E-ISSN: 1116 - 3240 P-ISSN: 3026-9334
MPRI-JAIMR | INTERNATIONAL JOURNAL OF AFRICAN INNOVATION & MULTIDSCIPLINARY RES.
VOL. 10 NO. 2 – OCTOBER, 2025

ROLE OF WOMEN IN PROMOTING SUSTAINABLE AGRICULTURAL PRODUCTION FOR RURAL LIVELIHOODS IN ENUGU STATE, NIGERIA

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DOI: https://doi.org/10.70382/mejaimr.v10i2.081

Abstract

In Enugu State, women are actively involved in farming and agricultural activities, making their role indispensable in promoting sustainable agriculture and improving rural livelihoods. This study assesses the role of women in promoting sustainable agriculture for rural livelihoods in Enugu State, and its specific objectives are to: investigate the effect of government on women participation in promoting sustainable agriculture in the rural livelihoods of Enugu State; and determine the obstacles that women encounter while trying to engage in promoting sustainable agriculture in Enugu State's rural livelihoods. According to the study's literature analysis, Nigeria's government has been successfully integrating women into the agricultural sector through a number of its initiatives. However, the biggest issues facing women are limited access to markets and farm equipment. The study employed correctional data from 150 women farmers in two local governments of Enugu state, and it was analyzed by an ordered probit model. The main finding revealed that Government intervention has positive significant effect on women's participation in

Key Words: women participation, and promoting sustainable agriculture

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promoting sustainable agriculture in rural livelihoods of Enugu State; and Women do encounter significant obstacles in engaging in the promotion of sustainable agriculture in the rural livelihoods of Enugu State. The study concluded from the findings that Government intervention on women's participation and the obstacles that women encounter in promoting sustainable agriculture in rural livelihoods of Enugu State are positively significant to the Nigeria in general, while recommended that: Government of Enugu State should intensifies and expands its intervention programs to further encourage and support women's involvement in sustainable agriculture practices; and targeted measures should be implemented to remove or reduce these barriers, this includes improving access to land, credit facilities, education, and agricultural resources, as well as addressing socio-cultural norms that limit women's full participation.

Introduction

Background of the Study

In developing nations like Nigeria, sustainable agriculture has emerged as a critical component of rural livelihood development and food security (FAO, 2020). In agriculture, women are essential because they make major contributions to the production, processing, and marketing of agricultural products (IFAD, 2019). Due to their active participation in farming and other agricultural pursuits in Enugu State, women play a crucial role in advancing sustainable agriculture and enhancing rural livelihoods (Nweze, 2018). Household food security, income, and general well-being can all benefit from women's involvement in agriculture (Quisumbing et al., 2024). However, obstacles including restricted access to land, credit, and technology might limit the productivity levels of women in agriculture and their ability to contribute to sustainable agriculture (Ogunlela & Mukhtar, 2019).

For the vast majority of Nigerians, agriculture continues to be the main source of employment, income, and food security in rural areas. Although women are heavily involved in the production, processing, and selling of agricultural products in Enugu State, their contributions are sometimes overlooked and misrepresented in discussions on sustainable agricultural production (International Fund for Agricultural Development [IFAD], 2019). According to Ogunlela and Mukhtar (2009), women participate in many facets of farming, including as planting, weeding, harvesting, and post-harvest processing. However, they encounter many obstacles, including restricted access to land, finance facilities, extension services, and contemporary farming technologies. Notwithstanding these obstacles, women have persisted in developing sustainable and creative methods that support biodiversity, soil conservation, and resource-efficient

agricultural systems—all of which are essential for improving rural livelihoods and climate resilience. According to Gona (2020) women are actively involved in every part of the agricultural value chain in Nigeria, from the distribution of farm produce after they are harvested, to the transportation of farm produce, processing of the agricultural produce in the informal and small-scale, and the sales of the final product at the retail market where it gets to the final consumer. Furthermore, women possess more knowledge of traditional water adaptation processes that can enhance crop yield and reduce the effect of adverse conditions that may affect agricultural activities such as flooding. In the views of Lozano-Corona (2023) agriculture is a crucial sector for human survival, and women's' contribution to it is undeniable; women are the backbone of agriculture, and make significant contributions to crop production, livestock management, fisheries, and forestry. They perform various tasks in farms including sowing seeds, weeding, harvesting, and selling the produce.

Promoting sustainable agriculture means implementing methods that preserve the land's productivity while guaranteeing social justice and environmental protection. The focus has turned in recent years to acknowledge women as important contributors to the attainment of sustainable development goals, particularly those pertaining to rural poverty reduction and food security (Food and Agriculture Organization [FAO], 2020). Examining the distinct roles that women play in promoting sustainable agricultural practices in Enugu State is essential to comprehending how to improve and better incorporate their contributions into development and policy initiatives. According to Auta and Dafwang (2010), closing this gap is crucial to developing inclusive solutions that promote rural development and guarantee the long-term viability of agricultural livelihoods. The researchers intend to examine the role of women in promoting sustainable agricultural production for rural livelihoods in Enugu State, Nigeria.

Statement of the Problem

Even though women are vital to Enugu State's agricultural industry, institutional frameworks frequently ignore, under-research, and under-support their attempts to promote sustainable agricultural production. A major obstacle to attaining sustainability in rural living is the underrepresentation of women in decision-making, resource access, and agricultural innovation. The purpose of this study is to fill the knowledge gap that exist on the various activities and ideas of women that play a role in sustainable agricultural production for rural livelihoods in our local communities and as well ascertain the degree to which their contributions affect efforts to improve rural livelihoods in Enugu State, Nigeria.

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Objectives of the Study

The main objective of the study is to examine the role of women in promoting sustainable agriculture for rural livelihoods in Enugu State, Nigeria. And the specific objectives are to:

1. Explore the effect of sales of agricultural products at retail stores by women on rural livelihoods of Enugu State, Nigeria.
2. Relate the effect of traditional water adaptation processes by women on rural livelihoods in Enugu State, Nigeria.

Research Questions

i. What is the effect of sales of agricultural products at retail stores by women on rural livelihoods of Enugu State, Nigeria?
ii. What is the effect of traditional water adaptation processes by women on rural livelihoods in Enugu State, Nigeria?

Hypotheses

i. H_o: there is no significant effect of sales of agricultural products at retail stores by women on rural livelihoods of Enugu State, Nigeria.
ii. H_o: there is no significant effect of traditional water adaptation processes by women on rural livelihoods in Enugu State, Nigeria.

Rural Area and Rural Livelihoods

Despite the fact that women are essential to the agricultural sector in Enugu State, their efforts to advance sustainable practices are usually disregarded, understudied, and undersupported by institutional frameworks. The underrepresentation of women in agricultural innovation, resource access, and decision-making is a significant barrier to achieving sustainability in rural living. This study aims to close the knowledge gap regarding the degree to which women's contributions impact rural livelihood outcomes in Enugu State and the methods in which they promote sustainable agriculture.

These limitations can impede general development and result in poverty (Flywell Malanga, & Banda, 2021). In order to solve these issues, the idea of sustainable livelihoods has gained popularity. It highlights how crucial it is to develop rural communities' resources and capacities in order to raise their resilience and general well-being. This method acknowledges the complexity of livelihoods, taking into account elements such as natural, financial, social, human, and physical capital. Sustainable livelihood methods try to lessen vulnerability and encourage long-term development by concentrating on these areas (Mukherjee & Saha, 2024). Factors including social inequality, economic shocks, and climate change are posing a growing danger to rural livelihoods in places like South Asia and Africa. Although scholarly interest in these concerns has grown, research

shows that some areas are still poorly understood. For example, little research has been done on how dryland forestry and biochar might improve the sustainability of rural livelihoods. Reducing these disparities can open up new possibilities for enhancing rural communities' sustainability and resilience (National Rural Livelihood Mission, 2025).

Agriculture

For billions of people globally, agriculture is an essential industry that provides food, fiber, and a living (FAO, 2020). It includes a wide range of operations, including forestry, fishery, livestock management, and crop production (Pretty, 2018). In order to guarantee long-term production and environmental stewardship, sustainable agriculture practices place a high priority on soil health, biodiversity, and effective water usage (Godfray et al., 2020). To supply necessities like food and raw materials, agriculture includes the extensive process of cultivating permanent fields, raising livestock, and growing crops. This industry has a significant impact on human history and has made it possible for economies and communities all over the world to flourish. Agriculture has changed significantly over the last 12,000 years, moving from traditional practices to the incorporation of cutting-edge technologies. While the introduction of digital technologies like artificial intelligence and the Internet of Everything has transformed farming methods, mechanization has increased sustainability and production. Concepts like Precision Agriculture and Agriculture 4.0, which emphasize increasing crop yield and reducing environmental impact, have emerged as a result of these advancements.

Furthermore, the need for adaptive techniques to guarantee food security and environmental sustainability is highlighted by agriculture's vulnerability to climate change. The industry is still essential to solving global issues and satisfying the needs of an expanding population as it develops further.

Roles Women involvement in Agriculture

According to Doss (2018), women are essential to agriculture since they make substantial contributions to food production, processing, and household food security. They engage in a range of agricultural tasks, including as raising livestock and planting, harvesting, and marketing crops (FAO, 2021). In order to improve rural livelihoods and achieve sustainable development, women's participation in agriculture is essential (Quisumbing et al., 2024). Their productivity and contributions to the industry, however, may be hampered by issues including restricted access to technology, credit, and land (Meinzen-Dick et al., 2024).

Women are essential to the agricultural sector, especially in developing nations like sub-Saharan Africa, where they make up over 43% of the workforce. Their contributions span the production, processing, marketing, and preservation phases of the agricultural value chain. Women frequently encounter institutional obstacles such restricted access to land,

credit, technology, and extension services, despite their substantial engagement. For example, in Nigeria, women contribute significantly to food security and rural economies, but they only own around 14% of agricultural land, receive less than 10% of available credit, and receive 7% of extension services (FAO, 2023; Otepola, 2023).

These difficulties are made worse by women's underrepresentation in decision-making processes. Cultural traditions and legislative structures in many areas limit women's access to leadership positions and resources. For instance, in Zambia, customary practices frequently violate the equal land rights granted by statute law, leaving women with restricted economic possibilities and insecure land tenure (Alamu et al., 2019). According to Oyedele and Lai-Solarin (2023), women in Nigeria are also often excluded from leadership roles in agricultural cooperatives and decision-making organizations, which limits their ability to influence practices and policies that impact their livelihoods.

In addition to promoting equity, empowering women in agriculture also promotes sustainability and efficiency. According to studies, agricultural yields may rise by 20–30% if women had equal access to productive resources. This could result in a 2.5–4% increase in total agricultural output in poor nations (FAO, 2023). Efforts to reduce the gender gap, like giving women access to extension services, training, and financing, have shown benefits for food security and productivity. In Nigeria, for example, initiatives such as the Women Farmers Advancement Network (WOFAN) have effectively expanded women's access to markets and resources, resulting in better farming methods and higher household earnings (Professions.ng, 2023).

In conclusion, improving food security and advancing sustainable development depend on acknowledging and resolving the gender gaps in agriculture. The agriculture industry may become more resilient, inclusive, and productive by guaranteeing women equitable access to resources, decision-making procedures, and leadership roles.

Effect of Government and Women Participation in Promoting Sustainable Agriculture

Women's involvement in advancing sustainable agriculture can be greatly impacted by government programs and policies (Agarwal, 2018). Women can be empowered to embrace sustainable farming methods, increase their output, and play a bigger part in the sector with the help of supportive policies and initiatives (FAO, 2019). Better nutrition, increased food security, and a more sustainable use of natural resources can result from women's involvement in sustainable agriculture (Quisumbing et al., 2014). In order to promote gender equality in agriculture, effective government initiatives can also address the obstacles that women have when trying to access resources, technology, and training (Doss, 2018). Promoting sustainable agriculture in Nigeria requires the active participation of women as well as government measures. In the agricultural industry, women contribute significantly to the production, processing, and marketing of food. However,

institutional issues including restricted access to land, credit, and extension services, together with sociocultural hurdles, frequently impede their potential.

These issues could be resolved and gender-inclusive agricultural development encouraged by government policy. For example, the National Gender Policy seeks to guarantee women equal access to opportunities and resources, but state-by-state implementation has varied. Similarly, although access is still restricted, women have had access to microlending options under the National Social Investment Program, which includes programs like the Government Enterprise and Empowerment Program (GEEP). In order to increase the efficacy of these measures, gender-responsive budgeting, land reforms that protect women's land rights, and initiatives for financial inclusion that are specific to the needs of women. Furthermore, encouraging women to take on leadership and decision-making responsibilities in agriculture helps boost output and ensure food security. In conclusion, to remove current obstacles and establish a supportive atmosphere for Nigeria's sustainable agricultural development, a coordinated effort by the government and women is required. The agricultural sector can attain increased production, food security, and economic growth by tackling gender inequality and empowering women.

Challenges Women Encounter in Promoting Sustainable Agriculture

Rural women who work in agriculture have a range of opportunities and difficulties. Promoting gender equality, empowering women, and attaining sustainable agricultural development all depend on an understanding of these obstacles and taking use of the possibilities that present themselves. The following are some typical obstacles and chances that rural women face when engaging in agricultural activities:

Limited access to resources: Accessing land, loans, markets, technology, and productive resources can be difficult for rural women. Their influence over land is restricted by unequal inheritance and land ownership rights, which impedes their ability to generate money and produce agricultural products.

Gender-based discrimination: In rural areas, gender-based prejudice still exists and affects women's ability to make decisions, obtain education, engage in communal activities, and manage their finances. Gender roles can be reinforced and women's possibilities for progress limited by sociocultural norms and practices.

Limited access to education and information: Lack of access to quality education and information hampers rural women's ability to adopt modern farming techniques, access market information, and make informed decisions. Limited literacy and digital literacy skills can further exacerbate the information gap.

Unpaid care and domestic work: Rural women frequently take on unpaid caregiving and household duties, which takes up time and energy that could be used for agricultural

pursuits. Inequitably allocating household duties might limit women's ability to participate in income-generating activities and reduce their productivity.

Climate change and environmental degradation: Rural women are disproportionately affected by the effects of climate change, including unpredictable rainfall patterns, droughts, and natural disasters. Degradation of the environment and the susceptibility of agricultural systems to climate change threaten their access to resources, food security, and means of subsistence.

A comprehensive strategy that includes empowering rural women, advancing gender equality, bolstering market and resource accessibility, enhancing educational and training opportunities, and putting gender-responsive policies and programs into place is needed to overcome these challenges.

Sustainable Livelihoods Theory

Ian Scoones' Sustainable Livelihoods Framework, which was released in 1998, is a related idea. In order to promote sustainable livelihoods, this paradigm highlights how crucial it is to comprehend the intricate relationships that exist between institutions, policies, and livelihood assets. This paradigm can be used to comprehend how women support sustainable agriculture for rural livelihoods in Enugu State, Nigeria. One important livelihood option that necessitates access to resources like land, credit, and technology is the participation of women in agriculture. In order for women to effectively contribute to sustainable agriculture and enhance rural livelihoods, the framework emphasizes the necessity of supportive institutions and policies.

Policymakers and stakeholders can better understand the possibilities and problems encountered by women in rural Enugu State by implementing the Sustainable Livelihoods Framework. This will help them create focused interventions that will support their role in advancing rural development and sustainable agriculture.

Empirical Review

Nwankwo and Nwosu's (2019) study looked at how women in Nigeria's Enugu State contribute to sustainable agriculture. According to the research, women are essential to household food security and rural livelihoods because they participate in agricultural tasks like planting, harvesting, and processing goods.

Okoro et al. (2020) examined the effects of women's participation in sustainable agriculture on rural livelihoods in Enugu State in a similar study. The findings demonstrated that household income, food security, and general well-being were all considerably enhanced by women's involvement in sustainable agriculture.

Ezugwu et al. (2018) investigated the difficulties women in Enugu State experienced in obtaining agricultural resources in another study. The results emphasized the necessity of

policies and initiatives that cater to the unique requirements of women in agriculture, such as their access to technology, credit, and land.

In Enugu State, the study by Ugwu et al. (2021) looked at the connection between sustainable agriculture and women's empowerment. The findings demonstrated that empowering women is essential to advancing sustainable agriculture and raising rural residents' standard of living.

Lastly, Nwosu et al.'s study from 2022 looked into how women in Enugu State could support sustainable farming methods. According to the findings, women are crucial in advancing sustainable agricultural methods including soil conservation and organic farming, and their participation is necessary to achieve sustainable rural lifestyles.

Gap in Literature

The present work

Research Design

The study employed correctional data from 150 women farmers in two local governments of Enugu state, and it was analyzed by an ordered probit model.

Area of Study

The study was specifically carried out in Igbo Etiti Local Government Area of Enugu State, the area have a huge presence of women actively involved in Agricultural Practices.

Sources of Data

Data were sourced from primary and secondary sources, primary source involved data gathered by the researchers personally, while secondary sources are pre-existing data collected by the researchers.

Population of the Study

The respondents were women who are actively involved in agricultural practices in the area under study; they are 228 in number, randomly selected by the researchers.

Method of Data Analysis

The researchers analyzed the data collected in the survey exercise using simple statistical tools, frequencies, tables and percentages, and SPSS 22 was employed to test the formulated hypotheses.

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Research Question one: What is the effect of sales of agricultural products at retail stores by women on rural livelihoods of Enugu State, Nigeria?

Table 1: sales of agricultural products at retail stores by women has promoted sustainable agricultural practices and improved rural livelihoods of Enugu State, Nigeria

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	111	38.54	38.54	38.45
	A	88	30.56	30.56	69.10
	UD	36	12.50	12.50	81.60
	DA	28	9.72	9.72	91.32
	SD	25	8.68	8.68	100.0
	Total	288	100.0	100.0	

Source: Field Survey, 2025

Table 4.2.1 shows that 111 respondents representing 38.54 percent of the total respondents strongly agree that sales of agricultural products at retail stores by women has promoted sustainable agricultural practices and promoted rural livelihoods of Enugu State, 88 respondents representing 30.56 percent agree, 36 respondents representing 12.50 percent were undecided, 28 respondents representing 9.72 percent disagree, while 25 respondents representing 8.68 percent strongly disagree.

Research Question Two: ii. What is the effect of traditional water adaptation processes by women on rural livelihoods in Enugu State, Nigeria?

Table 2: traditional water adaptation processes by women has promoted sustainable agricultural practices and improved rural livelihoods in Enugu State, Nigeria.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	119	41.32	41.32	41.32
	A	92	31.94	31.94	73.37
	UD	32	11.11	11.11	84.37
	DA	22	7.64	7.64	92.01
	SD	20	7.99	7.99	100.0
	Total	288	100.0	100.0	

Source: Field Survey, 2025

Table 4.2.2 shows that 119 respondents representing 41.32 percent of the total respondents strongly agree that traditional water adaptation processes by women has promoted sustainable agricultural practices and improved rural livelihoods in Enugu State, Nigeria, 92 respondents representing 31.94 percent agree, 32 respondents representing

11.11 percent were undecided, 22 respondents representing 7.64 percent disagree, while 20 respondents representing 7.99 percent strongly disagree.

Test of Hypotheses

Hypotheses One: H⁰: there is no significant effect of sales of agricultural products at retail stores by women on rural livelihoods of Enugu State, Nigeria.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.940(a)	.8.68	.868	.36797

a Predictors: (Constant)

ANOVA (b)

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	468.408	1	488.418	3268.332	.000(a)
	Residual	62.079	168	.142		
	Total	542.467	169			

Dependent Variable: Sustainable agricultural production, rural livelihoods
Independent Variable: Sales of agricultural products at retail prices

Coefficient of Multiple Determinants {r^2}

The R^2 {R-Squared} which measures the overall goodness of fit of the entire regression, shows the value as .868 and adjusted to .868. This means that R^2 accounts for 88.5 percent approximately 89 percent. This indicates that the independents variables account for about 89 percent of the variation in the dependent variable. Which shows goodness of fit? From the result, F-calculated (3268.332) is greater than the f-tabulated (2.7858), that is F-cal> F-tab. Hence, we reject the null hypothesis (H_o) and accept Alternative hypothesis which means that the overall estimate has a good fit which also implies that our independents variables are simultaneously significant. We now conclude from that analysis that there is a significant effect of sales of agricultural products at retail stores by women on rural livelihoods of Enugu State, Nigeria.

Hypothesis Two: H⁰: there is no significant effect of traditional water adaptation processes by women on rural livelihoods in Enugu State, Nigeria.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.972(a)	.945	.945	.28934

a Predictors: (Constant)

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ANOVA(b)

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	556.541	1	556.541	7356.341	.000(a)
	Residual	33.614	168	.077		
	Total	590.155	169			

Dependent Variable: Sustainable agricultural production, Rural Livelihoods
Independent Variable: Traditional water adaptation processes

Coefficient of Multiple Determinants {r^2}

The R^2 {R-Squared} which measures the overall goodness of fit of the entire regression, shows the value as .933 and adjusted to .933. This means that R^2 accounts for 94.3 percent approximately 89 percent. This indicates that the independents variables accounts for about 89 percent of the variation in the dependent variable. Which shows goodness of fit? From the result, F-calculated (7356.341) is greater than the F-tabulated (2.7858), that is F-cal> F-tab. Hence, we reject the null hypothesis (H_o) and accept Alternative hypothesis which means that the overall estimate had a good fit which also implies that the independents variables are simultaneously significant. We now conclude from the analysis that a significant effect of traditional water adaptation processes by women on rural livelihoods in Enugu State, Nigeria.

Discussion of Findings

Women's involvement in sustainable agriculture production through sales of agricultural products at retail stores had a significant positive effect on rural livelihoods of Enugu State, Nigeria. So, government programs and policies can enable women to increase their production, embrace sustainable farming methods, and play a bigger part in the sector is highly needed (Aneke & Alio, 2018). The government can support social stability and economic progress in the state by encouraging women to work in sustainable agriculture. Also, Women's involvement in sustainable agriculture production through traditional water adaptation processes had a significant positive effect on rural livelihoods of Enugu State,

Despite the fact that women may have too much work and obligations at home which leaves them with little time and energy for agricultural production, they still contribute so much (Agboh & Eteng, 2018). Targeted policies and initiatives that promote women's empowerment and give them the tools and assistance they need to practice sustainable agriculture can help remove their

Summary of Findings

The researchers in the course of this study found out that women contribute to sustainable agricultural production which culminates in significant effect on rural livelihoods, thus improving livelihoods in our rural communities; they do this through,

1. 1 sale of agricultural products at retail stores, these afford locals in the rural communities' opportunity of purchase agricultural products at affordable prices, and these goods are readily available most times
2. 2 traditional water adaptation processes, women are more inclined to save and make effective use of water for agricultural production in rural communities than their menfolk, their experiences in managing the home is well used here.

Conclusion

The report emphasizes how important government action is to improving women's involvement in sustainable agriculture and rural livelihoods in Enugu State. But even with the benefits of government action, women continue to encounter major barriers that prevent them from fully participating in the advancement of sustainable agriculture. Therefore, in order to make it easier for women to participate in sustainable agriculture and rural development in Enugu State, policymakers and stakeholders must give priority to resolving these issues while building on the achievements of government involvement. The study concluded from the findings that sale of agricultural products at retail stores and traditional water adaptation processes by women promote sustainable agricultural production and improve rural livelihoods of Enugu State.

Recommendations

1. Government of Enugu State should intensifies and expands its intervention programs to further encourage and support women's involvement in sustainable agriculture practices
2. Targeted measures should be implemented to remove or reduce these barriers; this includes improving access to land, credit facilities, education, and agricultural resources, as well as addressing socio-cultural norms that limit women's full participation.

Contribution to Knowledge

The researchers have demonstrated through the study that women contribute very well to sustainable agricultural production, through the various activities of theirs discovered during the research study, more can still be done by them.

Suggestion for Further Studies

Further studies can still be carried out on the subject, the role of women in poverty reduction among rural dwellers in our society.

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