FOREFRONT TECHNOLOGIES FOR SMALLHOLDER FARMERS: A PANACEA TO RURAL YOUTH MIGRATION IN ORASHI REGION OF RIVERS STATE

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Abstract

The study investigated Forefront technologies for smallholder farmers as a panacea to rural-urban youth migration in Orashi Region of Rivers State. Three research questions were posed and three null hypotheses were formulated that guided the study. The study employed a descriptive survey design. The population of the study is comprised of all rural farmers who are youth in the study area which is 521 smallholder farmers. A multistage sampling technique were employed to select a sample size of 200 respondents from 20 rural communities of the four Local Government Areas (LGAs) that make up the study area. A research questionnaire titled: Forefront Technologies for mitigation against rural migration of Smallholder young Farmers, was formulated and used for data collection which was structured with 4-point rating scale. The instrument was subjected to test of reliability using Cronbach Alpha reliability Coefficient and a reliability index of 0.90 was obtained which was reliable enough. With the help of 3 research assistants, 200 copies of the questionnaires were administered and all retrieved which was used for data analysis. Data collected were analyzed using mean statistics and standard deviation with mean value of ≥2.50 as Low Extent whereas mean value <2.50 as High Extent. Findings revealed that there is low awareness on availability of modern technologies among youths who are smallholder farmers in mitigating migration from rural communities in Orashi Region of Rivers State, no accessibility of modern technologies to youths who are Smallholder farmers as to mitigate migration from rural communities who are Smallholder farmers in Orashi Region of Rivers State, and others. Based on the findings, the study recommended that Government, companies within Orashi and NGOs should ensure that youths are aware of forefront technologies, policies that will enhance integration of technology into agricultural practices should be enacted and others.

Keywords: Forefront Technologies, Smallholder Farmers, Youths and Migration.

Introduction

Movement of living things happens on daily basis, so long as there is life which is basically referred to locomotion. However, when this movement tends to be from one's area of residency to another for a long time which may lead to some individuals not returning for a long period of time due to search for greener pastures, it is hence, termed migration. In the view of Castles, Haas & Miller (2014) migration is the movement of individuals or groups of people from one place to another, typically across geographical boundaries. Migration can take different forms, such as internal migration within a country or international migration between countries. Today, migration mostly occurs amongst the youths, particularly for greener pastures as earlier maintained.

Youth according to the United Nations (2017) are young people between the ages of 15 and 24 years. Youth generally refers to individuals in a stage of life between childhood and adulthood; typically ranging from adolescence to early adulthood. It is often characterized by energy, exploration, and a period of transition and enthusiasm being part of reason for migration. (World Watch Institute, 2013).

There are diverse reasons why people migrate from one place to another. Understanding this motivation is very essential in comprehending the complexities of migration patterns. One reason could be termed to be economic factors to which individuals may seek for job opportunities and better living standards elsewhere order than where they are used to living. Another reason could be for political instability, conflict, and persecution, forcing people to seek refuge in more stable regions. Also, another reason could be attributed to environmental factors, such as natural disasters or climate change, among others (Rivers State University, 2021).

However, in recent years, the surge in rural-urban migration among younger population in the society, most especially in rural areas in Rivers State have raised a lot of concern; as they seek for more successful opportunities in cities with a view that life in the cities is more meaningful and exotic than that of rural areas, therefore, leaving behind very aged farmers for Agricultural activities (Food and Agriculture Organization, 2020). This act tends to put agriculture into jeopardy since smaller population of aged men and women are left behind to suffer Agricultural production challenges and consequently, not meeting up with the high food demand of the ever-growing population of Nigeria. Researches on migration spans shows various disciplines including, sociology, anthropology, geography, and economics. Scholars used different theoretical frameworks to analyze migration patterns, such as push-pull theory, which examines the factors that push individuals out of their origin and pull them toward a new destination.

This paradigm shift has been found to pose a significant challenge to the sustainability of agricultural sector in Orashi region, most especially on the smallholder farmers. Orashi region of Rivers State is a renowned area with lush farmlands and predominantly agrarian. Smallholder farmers in the region have been an integral part of agricultural development in the State through their contributions to food production, thereby, deriving their sustaining livelihoods (Orashi Region Development Report, 2022).

Meanwhile, smallholder farmers are small scale or subsistence farmers, who play a crucial role in global food production, particularly in developing countries where they form the focal point of food security through their agricultural activities (FAO, 2019). These individuals or families according to Lowder (2014), manage relatively small plots of land for agricultural purposes, typical of a scale less extensive than commercial or large-scale agricultural operations.

The term smallholder farming encompasses a diverse range of agricultural activities, including the cultivation of crops, livestock rearing and agroforestry. The significance of smallholder farmers extends beyond their contribution to local and national food security. Their farming practices involves a close connection to the land, biodiversity, and traditional agricultural knowledge. These farmers often rely on cruel tools and unimproved farming techniques to do their work, therefore contributing below the expectations of the larger society rather than sustaining a smaller population. To support this assertion, FAO (2019) stressed that smallholder farmers produce a substantial portion of the world's food supply and are considered vital for rural livelihoods.

The smallholder farmers' resilience and adaptability to diverse agro-ecological conditions make them integral to sustainable agriculture practices. This sector is not only faced with migration challenges, but also youth's insufficient access to knowledge, information and education, youth's limited access to land, inadequate access to financial services, low productivity, post-harvest challenges leading huge losses of Agricultural produce and income among others (FAO, 2012). All these factors may be some

of the reasons why young farmers in rural communities tend to seek for greener pastures elsewhere, as against being consistent in their productivity. In addition, it could also result, due to incommensurate returns of agricultural investment as the only source of their sustainable livelihoods. However, changing the narrative of migration amongst young smallholder farmers is imperative in contributing to global food security.

To achieve the above, empowering the farmers with the necessary resource as well as supporting them by building a more equitable and sustainable food system and also encouraging the youths to improve the local communities with infrastructural development and social amenities, rather than migrate to urban cities. In doing these, one may look towards some factors that according to Kandpal & Arora (2017) which has been used to aid production in other developing countries in Africa, such as: encouraging the use of fertilizers, genetically modified crops and biotechnology, widespread adoption of smart farming, digital, and precision agricultural technologies (Li, *et al*., 2019) which presents a historic chance to enhance farm productivity. These technologies encompass mobile apps for decision support, field sensors for data collection, drones for automation (Andersen & Anderson, 2017), and digital platforms for market access.

These technologies such as mobile technology according to Kandpal & Arora (2017), play a crucial role in modernizing agriculture by providing farmers with timely and relevant information through SMS services and mobile applications. These tools empower farmers with real-time updates on various aspects, including weather forecasts, pest management strategies, and market prices, thereby significantly enhancing their decision-making processes and overall productivity (Qamar & Raza, 2018). SMS services facilitate the dissemination of pest management strategies, allowing farmers to respond promptly to potential threats and minimize crop damage (Biru & Ayalew, 2016). Also, precision agriculture employs advanced technologies such as GPS-guided tractors and drones, offering smallholder farmers the means to enhance their land management practices, minimize resource wastage, and augment crop yields (Brown & Jones, 2020; Li et al., 2019; Reitsma 2021; & Smith et al., 2018).

More so, drones equipped with sophisticated imaging sensors contribute to the collection of high-resolution data, enabling farmers to monitor crop health, identify potential issues, and implement targeted interventions (Andersen & Anderson, 2017). Furthermore, irrigation systems play a crucial role in mitigating water scarcity challenges, with drip irrigation standing out as an efficient method. This approach involves the precise application of water directly to the plant's root zone, minimizing wastage and optimizing water usage, enhance crop growth, encourages water conservation on the soil (Hochmuth, 2010; Lamm, et al., 2012; Pandey, et al., 2017 and Zhang, et al., 2018). In addition, the integration of smart technologies, like soil moisture sensors and weather-based controllers, enhances the precision, effectiveness of irrigation practices, enable farmers to make data-informed decisions, optimizing water application and minimizing unnecessary usage, among others (Stewart, et al., 2013).

Also, financial technology (Fintech) is another technology that plays a pivotal role in enhancing access to credit and financial services, particularly benefiting smallholder farmers. Fintech solutions such as mobile banking and digital lending have emerged as transformative tools, empowering farmers to invest in their farms and consequently improve their livelihoods, enable farmers to secure loans quickly and efficiently, by passing the protracted processes associated with conventional lending institutions, enhances smallholder farmers ability to navigate the complexities of the

financial landscape and make strategic choices for their agricultural enterprises (AgriFin, 2020; United Nations Capital Development Fund, 2019; and World Bank, 2017).

However, while these technologies have made a significant impact in large-scale farming in high-income countries, there is substantial untapped potential for their broader adoption by smallholder farmers as they make up the larger population in the production unit, especially among developing countries like Nigeria. It was reported by the FAO (2020), that in less affluent nations, over 80% of the world's 500 million farms operate on less than two hectares of land. Lowder (2014) reported that despite constituting only 12% of all farmland, these small farms contribute around 80% of the food produced in Asia and sub-Saharan Africa whereas the reverse is the case in Nigeria. The widespread adoption of smart, digital, and precision technologies is crucial to boosting agricultural productivity among smallholder farmers in developing countries like Nigeria. This move towards technological advancement is essential for achieving the Sustainable Development Goals (SDGs) by 2030, fostering rural transformation. The Forefront Technology Issue (FTI) zeroes in on specific technologies that address informational challenges faced by farmers, holding the potential to generate significant economic value for smallholder farms in developing nations. The FTI sheds light on the advantages of these technologies, the obstacles to their adoption, and the factors that may facilitate their implementation.

Having tried these cutting-edge technologies in other nations like Nigeria and they have proven to have the potential to bridge information gaps across the agricultural cycle for smallholder farmers which could lead to effective and efficient productivity, could this be the same in Orashi region of Rivers State? These and many more other questions shall be addressed in this study. Biru & Ayalew (2016) noted that these technologies were helpful in planning; acquiring inputs to processing, selling products in real-time as well as a precise data to address challenges like financial illiteracy and limited access to vital information such as weather, planting techniques, and market data. This in turn, empowers farmers to make informed decisions throughout every stage of their agricultural activities.

Statement of the Problem

The Orashi region of Rivers State, grapples with a critical issue of urban youth migration primarily attributed to the limited adoption and access to forefront agricultural technologies among smallholder farmers (Dixon, 2020). These technologies encompass modern farming practices, efficient irrigation systems, precision agriculture tools, and digital farming solutions. The prevalent absence of these innovations within the agricultural landscape of the region contributes to diminish agricultural productivity, unstable income streams, and insufficient opportunities for rural youth (Ogbonna & Onyeka, 2018). Consequently, the lack of technological advancements and modernization in farming practices intensifies the allure of urban settings for the younger population seeking better livelihood prospects, thereby perpetuating a cycle of rural depopulation and socio-economic imbalances (Adewale & Akintola, 2019). This phenomenon not only threatens the sustainability of rural people in communities but also accentuates the strain on urban infrastructure and services due to an influx of migrants from rural areas. So, this research is geared towards determining the impact of modern Technologies for Smallholder Farmers as a Panacea to Rural Migration among young people in Orashi Region of Rivers State.

Aim and Objectives of the Study

The study is aimed at investigating modern technologies for smallholder farmers as a panacea to rural migration in Orashi Region of Rivers State. Specifically, the study sought to:

i. Determine the level of awareness on availability of modern technologies among youths who are smallholder farmers in mitigating of migration from rural communities in Orashi Region of Rivers State.
ii. Examine the accessibility of modern technologies to youths who are Smallholder farmers as to mitigate migration from rural communities in Orashi Region of Rivers State.
iii. Ascertain the skillful application of modern technologies among youths who are Smallholder farmers as to mitigate migration from rural communities in Orashi Region of Rivers State.

Research Questions

The following research questions shall guide this study, thus:

i. To What extent does the awareness of modern technologies available to youths who are Smallholder farmers mitigate on migration from rural communities in Orashi Region of Rivers State?
ii. To what extent does the accessibility of modern technologies among youths who are Smallholder farmers mitigate on migration from rural communities in Orashi Region of Rivers State?
iii. To what extent does skillful application of modern technologies among youths who are smallholder farmers mitigate on migration from rural communities in Orashi Region of Rivers State?

Hypothesis

The following null hypotheses were tested at .05 level of significance, which states thus: There is no significant difference in the mean responses of male and female youths who are;

i. Smallholder farmers on the awareness of modern technologies availability in the study area.
ii. Smallholder farmers on the accessibility of modern technologies to mitigate the migration in rural communities of the study area.
iii. Smallholder farmers on the skillful application of modern technologies as to mitigate the migration from rural communities in the study area.

Methodology

The research was conducted in the Orashi region of Rivers State, situated in Niger Delta and south-south zone of Nigeria, housing an estimated 983,170 people over an area of 21,850sq.km (Rivers State Statistics, 2023). The region's favorable topography and ample rainfall support agricultural activities, historically dominated by fishing, livestock and crop production despite the presence of petroleum industries in the region. This study employed a descriptive survey design. The population of the study comprised of 521 registered youths who are smallholder farmers in the study area (Rivers State Chamber of Commerce, 2022) A multistage sampling technique was employed by the researcher to select a sample size of 200 smallholder farmers from 20 rural communities of the four Local Government Areas (LGAs) that make up Orashi region of Rivers State. Namely; Ahoada West, Ahead East, Abua Odua and Ogba-Egbema-Ndoni LGA. Firstly, from the 4 LGAs 5 rural communities were purposively selected while 10 respondents were randomly selected from each

community of the study area with total respondents of 50 from each LGA, giving a sample size of 200 respondents. Three null hypotheses were formulated to guide the study. The hypotheses were tested at 0.05 level of significance. A research questionnaire was structured and titled 'Forefront Technologies for Smallholder Farmers: A Panacea to Rural Migration which was used for data collection. The instrument was structured using modified 4-point Likert rating scale of VHE, HE, LE and VLE. The instrument was subjected to test of reliability using Cronbach Alpha reliability Coefficient and a reliability index of .90 was obtained which is considered reliable enough. 200 copies of the instrument were administered and were all retrieved which was used for data analysis. Data collected were analyzed using mean statistics and standard deviation with mean value of ≥ 2.50 as low extent whereas mean value <2.50 was regarded as high extent, Z-test was used to test the hypotheses.

Results and Discussion

Table 1: Mean scores on the level of awareness of smallholder youth farmers on the availability of technologies in small-hold farming in the communities

		Male Smallholder youth farmers (82)			*Female Smallholder youth farmers (118)*		
S/N	**Variables**	$\bar{x}_1$	**SD₁**	**Decision**	$\bar{x}_2$	**SD₂**	**Decision**
1.	There is no Technology that has impacted small-scale farming practices in the Orashi region of Rivers State among the youth	2.78	1.08	HE	2.74	.88	HE
2.	There are no specific technological tools or apps that local youths in Orashi are using to enhance agricultural productivity in their communities.	2.84	1.01	HE	2.65	1.10	HE
3.	There are no examples of how young farmers in Orashi are utilizing digital platforms for crop management or market access.	2.79	1.05	HE	2.67	1.10	HE
4.	Youths in small-hold farming face challenges when adopting new agricultural technologies in the Orashi region.	2.87	1.06	HE	2.69	1.11	HE
5.	There are no any local initiatives or organizations promoting the use of technology among youth in agriculture in Rivers State.	2.76	1.10	HE	2.69	1.08	HE
6.	Young farmers in Orashi are not updated on the latest advancements and innovations in agricultural technology.	2.18	1.32	LE	2.49	1.14	LE
7.	Youths have observed successful stories where technology has significantly improved the yield or efficiency of farming practices among the youth in Rivers State.	2.82	1.03	HE	2.61	1.13	HE
8.	Smartphones or other digital devices can play a significant role in connecting young farmers to information and resources in the Orashi communities.	2.85	1.01	HE	2.72	1.07	HE
9.	There is no community-based training programs or workshops focused on educating youth about the benefits and	2.88	.99	HE	2.64	1.11	HE

	applications of agricultural technology in the region.						
10.	The youth in Orashi do not perceive the overall accessibility and affordability of technology for small-scale farming in their communities.	3.00	.88	HE	2.74	1.09	HE
	Grand Mean and SD	**2.84**	**0.98**		**2.66**	**1.15**	

Source: *Field survey, 2023*

Result in Table 1 above shows the mean responses the level of awareness of smallholder youth farmers on the availability of technologies in small-hold farming in the communities in Rivers State. Based on the findings, both respondents' male and female smallholder youth farmers in the study agreed that: there are no specific technological tools or apps those local youths in Orashi are using to enhance agricultural productivity in their communities (2.84 & 2.65), there are no examples of how young farmers in Orashi are utilizing digital platforms for crop management or market access (2.79 & 2.67), youths in small-hold farming face challenges when adopting new agricultural technologies in the Orashi region (2.87 & 2.69), there are no any local initiatives or organizations promoting the use of technology among youth in agriculture in Rivers State (2.76 & 2.69), youths have observed successful stories where technology has significantly improved the yield or efficiency of farming practices among the youth in Rivers State (2.82 & 2.61), among others, were some of the level of awareness of smallholder youth farmers on the availability of technologies in small-hold farming in the communities. This is in conformity with the findings of (FAO, 2012) which stated that the sector is not only faced with migration challenges, but also youth's insufficient access to knowledge, information and education, youth's limited access to land, Inadequate access to financial services, low productivity, post-harvest challenges leading to huge losses of Agricultural produce and income among others.

Table 2: z-Test Analysis on level of awareness of smallholder youth farmers on the availability of technologies in small-hold farming

Categories	*n*	$\bar{x}$	*SD*	*A*	*df*	*z-cal*	*z-crit*	*Decision*
Male **SY** Farmers	82	2.84	0.88	0.05	198	1.18	1.96	HE
Female **SY** Farmers	118	2.66	1.13					

SY = Smallholder Youths
Source: *Field survey, 2023*.

Table 2 shows that male smallholder youth farmers had mean and standard deviation score of 2.84 and 0.88, while female smallholder youth farmers had 2.66 and 1.13 respectively. The z-cal value was 1.18, while the z-crit was 1.96 at 0.05 level of significance for two-tailed test. This result shows that z-cal was less than z-crit, which means that the null hypothesis was accepted. This shows that, there was a significant difference in the mean responses of male and female smallholder youth farmers on the level of awareness of smallholder youth farmers on the availability of technologies in small-hold farming in Rivers State.

Table 3: Mean scores on the extent to which the accessibility of modern technologies among youths who are Smallholder farmers mitigate migration from rural communities in Orashi Region of Rivers State

		Male Smallholder Youth Farmers (82)			*Female Smallholder Youth Farmers (118)*		
S/N	**Variables**	$\overline{x}_1$	**SD1**	**Decision**	$\overline{x}_2$	**SD2**	**Decision**
11.	The access to modern agricultural technologies can enhance crop yields among smallholder farmers in the Orashi region.	2.70	.99	HE	2.65	1.40	HE
12.	Digital tools and precision farming can contribute to the efficiency of agricultural practices for small-scale farmers in Rivers State if accessed.	2.67	.957	HE	2.72	1.40	HE
13.	There are specific technological solutions that have proven effective in addressing challenges faced by smallholder farmers in the Orashi region.	2.62	1.01	HE	2.75	1.40	HE
14.	Access to information and communication technologies (ICT) can improve the decision-making processes for farmers in managing their crops and resources.	2.80	1.02	HE	2.81	1.41	HE
15.	There have been successful examples of technology-driven initiatives that have positively impacted the agricultural landscape for smallholder farmers in Rivers State.	2.73	.994	HE	2.73	1.42	HE
16.	The use of mobile applications can facilitate better market access and fair pricing for agricultural products in the Orashi region.	2.78	.956	HE	2.71	1.43	HE
17.	Innovations like smart irrigation systems and weather forecasting apps can contribute to sustainable water management and crop planning for small-scale farmers.	2.72	1.03	HE	2.76	1.35	HE
18.	Government policies play very low role in supporting the integration of technology into agricultural practices for smallholder farmers in Rivers State.	2.76	1.00	HE	2.89	1.29	HE
19.	Challenges or barriers like access to land, finance, technologies and agricultural training can hinder the widespread adoption of agricultural technologies in the Orashi region.	2.78	.994	HE	2.89	1.29	HE
	Grand Mean and SD	**2.79**	**1.00**		**2.88**	**1.31**	

Source: *Field survey, 2023*

Result in Table 3 above shows the mean responses on the extent to which the accessibility of modern technologies among youths who are Smallholder farmers mitigate migration from rural communities in Orashi Region of Rivers State. Based on the findings, both respondents' male and female smallholder youth farmers in the study agreed that: The access to modern agricultural technologies

can enhance crop yields among smallholder farmers in the Orashi region (2.70 and 2.65), Digital tools and precision farming can contribute to the efficiency of agricultural practices for small-scale farmers in Rivers State if accessed. (2.67 & 2.72) and others. This is in line with the assertion by Kandpal and Arora (2017) which stated that technology has been used to aid production in other developing countries in Africa such as encouraging the use of fertilizers, genetically modified crops and biotechnology, widespread adoption of smart farming, digital, and precision agricultural technologies

Table 4: Z-Test Analysis on the extent to which the use of technologies can promote the agricultural activities of smallholder farmers in the communities

Categories	*N*	$\overline{x}$	*SD*	*A*	*df*	*z-cal*	*z-crit*	*Decision*
Male **SY** Farmers	82	2.79	1.00	0.05	198	0.54	1.96	HE
Female **SY** Farmers	118	2.88	1.31					

SY = Smallholder Youths

Source: *Field survey, 2023*.

Table 4 shows that male smallholder youth farmers had mean and standard deviation score of 2.79 and 1.00, while female smallholder youth farmers had 2.88 and 1.31 respectively. The z-cal value was 0.54, while the z-crit was 1.96 at 0.05 level of significance for two tailed test. This result shows that z-cal was less than z-crit, which means that the null hypothesis was accepted. This shows that, there was a significant difference in the mean responses of male and female smallholder youth farmers on the extent to which the use of technologies can promote the agricultural activities of smallholder farmers in the communities in Rivers State.

Table 5: Mean scores on what extent can the skillful application of technology mitigate youth migration in communities in Orashi region of Rivers State.

		Male Smallholder youth farmers (82)			Female Smallholder youth farmers (118)		
S/N	**Variables**	$\overline{x}_1$	**SD1**	**Decision**	$\overline{x}_2$	**SD2**	**Decision**
20.	Technology be harnessed to create employment opportunities for youth in the Orashi region and discourage migration?	2.91	1.10	HE	2.89	1.02	HE
21.	Digital skills training programs can be implemented to empower youth and make them more resilient to economic challenges in their communities.	2.87	1.13	HE	2.52	1.22	HE
22.	The use of technology can enhance local agricultural practices and contribute to sustainable livelihoods, reducing the need for youth migration?	2.93	1.17	HE	2.58	1.21	HE
23.	There are specific technological solutions that can improve access to education and vocational training for youth in the Orashi region, fostering skill development and local employment.	2.90	1.16	HE	2.58	1.24	HE

24.	The implementation of digital platforms for entrepreneurship and business development can play a role in retaining young talent within the Orashi communities.	2.79	1.23	HE	2.49	1.28	HE
25.	Technology can address infrastructure challenges in the Orashi region, contributing to improved living conditions and thereby reducing the incentive for youth to migrate.	2.83	1.22	HE	2.51	1.25	HE
26.	There are successful examples of technology-driven initiatives in other regions that have effectively curbed youth migration, and could be adapted to the Orashi context.	2.77	1.23	HE	2.65	1.20	HE
	Grade Mean and SD	**2.77**	**1.27**		**2.48**	**1.30**	

Source: *Field survey, 2023*

Table 5 shows mean responses on the extent the skillful application of technology can mitigate youth migration in communities in Orashi region of Rivers State. Based on the findings, both respondents' male and female smallholder youth farmers in the study agreed that: Technology be harnessed to create employment opportunities for youth in the Orashi region and discourage migration (2.91 & 2.89). Digital skills training programs can be implemented to empower youth and make them more resilient to economic challenges in their communities (2.87 & 2.52) and others. This is in line with assertion by Biru and Ayalew (2016) noted that the skillful application of these technologies were helpful in planning; acquiring inputs to processing, selling products in real-time as well as a precise data to address challenges like financial illiteracy and limited access to vital information such as weather, planting techniques, and market data. This in turn, empowers farmers to make informed decisions throughout every stage of their agricultural activities.

Table 6: Z-Test Analysis on what extent can the skillful application of technology mitigate youth migration in communities

Categories	*N*	$\overline{x}$	*SD*	*α*	*df*	z_{cal}	z_{crit}	*Decision*
Male **SY** Farmers	82	2.77	1.27	0.05	198	1.57	1.96	HE
Female **SY** Farmers	118	2.48	1.30					

SY = Smallholder Youths

Source: *Field survey, 2023*.

Table 6 shows that male smallholder youth farmers had mean and standard deviation score of 2.77 and 1.27, while female smallholder youth farmers had 2.48 and 1.30 respectively. The z-cal value was 1.57, while the z-crit was 1.96 at 0.05 level of significance for two tailed test. This result shows that z-cal was less than z-crit, which means that the null hypothesis was accepted. This shows that, there was a significant difference in the mean responses of male and female smallholder youth farmers on what extent can the skillful application of technology mitigate youth migration in communities in Rivers State.

Conclusion

This study reveals a lack of technological impact on small-scale farming in the Orashi region. There is a dearth of specific tools, apps, or initiatives aiding local youths in enhancing agricultural productivity. Challenges exist in technology adoption, but there are proven benefits, like improved crop yields through modern agricultural technologies. Access to ICT can aid decision-making, and mobile apps can enhance market access for agricultural products. However, there's limited government support and barriers hindering widespread technology adoption. Yet, there's potential for technology to create employment, empower youth, improve education access, and address migration issues in Orashi by adapting successful initiatives from other regions.

Recommendations

Based on the findings of the study, the following recommendations were made:

i. Government, companies operating within Orashi and NGOs should organize awareness of forefront technologies amongst smallholder youth farmers in the communities within Orashi region of Rivers state.
ii. Government policies must play a very leading role in supporting the integration of technology into agricultural practices for youth smallholder farmers, must ensure that challenges or barriers like access to land, finance, technologies and agricultural training that can hinder the widespread adoption of agricultural technologies in the Orashi region is tackled.
iii. Government, companies operating within Orashi and NGOs must ensure proper training of youths on the skillful application of forefront technologies. This will ensure that the youths are engaged, curbing youth unrest, enhancing agricultural activities and will mitigate youth migration in communities in Orashi region of Rivers State.

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