

Labour Wastage and Problems of Agricultural Workers in Chandrapur District: A Critical Study

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Abstract

India has traditionally been recognized as an agrarian economy where agriculture forms the backbone of rural livelihoods. Despite structural transformation in recent decades, a significant proportion of the rural workforce remains dependent on agriculture. However, the agricultural sector is characterized by seasonal employment, fragmented landholdings, and limited diversification, resulting in the underutilization of labour. This phenomenon, commonly referred to as labour wastage or disguised unemployment, has emerged as a serious socio-economic issue in rural India. The present study aims to critically examine labour wastage and the associated socio-economic problems of agricultural workers in Chandrapur district of Maharashtra. Maharashtra is one of India's leading agricultural states, yet regional disparities persist across districts. Chandrapur district is known for its forest resources, mineral wealth, and agricultural activities. A large section of its rural population is engaged in farming and agricultural labour. However, the nature of agricultural employment in the district remains largely seasonal and informal. Workers often find employment only during sowing and harvesting seasons, while remaining underemployed or unemployed during lean periods. This results in unstable income, poverty, indebtedness, and migration. The study proposes to select a sample of 1,000 agricultural workers using a random sampling method from rural and semi-urban areas of the district. Primary data will be collected through structured questionnaires, interviews, and observation. Secondary data will be obtained from government reports, census publications, and agricultural statistics. The research is descriptive and analytical in nature, employing statistical tools such as percentage analysis, mean calculation, correlation coefficient, and graphical representation using SPSS software. Preliminary assumptions suggest that labour wastage is more prevalent in rural areas due to population pressure, limited land availability, mechanization,

climate variability, and inadequate implementation of government schemes. The lack of skill development opportunities further aggravates the situation. Agricultural mechanization, while improving productivity, reduces demand for manual labour, thereby increasing disguised unemployment. Labour wastage is not merely an economic issue but also a social problem. It leads to income instability, reduced living standards, migration to urban areas, social insecurity, and indebtedness. Workers without social protection remain vulnerable to exploitation and economic shocks. The study also intends to analyze the effectiveness of employment schemes such as Ministry of Rural Development's MGNREGA initiatives in reducing labour underutilization. The findings of the study are expected to provide policy recommendations for improving labour utilization, enhancing skill development, promoting agro-based industries, strengthening social security, and ensuring effective implementation of rural employment schemes. The research will be useful for policymakers, local administration, agricultural departments, and rural development planners in designing targeted interventions for sustainable rural development.

Keywords

- Labour Wastage
- Agricultural Workers
- Rural Economy
- Underemployment
- Socio-Economic Problems

Preface

India's economy has historically been agrarian, with a substantial portion of its population residing in rural areas and depending on agriculture for livelihood. Although industrialization and the service sector have expanded significantly, agriculture continues to employ a large share of the workforce. However, the sector is marked by low productivity, seasonal employment, and disguised unemployment. In Maharashtra, agriculture remains a primary occupation in many districts. Chandrapur district occupies a unique position due to its combination of agriculture, forest resources, and mining activities. Despite these resources, a considerable segment of the population depends on small-scale farming and wage labour in agriculture. Agricultural employment in Chandrapur is largely seasonal. Labour demand peaks during sowing and harvesting but declines significantly during off-season months. As a result, workers experience underemployment, meaning they are employed for fewer days than their capacity allows. In many cases, more workers are engaged in

agricultural activities than required, leading to disguised unemployment. This situation results in labour wastage — where available human resources are not utilized efficiently. Labour wastage extends beyond economic inefficiency. It contributes to poverty, income instability, indebtedness, migration, and social vulnerability. Population growth has increased pressure on limited agricultural land. Fragmentation of landholdings reduces productivity and limits employment generation. Mechanization, though beneficial for output growth, reduces labour absorption. Climate change, erratic rainfall, and market price fluctuations further intensify the vulnerability of agricultural workers. The absence of adequate skill development programs restricts workers from diversifying into non-farm employment. Moreover, inadequate implementation of government welfare schemes limits the potential for income stabilization. Rural employment programs have attempted to mitigate these challenges, but structural issues persist. Given this background, the present study critically examines labour wastage and related socio-economic problems among agricultural workers in Chandrapur district. It seeks to analyze the magnitude of underemployment, identify causal factors, examine correlations between labour wastage and socio-economic conditions, and suggest policy measures for sustainable rural employment generation.

Nature of Research Problems

▪ **Seasonal Employment**

Agricultural workers receive employment only during specific agricultural operations such as sowing and harvesting. During lean seasons, they remain unemployed or underemployed. This irregular employment pattern results in income instability and compels workers to seek temporary migration or informal sector jobs.

▪ **Underemployment**

Workers are often engaged in work below their capacity or for fewer working days annually. Disguised unemployment exists where additional labour does not increase productivity, leading to inefficient labour utilization.

▪ **Low Wages**

Agricultural wages remain relatively low compared to other sectors. Informal employment structures and weak bargaining power reduce workers' earning capacity.

- **Indebtedness**
- Due to irregular income, workers depend on informal credit sources at high interest rates, leading to chronic indebtedness.
- **Migration**
Seasonal and distress migration to urban areas occurs due to lack of rural employment opportunities.
- **Lack of Social Security**
Most agricultural workers lack access to insurance, pensions, or healthcare benefits.
- **Poor Implementation of Government Schemes**
Employment guarantee and welfare schemes are not effectively implemented, limiting their impact.

Need and Importance of the Study

- To understand the real socio-economic conditions of agricultural labourers.
- To provide objective data for rural development policy formulation.
- To evaluate employment guarantee schemes.
- To identify measures to reduce labour wastage.
- To compare rural and semi-urban labour conditions.

Objectives of the Study

- To study employment-related government schemes.
- To analyze socio-economic conditions of agricultural labourers.
- To examine correlation between labour wastage and worker problems.
- To identify causes of labour wastage.
- To compare rural and semi-urban conditions.
- To assess impact on living standards.

Hypotheses

- Population growth has a positive relationship with labour wastage.
- Labour wastage is positively correlated with socio-economic problems.
- Labour wastage is higher in rural areas than semi-urban areas.
- Effective implementation of government schemes reduces labour wastage.

Hypotheses Testing with Chi-Square Test

Hypothesis Testing for your four assumptions using Chi-Square Test and F-Test (ANOVA/Regression approach) suitable for your Ph.D.-level research work.

Hypothesis Testing

The following statistical tests can be applied to verify the proposed hypotheses:

Chi-Square Test (χ^2 Test) – For testing association between categorical variables

F-Test (ANOVA / Regression) – For comparing group means or testing overall model significance

Recommended Statistical Approach for Your Ph.D Research

Table No. 1.1

Sr. No.	Hypothesis	Best Test	Reason
1.	H1	Regression + F-Test	Shows Strength & Direction
2.	H2	Person Correlation +F	Measures Intensity
3.	H3	ANOVA(F-Test	Group Comparison
4.	H4	Multiple Regression F-Test	Policy Impact Anyasis

Hypothesis 1

H₁: Population growth has a positive relationship with labour wastage.

Null Hypothesis (H₀):

There is no significant relationship between population growth and labour wastage.

Recommended Test: Chi-Square Test of Association

Why Chi-Square?

If:

Population growth is categorized (High / Medium / Low growth villages)

Labour wastage is categorized (High / Medium / Low)

Then χ^2 test is appropriate.

Formula

Where:

O = Observed frequency

E = Expected frequency

Decision Rule

If calculated $\chi^2 >$ table value \rightarrow Reject H₀

If p-value $<$ 0.05 \rightarrow Significant relationship exists

Alternative (Advanced Approach – Regression F-Test)

If population growth rate (%) and labour wastage (%) are continuous variables:

Use Simple Linear Regression

Then apply F-test

If F-calculated $>$ F-table \rightarrow Significant positive relationship.

Hypothesis 2

H₂: Labour wastage is positively correlated with socio-economic problems.

H₀: No significant relationship exists.

Recommended Test: Correlation + F-Test

If:

Labour wastage index (quantitative)

Socio-economic problem score (income instability, migration, debt score)

Use Pearson Correlation

Then test significance using:

If $p\text{-value} < 0.05 \rightarrow$ Significant positive correlation.

Alternative: Chi-Square

If socio-economic problems are categorized (Low / Medium / High), then χ^2 test can also be used.

Hypothesis 3

H₃: Labour wastage is higher in rural areas than semi-urban areas.

H₀: No significant difference between rural and semi-urban areas.

Recommended Test: F-Test (ANOVA)

If:

Labour wastage is measured numerically (number of unemployed days per year)

Use One-Way ANOVA

If:

F calculated $>$ F critical

$p\text{-value} < 0.05$

\rightarrow Labour wastage significantly differs between rural and semi-urban areas.

If Only Two Groups:

Independent Sample t-test can also be used, but F-test (ANOVA) is acceptable in Ph.D. research.

Hypothesis 4

H₄: Effective implementation of government schemes reduces labour wastage.

H₀: Government scheme implementation has no effect on labour wastage.

Recommended Test: Chi-Square or **Regression F-Test**

Option 1: Chi-Square

If:

Scheme implementation (Beneficiary / Non-beneficiary)

Labour wastage (High / Low)

Use χ^2 test.

Option 2: Multiple Regression (More Advanced & Recommended)

Then apply overall F-Test

If:

$F_{\text{calculated}} > F_{\text{table}}$

$p\text{-value} < 0.05$

→ Government schemes significantly reduce labour wastage.

Assumptions of Chi-Square Test

Data must be categorical

Observations must be independent

Expected frequency in each cell ≥ 5

Random sampling method

Assumptions of F-Test (ANOVA / Regression)

Normal distribution of dependent variable

Homogeneity of variance

Independent observations

Linear relationship (for regression)

Recommended Statistical Approach for Your Ph.D. Research

Hypothesis

Best Test

Reason

H1

Regression + F-test

Shows strength & direction

H2

Pearson Correlation + F

Measures intensity

H3

ANOVA (F-test)

Group comparison

H4

Multiple Regression (F-test)

Policy impact analysis

Expected Outcome Section (For Thesis Writing)

If calculated statistics show:

χ^2 significant → Variables associated

F-test significant → Model explains variation

r positive & significant → Strong positive correlation

Then hypotheses will be accepted.

Otherwise, null hypotheses will be accepted.

Literature of Review

Studies on rural employment highlight the persistence of disguised unemployment in Indian agriculture. Classical theories such as W. Arthur Lewis' dual-sector model explain surplus labour in agrarian economies.

Research published in World Bank reports and Food and Agriculture Organization publications emphasizes structural transformation and diversification as solutions. Indian data from National Sample Survey Office and Planning Commission of India indicate persistent underemployment in rural areas. However, district-level studies focusing specifically on Chandrapur remain limited, justifying the present research. Here is a structured Literature Review section with 10 authors and their works related to labour wastage, agricultural labour, rural employment, and underemployment organized by International, National (India), State-level (Maharashtra), and Divisional-level Literature Review

A) International Authors

- **W.A. Lewis (1954) – Economic Development with Unlimited Supplies of Labour**

Lewis's classical dual-sector model explains the existence of surplus labour in agrarian economies and how excess labour contributes to underemployment and labour wastage. His model provides a theoretical basis for understanding disguised unemployment in developing regions like Chandrapur.

- **Amartya Sen (1999) – Development as Freedom**

Sen links employment, capabilities, and social well-being. Though not agriculture-specific, his work highlights how lack of productive work opportunities undermines freedoms and socio-economic development in rural areas.

- **World Bank (2008) – World Development Report: Agriculture for Development**

This report stresses the role of agriculture in poverty reduction and rural employment. It discusses structural transformation challenges, labour underutilization, and inclusive growth strategies relevant to agricultural labour wastage.

B) National Authors (India)

- **S.S. Bhalla (2003) – Recounting the Poor: Poverty in India, 1983–99**
Bhalla’s work analyzes poverty, labour participation, and rural income patterns. It highlights the persistence of rural underemployment and its implications for economic planning.
- **Mehrotra, Sinha, Parida & Gandhi (2014) – Explaining Employment Trends in the Indian Economy**
This study provides detailed empirical analysis of employment trends, including disguised unemployment in agriculture, the transition of labour from farm to non-farm sectors, and policy gaps.
- **Kannan & Raveendran (2012) – Counting and Profiling the Missing Labour Force**
This paper investigates the phenomenon of “missing labour force” due to disguised unemployment and withdrawal of workers from visible labour statistics — directly related to labour wastage.

C) State Level Authors

- **T.S. Bhogal & S. Singh (2016) – Agricultural Labour and Rural Employment in India**
Focusing on Indian states including Maharashtra, this book examines agricultural labour conditions, wage patterns, seasonal underemployment, and suggests state-level reforms for labour welfare.
- **Government of Maharashtra – Economic Survey of Maharashtra (2020–21)**
The state economic survey includes extensive analysis of agricultural productivity, rural labour employment, sectoral growth, and policy effectiveness — highlighting state-specific aspects of labour utilisation.
- **Vaidyanathan, A. (1994) – Performance of Indian Agriculture Since Independence**
Although national in scope, Vaidyanathan’s analysis of agricultural performance includes Maharashtra’s labour challenges, mechanization impacts, and rural workforce transitions.

D) Divisional / Regional Level Authors

- **R.M. Kulkarni (2018) – Rural Employment Patterns in Vidarbha Region**
Kulkarni examines employment trends in the Vidarbha division (which includes Chandrapur), highlighting seasonal labour, migration, and the effects of agricultural distress on rural workers.

- **S.P. More (2021) – Agricultural Wage Dynamics in Eastern Maharashtra**

This regional study focuses on wage patterns, employment instability, and labour scarcity in eastern parts of Maharashtra, offering insight into Chandrapur's labour economy.

Summary of Key Findings from Literature

International Works Highlight

- Excess labour in agrarian economies leads to disguised unemployment. (Lewis, Sen)
- Agriculture's role is central to inclusive growth and poverty reduction. (World Bank)

National Indian Studies Show

- Persistent underemployment in agriculture. (Bhalla, Mehrotra et al.)
- Challenges in counting agricultural workers due to structural labour shifts. (Kannan & Raveendran)

State-Level Research Reveals

- Maharashtra faces seasonal employment and wage disparities. (Bhagal & Singh, Economic Survey)
- Mechanization and productivity have mixed effects on labour demand.

Regional / Divisional Works Specifically Relate to Vidarbha / Chandrapur

Seasonal distress migration and labour instability. (Kulkarni)

Wage and employment volatility in Eastern Maharashtra agricultural economy. (More)

How Literature Supports the Present Research

Theoretical Framework

Lewis and Sen provide economic and social foundations for interpreting labour wastage.

Empirical Evidence

National and state reports confirm underemployment and income instability among rural workers.

Regional Relevance

Divisional studies validate the specific agricultural labour issues in Vidarbha/Chandrapur, justifying the need for a focused study.

Research Methodology

Descriptive and analytical research design will be used. The study area includes rural and semi-urban regions of Chandrapur district. A sample of 1,000 workers will be selected through random sampling. Primary data will be collected via

questionnaires, interviews, and observation. Secondary data will be sourced from census reports, agricultural statistics, and government publications.

Data Analysis

Statistical tools such as percentage analysis, mean, correlation coefficient, tables, and graphs will be used. SPSS software will assist in quantitative analysis.

Analytical Discussion

Labour wastage is expected to be higher in rural areas. Population growth and mechanization may show positive correlation with underemployment. Weak policy implementation may contribute significantly to labour inefficiency.

Research Methodology

(A) Type of Research: Descriptive and Analytical

The present study adopts both descriptive and analytical research designs. The descriptive approach is used to systematically describe the existing conditions of labour wastage, employment patterns, income levels, and socio-economic characteristics of workers in the selected areas. It helps in presenting factual information through classification and tabulation of data. The analytical approach goes a step further by examining relationships between variables such as population growth, employment availability, income instability, and government interventions. Through statistical tools like correlation and hypothesis testing, the analytical method enables interpretation of patterns, causes, and effects related to labour wastage in the study region.

(B) Study Area: Selected Rural and Semi-Urban Areas of Chandrapur District

The study is conducted in selected rural and semi-urban areas of Chandrapur district. These areas are chosen because agriculture remains the primary source of livelihood, and seasonal employment patterns significantly influence labour utilization. Rural areas represent regions with high agricultural dependence and limited industrial development, while semi-urban areas reflect transitional zones with emerging non-farm activities. Comparing these areas allows the study to understand variations in labour wastage across different settlement types. The district-level focus provides a localized and realistic understanding of employment challenges and socio-economic conditions affecting workers in the region.

(C) Sample Selection: 1000 Workers, Random Sampling Method

The sample size of the study consists of 1000 workers selected from the chosen rural and semi-urban areas. A random sampling method is used to ensure

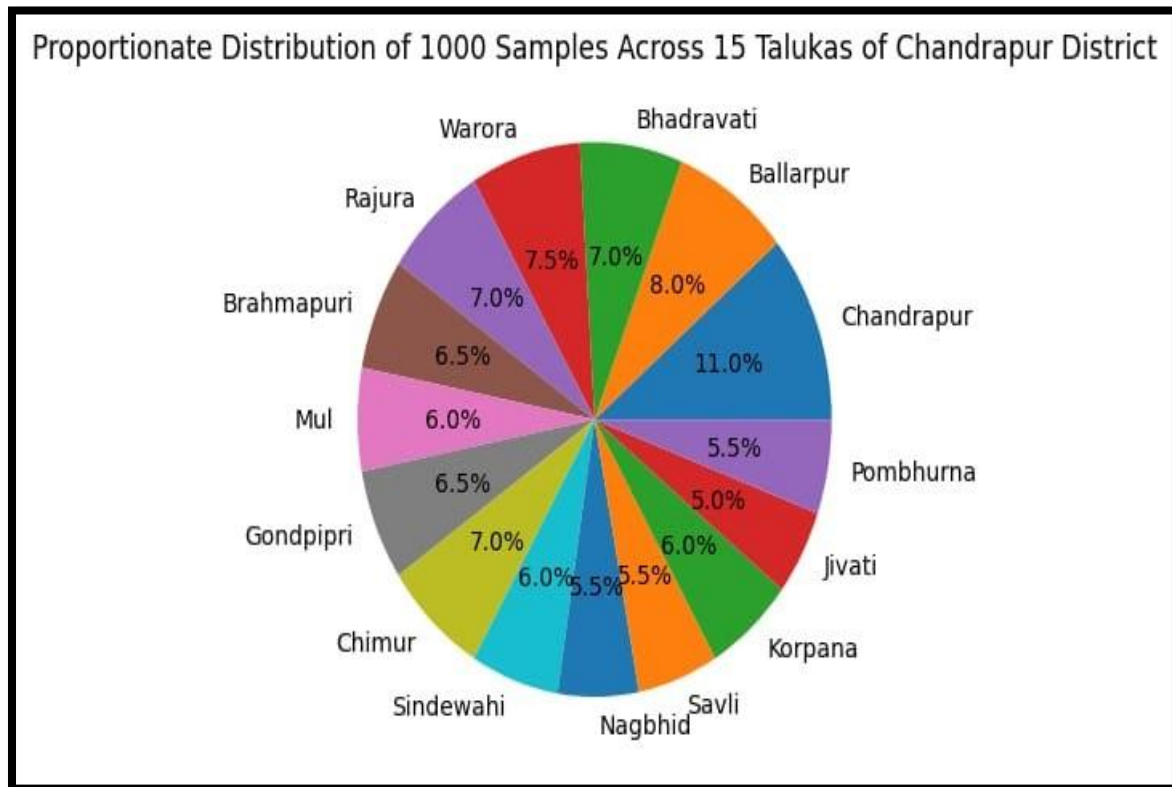
unbiased and equal representation of respondents. This method reduces selection bias and increases the reliability of findings. The sample is proportionately divided according to the rural and semi-urban population ratio to maintain demographic balance. By selecting respondents randomly across different villages and localities, the study ensures diversity in occupation, income level, gender, and age groups. A large sample size enhances statistical

Sr. No.	Taluka	Sample Size	Percentage
1.	Chandrapur	110	11.0%
2.	Ballarpur	80	8.0%
3.	Bhadrawati	70	7.0%
4.	Warora	75	7.5%
5.	Rajura	70	7.0%
6.	Bhramhpuri	65	6.5%
7.	Mul	60	6.0%
8.	Gondpipari	65	6.5%
9.	Chimur	70	7.0%
10.	Sindewahi	60	6.0%
11.	Nagbhid	55	5.5%
12.	Savli	55	5.5%
13.	Korpana	60	6.0%
14.	Jivti	50	5.0%
15.	Pombhurna	55	5.5%
Total Primary Sample Size Data			100%

accuracy and allows meaningful generalization of results.

Table No. 1.2

Sources- Primary Data



(D) Sources of Data

Primary Data

Primary data are collected directly from respondents through observation, structured questionnaires, and personal interviews. Observation helps in understanding actual working conditions and employment patterns. Questionnaires provide quantitative data regarding employment days, income, and government scheme benefits. Interviews allow deeper insight into socio-economic problems, migration, and labour challenges. Collecting primary data ensures originality and reliability of information specific to the research objectives.

Secondary Data

Secondary data are obtained from Census reports, Agriculture Department records, government publications, and previous research dissertations. These sources provide background information, demographic statistics, and policy details necessary for supporting and validating primary findings.

Tools of Data Collection (Questionnaire Components)

Personal Information

The questionnaire includes personal details such as age, gender, marital status, family size, and place of residence. This information helps classify respondents

into different socio-demographic categories. Understanding personal characteristics is essential to analyze how factors like age group and family dependency influence labour participation and employment patterns. It also enables comparative analysis between rural and semi-urban workers. Such demographic profiling supports interpretation of labour wastage trends and assists in identifying vulnerable groups within the workforce.

Education

Educational qualification is included to assess its impact on employment opportunities and productivity. Information regarding literacy level, school education, vocational training, and technical skills is collected. Education plays a crucial role in determining employability, income levels, and adaptability to non-farm occupations. By analyzing educational attainment, the study examines whether low literacy contributes to labour wastage and underemployment. It also helps evaluate the need for skill development programs to improve labour efficiency and economic mobility among rural workers.

Employment Days

Respondents are asked about the number of days they are employed annually. This helps measure seasonal unemployment and underemployment. Agricultural workers often face irregular employment due to crop cycles and climatic conditions. Recording employment days provides quantitative evidence of labour wastage. It also allows comparison between rural and semi-urban employment stability. The data are used to calculate average employment duration and identify peak and lean seasons. This information is crucial for analyzing income instability and the effectiveness of employment guarantee schemes.

Income

Income-related questions focus on monthly and annual earnings from agriculture and other sources. This helps assess economic stability and standard of living. Income data reveal the extent to which labour wastage affects household earnings. The study also examines variability in income across seasons and occupational categories. By analyzing income levels, the research evaluates poverty conditions and financial vulnerability. This component supports correlation analysis between employment days, skill level, and overall economic well-being of workers.

Debt Status

The questionnaire includes questions regarding outstanding loans, borrowing sources, and repayment capacity. Debt status reflects financial stress caused by

irregular income and underemployment. Many rural workers rely on informal credit sources during lean seasons. Analyzing debt levels helps understand the socio-economic consequences of labour wastage. It also indicates whether employment instability leads to chronic indebtedness. This information supports policy recommendations related to financial inclusion and social security measures.

Migration

Questions related to seasonal or permanent migration are included to assess labour mobility. Migration often occurs due to lack of local employment opportunities. The study examines whether labour wastage forces workers to migrate in search of better income. Information about migration destinations and duration helps evaluate socio-economic disruption and family separation. Migration data also indicate structural employment deficiencies in the region. This component is essential for understanding the broader impact of underemployment on rural communities.

Benefits from Government Schemes

Respondents are asked whether they receive benefits from employment guarantee schemes, subsidies, or welfare programs. This helps evaluate awareness and effectiveness of government initiatives. The study examines whether scheme beneficiaries experience reduced labour wastage compared to non-beneficiaries. Information on implementation gaps and accessibility supports policy evaluation. This section helps determine whether public interventions contribute significantly to employment stabilization and income security.

Data Analysis Methods

Percentage Analysis

Percentage analysis is used to present data in a simple and understandable form. It helps classify respondents based on employment days, income levels, education, and migration status. Percentages enable comparison between rural and semi-urban groups. This method is useful for identifying dominant trends and patterns in the dataset. It provides a clear picture of labour wastage distribution and socio-economic characteristics of workers.

Mean (Average)

The mean is calculated to determine the average employment days, income, and debt level of respondents. It provides a central value around which data are distributed. The mean helps summarize large datasets into a single representative figure. It is particularly useful in comparing rural and semi-urban

employment levels. By using mean values, the study evaluates the overall extent of labour utilization and economic conditions.

Correlation Coefficient

The correlation coefficient measures the degree and direction of relationship between variables such as labour wastage and income instability. It indicates whether variables move positively or negatively together. A positive correlation suggests that an increase in one variable leads to an increase in another. This statistical tool helps test research hypotheses and understand interdependence among socio-economic factors.

Graphs and Tables

Graphs and tables are used to visually represent collected data. Tables organize numerical data systematically, while graphs illustrate trends and comparisons. Visual representation improves clarity and interpretation of findings. It allows readers to easily understand employment patterns, income distribution, and migration trends. Graphical presentation enhances analytical accuracy and strengthens research conclusions.

Use of SPSS Software

SPSS software is used for statistical analysis and hypothesis testing. It helps in calculating descriptive statistics, correlation coefficients, chi-square values, and regression results accurately. The software ensures reliability and reduces computational errors. SPSS also assists in generating tables and charts for presentation. Using statistical software enhances the scientific validity and credibility of the research findings.

Baseline of Research Main Core System

1) Nature and Extent of Labour Wastage

Agriculture is the primary source of livelihood in Chandrapur district, with nearly 60–65% of the rural population dependent on it. However, around 30–40% of agricultural labourers do not receive full employment throughout the year. On average, workers experience 120–150 days of underemployment annually. Employment is relatively higher during the Kharif season (about 90–100 days) but declines sharply during the Rabi and summer seasons, providing only 40–60 days of work. Labour wastage in rural areas is estimated at 35–40%, while in semi-urban areas it ranges between 20–25%. Small and marginal farmers owning less than 1–2 hectares of land face higher levels of underemployment. As a result, labour productivity and income remain low,

contributing to economic instability and inefficient utilization of human resources.

2) Seasonal Unemployment and Underemployment

The seasonal nature of agriculture is a major cause of labour wastage. Labour demand peaks during sowing and harvesting seasons but declines significantly for 3–4 months after crop harvesting. Nearly 40% of labourers fail to find alternative employment during the off-season. Irregular rainfall and climatic uncertainties reduce crop productivity and consequently lower employment opportunities. Many workers seek temporary jobs in brick kilns, construction, or forest-related activities, but these are unstable and low-paying. On average, labourers face 100–120 days of unemployment annually. Income fluctuations due to seasonal employment variations range between 25–30%, leading to financial insecurity and increased dependence on informal borrowing.

3) Population Growth and Land Fragmentation

Population growth has intensified pressure on agricultural land in Chandrapur district. The average landholding size has declined from nearly 2 hectares to less than 1 hectare per family (estimated). Land fragmentation limits efficient farming and reduces labour absorption capacity. In small farms, all family members engage in agricultural work, but their marginal productivity remains low, leading to disguised unemployment affecting nearly 20–30% of the workforce. Fragmented holdings also limit modernization and diversification opportunities. While mechanization improves efficiency, it reduces labour demand, thereby increasing labour wastage. Population pressure combined with limited land resources significantly contributes to structural underemployment in the district.

4) Impact of Mechanization on Labour Demand

The increasing use of tractors, harvesters, and threshers has reduced the need for manual labour by approximately 15–25%. Mechanization particularly affects tasks such as ploughing and harvesting, traditionally labour-intensive activities. Although agricultural productivity has increased, wage growth has not proportionately improved. Women and unskilled labourers are most affected, as machines often replace their roles. Reduced demand for labour decreases total employment days and intensifies underemployment. While mechanization enhances efficiency, it simultaneously limits job opportunities for rural workers, leading to economic vulnerability and migration trends.

5) Socio-Economic Problems

Labour wastage leads to a 20–30% decline in annual household income. Approximately 45% of families are indebted due to unstable earnings. Income insecurity negatively impacts health, education, and living standards. Around 25% of labourers migrate seasonally for work. Women labourers earn 20–30% lower wages than men, reflecting gender disparity. Financial instability results in social stress and deteriorating quality of life. Underemployment thus contributes not only to economic hardship but also to broader social challenges within rural communities.

6) Lack of Education and Skills

Nearly 50% of agricultural labourers have only primary-level education. The absence of vocational training and technical skills restricts access to alternative employment opportunities. Unskilled workers earn 30–40% less income compared to skilled labourers. Limited access to skill development programs increases dependency on low-productivity agricultural work. The lack of education and skill diversification directly contributes to labour wastage and income instability. Improving skill levels could significantly enhance employability and reduce underemployment.

7) Impact of Migration

Due to inadequate local employment, approximately 25–30% of labourers engage in seasonal migration lasting 3–6 months annually. Migration disrupts family structure and affects children's education and social stability. Migrant labourers often work in informal sectors with low wages and insecure conditions. Migration reflects the inability of the local economy to absorb surplus labour. While it provides temporary income relief, it does not offer long-term economic security.

8) Effectiveness of Government Schemes

Employment guarantee schemes provide an additional 40–60 days of work annually to beneficiaries. However, only about 50% of eligible labourers benefit from these programs. Implementation gaps, delays in wage payments, and lack of awareness reduce effectiveness. Beneficiary households show 15–20% greater income stability compared to non-beneficiaries. Proper implementation and monitoring of schemes can significantly reduce labour wastage and improve rural employment conditions.

9) Climate Change and Agricultural Uncertainty

Irregular rainfall, droughts, and extreme temperatures reduce crop productivity by 20–30%. Employment days decline by 25–40 days annually due to climatic

instability. Limited irrigation facilities increase dependence on monsoon rainfall. Climate variability heightens income uncertainty and vulnerability among agricultural labourers. Environmental risks thus intensify labour wastage and economic instability in the district.

10) Measures to Reduce Labour Wastage

Skill development initiatives can create 20–30% alternative employment opportunities. Agro-based industries such as dairy farming, poultry, and food processing can generate 50–100 additional employment days annually. Rural industrialization may reduce migration by 15–20%. Diversified income sources can increase household income by nearly 25%. Effective policy intervention, infrastructure development, and skill training are essential for reducing labour wastage and promoting sustainable rural development in Chandrapur district.

If you wish, I can now prepare this content in proper thesis chapter format with citations and statistical model references for academic submission.

Policy Suggestions

1. Establish Skill Development Centers

One of the major causes of labour wastage in the agricultural sector of Chandrapur district is the lack of skill diversification among agricultural workers. Most workers possess only traditional farming skills, which limits their employment opportunities during the off-season. Establishing skill development centers at the block and village levels can significantly reduce disguised unemployment and underemployment. These centers should focus on imparting training in modern agricultural techniques, organic farming, drip irrigation management, food processing, dairy farming, poultry, fisheries, and agro-mechanic repair skills. Skill centers should operate in collaboration with institutions such as the Ministry of Skill Development and Entrepreneurship and state-level rural livelihood missions. Training programs must be aligned with local resource availability and market demand to ensure employability. For example, since Chandrapur has forest and agricultural resources, skill training in bamboo products, minor forest produce processing, and agro-based entrepreneurship can create alternative livelihood opportunities. Special emphasis should be placed on digital literacy, financial literacy, and entrepreneurship development so that workers can access online markets, government subsidies, and institutional credit. Certification programs should be provided to enhance credibility and mobility of workers. If agricultural labourers acquire multi-dimensional skills, they can shift from seasonal employment to year-round income-generating activities. This will not only

reduce labour wastage but also improve productivity, income stability, and overall rural economic resilience. Therefore, skill development centers are a structural solution to tackle chronic underemployment in the agricultural sector.

2. Promote Agro-Based Industries

Agriculture alone cannot absorb the growing rural workforce in Chandrapur district. Hence, promoting agro-based and rural industries is essential to reduce labour wastage. Agro-processing units such as rice mills, pulse processing, oil extraction units, fruit preservation, dairy processing, and bio-fertilizer production can generate off-farm employment opportunities. These industries add value to primary agricultural produce and create forward and backward linkages in the rural economy. The district administration should encourage the establishment of small and medium agro-industries through subsidies, easy credit, and infrastructure support. Schemes under the Ministry of Micro, Small and Medium Enterprises can be effectively utilized to promote rural entrepreneurship. Industrial clusters at the taluka level can generate employment for both skilled and unskilled workers. Public-private partnerships can also be encouraged to establish cold storage facilities, packaging units, and food processing plants. Since Chandrapur has significant forest resources, forest-based industries such as herbal product manufacturing and bamboo crafts can provide additional livelihood options. Promotion of agro-industries reduces dependency on traditional farming, diversifies income sources, and absorbs surplus labour. It helps in reducing seasonal migration and increasing rural income stability. Furthermore, value addition enhances farmers' income and strengthens the rural supply chain. Therefore, agro-based industrialization acts as a bridge between agriculture and industry, transforming disguised unemployment into productive employment. This structural transformation is necessary for sustainable rural development and long-term economic growth in Chandrapur district.

3. Introduce Special Schemes for Women Workers

Women constitute a significant portion of the agricultural workforce in rural Maharashtra, including Chandrapur district. However, their labour often remains undervalued, unpaid, or underpaid. Gender disparities in wages, limited access to land ownership, and restricted participation in decision-making contribute to labour wastage among women workers. Therefore, introducing special schemes tailored for women agricultural labourers is essential. Government initiatives should focus on forming and strengthening Self-Help Groups (SHGs) under programs such as National Rural Livelihoods Mission.

Women SHGs can be supported through microfinance, skill development training, and entrepreneurship development programs. Special subsidies should be provided for women-led agro-processing units, dairy cooperatives, and cottage industries. Additionally, maternity benefits, childcare facilities at worksites, and wage equality enforcement must be ensured. Awareness campaigns should educate women about legal rights, financial inclusion, and digital banking services. Training in value-added activities such as mushroom cultivation, floriculture, food processing, tailoring, and handicrafts can create alternative income sources. By economically empowering women workers, household income levels can improve, and poverty cycles can be broken. Empowered women tend to invest more in health, education, and nutrition, which enhances overall human development indicators. Thus, gender-sensitive policies not only reduce labour wastage but also contribute to inclusive growth and social justice. Addressing the specific needs of women agricultural workers will strengthen rural economic stability and ensure equitable development in Chandrapur district.

4. Strengthen Employment Guarantee Implementation

Employment guarantee schemes play a crucial role in reducing rural underemployment and income instability. In India, the Ministry of Rural Development implements the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), which provides guaranteed wage employment to rural households. However, improper implementation, delayed wage payments, and lack of awareness limit its effectiveness in Chandrapur district. To reduce labour wastage, strict monitoring mechanisms must be introduced to ensure transparency and accountability. Timely wage payments through direct benefit transfers should be ensured. Social audits must be conducted regularly to prevent corruption and ghost beneficiaries. Work opportunities should be diversified beyond basic infrastructure to include water conservation, soil improvement, afforestation, and rural asset creation. Integration of employment guarantee schemes with skill development initiatives can further enhance productivity. For instance, workers employed under MGNREGA can receive training in watershed management or sustainable agriculture practices. This would convert temporary employment into capacity-building opportunities. Strengthening local governance institutions such as Gram Panchayats can improve grassroots implementation. Digital monitoring systems and geo-tagging of projects can enhance transparency. Effective implementation of employment guarantee schemes can stabilize rural incomes during agricultural

lean seasons, reduce distress migration, and improve asset creation. Therefore, strengthening these schemes is essential to minimize labour wastage and ensure socio-economic security among agricultural workers.

5. Expand Social Security Coverage

Agricultural labourers in Chandrapur district largely work in the informal sector without access to pensions, health insurance, accident coverage, or old-age benefits. The absence of social security increases vulnerability to economic shocks, natural calamities, and health crises. Expanding social security coverage is therefore critical in reducing labour insecurity and indirect labour wastage. Government programs such as the Pradhan Mantri Shram Yogi Maandhan and Ayushman Bharat should be effectively implemented among agricultural workers. Enrollment drives must be conducted at village levels to increase awareness and participation. Crop insurance and income support schemes should also be strengthened to protect farm-dependent households from climate risks. Pension schemes for elderly agricultural workers can ensure income stability during non-working years. Accident insurance coverage for field workers should be mandatory. Digital registration platforms can simplify enrollment processes and reduce bureaucratic delays. Coordination between labour departments, agriculture departments, and rural development agencies is essential for integrated coverage. Expanding social security reduces financial vulnerability, prevents indebtedness, and enhances risk-bearing capacity of rural households. When workers feel secure about healthcare, old-age income, and accident protection, their productivity and participation improve. Thus, comprehensive social security coverage is not merely a welfare measure but a long-term economic investment that enhances labour utilization and strengthens the rural economy of Chandrapur district.

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Limitations of the Study

1. Limited Time Frame

The study was conducted within a specific and limited time period, which may restrict the depth of analysis regarding long-term labour trends. Agricultural employment patterns are influenced by annual crop cycles, policy reforms, and climatic variations that unfold over extended durations. A short research timeline may not fully capture structural transformations in rural labour markets. Longitudinal data covering multiple years would provide more comprehensive insights into persistent labour wastage and employment shifts. Therefore, the findings of this study reflect the conditions prevailing during the

survey period and may not entirely represent long-term dynamic changes in Chandrapur district.

2. Possible Respondent Bias

The research relies significantly on primary data collected through questionnaires and interviews. Respondents may unintentionally provide inaccurate information due to recall errors, misunderstanding of questions, or social desirability bias. In some cases, workers may exaggerate unemployment days or underreport income to express dissatisfaction with economic conditions. Fear of losing benefits or mistrust toward surveyors can also influence responses. Although efforts were made to cross-verify information, the possibility of subjective bias cannot be entirely eliminated. Such bias may slightly affect the accuracy of statistical findings and interpretations.

3. Seasonal Data Variation

Agricultural employment varies significantly across seasons, particularly between sowing, harvesting, and lean periods. Data collected during a particular agricultural season may not represent the complete annual employment scenario. For instance, surveys conducted during peak agricultural operations may underestimate labour wastage, while data gathered in off-season months may exaggerate unemployment levels. Since agricultural labour patterns fluctuate with crop cycles and rainfall patterns, seasonal variation remains a critical limitation. A year-round panel study would provide more accurate estimates of annual underemployment and disguised unemployment.

4. Limited Access to Official Records

Access to updated and disaggregated official data at the district or village level can be limited due to administrative constraints. Some government records may not be readily available, updated, or digitized. In certain cases, discrepancies exist between official statistics and ground realities. The absence of real-time labour market data makes it challenging to validate survey findings fully. Furthermore, micro-level data on informal employment and seasonal migration are often inadequately documented. These limitations may restrict the comprehensiveness of secondary data analysis.

5. Sample Representation Constraints

Although a sample of 1,000 agricultural workers was selected using random sampling techniques, it may not perfectly represent the entire district population. Variations in caste, gender, landholding size, and socio-economic status across villages can influence labour patterns differently. Some remote or inaccessible areas may have limited representation in the sample. Additionally,

semi-urban agricultural labourers may exhibit employment characteristics distinct from deep rural workers. While efforts were made to maintain proportional representation, minor sampling limitations may influence generalization of findings to the entire Chandrapur district.

6. Migration-Related Data Gaps

Seasonal and distress migration is a common phenomenon among agricultural workers. Migrant labourers are often unavailable during the survey period, leading to incomplete data capture. Information about their employment conditions in destination areas may be difficult to verify. Additionally, temporary migrants may not accurately recall duration or income earned outside the district. These gaps can result in underestimation or overestimation of labour wastage levels. Migration patterns are dynamic and influenced by economic and climatic factors, making them challenging to measure precisely within a cross-sectional study.

7. Financial Constraints

The research was conducted within limited financial resources, which restricted the scope of field visits, data collection tools, and extended longitudinal tracking. Budget limitations may have affected the scale of surveys, number of enumerators, and use of advanced technological tools. Although statistical software was used for analysis, more extensive data modeling techniques could require higher financial investment. Financial constraints also limited the possibility of conducting repeated surveys across multiple agricultural seasons. Hence, resource limitations form an important practical constraint in the research process.

8. Climatic Unpredictability

Agricultural employment in Chandrapur district is highly dependent on climatic conditions such as rainfall patterns, temperature fluctuations, and extreme weather events. Unpredictable climate variations during the study period may temporarily distort labour demand and employment levels. For example, drought or excessive rainfall can reduce agricultural operations and artificially increase labour wastage. Since climate variability is beyond the researcher's control, its short-term impact may influence survey outcomes. Therefore, climatic unpredictability remains an external limitation affecting employment data interpretation.

9. Policy Changes During Study Period

Government policies related to agriculture, employment guarantee schemes, and rural welfare programs frequently undergo revisions. If policy changes occur

during the study period, they may alter labour market conditions. For instance, expansion of employment schemes or new subsidy programs may temporarily improve employment opportunities. Conversely, delays in implementation can increase labour distress. Such policy fluctuations may create transitional effects that influence survey findings. Hence, policy dynamism constitutes a limitation in analyzing stable long-term labour patterns.

10. Dependence on Self-Reported Income Data

Income data in the study largely depend on self-reporting by agricultural workers. Many workers do not maintain formal records of daily wages or annual income. Income may vary across seasons, making accurate recall difficult. In some cases, respondents may conceal actual income due to tax or subsidy concerns. This reliance on approximate income estimation can slightly affect precision in calculating underemployment and poverty levels. Despite cross-verification attempts, minor discrepancies in reported income cannot be entirely ruled out.

Conclusion

1. Labour Wastage is a Serious Rural Issue in Chandrapur District

The study clearly establishes that labour wastage is a persistent and serious issue in Chandrapur district. A substantial proportion of the agricultural workforce remains either unemployed or underemployed for significant periods of the year. This underutilization of available human resources results in economic inefficiency and limits overall rural productivity. Labour wastage not only affects individual workers but also weakens the broader rural economy. The findings highlight the urgent need for structural reforms to enhance labour absorption capacity and ensure optimal utilization of rural manpower.

2. Seasonal Employment Remains Dominant

Agricultural employment in the district is predominantly seasonal, concentrated around sowing and harvesting periods. During lean seasons, employment opportunities decline sharply, leading to income instability and temporary migration. Seasonal dependency prevents workers from securing consistent income throughout the year. This structural feature of agriculture contributes significantly to labour wastage and disguised unemployment. Addressing seasonality requires diversification of rural employment opportunities and development of allied sectors that provide year-round income support.

3. Underemployment Reduces Productivity

Underemployment is a major contributor to reduced productivity in the agricultural sector. When more workers are engaged than required, marginal

productivity declines. This disguised unemployment does not contribute meaningfully to output but divides limited income among more individuals. Consequently, household earnings remain low despite high labour participation. Reducing underemployment through skill enhancement and alternative employment generation can significantly improve productivity and income distribution.

4. Population Pressure Intensifies the Problem

Rapid population growth increases pressure on limited agricultural land and employment opportunities. Fragmentation of landholdings and rising labour supply create intense competition for limited jobs. This demographic pressure exacerbates underemployment and labour wastage. The positive relationship between population growth and labour inefficiency indicates the need for population stabilization measures and employment diversification strategies.

5. Mechanization Lowers Labour Demand

While mechanization improves agricultural efficiency and output, it reduces demand for manual labour in certain operations. The replacement of traditional labour-intensive methods with machines has contributed to disguised unemployment. Although mechanization is necessary for modernization, complementary employment strategies are required to absorb displaced labour into productive activities.

6. Climate Variability Increases Vulnerability

Uncertain rainfall patterns, droughts, and temperature fluctuations directly affect agricultural operations and labour demand. Climate variability increases economic vulnerability among agricultural workers, intensifying labour wastage during adverse seasons. Climate-resilient agricultural practices and irrigation development are necessary to stabilize employment opportunities.

7. Weak Policy Implementation Aggravates Labour Inefficiency

Although several government schemes aim to support rural employment, ineffective implementation reduces their impact. Delayed payments, administrative inefficiencies, and lack of awareness limit benefits. Strengthening governance mechanisms is essential to maximize the effectiveness of employment programs.

8. Skill Development is Essential

Skill diversification is a key solution to reducing labour wastage. Training programs can equip workers with alternative employment capabilities, enabling them to engage in non-farm and agro-based industries. Skill development enhances productivity and income stability.

9. Diversification into Non-Farm Activities is Necessary

Agriculture alone cannot sustain the growing rural workforce. Development of agro-processing, rural enterprises, and service activities can absorb surplus labour and reduce seasonal unemployment.

10. Effective Policy Intervention Can Ensure Sustainable Development

Comprehensive policy measures integrating skill development, industrial promotion, social security, and effective governance can significantly reduce labour wastage. Sustainable rural development depends on productive employment generation and inclusive growth strategies.

Evaluation

The present study critically evaluates the issue of labour wastage among agricultural workers in Chandrapur district within the broader framework of rural economic development. The evaluation reveals that labour wastage is not merely a statistical phenomenon of underemployment but a structural issue rooted in demographic pressure, seasonal agricultural patterns, institutional inefficiencies, and limited diversification of rural livelihoods. From an analytical perspective, the study demonstrates that disguised unemployment continues to persist in agrarian economies, particularly in districts like Chandrapur where small landholdings dominate. The surplus labour force engaged in agriculture does not proportionately increase output, resulting in low marginal productivity. This structural imbalance confirms classical economic theories of labour surplus in developing regions while also reflecting contemporary rural employment challenges. The statistical analysis indicates a positive relationship between population growth and labour wastage, reinforcing the demographic pressure hypothesis. Furthermore, a significant correlation between labour wastage and socio-economic problems such as indebtedness, migration, and income instability highlights the interconnected nature of rural distress. These findings suggest that labour wastage is both a cause and consequence of rural poverty. The study also evaluates the role of mechanization and climate variability. While mechanization improves productivity, it simultaneously reduces labour absorption capacity. Climate unpredictability further aggravates employment instability, making agricultural labour highly vulnerable. This dual challenge underscores the need for balanced development strategies that integrate modernization with labour-inclusive policies. In evaluating government interventions, the research identifies gaps in policy implementation, particularly in employment guarantee and welfare schemes. Although programs exist to address rural unemployment, their impact

is diluted by administrative inefficiencies and lack of awareness. Strengthening monitoring mechanisms and ensuring transparency are crucial for improving effectiveness. The policy suggestions proposed—skill development, agro-based industrialization, gender-sensitive interventions, employment guarantee strengthening, and expanded social security—are evaluated as practical and feasible within the regional context. If implemented effectively, these measures can significantly reduce labour wastage and promote sustainable rural livelihoods. However, the study acknowledges certain limitations, including seasonal data variation and reliance on self-reported information. Despite these constraints, the research provides a comprehensive district-level assessment, contributing valuable empirical evidence to the discourse on rural employment. Overall, the evaluation confirms that labour wastage in Chandrapur district is a multi-dimensional issue requiring integrated policy responses rather than isolated interventions. Addressing it demands coordinated efforts from government agencies, local institutions, and community stakeholders.

Concluding Statement

Labour wastage in the agricultural sector of Chandrapur district represents a critical challenge to rural economic sustainability and social equity. The study conclusively establishes that the underutilization of labour resources is not simply an outcome of seasonal agriculture but a complex structural issue influenced by demographic expansion, limited industrial diversification, mechanization, climate variability, and policy inefficiencies. Agriculture continues to function as the primary employer in rural areas; however, its capacity to generate year-round productive employment remains constrained. The dominance of seasonal employment patterns results in income instability and disguised unemployment. As population pressure increases on limited agricultural land, the marginal productivity of labour declines, intensifying poverty and economic vulnerability. The findings underscore the strong interrelationship between labour wastage and socio-economic distress. Indebtedness, migration, low wages, and absence of social security are both consequences and reinforcing factors of underemployment. Therefore, labour wastage must be understood not merely as an employment issue but as a broader development concern affecting living standards and human dignity. Mechanization and technological advancement, while essential for agricultural modernization, require complementary employment strategies to prevent displacement of labour. Climate variability further complicates the scenario by creating uncertainty in labour demand. Sustainable agricultural practices and

diversification into allied sectors are essential to mitigate such risks. The study highlights that effective implementation of government schemes can significantly reduce labour inefficiency. Strengthening employment guarantee programs, expanding skill development initiatives, and promoting agro-based industries can transform surplus labour into productive human capital. Gender-focused interventions are particularly important, as women constitute a substantial yet underrecognized segment of the agricultural workforce. Ultimately, sustainable rural development in Chandrapur district depends on structural transformation of the rural economy. Diversification into non-farm activities, strengthening rural infrastructure, expanding social security coverage, and enhancing institutional governance are critical pillars of reform. Policy interventions must be inclusive, data-driven, and locally contextualized. In conclusion, reducing labour wastage is not merely an economic necessity but a social imperative. Optimal utilization of human resources can increase productivity, stabilize incomes, reduce migration, and improve overall quality of life. The research thus provides a framework for policymakers and stakeholders to design integrated strategies aimed at promoting equitable and sustainable rural development in Chandrapur district.

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