 32.7 |
| **Total** | **104** | **100** |
| **Age (Years)** | | |
| 20-30 | 35 | 33.7 |
| 31-40 | 34 | 32.7 |
| 41-50 | 17 | 16.3 |
| 51-60 | 18 | 17.3 |
| Total | **104** | **100** |
| **Marital Status** | | |
| Single | 43 | 41.3 |
| Married | 47 | 45.2 |
| Widowed | 10 | 9.7 |
| Separated | 4 | 3.8 |
| Total | **104** | **100** |
| **Length of Service (Years)** | | |
| 0-2 | 19 | 18.3 |
| 3-5 | 39 | 37.5 |
| 6-10 | 32 | 30.7 |
| Above 10 | 14 | 13.5 |
| **Total** | **104** | **100** |

***Source:*** *Field data (2020).*

### 3.2. The Influence of Job Planning on Employee Work-life Balance

In finding out the influence of job planning on employee work-life balance, five indicators of job planning namely, objective specificity, objective measurability, objective attainability, objective relevance and realistic deadlines were included in the model. The Adjusted R Square for all indicators was found to be 0.226; thus, all indicators were found to be collectively accountable for 22.6percent of the variation in the dependent variable that is, work-life balance in terms of working hours.

From the results as summarized in Table 2, objective specificity (beta = -0.651; p= 0.001) and realistic deadline (beta = -.386; p= 0.002) were found to have significant negative influence on the number of working hours among employees. This means, 1 unit increase in objective specificity improves work-life balance by reducing working hours by 65.1percent. Likewise, 1 unit increase in setting realistic deadlines improves work-life balance by reducing working hours by 38.6percebt. Thus, employee work-life balance in terms of reduced working hours can be attained by improving objective specificity and setting of realistic deadlines.

Related studies associate objective specificity to decreased errors in carrying out tasks, increased levels of work engagement, raised levels of accountability, flexibility in choice of work methods and mobilization of adequate and relevant resources (Clarke and Hill, 2004). All these factors are responsible for assisting an employee in spending less time in accomplishing his/her job tasks, hence, having time for personal roles. With regard to setting realistic task deadlines, similar studies link it to communication of urgency, prioritization and challenge in performing a certain assignment (Naithani, 2010). Therefore, setting realistic deadlines assists employees to have focus on the tasks at hand and drop all other irrelevant commitments in the attempt to meet the set time frame (Locke and Latham, 2002). Thus, this results in assisting workers to suitably use their time at work so are to remain with time for non-work-related matters.

**Table 2: Influence of Job Planning on Employee Work-life Balance**

| | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. Lower Bound | 95.0% Confidence Interval for B | |
|---|---|---|---|---|---|---|---|
| | Std. Error | Beta | | | | Upper Bound | |
| (Constant) | 49.029 | 1.592 | | 30.801 | .000 | 45.870 | 52.188 |
| Objective Specificity | -1.824 | .511 | -.651 | -3.571 | .001 | -2.837 | -.810 |
| Objective measurability | .179 | .574 | .059 | .312 | .755 | -.960 | 1.319 |
| Objective attainability | .842 | .589 | .255 | 1.429 | .156 | -.327 | 2.012 |
| Objective relevance | 1.170 | .799 | .246 | 1.464 | .146 | -.416 | 2.757 |
| Realistic task deadlines | -1.179 | .371 | -.386 | -3.173 | .002 | -1.916 | -.442 |
| | | | | | | | |

***Source:*** *Field data (2020).*

### 3.1.3 The Influence of Job Monitoring on Employee Work-life Balance

In examining the influence of job monitoring on employee work-life balance, five aspects of job monitoring, namely, direct supervision time, amount of directives, helpfulness of directives, supervisors' availability and frequency of job plans adjustments were analysed. The Adjusted R Square for all indicators was found to be 0.270. Therefore, all the aspects of job monitoring were found to be collectively accountable for 27percent of the variation in the dependent variable that is work-life balance in terms of working hours.

Basing on the results in Table 3, supervisors' availability (beta = -0.347; p=0.007) was found to significantly negatively influence the number of working hours among employees. In this case, 1 unit increase in supervisors' availability improves work-life balance through reducing working hours by 34.7percent. This implies that improvement in supervisors' availability leads to better work-life balance among employees by reducing their working hours. The existing literature relates availability of supervisors to timely provision of technical assistance and

behavioural support to employees (Luthans, 2011). Basically, technical assistance involves clarification of job objectives and timely mobilization of the required resources, while, behavioural support entails reinforcement and motivation. Therefore, both technical assistance and behaviour support are helpful in reducing working hours among employees; hence, improve their work-life balance by allowing them to have time for non-job-related matters.

**Table 3: Influence of Job Monitoring on Employee Work-life Balance**

| | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. Lower Bound | 95.0% Confidence Interval for B | |
|---|---|---|---|---|---|---|---|
| | Std. Error | Beta | | | | Upper Bound | |
| (Constant) | 50.805 | 1.523 | | 33.356 | .000 | 47.783 | 53.828 |
| Direct supervision time | .250 | .288 | .085 | .867 | .388 | -.322 | .822 |
| Amount of directives | -.678 | .344 | -.188 | -1.973 | .051 | -1.359 | .004 |
| Directives helpfulness | -.492 | .393 | -.169 | -1.252 | .214 | -1.272 | .288 |
| Supervisor's availability | -.998 | .361 | -.347 | -2.762 | .007 | -1.715 | -.281 |
| Frequency of job plans adjustments | .281 | .269 | .102 | 1.045 | .299 | -.253 | .814 |
| | | | | | | | |

***Source:*** *Field data (2020).*

### 3.4 The Influence of Appraisal Feedback on Employee Work-life Balance

In analysing the influence of appraisal feedback on employee work-life balance, two indicators of appraisal feedback namely, timeliness of appraisal feedback and clarity of appraisal feedback were examined. The Adjusted R Square for both indicators was 0.311. This means that both indicators were found to be collectively responsible for 31.1percent of the variation in the dependent variable namely, work-life balance in terms of working hours.

From the results in Table 4, timeliness of appraisal feedback was found to significantly negatively influence the number of working hours among employees (beta = -0.740; p= 0.000). On the other hand, clarity of appraisal feedback was found to have significant positive influence on the number of working hours among employees (beta = 0.271; p= 0.028). This means, 1 unit increase in timeliness of appraisal feedback improves work-life balance by reducing working hours by 74 percent, while, 1 unit increase in the clarity of appraisal feedback worsens work-life balance by increasing working hours by 27.1 percent. Therefore, employee work-life balance in terms of working hours can be improved by providing timely appraisal feedback and reducing emphasis on clarity of appraisal feedback.

Similar studies associate timeliness of appraisal feedback to an increase in the pace of employees in executing their job tasks and learning how to interpret and deal with similar job situations in the future (Naithani, 2010). Thus, increasing in the pace of doing the current and future similar job assignments assist employees to use less time at work so as to have time for their personal issues. Concerning clarity of appraisal feedback, the existing literature links emphasis and over clarification of appraisal feedback to the consumption of time and competency doubts (Greenblatt, 2002). While consumption of time directly entails increase of working hours, competency doubts lead to dissatisfaction, which in turn decreases the amount of effort an employee puts on his/her job (Robbins, 2000). Thus, the attempt of emphasizing on providing and seeking for clarity of appraisal feedbacks leads to an increase of time in the execution of job tasks, hence, worsening work-life balance by reducing the time for personal roles among employees.

**Table 4. Influence of Appraisal Feedback on Employee Work-life Balance**

| | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. | 95.0% Confidence Interval for B | |
|---|---|---|---|---|---|---|---|
| | Std. Error | Beta | | | Lower Bound | Upper Bound | |
| (Constant) | 48.357 | .808 | | 59.813 | .000 | 46.753 | 49.961 |
| Timeliness of Feedback | -1.768 | .290 | -.740 | -6.090 | .000 | -2.343 | -1.192 |
| Clarity of feedback | .703 | .314 | .271 | 2.235 | .028 | .079 | 1.326 |

***Source:*** *Field data, (2020).*

## 4.0 Conclusion and Recommendations

The study concludes that job planning with respect to job specificity and setting of task deadlines, job monitoring through supervisors' availability and appraisal feedback with respect to timeliness and clarity of appraisal feedback influence work-life balance in terms of working hours. Specifically, it implies that, if improvement is made in setting specific job objectives, having realistic deadlines, availability of supervisors and in timeliness and clarity of appraisal feedback employees will use their time at work properly. Thus, they will get time for personal matters; hence, improve their work-life balance.

The study recommends to supervisors that, during job panning, they should put special attention on improving specificity of job objectives and setting of realistic deadlines. Specifically, superiors should design job objectives in such a way that they become specific to the possible extent. Also, they should set realistic deadlines. Furthermore, the study recommends to supervisors that they should be available to their subordinates so as to provide technical consultations and behavioural support. The study recommends further to supervisors that all the time they should be in a position to provide timely appraisal feedback to their subordinates. On appraisal feedback, the study recommends again that, supervisors should not over emphasize on clarification when they provide appraisal feedback to their subordinates.

On the other hand, the study recommends to employees that, when they are given job tasks they should emphasize on specificity of job objectives and require to be assigned to job tasks with specific and realistic deadlines. The study further recommends to employees that, they should focus on requiring timely appraisal feedback from their supervisors. However, they should not focus much on seeking for clarification on appraisal feedback unless it is necessary.

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# Users' Perception on the Quality of Water Service Delivery in Iramba and Singida Districts

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## Abstract

*This study assessed users' perception towards quality of water services delivery in Iramba and Singida Districts. Data were collected from 350 water users in the study areas using a questionnaire and a guide for focus group discussion (FGD). Descriptive statistics such as frequency, mean, standard deviation and percentages were used to analyse the perceived quality of water service delivery, whereby socio-economic variables and explanatory variable were used as the best variables in assessing the delivery of quality water services. The results show that the level of satisfaction of water users with service parameters of quality, accessibility, quantity, and reliability was low. This is because only about half of all households were satisfied with the service they received. Water users had a negative perception towards water service delivery in the study area. Thus, initiatives need to be made by the service providers, service authority (community owned water supply organisations and District Councils) and service users to improve the service delivery*

***Key words:*** *Perception, Quality service, water service, service delivery*

## 1.0 Introduction

Water is a basic human right to which everyone is entitled (UNICEF, 2016). However, the majority of the people in the world are still lacking access to quality water service. Approximately 663 million people are reported not to have access to reliable sources of drinking water (UNICEF, 2016). The rate of access to domestic water services in rural sub-Saharan Africa (SSA) is among the lowest worldwide, with approximately 1 in 2 rural dwellers lacking access to reliable sources of drinking water. The demand for water is rising due to an increase in urban and rural populations (Akpor and Muchie, 2011). In Tanzania, despite decades of government and donor investments in water projects, nearly 50 percent of the rural population still lack access to improved drinking water (Joseph, et al., 2018). Almost 48 percent of the rural population has access to improved water source on their household premises. lack of access to improved water source, compel

many women to travel long distances in search of water for drinking and other domestic needs, wasting u a lot of time which could have been spent on other productive activities (Joseph, et al., 2018).

The Government of Tanzania has made several efforts including decentralisation of the water sector to ensure accessibility to quality water for all citizens in the country (Miquel-Florensa & Garcia-Valinas, 2013). In this respect, the central government acts as a coordinator in the water sector, while the administration at the district level holds the main competencies for implementation. According to Miquel-Florensa and Garcia-Valinas (2013), communities at the grassroots level have the opportunities of participating in designing, managing, and maintaining their water projects and services. The National Water Policy was formulated in 1991 and reviewed in 2002 to provide this avenue to the community. According to the National Water Policy (URT, 2002), water scarcity is becoming a serious problem in the country even in areas that had no such a problem in the past. This is caused by many factors including prolonged and severe drought and competing uses of water sources and catchments (Kabote and John, 2017).

The need for providing safe water to human population is clearly stated in the Tanzania Development Vision (TDV) 2025, which stresses on the universal access to safe water in both urban and rural areas. Furthermore, access to quality water services is vivid in the development and implementation of the Water Sector Development Programme (WSDP- 2006-2025), Water Resource Management Act No. 11 of 2009 and Water Supply and Sanitation Act No. 12 (Kabote and John, 2017). Despite the implementation of many policy reforms the country's rural water woes are reported to persist (UNDP 2014; Carlitz and Taylor, 2017; Jimenez et al., 2010). Among the policy reforms include decentralisation of water service delivery, transferring ownership of water points to a new village institution called Community Owned Water Supply Organisations (COWSOs) and significant donor funding which is budgeted at US $3 billion for the second phase (2015–2025),. In the decentralisation of water service delivery, communities have increasingly been engaged in significant responsibilities such as management of water supply infrastructure, supervision of daily water delivery, and maintenance of infrastructure. Communities have demonstrated a clear preference for dealing with such water delivery issues with the minimum possible contact with the administration and coordination of the central government.

Literature shows that geographical, socio-economic status, cultural context and the types of sources of water services account for the differences in perceptions towards the quality-of-service delivery (Rodríguez-Tapia et al. 2017; Kumasi et al., 2015). A study by Kumas et al. (2015) in Ghana revealed that water users have a positive perception towards the service provider. Hence, the people had more positive perceptions towards local government than towards the central government because the former was closer to people and thus was more capable of managing and ensuring effective and accountable service delivery at the local level than was the case with the latter. Rodríguez-Tapia et al. (2017) studied household's perception towards water quality and willingness to pay for clean water in Mexico City and found that families preferred alternative sources of drinking water instead of relying on the city's quality supply of the services. As Doria (2010) argues, for many years, a considerable amount of research has focused on attempting to understand how water quality is perceived. Other scholars such as Herbst et al. (2009) and Francis et al. (2015) focused on the relationship between perception, behaviour, long-term sustainability, and effectiveness of water services.

Scholarly research demonstrates that aesthetic qualities such as taste, colour, odour, and the manner in which water service is delivered have significant impact on consumers' perception towards water quality and water safety (Doria, et al., 2005; da Silva et al., 2010; Francis et al., 2015). Other researchers also indicated that perceptions among water users are influenced by demographic characteristics of individuals or community members, negative health and disease incidents related to water, and sanitation and hygiene education campaigns (WASH) Doria, 2010; Francis et al., 2015). Since little attempts have been made to examine the perceptions of water users towards the delivery of quality water services and factors such as quantity, quality, accessibility, and reliability on the perceived quality of water services, there was therefore a need of carrying out this study. In this respect, this paper adds knowledge to the exiting literature and informs service providers on the manner in which the community perceives the delivered water services. The study findings can be used as a guide to water service providers (government and NGOs) on use and management of water resources with the aimed of improving the quality and enhance service delivery and performance of the water sector.

The study was guided by the agency theory, that is, the 'agent – principal relationship,' which depends on power positions and information flow between

the principals and the agents. The question, then, is how can the principals manage the interests of the agents to enable the latter be in line with the goals which they (principals) wish to achieve as an alteration of principal-agent relationships, where principals theoretically gain more leverage over agents who are directly responsible for service provision. Analysing users' perception using the principal agent perspective helps to explain the trade-offs between different actors and the changes that service providers (agents) bring with them, given the new responsibilities of the actors involved. The ultimate principals are the citizens or service users, and the manner in which they perceive the quality of water service delivery while politicians are the agents as representatives in decision-making organs.

Users' perception is an opinion about something viewed and assessed; every customer has different beliefs towards certain services. These beliefs play an important role in determining customers' satisfaction, and this cannot be taken as an afterthought (Angelova and Zekiri, 2011). Therefore, socio-economic variables such as sex, age, education, marital status, household size and explanatory variables, which are quantity, quality, accessibility, and reliability were analysed to understand the users' perception of the quality of water service.

Therefore, this paper adds knowledge to the exiting literature and informs service providers on the manner in which the community perceives the delivered water service.

## 2.0 Methodology

Data were collected from Iramba and Singida Districts in Tanzania. These two districts were selected because they constitute a large population with challenges of water services in Singida region (URT, 2015). A cross sectional study design and multistage sampling techniques were used in selecting the study area. In the first stage, two districts were selected purposively because of having relatively more challenges of water services than there are in the remaining districts. The second stage involved random selection of three wards from each district making six wards. In the third stage, one village was purposively selected from each ward amounting to six villages selected. The villages selected were Mgori, Ilongero, and Mtinko from Singida District and Msigiri, Nselembwe, and Nguvumali from Iramba District. A sample of 350 households was involved in the study. Proportional sampling using a household village register was applied

to determine sub-samples from each village and thereafter, simple random sampling was used to select respondents from each village.

A combination of both qualitative and quantitative data collection methods was used for triangulation purposes. Qualitative data were collected through Focus Group Discussions (FGDs) and key informants interviews. One FGD was conducted in each village making six FGDs. Each FGD comprised 8 -10 participants. The Village Executive Officers (VEOs), chairperson and a secretary of COWSO from each village, 2 Ward Councillors, and 2 District Water Engineers were involved as key informants. Household questionnaire survey was used to collect both qualitative and quantitative data. Descriptive statistical analysis was computed to explore the distribution of socio-demographic characteristics of the respondents. The qualitative data, which were collected from FGDs and KIIs, were analysed using content analysis technique, which is consistent with the objectives of the study. Data were analysed by using thematic analysis, whereby data were coded and conclusions were drawn based on the themes of the study. The analysis of perception involved calculation of index scores from a Likert scale using the formula: index scoreX 100%. Every respondent was required to rate his/her perception towards the delivery of quality water services which were ranged from dissatisfied (1), undecided (2) to satisfied (3).

## 3.0. Results and Discussion

### 3.1 Water Users' Perception on the Quality of Water Services

#### *3.1.1 Users' perception of water quality*

Descriptive results showed mixed responses on colour, odour (smell), taste, water treatment, and protection of the source. The perception of users of quality of water services delivery in the study area is presented in Table 1. The average of the points scored was distributed in three categories namely dissatisfied (negative perception), satisfied (positive perception), and neutral perception.

**Table 1: Users' perception on the quality of water (n = 350)**

| Statements | Dissatisfied | Undecided | Satisfied |
|---|---|---|---|
| Colour of water from the source | 187(53.4) | 65(18.6) | 98(28.0) |
| Smell of water collected from the source | 190(54.3) | 118(33.7) | 42(12.0) |
| Test of water from the source | 176(50.3) | 96(27.4) | 78(22.3) |

| | | | |
|---|---|---|---|
| Water treatment | 182(52.0) | 107(30.6) | 61(17.4) |
| Water source protection | 212(60.5) | 72(20.5) | 66(18.0) |

The results in Table 2 show that the perception of water users towards the quality of water was negative. About 45.7 percent of the respondents indicated a negative perception, while 12.9 percent indicated positive perception towards water quality. The situation was supported by findings from FGD at Mgori village:-

> *"The quality of water is not good as it has salt taste and the colour is like milk, therefore it is suitable for neither drinking nor washing clothes. Normally we walk a long distance to find water suitable for drinking and washing clothes."*FGD's in Mgori Village.

The findings are in line with the findings reported in a study by Doria et al. (2005) which revealed that the perception of water quality was largely influenced by water taste, perception of risk, colour, odour, familiarity, and trust. Barnett et al. (2018) found that many problems of water quality are related to decisions and behaviours made by human actors.

**Table 2: Quality perception level (n = 350)**

| **Variables** | | **Score** | **Frequency** | **Percent** |
|---|---|---|---|---|
| Dissatisfied | (Negative) | 0 – 5 | 160 | 45.7 |
| Undecided | (Neutral) | 6 – 10 | 145 | 41.4 |
| Satisfied | (Positive) | 11 – 15 | 45 | 12.9 |
| **Total** | | | **350** | **100.0** |

### 3.1.2 Perception of users of the quantity of water

Perception of water users on the quantity of water is presented in Table 3 with various attitudinal statements concerning water for drinking and food preparation, house clean up and personal hygiene, laundry and a flow of collected water. The finding indicated that users were dissatisfied with the water collected for drinking and food preparation, clean up and personal hygiene, laundry, flow of water and the total quantity of water collected per day. Majority (55.7%) of the respondents had a negative perception towards the quantity of water (Table 4). The negative perception among users is influenced by the quantity of water collected per person daily, that is 1- 5 buckets of 20 litres each.

**Table 3: Users' perception on quantity of water (n = 350)**

| Statements | Dissatisfied | Undecided | Satisfied |
|---|---|---|---|
| Water collected for drinking & food preparation | 159(45.4) | 56(16.0) | 135(38.6) |
| Water collected for house clean-up & personal hygiene | 224(64.0) | 48(13.7) | 78(22.3) |
| Water collected for laundry | 208(59.4) | 52(14.9) | 90(25.7) |
| Flow of water at WCP = | 161(46.0) | 57(16.3) | 132(37.7) |
| Total water collected per day | 233(66.6) | 46(13.1) | 71(20.3) |

Lpcd = litres per capita per day, WCP = Water Collection Point

### 3.1.3 Buckets of water collected daily

The majority (55.7%) of the respondents reported that the quantities of water collected daily by the household ranged from 1 to 5 buckets of 20 litres each, while 28.9 percent of the respondents indicated that the quantity of water collected daily ranged from 6 to 10 buckets per household. However, 15.4percent of the respondents argued that the quantity of water collected daily by the household was more than 10 buckets. The results indicate that the majority of the household were getting 1 to 5 buckets daily, which is equivalent to 20 to 100 litres. The quantity of water obtained by a household was not enough as the majority 53% - 54%) of the respondents had a household size of 5 to 10 persons. According to the water policy of Tanzania (URT, 2002), a household of that size is required to get 125 – 250 litres of water per day (25 litres per person per day). The findings are inconsistent with policy requirement. Therefore, there is a need for district council and water users associations to improve the quantity of water required by users.

**Table 4: Buckets (20 litres each) of water household collect per day (n = 350)**

| Variables | Frequency | Per cent |
|---|---|---|
| 1-5 buckets | 195 | 55.7 |
| 6-10 buckets | 101 | 28.9 |
| More than 10 buckets | 54 | 15.4 |
| **Total** | **350** | **100.0** |

### 3.1.4 Distance covered to access water

The majority (54.1%) of the respondents walk more than 1000 meters (Table 5), while 16.5 percent of the respondents walk fewer than 400 metres from their homesteads to the water sources. This is in contrast with the Tanzania National Water Policy (2002), which requires the distance covered from the homestead to the water source to be not more than 400metres. Long distances covered leads to a negative perception among users towards accessibility. The findings are in line with Human Development Report (2006) by UNDP, which reveals that women in Africa and Asia walk for an average distance of 6 kilometres to collect water. This makes them consume less quantities of water, as it is heavy to carry the water for a long distance.

**Table 5: Distance covered from household home to water source (point) (n = 350)**

| Variables | Frequency | Percent |
|---|---|---|
| Less than 400 meters | 58 | 16.5 |
| Between 401-1000 meters | 103 | 29.4 |
| More than 1000 meters | 189 | 54.1 |
| **Total** | **350** | **100.0** |

### 3.1.5 Waiting time on accessing water

Waiting (queuing) time before accessing water is also an indicator of accessibility of water. The findings showed that the majority (64.6%) of the respondents spent more than an hour waiting for water for one round trip (Table 6). Minority (22.9%) of the respondents used less than 30 minutes as waiting time. This situation is caused by long queue and low pressure of water from the water point. The findings are consistent with what is reported by Kayser et al. (2013) who found that in low-income countries women and children spend an average of one hour per trip collecting water, which reduces school attendance among children. In another study, Karimi (2016) found that in Githurai, Nairobi, citizens were spending 30 minutes to more than one hour waiting for water at water kiosks. The findings revealed that water users were spending a lot of time in water collection the time could otherwise be used on other productive activities.

**Table 6: Waiting time for accessing water from the source (in minutes) (n = 350)**

| Variables | Frequency | Percent |
|---|---|---|
| Below 30 minutes | 80 | 22.9 |
| 30 minutes to 1 hour | 44 | 12.6 |
| More than 1 hour | 226 | 64.6 |
| **Total** | 350 | 100.0 |

### 3.1.6 Users' perception of accessibility

Slightly more than half (52.6%) of the respondents had a negative perception towards water accessibility while 9.7 percent showed a positive perception on water accessibility. The fact that users failed to get enough water within the required distance of 400 metres and acceptable time of 30 minutes caused them to have a negative perception towards accessibility of water services. This finding shows that the users were not accessing enough water to meet their daily domestic uses. The findings are in line with the findings in a study by Katomero (2017) who found that overall access to safe and clean water among rural population is poor. The author reveals further that in Bunda District only 51.9 percent of the rural population out of 212,485 people were served with clean and safe water. The remaining 48 percent had no access to safe and clean water. A FGD at Nguvumali village reported the following,

> *"Sometimes access to water is difficult because of charges paid for a bucket collected, whereby one bucket of 20 litres is charged Tshs.50/=, we suggest that the affordable price should be Tshs 30/= or 20/= "* FGDs in Nguvumali Village.

### 3.1.7 Users' perception of water service reliability

The perception of water users on water reliability is presented in Table 7 with various attitudinal statements concerning continuity of water service, maintenance of infrastructure, and availability of electricity or diesel. Different responses were obtained whereby the majority (50.9% to 58.6%) of users had a negative perception towards or rather were dissatisfied with availability of water service. Water service was not reliable to users due to poor maintenance of water facilities, lack of technicians, and shortage of electricity or fuel to run water pumps.

**Table 7: Users' perception on Reliability (n = 350)**

| Statements | Dissatisfied | Undecided | Satisfied |
|---|---|---|---|
| There is continuity of water services | 183(52.3) | 51(14.6) | 116(33.1) |
| Availability of maintenance of water facilities | 102(29.1) | 59(16.9) | 189(54.0) |
| Availability of technicians to repair water facilities | 193(55.1) | 36(10.3) | 121(34.6) |
| Availability of water supply for 24 hours in the village | 178(50.9) | 42(12.0) | 130(37.1) |
| Availability of energy (electricity/Diesel) to run water pump | 205(58.6) | 31(8.9) | 114(32.6) |

The findings in Table 8 revealed that the majority (52.6%) of the respondents had a negative perception towards the reliability of water service, while 12.9 percent of the respondents had a positive perception towards water reliability. The findings indicate that users were not getting water services throughout the day. Normally, water was available through rationing of 3 to 6 hours per day and the water kiosk was opened from 7.00 am to 10.00 am in the morning and from 4:00 pm to 7:00 pm in the evening hours. The water rationing was mostly caused by shortage of fuel or electricity to operate water pumps. The findings are consistent with the findings in a study by Ngwenya and Kgathi (2006) in Ngamiland Botswana. The study findings showed that, there was unreliable water supply caused by break down of diesel pump and erratic delivery of diesel fuel. This finding was supported by the observation in FGD at Ilongero village which is as follows, -

> *"We don't get water throughout the day because the pump is too old to work throughout the day and night. Therefore, we are getting by rationing (6 hours per day for 3 days per week only) "* FGD in Ilongero Village.

This finding implies that there was no reliable water supply as water service was not provided to users for 24 hours per day and users were dissatisfied with the services provided.

**Table 8: Reliability Level (n = 350)**

| Variables | Score | Frequency | Percent |
|---|---|---|---|
| Dissatisfied | 0 – 5 | 184 | 52.6 |
| Undecided | 6 – 7 | 121 | 34.6 |
| Satisfied | 8 – 15 | 45 | 12.9 |
| **Total** | | **350** | **100.0** |

### 3.1.8 Overall perception of quality of water services

The perception of quality of water services delivery was on four elements of quality water services (Quality, quantity, accessibility, and reliability). The findings reveal that 50.9 percent of the respondents had a negative perception, 40percent were neutral, and 9.1 percent had a positive perception towards the quality of water services delivered. Generally, the results as presented in Table 9 imply that the perception of water users on the quality of water service delivery was negative. This trend was contributed by, among other factors, poor infrastructure of facilities such as water tanks, pumps, and water pipes, and low ability of service providers to pay for water bills or to purchase fuel for operating the pumps. Poor maintenance of facilities and poor administration of water service delivery by the community owned water supply organizations (COWSOs) also contributed to the problem. These findings are consistent with the findings reported in a study by Sherry (2017) who found that water users in Dar es Salaam were generally dissatisfied with the level and quality of water services. This was because of worn out water infrastructure, poor administration, and poor maintenance leading to poor water quality as well as poor physical access to water points.

**Table 9: Users' Perception on Quality of Water Services Delivery n = 350**

| Levels | | Frequency | Percent |
|---|---|---|---|
| Dissatisfied | (Negative) | 178 | 50.9 |
| Undecided | (Neutral) | 140 | 40 |
| Satisfied | (Positive) | 32 | 9.1 |

## 4.0. Conclusions and Recommendations

Water users had a negative perception towards water service delivery in the study area. The service delivery does not meet the required standards as per the national water policy of 2002 and international water guidelines. There is

a gap between water service delivery and the required service to be delivered at the study area. The results show further that the agent was not performing its functions of ensuring that quality water services are delivery leading to poor relationship between the agent and the principal. Water users in the study area has a negative perception towards quality of water services, thus the intention of the government is to ensure that quality water service is delivered to the community. Initiatives need to be made by the service providers, service authority (community owned water supply organisations and District Councils) and service users of improving the service delivery. The old diesel operated water motor pumps should be replaced with modern electrical operated water pumps in order to improve the reliability of water service provision. Water users should be educated on the cost sharing and paying for water tariffs.

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# Extension Service Delivery following Marketing Approach for Maize Productivity in Morogoro and Dodoma Regions

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## ABSTRACT

Agricultural extension service is one of the strategies specified in the Agricultural Sector Development Strategy *(ASDS) I and II for successful productivity of Agricultural sector in Tanzania. The ASDS I and II emphasize on delivering extension services to farmers using marketing approach. The extent to which extension service are provided to farmers using marketing approach is not yet scholarly established. This study therefore evaluates the extent to which extension services are delivered to maize farmers following marketing approached-based skills in Morogoro and Dodoma Region. The study also determines the influence of marketing approached-based skills on maize productivity.* The study quantitatively employed descriptive and explanatory survey designs. The data were gathered using questionnaire from 500 farmers who were sampled through stratified simple random technique. The gathered data were analysed using Descriptive Statistics and Multiple Linear Regressions. that the findings revealed that, extension services are delivered to maize farmers to some extent using marketing approach-based skills; but to a large extent the services are delivered on pure agricultural skills. Furthermore, the marketing approach-based skills were found to have positive and significant influence on maize productivity. It is therefore recommended that, the government and other stakeholders through their respective extension agents should emphatically provide pure agricultural skills in conjunction with marketing approach-based skills to maize farmers.

**Key Words:** Marketing Approach, Productivity, Extension Service

# 1. INTRODUCTION

Agricultural extension service is one of the drivers and interventions specified in the Agricultural Sector Development Strategy *(ASDS) I and II for successful growth and productivity of the Agricultural sector in Tanzania (ASD, 2015/2016-2024/2025).* The importance of agricultural extension services in the country's development is extensively accredited as one of the drivers and prerequisites for successful agricultural production and productivity (Masanyiwa, et al., 2019). agricultural extension services simply the transfer of knowledge, skills and best practices to farmers for high production and productivity (Sanga, et al., 2013).

Due to its importance, agricultural extension services have attracted extensive research in Tanzania. For example, Sanga, et al. (2013) assessed the effectiveness of an impact-driven, radio-based extension service delivery system, which was introduced in some rural areas of Tanzania and found that some farmers have begun sharing agricultural information and have changed to best practices. elsewhere, Wambura, et al. (2015) studied extension systems in Tanzania and identified research gaps in such areas as the use of technology for extension services, privatization of extension services, decentralization of extension services, and extension services for commercialized agriculture particularly in marketing.

Masanyiwa, et al. (2019) investigated the impact of decentralization by devolution on farmers' access to agricultural extension services in the selected villages in Dodoma. The findings revealed that, implementation of decentralization facilitated farmers access to several types of extension services in Dodoma. In another study, Shausi, et al. (2019) assessed crop farmers' willingness to pay for agricultural extension services (AESs) and identified factors influencing their willingness to pay for AESs. The findings revealed that, education level, age, experience in farming, distance from the significant roads, income level and attitude towards AESs have influenced 92percent of the farmers to be willing to pay for AESs .

Abed, et al. (2020) estimated farmer's willingness to pay (WTP) for four types of agricultural extension services (AES) in the cereals' value chains as part of two United States Agency for International Development (USAID)-funded Feed the Future initiatives in Tanzania. The study indicated that, the average figures that farmers are WTP ranged from 20,000 to 24,000 TZS (8–10 USD) depending on the type of AES and in accordance to socioeconomic and agriculture-related

variables such as sex, age, household size, land ownership, agricultural revenues, off-farm income, location, and access to technology. Ortiz-Crespo, et al. (2020) investigated the user-centred design of a digital advisory service for enhancing public agricultural extension for sustainable intensification in Tanzania. The study revealed that, a mobile advisory service "Ushauri," which is created through a user-centred design process, can help to address communication and information challenges of Sustainable Intensification and effectiveness of extension services.

With reference to the above studies, the *ASDS I and II prioritized* agricultural extension service as one of the drivers and interventions specified in the strategy *for successful growth and productivity of the agricultural sector in Tanzania. Specifically, the emphasis is on commercialized agriculture through having specialized extension agents for marketing approach in the agriculture sector. According to the ASDS I and II,* specialized extension agents for marketing approach are significant in advising farmers on business skills (business planning, market survey, negotiations, etc.) and market demand (production volume, timing, quality, etc.). Additionally, commercialized agriculture is advocated in KILIMO KWANZA resolution whose initiatives such as agricultural commoditization, implementation of incentives are meant to ensure competitiveness and address market barriers, price stabilization mechanisms, industrialization and infrastructure development (United Republic of Tanzania [URT], 2010b).

Commercialized agriculture is based on production for the market and aimed at profit making and introduction of products, services, and technologies to the market for purchase (FAO, 2015; USAID, 2017). Commercialized agriculture enables farmers to have access to transformational innovations and to do away with subsistence farming. commercialized agriculture following marketing approach plays a central role in addressing what customers want and supplying to them accordingly for profit, saving costs of exchange of agro-produce, guaranteeing adequacy and stability of food supply in ways that reward farmers, agro-traders and consumers (Chami, 2020).

Despite the significance of commercialized agriculture to the wellbeing of farmers and the country's' economy as a whole, major challenges are still registered in the agricultural markets hampering commercialization of subsistence agriculture (FAO, 2015). Some of these challenges include poor infrastructure, inadequate support services and weak institutions, increasing transaction costs and volatility of prices (FAO, 2015; Chami, 2020). It must be noted that, *specialized extension*

*agents for marketing and vale chain approach in the agricultural sector is one of the inadequate support services is one of the identified challenges. It is established that, agriculture in Sub-Saharan Africa has historically been challenged by* isolation from the markets and lack of institutional support (FAO, 2015). The majority of farmers in Tanzania lack access to commercial markets, business and market orientation (Mutabazi, et al., 2010; Rwehumbiza, 2014). There is noted lack of support and expertise in agricultural product marketing and promotion, and poor access to markets among farmers due to lack of networking with other farming groups and weak relations with local government and other local NGOs (FAO, 2018).

Advocacy on *commercialized agriculture through specialized extension agents for marketing approach in the agricultural sector was expected to be prioritized in the previous studies. However, several previous studies (e.g.,* Masanyiwa et al., 2019; Shausi et al., 2019; Abed et al., 2020; Ortiz-Crespo, et al., 2020) have paid little attention to *specialized extension agents for marketing approach in the agricultural sector. The cited studies have mainly focused on extension agents for advising farmers on improved seeds, pesticides, fungicides, implements, and farming techniques and little was done regarding advice on marketing approach.*

*Maize is one of the crops that require extensive service based on marketing approach.* maize is the major staple crop grown by the majority of smallholder farmers in Tanzania (Global Agriculture and Food Security Program [GAFSP], 2016; Chami, 2020). Maize is also one of the most important food crops in Tanzania accounting for nearly 20percent of agricultural GDP, 30percent of overall food production and 40 percent of the total calories consumed (GAFSP, 2016). *maize yields have remained stagnant while its demand and importance for guaranteeing food security have increased.* Maize yields in Tanzania has been low in spite of its significance to the country's food security and economic well-being of farmers *and* the commendable efforts made by the government in recruiting many extension agents in the country *(*FAOSTAT, 2020). Hence, new approaches to extension and advisory service delivery are needed in order to stimulate increased maize production (Wambura, et al., 2015)

*This study therefore intended to assess the extent to which extension service are delivered to farmers following marketing approach. Specifically, the study aimed at examining the extent to which maize farmers are advised by the extension agents on marketing approach-based skills, and the influence of marketing approach-based skills on maize productivity.*

## 2.0 METHODOLOGY

The study adopted cross-sectional strategy whereby data were collected from different farmers at a single point in time as from August, 2019 to March, 2020. The data were collected from *Morogoro and Dodoma regions in Tanzania*. *According to the URT (2012), the regions face* continuous food shortages despite greater potential for food production and agricultural development as a whole. This study adopted model by Wambura, et al. (2015) on maize extension and advisory services in the given regions which is focused on agricultural marketing approach. Four wards from each district (Mvomero, Kilosa, Kondoa and Kongwa) in the two regions were surveyed in data collection.

This study used stratified simple random sampling, which aided in classifying the population of farmers as from 2015/2016 into a stratum of their characteristics (original district). The technique also provided an equal chance for each farmer of being selected from the stratum specified. The study had the sample size of 500 farmers, whose selection criteria. include the size of the population as whole, saturation point, and nature of data analysis. However, this study obtained its sample size based on the nature of data analysis, notably Multiple Linear Regression (MLR).

The sample size was calculated using the nature of data analysis due to lack of exact figure of maize farmers from the regional authorities. a quick scientific optional way was to obtain the sample size using the nature of data analysis. The sample size requirements for MLR is calculated using the formula "N > 50 + 8m (where m = number of predictors" by Tabachnick and Fidell (2001, p. 117). After calculation, it was noted that, the study has not violated the sample size assumption that is N>50+8 (2) = 66. This study has a maximum of two predictors and 500 cases which are more than 74 obtained from the given formula. However, 425 questionnaires were found complete and useful for the data analysis that means the response rate was 85 percent.

**Table 1: Proposed and Field Obtained Sample Size**

| Surveyed Districts | Proposed Sample Size | | Obtained Sample Size | |
|---|---|---|---|---|
| | Farmers Number | Farmers Percentage | Farmers Number | Farmers Percentage |
| Mvomero | 139 | 28.0 | 116 | 27.0 |
| Kilosa | 131 | 26.0 | 103 | 25.0 |
| Kondoa | 107 | 21.0 | 99 | 23.0 |
| Kongwa | 123 | 25.0 | 107 | 25.0 |
| **Total** | **500** | **100.0** | **425** | **100.0** |

The study essentially used primary data, which were collected using questionnaires. Because data were collected from 500 farmers in sixteen different wards in different districts, the questionnaire became relatively cheap, quick and efficient in obtaining large amounts of information from that large sample of farmers. The questionnaire had closed-ended questions with multiple choice answer-options, which simplified their analysis which was done using descriptive statistics and Multiple Linear Regression.

The collected data of this study were analysed using descriptive statistics and Multiple Linear Regression. The Descriptive Statistics was used to analyse the respondents' personal information, variables for any assumption violation, and to address specific objective number one. Multiple Linear Regression was used to analyse specific objective two in testing and establishing relationship between a business and market demand skills and maize productivity. The two specific objectives had more than one predictor and one dependent continuous variable as follows,

***Objective Two:***

$$Y=\alpha+\beta_1\chi_1+\beta_2\chi_2+\varepsilon$$

***Where:***

***Y****-Criterion (i.e. Maize Productivity)*
***α****-constant (intercept)*
***β*** $_{1\text{-}2}$***-****Regression Coefficients*
***χ*** $_{1\text{-}2}$***-****Predictors (i.e. Marketing Approached-based Skills which Business Skills, Market Demand Skills)*
*ε- Margin error*

This study has major variables such as marketing approach-based skills, pure agricultural approach-based skills and maize productivity. Marketing approach-based skill is a non-continuous variable using ten items (i.e., marketing planning, market survey, marketing negotiations, market networking, honey promotion, production volume for the market, production timing for the market, production quality for the market, and supply to customers for profit, and saving costs of exchange in the market). The items are drawn from previous studies (ASD, 2015/2016-2024/2025; FAO, 2015; USAID, 2017). The 5-point Likert-type scale ranging from 1 ( a very small extent) to 5 (a very large extent) was used to measure the items of marketing approach-based skills.

Pure agricultural approach-based skill is a non-continuous variable using five items (i.e., improved seeds, improved pesticides, improved fungicides, improved implements, and using improved farming techniques). The items are drawn from the previous studies (ASD, 2015/2016-2024/2025; FAO, 2015; USAID, 2017). The 5-point Likert-type scale ranging from 1 (To a very small extent) to 5 (To a very large extent) was used to measure the items of pure agricultural approach-based skills.

Maize productivity is a continuous variable measured using the number of tons produced per hectare taken from the previous study (Kizito, 2015). The number of tons were grouped in the scale of 1-5 (i.e., 1. below 1.7 tons per hectare; 2. 1.7 tons per hectare; 3. 3.5 tons per hectare; 4. 4.0 tons per hectare; and 5. Above 4 tons per hectare).

## 3.0. FINDINGS

### 3.1 Personal Information of the Surveyed Farmers

The results in **Table 3** indicate that, majority of the surveyed farmers were males. This implies that, more male farmers are engaged in maize production as opposed to females. Although female farmers play a significant role in maize production activities, most of the households are dominated and headed by male farmers. These results are supported by what was previously found by Wambura, et al. (2015); Masanyiwa, et al. (2019); Shausi, et al. (2019) who noted that, more than half of the surveyed farmers were males when evaluating accessibility of extension services by farmers in Dodoma region.

Furthermore, the majority of the surveyed farmers were between 40-44 years of age. maize production in the surveyed regions was mainly carried out by middle and productive ages although minimal difference between ages is noted. These findings are consistent with the findings reported in a study by Masanyiwa, et al. (2019) who revealed that, two thirds (66%) of the farmers were between 36 and 45 years of age while Shausi, et al. (2019) noted that about 70 percent of the respondents were between 39 and 49 years of age.

Marital status was one part of personal information assessed among the surveyed farmers in the study area. The results in **Table 3** demonstrate that, the majority of the farmers surveyed in the regions were married. maize production is majorly done by married farmers as opposed to other groups of farmers. In another study, Shausi, et al. (2019) revealed that, the majority (68.4%) of the surveyed farmers were married as compared to other groups.

The lowest education level considered in the current study is no formal education while the highest level is postgraduate education. The results in **Table 3** indicate that, the majority of the surveyed farmers had primary education. This implies that, most of them had no marketing approach-based skills as these are not taught in primary schools. The acquisition of skills could highly depend on extensive agents and other sources. Similar findings are reported by Shausi, et al. (2019) that, the majority (84.2%) of the surveyed farmers in Mpwapwa and Mvomero districts had primary education.

Because this study was carried out in four districts in the surveyed regions, the surveyed farmers had to identify specific district they lived and worked. The majority of the surveyed farmers were living/working in Mvomero though the difference in the number of farmers living Mvomero and those living in other districts was insignificant. These results imply that, there are farmers who engage in maize production in the given districts although they do not live in the locality. In another study, Masanyiwa, et al. (2019) revealed that 94 percent of the surveyed farmers lived in the respective villages which were original birth places.

**Table 3: Personal Information of the Farmers**

| FARMERS' INFORMATION | | | |
|---|---|---|---|
| **Personal Information** | **Scale** | **Frequency** | **Percent** |
| Sex | 1. Male | 291 | 68.0 |
| | 2. Female | 134 | 32.0 |
| | **Total** | **425** | **100.0** |
| Age | 1. 29 and below years | 61 | 14.0 |
| | 2. 30-34 years | 80 | 19.0 |
| | 3. 35-39 years | 91 | 21.0 |
| | 4. 40-44 years | 100 | 24.0 |
| | 5. 45 and above years | 93 | 22.0 |
| | **Total** | **425** | **100.0** |
| Marital Status | 1. Single | 97 | 23.0 |
| | 2. Married | 231 | 54.0 |
| | 3. Divorced | 62 | 15.0 |
| | 4. Widow | 35 | 08.0 |
| | **Total** | **425** | **100.0** |
| Residential and Working District | 1. Mvomero | 100 | 25.0 |
| | 2. Kilosa | 95 | 23.0 |
| | 3. Kongwa | 91 | 21.0 |
| | 4. Kondoa | 80 | 19.0 |
| | 5. Beyond | 49 | 12.0 |
| | **Total** | **425** | **100.0** |
| Education Level | 1. No Formal Education | 40 | 09.0 |
| | 2. Primary Education | 118 | 28.0 |
| | 3. Secondary Education | 80 | 19.0 |
| | 4. Certificate | 69 | 16.0 |
| | 5. Diploma | 58 | 14.0 |
| | 6. Bachelor degree | 38 | 09.0 |
| | 7. Postgraduate Education | 22 | 05.0 |
| | **Total** | **425** | **100.0** |

## 3.2 Extension Service Delivery Following Marketing Approach

This section establishes the extent to which extension services are delivered to the surveyed farmers by extension agents following marketing approach-

based skills in addition to pure agricultural skills in maize production. It must be remembered that, the marketing approach-based skills include mainly business skills and market demand skills.

The results in **Table 4** indicate that, extension services were delivered to the majority of the surveyed farmers by extension agents largely based on pure agricultural-based skills in the surveyed regions. On the other hand, extension services were delivered to the majority of the surveyed farmers following marketing approach-based skills (i.e., business skills and market demand skills) to a small extent in Dodoma and Morogoro regions.

These results imply that, maize farmers obtain extension services from extension agents however, the given extension services lack agricultural marketing skills. As a result, farmers fail to produce as per the requirements of the market, making them continue to practise subsistence rather than commercial agriculture.

Generally, the farmers in the surveyed regions were advised by extension agents on pure agricultural skills to a large extent and on business and market demand skills to a small extent in Dodoma and Morogoro regions. These results are supported by other results in the previous studies. Despite the importance of commercialized agriculture, agricultural markets, business and market demand skills among farmers still remain as major challenges (FAO, 2015; Chami, 2020). It is further established that, agriculture in Sub-Saharan Africa has historically been challenged by isolation from markets and lack of institutional support (FAO, 2015). The majority of farmers lack access to commercial markets, business and market orientation in Tanzania (Mutabazi, et al., 2010; Rwehumbiza, 2014). Also noted include lack of support and expertise in marketing and promotion of agricultural product and low access to markets among farmers due to lack of networking with other farming groups, weak relations with local government, and other local NGOs (FAO, 2018).

**Table 4: Extension Service Delivery Following Marketing Approach**

| Scale | Pure Agricultural Skills | | Business Skills | | Market Demand Skills | |
|---|---|---|---|---|---|---|
| | Frequency | Percent | Frequency | Percent | Frequency | Percent |
| To a very small extent | 20 | 05.0 | 81 | 19.0 | 94 | 22.0 |

| | | | | | | |
|---|---|---|---|---|---|---|
| To a small extent | 34 | 08.0 | 221 | 52.0 | 241 | 57.0 |
| To a moderate extent | 81 | 19.0 | 51 | 12.0 | 44 | 10.0 |
| To a large extent | 239 | 56.0 | 39 | 09.0 | 32 | 08.0 |
| To a very large extent | 51 | 12.0 | 33 | 08.0 | 14 | 03.0 |
| **Total** | **425** | **100.0** | **425** | **100.0** | **425** | **100.0** |

### 3.3 Influence of the Marketing on Maize Productivity

This section presents results addressing objective, which aimed at examining the influence of the marketing approach-based skills (i.e., business skills, market demand skills) on maize productivity among farmers in the surveyed regions. The MLR results indicate that maize productivity (outcome variable) was explained by business and market demand skills (predictor variable) by 47percent. The value obtained was .470, implying the model explained 47percent of the variance in maize productivity (see **Table 5**). In testing how well the regression model fitted the data, it was found that the computed F statistics was 36.091 with an observed significance level of 0.000. The models reached the statistical significance which was $p<0.001$ (see **Table 5**). It was predicted that, the marketing approached-based skills (i.e., business and market demand skills) had a significant and positive relationship with maize productivity in the surveyed regions. The results of regression analysis are summarised in **Table 5.**

Moreover, the results confirm that the business and market demand skills had a statistically significant and positive relationship with maize productivity (Beta=.513, t=8.309, $p<0.001$; Beta=.347, t=6.133, $p<0.001$).

These results indicate that the more the farmers possess the given skills, the more they raise maize productivity in Tanzania. The results imply further that, maize farmers can do farming for commercial agriculture if extension services are delivered to them following marketing based-approach.

These results conform to the results in several previous researches (i.e., Mutabazi, et al., 2010; Rwehumbiza, 2014; FAO, 2018). The studies indicate that, business and market demand skills positively and significantly influence agricultural productivity in addition to other pure agricultural skills as noted in this study.

**Table 5: Influence of the Marketing on Maize Productivity**

| | B | t | Sig. |
|---|---|---|---|
| **(Constant)** | 6.09 | 19.001 | <.001 |
| Business Skills | .513 | 8.309 | <.001 |
| Market Demand Skills | .347 | 6.133 | <.001 |
| Multiple R | .738[a] | | |
| R Square | .491 | | |
| Adjusted R | .47 | | |
| ANOVA (F, SIG.) | 1.91 (< .001) | | |

## 4.0 CONCLUSION AND RECOMMENDATION

This study assessed the delivery of extension service following marketing-based approach for maize productivity in Morogoro and Dodoma Regions. The study findings have led to the conclusion that, agricultural extension services are delivered to maize farmers to a small extent following marketing approach-based skills although the given approach is statistically significant and positive to maize productivity. On the other hand, the extension agents to a large extent deliver extension services to the maize farmers following pure agriculture-based approach and not marketing-based approach.

The findings of this study imply that, the extension service following pure agriculture-based approach should be delivered in tandem with marketing-based approach for increasing maize productivity in Tanzania. The marketing-based approach would enable farmers to migrate into commercialized agriculture which simply implies production for the market requirements. The government through relevant ministry, policy makers, and other key stakeholders should enable extension agents acquire both pure agriculture and business skills for them to transfer the skills to farmers in Tanzania.

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# The Role of Feedback on School Performance

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## *ABSTRACT*

*This study aims at investigating the role of feedback on school performance. A total of 444 respondents including 217 males and 227 females were sampled from twelve secondary schools in Dodoma region in Tanzania. In the sample, 218 respondents were drawn from the group of high performing schools and 226 from the group of low performing schools in the regional ranking list of school performance in the Form Four National Examinations. The comparison between the two groups was made based on the extent to which the component of feedback was given in schools. Data were collected using questionnaire which assessed whether feedback was given in schools. The comparison also focused on completion of the planned topics, administering quizzes and tests, timely provision of performance feedback, correction of the performance feedback, re-writing of the exercises or tests after correction of performance feedback and re-marking of the re-written exercise or tests. Data were descriptively analysed to obtain frequencies and percentages for each group. The findings revealed that about 35.4 percent of students from the group of low performing schools reported a maximum of 57.14 percent of unfinished topics as opposed to 17.4 percent from their counterparts the high performing schools who reported the same proportion of unfinished topics. Therefore, it was concluded that failure to complete topics as per the syllabus and feedback provision are among the determinants of school performance. These findings have theoretical and practical implications for future research. The paper recommends that teachers should stick to their professional responsibilities and ensure completion of topics and timely provision of feedback to students.*

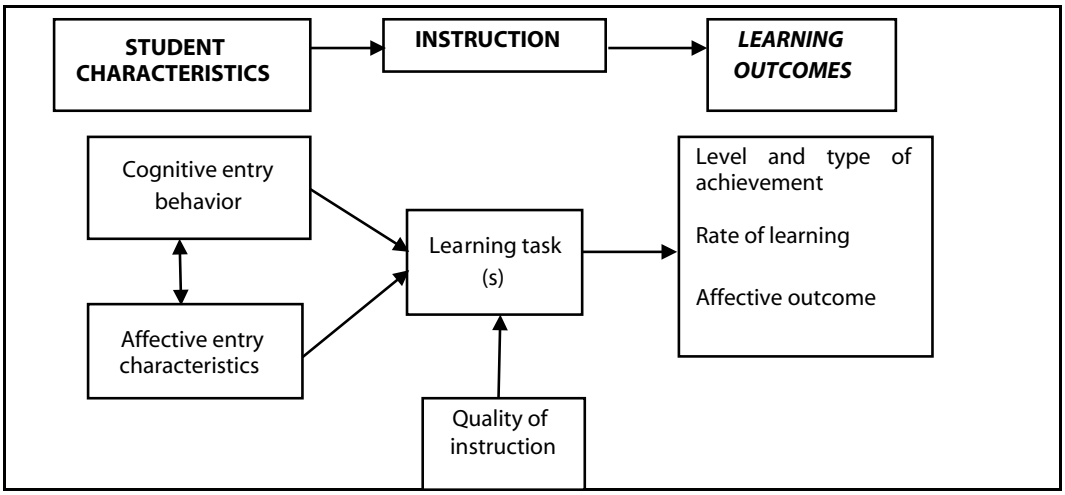
**Key words:** School performance, feedback, performance feedback, timely feedback

## 1.0 INTRODUCTION

Previous studies on the determinants of school performance identified communication, learning facilities, guidance and family stress (Mushtaq and Khan, 2012); students' divergent t, convergent thinking, and metacognitive thinking, and teachers' ability to foster divergent, convergent and metacognitive thinking (Joshua, 2016) as determining factors of school performance. Other factors include students' self-efficacy and use of teachers' feedback (Kyaruzi, 2019). Addressing school performance, the theory of school learning as expounded in Bloom (1976) proposes some variables that account for much of the variations in school learning. One of the dual basic assumptions underlying this theory is that the history of the learner is at the core of school learning; and the other is the possibility of modifying the characteristics of the learner during instruction. The theory of school learning deals with three major variables namely, students' characteristics, instruction, and learning outcomes. According to Bloom, two major levels of student's characteristics that determine student's learning are cognitive entry behaviours and affective entry characteristics. Cognitive entry behaviours refer to the prerequisite learning required for the learning tasks on which instruction is to be provided. Affective characteristics refer to the student's motivation to learn new learning tasks. The instruction variables are defined in the theory as the quality of instruction. This is the extent to which the cues, practice, and reinforcements of the learning process are appropriate to the needs of the learner. The next paragraph describes how these variables relate to students' difference in learning.

According to the theory, cognitive entry behaviours, affective entry characteristics, and the quality of instruction determine the nature of learning outcomes. The said learning outcomes are the level and type of achievement, rate of learning, and affective outcomes. This means that, given favourable learner's entry characteristics and quality of instruction, all learning outcomes are likely to be at a high or positive level, leading to minimal variation in the learning outcomes including academic performance. Figure 2.2 illustrates the constructs of the theory of school learning.

**Figure 2.2: Major Variables in the Theory of School Learning**




**Source:** Bloom (1976)

Briefly, three interdependent variables focused in this theory include the extent to which a student has already learned the basic prerequisites for the learning to be accomplished; the extent to which a student is motivated to engage in the learning process; and the extent to which the instruction to be given is appropriate to the learner. On the other hand, the variable quality of instruction is in one way or another related to both what teachers can do to help students succeed in school learning and teachers' ability to foster creative and metacognitive thinking in the classroom. According to the theory of school learning, quality of instruction mediates the relationship between learners' cognitive entry behaviour and academic performance. The theory defines the construct quality of instruction as being comprising of cues, reinforcements, participation, feedback, and correctives of the mistakes done by the learners (Bloom, 1976).

Defining these components, Bloom has these to say: quality of instruction … has to do with the cues or directions provided to the learner, the participation of the learner in learning activity (covert or overt), and the reinforcement which the learner secures in some relation to the learning. Because much of school instruction is group instruction and because any attempt at group instruction is fraught with error and difficulty, a feedback and corrective system must be also included in the quality of instruction (p.115).

In Bloom's theory of school learning, the term feedback refers to short formative tests at the end of each lesson which may indicate what the student has learned and what the student still needs to learn to attain mastery of the learning objectives. The term correctives on the other hand, refers to suggestions as to what each student should review in the original or new instructional materials, special explanations and additional workbooks and practice exercises. These can also include additional instruction on particular ideas missed by the student which should be frequently reviewed. Kluger and DeNisi (1996) define feedback as actions taken by the teachers to provide information regarding some aspect(s) of students' task performance. In the similar manner, Hattie (2011) conceptualized feedback as information provided by the teacher, peer, book, parent, self, or experience about the aspects of one's performance or understanding. In this article, the term feedback is in line with the definitions by both Kluger and DeNisi (1996) and Hattie (2011). It specifically involves teachers' provision of informative results of short formative classroom tests at the beginning of the term before starting instructions, at the end of each lesson, weekly and monthly tests, provision of corrective instructions, and remarking (scoring) students' mistakes.

This theory informed the formulation of specific objectives of this study. This is because the determinant variables of specific objectives of the present study were deduced from the feedback construct of the theory. Thus, the main question was whether or not there would be differences between the students from the group of schools ranked as high performing and those from the group of schools ranked as low performing in terms of feedback. feedback in this respect comprise completion of the planned topics, administering quizzes and tests, timely provision of performance feedback, correction of the performance feedback, re-writing the exercise or tests after correction of the performance feedback and re-marking the re-written exercise or tests. This question has been thoroughly addressed in this work.

The reviewed literatures on the role of feedback on school performance have indicated that feedback is one of the important variables in explaining school performance. However, it seems that it is not the feedback alone, but rather interpretation and utilization of such information in correcting past mistakes in learning and performance. For example, Oettingen, Marquardt and Gollwitzer (2012) instructed their participants to receive positive or moderated bogus feedback on their creative potential and then engaged in groups of mental contrasting, indulging in the desired future, dwelling on the present reality or

irrelevant contrasting with respect to taking a creative test. Their findings revealed that mental contrasting participants who received positive feedback performed better than those who received moderate feedback. They also performed better than the indulging, dwelling, and irrelevant contrasting participants, regardless of the feedback received. These authors concluded that mental contrasting of a desired future with present reality transforms positive feedback on creative potential into successful performance.

Hattie (2011) observes that given the importance of feedback, the teacher needs to direct it at the right level to help students comprehend, engage, or develop effective strategies to process information intended to be learned. This is not just a matter of providing feedback, but rather the feedback should be timely, clear, purposeful, meaningful, and compatible with students' prior knowledge and provide logical connections. Other researchers have debated on whether the feedback should be immediate or delayed. On the one hand there are studies that emphasise on immediacy of feedback for successful performance while some have suggested reasoning the timing for feedback because sometimes negative feedback might be harmful if provided immediately than if it is delayed (Nicol & Macfarlane-Dick, 2006). To them (Ibid.), good feedback should be given close to the act of learning production so as to facilitate development of self-assessment in learning; deliver sufficient information about students' learning; encourage dialogue around learning by teachers and peers, positive motivational beliefs and self-esteem; provides opportunities to rectify mistakes; and provide information to teachers that might help to improve teaching. In the same vein, having analysed studies from 240 million students on the role of feedback on school achievement, Hattie (2011) ranks feedback as among the top ten influencing factors of school achievement.

More studies regarding the role of feedback on human performance are reported elsewhere. For example, in Nigeria, Danga (2012) reports the role of feedback on academic performance among senior secondary school students. In Singapore, Cheah and Li (2020) report that company supervisors' structured feedback as positively influencing students' overall project performance in presentation and reports. Further, Scherman, Smit and Archer (2013) report the role of the use of feedback in schools as a means of improving academic performance in schools. Despite such a crucial role of feedback in academics, its role in school performance in Tanzania has received little attention in research and thus, it was unclear in the context of secondary schools examinations.

### Classroom Tests, Corrective Instructions and School Performance

Although better criterion performance has been associated with more frequent testing, the amount of improvement in achievement seems to diminish with the increasing number of tests (Cankoy & Tut, 2005). On the other hand, research has advised to cautiously emphasize the role of tests on learning. For example, Cankoy and Tut (2005) found that there was no difference in performance on non-routine math story problems among three groups of subjects, one of which spent 70percent of class time on test-taking skills, the second spent 50percent and the third of which only spent 30percent of class time on the same. This researcher concluded that tests and classroom instruction should emphasize and foster problem-solving skills than test-taking skills.

In similar manner, the use of corrective instructions is thought to be one of the important classrooms practices a teacher should employ as a way of helping learners reflect and assess their way of achieving learning objectives. Students also seem to be benefiting much from corrective instructions and would like to receive them for their successful learning. Calsiyao (2015) investigated the attitude of students toward corrective feedback in classroom oral errors among 365 students and found that students desired correction for all their spoken errors. Students wished they had teacher correction, peer correction, self-correction when given hints and would like to see their grammatical errors being always corrected. On the other hand, students regarded teaching without corrections as a poor method of instruction. Similarly, Kyaruzi (2019) reports that students' self-efficacy and use of teachers' feedback jointly predicted their mathematics performance to a small extent and recommends potential interventions to improve students' self-efficacy in mathematics and the use of mathematics teachers' feedback. Yet, the extent at which these subtle classroom practices and feedback might be influencing school performance in secondary schools is unclear.

## 2.0 METHODOLOGY

The study was conducted in Dodoma region. Dodoma region was purposively selected because it had the highest decline in passes in Divisions I-III of 3,822 pupils from 4,728 in 2010 to 906 in 2011 (URT, 2012). Within the region, Dodoma Municipality and Mpwapwa Districts were purposively selected so as to obtain one urban district and one rural district. Participants in this study were strategically

drawn from 12 secondary schools. The main criterion for school selection in the study was being in either low or high performing schools category; therefore, 6 schools were drawn from the top list of high performing schools and the other six were from the least performing schools in Dodoma region. This is because it was thought that students from high performing schools might be experiencing good classroom practices related to feedback and corrective instructions. About 48.9 percent (217) were males and 51.1 percent (227) were females. Their age varied between a minimum of 16 years and a maximum of 23 years with a mean age of 17.76 and a standard deviation of 1.19. Participants came from both urban and rural schools, the proportions of which are indicated together with other variables in Table 1.

**Table 1: Characteristics of the Respondents**

| Variables | Levels | Proportion | |
|---|---|---|---|
| | | F | % |
| Sex | Males | 217 | 48.9 |
| | Females | 227 | 51.1 |
| School Ownership | Government | 165 | 37.2 |
| | Private | 76 | 17.1 |
| | Community | 203 | 45.7 |
| Location of the School | Urban | 186 | 41.9 |
| | Rural | 258 | 58.1 |

Feedback and correctives were measured as part of the study conducted among 444 secondary school students. To measure this important variable, one academic subject, geography, which was a subject of interest to the researcher, was selected. questionnaire was administered to students with questions intending to collect information on teachers completion of topics as indicated in the syllabus, the kind of tests administered, timely provision of performance feedback, after-test corrections and re-marking of the corrections to check for students' improvement.

The term school performance as used in this study refers to a categorization of a school in a performance rank in terms of performance position from the first to the last. The groups are normally labelled in the best 10 and in the worst 10. The term was thus, represented by two levels of school performance namely,

high performing school (if it falls within the best 10 in the regional list) and low performing school (if it falls in the worst 10 in the regional list). This was based on the consistent appearance of some schools among the group of high performing schools while on the other hand some schools consistently appeared among the low performing group of schools. Students were thus, sampled based on low and high performing schools, the analysis was made to compare the two groups of students in what their teachers practiced regarding feedback and corrective instructions. It was thought that students from high performing schools might be experiencing good classroom practices related to feedback and corrective instruction.

## 3.0 RESULT AND DISCUSSION

### 3.1 Completion of the Planned Topics

The question on whether Geography teacher completed the topics as planned in the previous class (Form 3) syllabus was supplemented by the question that reporting the number of topics not completed if any. The findings revealed that about 82 percent (180) of students from high performing schools reported that their geography teachers completed topics as planned in the syllabus while only 17percent (38) reported that the topics were not completed. On the other hand, about 81percent (183) of students from the group of low performing schools reported not to have finished the intended topics while only 19 percent (43) reported to have completed the topics. Table 2 summarizes the results on the number of topics not completed.

**Table 2: Unfinished Topics by School Performance**

| | | High performing schools | | Low performing schools | |
|---|---|---|---|---|---|
| **Unfinished Topics** | | Frequency | Percent | Frequency | Percent |
| **Freq.** | Percent | | | | |
| **0 out of 7** | 00.0 | 180 | 82.6 | 43 | 19.0 |
| **1 out of 7** | 14.29 | - | - | 36 | 15.9 |
| **2 out of 7** | 28.57 | - | - | 67 | 29.6 |
| **3 out of 7** | 42.86 | - | - | - | - |
| **4 out of 7** | 57.14 | 38 | 17.4 | 80 | 35.4 |
| **Total** | | 218 | 100.0 | 226 | 100.0 |

Table 2 indicates that the 17 percent of students from the group of high performing schools, who reported that their teachers did not complete the intended topics, also reported that four out of 7 ideal topics were not finished. This implies that these students actually learned less than a half of the syllabus. On the other hand, of the 81 percent students from the group of low performing schools, who reported not to have finished the topics, 35.4percent learned less than a half of the syllabus (three topics), 29.6 percent missed two topics and about 15.9 percent missed one topic.

### 3.2 Administering Tests

The second component of feedback investigated was test provision in the schools. It was thought that timely testing would encourage learning, and that difference in the number of tests provided to students from high performing schools would be significant in comparison to their counterparts from low performing schools. The main question a was, 'Does your Geography teacher provide the following tests?' Table 3 summarizes the results.

**Table 3: Administering Tests by School Performance**

| | High performing schools | | | | Low performing schools | | | |
|---|---|---|---|---|---|---|---|---|
| | Yes | | No | | Yes | | No | |
| Type of test | Freq | Percent | Freq | Percent | Freq | Percent | Freq | Percent |
| A test on the first-class session before learning any Form Three geography topic | 0 | 00.0 | 218 | 100.0 | 0 | 00.0 | 226 | 100.0 |
| Short quizzes after each completed lesson | 0 | 00.0 | 218 | 100.0 | 0 | 00.0 | 226 | 100.0 |
| Weekly tests | 0 | 00.0 | 218 | 100.0 | 0 | 00.0 | 226 | 100.0 |
| Monthly tests | 38 | 17.4 | 180 | 82.6 | 0 | 00.0 | 226 | 100.0 |
| Midterm tests | 218 | 100.0 | 0 | 00.0 | 226 | 100.0 | 0 | 00.0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| End of term examinations | 218 | 100.0 | 0 | 00.0 | 226 | 100.0 | 0 | 00.0 |
| Annual examinations | 218 | 100.0 | 0 | 00.0 | 226 | 100.0 | 0 | 00.0 |

Table 3 indicates that all students from both groups of high and low performing schools reported that there were no tests on the first-class session before learning any Form Three geography topic (Diagnostic tests), short classroom quizzes after each completed lesson and weekly tests. While only 17.4 percent (38) students from the group of high performing schools (a non-government school) reported the provision of monthly tests as a common practice in their school, about 82.6 percent (180) of students from the group of high performing schools and about 100percent (226) of students from the group of low performing schools reported not to have been assessed on monthly basis. There was no difference observed between students from the group of high performing schools (N=218) and students from the group of low performing schools (N=226) in reporting midterm, end of the term and annual assessments in the schools. All students from the two groups replied in affirmative in response to the question. This was interpreted that regardless of the school category, testing (assessment) seems to be one component of feedback which is not very much emphasized in schools since with the exception of one school, the rest of the sampled schools were only conducting mandatory tests as instructed by the ministry of education and training.

### 3.3 Timely Provision of Performance Feedback

Timely provision of performance feedback was the third component of feedback investigated in this study. Students were asked whether their Geography teacher marked and brought back the marked scripts immediately after scoring. It was assumed that students from the group of high performing schools would report the timely provision of performance feedback as opposed to students from the group of low performing schools who would report the delayed feedback. The results indicated that about 82.6 percent (180) of students from the group of high performing schools reported that their teachers marked and brought back the marked scripts immediately after scoring while only 17.4 percent reported the opposite. On the other hand, about 100percent (226) of students from the group

of low performing schools reported timely provision of performance feedback (their teachers marked and brought back the marked scripts immediately after scoring).

### 3.4 Correction of the Performance Feedback

Students were asked as to whether their Geography teacher made corrections of test questions in the class after providing them with performance feedback. The results indicate that about 16.5 percent (36) of students from high performing schools reported that their teacher would make corrections of the test questions in the class immediately after scoring and giving back the marked scripts. The rest 83.5 percent (182) from the group of high performing schools and 100percent (226) students from the group of low performing schools reported that their teachers were not making corrections of the students' mistakes after receiving the performance feedback. This means that most students remained uncertain of what they were supposed to learn even after tests.

### 3.5 Re-Writing the Exercise or Tests after Correction of the Performance Feedback

This aspect sough to determine whether t students had a tendency or were directed to re-write exercises, quizzes or tests after correction of the performance feedback. about 16.5 percent (36) of students from the group of high performing schools, who reported a tendency of making corrections of the test questions in the class, also reported of re-writing the exercises, quizzes or tests after correction of the performance feedback in the class. On the other hand, 83.5 percent (182) from the group of high performing schools and 100percent (226) students from the group of low performing schools who reported that their teachers were not making corrections of the students' mistakes, also reported not to have been directed or had no tendency of re-writing the exercises, quizzes or tests.

### 3.6 Re-Marking the Re-written Exercise or Test

The last component investigated was whether teachers re-marked the re-written exercise or test for the purpose of checking students' improvement in understanding t. The results indicated that 100percent (218) of students from the group of high performing schools and 100percent (226) of students from the group of low performing schools said their teachers were not re-marking the re-written exercise, quiz, tests or examinations. Despite the fact that there was no

difference between the two groups regarding this component, it may be logically argued that given the interaction nature of the investigated components that seemed to favour students from the group of high performing schools, students from the group of low performing schools were much likely to be affected by this component. On the other hand, even students from the group of high performing schools could have increased their performances had the practice been faithfully carried out.

## DISCUSSION

This study found that feedback has something to do with school performance. This is because the acts that characterized the components of feedback in this study were found being practiced in the high performing schools than in the low performing schools. These findings are consistent with the findings in other past empirical studies (Bangert-drowns, Kulik and Kulik, 1991; Nicol & Macfarlane-Dick, 2006; Hattie, 2011; Oettingen, Marquardt & Gollwitzer, 2012) with regard to the role of feedback on school performance. Feedback in the context of this study includes completion of the planned topics, provision of short diagnostic and formative classroom tests at the beginning of the term and at the end of each lesson, weekly and monthly tests, provision of corrective instructions, and remarking (scoring) of students' mistakes. These acts, if put together with other students' characteristics have the power of making significant changes in individual student's academic performance and in the school performance as a whole. However, in the light of the past studies (Bangert-drowns, Kulik and Kulik, 1991; Cankoy and Tut, 2005), tests should be placed at an interval that allows both reflection and correction of the past mistakes while at the same time giving room to learn new materials. In addition, tests should focus on problem solving rather than test taking skills.

### Implications for School Teaching and Learning

Teaching and learning seem to be the central tasks of any learning institution. Ultimately, the quality of schools are judged by, among other criteria, school performance in terms of completion rates, how students pass examinations, and how competent they become in the skills they were being trained. In the learning process however, feedback seems to play a big role in determining school performance. If schools want to improve students' performance, teachers should actively start by testing students' abilities and skills they are potentially

and actually possessing at the beginning of the term even before teaching starts. This will inform the teacher on the appropriate approach and methods to adopt for each learner in a particular subject. In Tanzania, it seems, a tradition of providing classroom quizzes, exercises and tests is receiving less attention among subject teachers. Even when these are done little is done in practice in terms of correction of the performance feedback. It follows then that students who o score higher feel comfortable and become contented with their performances, while at the same time ignoring the mistakes and errors they make in the tests. As one keeps on ignoring such uncorrected mistakes and failures, one accumulates the potential underperformance in one's learning. Even if such a student happens to pass the final examinations and become employed, such uncorrected mistakes will ultimately limit one's performance in the job environment. This might partly explain the cry of employers that universities are preparing incompetent graduates who do not fit for employment.

These findings can also help the responsible authorities such as heads of schools, education officers and the Ministry of Education and Vocational Training to revisit the syllabus to see whether the content planned is proportionate with the time required for learning. If some schools (about 35%) are unable to finish about 57.4 percent of the planned topics in the syllabus without any disciplinary actions against the responsible teachers, then it is high time the Ministry re-visited the syllabus in connection to its structure, relevance, credits, units and time allocation. On the other hand, if these are correctly in place then teachers need to be appropriately guided to do their job responsibly.

**Implications for the Theory of School Learning**

The construct 'quality of instruction' in the theory of school learning (Bloom, 1976) includes the feedback/correctives component. In the theory, the use of feedback and correctives is emphasized as a means of ensuring that students get good quality instruction they need. The theory propounds further that feedback and correctives are likely to account for the relatively high level of students' achievement of or the relatively rapid rates of mastery set by the teacher. These findings are consistent with the arguments of the theory and the findings of the current study that students from the group of high performing schools reported much of the components of feedback including correctives than their counterparts from the group of low performing schools. Though in this study not all the constructs of school learning were exhaustively studied, most of the

constructs studied have supported the applicability of the theory in the context of school performance in Tanzania.

### Limitations, Generalization of the Findings and Implication for Future Research

the sample selection considered all the necessary criteria for inclusion in the context of school learning. Consistent to the theory of school learning, this study and previous studies elsewhere have indicated the role of feedback on school performance. The difference in the way schools implement feedback components is highly significant in school performance. However, the role of feedback was inquired from students' experiences and judgments on what they experienced in their daily schooling, and not in highly controlled experiment. In addition, though most of the constructs studied have supported the applicability of the theory in the context of school performance in Tanzania, these determinants were not studied against subsequent learning and school performance as the theory suggests. Future research therefore, might address the limitations of the current study findings. This might be by conducting experimental research on for example, how failure of completing topics in the syllabus affects school performance, whether the syllabus of secondary schools are adequately planned to be completed in the given time and whether the final examinations are detailed enough to measure all intended skills. Future research may also study the connection between feedback and subsequent learning and school performance, the impacts of correction of performance feedback on subsequent school performance, the role of re-writing exercises and tests after oral correction in the class, and re-marking the re-written tests for checking students' improvement all these could be juxtaposed with subsequent learning and school performance.

## 4.0 CONCLUSION

Based on the study findings the following conclusions are drawn, first, since students from the group of low performing schools reported higher proportion of unfinished topics than students from the group of high performing schools, unfinished topics is one of the classroom practices that play a role in determining school performance. Second, though students from both groups of low and high performing schools reported timely provision of performance feedback, most of the students regardless of the group of they came from, reported of lack of

corrections of the test mistakes in the class immediately after scoring and giving back the marked scripts; students were not directed or had no tendency of re-writing the exercises, quizzes or tests; and their teachers were not re-marking the re-written exercise, quizzes, tests or examinations. It is thus, concluded that failure to provide feedback in time and to complete topics as per the requirements of the syllabus are among the contributing factors of school performance. thus, teachers are reminded that national examinations are set based on the syllabus and the best examinations are expected to have their tables of specifications focusing on each objective of the subject matter. in this respect, good teachers should ensure timely completion of the topics to give students ample time to revise and as attempt as many exercises as possible. Furthermore, Quality Assurance Units of education should devise a mechanism of ensuring that teachers are consistently abiding by standard procedures in carrying out such important classroom practices as completion of topics and timely provision of feedback to students.

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# Impact of Land use Interventions on Crop production: A case of Payment for Ecosystem Services Scheme in the Uluguru Mountains, Tanzania

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## *Abstract*

*It was not known whether land use interventions promoted by payment for ecosystem services (PES) scheme had an increase in crop production. The study assessed the impact of PES scheme interventions on crop production in Uluguru Mountains, Tanzania. Specifically, the objectives of the paper were to (i) compare crop production before, during, and after PES scheme, and (ii) to examine factors affecting crop production. To achieve these objectives 219 randomly selected households were involved during data collection using a questionnaires survey. In addition to this, focus group discussions (FGDs), and key informant interviews were employed whereby checklists were used. Multiple regression was used to assess factors influencing crop production. A repeated measure ANOVA was used to compare crop production before, during, and after the PES scheme. The results show that, there was an increase of crop production for maize, beans, and rice where bench terraces and grass strip farming were practised, and where enough labour force was available and extension services were accessible. Farmers realise benefits using the proper interventions promoted by PES scheme, which are beyond the incentives that were provided to them. Thus, the study recommends that farmers be encouraged to continue practising bench terraces and the promoted grass strip interventions because they are appropriate for crop production and ecosystem management.*

**Keywords**: Ecosystem services, watershed, land use interventions, crop production, land degradation, bench terraces.

## 1.0 BACKGROUND INFORMATION

The agricultural sector continues to be one of the major contributors of human livelihoods because it provides employment for 2.6 billion people worldwide and

accounts for 20 to 60 per cent of the gross domestic product of many developing countries (Dickie et al., 2014). Despite that agriculture production depends on land, land degradation including soil erosion is among the fundamental global challenges facing farmers' livelihoods (Dubale, 2001; Eswaran et al., 2001; Damene et al, 2013 and Dickie et al., 2014). These challenges can lead to soil infertility, which in turn reduces the ability of the land to produce more yields.

The challenges of land degradation and low crop production are persistent phenomena in many countries including Tanzania. Crop production is the quantitative measure of crop yield in a given measured area of field (Noor and Singh, 1981). As highlighted by scholars (Bagoora, 1988; Amsalu & de Graaff, 2007), soil erosion is one of the severe challenges of crop production especially in highland areas. This is endemic in some parts of Tanzania such as Uluguru Mountains where degradation of watersheds was reported to be high (CARE and WWF, 2009), leading to a decrease of crop yields (Mahenge, 2014). The trend led to the introduction of payment for ecosystem services (PES) scheme in different countries including Tanzania as an approach aiming at minimizing environmental degradation through sustainable farming practices (Engel et al., 2008; and Waage et al., 2006)

In Tanzania, PES scheme was piloted at Kibungo Juu Ward on the Uluguru Mountains. This scheme was initiated by CARE and WWF in 2006 and the actual implementation started in 2008 and ended in 2012 (John, 2012). PES scheme aimed at improving the welfare of the people through poverty alleviation and at improving watershed management through sustainable farming methods, including bench terraces, construction, and agro-forestry (CARE and WWF, 2009). These farming methods aimed at reducing soil erosion and overall land degradation. Such practices were expected to promote the growth of the agricultural sector and hence an increase in crop production (CARE and WWF, 2008). However, it was not known whether practising the promoted interventions led to increase in crop production. In this respect, the current study investigated the impact of PES scheme on crop production.

As Adhikari and Agrawal (2013) noted, PES schemes are multi-dimensional targeting the improvement of more than one outcome. Thus, a focus on watershed management is likely to lead to continued provision of ecosystem services and improvement of land production and thereafter crop production as well. The first target of promoting adoption of land use interventions was successful as

reported by Kagata et al. (2018). Accordingly, about 60 and 90 percent of farmers adopted various types of land use interventions during and after PES scheme respectively. The findings revealed further that, while the percentage of farmers who adopted agro-forestry, reforestation, and grass strip farming practices increased after PES scheme, it was different for bench terraces. Therefore, this scenario influenced the need of assessing the impact of land use interventions on crop production. Specifically, the study (i) compared crop production before, during, and after the phasing out of the PES scheme and (ii) determined the factors influencing crop production.

The theoretical foundations of PES lies in the major principal of theory of change which tries to describe the process of social change by making explicit the perceived current situation, its underlying causes, the long term change desired, and the things that need adjustment for the change to happen. Weiss (1995) describes the theory of change as a theory of how and why an initiative works. Building on this definition, we have defined the theory of change approach to show the impact of land use interventions on crop production as a study of the links between the adoption of interventions and outcomes. The experienced low agricultural production in many developing countries is a result of different factors associated with farming practices and ecosystem management. This has resulted into the rise of different pressures from researchers, policy makers, and development agencies into focusing attention on what is really causing the current low production of African agriculture (Adekunle and Fatunbi, 2014).

This critical attention of key stakeholders in agricultural development has necessitated the promotion of conservation of natural resources and ecosystems leading to the development of Payment for Ecosystem Services (PES) schemes (Grima, 2016). Therefore, the theoretical framework of this study builds on the overarching principle of PES, which ensures that those who benefit from a particular ecosystem service compensate those who provide it, thus giving them an incentive of continuing doing so. The incentives attached to the PES are a driver for behaviour change among farmers. This is because according to researchers, environmental degradation leading to soil erosion is caused by poor farming practices carried out by farmers (CARE and WWF, 2009; Dickie et al., 2014).

Thus, long-term sustainable environmental management, which is directly linked to good soil fertility resulting into crop production, cannot be achieved

unless farmers adopt new land use interventions promoted by PES. The theory of change helps to not only understand and foster collective thinking regarding the process needed to achieve the desired change but also it helps to engage in a better learning that brings together theory and action. These changes include changes within agricultural production systems and changes in land-use practices, which help to maintain long-term production of ecosystem functions and increase production of agricultural goods, and environmental services, which is the heart of PES scheme.

## 2.0 METHODOLOGY

The study was carried out in Kibungo Juu ward, in Morogoro Rural District, Morogoro Region, Tanzania where a PES scheme was piloted. The area was selected because of the existence of land use interventions promoted by PES scheme namely bench terraces, agro-forestry farming, grass strip farming, forestation, and low crop production because of land degradation (CARE and WWF, 2008). A cross-sectional research design was employed because the design allows many variables to be incorporated at one specific time (Walliman, 2006**).** Three villages namely, Lanzi, Nyingwa, and Lukenge were randomly selected for this study. about 219 households were selected randomly for questionnaire administration while two focus group discussions (FGDs) of about 7 to 8 participants per village and 7 key informant interviews were conducted using checklists. The composition of participants in FGD based on gender issues in order to allow freedom of expression during discussion whereby in each village two FGDs were composed one for women and another for men separately.. The selection of key informants considered experience and leadership of a particular person in question at an area.

The data collection among others, included production (output per unit land per year) of cassava, maize, beans, rice, and bananas crops basing on three major periods that is before, during, and after the end of the scheme on the same piece of land. Cassava and bananas were measured in boxes commonly known as 'matenga' while maize, beans, and rice were measured in bags of 100 kg each. Furthermore, the type and number of interventions practised per each crop were also collected. Data collected on harvest quantities relied largely on farmers' memory and available records for those who kept records whereby respondents were required to provide data basing on the periods before, during, and after PES scheme implementation.

During data analysis, only those farmers who were not practising the promoted interventions but had adopted them during the scheme implementation were subjected to analysis to find out if there was any change in crop production before, during, and after PES scheme as indicated in Table 4.1. Quantitative data were summarized, coded, and analysed using Statistical Package for Social Sciences (SPSS) computer software version 16.0 to obtain descriptive statistics including means and standard deviations of the selected crops before, during, and after PES scheme. Multiple regression was used to assess factors influencing crop production after PES scheme implementation. Since this study satisfied the requirement for multiple regressions, it was used for the analysis to assess factors that influence crop production.

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + ..... + \beta_{11} x_{11} + \varepsilon_i$$

Where:

$y$ = crop production in bags/boxes measured in kg

$\beta_0$ = constant

$\beta_1 - \beta_{11}$ = coefficients

$\varepsilon_i$ = Error term

$x_1 - x_{11}$ = Independent variables

$x_1$ = Marital status of the household head (1= Married, 0 = Unmarried)

$x_2$ = Sex of the household head (1 = Male, 0 = Female)

$x_3$ = Age of the household head in years

$x_4$ = Education level (years of schooling of the household head)

$x_5$ = Number of interventions adopted by the farmers

$x_6$ = Adopt bench terraces (1 = Yes, 0 = No)

$x_7$ = Adopt agro-forestry (1= Yes, 0 = No)

$x_8$ = Adopt grass strip farming (1= Yes, 0 = No)

$x_9$ = Access to extension services (1= Yes, 0 = No)

$x_{10}$ = Household labour force size

$x_{11}$ = Years living in the same village by the household head

A one-way repeated measure ANOVA was employed to compare the mean of crop production before, during, and after PES scheme where pairwise comparison was conducted to find out if there was an increase in production. Pairwise comparison

was conducted for crops that showed significant difference in Table 4.1. One-way repeated measure ANOVA is used where the same group of participants is tested in all experimental conditions (Field, 2004). As Field (2004) suggests, repeated measures design make efficient use of participants and thus saving time and money. In this study, one-way repeated measure ANOVA was used because the same respondents were interviewed to give data basing on before, during, and after PES scheme. Qualitative information was analysed using content analysis whereby themes and sub-themes were summarized for interpretation.

As Cohen and Cohen (1983) argue, when choosing to analyse data using a repeated measures ANOVA, part of the process involves checking to make sure that the data can actually be analysed using a repeated measures ANOVA. Firstly, the dependent variable should be measured at the continuous level. In this study, the dependent variable was crop production measured in bags (100 kg per bag per acre) or boxes (50 kg per box per acre) depending on the nature of the crop. Secondly, the independent variable should consist of at least two categorical, "related groups," or "matched pairs." "Related groups" indicates that the same subjects are present in both groups. The same respondents were assessed basing on before, during, and after PES scheme. Thirdly, there should be no significant outliers in the related groups. Fourthly, the distribution of the dependent variable in the two or more related groups should be approximately normally distributed. Fifthly, the variances of the differences between all combinations of related groups must be equal. In this study, these assumptions were checked and found that the method was appropriate for data analysis.

## 3.0 RESULTS AND DISCUSSION

### 3.1 Comparison of crop production before, during, and after the PES scheme

The results in Table 1 revealed that production for cassava, maize, beans, rice, and bananas increased during PES scheme. The results indicated that there was an increase in maize production during and after PES scheme. Furthermore, there was a dramatic increase in beans production after PES scheme. However, the results revealed also that rice production decreased after the PES scheme in the study area**.** In addition, there was a small increase in both cassava and bananas production.

**Table 1: Results of crop production before, during, and after PES scheme and number of interventions adopted**

| Crop | Period of PES scheme | n (sample size) | Mean (in bags/ boxes) | Std Deviation | Wilks' lambda value | F | P- value |
|---|---|---|---|---|---|---|---|
| Cassava | Before PES scheme | 126 | 51.94 | 5.21 | 0.98 | 1.21 | 0.30 |
| | During PES scheme | 126 | 52.07 | 14.72 | | | |
| | After PES scheme | 126 | 53.33 | 9.15 | | | |
| Maize | Before PES scheme | 132 | 1.42 | 0.59 | 0.29 | 160.67 | 0.000** |
| | During PES scheme | 132 | 2.65 | 1.36 | | | |
| | After PES scheme | 132 | 4.65 | 2.43 | | | |
| Beans | Before PES scheme | 132 | 1.39 | 0.56 | 0.24 | 202.07 | 0.000** |
| | During PES scheme | 132 | 2.70 | 1.35 | | | |
| | After PES scheme | 132 | 4.67 | 2.41 | | | |
| Rice | Before PES scheme | 126 | 1.22 | 0.49 | 0.89 | 7.74 | 0.001** |
| | During PES scheme | 126 | 1.56 | 0.80 | | | |
| | After PES scheme | 126 | 1.36 | 0.57 | | | |
| Banana | Before PES scheme | 124 | 52.22 | 5.19 | 0.96 | 2.65 | 0.075 |
| | During PES scheme | 124 | 53.73 | 13.24 | | | |
| | After PES scheme | 124 | 54.43 | 10.19 | | | |

**denote significance at 5% level

The results for maize production, as indicated in Table 4.1, revealed that there was a significant difference before, during, and after the PES scheme (Wilks' Lambda = 0.288, F (2, 130) = 160.673, p = 0.000). These results suggest that maize production increased significantly over time as indicated in Table 4.2 which shows a remarkable increase in maize production whereby the change

was significant for all pairs. The increase in maize production was contributed by introduction of PES scheme in the area, which left some benefits to farmers. In this case, poor agronomic practices were the major source of low crop production as compared to high production after the introduction of PES in the study area. This assumption is also supported by one of the key informants from Lanzi village who said, "Farmers are experiencing an increase of maize production in this area as a result of the adoption of interventions promoted by PES." This means that before using the interventions, maize production was low. Similar results are reported by Stanton et al. (2010) and John (2012) who revealed that crop production in some parts of Uluguru Mountains, particularly at Kibungo Juu ward, was low before the implementation of PES scheme. As Kisaka and Obi (2013) observe, if farmers use PES opportunities, they are likely to meet their goals of increasing crop production.

Similarly, results for beans production revealed a significant increase of production (Wilks' Lambda = 0.243, F (2, 130) = 202.067, p =0.000) before, during, and after phasing out of the scheme. As Table 4.2 indicates, the difference was positive implying that beans production increased, which was probably due to the use of bench terraces farming during and after the PES scheme, leaving other factors constant. In this respect, in one of the FGDs held at Lukenge village the following was revealed:

> *"When we started to practise bench terraces in our farms, beans harvest has increased than before" (FGD with farmers at Lukenge, 21st May 2016)*

This means that proper land use interventions have an impact on crop production. Similar observation is made by a key informant at Lukenge Village, who said,

> *"There was an increase of beans production as a result of using bench terrace farming because the steep slope is reduced by the bench terraces thus soil erosion decreases".* FGDs in Lukenge Village *26st June 2016.*

Before PES, many farmers used to grow such crops on steep slopes, which were more vulnerable to erosion (CARE and WWF, 2008). The results on rice production revealed further that there was a significant increase during PES scheme (Wilks' Lambda = 0.889, F (2,124) = 7.736, p = 0.001). Pairwise comparison in Table 2 shows a decrease in rice production after PES, because some farmers abandoned the appropriate practices such as bench terrace farming because of being labour

intensive (Kagata et al., 2018). One of the key informants from Nyingwa village revealed further,

> "*Some farmers continued to grow rice on steep slopes, a situation which led to decrease of production*." KIIs in Nyingwa Village *24st June 2016*

However, for banana crop, there was no significant difference in production (Wilks' Lambda = 0.938, F (2,122) = 2.647, p = 0.075). In the FGDs held at Nyingwa village one of the participants reported,

> "*Many of us did not change our farming practices for some crops such as bananas that is why there is no change in production" (FGD with farmers at Nyingwa, 11st April 2016)*
>
> *This observation is in line with the observation by one of the key informants from Lukenge village, who said, "Farmers who are practising bench terrace farming for crops such as maize and beans had increased production*." FGD's in Nyingwa Village *23st June 2016.*

This means that if farmers could practise these interventions, particularly the bench terraces in the study area, they were likely to increase banana production, other factors remaining constant. Similar observation is made by Obalum et al. (2012) who say that sustainable agricultural practices can increase crop production. The terraces reduce erosion and conserve moisture, which in turn improves soil fertility (Damene et al., 2013). An increase in soil fertility may lead to an increase in crop production.

Cassava production results showed no significant difference in production across the three periods before, during, and after PES (Wilks' Lambda = 0.981, F (2,124) = 1.214, p =0.301). This was because few cassava farmers used the appropriate agricultural practices promoted by the PES scheme as one of the key informants from Lanzi village revealed,

> *"Few farmers implemented the appropriate interventions for cassava crop."* KII in Lanzi Village. *26st June 2016.*

This was also supported by one of the key informants from Nyingwa village who said, if many farmers could use bench terraces on steep slopes cassava

production could increase and thus encourage other farmers into using the promoted interventions.

**Table 2: Pairwise Comparisons results for crop production before, during, and after PES scheme**

| Measure | (I) factor1 | (J) factor1 | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval for Difference | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| Maize | 2007 | 2010 | -1.235 | 0.143 | 0.000** | -1.581 | -0.888 |
| | | 2015 | -3.250 | 0.233 | 0.000** | -3.816 | -2.684 |
| | 2010 | 2007 | 1.235 | 0.143 | 0.000** | 0.889 | 1.581 |
| | | 2015 | -2.015 | 0.114 | 0.000** | -2.292 | -1.738 |
| | 2015 | 2007 | 3.250 | 0.233 | 0.000** | 2.684 | 3.816 |
| | | 2010 | 2.015 | 0.114 | 0.000** | 1.738 | 2.292 |
| Beans | 2007 | 2010 | -1.318* | 0.120 | 0.000** | -1.609 | -1.027 |
| | | 2015 | -3.280* | 0.223 | 0.000** | -3.820 | -2.741 |
| | 2010 | 2007 | 1.318* | 0.120 | 0.000** | 1.027 | 1.609 |
| | | 2015 | -1.962* | 0.271 | 0.000** | -2.619 | -1.306 |
| | 2015 | 2007 | 3.280* | 0.223 | 0.000** | 2.874 | 3.820 |
| | | 2010 | 1.962* | 0.271 | 0.000** | 2.741 | 2.619 |
| Rice | 2007 | 2010 | -0.330* | 0.086 | 0.000** | -0.542 | -0.125 |
| | | 2015 | -0.135 | 0.670 | 0.139 | -0.298 | 0.028 |
| | 2010 | 2007 | 0.333 | 0.860 | 0.000** | 0.125 | 0.542 |
| | | 2015 | 0.198 | 0.890 | 0.081 | -0.017 | 0.414 |
| | 2015 | 2007 | 0.135 | 0.670 | 0.139 | -0.028 | 0.298 |
| | | 2010 | -0.198 | 0.890 | 0.810 | -0.414 | 0.017 |

Based on estimated marginal means

**. The mean difference is significant at the 0.05 level.

b. Adjustment for multiple comparisons: Bonferroni.

**Note: 2007 = Before PES scheme, 2010 = During PES scheme, 2015 = After PES scheme**

### 3.2 Factors Influencing Crop production in the study area

The multiple regression results in Table 4.3 show that grass strip farming, bench terraces farming, years of living in the same area, extension services, and the size of household work force were statistically significant in influencing crop production in the study area. The type of interventions, particularly bench terraces and grass strip farming practises increased maize production. The number of interventions alone did not have statistical significance in influencing crop production. The evidence that the type of land use intervention rather than the number of implemented intervention influence crop production was supported by participants during FGDs, which showed that bench terraces construction and the use of grass strip farming increased production for beans and maize.

This observation was supported by one of the key informants from Lanzi Village, who said,

> "*Some farmers in the village who decided to grow crops such as beans and maize on bench terraces increased production." KII 26st June 2016*

The findings imply that the adoption of appropriate interventions for a certain crop is what matters**.** Access to extension services was also found to influence crop production because farmers were advised by Agricultural Extension Officers to use proper land use interventions. That is, as farmers get more extension services, there is a possibility to have farmers adopting appropriate interventions and thereby implementing them appropriately, as. One of the key informants said,

> *"PES scheme implementation requires access to extension services for close technical support." KIIst June 2016*

In another FGD at Lukenge Village, one participant had this to say,

> *"Extension officers always assist us to adopt the right interventions in order to increase crop production" (FGD with farmers at Lukenge, 26st June 2016)*

This means that farmers need information about proper farming practices. This is in line with Lambrecht's et al. (2014) observation that access to information through extension agents and programmes not only increases farmers' awareness

about improved technologies but also facilitates access to quality information that is more appropriate and adaptable to their local conditions.

**Table 3: Factors that Influence Crop production**

| Input variable | Coefficient ( β ) | Standard error | t | Sig. |
|---|---|---|---|---|
| (Constant) | 0.252 | 0.154 | 1.641 | 0.104 |
| Agro-forestry | -0.026 | 0.039 | -0.670 | 0.504 |
| Grass strip farming | 0.339 | 0.058 | 5.860 | 0.000** |
| Sex | -0.073 | 0.044 | -1.660 | 0.099 |
| Age | 0.000 | 0.001 | -0.679 | 0.499 |
| Education level | 0.004 | 0.005 | 0.801 | 0.425 |
| Marital status of the household head | -0.012 | 0.041 | -0.304 | 0.761 |
| Extension services | 0.090 | 0.041 | 2.206 | 0.029 |
| Household labour force size | 0.229 | 0.058 | 3.941 | 0.000** |
| Years living in the same area | -0.011 | 0.002 | -5.652 | 0.000** |
| Bench terraces farming | 0.565 | 0.054 | 10.488 | 0.000** |
| Number of interventions adopted | -0.001 | 0.031 | -0.041 | 0.968 |

Residual DF =118, $R^2$ = 0.839, Adjusted $R^2$ = 0.821, Std error estimate = 0.208, RSS = 5.087

**Significant at 5%

Years of living in the same area was found to influence crop production negatively because number of years of the farmer living in the same area reduces the probability of adopting new agricultural practices. In one of the FGDs, it was reported that,

> *"We were born in this area and we used to cultivate on the slopes without the use of bench terraces, we cannot use them unless there is an additional benefit to convince us (FGD with farmers at Lanzi, 15th April 2016)*

This means that farmers who are still living in the same place of birth, convincing them is difficult. These results are in line with the results in a study by John (2012) revealing that the number of years a farmer lived in the same area is likely to influence the adoption of new agricultural practices negatively. Household labour force influenced the chances of farmers' adoption of new agricultural practices, particularly the bench terraces farming, and this in turn influences crop production. This means that households with more labour force were more likely

to adopt interventions, especially labour-intensive ones such as bench terraces farming. One of the participants of FGDs at Nyingwa village had this to say,

> *"In order to implement land use interventions promoted by PES scheme such as the bench terraces farming, enough labour force is needed because they are labour intensive." (FGD with farmers at Nyingwa, 11st April 2016)*

The majority of households had an average of two people who could work on the farms. This made it difficult to implement some of the proposed interventions such as bench terraces, which are labour intensive as it was revealed by one of the key informants in the study area.

## 4.0 CONCLUSIONS AND RECOMMENDATIONS

Generally, the study found an increase in crop production for beans and maize during and after PES scheme intervention. The findings revealed further that farmer who practise bench terraces and grass strip farming were likely to report experiencing higher crop production than was the case with their counterparts. Other factors such as access to Agricultural Extension Officers, enough work force in the farming households were among the significant factors for increased crop production. Thus, the study concludes that farmers realise that the PES scheme was beneficial in terms of crop production because of adopting land use interventions promoted. Therefore, basing on this argument, this study recommends that Department of Agriculture at the district level should encourage farmers to adopt proper land use interventions so that they can get short term benefits direct from farming practices.

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# Gendered Access and Control over Quality Declared Seeds (QDS) Resources among Rice Producers in Kilombero District, Morogoro, Tanzania

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## *Abstract*

*Quality Declared Seed for increased agricultural productivity is pertinent to farmers. This study assessed the gendered access to and control over QDS resources among rice producers. A cross sectional research design was used, whereby a questionnaire was administered to 218 rice farmers in Kilombero District. Focus Group Discussions and Key Informant interviews were conducted to complement and allow triangulation of data. Descriptive statistics were analysed using SPSS, while content analysis was used to analyse qualitative data Specifically, SPSS computer software was used to analyse descriptive statistics such as Tab. The results show that access to credit was very low among farmers in the area even though women (45%) were found to have more access to credit than has been the case with men (13%). On the other hand, men were found to have more access to inputs (22%) and agricultural training (29%) than was the case with women. Women in the study area had access to land, but lacked control over it. Cultural barriers strongly affect and influence ownership of resources including land for rice Quality declared seed production among women farmers. ,. It is concluded that women get less benefits in rice QDS production due to poor access to and control of productive resources. There is a need of removing all cultural barriers by creating awareness on equitable access and proper control of productive resources among both men and women using gender sensitive programs in collaboration with relevant government machinery.*

**Keywords:** Gender, land access, control resources, quality declared seeds.

## 1. Introduction

The Tanzanian government is determined to improve agricultural productivity as a source of raw material for industries and to attain sustainable development.

The National Agricultural Policy of 2013 considers gender as an important crosscutting issue in improving agricultural production (Mnimbo, 2018). Gender refers to the social constructed relationship and responsibilities between women and men (see Madaha, 2012, 2018). An important element for improving agricultural productivity is increased farmer access to improved technologies. Tanzanian women constitute the majority (over 90.4%) of agricultural labour force producing about 70 percent of the country's food requirements (FAO, 2015). However, most farming and livestock keeping activities have been socially assigned to women. Consequently, women face many challenges including lack of credit, improved seeds, pesticides, and fertilizers. Women are further constrained by limited educational background, poor networks, and mobility restrictions. The capacity of women farmers to employ improved technology and investment depends on their access to and control over productive resources. If incomes of women are increased, they may have more access to resources, which can help them invest in their children's education, health care, and nutrition (Sikira and Kashaigili, 2016). Both men and women contribute significantly to agricultural production yet, women's access to and control over these agricultural productive resources differ (Thabit 2014). The term access to resources means that both women and men are able to use and benefit from specific resources (material, financial, human, social, and political). Control over resources means that both men and women have access to a resource and can make decisions on the use of those resources. For example, control over land means that women can access land (use it), own land (can be the legal title-holders), and make decisions about whether to sell or rent the land.

An important productive input, among others includes Quality Declared Seeds (QDS): QDS refers to seeds subjected to a form of quality assurance that was created to reduce the burden of rigorous conventional seed certification, while retaining the basic characteristics of external quality assurance. This was meant to increase access to quality seed for smallholder farmers. Smallholder farmers refer to people who provide labour, management and own/control small landholding they farm (Assuming-Brepong et al., 2007). QDS are produced by small-scale farmers who are trained by Tanzania Official Seed Certification Institute (TOSCI) under the supervision of Seed Inspectors working for Local Government Authorities (LGAs) (TOAM, 2015). This kind of production needs many administrative procedures whereby the farmer has to be registered at TOSCI. However, studies focusing on gendered access to and control over QDS resources especially within the Tanzanian context are rare. The existing studies have focused on access to and

control over land (Barume, 2014; Loserian and Jeckoniah 2018), and gendered access and control over land and water resources (Sikira and Kashaigili, 2016). Other recent studies focus on agricultural productivity (Doss, 2018), rice yield (Kulyakwave1 Shiwei1, and Yu1 2019), adoption of recommended rice varieties (Mligo and Msuya, 2015), and agricultural land use planning (Massawe et al., 2020). However, none of the studies has focused on gendered QDS utilization and production. Gender difference arising from socially constructed relationship between men and women, affects the distribution of agricultural resources and cause many disparities in the outcomes of development (Mnimbo, 2018)

Further, women face several challenges, most importantly cultural barrier restrictions in accessing land compared to men. Women control land that is often of poorer quality within the secure tenure (Sikira and Kashaigili, 2016). Similar observation is made by Mehra and Rojas (2008) who reveal that women were able to access only one per cent of credit in the agricultural sector because of lack of land as collateral. Equally, in cases where rice QDS equipment suitable for women rice QDS production are available, the majority of them are either unaware or do not have enough funds to purchase them. They therefore continue to use old methods such as f hand hoes, which decrease their working speed and productivity (World Bank, 2008).

Other challenges facing women farmers include the reason that their work in the agricultural sector is largely ignored (FAO, 2015), application of inappropriate technologies, and discriminatory social-cultural practices and beliefs (URT, 2013). Due to these facts, progress in the agricultural sector is hindered. Scholars such as Massawe et. al., (2020), Jeckoniah (2019), Sikira and Kashaigili (2016), Thabit (2014), have studied gender access to and control over agricultural resources and gender analysis in rice production. However, the studies are predominantly quantitative. Besides, little has been documented on gendered access to and control over resources among rice QDS beneficiaries in Kilombero District. Thus, this study assessed gendered access to and control over rice QDS resources among rice producers so as to highlight areas for boosting QDS production among smallholder farmers in Kilombero District.

This study was guided by Socialist feminism informs this article. The theory recognizes oppression of women within multiple identities such as race, sexuality, ethnicity, gender, and nationality. That is, socialist feminism recognizes that gender oppression is context specific. In this regard, socialist feminism

synthesizes women's oppression by capitalism and patriarchy. It calls for inclusive movements by the oppressed women such as working-class women and rural peasants in collaboration with interested men to transform power relations in favour of a more just society. The GAD strategy is a strand of socialist feminist theory that has become a buzzword in the Global South including Tanzania (Moser, 1993; Parpart et al., 2000; Kabeer 2003; Brenner, 2014; Madaha, 2018). Informed by socialist feminism, this study explored gender roles, responsibilities, access to and control over resources, and opportunities, as well as hidden power structures that govern the relationships between them. Gender relations in most societies tend to influence access of males and females to critical resources necessary for their development. However, the elements are also important since gender relations in rice QDS production consider gender as an important aspect that can hinder development (UNDP, 2010). Therefore, for the rice QDS production to be achieved among smallholder farmers it is very important to integrate gender at all levels. As such, GAD, as a strand of socialist feminist theory, is in a position to examine the existing gender inequalities and opportunities in the distribution of resources, responsibilities, and power across rice QDS production in Kilombero District. According to World Bank (2012), gender inequality is the difference between men and women in terms of opportunities or unequal treatment or perceived differences based solely on issues of sex.

## 2.0 Methodology

This study was conducted in Kisawasawa, Mang'ula, and Nkula Wards in Kilombero District, Tanzania. Kilombero district was chosen because (i) The district has farmers registered for rice QDS production (TOSCI, 2018) and (ii) The district is one of major rice production and supply centres (Mligo and Msuya, 2015). The population for this study consisted of all rice farmers (also referred to as rice producers) in Kilombero District Council with some access to QDS. The study employed cross-sectional research design whereby data were collected at a single point of time.

The unit of analysis included individual farmers who produce and utilize QDS. A representative sample was drawn from all farmers who produce and utilize QDS. The sample size was determined using Yamane (1967). Random sampling procedure was used to select a representative sample of rice producers. A sample of 389 smallholder rice farmers was randomly chosen. To ensure that the number of sampled households of smallholder farmers in a particular village

is proportional to its total number of households, a proportionate random sampling was applied. However, a sample of 218 was available during the survey for interview.

Data were collected using qualitative and quantitative methods. A semi-structured interview guide was employed to collect qualitative and some descriptive statistics. A semi-structured interview comprising closed and open-ended questions was designed to solicit information from the respondents. Harvard Analytical Framework (HAF) was used to guide the collection of information related to gendered access and control over resources in QDS production.

Data entry and cleaning were done after data collection. Quantitative data were analysed using Statistical Product and Service Solutions (SPSS) version 20. Specifically, SPSS was used to generate descriptive statistics including percentages. Qualitative data were analysed using content analysis.

## 3.0 Results and Discussion

The demographic variables used in this study include age and education level. Results in Table 1 show that the maximum and minimum ages of the respondents were 61 and 18 years respectively. A large proportion (68.8%) of the respondents fell within the age groups 25-34, 35-44, and 45-54 years, meaning that, the majority of the respondents were within the economically active age category. One of the explanations of the findings is that the majority of rice producers are young people. The results also show that 51.4 percent of the respondents were males while 48.6 percent were females. This suggests dominance of males in the rice QDS farm sector.

As for the educational level, the majority (99.5%) of the respondents had qualifications ranging from primary education to college/tertiary levels, while only 5.0 percent of the respondent had no formal education. Education level is used to measure the ability of a person to utilize the available information to increase production and to influence major decisions made in the household and in farm management (Thabit, 2014).

**Table 1: Social-demographic characteristics**

| Variable | Frequency | Percentage |
|---|---|---|
| **Age of respondents** | | |
| 18-24 | 21 | 9.6 |
| 25-34 | 44 | 20.2 |
| 35-44 | 61 | 28.0 |
| 45-54 | 45 | 20.6 |
| 55-60 | 34 | 15.6 |
| 61 and above | 13 | 6.0 |
| **Sex of respondents** | | |
| Male | 112 | 51.4 |
| Female | 106 | 48.6 |
| **Education level of respondent** | | |
| No formal education | 11 | 5.0 |
| Primary education | 170 | 78.0 |
| Secondary education | 34 | 15.6 |
| College education | 2 | 0.9 |
| Graduate and above | 1 | 0.5 |
| Married | 157 | 72.0 |
| Single | 32 | 14.7 |
| Divorced | 2 | 0.9 |
| Widow/Widower | 12 | 5.5 |
| Separated | 10 | 4.6 |
| Cohabit | 5 | 2.3 |

A literate society is better in understanding and competent in performing different activities including rice QDS production. Thus, education level is one of the basic measures, which can be used to decide the status of the society. Low level of education denotes powerlessness in social and economic spheres of life. Lack of power is reflected in their less control over their own income, and lack of bargaining power in selling their own produce and labour (Jeckoniah et al., 2012).

Lack of or having little education makes it difficult for women to gain access to and to use some of the resources such as land, improved seeds, credit facilities, and farming inputs including fertilizers (Madaha, 2012, 2018). Lack of or having little education also prevents women from adopting new technologies as readily as men do (Kulyakwave1 et al., 2019: Fakih, 2015). Equally, women have inadequate skills and knowledge because of discriminatory access to the productive resources (Ellis, 2000). Similar findings are reported by Kulyakwave1 et al. (2019) who pointed out that adequate education could help farmers in technology acceptance and accessing extension services.

The survey results indicated further that majority (72%) of the respondents were married, while less than one-third (28%) were divorced, single, widows/ widowers, separated/divorced, and cohabiting. One explanation of the study is that the society is matrimonially stable. A study by Kulyakwave1 et al. (2019) has revealed that marital status of farmers has significant influence on rice yields. The findings also imply that married couples are more experienced and are capable of sharing knowledge and capital to influence yields. These findings are consistent with the findings in some past quantitative studies reported by other scholars (see Otekhile, 2019; Mwatawala, 2016; Ogunmefun, 2015; Mango et al. 2018; Ngailo et al., 2016). However, the article supports the thesis by Kulyakwave1 et al. (2019) that, many household members could contribute more to the households' welfare if all are engaged to rice QDS production.

Slightly more than one-third (34.9%) rented land, 31.2 percent bought their farm, and 19.7 percent inherited their farms. Another segment indicates that 14.2 percent borrowed land from their families. Families owning land have a wider chance of practicing crops diversifications and could lease land to other families. In return, the received money could help to cover for some farming operations such as weeding, purchase of fertilizer and improved seed and irrigation.

The distribution of the farm sizes showed that 26.2 percent had farm size ranging from 0.1-1.9 acres, 48.6, 15.6, and 6.4 percent had farm sizes ranging from 2.0-3.9, 4.0-5.9 and 6.0-10.9 acres respectively. Only 3.2 percent of the respondents had farm size ranging from of 11.0 acres and above. The findings indicate further those farmers own farm size less than 11 acres. Farm size in this case is the total area of the cultivated land measured in units such as an acre. According to Sikira

and Kashaigili (2016), there is a positive relationship between farm size and an increase in food production. A similar observation is reflected in this study. The larger the farm size the higher the expected level of food production. It is also expected that farmers with larger farmland would cultivate rice QDS since QDS requires enough land for isolation. That is, women can only engage in QDS production if they own a relatively large plot of land.

The findings reveal some key challenges in the ownership of farms. For instance, 33.5 percent of the respondents cultivate rice in the farms owned by their parents. The majority of the parents (i.e. 82%) were men. Further, 25.5 percent of the respondents cultivate rice in the farms owned by husbands. Given the patriarchal culture in the district, women can easily loose access to such farms. Sadly, only 7.8 percent cultivate rice in farms owned by wives. Farms, which are jointly owned, by husbands and wives were only 2.3 percent. This is very small proportion. The disturbing results indicate that about 30.9 percent of the respondents cultivated farms owned by nonfamily members. One explanation of the finding is that such peasants are vulnerable because they can end up losing such access.

Again, women are disproportionately affected because 76 percent of such farms were owned by men. Overall, the results imply that men have dominance over women in farm ownership. Meaning that, there is a need for women to be assisted in the ownership of farm. Farm ownership can serve as collateral for accessing credit. The findings are in line with findings in a study by Sikira and Kashaigili (2016), who revealed that, lack of control over land, endangers women's ability of improving their livelihood. However, the study did not focus on QDS; instead, it focused on gendered access and control over land and water Resources in the Southern Agricultural Growth Corridor. Overall, the constraints to land ownership also affect rice QDS farmers, as they cannot use their land to access loan from financial institutions. A salient finding of the study is that access to QDS is not sufficient in absence of farm ownership. Further, for QDS production to be efficient, and effective, there is a need of addressing gender inequalities among rice producing communities.

Table 2 indicates that women had more access to land (22%) than men (16.1%). Further, although access to credit was very low among farmers in the area, women (45%) had more access to credit than men (13%) did. On the other hand,

men had more access to inputs (22%) and agriculture training (29%) than women did (17.9% and 16.9%).

**Table 2: Access to QDS productive resources**

| Gender / Variables | Men | | Women | | Men & Women | | None | |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % |
| Access to land | 35 | 16.055 | 48 | 22.0183 | 111 | 50.9174 | 24 | 11.0092 |
| Access to inputs (i.e. QDS) | 49 | 22.4771 | 39 | 17.8899 | 83 | 38.0734 | 47 | 21.5596 |
| Access to credit | 13 | 5.9633 | 45 | 20.6422 | 75 | 34.4037 | 62 | 28.4404 |
| Access to agricultural training | 64 | 29.3578 | 37 | 16.9725 | 67 | 30.7339 | 51 | 23.3945 |
| Access to extension services | 65 | 29.8165 | 36 | 16.5138 | 77 | 35.3211 | 40 | 18.3486 |
| Access to technology | 58 | 26.6055 | 31 | 14.2202 | 65 | 29.8165 | 64 | 29.3578 |
| Access to hand hoe | 40 | 18.3486 | 48 | 22.0183 | 108 | 49.5413 | 22 | 10.0917 |
| Access to Ox plough | 43 | 19.7248 | 27 | 12.3853 | 81 | 37.156 | 67 | 30.7339 |
| Access to backpack sprayer | 69 | 31.6514 | 38 | 17.4312 | 77 | 35.3211 | 34 | 15.5963 |
| Access to bicycle | 38 | 17.4312 | 36 | 16.5138 | 106 | 48.6239 | 38 | 17.4312 |
| Access to motorcycle | 56 | 25.6881 | 31 | 14.2202 | 71 | 32.5688 | 60 | 27.5229 |
| Access to vehicle | 45 | 20.6422 | 27 | 12.3853 | 64 | 29.3578 | 82 | 37.6147 |
| Access to tractor | 67 | 30.7339 | 36 | 16.5138 | 80 | 36.6972 | 35 | 16.055 |
| Access to bank account | 34 | 15.5963 | 23 | 10.5505 | 70 | 32.1101 | 91 | 41.7431 |

**Key**: *No. number of the farmers*

The fundamental point is that input access is important in rice QDS production because it ensures increased production. The finding implies that women with less access to input can experience reduced productivity per acre as compared to men with access.

These findings show that agricultural productivity is decreased if women have less access to farm inputs. The finding is consistent with the findings in a study by Doss (2018) whose study had a similar conclusion. According to Umuhoza

(2012), the capacity of an individual to engage in rice QDS production normally depends on access to the productive resources. The findings from FGD showed that women require the enabling environment to make sure that they have access and control over resources and utilization of QDS in order to increase production. , The findings are in contrast with those reported in a study by Akter et al. (2016) who revealed that in some South-East Asian countries, there is no evidence of a gender gap in terms of access to and ownership of resources.

In terms of access to credit, women enjoyed better access to credit (20.6%) than the men (6.0%) did. As for credit, men had more control (26.6%) than women (12.8%) did. The findings are consistent with the findings in a study by Seleman (2017) who found that many Government initiatives attempt to increase access to credit but they ignore gender empowerment. A useful initiative would be the one that enables women to own collateral.

In terms of bank accounts, men also dominate in access (15.6%) and in control (23.4%) over bank accounts. Key informant interviews revealed that women in the society are not given much opportunity to control over finances within their family. One of the key informants summarized the views captured in other key informant interviews by saying

> *"I do not ask my husband for money for agriculture. I know that he will not provide me with such money. In the beginning of the farming season, I normally go and borrow money from our community bank known as Village Community Bank (VICOBA) group for land preparation, harrowing, planting, weeding and harvest. I also buy inputs such as improved seeds, fertilizers, herbicides and pesticide etc". (A female participant, QDS producer at Nkula village, Kilombero District, Morogoro 23/10/2019)*

The findings are consistent with the findings reported from FGDs, which indicated that women hardly make decisions on finances within their households. Some women who attempted to inquire on financial resources from their partners became victims of Gender Based Violence. One explanation of the finding is that women lack control of financial resources in such patriarchal households. Instead, they rely on external informal sources such as VICOBA to meet some of their financial needs. They do so to avoid quarrelling with their partners. The findings are similar to the findings in other studies (see Fakih, 2015; Thabit, 2014). Fakih (2015) reports that women depend on own means to get things

done during the agricultural production season. Similarly, Thabit (2014) is of the opinion that women have more difficulties than is the case with men in gaining access to resources such as land, credit, and productivity enhancing inputs such as QDS and extension services. This trend can be attributed to the reality that, QDS production experience challenges that affect overall agricultural production. That is, for QDS challenges to be addressed, the government, and other development agencies need to employ a holistic approach that addresses all challenges in the agricultural sector.

In the same vein, the patriarchal culture allows men (see Table 3) to have more control over the land (41.0%) than it does with the women (18.8%). The consensus across FGDS was in line with the findings. The findings are consistent with the findings in a study by Quisumbing and Pandolfelli (2010) who revealed that men are given preference over women in controlling land. However, the study by Quisumbing and Pandolfelli was conducted in a different context. A unique contribution of this study is the identification of a number of reasons that block women from inheriting land in Kilombero District. First, there is a belief that land owned by a woman may be transferred to another man, if the husband dies. Second, the wife who divorces her husband may transfer land ownership to another man who marries her. The findings imply that interested women have a less chance of producing rice QDS because of gender-based discrimination. Women need to own an additional farm for producing QDS. That is, rice QDS need to be produced within an isolation distance of 4 metres away from the surrounding farms. This is done to avoid cross-pollination.

**Table 3: Control over productive resources**

| Gender Variables | Men | | Women | | Men & Women | | None | |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % |
| Control of land | 89 | 40.8257 | 41 | 18.8073 | 67 | 30.7339 | 21 | 9.63303 |
| Control of inputs | 77 | 35.3211 | 35 | 16.055 | 70 | 32.1101 | 36 | 16.5138 |
| Control of credit | 58 | 26.6055 | 28 | 12.844 | 41 | 18.8073 | 91 | 41.7431 |
| Control of agricultural training | 72 | 33.0275 | 35 | 16.055 | 48 | 22.0183 | 63 | 28.8991 |
| Control of extension services | 64 | 29.3578 | 33 | 15.1376 | 58 | 26.6055 | 63 | 28.8991 |
| Control of technology | 56 | 25.6881 | 28 | 12.844 | 53 | 24.3119 | 81 | 37.156 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Control of hand hoe | 68 | 31.1927 | 49 | 22.4771 | 89 | 40.8257 | 12 | 5.50459 |
| Control of Ox plough | 46 | 21.1009 | 16 | 7.33945 | 15 | 6.88073 | 141 | 64.6789 |
| Control of backpack sprayer | 78 | 35.7798 | 23 | 10.5505 | 47 | 21.5596 | 70 | 32.1101 |
| Control of bicycle | 82 | 37.6147 | 28 | 12.844 | 61 | 27.9817 | 47 | 21.5596 |
| Control of motorcycle | 54 | 24.7706 | 15 | 6.88073 | 23 | 10.5505 | 126 | 57.7982 |
| Control of vehicle | 37 | 16.9725 | 13 | 5.9633 | 21 | 9.63303 | 147 | 67.4312 |
| Control of tractor | 40 | 18.3486 | 15 | 6.88073 | 19 | 8.7156 | 144 | 66.055 |
| Control of bank account | 51 | 23.3945 | 19 | 8.7156 | 34 | 15.5963 | 114 | 52.2936 |

**Key**: No. number of the farmers

The findings are in line with what was reported during key informant interviews. One female key informant- summarizing the views of other key informants- by remarking that women in the society are not given the opportunity of controlling land within their family; this is what she had to say,

> *"I cannot produce rice QDS. QDS production requires large land area. It is extremely difficult for women to own land. Besides, I cannot take land from my neighbours to grow QDS (A female Key informant, at Kisawasawa village, Kilombero district, Morogoro 20/10/2019.)*

All FGDs arrived at a similar conclusion. The statement and the FGDs indicate how some women experience socially imposed barriers to the production of rice QDS because of lack of land. One explanation is that land is an important asset for humans' survival. It is a major source of income and livelihoods for most rural people as it is for urban dwellers. The finding resonates with the findings in past research conducted elsewhere (Barume, 2014; Loserian and Jeckoniah, 2018). Given its importance, access to and availability of land resources is critical in ensuring real and long-lasting improvements in social, economic, and political well-being. The ownership and utilization of land as a productive resource for rice QDS production and as an important asset directly define wellbeing of farmers in the community. Table 3 reveals that men have more control over inputs (35%) than is the case with women (16.1%).

Agricultural training, extension services, and technology can play a crucial role in boosting production, and utilization of QDS. Nevertheless, gender mainstreaming has to be incorporated to ensure fair access to such resources

by all sexes. Overall, the findings of the study indicate that a higher percentage (29.4%) of men have access to agricultural training compared to women (17.0%). A similar trend is observed for access to extension services and access to, and control over technology (see Table 2). Some related studies have shown a similar trend (see Simiyu and Foeken, 2014, Quisumbing et al., 2014; Lamontagne-Godwin et al., 2017; and Mudege et al., 2017). According to Mudege et al., (2017), women are often at a disadvantage position concerning accessing agricultural training, extension services, and modern technology.

Agricultural extension services are meant to assist farmers adopt enhanced practices leading to increasing production and ensuing well-being. It has been generally accepted that extension services are more available to male than to female farmers. In addition, in Kilombero there were NGOs (e.g. USAID-Feed the Future) and Government Institutions such as TOSCI, which helped farmers with knowledge and extension service. The institutions encouraged women to be included in such interventions to allow them access aid such as seed for QDS training and extension service.

As FAO (2011) observes, service providers tend to approach men more often than they do for women because of the general misperception that women do not farm. It is evident that women do not have the powers to decide at the household level, men have to decide on their behalf that is why men have the powers to decide to attend trainings on behalf of women. In addition, there are some expectations that there would be a "trickle down" effect from men as heads of households to the rest of the household members. Information from key informants and focus group discussions also indicated that men normally represent their wives in accessing agricultural training, extension services, and modern technology. These results reveal that women are often at a disadvantage position concerning accessing agricultural training, extension services, and modern technology. Women are the main contributor to agricultural production, leading to increased food security and in income in the community. If women do not have access to agricultural training, extension services, and modern technology, agricultural productivity is likely to decrease.

In case of bank accounts, men also dominate in access (15.6%) and in control (23.4%) over bank accounts (see Tables 2 and 3). During key informant interview, one of the key informants remarked that women in the society are not given much opportunity to control over assets in the society and in their family because

of religion. This is shown in the quote below of one of the key informants: "In our religion (Muslim) women must be behind men and not in front of men in everything" (A male key informant at Kiberege village, Kilombero District, Morogoro 4/10/2019).

Overall, the study reveals that socially constructed roles and stereotypes in production, and utilization of QDS favour men at the expense of women. The findings imply that gender mainstreaming is an essential ingredient for successful interventions in QDS utilization and production.

## 4.0 Conclusion and Recommendations

The study has revealed that women get fewer benefits in rice QDS production due to poor access to and control over productive resources, which are largely are a result of cultural barriers that exist in many societies. To achieve increased production in rice QDS; there is a need of getting rid of cultural barriers to integrate gender at all levels and create awareness for both men and women. Using gender sensitive programs, will allow not only equality in use, but also a sustainable utilization of rice QDS resources. The important contribution of the study is that QDS cannot be isolated from the rest of the challenges facing the agricultural sector. That is, there is a need of a holistic approach that addresses the challenges in the agricultural sector including gender-based oppression. Isolated efforts are unlikely to be fruitful. Further, the findings of this study support the GAD theory, that is, socially constructed roles indeed affect not women alone but the entire community. There is a need of ensuring gender equality to facilitate production and utilization of QDS rice.

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- Level 3 Headings: 12-point size, bold font style, italics

For example:

*3. **Study Methodology***

***3.1 Study Design***

***3.1. Data Collection tools***

Divide your article into clearly defined and numbered sections. Subsections should be numbered as indicated above (the abstract is not included in section numbering). Use this numbering also for internal cross-referencing: do not just refer to 'the text'. Any subsection may be given a brief heading.

## Tables and Figures Format

Figures and tables should be embedded in the body of the paper. The title of figures and tables should be in 12-point size, bold font style. Capitalize the first letter of principal words and leave all other letters as lowercase. If the data in the columns of your table include items in parentheses (like p-values), they

should be included below the data they refer to, not beside them. For in-text references, the words "Table" and "Figure" are always capitalized.

## Tables Format

The title of tables should be on the top left of a table. Text in tables should normally be not smaller than 10-point. Use Landscape where necessary to keep table text together. Try to avoid separating a table into two pages, just move text to keep table together. When a table has to move to the next page, try not to leave large gaps between texts.

### 6.3.1 Indications of statistical significance levels in table notes

*, **, and *** represent significance levels of 0.10 [or 10 percent], 0.05 [or 5 percent], and 0.01 [or 1 percent], respectively.

### 6.3.2 Table notes

Table notes appear at the bottom of the table. Notes should be as brief as possible; for example, rather than including extensive definitions of variables in the notes, consider placing the definitions in an Appendix, and referring to the Appendix in the notes.

## 6.4 Figures Format

The title of figures should be centred below a figure.

**Equations**

We recommend using MathType for display and inline equations, as it will provide the most reliable outcome. If this is not possible, Equation Editor is acceptable. Avoid using MathType or Equation Editor to insert single variables (e.g., "$a^2 + b^2 = c^2$"), Greek or other symbols (e.g., β, Δ, or ′ [prime]), or mathematical operators (e.g., x, ≥, or ±) in running text. Wherever possible, insert single symbols as normal text with the correct Unicode (hex) values.

Do not use Math Type or Equation Editor for only a portion of an equation. Rather, ensure that the entire equation is included. Avoid "hybrid" inline or display equations, in which part is text and part is MathType, or part is MathType and part is Equation Editor

Do not use Math Type or Equation Editor for only a portion of an equation. Rather, ensure that the entire equation is included. Avoid "hybrid" inline or display

equations, in which part is text and part is MathType, or part is MathType and part is Equation Editor

**Hypotheses, Definitions, Theorems, Lemmas, Etc.**

The headings of hypotheses, definitions, theorems, propositions, and similar items are set in initial cap and small caps (boldface). The text, including mathematical expressions, is in italics. Indent the first line from the left margin (0.5 inch) with a further hanging indent (0.5 inch) for any subsequent lines of text. If there is more than one hypothesis, definition, and similar things number them consecutively using Arabic numerals. After the item, drop a line and continue with the text of the article, flush left. For example:

**Hypothesis 1: Board size is positively related with firm performance**

**References Format**

The reference should follow **Harvard** reference style. The list should be arranged alphabetically according to the surname of the first author or editor, and not be numbered at the end of the paper. Please see the most common examples of references and notes below.

**In-text citations**

The **in-text citation** is placed at the exact point in your document where you refer to someone else's work, whether it is a book, journal, online document, website, or any other source. The following guidelines apply to all types of sources, including online documents and websites.

The in-text citation consists of author (or editor) and publication year, in brackets. For example:

> Agriculture still employs half a million people in rural Britain (Shucksmith, 2000).

An author can be an organisation or Government Department (known as a 'corporate author'). For example:

> (English Heritage, 2010)

If there are two, both names should be given. For example:

(Lines and Walker, 2007)

If there are more than two authors, cite the first author, followed by 'et al.' (in italics) followed by a coma. For example:

(Morgan et al., 2013)

To refer to two or more authors at the same time, list them by date of publication and separate them by a semicolon. For example:

(Taylor, 2013; Piper, 2015)

For several publications by the same author published in the same year, use letters (a, b, c) accordingly to specify the publication cited by that author. For example:

(Watson, 2009a)

If the author's name occurs naturally in the text, only the year of publication is given in brackets. For example:

In his groundbreaking study, Jones (2014) …

If the date cannot be identified, use the phrase 'no date'. For example:

(Labour Party, no date)

If there is no author, use a brief title instead (title is in italics). For example:

(Burden of anonymity, 1948)

For web pages, use author and date; if no author, use title, and date; if no author or title, use URL and date. For example:

(https://www.brookes.ac.uk, 2014) **(Use this ONLY when there is no author or title)**

Page number(s) for in-text citations should be included when there is a need to be more specific, for example, referring to specific information or data, or when making a direct quotation. Use p. (for a single page) or pp. (for more than one page). If page numbers are not given (e.g. for some ebooks), use the information that is available, such as 58%. For example:

(Thompson, 2011, p.100) or (Thompson, 2011, 58%)

**Secondary sources:** (this means a document, which you have not accessed but which is quoted or mentioned in a source you are using). Link the two sources with the term 'cited in' or 'quoted in'. For example:

…Turner's analysis of development trends (2000, cited in Walker, 2004, p.53).

**NB for above example of secondary sources:** You can only include the source you have actually read in your reference list, so, unless you have read Turner yourself, you can only include Walker in your reference list. It is a good practice to read the original source (Turner) so that you can refer to it in addition to Walker.

**Handling Quotations in the text:**

**Short quotations may be run into the text, using single or double quotation marks (be consistent). For example:**

**As Owens stated (2008, p.97), 'the value of...'**

**Longer quotations should be a separate, indented, paragraph – no need for quotation marks. For example:**

Simone de Beauvoir examined her own past and wrote rather gloomily: The past is not a peaceful landscape lying there behind me, a country in which I can stroll wherever I please, and will gradually show me all its secret hills and dales. As I was moving forward, so it was crumbling (Simone de Beauvoir, 1972, p.365).

## 7. Reference List

At the end of your paper, you need to provide a complete list of all sources used. The entries in the list(s) are arranged in **one alphabetical sequence** by author's

surname, title if there is no author, URL if there is no author, or title – **whatever has been used in the in-text citation**, so that your reader can go easily from an in-text citation to the correct point in your list.

All references, **including those for online resources**, must contain author, year of publication and title (if known) in that order. Further details are also required, varying according to type of source (see below):

**Printed books or reports AND Ebooks, which look the same as a printed book, with publication details and pagination:**

**i)** **Author/Editor:** Surname/family name first, followed by initials.

**ii)** **Year of publication:** Give the year of publication in round brackets, or (no date).

**iii)** **Title:** Include title as given on the title page of a book; include any sub-title, separating it from the title by a colon. Capitalise the first letter of the first word and any proper nouns. Use italics.

**iv)** **Edition:** Only include if not the first edition. Edition is abbreviated to 'edn'.

**v)** **Place of publication and publisher:** Use a colon to separate these elements. If more than one place of publication, include only the most local.

**vi)** **Series:** Include if relevant, after the publisher.

**vii)** **Page number:** Include the page number.

***Example of printed book, or ebook, which looks like a printed book, or report:***

*Shone, A. and Parry, B. (2013).* Successful event management: a practical handbook. *4th edn. Andover: Cengage Learning, pp. 86.*

***Example of organisation/Government Department as author:***

*Department of Health (2012)* Manual of nutrition. *12th edn. London: TSO, pp. 20.*

***Example of book with no author:***

Whitaker's almanack *(2013) London: J Whitaker and Sons, pp. 30.*

**Ebooks for which publication details and page numbers are not available AND Online reports**

i) Author/editor

ii) Year of publication (in round brackets)

iii) Title (use italics)

iv) Available at: URL (Accessed: date) OR (Downloaded: date)

*Marr, A. (2012).* A History of the World. *Available at: [http://www.amazon.co.uk/kindle-ebooks] (Downloaded: 23 June 2014).*

**Chapter in a book:**

i) Author of chapter

ii) Year of publication

iii) Title of chapter (in single quotation marks)

iv) 'In' and then author, title of complete book (in italics), place of publication, publisher, page numbers of chapter.

*Smith, H. (1990) 'Innovation at large', in James, S. (ed.)* Science and innovation. *Manchester: Novon, pp. 46-50.*

**Journal articles, print and electronic:**

i) Author

ii) Year of publication

iii) Title of article (in single quotation marks)

iv) Title of journal (in italics). Capitalise the first letter of each word in title, except for grammatical words such as 'and', 'the', 'of'

v) Volume number (no brackets), issue number and/or date (all in round brackets)

vi) Page numbers or equivalent **(issue and page numbers may be replaced by article numbers)**

vii) Available at: URL (Accessed: date) **(if required)** OR DOI **(if available)**

**(URL is required for an article, which is ONLY available online)**

***Example of print or online journal article:***

*Matsaganis, M. (2011). 'The Welfare State and the Crisis: The Case of Greece.* Journal of European Social Policy, *21(5), pp.501-512.*

***Example of online journal article including doi:***

*Williams, J. (2000). 'Tools for Achieving Sustainable Housing Strategies in Rural Gloucestershire',* Planning Practice & Research, *15(3), pp.155-174.*

**Newspaper articles, print and electronic:**

Potter, R. (2013) 'Time to take stock', The Guardian, 20 May, p.15.

**(If specifically using an online version, include the URL and date accessed)**

**Web page (the main web page, not a pdf on the web page):**

OXFAM (2013). Gender Justice. Available at:

[http://policy-practice.oxfam.org.uk/our-work/gender-justice] (Accessed: 12 June 2014).

**Pdf on web page:** [Follow guidelines on previous page for referencing ebooks and online reports]

**Report from a database:**

Mintel Oxygen (2014) 'Prepared meals review – UK – May 2014'. Available at: [http://academic.mintel.com] (Accessed: 12 June 2014).

**Email:**

Saunders, L. (2010) Email to Linda Hinton, 18 August.

**[You can also use this pattern for other personal communications e.g. letter, conversation]**

**Film on YouTube:**

Page, D. (2008). How to Draw Cartoon Characters: How to Draw the Head on a Cartoon Character. Available at: [https://www.youtube.com/watch?v=g18gHMKFlhM] (Accessed: 26 August 2016).

## Photograph from the internet:

Lake, Q. (2010). Emperors' Heads Outside the Entrance to the Sheldonian Theatre, Broad Street, Oxford. Available at: [https://blog.quintinlake.com/2010/11/05/photos-of-the-emperors-heads-sheldonian-theatre-oxford/] (Accessed: 26 August 2016).

## Thesis:

### Online

Matheson, C. M. (2004). Products and Passions: Explorations of Authenticity within Celtic Music Festivities. PhD Thesis. Glasgow Caledonian University. Available at: [http://ethos.bl.uk/OrderDetails.do?did=5&uin=uk.bl.ethos.414865] (Accessed: 23 June 2014).

### Hardcopy

Matheson, C. M. (2004). Products and Passions: Explorations of Authenticity within Celtic Music Festivities. PhD Thesis. Glasgow Caledonian University, pp.200.

## Interview:

Taylor, F. (2014). 'The future is bright'. Interview with Francis Taylor. Interviewed by Sally Ross for BBC News, 15 March. **[If published on the internet also include the URL and date accessed]**

## Manuscript Organization

Manuscripts should be organized as follows. Instructions for each element appear below the list.

## Beginning section: *The following elements are required, in order:*

- Title page: List title, authors, and affiliations as first page of manuscript
- Title page should be brief and focused on the content of the paper containing authors' full names & affiliations with indicated phone numbers, email address, postal address;
- All in bold form, except for authors 's names
- Abstract (should not be more than 250 words)

Should be both Informative and brief not exceeding 250 words in one paragraph (max. length). Should include: Purpose, Study design/methodology, Findings, Originality/value and Implication (research/practical/social) of the study

- Key words should not exceed five (5) key words which clearly explain the manuscript 's theme & purpose
- Introduction

**Middle section:** *The following elements can be renamed as needed and presented in order:*

- Literature Review
- Methodology
- Results
- Finding and Discussion
- Conclusions and Recommendations

**Ending section:** *The following elements are required, in order:*

- References
- Appendices
- Include appendices only if they provide essential information not possible within the body of the article

**Acknowledgement**

Acknowledgement findings and the authors' manuscript submitted for review and publishing should constitute an acknowledgement of the people who contributed to the work, funding agencies in brief, and so on.

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