



Effect Of Mechanisation And Migrant Workers On Female Work Participation In Agriculture: A Case Study Of Palakkad District, Kerala

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Abstract

This study investigates the impact of agricultural mechanisation and migrant labour on female work participation in Palakkad district of Kerala an area known for its agrarian economy and high reliance on female labour in paddy cultivation. While mechanisation has enhanced productivity, it has simultaneously displaced many women from traditional agricultural roles due to limited access to technology, training, and ownership. The influx of male migrant workers from other Indian states has further reduced employment opportunities for local women, exacerbating wage disparities and social exclusion. Using a mixed-methods approach, including surveys and interviews with 50 female agricultural workers and relevant stakeholders, the study reveals a sharp decline in female workdays, increasing economic vulnerability, and gendered barriers in accessing mechanised employment. The findings underscore the urgent need for gender-inclusive agricultural policies, skill development programs, and regulated labour practices to mitigate the socio-economic displacement of women in agriculture.

Key Words: *Female work Participation, Mechanisation, Migrant Workers*

Introduction

Agriculture has long served as a cornerstone of rural livelihoods in India, particularly in states like Kerala, where a significant share of the population has traditionally relied on farming and allied activities. Within this context, women have historically played an essential role, especially in labour-intensive operations such as paddy cultivation. However, recent decades have witnessed a marked transformation in agricultural employment patterns due to the increasing mechanisation of farm work and the influx of migrant labour (Agarwal, 2012; Government of Kerala, 2022).

Palakkad district, often dubbed the “rice bowl of Kerala,” is emblematic of these changes. Known for its expansive paddy fields and agrarian economy, the region has seen high levels of female participation in farming tasks like transplanting, weeding, harvesting, and post-harvest processing. These roles, despite

being informal and low-paid, have traditionally provided rural women with critical sources of income and social identity (Devika & Thampi, 2020). Nevertheless, over the last two decades, this participation has significantly declined due to structural shifts in the labour market.

The introduction of agricultural machinery such as paddy transplanters and combine harvesters has undoubtedly improved farm productivity and reduced dependency on seasonal labour. However, this mechanisation has also displaced a substantial proportion of the manual workforce, particularly women, who often lack access to technological skills or ownership of equipment (FAO, 2011; Agarwal, 2012). Consequently, the demand for traditional female-dominated tasks has diminished.

Simultaneously, the district has seen an increasing presence of migrant labourers, mainly men from states like Bihar, Jharkhand, and West Bengal. These workers are often preferred by employers because they are seen as more cost-effective, physically resilient, and capable of adapting to machine-based operations (Rajan & Zachariah, 2019). As a result, many local women have found themselves excluded from the agricultural labour market, experiencing declining workdays, depressed wages, and shrinking opportunities for meaningful economic participation.

Significance of the study

The ongoing transformations in the agricultural sector raise important concerns regarding gender equality, rural employment opportunities, and the inclusiveness of agricultural development. While mechanisation and the influx of migrant labour are often considered indicators of progress, they may unintentionally exacerbate gender disparities in rural employment. Many female agricultural workers, especially those who are landless and reliant on daily wages, now face economic exclusion and social marginalisation. Understanding the impact of these changes on women's lives is crucial for crafting gender-sensitive agricultural policies, particularly in states like Kerala, which are experiencing rapid rural development and transition.

By focusing on Palakkad district, this study provides a micro-level examination of these larger trends. The case study approach facilitates a deeper understanding of how mechanisation and labour migration are influencing female participation in agriculture. Through a combination of field interviews, data analysis, and community observations, this research aims to uncover emerging patterns, challenges, and potential solutions to ensure that women are not sidelined in the process of agricultural modernization in Kerala.

Objectives of the Study

- The main objective of this study is to analyze the impact of agricultural mechanisation and migrant labor on the participation of women in the agricultural workforce of Palakkad district, Kerala.

Specific Objectives:

1. To examine the current status of female participation in agricultural activities in Palakkad.
2. To identify the nature and extent of mechanisation in agriculture in the district.
3. To assess the influence of migrant labor on the employment opportunities available to local female agricultural workers.
4. To explore the socio-economic challenges faced by women due to mechanisation and labor displacement.
5. To identify strategies and policy interventions that could support female employment and empowerment in the agricultural sector.

Methodology

This study adopts a mixed-methods approach, combining both quantitative and qualitative data to provide a well-rounded understanding of the issue. The research is conducted in Palakkad district, which is renowned for its widespread paddy farming and mechanisation practices. Stratified random sampling is used to select 50 female agricultural workers from various age groups, landholding statuses. Additionally, 10 male farmers, 5 agricultural machinery operators, and 5 migrant workers are interviewed to offer comparative perspectives. Primary data is collected through structured questionnaires, focus group discussions, and key informant interviews, while secondary data is sourced from government reports, Kerala Economic Review, Census data, academic publications, and media outlets. The quantitative data is analysed using descriptive statistics such as frequencies and percentages, while qualitative data is thematically analysed to uncover recurring patterns and narratives.

Literature Review

Several studies have highlighted the gendered impacts of rural development, particularly in the context of mechanisation and labour migration. According to the Kerala Economic Review (2022), the share of female labour in agriculture has declined, while the use of farm machinery has increased steadily, especially in paddy cultivation. Scholars like Bina Agarwal (2012) have emphasized that mechanisation often leads to the masculinisation of agriculture, where women lose access to paid labour opportunities.

In Kerala, initiatives such as Kudumbashree's Joint Liability Groups (JLGs) have attempted to integrate women into collective farming, but these efforts are often limited by lack of access to capital, training, and machinery. Meanwhile, studies on migrant workers in Kerala (e.g., Zachariah & Rajan, 2015) have shown how low-cost migrant labor is increasingly replacing local workers in sectors like construction and agriculture, further straining local employment.

However, there is still a research gap in understanding how both mechanisation and migration jointly affect female agricultural workers, particularly in district-level contexts like Palakkad. This study aims to fill that gap by offering evidence-based insights and suggesting inclusive rural development strategies.

Major Findings of the Study

This section presents the key findings from the field survey conducted across selected panchayats in Palakkad. The analysis is structured around major themes: demographic profile, participation in agricultural work, impact of mechanisation, effect of migrant labour, and coping strategies.

The demographic profile of the respondents highlights several key characteristics. The majority of the respondents (60%) were between the ages of 36 and 55, suggesting that the workforce is composed of middle-aged individuals who have likely accumulated substantial experience in agricultural work. In terms of education, a significant portion (45%) had completed only primary education, while 35% were literate, indicating a relatively low level of formal education among the respondents. Only 5% had completed higher secondary education, pointing to limited access to advanced education in the rural agricultural context. Regarding land ownership, a large percentage (68%) of the respondents were landless agricultural labourers, reflecting the widespread landlessness in the region. The remaining 32% owned small plots of land, typically less than 50 cents, underscoring the prevalence of small-scale farming or subsistence agriculture among a minority of respondents. These demographic factors are crucial in understanding the socio-economic conditions of the female agricultural workforce in Palakkad district, which often faces limited opportunities for economic mobility and social empowerment.

The nature of female agricultural work in Palakkad is characterized by several key activities and patterns. The main tasks performed by women include transplanting (75%), weeding (65%), harvesting (80%), and post-harvest work (40%). However, the number of working days for these women is limited, with most reporting working only 10 to 15 days per month, primarily during the peak paddy cultivation seasons. In terms of wages, the average daily wage was ₹350, but 78% of women indicated that their wages were lower than those received by their male counterparts, highlighting a significant gender wage disparity in agricultural labour.

The impact of mechanisation on female agricultural workers in Palakkad has been significant, particularly in terms of task replacement and access to machinery. A substantial 85% of the respondents reported that mechanisation had replaced manual jobs such as transplanting and harvesting, with combine harvesters and paddy transplanters being identified as the main drivers of this job loss. Despite the rise in mechanisation, only 4% of women had ever used farm machinery, and none owned or co-owned any equipment. This limited access to machinery underscores the technological divide within the rural agricultural workforce. Furthermore, 93% of the women reported never receiving any training in machinery use, highlighting the gender gap in skill development related to agricultural technology. In terms of

perceptions, 71% of women felt that mechanisation had reduced their income opportunities, as fewer manual labour positions were available. Additionally, 20% believed that mechanisation benefited men more than women, as they are more likely to be employed for machine-based tasks or to gain higher earnings through its use. These findings suggest that mechanisation, while improving productivity, has unintentionally marginalized female workers and reduced their economic participation in the agricultural sector.

The presence of migrant workers in Palakkad's agricultural sector has had a notable impact on female agricultural labour. A significant 92% of the respondents acknowledged the presence of migrant labourers on nearby farms. Many women (68%) reported losing agricultural work opportunities as employers increasingly preferred migrant workers. This shift has contributed to stagnation or even reduction in wage rates, as the influx of migrant labourers has increased the overall labour supply. Additionally, farmers often exhibited a preference for male migrant workers, particularly for tasks that involve machinery, further excluding local women from certain employment opportunities. These factors indicate that the influx of migrant workers has intensified competition for jobs and exacerbated the economic challenges faced by female agricultural workers.

To cope with the challenges arising from mechanisation and the influx of migrant labour, many female agricultural workers in Palakkad have turned to alternative sources of income. Approximately 42% of respondents reported taking up informal jobs, such as participating in MGNREGS (Mahatma Gandhi National Rural Employment Guarantee Scheme), domestic work, or tailoring, to supplement their income. However, only 23% of women were involved in initiatives like Kudumbashree or women's farming collectives, which could offer greater social and economic support. Despite these challenges, 61% of women expressed a keen interest in learning how to operate farm machinery if given the opportunity, indicating a willingness to adapt and upskill. Furthermore, the majority of women advocated for government policies that would provide wage protection, farm-based training, and support for women-led cooperatives, highlighting the need for targeted interventions that promote women's empowerment and economic security in agriculture.

The key issues identified in the study highlight the multifaceted challenges faced by female agricultural workers in Palakkad. Mechanisation has led to the loss of traditional labour roles for women, particularly in tasks such as transplanting and harvesting, which were once their primary sources of income. The influx of migrant labour has further exacerbated this situation by displacing local women and increasing competition for jobs, often leading to lower wages. Additionally, the lack of training opportunities for women in operating machinery has excluded them from tasks that require technological skills, further limiting their employment prospects. The informality of agricultural work also means that women are left without social security or job protection, making them more vulnerable to economic instability. Moreover, low participation in Self-Help Groups (SHGs) and women's farming collectives has resulted in missed opportunities for social and economic empowerment. These findings underscore that, while mechanisation and migrant labour contribute to agricultural productivity, they simultaneously

marginalize local women, particularly those engaged in labour-intensive and unskilled roles, leaving them economically and socially disadvantaged.

The results of this study highlight the significant effects that mechanisation and migrant labour have had on female participation in agriculture in Palakkad district. While technological advancements and increased labour mobility have enhanced agricultural productivity and efficiency, they have also posed considerable challenges for rural women, especially those from landless and economically disadvantaged backgrounds. Mechanisation has replaced many labour-intensive tasks traditionally performed by women, such as transplanting, weeding, and harvesting. With limited access to machinery, training, or ownership rights, most women are unable to transition into the mechanised workforce. Additionally, the influx of male migrant workers has intensified competition for jobs, marginalising local female labourers by driving down wages and shifting employer preferences.

As a result, there has been a noticeable decline in female participation in agriculture, limiting women's access to stable incomes, economic autonomy, and their traditional roles as farmers. Many have been forced into low-paid informal work or government employment schemes like MGNREGS, which do not provide consistent or dignified alternatives. If these issues are not addressed through targeted interventions, the trend is likely to exacerbate gender inequality and undermine the resilience and inclusiveness of the rural economy.

Recommendations

Gender-Inclusive Mechanisation Policies

To address the gender disparities created by mechanisation, policies should focus on designing and promoting small-scale, women-friendly machinery. Subsidies and credit support should be offered to women's Self-Help Groups (SHGs) to enable them to purchase or lease machinery. Additionally, hands-on training programs should be launched to equip women with skills in operating, repairing, and maintaining agricultural machinery.

Strengthen Female Labor Rights and Wages

Wage parity policies must be implemented to ensure that women receive equal pay for equal work in agriculture. Moreover, minimum wage protections should be enforced for all agricultural labourers, regardless of gender, to combat the wage discrimination that female workers often face.

Promote Women's Collectives and Cooperatives

The reach of women's farming groups, such as Kudumbashree, should be expanded and integrated into agricultural supply chains. Providing support for market access, branding, and value addition in rice

milling, organic certification will enhance the economic potential of these groups, empowering women and strengthening their position in the market.

Expand Skill Development and Alternate Livelihoods

To improve women's economic opportunities, skill development programs should be introduced in areas like agro-processing, poultry farming, mushroom cultivation, and other rural enterprises. Furthermore, strengthening the connection between women and the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) will ensure consistent, farm-related employment options for women in rural areas.

Policy Integration

Gender-sensitive agricultural planning should be integrated at the local body level to ensure that their policies should address the specific needs of women in agriculture. It is also crucial to include women's voices in local agricultural committees and farm planning boards, allowing for more inclusive decision-making that reflects the needs and priorities of female agricultural workers.

These recommendations aim to create a more equitable and inclusive agricultural sector, where women can fully participate and benefit from advancements in the industry.

This study emphasizes that the future of inclusive agriculture in Kerala hinges on effectively managing mechanisation and migration through a gender-equity perspective. Shifting policies to focus on empowering women, enhancing their skills, and promoting their economic inclusion is not only crucial for social justice but also vital for sustainable rural development.

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