
**IMPACT OF AGRO-BASED INDUSTRIES ON THE ECONOMY OF ITS
EMPLOYEES: A CASE STUDY IN SELECTED DISTRICTS IN THE STATE OF
KARNATAKA**

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ABSTRACT

This study investigates the economic impact of agro-based industries in Karnataka, focusing on their effects on land ownership, cultivable land, land value and income levels. Findings of the present study has significantly emphasised positive changes in the economic variables since their engagement with agro-based industries. The statistical analysis of the data obtained during the study has revealed an increase in the mean number of acres owned, cultivable land, a substantial rise in land value and a notable boost in their net annual income. Statistical evaluation of the data generated during the studies has also confirmed the transformative impact of agro-based industries on local economy. The results of the present studies act as base line data which contributes to the understanding of how agro-based industries drive regional economic development and provides insights into their role in enhancing household income and land value. It is suggested that, the further research on the impact of agro-based industries on the economy of its employees in the present study area can be taken up by considering the variables such as longitudinal impact, sector specific dynamics and the role of technological advances in agro-based industries

Keywords: *Agro-based industries, economic impact, employment, income generation, land value productivity*

INTRODUCTION

Agro-based industries rely on agricultural raw materials for processing and manufacturing are critical drivers of economic activity particularly in agrarian states like Karnataka. These industries encompass a broad range of sectors including food processing, sugar production,

dairy farming and agrochemicals. All these play a pivotal role in transforming raw agricultural outputs into value added products. Through, various stages of refinement Agro-based industries significantly contribute to economic growth and development (Rao & Naik, 2020). Karnataka located in Deccan plateau of southern India stands as a key centre for agro-based industries, leveraging its agricultural diversity to drive economic development. The state's leadership in the production of sugarcane, coffee, spices and horticultural products has positioned it as one of the India's leading agro-based industrial hubs. The extensive network of sugar mills and coffee processing units in Karnataka generates substantial economic activity, particularly in rural regions, further solidifying its role in promoting regional development (Kumar & Rao, 2020). Additionally, the expansion of food processing industries that manage fruits, vegetables and grains is essential for both food security and economic stability in Karnataka (Sharma, 2019). The transformation of these agricultural outputs into processed goods not only enhances productivity but also adds considerable value to the state's Gross Domestic Product (GDP). Agro-based industries are critical to both local and national economies, contributing to employment generation, income enhancement and overall economic stability. These industries stimulate economic growth by converting agricultural raw materials into value added products. Furthermore, their indirect contributions such as improving market access, enhancing rural infrastructure and fostering investment are crucial for promoting balanced regional development. The establishment of agro processing units often serve as a catalyst for regional economic integration by enhancing transportation networks and attracting investment, thereby promoting equitable growth across different regions (Rao & Naik, 2020).

This research article presents an in depth analysis of how agro-based industries contribute to Karnataka's economic landscape driving both regional and national economic expansion. Cheng & Wu, (2022) in their studies examined the direct and indirect impact of agro-based industries on job creation, income distribution and poverty alleviation and were of the opinion that these industries have improved the livelihoods of employees in semi urban and urban areas, the same is true to the present investigation also. Thus, this article not only advances the understanding of the economic contributions of agro-based industries but also provides critical data for shaping future policy. By elucidating their role in regional economic

growth, livelihood improvement and value chain enhancement the research underscores the potential of these industries to drive long term inclusive development in Karnataka.

IMPORTANCE OF AGRO-BASED INDUSTRIES IN THE ECONOMY OF KARNATAKA

Agro-based industries form the backbone of Karnataka's economy driving employment, income generation and regional development. These industries not only support rural livelihoods but also significantly contribute to the state's Gross Domestic product by adding value to agricultural products. Their economic influence extends to ancillary sectors like transportation, packaging and retail, amplifying their impact across the economy. The Ministry of Agriculture and Farmers Welfare (2021) has emphasised the vital role of agro-based industries in generating both direct and indirect employment especially in rural areas. In addition to employment, these industries boost farmer's incomes by increasing returns on agricultural produce with sectors like sugar ensuring stable markets and fair pricing mechanisms. Agro-based industries also catalyze regional development by fostering infrastructure growth including roads, storage facilities and market linkages which drive further economic integration. Despite their importance, quantitative assessments of their economic contributions are limited, representing a significant research gap.

The economic evaluation of agro-based industries in Karnataka requires a multi dimensional approach analyzing their direct impact on job creation, income generation and value addition alongside their indirect effects on related sectors. Additionally, these industries stimulate infrastructure development critical for regional growth. Identifying challenges such as supply chain inefficiencies and commodity price volatility is essential for understanding the sector's constraints and growth potential (Kumar & Sharma, 2019). A comprehensive analysis of impact of agro-based industries on economy will provide key insights into their role in the development of Karnataka and inform policy interventions to enhance their contribution.

Table 1: Number of Agro based Industries and Employment in the Study Area (2023)

Sl. No	Districts	Units				Employment			
		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>

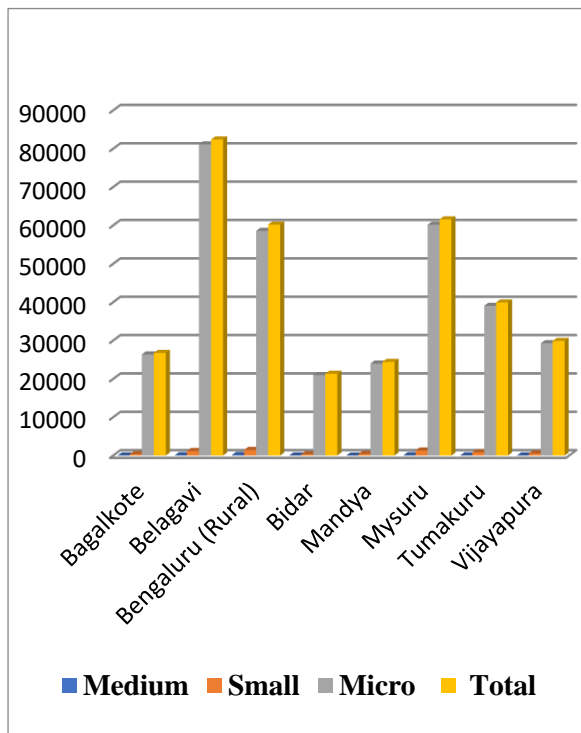


Figure 1: Different Types of Agro based industries in the study area (2023)

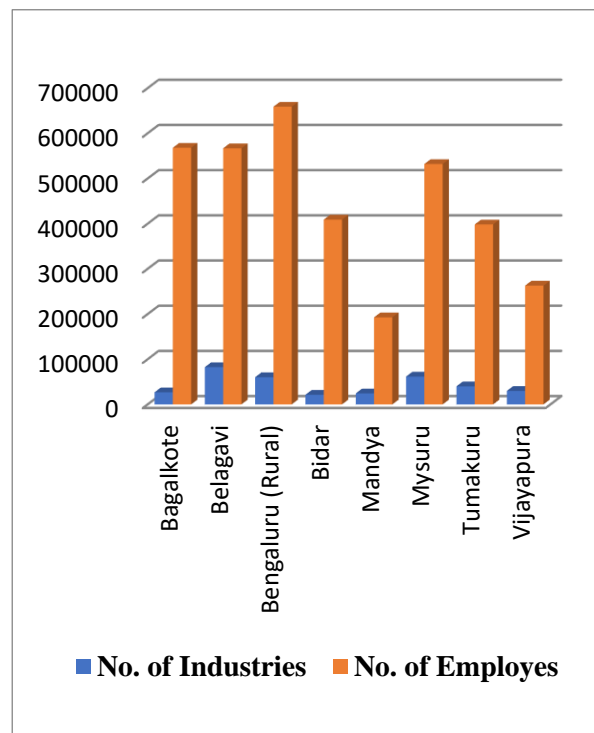


Figure-2: Agro based Industries and Employment in the Study Area

REVIEW ON INCOME CREATION

Patel and Kumar (2020) demonstrated that agro-based industries enhance rural household income by providing employment and increasing the value to the agricultural products and improving economic conditions. Singh and Sharma (2019) emphasized the crucial role of agro processing industries in boosting household income through value addition and expanding market opportunities. Kumar and Rao (2021) established a positive link between agro industrial growth and regional income levels showing that increased agricultural industrial activity leads to higher local income. Rao and Naik (2020) revealed income disparities in Karnataka's agro industries noting uneven distribution of benefits across regions. Miller and Thompson (2021) confirmed in South-East Asia that agro industries significantly boost rural income by producing higher value goods and enhancing market access. Kumar and Jain (2020) highlighted the pivotal role of agro industries in rural employment generation particularly in processing and manufacturing and improving livelihoods. Agarwal and Singh (2018) discussed the importance of agro industries in employment creation across South Asia especially in agriculture dominated regions and their stimulation of related sectors. Reddy and Prasad (2019) found that the employment impact of agro industries varies across Indian states influenced by industrialization and investment levels. Miller and Thompson (2021) demonstrated globally that, while agro industries enhance employment opportunities the extent depends on regional factors and practices. Cheng and Wu (2022) concluded that, agro industries in rural China generate diverse employment opportunities stabilizing the economy and reducing migration rural to urban areas.

REVIEW ON REGIONAL DEVELOPMENT

Srinivasan and Jain (2021) demonstrated that agro-based industries in Tamil Nadu substantially enhance infrastructure, stimulate local economies and drive regional growth. Similarly, Reddy and Prasad (2019) found that these industries have improved economic conditions and foster infrastructure development in Andhra Pradesh. Agarwal and Singh (2018) were of the opinion that agro-based industries across South Asia promote regional

growth by creating jobs, enhancing infrastructure in boosting local economy. Kumar and Sharma (2020) reported that, these industries attract local investments and stimulate economic growth in the Indian subcontinent. Smith and Patel (2021) focused on Latin America and revealed that, agro-industries contribute to employment and local economic growth. Jansen and Hofstede (2019) emphasized the role of agro-industries in job creation and infrastructure improvement in Sub-Saharan Africa. Wilson and Smith (2020) showed through a meta-analysis that agro-industries significantly advance rural economic development in South east Asia. Johnson and Lee (2021) compared agro-based industries in developed regions, finding that while they are crucial for job creation and income growth, their impact varies between developed and developing countries.

METHODOLOGY

Objectives of the study

The primary aim of this study was to conduct a comprehensive evaluation of the economic impact of agro-based industries in Karnataka. To achieve this overarching goal, the study was structured around the following specific objectives

- 1] To evaluate the economic impacts of agro-based industries on agricultural labourers
- 2] To analyze the contribution of agro-based Industries on employment, income generation, and also regional development

The objectives of the study seek to quantify and assess the overall economic contributions of agro-based industries within the study area. The evaluation will encompass several dimensions, including the direct economic impact on land holding, income generation, savings and household assets.

Present study was intended to examine agro-based industries across the selected districts in the state of Karnataka. The districts selected for the present studies were Belagavi (Extensive sugarcane processing), Bagalkot (Production and processing of grapes and sugarcane), Bangalore Rural (Dairy farming, poultry, and floriculture), Tumkuru (Coconut-based industries, oil extraction and coir production), Bidar (Horticulture and food processing industries), Bijapur (Grape processing and other fruit-related agro-industries), Mandya

(Sugarcane cultivation and associated industries) and Mysore (Silk production, and sandalwood industries). This selection aims to provide a holistic view of the impact of agro-based industries within diverse geographical and economic settings throughout the state. These districts collectively represent a blend of traditional and contemporary agro-based industries, providing an ideal context for evaluating their effects on local employment and income levels. Data was gathered using structured questionnaires administered to a sample of 480 respondents, with 60 participants from each of the eight districts. The questionnaires were designed to collect detailed information on employment, income levels and the perceived socio-economic impact of agro-based industries.

Result and Discussion

Table 2 presents the profile of the respondents, while Table-3 provides descriptive statistics on the impact of agro-based industries on their employees. Table-4 outlines the correlations related to the impact of agro-based industries and Table-5 offers a statistical evaluation of the data.

Basic profile of the respondents

Table-2 provides a basic demographic profile of the respondents of the present study offering insights into their age, gender, educational qualifications and roles within agro-based industries, family structure and social class affiliations. This data is essential for understanding the diverse backgrounds of respondents and the context in which they interact with agro-based industries.

Age: The distribution of respondents by age shows a varied range with the majority falling within the 36-45 age groups (25.6%). The age groups 18-25 and 56-65 each constitute 17.9% of the sample, while those aged 46-55 represent 15.0%. Respondents over 65 years old are the smallest group comprising 6.0%.

Gender: The sample is relatively balanced in terms of gender with female's slightly out numbering males (53.1% female vs. 46.9% male).

Table 2: Basic profile of the Respondents

Variable	Categories	Number	Percentage
Age	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
Gender	Male	225	46.9%
	Female	255	53.1%
	Total	480	100.0%
Education qualification	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	Nuclear	227	47.3%
	Joint	253	52.7%
	Total	480	100.0%
Social classes	GM	124	25.8%
	OBC	120	25.0%
	SC	124	25.8%
	ST	112	23.3%
	Total	480	100.0%

Source: Primary data

Educational qualification: Respondents have a range of educational backgrounds. Primary Education is held by 19.4%, Secondary Education by 18.1%, Higher Secondary Education by 20.8% and both Diploma and Bachelor qualifications are also at 20.8% each.

Role in agro-based industry: A majority of the respondents are direct workers in agro-based industries (74.0%), while a smaller proportion holds managerial or supervisory positions (26.0%).

Type of family: The majority of respondents come from joint families (52.7%) with nuclear families comprising 47.3%.

Social classes: The distribution across social classes shows that General Category (GM) and Scheduled Castes (SC) each make up 25.8% of the sample, followed by Other Backward Classes (OBC) at 25.0% and Scheduled Tribes (ST) at 23.3%.

Table 3: Descriptive statistics and impact on Agro-based Industries

Sl. No	Particulars	Mean	Number	Std. Dev.	Std. Error Mean
1	Number of acres owned before	2.97	480	.425	.019
	Number of acres owned present	4.91	480	.321	.015
2	Number of acres cultivable before	2.01	480	.826	.038
	Number of acres cultivable present	4.08	480	.578	.026
3	Total value of land before	650589.64	480	83229.874	3798.907
	Total value of land present	992645.11	480	141417.655	6454.803
4	Net annual income before	27123.74	480	4222.970	192.751
	Net annual income present	42629.60	480	7191.729	328.256

Land ownership: The mean number of acres owned increased from 2.97 before to 4.91 after involvement in agro-based industries indicating a significant increase in land ownership (Mean difference = 1.94 acres). The standard deviation decreased from 0.425 to 0.321, reflecting a more consistent change in land ownership among respondents.

Cultivable land: The mean number of cultivable acres rose from 2.01 to 4.08, showing a considerable increase (Mean difference = 2.07 acres). The standard deviation for cultivable land also reduced from 0.826 to 0.578, suggesting a more uniform expansion in cultivable land across the sample.

Land value: The total value of land increased from 650,589.64 to 992,645.11, with a significant rise in mean value (Mean difference = 342,055.47). The increase in standard deviation from 83,229.874 to 141,417.655 indicates greater variability in land value among respondents after engaging with agro-based industries.

Net annual income: Net annual income saw a substantial rise from 27,123.74 to 42,629.60, with a mean difference of 15,505.86. The standard deviation increased from 4,222.970 to 7,191.729 indicating a higher spread in income changes among respondents.

Land ownership: A moderate positive correlation ($r = .210, p < .001$) between the number of acres owned before and after indicates a moderate association, suggesting that changes in land ownership are somewhat linked over time

Cultivable land: A low positive correlation ($r = .112, p = .014$) between the cultivable land before and after shows a weaker, yet significant association, suggesting that while there is some link, the change in cultivable land is less consistent.

Land value: The correlation between the total value of land before and after is very low and not significant ($r = -.037, p = .414$), indicating no substantial relationship in land value changes over time.

Table 4: Paired samples correlations and impact on Agro-based Industries

Sl. No	Particulars	Number	Correlation	Sig.
1	Number of acres owned before & Number of acres owned present	480	.210	.000
2	Number of acres cultivable before & Number of acres cultivable present	480	.112	.014
3	Total value of land before & Total value of land present	480	-.037	.414
4	Net annual income before & Net annual income present	480	.152	.001

Net annual income: A moderate positive correlation ($r = .152, p < .001$) between net annual income before and after reflects a modest association, indicating that increases in income are somewhat related over the study period.

Land ownership: The paired sample t-test shows a significant decrease in the number of acres owned (Mean difference = -1.946, $t = -89.54, p < .001$), indicating a statistically significant reduction in land ownership after engaging with agro-based industries.

Cultivable land: There is a significant decrease in the number of cultivable acres (Mean difference = -2.067, $t = -47.47, p < .001$), highlighting a substantial reduction in the amount of land available for cultivation.

Land value: The paired sample t-test reveals a significant decrease in the total value of land (Mean difference = -342,055.47, $t = -44.94$, $p < .001$), suggesting a marked reduction in land value over time.

Net annual income: The test shows a significant decrease in net annual income (Mean difference = -15,505.86, $t = -43.74$, $p < .001$), indicating a notable reduction in income levels associated with agro-based industry participation.

Table 5: Statistical evaluation of paired samples and their impact on Agro-based Industries

Sl. No	Particulars	Paired Differences			t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean			
1	Number of acres owned before – Number of acres owned n present	-1.946	.476	.022	-89.54	479	.000
2	Number of acres n cultivable before – Number of acres cultivable present	-2.067	.954	.044	-47.47	479	.000
3	Total value of land before – Total value of land present	-342055.47	166753.466	7611.220	-44.94	479	.000
4	Net annual income before – Net annual income present	-15505.860	7766.942	354.511	-43.74	479	.000

Land ownership: The paired sample t-test shows a significant decrease in the number of acres owned (Mean difference = -1.946, $t = -89.54$, $p < .001$), indicating a statistically significant reduction in land ownership after engaging with agro-based industries.

Cultivable land: There is a significant decrease in the number of cultivable acres (Mean difference = -2.067, $t = -47.47$, $p < .001$), highlighting a substantial reduction in the amount of land available for cultivation.

Land value: The paired sample t-test reveals a significant decrease in the total value of land (Mean difference = -342,055.47, $t = -44.94$, $p < .001$), suggesting a marked reduction in land value over time.

Net annual income: The test shows a significant decrease in net annual income (Mean difference = -15,505.86, $t = -43.74$, $p < .001$), indicating a notable reduction in income levels associated with agro-based industry participation.

Strategic initiatives: Results of the study reveals that Agro-based industrial clusters, smart agricultural technologies, Workforce Skill Enhancement, Public-Private Partnerships, Export-Oriented Growth, Inclusive Growth sustained growth and effectiveness of Agro-based industries in the study area.

To ensure the sustained growth and effectiveness of agro-based industries, the following strategic initiatives are recommended.

- 1) *Agro-Industrial Clusters:* Establishing clusters can enhance collaboration among stakeholders, improve economies of scale, and drive innovation, leading to increased productivity and competitiveness (Chakraborty & Das, 2021).
- 2) *Smart Agriculture Technologies:* Adopting technologies such as precision farming, IoT systems, and automated machinery can optimize resource use, boost yields, and enhance sustainability (Gupta & Kumar, 2023).
- 3) *Workforce Skill Enhancement:* Investing in training programs focused on modern techniques and technology can improve operational efficiency and productivity (Sinha & Verma, 2022).
- 4) *Public-Private Partnerships:* Strengthening partnerships can facilitate technology transfer, market expansion, and infrastructure development, driving industry growth (Sharma & Patil, 2021).
- 5) *Export-Oriented Growth:* Developing strategies to boost export potential through compliance with international standards and marketing support can open new markets and increase revenues (Singh & Sharma, 2024).
- 6) *Inclusive Growth:* Ensuring equitable distribution of benefits to all societal segments, including smallholder farmers and marginalized communities, is crucial for inclusive development (Rao & Gupta, 2023).

CONCLUSION

The study presents a thorough assessment of the economic impact of agro-based industries in selected districts of Karnataka with a focus on their effects on land ownership, cultivable

land, land value, and income levels. The analysis revealed substantial positive changes in these metrics over the study period, indicating the significant transformative influence of agro-based industries on local economies. Statistical tests including paired samples tests, confirmed that these changes were significant with notable t-values and p-values underscoring the robustness of the findings related to land ownership, cultivable land, land value and income levels.

This study provides valuable empirical evidence demonstrating the economic impact of agro-based industries on key indicators such as land ownership, land value, and income. By documenting these effects, the research enhances the understanding of how agro-based industries drive regional economic growth and development. The study offers insights into the varying effects of agro-based industries across selected districts in Karnataka. This regional perspective contributes to the existing literature by helping to develop targeted policies and strategies that address specific regional needs and opportunities.

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