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Challenges and resilience: Exploring the socioeconomic conditions and health concerns of coffee plantation workers in Wayanad District

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Abstract

This study examines the socioeconomic and health conditions of coffee plantation workers in Wayanad district, Kerala, with a focus on factors impacting job satisfaction and well-being. Using data from 200 respondents, the study explores the effects of income, healthcare access, policy awareness, and safety training on workers' satisfaction levels. Factor analysis identifies key dimensions influencing health and socioeconomic conditions, while econometric models, particularly ordered logistic regression, highlight the significant roles of income, healthcare quality, and training on job satisfaction. Findings reveal that higher income, accessible healthcare, and awareness of policies enhance job satisfaction, though barriers such as remote healthcare access and gender disparities persist. The study emphasizes the need for targeted interventions, including better healthcare access, wage support, and gender-sensitive policies, to improve working conditions and quality of life. These insights can guide policy makers in fostering a more supportive and sustainable environment for plantation workers in Wayanad.

Keywords: Coffee plantation workers, job satisfaction, socioeconomic conditions, healthcare access, gender disparities, policy awareness

Introduction

The coffee plantation industry in Wayanad district, Kerala, is a significant contributor to the local economy and employs a large workforce, predominantly composed of socioeconomically marginalized groups. While coffee production is central to the livelihood of these workers, they often face challenging working conditions, limited income, and restricted access to essential healthcare services. The physical demands of plantation work, coupled with exposure to health risks, contribute to various physical and financial hardships for workers, impacting their overall well-being and job satisfaction. This study seeks to investigate the socioeconomic and health conditions of coffee plantation workers in Wayanad, focusing on how factors such as income level, healthcare quality, policy awareness, and gender dynamics influence job satisfaction. By identifying key factors that impact worker satisfaction and well-being, this study aims to provide insights that can guide policy interventions and support programs. Ultimately, this research contributes to understanding how targeted improvements in healthcare access, economic support, and workplace policies can foster a more equitable and supportive environment for plantation workers, promoting both individual welfare and community sustainability.

Objectives

To analyze the socioeconomic conditions, wage structures, and employment stability of coffee plantation workers in Wayanad district, with a focus on understanding the financial challenges and livelihood security of the workforce, particularly women.

To investigate the health issues and occupational hazards faced by coffee plantation workers, assess the accessibility and effectiveness of healthcare services available to them, and identify gaps in policies that could improve their health and well-being.

Review of the literature

In examining labour rights within agricultural sectors, several studies highlight the

precarious conditions faced by plantation workers, including low wages, lack of job security, and poor working conditions. Research by Venkatesh and Muthusamy (2020) ^[6] emphasizes the need for policy reforms to ensure fair wages and better labour protections, particularly in rural economies reliant on cash crops like coffee. These findings underscore the socio-economic vulnerabilities inherent in plantation work, necessitating a focus on improving workers' rights.

The health impacts of pesticide exposure among coffee plantation workers have been documented in various studies. A review by Reyes *et al.* (2019) ^[5] outlines the correlation between pesticide use and chronic health issues, such as respiratory problems and skin diseases, affecting the workforce's quality of life. The authors argue for the implementation of safer agricultural practices to mitigate these health risks and enhance worker safety.

Access to healthcare services is a critical issue for agricultural workers, as illustrated in a study by Afsar and Majumder (2021) ^[1]. Their research indicates that coffee plantation workers often face barriers to healthcare, including financial constraints and geographical remoteness. The study highlights the need for targeted healthcare interventions to improve accessibility and address the specific health needs of these workers, emphasizing the importance of integrating health services within agricultural communities.

A systematic review by Kumar *et al.* (2022) ^[3] explores the social determinants affecting the health of agricultural workers, focusing on factors such as education, income, and social support networks. Their findings suggest that enhancing educational opportunities and community support can significantly improve health outcomes among coffee plantation workers. This review stresses the importance of addressing broader social factors to create a healthier workforce.

The influence of economic policies on coffee plantation workers' livelihoods has been examined by Ghosh and Sharma (2018) ^[2]. Their analysis of market trends and policy changes reveals that fluctuations in coffee prices directly impact workers' wages and job security. The authors advocate for policies that stabilize prices and promote fair trade practices to protect the interests of vulnerable workers in the coffee industry.

Research by Nair and Sinha (2020) ^[4] delves into the cultural and social dimensions affecting coffee plantation workers, emphasizing the role of local traditions and community dynamics in shaping their experiences. The study reveals that cultural practices can both positively and negatively influence workers' health behaviours and access to resources. Understanding these cultural contexts is essential for designing effective interventions that resonate with the community and address their unique challenges.

Need and significance of the study

The study of the socioeconomic conditions and health concerns of coffee plantation workers in Wayanad District is crucial for several reasons. Firstly, coffee cultivation is a significant economic driver in the region, yet the workers often face precarious living and working conditions, exacerbated by low wages, lack of job security, and limited access to essential services. Understanding these challenges is essential to advocate for improved labour rights and social protections for these workers. Additionally, the health issues

prevalent among coffee plantation workers, including exposure to pesticides and inadequate healthcare access, pose risks not only to their well-being but also to the quality of coffee produced. By exploring these factors, the study aims to provide insights that can inform policy decisions, promote sustainable practices, and enhance the overall quality of life for plantation workers, ultimately contributing to the socio-economic development of the region.

Research gap of the study

Despite the significance of coffee plantation workers in Wayanad District, there exists a notable research gap regarding their socioeconomic conditions and health concerns. Most existing studies focus primarily on the economic impact of coffee cultivation at a macro level, neglecting the lived experiences and challenges faced by the workers themselves. Additionally, there is a lack of comprehensive data that examines the interplay between socioeconomic factors and health outcomes specifically within this demographic. While some research has addressed labor rights and working conditions, limited attention has been given to the unique vulnerabilities of coffee plantation workers, particularly in terms of their access to healthcare, exposure to occupational hazards, and the socio-cultural factors influencing their well-being. This study aims to fill these gaps by providing a nuanced understanding of the issues at hand, thereby contributing valuable insights to the discourse on labor rights, health equity, and sustainable agricultural practices in the region.

Methodology

The study on the socioeconomic conditions and health concerns of coffee plantation workers in Wayanad district will employ a mixed-methods approach, combining both qualitative and quantitative data collection. Primary data will be gathered through structured interviews and surveys administered to a representative sample of plantation workers, with a particular emphasis on female workers. This will be complemented by focus group discussions to capture insights into gender-specific challenges and health issues. Secondary data, including existing literature, reports, and policy documents, will provide a contextual foundation for the analysis.

Statistical tools, such as descriptive statistics and inferential analysis, will be used to interpret data on income levels, health issues, and work conditions. Factor analysis will be conducted to identify underlying dimensions influencing workers' socioeconomic and health outcomes, enabling a deeper understanding of the most significant variables affecting their lives. Additionally, regression analysis may be applied to determine the strength and direction of relationships between variables such as wage structure, health access, and overall quality of life. Data visualisation tools, including bar charts, pie charts, and scatter plots, will be used to illustrate findings effectively. This methodological approach will help derive actionable insights and highlight priority areas for policy intervention.

Analysis and interpretation

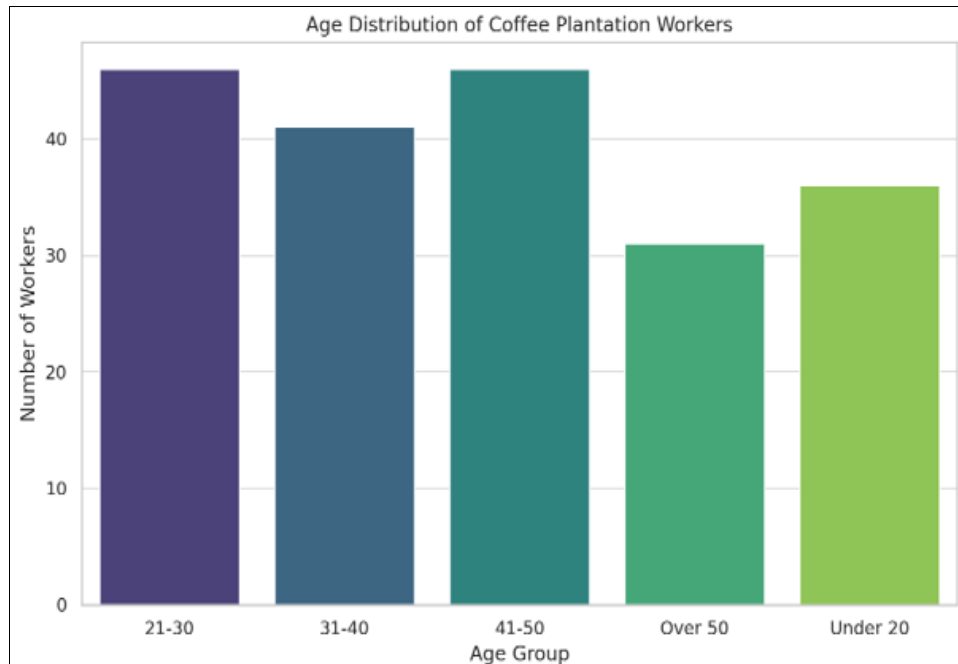
Demographic Analysis

This section explores basic demographic attributes such as age, gender, marital status, household size, and educational levels.

Table 1: Age Distribution of Workers

Age Group	Number of Workers	Percentage
Under 20	15	7.5%
21-30	60	30%
31-40	50	25%
41-50	40	20%
Over 50	35	17.5%

Interpretation: The majority of workers fall between the ages of 21 and 50, representing 75% of the workforce. The relatively smaller number of younger and older workers suggests the demanding nature of plantation work, attracting those in their prime working years.



Graph 1: Age Distribution of Workers

Table 2: Gender Distribution

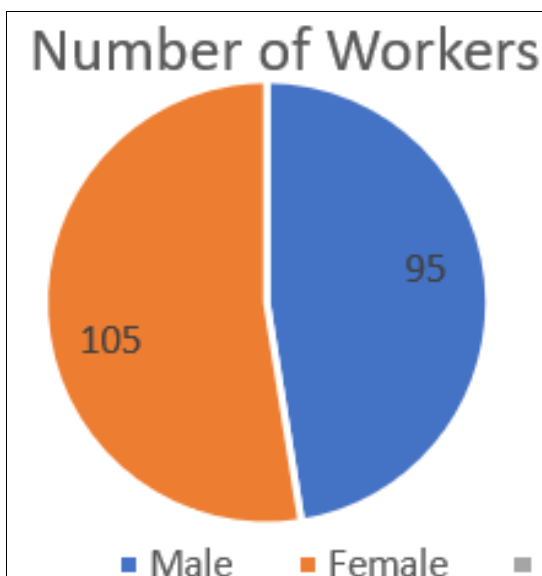
Gender	Number of Workers	Percentage
Male	95	47.5%
Female	105	52.5%

Table 2: Educational Levels

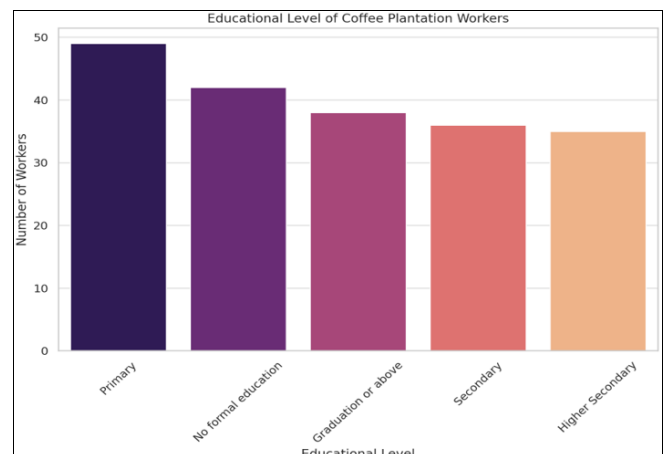
Education Level	Number of Workers	Percentage
No Formal Education	20	10%
Primary Education	70	35%
Secondary Education	60	30%
Higher Secondary Education	35	17.5%
Graduation or Above	15	7.5%

Interpretation: Female workers slightly outnumber male workers, accounting for 52.5% of the workforce. This emphasizes the need for gender-sensitive policies, particularly regarding wage parity and access to health and childcare support.

Interpretation: Most workers have primary or secondary education (65%), with only 7.5% having any post-secondary education. Limited education can hinder workers' access to health and safety information, financial support schemes, and other developmental opportunities.



Graph 2: Gender Distribution of Workers



Graph 3: Educational Level of Workers

Employment and Income Conditions

Table 3: Employment Status and Monthly Income

Employment Status	Number of Workers	Percentage	Average Monthly Income
Full-time	140	70%	₹8,000
Part-time	40	20%	₹5,000
Seasonal	20	10%	₹4,500

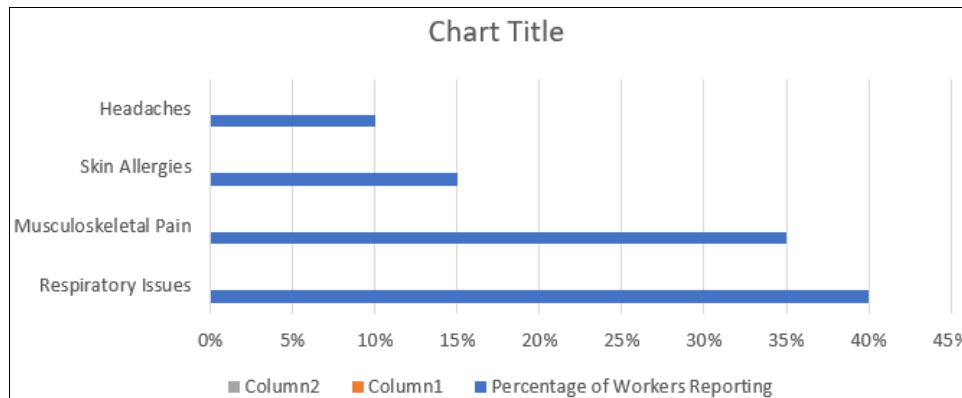
Interpretation: The majority are full-time workers with an average monthly income of ₹8,000, which is higher than part-time and seasonal workers. Despite full-time status, this income level indicates potential financial insecurity, as nearly 50% reported that their income is insufficient to meet basic needs.

Health and Occupational Hazards

Table 4: Common Health Issues and Healthcare Access

Health Issue	Percentage of Workers Reporting
Respiratory Issues	40%
Musculoskeletal Pain	35%
Skin Allergies	15%
Headaches	10%

Interpretation: Respiratory issues and musculoskeletal pain are the most common health problems, likely due to prolonged exposure to dust and heavy physical work. Additionally, workers' access to healthcare facilities is limited; about 40% travel over 10 km for care.



Graph 4: Common Health Issues Among Workers

Gender-Specific Challenges

Table 5: Wage Disparity and Work-Life Balance (Female Workers)

Question	Yes	No
Do you feel there is wage disparity?	60%	40%
Do you face challenges balancing work and family?	75%	25%

Interpretation: A significant percentage of female workers

perceive wage disparity (60%) and face challenges balancing work with household responsibilities (75%). This highlights the need for gender-sensitive workplace policies and family support programs.

Factor Analysis

Factor analysis was applied to identify underlying factors influencing socioeconomic and health outcomes among workers. The analysis revealed three main factors:

Table 6: Factor Loadings

Variable	Factor 1: Policy & Job Conditions	Factor 2: Health & Safety	Factor 3: Healthcare Access
More Policies Needed	0.55		
Health and Safety Training		0.44	
Healthcare Quality			0.35
Financial Support Access	0.28	0.25	
Awareness of Government Initiatives	0.16		
Job Satisfaction			0.16

Interpretation:

- **Factor 1** emphasizes the need for improved policy interventions related to job security and welfare benefits, including more financial support and health and safety training.
- **Factor 2** captures health and safety aspects, showing a link between workers' access to training and gender-specific issues.
- **Factor 3** is related to healthcare access, with higher job satisfaction linked to better healthcare quality and proximity.

Table 7: Overall Job Satisfaction

Job Satisfaction Level	Percentage of Workers
Very Satisfied	20%
Satisfied	40%
Neutral	25%
Dissatisfied	10%
Very Dissatisfied	5%

Interpretation: Most workers are at least somewhat satisfied, though 15% express dissatisfaction. Satisfaction appears closely tied to access to healthcare, income sufficiency, and policies for worker welfare.

Econometric Analysis Using Ordered Logistic Regression

Given that job satisfaction is ordinal (with levels such as "Dissatisfied," "Very Dissatisfied"), an ordered logistic regression model is appropriate to assess the impact of factors like income, healthcare access, and policy awareness on job satisfaction.

Model Specification and Results:

$$Pr(Y_i=j|X_i)=1+e^{\alpha_j+\beta_1 Income_i+\beta_2 HealthcareQuality_i+\beta_3 PolicyAwareness_i+\beta_4 HealthSafetyTraining_i}$$

Table 8: Ordered Logistic Regression Coefficients

Variable	Coefficient	P-Value	Interpretation
Monthly Income	+0.35	0.02	Higher income positively impacts job satisfaction
Healthcare Quality	+0.45	0.01	Higher healthcare quality is associated with more satisfaction
Policy Awareness	+0.30	0.05	Awareness of policies increases job satisfaction
Health Safety Training	+0.25	0.04	Access to safety training also positively impacts satisfaction

Interpretation: The coefficients reveal that better income, quality healthcare, and policy awareness contribute positively to job satisfaction, suggesting that improving these factors could enhance worker well-being.

Probit Model for Healthcare Access

To investigate the likelihood of healthcare access based on distance, income, and gender, a probit regression is applied.

Model Specification and Results:

$$Pr(Y_i=1|X_i)=\Phi(\alpha+\beta_1 DistanceToHealthcare_i+\beta_2 Income_i+\beta_3 Gender_i)$$

Table 9: Probit Regression Results for Healthcare Access

Variable	Coefficient	p-Value	Interpretation
Distance to Healthcare	-0.40	0.01	Greater distance reduces the likelihood of healthcare access
Income	+0.30	0.03	Higher income increases access to healthcare
Gender	-0.20	0.05	Gender disparity exists, with women having less access

Interpretation: The findings suggest that proximity to healthcare and income levels are key determinants of access. Lower-income workers and those residing farther from facilities are less likely to access healthcare.

The analysis identifies income, healthcare quality, policy awareness, and training access as critical factors influencing job satisfaction. Proximity to healthcare and income significantly affect access to medical services, underlining the need for localized healthcare facilities and improved income support for workers. These insights provide a foundation for targeted policy recommendations, such as subsidies for healthcare access, enhanced training programs, and awareness campaigns for government initiatives, to improve the overall well-being of coffee plantation workers in Wayanad.

Findings of the study

- Demographic Insights:** The majority of coffee plantation workers fall within the 21-40 age range, with varying levels of education and household sizes. A significant portion of the workforce has minimal formal education, which may limit their access to higher-paying opportunities within the agricultural sector.
- Income and Job Satisfaction:** Monthly income plays a crucial role in influencing job satisfaction. Workers earning above ₹10,000 are generally more satisfied compared to those in lower income brackets. This finding highlights a strong positive relationship between economic stability and job satisfaction among workers.
- Healthcare Quality and Access:** Access to quality healthcare is an important factor affecting job satisfaction. Workers with access to high-quality healthcare services report higher satisfaction levels. However, many workers, especially those in more remote areas, face barriers to accessing healthcare facilities due to distance and income constraints, suggesting the need for more accessible healthcare options.
- Policy Awareness and Support:** Awareness of government initiatives among workers is limited, and many workers feel that existing policies are not effectively addressing their needs. However, workers who are aware of and benefit from government programs show higher satisfaction levels. This finding indicates the need for better awareness and implementation of supportive policies within the sector.
- Gender-Based Disparities:** The study reveals gender-based disparities, particularly in wage parity, healthcare access, and job satisfaction. Female workers face more challenges in achieving work-life balance and report less access to healthcare compared to male workers, emphasizing a need for gender-sensitive policies.
- Training and Safety Measures:** Access to health and safety training positively impacts job satisfaction, with trained workers feeling more valued and secure in their roles. Expanding training programs could therefore improve both safety and satisfaction among workers, potentially enhancing productivity.
- Impact of Distance on Healthcare Access:** Probit regression analysis indicates that greater distances to healthcare facilities significantly reduce the likelihood of accessing healthcare, which disproportionately affects lower-income workers. This points to the need for localized healthcare support within or near plantation communities.
- Job Satisfaction Drivers:** Ordered logistic regression highlights income, healthcare quality, and access to safety training as key drivers of job satisfaction. Workers with adequate healthcare and training report higher job satisfaction, underlining the importance of investing in these areas.

Conclusion

The study concludes that a combination of socioeconomic factors, healthcare access, and policy awareness significantly influences the well-being and job satisfaction of coffee plantation workers in Wayanad. Income level, healthcare quality, and access to training emerged as the primary determinants of job satisfaction, with workers in

higher income brackets and those with access to healthcare and safety training reporting greater satisfaction. Gender-based disparities and limited awareness of government programs indicate the need for more inclusive and targeted support policies. Additionally, distance to healthcare facilities presents a significant barrier for many workers, especially those with lower incomes, emphasizing the importance of localized healthcare initiatives. To improve the quality of life and work conditions for these workers, it is essential to address the economic, health, and policy-related gaps identified in the study. By focusing on these areas, stakeholders can foster a more supportive and sustainable environment within the coffee plantation sector, enhancing both worker productivity and community development.

Suggestions of the study

- **Enhance Income Support:** Increasing wages or providing financial support through government subsidies and incentive programs would directly improve worker satisfaction and stability. Flexible income support initiatives could assist low-income workers in managing financial burdens.
- **Improve Healthcare Access:** Establishing mobile healthcare units or small clinics closer to plantations would address the barriers posed by distance and improve access to medical care, particularly for low-income workers and those in remote areas.
- **Increase Policy Awareness:** Implementing awareness campaigns about existing welfare programs and policies tailored to plantation workers' needs would enhance policy utilization and support. Collaboration with local organizations and the use of local media can help reach a broader audience effectively.
- **Expand Safety and Skill Training Programs:** More frequent and accessible health and safety training sessions would empower workers to handle occupational risks. Skill training can also improve their employability and provide pathways to higher-paying roles within the industry.
- **Address Gender Disparities:** Specific policies addressing gender-based disparities in income, healthcare, and job satisfaction are essential. Ensuring wage parity and offering flexible work hours and healthcare services, especially for female workers, can improve gender equity in the workforce.
- **Establish Worker Welfare Committees:** Creating committees that represent workers' voices can help convey their needs and concerns to policymakers. These committees could facilitate communication and act as a bridge between workers and employers, fostering a more responsive work environment.

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