



The Role of Women in Sustainable Farming Practices and Rural Development

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Abstract

In the realm of sustainable agriculture and rural development, women play a crucial role, making major contributions to the preservation of biodiversity, the preservation of food security, and the maintenance of economic stability. The influence of women's participation in environmentally responsible agricultural techniques is investigated in this abstract, with a particular focus on the contribution that women make to the ecological resilience and rural livelihoods. Traditional knowledge systems, organic farming, agroecology, and creative techniques such as perm culture are all examples of the varied ways in which women participate in agriculture. Through the use of organic fertilisers, crop rotation, and water conservation measures, they engage in sustainable farming practices. These practices improve the health of the soil and lessen the reliance on artificial nutrients and fertilisers. Additionally, women play a significant role in the conservation of indigenous seeds, the promotion of crop diversity, and the practice of climate-smart agriculture, all of which assist communities in adapting to shifting environmental circumstances for better outcomes. Food security and family nutrition are both improved as a result of their participation in decision-making processes at the household and community levels. It has been demonstrated that increasing farm production and leading to more sustainable and equitable development may be achieved by providing women in agriculture with access to resources, education, and financial assistance with the goal of empowering them. Women frequently encounter obstacles, such as limited land ownership, poor access to financing, and restricted participation in agricultural training programs, despite the fact that they make significant contributions. For the purpose of maximising the potential of women in sustainable farming, it is vital to address these issues through the implementation of gender-sensitive policies and inclusive rural development initiatives. By highlighting the need of recognising and increasing the role of women in sustainable farming as a critical component of rural development initiatives, this abstract emphasises the significance of accomplishing this. Fostering inclusive growth, enhancing environmental sustainability, and improving the overall resilience of rural communities are all attainable outcomes that may be achieved via the incorporation of gender equity into agricultural policies and programs.

Key words: Women, Sustainable, Farming, Rural Development

Introduction

When it comes to tackling issues of global food security, environmental sustainability, and socioeconomic progress, sustainable agriculture and rural development are essential components. The implementation of sustainable agricultural techniques is more important than it has ever been before in light of the growing number of issues that the globe is facing in relation to climate change, the degradation of land, and the rise of the population. In this context, the role of women in agriculture, particularly in developing countries, has

garnered a great amount of attention due to the enormous contribution that they make to the production of food, the management of natural resources, and the welfare of the community. In many regions of the world, particularly in rural areas, women make up approximately half of the workforce in the agricultural sector. They are actively involved in a variety of farming chores, such as planting, weeding, harvesting, and processing once the crop has been completed. In addition, women frequently operate small-scale farms and are accountable for the food security of their households; hence, their involvement is essential in the transition towards more sustainable agricultural methods than it would otherwise be. For the purpose of encouraging sustainable agricultural methods that improve biodiversity and resilience against climate change, their traditional knowledge of local crops, soil management, and water conservation techniques is of incalculable value. Women in agriculture encounter a multitude of obstacles, despite the considerable contributions they make to the industry. The limited access to land ownership, financing, training, technology, and agricultural inputs are some of the factors that contribute to this. In addition, their decision-making ability is further restricted by socio-cultural norms and gender prejudices, which further limit female involvement in agricultural extension programs and the creation of policies. These inequalities prevent women from reaching their full potential in terms of their contributions to the development of rural areas and sustainable agriculture. The empowerment of women and the incorporation of gender considerations into agricultural policy have the potential to result in farming systems that are more efficient and sustainable. It has been demonstrated via research that if women were had the same access to resources as males, agricultural yields might increase by as much as thirty percent, resulting in enhanced food security and economic expansion. Recognising the significance of women's roles in agriculture can not only improve the overall resilience of rural communities, but it can also help reduce poverty and contribute to the Sustainable Development Goals (SDGs), particularly those that are associated with achieving zero hunger (SDG 2), gender equality (SDG 5), and climate action (SDG 13). The purpose of this study is to investigate the complex role that women play in the development of rural areas and sustainable agricultural techniques. Additionally, it addresses the issues that they are now facing while also analysing the contributions that they have made to the areas of food security, environmental sustainability, and economic stability. The purpose of this study is to give insights into how empowering women in agriculture may alter rural economies and promote sustainable development. This will be accomplished by underlining the need for gender-inclusive policies and practices.

Women in Agriculture: A Vital Yet Underrecognized Force

Agriculture is a field in which women play an essential role, particularly in the rural landscapes of developing nations. According to the Food and Agriculture Organisation (FAO), women make up around 43 percent of the labour in the agricultural sector worldwide. In certain countries of Africa and Asia, this percentage can reach as high as 60 to 70 percent. Their engagement is all-encompassing, ranging from farming for sustenance to producing goods on a small scale for commercial purposes. Participating in activities like as seed selection, planting, weeding, harvesting, and processing are typical activities that women engage in. These activities provide a substantial contribution to the whole agricultural value chain.

The contributions made by women are sometimes overlooked and devalued, despite the fact that they play a crucial role. One of the reasons for this lack of acknowledgement is because a significant portion of their job is performed in an informal setting, and it is commonly referred to as "unpaid family labour." A further factor that contributes to the marginalisation of women in agriculture is the presence of traditional gender

norms and cultural practices. These factors restrict women's visibility and involvement in official agricultural decision-making activities and leadership roles.

Sustainable Farming Practices and Women's Traditional Knowledge

When it comes to agriculture, sustainable practices prioritise the preservation of ecosystems while also catering to the dietary requirements of the populace. Because they are the major carers and managers of household food supplies, women have a profound understanding of the ecosystems, traditional crops, and biodiversity of the environments in which they live. They frequently participate in agroecological methods like as intercropping, crop rotation, the use of organic manure, and integrated pest control, all of which are crucial for preserving the fertility of the soil and minimising the negative effects on the environment.

In the context of sustainable agriculture, the traditional wisdom that women possess is very significant. Historically, for instance, women have played a vital role in the preservation of indigenous seeds, so assuring the survival of a wide range of agricultural types that have adapted to the climatic circumstances of the area. By increasing crop resistance to pests, diseases, and shifting weather patterns, this approach contributes to the sustainability of agriculture and the nation's capacity to provide food for its citizens. Additionally, the participation of women in home gardening and the management of small animals also helps to the diversification of diets, improved nutrition for families, and less reliance on food supplies that are obtained from outside sources.

Research Methodology

Research data

The research was conducted in the Probolinggo regency, with a particular emphasis on two areas that had the largest percentage of potato production. Potato growers were the ones who participated in this study, and the selection of respondents was accomplished by a multistage random sample procedure. In the first step of the study process, a list of farmers who cultivate potatoes in the two districts that make up each research target area will be compiled. This will allow for the collection of a research sample frame. In addition, 75 farmers will be chosen at random from the list of farmers in each area, resulting in a total of 150 farmers being gained in each district.

Data analysis

The following equation will be utilised in order to study the influence that gender plays in the implementation of sustainable agricultural practices:

$$S_i^j = \alpha_i g_i + \beta_i x_i + e_i \quad (1)$$

Given that s_i is an ordinal value that represents a number of sustainable agriculture practices ranging from 0 to 4, the key variable that represents the presence of female farmers in the family is denoted by the variable g_i , which is equal to one if the household has female members who are farmers and zero otherwise. factors that are likely to have an impact on sustainable agricultural practices include the age of the farmer, the level of education they have, and the number of families they have. α_i and β_i consists of the error term as well

as the regression coefficient. After that, we utilised an ordered probit model in order to determine the impact that gender has on the sustainable agricultural practices of farmers. This was done since the dependent variable in equation 1 is an ordinal variable.

Results and Discussion

Descriptive statistics

The presentation of the definitions of the study variables may be found in table 1. According to the findings, more than ninety-one percent of the homes in our samples consisted of a female farmer. The average age of our sample is 48 years old, the education level of the household head is six years, and the maximum education level of a family member is eight years old. Furthermore, in relation to agricultural factors, the average total land possessed is around 2.39 hectares, 58% of which is their own, and just 1% of them have access to a government institution. Sixty-five percent went to the farmer's group. There are between one and two units of agricultural machinery that are owned by the responder on average. As a conclusion, the monthly average income is around 1177.28 United States Dollars.

Table 1. Descriptive statistics

Variable	Measurement	Mean	Std.
Female farmers	Dummy, 1 if the household at least have a female farmer; 0 otherwise	0.91	0.28
Age	Age of household head in years	48.18	12.82
Education	Education level of household head in years	6.05	2.98
Family education	The highest education level of the family members	7.89	2.78
Total area	Total cultivated area in Ha	2.39	2.23
Land status	Dummy, 1 for own land; 0 otherwise	0.68	0.48
Social network	Dummy 1 if the farmers have access to government institution	0.01	0.12
Farmer group	Dummy 1, if the farmer participates in farmer group; 0 otherwise	0.65	0.48

Agricultural Machinery	Numbers of agricultural machinery owned by the farmers	1.27	0.77
Income	Household income in USD	1177.28	903.37
Sustainable Agriculture Practices (SAP) Adoption	Number of farmers agricultural practice adoption (0- 4)	2.17	1.58

The role of gender in sustainable agricultural practices

The findings of the ordered probit model were reported in table 2, and the primary conclusion revealed that female farmers have a positive and substantial influence on the decisions that households make about the adoption of the greatest number of sustainable agricultural practices. It may be deduced from this study that farmers who have female family members working in agriculture are more likely to embrace environmentally responsible farming techniques. As a result, we asserted that women make a more significant contribution to the development of sustainable agriculture. Based on the findings from the other control variables, it can be concluded that total area has a negative impact on the decisions made by households to implement the greatest amount of sustainable agricultural practices. Farmers in areas with the largest total area tend to implement agriculture intensification in order to boost their production rather than adopting agricultural techniques that are sustainable. The status of the land has a negative and significant influence, which indicates that farmers who own their own property are more likely to employ techniques that are detrimental to the environment. There is a favourable and considerable impact that participation in the farmers group has on the decisions that households make regarding the application of sustainable farming techniques. It is possible to demonstrate that a farmer group is a social capital that is associated with agricultural-related information and practice. Consequently, farmers who are members of farmer associations are more likely to adopt new methods, such as environmentally responsible farming practices.

Table 2. The part that gender plays in environmentally responsible farming methods

Sustainable Practices	Coef.	Std.	Err.	Sig
Female farmers	1.19	0.37	3.23	0.00***
Age	-0.01	0.01	-1.58	0.11
Education	0.00	0.04	-0.03	0.98
Family education	0.03	0.05	0.65	0.52
Total area	-0.19	0.06	-2.94	0.00***
Land status	-0.87	0.20	-4.24	0.00***
Social network	0.15	0.82	0.18	0.86

Farmer group	0.56	0.21	2.68	0.01***
Agricultural Machinery	0.24	0.14	1.66	0.10
Income	3.81×10^{-6}	7.51×10^{-6}	1.97	0.05**
/cut1	-0.54	0.67	-1.84	0.77
/cut2	0.65	0.67	-0.66	1.97
/cut3	0.84	0.67	-0.47	2.16
/cut4	1.17	0.67	-0.15	2.48
Log likelihood =	-187.49			
LR chi2(11) =	53.89			
Prob > chi2 =	0.00			
Pseudo R2 =	0.13			
Number of obs=	150.00			

Note: ** and *** denotes significant in 5% and 1% respectively

Conclusion

In the realms of agriculture and rural development, women play a crucial role, especially in the adoption of sustainable farming practices. Climate adaptation, resource management, and food production are just a few of the many areas that have benefited from their work. When it comes to protecting soil health, increasing biodiversity, and using environmentally friendly farming practices, women have a unique mix of traditional knowledge and skills that are crucial. Women face significant barriers, including limited access to property, financial services, educational opportunities, and decision-making platforms, despite the substantial role they play. Because of these challenges, they will not be able to fully contribute to the improvement of rural regions and sustainable farming. There are several potential benefits of empowering women in agriculture, including improved nutrition, enhanced resilience to climate change, and increased food security. Giving women the same opportunities as males leads to increased agricultural productivity, a wider variety of crop systems, and better land management practices. Numerous social and economic benefits accrue from empowering individuals, such as reduced poverty, improved household well-being, and more equitable development in rural regions. Addressing the gender gap in agriculture requires the implementation of policies and programs that are attentive to gender dynamics. A combination of improved access to capital and banking services, new specialist agricultural training programs, and legislative improvements protecting women's land rights can close the gap. It is also critical to promote women's involvement in agricultural cooperatives, community groups, and policy-making organisations so that their voices are heard and their needs are met. Finally, if we are serious about ensuring food security and environmental sustainability on a worldwide scale, we must address the gender gap in agricultural production and rural development by include women in these efforts. Recognising and empowering women in agriculture can help us achieve the

Sustainable Development Goals (SDGs), especially those pertaining to ending hunger, promoting gender equality, and combating climate change. By doing so, we can strengthen rural economies, lessen the impact of climate change, and accelerate our progress towards these important causes. Women must actively participate in the process of defining agricultural practices and policies in order to unlock the full potential of sustainable farming and to construct a future that is more inclusive and fair for rural communities.

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