

# Impact on Livelihoods of Women's Engagement in Agriculture in Bangladesh: A Social Research Approach

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## ABSTRACT

*In Bangladesh, women's engagement in economic activities in general and in agriculture in a particular area has remained low, but in modern times, the participation of women in agriculture has rapidly increased and also contributed to economic activities according to the survey guided by the Bureau of Statistics. Women's role is changing from unpaid family workers to farm managers, a phenomenon termed as "feminization of agriculture" in absence of males. In order to determine the involvement of women in agricultural activities, secondary data from a representative sample survey in 62 villages conducted by the Bangladesh Bureau of Statistics from 2000 to 2022 was used in conjunction with primary data from the Bangladeshi districts of Dinajpur, Cumilla, and Moulvibazar. The results show that 71% of women engaged in agricultural activities in 2022, an increase of about 11% from 2000. The participation was restricted to mostly crop farming, livestock and poultry rearing which is a marginal economic activity with the allocation of only about 1.5 hours of labor per day. Only 22% of the female workers participated in crop farming in 2022, compared to 45% of men. Only about 5% of the women participated in the agricultural labor market in 2000 and 2022. Women's participation in the agricultural labor market remains insignificant at 3.07% of agricultural workers. A regression analysis shows that women's engagement in agriculture is negatively related to land holding, different age gap, education of household members and wage rate, on the other hand, favorable way with the women's ages, the number of their homes that are irrigated, their membership in NGOs, the village's isolation, and the wage rate for agriculture in the community.*

**KEYWORDS:** Livelihood, Economic Contribution, Women, Agriculture, Bangladesh.

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## **INTRODUCTION**

In rural areas, women make important economic contributions as wage earners, farmers, and company owners. They are also responsible for taking care of their family's needs, which include cooking, washing clothes and kitchenware, and gathering wood for the fire. However, due to the lack of a monetary value, these are regarded as unpaid employment. The traditional wisdom that indigenous and grassroots women usually guard is crucial to the culture, resiliency, and way of life of their communities.

In Asia, women's economic contribution to agriculture is growing considerably. Estimation of the ratio of women working in agriculture range between 60 to 98 percent in Bangladesh, India, Bhutan, Nepal, Pakistan, Vietnam, China, Myanmar, and Cambodia (FAO, 2003). Only 59 percent of Bangladeshi women work in agriculture, compared to over 74 percent of Indian women, 64 percent of Pakistani women, and 85 percent of Nepalese women. Women's involvement in agriculture is considered to be unpaid family labor and is sadly under-appreciated. Even more, women would be employed in agriculture if unpaid work were considered (FAO, 2003).

In recent years, there has been a manpower deficit in the remote agricultural sector, and farm technology has not developed quickly enough to fill this gap. As a result, Bangladesh is seeing an increase in women's participation, particularly in agriculture and as business owners (Hossain & Jaim 2011; Birner et al. 2010). Poverty, women's suffrage, and the shift of male family members from agriculture to on-farm jobs are all cited as factors in the development.

This study focused on the investigation of female labor forces and the determination of women's involvement in agriculture. In Bangladesh, this study also investigated the rise of female labor in the agricultural sector. Also, focusing research and identification of the elements that affect women's involvement in agriculture. Additionally, investigating the determinants of income changes and evaluating the changes in income in households as a result of women's engagement in agriculture.

## **REVIEW OF LITERATURE**

Gender inequality in rural Bangladesh has been linked to both economic and sociocultural causes thus women's empowerment was found to be

weakly influenced by rural economic activity inside the household (Ahsan et al.1986). Women's Empowerment in Agriculture Index (WEAI) is a tool that can be used to measure the level of women's empowerment in agriculture and identify areas where there are gaps in empowerment so that programs and policies may be focused on those regions (Birner et al. 2010). It is well known that Bangladesh is a predominately male-dominated country, with cultural and religious beliefs that impose limitations on women's mobility and involvement in economic and social activities. Researchers have discovered links between economic and sociocultural factors and the pervasive gender wage gap in rural Bangladesh (Bose et al. 2009). Market employment, primarily done by men, and a sizable amount of subsistence and domestic labor, mostly done by women, make up the productive work within homes (Chowdhury, N 1986)

According to Jaim & Hossain (2011), Bangladesh's traditional Muslim culture is to blame for the continued low involvement of women in the economy, particularly in agriculture. In order to empower women, NGOs have been working hard. Additionally, male family members have been moving away from agriculture and into non-farm occupations, which has led to an increase in the participation of women in economic activities. Moreover, according to Hossain & Bayes, 2009; Abdullah & Zeidenstein, 1982, Bangladeshi women rarely work in agriculture outside of the home since it is a traditional Muslim community. Women's involvement in agriculture used to be limited to homestead vegetable production and post-harvest activities, but in past years, it has expanded to include tasks such as raising cattle and poultry in addition to crop production. In the 1980s, a lot of research on women's activities was done (Abdullah & Zeidenstein 1982; Ahsan et al. 1986; Begum 1983; Chowdhury 1986; Farouk 1979 & 1983; Halim & McCarrthy 1985; Westergaard 1983, Jaim & Rahman 1988). These researchers stated that women's contributions to socioeconomic progress were not evident, possibly as a result of a set of societal norms that allowed the domination of men over women (Bose et al. 2009).

## **METHODOLOGY**

Data from the Labor Force Surveys (LFS) carried out by the Bangladesh Bureau of Statistics (BBS) in 1995-1996, 1999-2000, 2002-2003, 2005-2006, 2006-08, and 2019-2020 were used to estimate the

developments in women's labor participation on a nationwide scale. Additionally, the data of a longitudinal panel from the Bangladesh Bureau of Statistics were obtained to examine the pattern and factors of women's participation in agricultural activities at the household level. 33 villages in Bangladesh's Dinajpur, Cumilla, and Moulvibazar districts provided the raw data, which were collected. The BBS secondary sample was selected in 1987 the same sample was chosen once more in 2000 using a multi-state (districts, unions, villages, and households) random sampling approach. By stratifying households by variables related to land ownership and tenure, a random sample was chosen in 2000 based on "wealth ranking," which included families chosen in the benchmark survey from 1987, (Hossain et al., 2004). In 2022, a new poll of the same households was conducted. For each working member, a thorough activity time budget is created and documented using a BBS survey, in addition to socio-demographic and socio-economic data at the member level. For this research perspective, descriptive statistics were used in conjunction with some multivariate regression analysis and the T-test is an example of statistical t-test

## FINDINGS

Increase of women labor force in agriculture: Dinajpur, Cumilla and Moulvibazar District of Bangladesh.

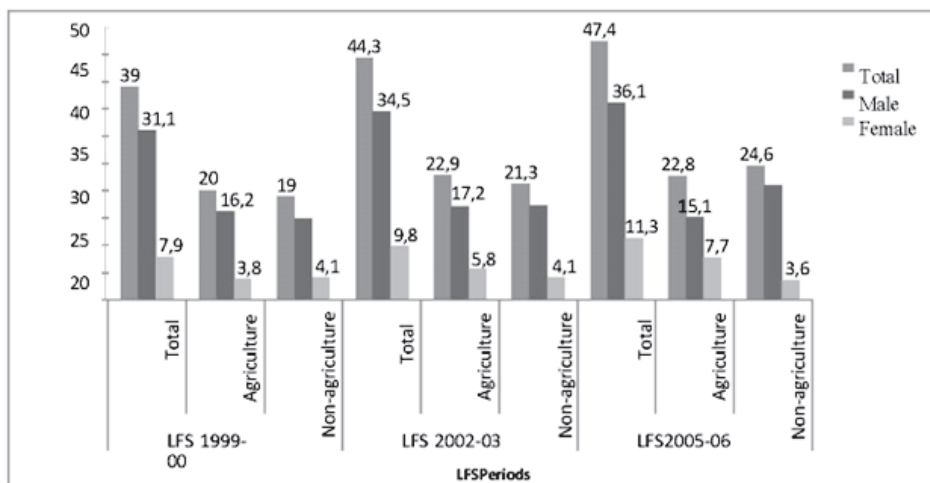
The dimension of the adult (15+ yrs) labor force rose from 1995-1996 to 1999-2000, reflecting a 3.2 percent growth rate. However, female labor force growth outpaced male labor force growth. During the period, female labor force growth was 14.4 percent, while male labor force growth was only 1.2 percent. The same pattern was discovered by Labor Force Surveys (LFS) in 2002-2003, 2005-2006, 2015-2017 to 2019-2020 (Table- 1).

**Table 1:** Bangladesh's yearly average labor force grows at a different rate depending on gender.

Periods	Both male & female	Male	Female
1995-1996 to 1999-2000	3.2	1.2	14.4
1999-2000 to 2002-2003	4.4	3.8	6.5
2002-2003 to 2005-2006	2.21	1.23	5.45
2015-2017 to 2019-2020	5.5	3.25	7.75

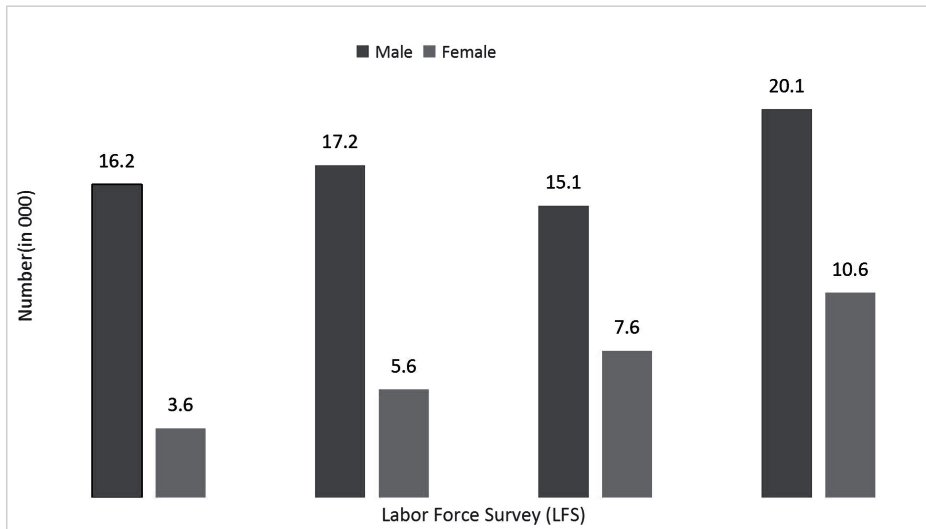
**Source:** The BBSs from 2002, 2004, 2008, and BBS (2020)

Women's work engagement in the sector of agriculture has increased over time as compared to male labor. The adult labor force increased by 21.53 percent from 1999-2000 to 2021-22 (Figure-1). During the same time period, the female and male labor force involvement rates climbed by 43% and 16%, respectively. There had been a significant drop in male labor force participation, particularly in agriculture. The agricultural male workforce declined by nearly 7% between 1999-2000 and 2005-2006, from 16.2 to 15.1 million. During the same time span, the women's labor force in agriculture expanded from 3.8 million to 7.7 million, a 103 percent rise. The above graphic depicts the comparative situations of men and women in agricultural participation in recent years. According to the LFS for 1999-2000, 2002-2003, and 2005-2006, the percentage of adult male engagement in agriculture has fallen down from 51.9 percent to 41.4 percent and 31.9 percent, respectively. According to the LFS for 1999-2000, 2005-2006, and 2021-22, the percentage of women in agriculture climbed gradually from 48.1 percent to 80 percent.

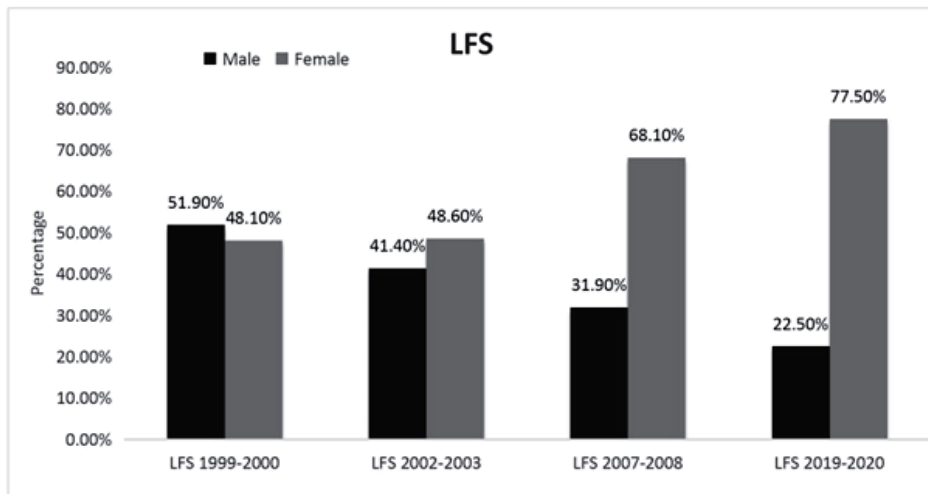


**Source:** 1999–2000, 2002–2003, and 2005–2006 year's data of Labor Force Survey (LFS).

**Figure- 1:** Gender differences in Bangladesh's history of labor force involved in agricultural and non-agricultural activities



**Figure- 2:** Engagement of females compared to males in the agriculture sector of Bangladesh



**Source:** Labor Force Survey (LFS) results for the years 1999–2000, 2002–2003, 2005–2006, and 2019–20

**Figure-3:** Adult male and female agricultural participation rates in Bangladesh across time.

### **Household Data on the Type and Amount of Women's Agriculture Involvement**

Adult male engagement in agriculture declined from 83% in 1987 to 56% in 2000, a 27 percent drop; however, this has rebounded at a level of 65 percent during 2008. Women's

agricultural engagement, on the contrary, stayed nearly constant between 1987 and 2000 (59% and 58%, respectively); but, as compared to 2000, women's participation grew by about 8% in 2008. Male labor in agriculture farming has declined in the past few years as numerous farm processes (such as ploughing, irrigation, paddy threshing, and so on) have become entirely or largely mechanized.

Women's participation in agricultural production has likewise fallen substantially, from approximately 23 percent in 1987 to approximately 3 percent in 2000 and 4 percent in 2008. It is mostly due to the cause that women's participation in after-harvest operations, particularly crop processing (drying, winnowing, husking/milling, parboiling etc.), has become vastly mechanized. At the moment, female is primarily active in livestock rearing and poultry farming rather than crop cultivation. Adult women's participation in livestock and poultry production climbed from 43 percent in 1987 to 51 percent in 2000, and then to 69 percent in 2008. Women's engagement in household production has also grown in past few years. According to the findings, 18% of adult female household members engaged in homestead production in 2008, compared to 9 to 10% in 2000 and 1987, respectively. Credit assistance from non-governmental organizations has greatly facilitated women's participation in homestead gardening and the raising of livestock and poultry practiced in rural Bangladesh. Adult women's participation in non-farm activities, on the contrary, has dropped over time. During 1987, over 14% of adult female members were participating in non-agricultural activities, which had declined to 7% in 2000 and 8% in 2008, showing that chances for rural women in non-farm activities had diminished over time. Women's involvement in the non-farm enterprise has similarly dropped over time in situations of industry/processing, construction labor, business and commerce, with a minor improvement in the service sector (Table-2).

**Table 2:** *Adult male and female employment in agriculture and non-agriculture over time*

Activity	Adult Employment (%) in the Activity							
	1987		2000		2008		2022	
	Men	Women	Men	Women	Men	Women	Men	Women
Agriculture	83.17	58.91	56.23	57.58	65.32	66.40	68.20	79.25
Crop cultivation	79.17	22.66	42.21	2.79	52.63	3.85	60.52	10.35
Livestock and poultry	28.70	43.18	25.09	50.77	34.52	68.93	35.43	73.12
Homestead gardening	1.53	9.72	2.67	9.24	2.36	18.00	5.25	25.32
Fisheries	5.16	1.01	5.74	0.39	3.68	0.48	11.2	1.00
Non-agriculture	34.21	14.20	45.88	7.09	43.68	8.42	51.25	12.89
Total employed	94.37	65.09	90.37	61.95	94.52	71.39	98.01	74.35

According to the analysis, just 2.45 percent of women worked as payoff labor in 1987 in compared to 24.63 percent of men. Women's wage labor participation in agricultural activities fell to around 1% between 2000 and 2008. Male wage laborer participation, on the other hand, has fallen down to some extent, from approximately 25% in 1987 to 22% in 2000 and 23% in 2008. The study also discovered that wage rates of farming for both men and women rose over time. Though, since 1987, women's wages have consistently been lower than men's (Table-3). Furthermore, the difference has grown more recently than in the past. In 1987, women earned 26 percent less than males in agriculture, but by 2000 and 2008, it had dropped to 42 percent and 39 percent, respectively. The above table shows whether the trend is increasing or declining in 2022.

**Table 3:** *Wage laborer participation in agriculture by gender and wage/payoff rate over time*

Gender	1987		2000		2008		2022	
	Labor (%)	Payoff rate per day (\$)	Labor (%)	Payoff rate per day (\$)	Labor (%)	Payoff rate per day (\$)	Labor (%)	Payoff rate per day (\$)
Men	24.63	0.73	22.26	1.02	23.08	1.76	35.02	3.79
Women	2.45	0.54	1.02	0.59	1.08	1.07	10	3.07

A replication of surveys conducted between 2000 and 2008 reported that the amount of days each woman spent working in agriculture each year has gradually increased from 1987 to the present. The range of a woman's



employment days in agriculture in 1987 was between 56 and 67 depending on the size of the farm, however, in 2000 and 2008, it was between 80 and 90 and 80 to 103. With an increase in farm size, there was a trend for the number of working days per year to rise.

### **Determinants of Women's involvement in Agriculture**

The investigation of factors affecting women's participation in agriculture has been done using logit regression. For this analysis, the most recent survey data from 2022 were considered. A dummy variable with a value = 0 for participants who received less than one hour/day and a value = 1 for participants who received more than one hour per day was used to measure the dependent variable (considered as participated). Table 4 shows the explanatory variables (X11) that were taken into account for the model.

**Table 4:** *Estimates of the Logit Function for the factors influencing women's engagement in agriculture: 2020*

Independent Variables or Determinants	Coefficients	Standard Error	Level of Significance
(X <sub>1</sub> ) Own land of the female worker HH (ha.)	-0.03265 <sup>ns</sup>	0.06051	0.59000
(X <sub>2</sub> ) Female worker's age (yrs)	0.24312*	0.01830	0.00000
(X <sub>3</sub> ) Age <sup>2</sup>	-0.00271*	0.00021	0.00000
(X <sub>4</sub> ) Female worker's education maturity (yrs)	-0.05805*	0.01549	0.00000
(X <sub>5</sub> ) Farming area covered by female worker HH (ha)	0.27645**	0.11687	0.01800
(X <sub>6</sub> ) Membership in NGO	0.36544*	0.11869	0.00200
(X <sub>7</sub> ) Electricity provided in the village	1.48139*	0.37774	0.00000
(X <sub>8</sub> ) Wage rate in the Non-agriculture sector(Taka/day)	-0.10264*	0.00117	0.00000
(X <sub>9</sub> ) Wage in the agricultural sector (Tk/day)	0.02921*	0.00251	0.00000
(X <sub>10</sub> ) Distance between bus stand and village (Km.)	-1.03192*	0.08743	0.00000
(X <sub>11</sub> ) Distance <sup>2</sup>	0.06046*	0.00367	0.00000
Degrees of freedom: 2603			

**Notes:** HH=Households

\*Significant at 1% level, \*\*Significant at 5% level, ns= not significant

The Logit function was used to estimate the coefficients, and the results showed that the age of the female workers, the amount of land their households had access to for irrigation, their membership in NGOs, the

village's remoteness, and the agricultural wage rate in the village were all significantly related to their participation in agriculture. However, the model's estimates showed that the involvement of women in agriculture had a significant inverse correlation with their literacy, the availability of electricity in the rural area, the distance from the bus stop, the wage rate earned by non-agricultural workers in the village, and their age in squares. Although the correlation was not determined to be significant, the proportion of women working in agriculture is similarly inversely correlated with the size of their own land holdings.

### **Determinants of Changes in Income**

To analyze the factors that affected how much the average income changed between 2008 and 2000, a multiple regression model was used. From Table 5, 10 independent variables were taken into consideration, with the change in income being the dependent variable (Y). Table 5 lists the predicted regression coefficients along with the level of significance. The R<sup>2</sup> value was determined to be 0.567, indicating that the explanatory factors considered for the model have been able to explain roughly 57 percent, considering the changes in household income for females who participate in agriculture both significantly and not at all between the years of 2000 and 2022. The findings indicate that changes in the amount of land owned in 2000, the level of education of adult family members in 2000, the value of capital items in 2000, the number of male and female workers in 2000, the area of cultivated land in 2000, and the value of capital items in 2000 all significantly influenced changes in household income. On the other hand, a change in the area of rented land had a large adverse effect on changes in income because a household's income is likely to decline as the rented land area increases.

**Table 5:** *Estimates from a Multiple Regression Model: Factors Changing the Income of Households with Female Labor*

Determinants or (X <sub>n</sub> ) Factors	Coefficients		t-value	Significance
	$\beta$	Std. Error		
Constant term (a)	13494	3513	3.841	0.0001
(X <sub>1</sub> ): Household own land (ha) in 2000	21154	2898	7.299	0.0000
(X <sub>2</sub> ): Income in the household (Tk) in the 2000s	-0.708	0.021	-34.244	0.0000
(X <sub>3</sub> ): Changes in adult (15+) members' education	1539	227	6.774	0.0000
(X <sub>4</sub> ): Capital value (Tk) in 2000	0.132	0.019	6.872	0.0000
(X <sub>5</sub> ): Variation in the amount of land under cultivation (ha)	30716	4586	6.698	0.0000
(X <sub>6</sub> ): Changes in the proportion of female workers	17716	5746	3.083	0.0021
(X <sub>7</sub> ): Changes in the proportion of male workers	12294	2872	4.281	0.0000
(X <sub>8</sub> ): Capital item value change (Tk)	0.257	0.021	12.542	0.0000
(X <sub>9</sub> ): Changes in the size of hired land (ha)	-34639	5115	-6.773	0.0000
<b>R<sup>2</sup></b>	<b>0.5670</b>			
<b>Dependent Variable (Y) = Income fluctuations for households with female workers</b>				

**Notes:**  $\beta$  =Coefficient N=1599

In contrast to better-off households, poorer households did well in boosting their income level over time, according to a substantial negative coefficient for household income in the base year of 2000.

## DISCUSSION

The proportion of adult women who work in agriculture remained stable and nearly unchanged between 1987 and 2000 (59% and 58%, respectively), according to household survey data, but it has climbed from zero in 2022 (71%). Women's participation in agricultural production has dropped over time, but their involvement in livestock and poultry production activities has more than made up for this. The participation of women in farmhouse gardening during the Covid period has also grown over time, doubling in 2022 compared to 2000 (from 9% in 2000 to 20% in 2022). Age of female workers, the amount of irrigated land in their households, their membership in NGOs, the village's remoteness, and the agricultural wage rate in the village were all

estimated using the Logit function. These factors all had a significant impact on the amount of agricultural work that women did. As wage workers, women also contributed to the household revenue. However, there were very few women employed as wage workers, and their pay rates were far lower than those of men (about 20 percent less).

When compared to 2000, men's involvement in agriculture has significantly decreased. This was mostly due to the fact that many farm activities in which men farmers are typically engaged have been mechanized. Farmers benefited from the policy of privatization and import liberalization of farm machinery at this time. Almost all of the land is now under cultivation, and tasks that male workers once performed with tractors, combine harvesters, and other agricultural equipment are now partially or entirely automated. The data also revealed that while women's involvement in non-farm initiatives has decreased over time, men's involvement has increased. Only the service sector in the non-farm sector has seen an increase in women's participation (from 3.28 percent in 1987 to 30.4 percent in 2022).

Additionally, it was discovered that changes in the amount of cultivated land, adult members' levels of education, the value of capital items, the ratio of male to female workers, and the amount of land owned by the household all had a significant positive impact on changes in household income over time. However, changes in the size of the land that was rented out had a detrimental effect on changes in income. Furthermore, it was discovered that households with low incomes in the base year saw substantial income rise over time.

## **CONCLUSIONS**

It is clear that labor productivity in agriculture has grown recently because fewer male members are contributing to higher production than in the past. A growing labor shortage for agricultural operations in rural regions will be caused by the assumption of greater farm technology in the future and the extension of lucrative non-farm job options for males, which will need the involvement of more female participation in agriculture. As a result of the male labor shortage, more women are becoming involved in managerial tasks associated with crop production. Actions involved in producing pre-harvest crops by male farmers predominate are the focus of the majority of agricultural technology

currently in development. For women to participate effectively in agriculture, gender-friendly pre-harvest and post-harvest crop production and processing methods must be created. Planners and scholars alike may need to pay attention to the issue for the improvement of modern Agriculture.

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### **CONFLICT OF INTEREST**

There is no conflict of interest.

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