Assessing the Impact of TANRICE Project Interventions on Social Demographic Change among Rice Farmers in Zanzibar

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Abstract: *SoA which was formally called KATI initiated rice farming trainings using TANRICE projects supported by JICA. The trainings were intended to help increase rice farmers' yield as well as social welfare. The purposes of this study are to evaluate the sociodemographic changes in gender and education among rice farmers in Zanzibar following the TANRICE project interventions. Using data collected from 120 farmers across six farming areas and applying nonparametric tests in SPSS, the study identifies significant shifts in gender distribution and education levels. Findings indicate that the project has led to an increase in female participation and a rise in secondary education among farmers. The study recommends further subject matter training to enhance farmers welfare and productivity.*

Keywords: Gender, Education, Rice farming, TANRICE project, Sociodemographic change

1. Introduction

Rice is the main staple food for the Zanzibar's community. For many years rice production in Zanzibar has been on subsistence level and famers have been producing rice for merely family consumption. Currently, Zanzibar has witnessed a rapid rise of population as seen in many African countries (URT, 2023). This population rise has necessitated the government to step up effort to increase rice production in order to maintain food security. Not only food security but rice production is aimed at becoming a cash crop as in other parts of the world such as Asia and Western Africa, despite of their higher population (Kadiri and Eze, 2015). To facilitate the increase in rice production in Zanzibar, there have been projects conceived by the government to train rice farmers on rice production techniques as well as subject matter training for family labor equity. For more than a decade, School of Agriculture (SoA) formally known as Kizimbani Agricultural Training Institute (KATI) has been involved in these projects as the implementing institute. One of the projects is the project for Supporting Rice Industry Development in Tanzania (TANRICE) at different phases. It is believed that, this project helped to increase farmers' skills in rice farming leading to increasing yield. Not only yield, rice farmers have also been equipped with skills in gender equity and use of education in rice farming in order to create socio - demographic change and fair engagement of family labor. When sociodemographic characteristics of farmers change there is a corresponding increase in fairness and benefits of farming fruits to families. (Noor N & Loganathan K, 2014) There is also a consolidated perception that training institutes have potential contributions on helping community in behavioral changes through community engagement.

Currently, there is scanty records that showed the impact of the interventions in terms of socio - demographic change amongst beneficial farmers of SOA TANRICE project intervention. This study was therefore intended to assess gender relation and education level change in rice farming through TANRICE project intervention by SOA.

2. Methodology

2.1 Research design

The study was a cross - sectional in design whereby quantitative and qualitative data were collected at one point in time using structured questionnaire. The participants were interviewed through open and closed ended questions based on the best practices of TANRICE approaches disseminated by SOA. The population for this study composed of rice farmers from irrigated and rain - fed rice farming areas. To enhance the validity and reliability of these instruments, a pilot study was conducted prior to the main primary data collection process. The pilot survey was conducted to 10 rice farmers at Kizimbani area and necessary corrections were done in these instruments. The secondary data were those data relating to rice farming progress reports by TANRICE project phase 1 and 2.

2.2 Study area

The research was conducted in the two islands of Zanzibar (Unguja and Pemba) which are located between latitudes 4°S and 6°S and between longitudes 39°E and 40°E. The distance from Unguja to Pemba is about 50 Km. Unguja is 1, 658 sq. Km in size, and Pemba about 985 sq. Km (Hassan, 2007). The

study covered four districts (Magharibi A, Kusini Unguja, Wete and Mkoani) among eleven (11) districts of Zanzibar.

2.3 Sample techniques

The target participants were rice farmers who received trainings delivered by TANRICE project. The four districts were Wete and Mkoani for Pemba as well as Kusini and Magharibi "A" for Unguja. The total population of rice farmers trained under TANRICE project were 1446 distributed in nine (9) districts. A simple random sampling method was employed to select the rice producing areas that fall into two districts for Unguja and two for Pemba. These four districts comprise of 401 farmers. Then the respondents were randomly selected from farmers in rice farming communities where the training project was provided and implemented.

2.4. Sample size

The sample size of the farmers was determined using Krejcie and Morgan's sample scale (Krejcie. R, 1970). A total of 120 farmers were selected for the study. Proportionate sampling technique was used to select the respondents from each district by visiting the farms at random times until the required sample sizes were met. The population distribution by districts were shown on the table below

Table 1: Distribution of sample size by districts

Districts	Name of farming Area	Population size	Sample size
Wete – Pemba	Mangwena	124	19
	Wete		11
Mkoani – Pemba	Darajani - Makombeni	137	16
	Maotwe Kangani		14
South Unguja	Bumbwisudi	63	30
West A Unguja	**Muyuni**	77	30
Total		**401**	**120**

2.5 Data analysis

The collected data were recorded, compiled, coded, cleaned and analyzed by using the Statistical Package for Social Science (SPSS version 21) computer software. The results were presented in frequency, percentages and means were compare to show statistically significant relationship between variables. These helped to convey data into meaningful information and making conclusion based on the results obtained from the study

3. Results and Discussions

3.1 Social Demographic Characteristics Change of Respondents in rice farming

3.1.1 Gender change
The study sought to address if there is a gender shift from previous perception in rice farming. The results from the nonparametric test (Mann - Whitney U test) showed that there was a significant difference in gender distribution in the rice farming areas (p= 0.02) (Table 3.2.1).

Table 2: Shows ANOVA with nonparametric tests

Total population	Mann - Whitney U	Wilcoxon W	Test statistic	Standard error	Standardized test statistic	p - value
120	1, 209.000	4, 369.000	1, 209.000	177.080	- 2.318	0.02

Overall, the larger portion of the respondents was female as compared to male. For the case of female to male comparison, Weni, Mangwena and Maotwe female rice farmers showed a significantly higher number compared to Darajani, Makombeni, Maotwe, Bumbisudi and Muyuni male rice farmers. Furthermore, Weni also showed significantly higher number of female rice farmers as compared to Bumbwisudi female rice farmers.
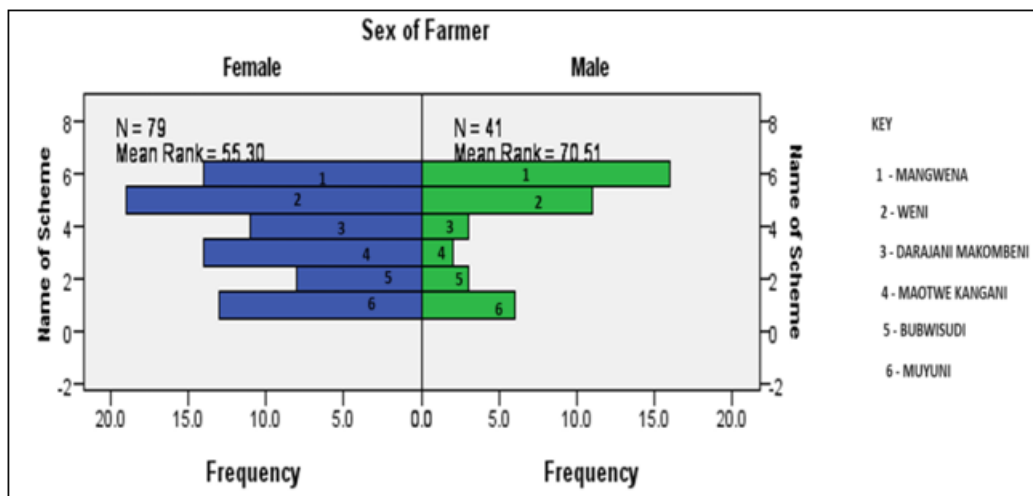

Figure 3.2.1 shows comparison of gender distribution of the respondents with non - parametric Mann - Whitney U test

In the case of male farmer's comparison, Mangwena showed a significantly higher number of male farmers as compared to Darajani - Makombeni, Maotwe - Kangani and Bumbwisudi.

These findings indicate that rice farming is now a female dominated activity. This is in contrary to the composition before TANRICE project intervention baseline survey that showed that the rice farming in Zanzibar is a male dominated activity (JICA progress report 2012 - 2018). Furthermore, it was different from the study done in other parts of Africa by Kadiri and Eze (2015) that showed male rice farmers were dominant in Nigeria and Asia. Another study by Osanyilusi & Adenegan (2016) revealed that majority of rice farmers in West Africa were male.

3.1.2 Education

The study sought to address if there are education levels shift from previous perception in rice farming. The results from the nonparametric test (Kruskal - Wallis test) showed that there was a significant difference in education level for the rice farmers ($p< 0.001$) as shown in Table 3.1.2.

Table 3: Shows Education level differences between rice farming areas in Zanzibar

Total population	Test statistic	Degree of freedom	p - value
120	23.875	5	0.000

For tertiary education Maotwe had a significant higher number of respondents compared to all other rice producing areas. However, overall, the larger portion of the respondents has secondary education as compared to tertiary and primary education (Figure 3.2.2)
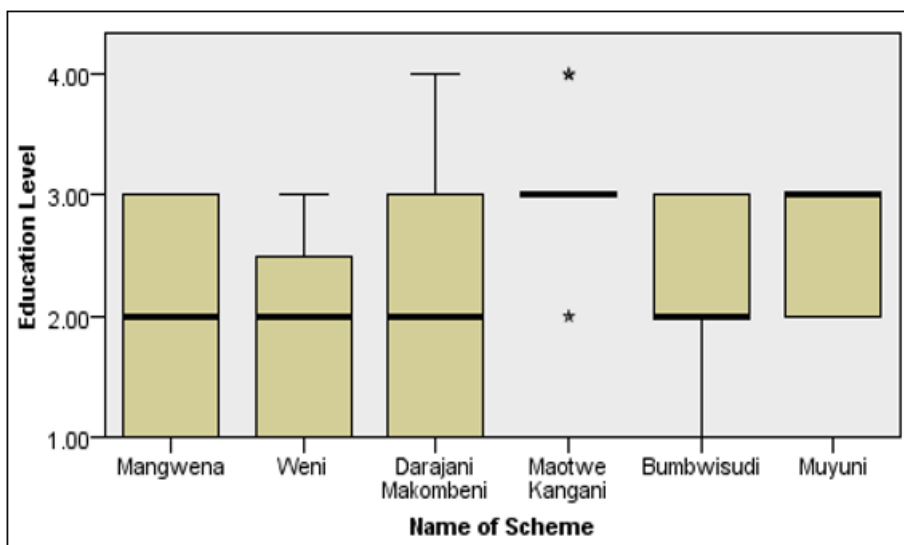

Figure 3.2.2 shows Education level distribution of the respondents with nonparametric Kruskal - Walis test.

There was also a significant difference of respondent who responded no formal education with Muyuni showing the lowest number while Weni showing considerable higher portion.

This result is an indication that the current rice farming in the selected areas is educational dominated activity. This is contrary to the composition before TANRICE project intervention baseline survey that showed that the rice farming in Zanzibar is a non - educational dominated activity (JICA progress report 2012 - 2018). The data shows that most of rice farmers attended school and more than half were in the level of secondary education. The findings imply that all respondents had a certain level of education. This result indicates differences from the study done by Himatay (2003) who showed that majority of rice farmers in irrigated and rainfed farms have elementary education.

4. Conclusion

During the last decades, a considerable amount of improved training has been delivered by SoA to Zanzibar rice farmers aiming at increasing rice yield and improves social welfare. Consequently, it is principally necessary to understand the change in production level and farmers appreciation although the relevant feedback has been lacking. This paper presents the first analyses of sociodemographic change, taking gender and education level as models features of the various other subject matter training using the cross - sectional data collection. It was possible to uncover the change in male to female composition of rice farmers from the male domination to female domination contrary to the perceived composition before the trainings. The education component, with important fractions of no formal, primary, secondary and tertiary education indicated that heterogeneity exists in education composition among rice farmers. The rice farming has inclined towards secondary education and beyond, contrary to the period before training where rice farming was mostly done with informal and elementary education.

This study reveals the substantial sociodemographic changes brought about by the TANRICE project interventions in Zanzibar, with a shift towards female dominated rice farming and higher education levels among farmers. While the project has achieved significant success in these areas, more comprehensive training is needed to address remaining challenges in rice farming. Further research could explore additional socioeconomic impacts and develop predictive models to optimize training outcomes.

5. Recommendations

The study detailed above assumes that socioeconomic changes occur continuously in time and rates that are proportional to the delivery of the training. Furthermore, each subject matter training is independent of the other in influencing the change in socio - demographic characteristics. Generally, the following recommendations can be drawn for effective and realistic delivery of quality training for rice farmers:

1) The training should be enriched with more subject matter training for rice farmers to streamline more welfare components that are currently discouraging rice farming activity.

2) The training should establish an effective benchmarking with other projects so as to get standard comparison of training efficiency

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