The Role Of Agrobased Industries In Generation Of Employment And Income: A Case Study In Selected Districts In The State Of Karnataka

[1]Roopa M. N and Nila Chotai

Department of Economics, Al-Ameen College Research Centre, Bangalore – 56002, Karnataka, India

Abstract

This paper deals with the role of agro-based industries in employment and income generation across the selected districts in the state of Karnataka, India. Data obtained from 480 respondents across eight districts was analysed by employing the statistical tools such as Z-test, proportion analysis and descriptive statistics. The results revealed that agro-based industries contribute significantly to local employment, with over 80% of household income in these regions derived from such industries. Z-test confirmed that the proportion of employment migration significantly exceeds the hypothesized value, highlighting the sector's impact on stabilizing livelihoods. Despite their positive contributions, challenges such as labour shortages, seasonal employment, and limited sustainability measures persist. The study concludes with recommendations for targeted infrastructure development, enhanced skill training programs and policies to maximize the socio-economic benefits of agro-based industries.

Keywords: Agro-based industries, employment, income generation, rural economy.

INTRODUCTION

Agro-based industries, which process agricultural raw materials into consumable products such as food, textiles and biofuels are crucial to the global economy. They stabilize agricultural income, reduce post-harvest losses and enhance product marketability, linking agriculture to consumers and driving sustainable development (Singh, 2018). The growth of the agro based industries in India so also in the state of Karnataka depending mainly on the availability of raw materials, basic infrastructure, technological appliances human resources, man power and marketing. Agro-based industries playa vital role inoffering employment particularly in rural area which has reduced rural-urban migration thus promoting balanced development. (Chand & Srivastava, 2020). In urban areas agro-based industries diversify the economy by creatingemployment based on the skill of the employees their improved household income which has ledtobetter socio-economic standards and improved human life. Understanding the role of agro-based industries in employment and income generation is the key for economic development, especially in agricultural regions like Karnataka. These industries add value to raw products, create economic opportunities and support poverty reduction, food security and sustainable growth (Desai, 2017). Present study examines their impact on Karnataka's economy, highlights challenges and suggests strategies for inclusive development.

LITERATURE REVIEW

Agro-based industries depend primarily on agricultural raw materials for production. These industries include activities like processing, manufacturing and distributing agricultural products. According to Ray and Basu (2019) agro-based industries are classified into four main categories: food processing (transforming raw products into consumables), textiles (turning fibers into fabric), leather (utilizing hides for goods) and wood and paper (processing timber). Other sub-sectors like dairy, poultry and biofuels also contribute to rural and semi-urban economies, enhancing and fostering economic growth (Kumar & Singh, 2020).

Theoretical reviews on impact of agro-based industries on employment and income.

Keynes' multiplier effect theory (1936) states that investment in agro-industries boosts economic activities, creating employment across sectors linked to agriculture. Lewis' structural change theory (1954) suggests that agro-based industries absorb surplus labour reducing unemployment and increasing income. Hirschman's linkage theory (1958) highlights backward linkages that drive agricultural demand and forward linkages that process products creating more jobs. Schultz's human capital theory (1961) underscores skill development to enhance productivity. Porter's value chain theory (1985) emphasizes adding value to agricultural products, generating employment and income. Romer's endogenous growth theory (1990) note that innovation in agro- based industries fosters job creation and income growth.

Empirical reviews on the impact of agro-based industries on employment and income.

Studies haveshown the positive impact of agro-based industries on employment and income. In West Bengal, the expansion of tea and rice milling industries increased rural employment and reduced poverty (Roy & Banerjee, 2017). Similarly, agro-industries in Punjab's food processing units provided job opportunities for unskilled workers, boosting household incomes (Singh & Kaur, 2017). Other regions including Gujarat (Patel & Desai, 2017) and Andhra Pradesh (Rao & Reddy, 2018) experienced similar benefits, where agro-industries have significantly contributed to income diversification and rural development.

Empirical reviews on challenges and opportunities in agro-based industries.

Challenges in agro-based industries include supply chain inefficiencies lack of skilled labour and limited access to finance. In Gujarat, inconsistent raw material supply and inadequate storage posed issues, while modernizing supply chains presented growth opportunities (Patel & Desai, 2017). In Punjab, technology adoption and vocational training were suggested to overcome labour shortages (Singh & Kaur, 2018). Climate change, water scarcity and infrastructure deficits remain critical barriers though advancements in technology mechanization and public-private partnerships offer pathways for industrial growth across various regions.

METHODOLOGY

Data collection methods

Structured questionnaires were administered to 480 respondents across eight districts, with 60 participants from each district to collect the data on   employment, income level and the perceived socio-economic impact of agro-based industries on socio-economic conditions of the people in the area.

Hypotheses

- Agro-based industries significantly contribute to employment generation.
- Employees working in such industries are leading better life with improved socio-economic standards.

The present   study was conducted in eight districts of Karnataka, chosen for their diverse agro-based industries and significant agricultural activities. The selected districts are Belagavi, Bagalkot, Bangalore Rural, Tumakuru, Bidar, Bijapur, Mandya, and Mysore. These districts were selected to provide a comprehensive analysis of agro-based industries across different geographical and economic contexts.

Objectives

To assess the impact of agro-based industries on employment generation and income creation in selected districts of Karnataka.

Table 1: District-wise Industries and Employees in Karnataka during 2023

| Sl. No	Districts	Units				No of Employees working			
		Micro	Small	Medium	Total	Micro	Small	Medium	Total
1	Bagalkote	26357	374	17	26748	562327	4890	657	567874
2	Belagavi	81110	1185	81	82376	524977	33179	8600	566756
3	Bengaluru (Rural)	58564	1468	169	60201	562446	65632	30668	658746
4	Bidar	20973	329	29	21331	402469	5180	1283	408932
5	Mandya	23982	428	8	24418	183483	8839	295	192617
6	Mysuru	60175	1315	84	61574	472372	50927	8672	531971
7	Tumakuru	39027	827	48	39902	374167	17988	6054	398209
8	Vijayapura	29274	560	32	29866	248606	13528	799	262933

Source: https://des.karnataka.gov.in/english
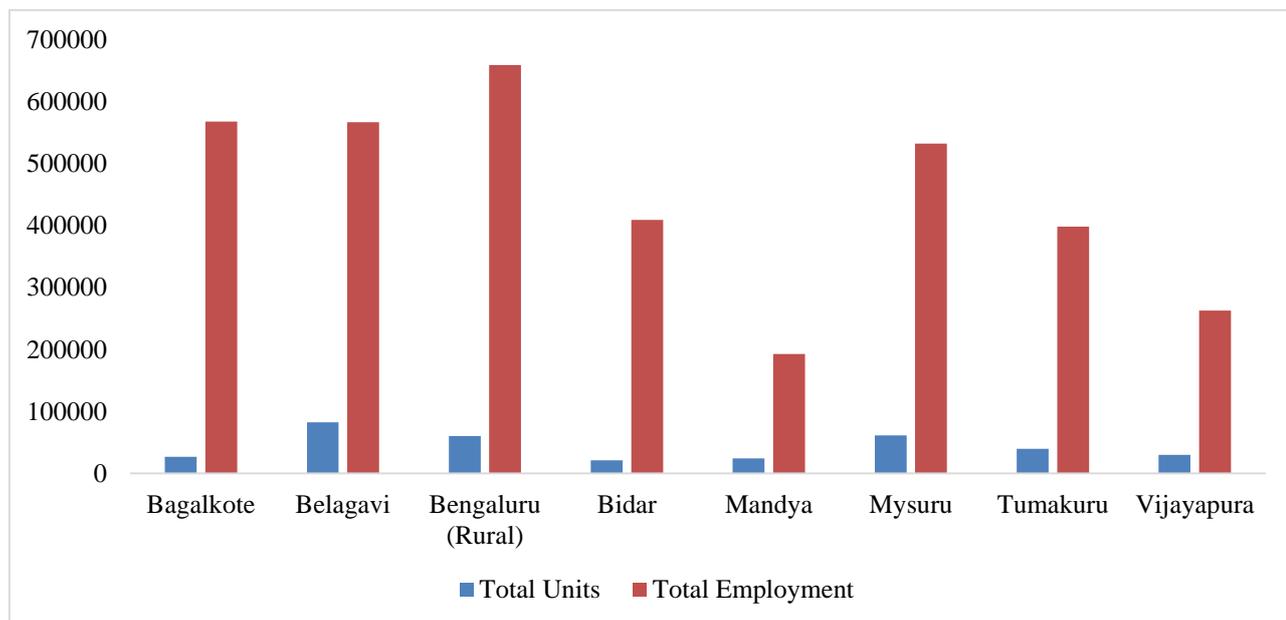
Figure 1: Total number of units and employment in the study area

These districts represent a mix of traditional and modern agro-based industries, making them ideal for examining the impact of such industries on local employment and income levels.

BASIC PROFILE OF THE RESPONDENTS

Table- 2 summarizes the demographic and social characteristics of the 480 respondents in the study area focusing on key variables:

Table 2: Basic profile of the Respondents

Variable	Categories	Number	Percentage
Age of the Respondents	18 - 25	86	17.9%
	26 - 35	84	17.5%
	36 - 45	123	25.6%
	46 - 55	72	15.0%
	56 - 65	86	17.9%
	Over 65	29	6.0%
	Total	**480**	**100.0%**
Gender of the Respondents	Male	225	46.9%
	Female	255	53.1%
	Total	**480**	**100.0%**
Education qualification of the Respondents	Primary Education	93	19.4%
	Secondary Education	87	18.1%
	Higher Secondary Education	100	20.8%
	Diploma	100	20.8%
	Bachelor	100	20.8%
	Total	**480**	**100.0%**
	Agro-based industry worker	355	74.0%
	Manager/Supervisor in agro-based industry	125	26.0%
	Total	**480**	**100.0%**
Type of family of the Respondents	Nuclear	227	47.3%
	Joint	253	52.7%
	Total	**480**	**100.0%**
Social category of the Respondents	GM	124	25.8%
	OBC	120	25.0%
	SC	124	25.8%
	ST	112	23.3%
	Total	**480**	**100.0%**

Source: Primary data

The age distribution shows that the largest group of respondents is aged 36-45 years, representing 25.6%, while the smallest group is those over 65 years, at 6%. Respondents aged 18-25 and 26-35 account for 17.9% and 17.5%, respectively, indicating a youthful workforce. In terms of gender, females make up 53.1% of the respondents, while males account for 46.9%. Regarding educational qualifications, 20.8% of respondents hold a Bachelor's degree or diploma, while 19.4% have primary education, and 18.1% have secondary education. As for occupation, 74.0% are workers, while 26.0% hold managerial or supervisory positions. In terms of family structure, 52.7% come from joint families, while 47.3% belong to nuclear families. Lastly, social class distribution reveals that General category (GM) and Scheduled Castes (SC) each make up 25.8%, Other Backward Classes (OBC) account for 25.0%, and Scheduled Tribes (ST) represent 23.3%.

IMPACT OF AGRO-BASED INDUSTRIES

Agro-based industries play a key role in socio-economic development by creating significant employment opportunitiesirrespective of locality. These industries rely on agricultural raw materials,generate employment and stimulate related economic activities and promote sustainable growth.

Historically, agro-industries have been vital in providing employment, such as manual labour technical and managerial roles. In developing regions like Karnataka, these absorb agricultural labour, reduce seasonal

unemployment and offer stable income, especially in rural areas where employment opportunities are meagre.

Table-3: Number of employee's employed per family in agro-based industries.

Number of employees	Number of family	Percentage
1	218	45.4%
2	262	54.6%
Total	**480**	**100**

Source: Primary data.

Table 3 shows that 45.4% of respondents have one family member employed in the agro-based industries, while 54.6% have two. This indicates that agro-based industries frequently employ multiple members of a household, underscoring their importance in supporting families.

Table 4: Status of employment in agro-based industry

Nature of Employment	Number of Employees	Percentage
Permanent	153	31.9%
Seasonal	156	32.55%
Temporary	171	35.6%
Total	**480**	**100.0**

Source: Primary data

Table- 4 shows that 31.9% of respondents hold permanent jobs, 32.5% are in seasonal roles, and 35.6% have temporary positions. Temporary and seasonal work dominate permanent employment andstill provides significant job stability in the agro-based industries.

To test the hypothesis that "Agro-based industries significantly contribute to employment generation in the selected districts," the test of proportion is applied to analyze whether the proportion of respondents who migrated for employment (84.2%) is significantly different from a hypothesized proportion of 50%.

Null Hypothesis (H_o): The proportion of individuals migrating for employment is equal to 50% (p = 0.50).
Alternative Hypothesis (H_1): The proportion of individuals migrating for employment is not equal to 50% (p $\neq$ 0.50).

- Proportion of employment migration, $\hat{p}$ = 84.2% = 0.842
- Sample size, n = 480
- Hypothesized proportion, p_0 = 50% = 0.50

To perform the test of proportion, the following formula for the Z-test statistic is used

$$z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}} = \frac{0.842 - 0.50}{\sqrt{\frac{0.50(1-0.50)}{480}}} = 15.0$$

To determine significance, the calculated Z-value is compared to the critical value from the standard normal distribution. For a two-tailed test at the 0.05 significance level, the critical Z-value is approximately ±1.96. Since the calculated Z-value (15.0) far exceeds the critical value (1.96), we reject the null hypothesis. This indicates that agro-based industries significantly contribute to employment generation in the selected districts.

INCOME GENERATION AND ECONOMIC IMPACT

Income generation and economic impact are vital for assessing the contributions of various sectors to regional economic health. Income generation refers to the ability of economic activities to create and distribute income among individuals and businesses, including wages, salaries, and profits. Effective income generation is crucial for improving living standards, reducing poverty, and fostering economic growth. The economic impact of income generation extends beyond immediate benefits, influencing consumption

patterns, investment levels and overall stability. Rising income levels often lead to increased consumer spending, stimulating demand for goods and services and driving further economic activity.

Industries that significantly contribute to income generation, such as agro-based, manufacturing, and technology sectors, create job opportunities and enhance local economies through their supply chains and ancillary services.

Evaluating the income generation and economic impact of specific sectors involves analyzing income amounts, distribution across demographics and broader economic effects on employment and investment. Understanding these dynamics allows policymakers to devise strategies that maximize economic benefits, address disparities and promote sustainable development.

In summary, the relationship between income generation and economic impact underscores the importance of various sectors in driving economic growth and improving financial well-being. A comprehensive analysis of these factors provides insights into how different industries contribute to economic development and supports informed decision-making for enhancing prosperity.

Table 5: Monthly income of the family from agro-base industry

Monthly income in Rs.	Number	Percentage
<13000	76	15.8%
13001 - 15000	139	29.0%
15001 - 17000	140	29.2%
17001 - 19000	27	5.6%
19001 - 21000	31	6.5%
21001 - 23000	38	7.9%
>23000	29	6.0%
Total	**480**	**100%**

Table 5 reveals the monthly income distribution among families in the agro-based industries. It shows that 15.8% earn less than Rs13,000/month indicating a lower-income segment. A significant 29.0% fall within the Rs. 13,001 to Rs. 15,000/month range, and 29.2% earn between Rs. 15,001 and Rs. 17,000/month representing the highest concentration of earners. Smaller percentages earn in higher brackets: 5.6% between Rs. 17,001 and Rs. 19,000/month 6.5% between Rs. 19,001 and Rs. 21,000/month and 7.9% between Rs. 21,001 and Rs. 23,000/month Only 6% of families earn above Rs. 23,000/month. This distribution highlights that, most of the families earn within middle-income ranges, with fewer achieving higher income.

Table 6: Descriptive statistics of monthly income of the family

Particulars	Number	Min.	Max.	Mean	Std. Dev.
Monthly income of the family from agro-based industry	480	12000	24900	16227.50	3401.503
Monthly income of the family from other sources	480	1000	6990	3907.40	1746.312
Total monthly income	**480**	**13020**	**31880**	**20134.90**	**3838.436**

Table-6 summarizes the descriptive statistics for monthly income, distinguishing between earnings from agro-based industries and other sources. Families earning from agro-based industries report income ranging from Rs12,000 to Rs. 24,900, with a mean of Rs. 16,227.50 and a standard deviation of Rs. 3,401.50, indicating substantial variation. In contrast, income from other sources ranges from Rs. 1,000 to Rs. 6,990,

with a mean of Rs. 3,907.40 and a standard deviation of Rs. 1,746.31, suggesting lower and less variable earnings. Overall monthly income, combining both sources, ranges from Rs. 13,020 to Rs. 31,880, with an average of Rs. 20,134.90 and a standard deviation of Rs. 3,838.44. This overall income distribution reflects greater economic stability and variability within the studied population.

Table 7: Descriptive statistics of proportion of monthly income from agro-base industries to total income of the family

	Number	Mean	Std. Deviation	Std. Error Mean
Proportion of income	480	80.7505	7.76360	.35436

Table 7 presents descriptive statistics for the proportion of monthly income derived from agro-based industries relative to total family income. The sample of 480 families has a mean proportion of income from agro-based industries at 80.75%, with a standard deviation of 7.76%. The standard error of the mean is 0.35, indicating a precise estimate. This high mean suggests that a substantial portion of total family income in agro-based industries areas comes from these industries.

Table 8: One-Sample test of proportion of monthly income from agro-based industry to total income of the family

	Test Value = 0.5					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Proportion of income	226.467	479	.000	80.25051	80.0542	81.4468

Table 8 presents the results of a one-sample test to determine whether this average proportion significantly differs from a test value of 50%. The test yields a t-value of 226.47 with 479 degrees of freedom and a significance level (p-value) of 0.000. The mean difference between the observed proportion and the test value is 80.25, with a 95% confidence interval of 80.05 to 81.45. This indicates that, on average, a substantial majority of family income in the studied areas comes from agro-based industries.

The one-sample t-test compares this observed mean proportion against the hypothesized value of 50%. The test shows that the observed mean is significantly higher than the hypothesized proportion, with a highly significant p-value ($p < 0.001$). This result confirms that agro-based industries contribute a large share of total income in these areas. The high t-value and significant p-value suggest that this difference is not due to random chance but indicates a true effect. Based on this analysis, the hypothesis that "Income levels in areas with agro-based industries are higher compared to areas without such industries" is supported. The data shows that families in these areas derive a significantly larger proportion of their total income from agro-based industries, highlighting their substantial impact on increasing local income levels.

CONCLUSION

The present study underscores the significant role of agro-based industries in employment generation and income creation across the selected districts of Karnataka. By analyzing data from 480 respondents in eight districts, the study reveals that agro-based industries serve as a critical driver of rural economic development by absorbing a substantial workforce and contributing over 80% of household income in the surveyed regions. The findings confirm that these industries provide employment across permanent, seasonal, and temporary categories, enabling economic participation of multiple household members and improving socio-economic conditions.The analysis further highlights that families engaged in agro-based industries experience higher income levels compared to those without such opportunities, as demonstrated by statistical tests. This underscores the industries' potential to stabilize livelihoods, reduce unemployment, and mitigate rural-to-urban migration, which are key challenges in agrarian economies. However, the study also

identifies challenges such as labour shortages, seasonal employment patterns, and inadequate infrastructure that hinder the optimal growth and sustainability of the sector.

To address these limitations and maximize the socio-economic benefits, the findings emphasize the importance of strategic interventions that focus on infrastructure enhancement, workforce skill development, and financial incentives to promote innovation and technological advancements. Moreover, strengthening market access and ensuring the adoption of sustainable practices will be essential for long-term viability and inclusive growth.

In conclusion, agro-based industries play a transformative role in enhancing employment opportunities and raising income levels, particularly in rural and semi-urban areas. By addressing the identified challenges through targeted policy measures and fostering a supportive environment, these industries can continue to drive sustainable economic growth and improve the livelihoods of rural households in Karnataka. Further research exploring the impact of technological innovations, market diversification, and regional comparisons would provide deeper insights for optimizing the sector's contribution to economic development.

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