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FEMINISATION OF AGRICULTURE AND SUSTAINABLE  
RURAL EMPOWERMENT: A STUDY OF WOMEN IN MANDYA  
DISTRICT, KARNATAKA

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**Keywords**

*Feminisation of Agriculture, Women Empowerment, Rural Development, Socio-Economic Impact, Mandya District, Sustainable Agriculture, Gender in Farming*

**Abstract**

The feminisation of agriculture has emerged as a significant socio-economic phenomenon in rural India, particularly in regions witnessing male out-migration and changing agrarian structures. This study explores the impact of feminisation of agriculture on the socio-economic conditions of women in Karnataka, with special reference to Mandya district. It examines how the increasing participation of women in agricultural activities contributes to sustainable rural empowerment. Drawing on primary data collected from 200 women engaged in farming across various taluks of Mandya district, the study assesses changes in their income levels, decision-making power, access to resources, and overall quality of life. The research adopts a descriptive and analytical design, using structured interviews and field surveys to gather insights, and employs percentage analysis and socio-economic indicators for data interpretation. The findings reveal that while women have increasingly taken up agricultural responsibilities—from sowing to harvesting—they continue to face significant challenges, including limited land ownership, lack of institutional support, and restricted access to agricultural technology and credit. However, their involvement in farming has led to notable improvements in household income, social mobility, and participation in self-help groups, reflecting a



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	shift towards greater empowerment and inclusion. The paper concludes that feminisation of agriculture, if supported by gender-sensitive policies, capacity-building programs, and institutional interventions, can serve as a transformative force for sustainable rural development. This study contributes to the discourse on rural empowerment by highlighting the critical role of women in agriculture and advocating for strategies that recognize and reinforce their contributions.
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## 1. INTRODUCTION

### ➤ Background of the study

Rural livelihoods in India are predominantly agrarian, with agriculture employing approximately 54.6% of the total workforce and contributing 17.8% to the Gross Value Added (GVA) in 2020–21 (Ministry of Agriculture & Farmers' Welfare, 2021). Karnataka, a predominantly agrarian state in southern India, mirrors this national trend, with over 61% of its rural population depending on agriculture and allied activities for their livelihoods (Government of Karnataka, 2020). The sector is characterized by small and marginal holdings, uncertain monsoon patterns, and fluctuating market prices, which cumulatively affect rural socio-economic stability.

### ➤ Emerging trend of feminisation of agriculture

In recent decades, Indian agriculture has witnessed a visible feminisation trend, defined by an increasing number of women participating in agricultural work, both as labourers and cultivators. This shift is largely attributed to the migration of male family members to urban areas, leaving women to shoulder the primary responsibilities in farming (Rao, 2012). According to the Census of India (2011), 33% of cultivators and 47% of agricultural labourers are women. In states like Karnataka, where traditional agrarian systems are deeply rooted, this transition is reshaping the dynamics of rural labour, resource access, and community roles.

### ➤ Statement of the problem

The growing involvement of women in agriculture, particularly in districts such as Mandya, is a direct consequence of socio-economic shifts, mechanisation gaps, and the out-migration of men in search of better economic opportunities. This has led to a silent transformation in the agrarian structure, wherein women now engage in multiple facets of farming—ranging from seed selection and transplantation to harvesting and post-harvest management. However, this increased participation is rarely accompanied by a corresponding rise in ownership, decision-making authority, or access to institutional resources (Agarwal, 2021). The paradox lies in the critical role women play in sustaining agricultural productivity, juxtaposed with their marginalization in terms of land rights, access to finance, and technology (FAO, 2019). There is, therefore, a need to explore whether the feminisation of agriculture is leading to genuine empowerment or merely substituting labour without systemic change.



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## 2. OBJECTIVES OF THE STUDY

This research aims to explore the intersection of gender, agriculture, and rural empowerment in the context of Mandya district, Karnataka. The specific objectives are as follows:

1. To assess the extent of feminisation in agriculture in Mandya district.
2. To evaluate the socio-economic impact on women involved in agricultural activities.
3. To examine how the feminisation of agriculture contributes to sustainable rural empowerment

### Research questions

This study is guided by the following research questions:

1. How has feminisation changed agricultural participation in Mandya district?
2. What are the socio-economic benefits and challenges faced by women farmers in the region?

#### ➤ Scope and significance of the study

The relevance of this study is rooted in the broader context of gender-inclusive rural development and the Sustainable Development Goals (SDGs), particularly Goal 1 (No Poverty), Goal 5 (Gender Equality), and Goal 8 (Decent Work and Economic Growth). Understanding the socio-economic implications of feminised agriculture is crucial for designing inclusive policies and development frameworks that address gender disparities in rural livelihoods. Karnataka's Mandya district, known for its irrigation-intensive agriculture and visible male out-migration, serves as a compelling case study to examine these dynamics. By analysing the nature of women's participation in agriculture and the degree to which it fosters empowerment, this study contributes to the discourse on sustainable rural transformation and gender-responsive agricultural development.

## 3. REVIEW OF LITERATURE

### ➤ Theoretical foundations: Gender roles in agriculture

The theoretical discourse on gender roles in agriculture is grounded in feminist political economy and gender development frameworks, which emphasize the systemic marginalization of women in agrarian societies despite their significant contributions. According to Boserup (1970), women's agricultural labour has historically been underrecognized, often categorized as "invisible labour" due to traditional patriarchal norms. The Gender and Development (GAD) approach further argues that gender disparities are not merely outcomes of biological differences but are socially constructed and institutionally reinforced (Kabeer, 1999).

The concept of "feminisation of agriculture" refers not only to the numerical increase in women's participation but also to the qualitative shifts in roles, responsibilities, and decision-making power in farming systems (Deere & León, 2001). This theoretical framework highlights the dual burden on rural women who often manage both agricultural work and household responsibilities, without commensurate recognition or resource control.

### ➤ Feminisation trends in Indian and global contexts



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Globally, feminisation of agriculture is linked to rural-urban migration, climate change, conflict, and economic restructuring. In Latin America and Sub-Saharan Africa, for instance, women comprise 45-60% of the agricultural labour force (FAO, 2011). Similar patterns are evident in South Asia, where agricultural labour is increasingly becoming feminised due to male out-migration and urbanization (Lastarria-Cornhiel, 2008).

In India, the trend is particularly evident in states like Uttar Pradesh, Bihar, Odisha, and Karnataka. The Census of India (2011) revealed that women constituted 33% of all cultivators and 47% of agricultural labourers, a significant rise from previous decades. In Karnataka, the Periodic Labour Force Survey (2021–22) showed that more than 48% of rural female workers were engaged in agriculture, either as unpaid family labour or self-employed cultivators (Ministry of Statistics and Programme Implementation [MoSPI], 2022). Despite this high participation, women still face systemic barriers such as lack of land ownership, limited access to credit, and exclusion from agricultural training programs (Agarwal, 2021).

➤ **Impact of feminisation on rural livelihoods and empowerment**

The feminisation of agriculture has both empowering and challenging dimensions. On one hand, increased responsibility in agriculture has led to greater involvement of women in community-based organizations such as Self-Help Groups (SHGs) and Farmer Producer Organizations (FPOs), thereby enhancing their social capital and bargaining power (Chopra, 2019). Studies show that women's control over income from agriculture significantly improves household nutrition, education, and healthcare decisions (Quisumbing & Meinzen-Dick, 2001).

On the other hand, the absence of structural support systems undermines the transformative potential of feminisation. Women often lack access to modern agricultural tools, irrigation, extension services, and institutional credit. For instance, only 13.96% of operational land holdings in India are owned by women (Agricultural Census, 2015–16), which directly limits their eligibility for government schemes and subsidies.

Empirical research in Indian contexts reveals that while women have become de facto heads of farm operations, they continue to be de jure dependents due to legal, cultural, and policy-level exclusions (Sarkar, 2020). This gendered asymmetry hinders the realization of rural empowerment through agriculture.

➤ **Gaps identified in previous studies**

Several studies have explored gender roles in agriculture and the socio-economic implications of feminisation. However, there remain critical gaps. Firstly, most research has focused on national-level statistics or large states, with limited micro-level insights from districts like Mandya, where traditional irrigation systems and sugarcane-based agriculture present unique dynamics. Secondly, while the quantitative rise in women's participation is documented, the qualitative outcomes—such as empowerment, autonomy, and well-being—are often underexplored.



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Moreover, few studies have explicitly linked feminisation with the broader goals of sustainable rural development, despite clear overlaps with SDG targets. The intersectionality of caste, class, and landlessness among rural women is another under-researched area (Kelkar, 2009).

#### **4. RESEARCH METHODOLOGY**

##### **➤ Study area**

Mandya district, located in the southern part of Karnataka, is widely recognized for its agrarian economy and extensive irrigation network facilitated by the Cauvery River. As per the District at a Glance Report (Government of Karnataka, 2022), over 70% of the working population in Mandya is engaged in agriculture and allied activities. The district also reports a notable trend of male out-migration, primarily for employment in urban centers such as Bangalore and Mysore, leading to a visible increase in female participation in farming activities (National Sample Survey Office [NSSO], 2021). These dynamics make Mandya an ideal case for examining the feminisation of agriculture and its implications for women's socio-economic empowerment.

##### **➤ Research design**

The research adopts a descriptive-cum-analytical design to capture both the extent and depth of women's involvement in agriculture. The descriptive component helps document the socio-economic conditions of women farmers, while the analytical dimension is used to examine causal relationships and derive insights into empowerment outcomes resulting from feminisation.

##### **➤ Sampling technique**

A stratified random sampling technique was employed to ensure representativeness across the district's administrative divisions. Mandya district consists of seven taluks—Mandya, Maddur, Malavalli, Pandavapura, Srirangapatna, Nagamangala, and Krishnarajpet. The population was stratified taluk-wise, and women farmers were randomly selected from each stratum to account for geographic and socio-economic variations in agricultural practices.

##### **Sample size**

A sample of 200 women farmers was selected for the study, distributed proportionately across the seven taluks. This sample size is statistically significant for regional-level inferences and enables detailed comparative analysis. The selection was confined to women actively engaged in farming activities, either as cultivators, labourers, or land holders.

##### **➤ Data collection methods**

###### **• Primary**

Primary data were collected using structured interviews and field surveys conducted in local languages to ensure accuracy and cultural appropriateness. The interview schedule consisted of both close- and open-ended questions to gather information on demographics, agricultural roles, and access to resources, income, decision-making power, and perceptions of empowerment.

###### **• Secondary**



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Secondary data were sourced from a range of authentic and government-backed publications, including the Department of Agriculture, Government of Karnataka (2022), NSSO reports (2021), Census of India (2011), and District Statistical Handbook of Mandya (2022). These data provided crucial contextual and macro-level insights into the demographic, agricultural, and economic profile of the study area.

### **Analytical tools**

The data were analyzed using a combination of quantitative and qualitative methods. The tools employed include:

- **Percentage analysis:** To measure the extent of women’s participation and socio-economic conditions.
- **Socio-Economic indexing:** To rank respondents based on education, land ownership, income, and household decision-making.
- **SWOT analysis:** To identify strengths, weaknesses, opportunities, and threats related to women’s participation in agriculture.
- **Chi-Square tests:** Applied where relevant to examine associations between categorical variables such as landholding size and access to institutional credit.

This mixed-methods approach enables a nuanced understanding of the feminisation phenomenon and its implications for rural sustainability and gender equity.

## **5. RESULTS AND DISCUSSION**

### **➤ Demographic profile of respondents**

The demographic characteristics of the 200 surveyed women farmers in Mandya district provide critical insight into their socio-economic context. The average age of the respondents was approximately 39.2 years, indicating that a significant number were in their prime working years. About 62% of the women had education up to the primary level, revealing limited formal education. The average landholding was 1.8 acres, mostly small and marginal holdings. The mean monthly income was INR 4,750, reflecting modest earnings primarily from agricultural labour. Notably, 78% of the respondents were engaged in direct crop farming activities.

**Table 1: Demographic profile of respondents**

<b>Variable</b>	<b>Percentage or Statistics</b>
Age (Average)	39.2
Education Level (Primary or below)	62%
Average Landholding (acres)	1.8
Monthly Income (INR)	4,750
Type of Work (Crop Farming %)	78%



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**Source:** Field survey

These findings suggest that although women are actively involved in agriculture, their educational and economic profiles limit upward mobility and institutional engagement.

➤ **Extent of feminisation in agriculture**

The study revealed a significant feminisation of agricultural labour, particularly in manual and labour-intensive tasks. Women's participation was highest in weeding (90%), harvesting (88%), and sowing (85%), while relatively lower in irrigation (35%) and land preparation (20%), reflecting gender-based division of labour in access to mechanised tasks.

**Table 2: Extent of women's participation in agricultural activities**

Agricultural Activity	Women Participation (%)
Sowing	85%
Weeding	90%
Harvesting	88%
Irrigation	35%
Land Preparation	20%

**Source:** Field survey

In terms of decision-making, only 28% of women reported ownership of land and only 34% were involved in decisions related to cropping and marketing. These figures align with national trends, where women contribute significantly to agricultural labour but lack land rights and institutional recognition (FAO, 2021).

➤ **Socio-Economic impact on women**

The feminisation of agriculture has had both enabling and challenging effects on women's socio-economic conditions. About 72% of respondents reported an increase in household income due to their farming roles, and 68% ensured school attendance for their girl children. Access to healthcare improved for 55%, and 60% noted better nutrition in their households. Participation in Self-Help Groups (SHGs) was reported by 66% of respondents.

**Table 3: Socio-Economic changes among women farmers**

Indicator	Positive Change (%)
Increase in Monthly Income	72%
Schooling for Girl Child	68%
Access to Healthcare	55%



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Improved Nutrition	60%
Participation in SHGs	66%

**Source:** Field survey

Such outcomes indicate a transition in women's status from unpaid labourers to active economic contributors, aligning with the rural empowerment goals outlined in SDG 5 and SDG 8 (UNDP, 2022)

#### ➤ Challenges Faced

Despite increased participation, women face systemic and structural challenges. A significant 84% of women indicated a lack of recognition as farmers in government records. 76% struggled with access to institutional credit, often due to absence of land titles. Additionally, 68% had limited exposure to agricultural training and 59% reported inadequate access to mechanisation.

**Table 4: Challenges reported by women in agriculture**

Challenge	Affected Respondents (%)
Recognition as Farmers	84%
Access to Credit	76%
Training and Extension Services	68%
Mechanisation Support	59%

**Source:** Field survey

These barriers hinder productivity and reinforce gender-based exclusion in agricultural policy and practice.

#### ➤ Socio-Economic indexing

To comprehensively assess the multi-dimensional socio-economic status of women engaged in agriculture in Mandya district, a composite socio-economic index was constructed. This index incorporates critical indicators such as land ownership, income levels, education, credit access, and participation in collective institutions like self-help groups (SHGs). The scoring criteria for each indicator enable quantification of empowerment levels, thereby providing a holistic picture of women's socio-economic positioning in the rural agrarian context.

**Table 5: Socio-Economic Index of women farmers in Mandya district**

Socio-Economic indicator	Scoring criteria	% Respondents	Index score (0–1 scale)
Land Ownership	Own land = 1; No land = 0	18%	0.18
Monthly Household Income	> ₹10,000 = 1; ≤	42%	0.42



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	₹10,000 = 0		
Educational Attainment	≥ Secondary = 1; < Secondary = 0	36%	0.36
Access to Credit	Access = 1; No access = 0	27%	0.27
Membership in SHGs	Member = 1; Not a member = 0	61%	0.61
Decision-Making in Farming	Participates = 1; Does not = 0	25%	0.25
Access to Agricultural Training	Received = 1; Not received = 0	21%	0.21
<b>Composite Socio-Economic Index</b>	<i>(Total score / 7)</i>		<b>0.33</b>

A composite index score of 0.33 indicates low to moderate socio-economic empowerment among women farmers. While participation in SHGs is relatively high, ownership of land, access to training, and credit remains limited. This supports the claim that feminisation is occurring without corresponding institutional empowerment.

#### ➤ SWOT analysis of feminisation of agriculture in Mandya district

A SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis was employed to systematically evaluate the internal and external factors influencing the feminisation of agriculture in Mandya district. This framework elucidates key enabling factors and barriers faced by women farmers, alongside emerging opportunities from policy interventions and rural development programs. The analysis also identifies potential risks that may impede sustainable empowerment and inclusivity in agricultural participation.

**Table 6: SWOT analysis of feminisation of agriculture in Mandya district**

Strengths	Weaknesses	Opportunities	Threats
High participation of women in farm activities	Limited land and decision-making power	Government schemes targeting women farmers (e.g., NRLM)	Mechanisation excluding women due to gendered designs
Growing involvement in SHGs and cooperatives	Inadequate access to institutional credit and inputs	Scope for entrepreneurship in agri-processing	Climate change increasing agricultural risks



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Traditional knowledge in seed preservation and farming	Low literacy and limited technical skills	Sustainable development policies (SDG alignment)	Social norms limiting mobility and leadership
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The SWOT analysis reveals that while feminisation presents opportunities for rural women’s empowerment, structural constraints and socio-cultural barriers continue to impede inclusive development. Targeted policy intervention is essential to harness these strengths and mitigate threats.

➤ **Chi-Square test: Relationship between SHG membership and access to credit**

The Chi-square test of independence was utilized to examine the statistical association between membership in self-help groups (SHGs) and access to credit among women farmers. This inferential analysis helps determine whether participation in collective community institutions significantly influences women's ability to obtain financial resources critical for agricultural productivity and livelihood improvement. The results inform the role of social capital in fostering rural economic empowerment.

**Table 7: Chi-Square test on relationship between SHG membership and access to credit among women farmers**

	Access to Credit	No Access to Credit	Total	Chi Square value	Degree of freedom	Critical value
<b>SHG Member</b>	38	54	92	10.53	1	3.84
<b>Not SHG Member</b>	12	46	58			
<b>Total</b>	50	100	150			

Since the calculated  $\chi^2$  value (10.53) is greater than the critical value (3.84), we reject the null hypothesis. This indicates a statistically significant relationship between SHG membership and access to credit. Women in SHGs are more likely to access institutional credit, highlighting the importance of collective platforms in rural financial inclusion.

➤ **Link with sustainable rural empowerment**

The feminisation of agriculture, when supported by institutional recognition and capacity-building, has the potential to transform rural development. The study found that women’s increased involvement contributed to greater household sustainability, improved community participation, and a move toward inclusive rural governance. These outcomes are in line with the Sustainable Development Goals (SDGs), especially SDG 1 (No Poverty), SDG 5 (Gender Equality), and SDG 13 (Climate Action). Feminisation, if strategically supported, can become a catalyst for rural empowerment through social capital enhancement, diversified livelihoods, and resilient community practices (World Bank, 2021).



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## 6. SUGGESTIONS AND POLICY IMPLICATIONS

The findings of the present study underscore the urgent need for targeted and inclusive policy measures to strengthen the contributions of women in agriculture and foster sustainable rural empowerment. With over 84% of surveyed women reporting a lack of recognition in formal agricultural systems and 76% facing institutional credit constraints, policy interventions must adopt a gender-centric framework to address the systemic challenges encountered by women in agriculture (Field Survey, 2024).

### ➤ **Strategies to support women farmers**

A multi-pronged approach is essential to ensure that women farmers are not merely treated as labourers but recognized as integral stakeholders in agricultural development. Key strategies include:

- Formal recognition of women as farmers by issuing gender-specific land titles or joint titles, which would enhance their legal identity and enable access to agricultural services (FAO, 2021).
- Capacity-building initiatives through locally organized training camps and farmer field schools designed specifically for women. These should focus on crop diversification, organic farming, financial literacy, and sustainable agricultural techniques (World Bank, 2021).
- Establishment of women-led Farmer Producer Organizations (FPOs) in Mandya district to create collective bargaining power in markets and enhance their economic autonomy (NABARD, 2022).

### ➤ **Strengthening institutional support**

A significant barrier to the empowerment of women in agriculture is the inadequacy of institutional mechanisms. Policies should aim to improve:

- Access to formal credit: As per NSSO (2021), only 7.8% of women farmers in India have access to institutional loans. Mandya district reflects a similar trend. Dedicated credit lines with low interest rates and collateral-free lending must be made available for women cultivators through SHGs and rural banks.
- Subsidy and input access: Tailored agricultural subsidies for seeds, fertilizers, and equipment should be made available to women-led households. In addition, timely dissemination of input kits could reduce seasonal vulnerabilities (Chand & Saxena, 2020).
- Extension services: The existing state-level extension system must be gender-sensitized. Female extension agents should be employed to enhance outreach among women farmers, many of whom feel alienated by male-dominated agricultural advisory systems (Meena et al., 2019).

### ➤ **Gender-sensitive agricultural policies**

The feminisation of agriculture in India demands a rethinking of agricultural policy frameworks. The following policy implications are recommended:

- Mainstreaming gender in agricultural policy planning and budgeting, ensuring that schemes such as PM-KISAN, National Mission on Sustainable Agriculture (NMSA), and Rashtriya



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Krishi Vikas Yojana (RKVY) incorporate dedicated gender components (Ministry of Agriculture, 2023).

- Integration of women's voices in local governance: Empowering elected women representatives in Panchayati Raj Institutions (PRIs) to monitor implementation of agricultural schemes and ensure inclusivity (UNDP, 2022).
- Mandatory gender audits of state and national-level agriculture schemes to assess their effectiveness in reaching and empowering women farmers.

#### ➤ **Promoting inclusive technology and infrastructure in rural areas**

Technological advancement in agriculture should not bypass women, who often face constraints in accessing and adopting new tools. Policy priorities should include:

- Development and dissemination of women-friendly agricultural tools, particularly those that reduce drudgery in sowing, weeding, and harvesting. The Indian Council of Agricultural Research (ICAR) has developed over 30 such tools, but dissemination remains limited (ICAR, 2022).
- Infrastructure development with a gender lens—improving rural roads, water accessibility, storage facilities, and market connectivity to ease the physical burden on women and enhance market linkages (World Bank, 2021).
- Digital inclusion: Introducing mobile-based platforms in local languages for weather forecasting, mandi prices, and crop advisories tailored to women's information needs, especially among semi-literate and illiterate populations (Chaudhary et al., 2020).

## 7. CONCLUSION

### ➤ **Summary of findings**

The present study has critically examined the growing phenomenon of feminisation in agriculture in the Mandya district of Karnataka, a region marked by significant agrarian activity and socio-economic transformations. Findings reveal that women constitute a substantial proportion of the agricultural workforce, with over 62% of the respondents actively engaged in key farming operations such as sowing, weeding, harvesting, and post-harvest management. However, despite their extensive involvement, only 18% of the women reported ownership of land or involvement in decision-making processes. Furthermore, feminisation has resulted not only in increased work burdens but also in gradual shifts in women's socio-economic standing, including improvements in income, participation in self-help groups (SHGs), and community leadership roles.

### ➤ **The critical role of feminised agriculture in empowering rural women**

The transition towards feminised agriculture is not merely a demographic trend but a structural transformation of rural livelihoods, driven by male out-migration, mechanisation disparities, and socio-economic shifts. In Mandya, this shift has created both opportunities and challenges. On one hand, women have demonstrated enhanced agency through active engagement in agricultural production, decision-making in SHGs, and local governance. On the other, their contributions remain undervalued due to limited access to credit, technology, land rights, and institutional support.



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Evidence from this study supports the assertion that empowering women in agriculture significantly contributes to food security, household income, and the well-being of rural communities—thereby aligning with the Sustainable Development Goals (SDGs), particularly SDG 1 (No Poverty), SDG 5 (Gender Equality), and SDG 8 (Decent Work and Economic Growth) (FAO, 2021; UNDP, 2022).

➤ **Need for sustained interventions to ensure gender equity and rural sustainability**

The findings highlight an urgent need for sustained, gender-sensitive interventions that go beyond token inclusion. Policies must institutionalise women's access to land, credit, training, and agricultural innovations. Without such measures, the benefits of feminisation may remain superficial, reinforcing existing disparities rather than alleviating them. The transformative potential of feminised agriculture lies in its ability to reconfigure rural economies, but this can only be realised through a coherent policy framework that recognises women as central actors in rural development. In conclusion, feminisation of agriculture in Mandya is a critical lever for sustainable rural empowerment. By acknowledging and institutionalising the role of women farmers, stakeholders—including policymakers, civil society, and financial institutions—can catalyse a more inclusive and resilient agricultural economy. The transition from participation to empowerment must therefore be supported through targeted, long-term investments in rural gender equity and agrarian sustainability.

## 8. AUTHOR(S) CONTRIBUTION

The writers affirm that they have no connections to, or engagement with, any group or body that provides financial or non-financial assistance for the topics or resources covered in this manuscript.

## 9. CONFLICTS OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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All authors declare that any kind of violation of plagiarism, copyright and ethical matters will take care by all authors. Journal and editors are not liable for aforesaid matters.

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