PREFACE TO THE EDITION

It is with great pleasure that we present the forthcoming issue of the **Journal of Economics Insights and Research (JEIR)**, which brings together a diverse range of scholarly contributions examining critical intersections of environment, industry, migration, and rural transformation within the Indian economy. The articles featured in this issue reflect both pressing contemporary challenges and long-term structural shifts, providing empirical insights and conceptual reflectionsthat are invaluable to researchers, policymakers, and practitioners alike.

The issue opens with a study on the Conservation of Kerala Mangroves, which highlights the socio-economic and ecological importance of mangrove ecosystems. By foregrounding the value of these fragile landscapes, the article underscores the need for comprehensive valuation frameworks that inform sustainable policy and conservation strategies.

The subsequent article, Indian Construction Sector: Post COVID Scenario, addresses one of the most affected industries of the pandemic era. Through a thorough review of the challenges and opportunities in the post-COVID landscape, it sheds light on resilience, digital innovation, and the sector's potential to contribute to sustainable growth.

A closer look at labor dynamics is offered in the article on Internal Labour Migration and Economic Sustainability in India. Focusing on Kerala's labor market, this paper situates migrant workers within the broader framework of economic stability, drawing attention to their crucial role in bridging labor market gaps and sustaining industrial productivity.

Industrial development is further examined in the article on the Status of the Paint Industry in India, which analyzes trends, competitive dynamics, and contributions to the national economy. By addressing issues of sustainability and innovation, the study situates the paint sector as a vital player in India's industrial transformation.

Migration and rural development remain central themes in the next contribution, Return Migration and Remittance Use in Reshaping Kerala's Rural Economy. Drawing from longitudinal survey data, the study traces how remittance flows and return migration patterns have redefined rural livelihoods, asset ownership, and agricultural structures, while also raising questions about sustainability in the long run.

The final article, Rural Economic Transformation in South Karnataka, provides a regional lens on agricultural diversification, income distribution, and evolving livelihood patterns over more than a decade. Employing robust econometric tools, the research not only documents rising inequality but also proposes pathways for inclusive and sustainable rural development.Taken together, these articles present a nuanced portrait of India's evolving economic landscape—one that is simultaneously shaped by global disruptions, local ecological imperatives, sectoral transformations, and the lived realities of migration and rural livelihoods. As editors, we hope this issue stimulates further debate, inspires policy dialogue, and supports the advancement of knowledge in economic research and practice.We extend our gratitude to the authors for their valuable contributions, the reviewers for their insightful feedback, and our readers for their continued engagement with JEIR.

Dr. Sinitha Xavier
Chief Editor

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Conservation of Kerala Mangroves: Economic and Environmental Relations

Sindhu P.J

Assistant Professor, Department of Economics, St. Xavier's College for Women, Aluva, Kerala, India

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Abstract

Purpose: Research is the systematic investigation into and study of materials and sources to establish facts and reach new conclusions. This study aims to analyze mangrove forests' socio-economic and ecological systems and their linkages for their conservation and identify important mangrove ecosystem values.

Methodology: This investigation aims to utilize a Descriptive Research design, relying on secondary information sources. The secondary data is obtained from books, journals, newspapers, articles, and government websites.

Findings: Extreme scientific information is lacking regarding the utilization of mangroves as a natural nursery for migrating fishes and other species. An absolutely necessary research.It's clear that native inhabitants have relied on mangrove ecosystems for a number of products made from animals and plants, and that this practice continues today. Preserving and managing the remaining mangrove stretches in the manner that guarantees their ability to produce, is essential if these activities are to continue. Further research might investigate the usefulness and significance of managing numerous purposes as a means to boost efficiency.There is a dearth of research that provides foundational understanding of mangrove settlements, including their demographics, economic status, and how they use resources. This makes it harder to put a strategy in place to protect this ecological system effectively. Because of this, thorough investigation into mangrove communities is required, as these people rely on the mangrove for their survival.The valuation of goods and services offered by this ecological system is necessary for greater preservation of mangroves because of the numerous advantages they offer. Conserving them to the fullest extent possible is important because of the many ways in which they contribute to society, including economically, ecologically, scientifically, and culturally both for the current and subsequent generations. Therefore, in order to inform public discussions and incorporate these values into policy and decision-making processes, further data regarding the values of mangroves and the interplay with one another is required. In order to comprehend its significance, it is necessary to compare the expenses and advantages of preservation of mangroves with those associated with other potential uses. It is possible to conduct research into the monetary worth of mangrove advantages and the expenses associated with replacing the ecological services provided by forests of mangroves.

Keywords:- conservation of mangroves, natural nursery, ecosystem, economic valuation.

I. INTRODUCTION

Mangroves are bushes or trees that thrive in salty or brackish water along the coast. The word is also applied to describe coastline habitat in tropical regions that consists of these kinds of plants. Convergent evolution in multiple plant families is responsible for the taxonomic diversity of mangroves (Giri et al., 2011). Mangroves are halophytes, or trees that can tolerate high levels of salt, that have evolved to withstand the extreme conditions found along the coast. To withstand exposure to saltwater and the effects of waves, they have an intricate salinity filtering mechanism and an equally intricate root mechanism. Even though they've accustomed to life in waterlogged mud, where oxygen is scarce, they'll have the best chance of success in the upper intertidal zone (Flowers & Colmer, 2015). There is interest in mangrove restoration for several reasons. Mangroves

support sustainable coastal and marine ecosystems. They protect nearby areas from tsunamis and extreme weather events. Mangrove forests are also effective at carbon sequestration and storage and mitigate climate change.

Mangrove ecosystems are thought to assist local ecosystems in adapting to and surviving climate change-related changes, such as increased frequency and intensity of extreme weather events and greater levels of seawater (Friess et al., 2019).

The meeting of rivers, backwaters, and the sea forms an ecosystem where these distinct species of plants thrive. Their abundant underlying and aerial rhizomorphs make them an excellent geotextile for soil bonding. The plants are able to resist the waves because of the extremely strong anchoring provided by this. Protecting mangrove forests is critical because they are home to a wide variety of plant and animal species, play an important role in maintaining coastal stability and financial stability, and are particularly vulnerable in light of the dire predictions of future climate change and increases in sea levels (Barbier, 2012).

II. REVIEW OF LITERATURE

In the event of severe weather, such as a hurricane, mangroves absorb the impacts of storm wave action and prevent erosion, thus protecting nearby populated areas. They play an essential role in the ecosystem as well. Binding and building soils are assisted by their thick roots. All around the globe, mangroves play an important role in coastline populations' well-being, food security, and defense. From 2004 to 2022, the words "conservation of mangrove's," "natural nursery," "ecosystem," and "economic valuation" are employed to describe the impacts of mangroves on these two fronts.

Table 1**:** This table reviews the various works of literature on a Conservation of Kerala Mangroves: Economic and Environmental Relations

Sl. No.	Area	Contribution	Authors
1.	Mangroves of Kerala	The study reports 15 true mangrove and 49 mangrove associate species from Kerala coast. Developmental and anthropogenic activities, grazing and widespread prawn farming are the major threats to Kerala mangroves.	C. Anupama & M. Sivadasan
2.	Mangroves of Kerala	This paper observed that the mangroves of mangroves of Kerala were degraded and grew in isolated patches.	A. S Khan, A Ramachandran, N. Usha, I. A Aram & V. Selvam
3.	Ecological linkages of mangrove	This study focused on identifying mangroves and their associated species in the Kannur district of Kerala, along with their monetary and biological connections. Mangroves offer numerous ecological, environmental, and socioeconomic advantages to humanity. The mangroves in the region face unparalleled devastation due to economic exploiting of resources, land reclaiming for aquaculture, farming, and construction of dwellings.	M. Vaiga & S. Joseph
4.	Mangrove forest	This investigation analyzes the present condition of mangrove vegetation throughout the Kerala coastline, the factors contributing to the decline of mangroves, conserving strategies implemented, and the prospective outlook. Scientific data regarding the mangrove regions in numerous districts of this southern Indian state remains insufficient.	S. Sreelekshmi, B. K Veettil, S. B Nandan & M. Harikrishnan
5.	Carbon stock and mangrove ecosystem	With their high rates of carbon storage and sequestration and their ability to become significant sources of greenhouse gases when disturbed by land-use change, mangrove ecosystems are of great significance for climatic shifts adapting and minimizing strategies. This research shows that gaining insight into the amount of carbon stocks in Keralan mangroves, along with other ecosystem services they provide, emphasizes their importance in developing preservation, rehabilitation, and prevention plans for the country.	S Sreelekshmi, M Harikrishnan, S. B Nandan, V. S Kaimal & N. R Hershey

Source: Compiled by the author

Many social, economic, and environmentally beneficial benefits accrue to humanity as a result of mangroves. Around the world, mangrove ecosystems, which are rich in biodiversity, are rapidly disappearing. Despite an estimated size of around 1,670 hectares, the current size of unspoiled mangroves in Kerala is only 150 hectares, spread out mostly among the districts of Ernakulum, Kannur, and Kozhikode. The plant life in Kerala is now considered vulnerable due to its severely decreased extent (Muraleedharan et al., 2009).

III. RESEARCH GAP

Many scholars and government officials have conducted the studies about mangroves of Kerala, mangrove forest, ecological linkages of mangrove, carbon stock and mangrove ecosystem. However, none of the studies have looked into the effects of the mangrove ecosystem on the environment or the economy.

IV. RESEARCH AGENDA

- How do mangroves contribute to the environment?
- To what extent does the mangrove ecosystem contribute to the economy?
- How does the mangrove ecosystem function economically and ecologically?

V. OBJECTIVES

- To learn about mangroves' role in the environment.
- To know how much money is involved in mangrove ecosystems.
- To understand environmental and monetary connections to the mangrove ecology.

VI. STUDY AREA AND METHODOLOGY

Kerala possessed dense mangrove vegetation, especially around the coast. One estimate indicates that Kerala once sustained approximately 700 km² of mangroves throughout its coastline. The expanse of mangrove habitat has diminished considerably. The Kerala Forest Department estimates that mangrove coverage spans approx 17 km² across the coastlines of 10 districts in fragmented portions.

A descriptive approach, which relies on secondary sources of information, was employed in this investigation. Books, newspapers, magazines, articles, and official government websites are examples of publications from which secondary data is culled. We found this information by searching for "conservation of mangrove's," "natural nursery," "ecosystem, and economic valuation" on Sci-Hub and Google Scholar. The required materials were located through online searches and subsequently examined by hand.

VII. RESULTS OF THE STUDY

7.1. Mangroves and Their Role in Ecosystems

7.1.1. Shoreline Stabilisation

The growth of mangroves slows or stops the coast from being eroded. This is accomplished by means of sediment trapping, stabilizing the soil through plant roots and deposition of vegetal substance, while sediments are trapped and erosional forces like wind and waves are minimized. Cutting down mangroves increases the risk of coastal flooding and soil loss (Dale et al., 2014).

7.1.2. Groundwater Recharge

When surface water rushes into the underground water flow system, it is known as groundwater recharge. After flowing out of the mangroves and into an aquifer, the water has two possible destinations: either the shallow groundwater system, which supplies water to nearby areas and keeps the water table stable, or the deep groundwater system, that supplies water for the foreseeable future. Industries as well as neighbourhoods that use water from moderate or deep wells will find this useful (Dale et al., 2014).

7.1.3. Groundwater Discharge

The Flow from underground aquifers into aboveground bodies of water (like springs) is known as groundwater flow. The groundwater discharge functions of mangroves are usually average or unclear (Rönnbäck, 1999).

7.1.4. Flood and Flow Control

When large quantities of water enter a mangrove, they can be preserved or held back on their way downhill, a process known as flood and flow control (Rönnbäck, 1999). This can happen during periods with extensive rainfall or heavy flow rates of rivers.

7.1.5. Sediment and Nutrient Retention

There is a general trend for the physical characteristics of mangroves, such as their proportions, plant life, and the level of water, to reduce the rate of water flow. As a result, sediments can be more easily accumulated. Due to the binding nature of toxicants and nutrients to sediment particles, their effective elimination is closely associated with this accumulation. It is possible to deposit nutrients alongside sediments because of their common association (Aye et al., 2019).

7.1.6. Habitat Protection and Biodiversity

Some organisms' habitats serve as both food sources and protective covers. Many species of plants and animals rely on mangroves as part of their lifespan cycle. Few species, especially plants, can acquire all the nutrition they require from a single mangrove. Many aquatic animals, like fish and prawns, rely on mangrove regions for breeding and growth of younger ones, and other species may rely on the region of mangroves for component of a more complicated phases of life cycle.

It is necessary to conduct an international assessment of the mangrove's significance in cases where migratory bird species depend on its resources as part of their entire life span, such as when they stop to rest or feed while migrating (Aye et al., 2019).

7.1.7. Biomass and Productivity

Ecological system biomass constitutes the foundation of the food chain and is therefore a crucial indicator for assessing the overall functionality of the framework.

The 'natural capital' of the system is the stock of plant biomass, which is maintained, increased, and sustained by the combination of water, nutrients, and light. This biomass is then utilized for growing newer biomass, which is used to support the remaining parts of the chain of food. An additional significant abiotic aspect of landscapes is plant biomass, which serves as an underlying structural element. It has both physical and biological uses, such as gathering sediment and providing a spot for animals to nest (Aye et al., 2019).

7.1.8. Gene Bank

Numerous mangrove regions harbor wild species that possess the ability to provide biological resource for the enhancement of commercially viable species. The genes from wild species can enhance the flavor and growing rates of produce from agriculture while decreasing their vulnerability to illness (Krauss et al., 2022).

Recreation and Tourism**:** Mangrove regions can be utilized for leisure and tourist activities. Locations more appropriate for leisure and tourist activity are those with adequate amenities or a possibility for creating such facilities (Moslehi, 2018).

7.1.9. Hunting and Fishing

The term "hunting and fishing" describes the human practice of taking wildlife that rely on mangroves for food and profit (Moslehi, 2018).

7.1.10. For**e**stry Products

The ecology of mangroves is an abundant supply of power, energy and building materials. Charcoal and wood for fuel are two examples of energy-producing materials (Lee, 1999).

7.1.11. Water Transport

Waterways in a mangrove ecosystem can facilitate the transportation of passengers as well as products to the nearby markets. Maritime transport may be an extremely effective and ecologically friendly mode of transportation. In some cases, it may represent the sole viable mode of conveyance.

7.2. The Economics of Mangrove Eco-System

Mangroves serve as an essential supplier of firewood for the nearby rural populace and for charcoal production intended for sale in urban regions. Additionally, mangrove regions offer a diverse array of fisheries, including shrimp, fish, mud crabs, sand extraction, coir soaking, boat operations, mussel farming, and various aquatic and botanical products. (Rizal et al., 2018)

7.2.1. Shrimp Farming

Many marine organisms rely on mangrove swamps for their survival, including shrimp and fish, and the nutrients they contain are carried in and out by the tides. Both the location of fishing and the volume of shrimp that breed alongshore determine the shrimp productivity (Ministry of Forest, Government of Kerala, 2022). Since pelagic larvae find their way to lagoons, wetlands made up of mangroves play an important role as hatching grounds. It is commonly believed that the region of mangroves directly correlates to the yield of shrimp. An aggregate of 140 shrimp ponds covering 524.4 hectares were recorded in Kannur. Back in 2007, it barely covered 251.5 hectares. About 60.6% of the land was used for conventional cultivation of shrimp, while 36.9% was used for more unconventional methods. Ezhome, Dharmadam, and Cherukunnu are home to more shrimp farms than any other areas (Rizal et al., 2018).

7.2.2. Fish Farming

The ideal habitat for brackishwater fish farming is typically lowland estuarine regions, such as mangrove wetlands. Some of the species that are grown in captivity include Penaeus monodon, Chanos, Mugil cephalus, Liza parsia, and Fenneropenaeus indicus (Lal, 2003).

7.2.3. Natural Nursery

The fishes lay their eggs in tangled roots of mangrove trees and later hatch and grow with needed nutrients available. Thus, mangroves act as natural nursery grounds. Mangroves offer shelter to the juveniles of a wide variety of marine organisms, notable among them being certain species of penaeid shrimps (Novizantara et al., 2022). A linear relationship exists between shrimp production and the size of the mangrove forest area. Mangroves give recreation to hunters, fishermen, bird-watchers, photographers and others who treasure natural areas (Krauss et al., 2022).

7.2.4. Commercial Exploration

The wood from mangrove trees is a popular material for making furniture and other home furnishings. Throughout history, mangrove trees have served as a reliable source of fuelwood. Rhizophora mucronata, Bruguiera gymnorrhiza, and Ceriops tagal are three mangrove species whose layers of bark are used for obtaining tannin (Moslehi, 2018). The tannin

content of the bark of Indian mangrove trees is 35%, which is higher than that of trees from other nations. The nets used for fishing undergo dyeing and made more durable using extracts from mangrove bark (Lee, 1999). A lucrative enterprise could be the gathering of honey from mangrove swamps. Aegicera corniculatum and Derris heterophylla are utilized as a mild fish poison, derived from their bark and roots, respectively. Human beings and livestock both benefit from the usage of Avicennia spp., Phoenix paludosa, and Sonneratia caseolaris. The nypa fruticans plant is used to make a type of alcohol (Aquafind, 2022).

VIII. CONCLUSIONS

Theoretically, mangrove diversification has been around for a while, and for good reason: it boosts ecosystem's efficiency and stabilization. To better understand mangroves, one must be aware of the ways in which they contribute to coastline ecological equilibrium and yield. Mangroves are vital to the survival of fishery and the livelihoods of fishers because of the crucial role they play as nests for juvenile aquatic creatures. Ecological systems are highly beneficial and diverse, and they play an important role in the coastline by acting as protection against eroding, waves from storms, and tsunamis that occur. In order to restore the coastal environment to its former perfect state, massive reforestation of mangrove areas is the top priority right now.

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Indian Construction Sector: Post COVID Scenario

Sajitha P

Assistant Professor, Department of Economics, NSS College Ottapalam, Kerala, India.

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Abstract

The COVID-19 outbreak has had a devastating effect on India's construction industry, causing many problems and setbacks. Examining the industry from multiple angles, including social, economic, and environmental concerns, this paper seeks to assess the post-COVID situation in India's construction industry. The study examines the immediate and future consequences of the global outbreak on India's construction industry by conducting an in-depth review of the literature. It delves into the difficulties encountered by construction companies as a result of shutdown restrictions, interruptions in the supply network, scarcity of workers, and budgetary restrictions. This research also delves into what the construction industry in India can expect from the post-COVID age in terms of developments and possibilities. Sustainable and resilient building practices are becoming more important, and this article looks at how digital technologies like Building Information Modeling (BIM) and remote collaboration tools are being used. The results of this study add to our knowledge of the situation in the construction industry of India after COVID. It helps researchers, professionals in the field, and lawmakers understand the opportunities and threats posed by the dynamic construction industry. In the wake of the COVID-19 global outbreak, India's construction industry has an opportunity to help the country achieve its sustainable development goals, create jobs, and boost the economy by adjusting to new circumstances.

Keywords:- Construction sector, post-covid era, employment, economic development, real estate sector.

I. INTRODUCTION

Since it is the second biggest industry in India in terms of labor force employment, after agriculture, the construction industry is greatly contributing to the country's socioeconomic growth. In order to reach an economy worth $5 trillion by 2025, it boosts national growth through developing and improving transportation and building infrastructure. Investments in transportation infrastructure (Dedicated Freight Corridor, High-Speed Rail, Sagarmala), urban development (Smart Cities Mission, Swachh Bharat Mission, and Atal Mission for Rejuvenation and Urban Transformation), and buildings (Pradhan Mantri Awas Yojana - Housing for All) are expected to total $1.1 trillion from 2020 to 2025, according to the National Infrastructure Pipeline report by India's Ministry of Finance (GoI 2019). The report also highlights plans to accelerate the country's consumption of natural minerals (MII 2021).

The worldwide economy has been hit hard by the COVID-19 global outbreak, which has disrupted many different industries. These difficulties have also affected India's construction industry, which is crucial to the country's financial growth. Examining the revival and current situation of the Indian construction industry is crucial as the country faces the post-COVID situation. Repairing supply chains, getting people back to work, boosting investor confidence, and getting the construction industry back on their feet are all parts of the recovery process. If we want to know how resilient and growth-friendly this industry is, we need to know how this recovery has worked.

The construction industry has historically been regarded as a vital contributor to India's GDP, job creation, and infrastructure advancement. The global outbreak has introduced novel obstacles, such as project delays, financial limitations, and alterations in demand and consumer behavior. Analyzing the sector's condition after COVID enables us to assess its present position within the wider economic framework and pinpoint areas necessitating focus and strategic measures.

II. OBJECTIVES

This article aims to provide in-depth knowledge of the post-COVID landscape in India's construction industry and to establish a foundation for a resilient and sustainable future. The explicit objectives are as follows:

- To examine the recovery dynamics of India's construction industry following the downturn caused by Covid-19.
- To assess the condition of the construction sector within the economy of India in the post-Covid-2019 period.

III. METHODOLOGY

The paper is descriptive in nature, based on secondary data, and attempts to discuss various issues during the post-Covid-19 scenario in the construction sector. Changes in Investment, contribution to GDP, and reemployment of the workforce during the post-Covid-19 are analyzed. Further, the status of the construction sector in the economy of India in the post-Covid-19 era is also analyzed.

IV. RESULTS AND DISCUSSION

The construction industry in India is divided into several subsectors, including commercial, residential, industrial, infrastructure, transportation, energy, and utility. Over the last half-century, construction in India has received about 40% of the total growth funding. The construction industry provides a living for about 16.0% of the employed community. More than 30 million people find work in India's construction sector, which generates assets valued at more than ₹200 billion.

4.1. Indian Construction Industry: Pre-COVID Scenario

When it comes to India's economic growth and development, few sectors can be considered as important as the construction sector. Government initiatives, urbanization, infrastructure development, and increased foreign investments were among the factors driving the sector's steady progress prior to the COVID-19 pandemic.

4.1.1. Infrastructure Development

The Indian government had been focusing on enhancing the country's infrastructure through ambitious projects such as the construction of highways, ports, airports, and smart cities. This emphasis on infrastructure development created numerous opportunities for construction companies and stimulated the growth of the industry.

In addition to continuing the remarkable speed of work accomplished over the years, the Ministry of Road Transport and Highways has made a number of decisions regarding policy and taken a number of actions for the benefit of the public. In the fiscal year 2019–20, a total of 10,237 kilometers of roads were finished, with a total of 8948 kilometers of awarded projects. There has been an enormous spike in the pace of road growth and development, with approximately 28 km expected in 2019–20 from 11.7 km in 2013–14. Thanks to the Ministry's dogged pursuit, the length of the National Highways (NHs) has gone up from 91,287 km in April 2014 to around 1,36,155 km as of December 20, 2020.

Table:1 Construction of National Highways

Year	Award (km)	Construction (km)
2019-20	8,948	10,237
2018-19	5,493	10,855
2017-18	17,055	9,829
2016-17	15,948	8,231
2015-16	10,098	6,061
2014-15	7,972	4,410

Source: Ministry of Road Transport and Highways

The Indian government has launched the massive Sagarmala Programme to encourage port-led growth and development throughout the nation, capitalizing on its coastal region, 14,500 km of possibly accessible water routes, and advantageous position on important global maritime trading routes. The Programme aims to minimize logistics costs for EXIM and internal trade while requiring minimal infrastructure funding. This encompasses decreasing domestic cargo transportation expenses; minimizing logistics expenses for large quantities of goods by situating prospective production facilities near the coastline; enhancing the ability to export through the establishment of independent production units in vicinity to ports, among other measures. The Sagarmala Programme has delineated 504 projects across four categories: 211 port moderniing initiatives, 199 endeavors to connect various ports, 32 port-led industrial development schemes, and 62 coastal regions initiatives to develop communities, which have the potential to facilitate port-led growth development and are anticipated to generate over Rs. 3.57 Lac Cr in funding in infrastructure.

Within the past fifteen months (July 2019–October 2020), twenty Sagarmala projects with a combined budget of Rs. 4,543 crores have been executed. These projects include nine port modernising and upgrading projects valued at Rs. 1,405 crores, seven projects to connect various ports valued at Rs. 2,799 crores, and four coastline initiatives for community development totaling Rs. 339 crores.

4.1.2. Real Estate Boom

The pre-COVID-19 period experienced a real estate surge in India, characterized by an increase in residential and commercial construction projects. Accelerated urbanization, an expanding middle-class demographic, and advantageous

governmental policies, including affordable housing initiatives, have stimulated the demand for real estate, resulting in a vigorous construction industry.

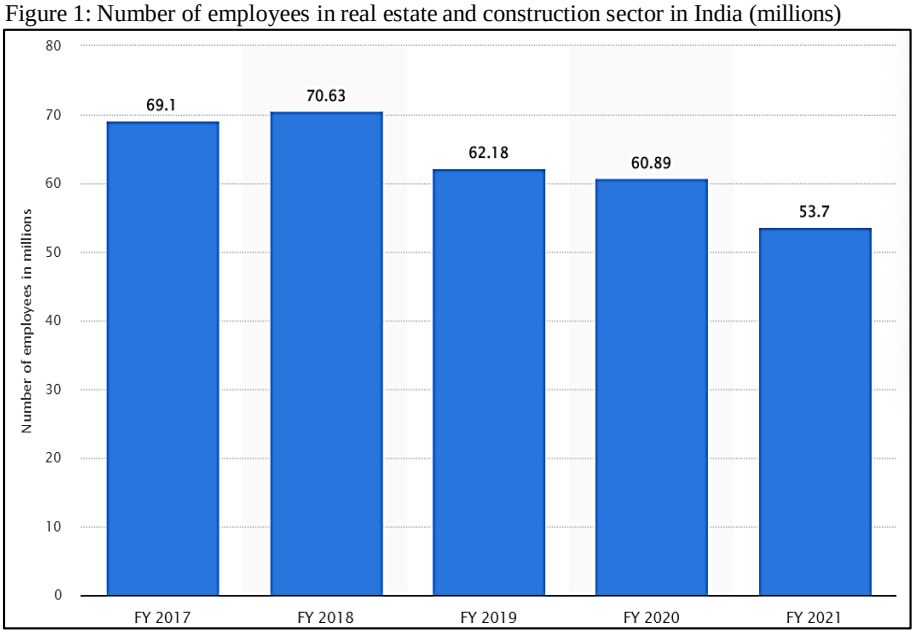
4.1.3. Foreign Direct Investment (FDI)

The Indian construction sector garnered substantial foreign direct investment, chiefly owing to governmental initiatives aimed at relaxing FDI regulations and fostering a conducive business climate. Global entities penetrated the market via joint ventures and collaborations, introducing sophisticated technologies, expertise, and capital that further accelerated the industry's expansion. Complete foreign direct investment (FDI) in the construction growth and development industry via the automatic approach is authorized for operational and managerial activities in finalized projects, including townships, malls/shopping complexes, and commercial constructions. From 2000 to 2020, the construction sector received the second highest volume of foreign direct investment (FDI).

4.1.4. Employment Opportunities

The construction sector was a significant source of employment in India, offering jobs to a large workforce comprising both skilled and unskilled laborers. The sector's growth created job opportunities in diverse areas, including civil engineering, architecture, project management, and skilled occupations, thereby enhancing the nation's socio-economic development. Of India's thirteen main economic sectors, the construction sector ranks third and is second only to agriculture in terms of employment.

Figure 1: Number of employees in real estate and construction sector in India (millions)



Source: Statista 2023

In the financial year 2021, employment in India's real estate sector and construction industry decreased by 25 percent over five years, totaling approximately 54 million employees. This represented a decline of 12.0 percent compared to the employment figures of the preceding financial year. The decrease in employment has been ascribed to the recent coronavirus pandemic, along with persistent challenges such as inventory accumulation, delivery setbacks, and developer shortcomings.

4.1.5. Technological Advancements

The Indian construction industry was gradually adopting advanced technologies and practices, such as Building Information Modeling (BIM), modular construction, green building techniques, and automation. These technological advancements enhanced efficiency, productivity, and quality in construction projects, making them more sustainable and cost-effective.

4.1.6. Positive Economic Impact

The expansion of India's building sector boosted the country's GDP by a factor of several. It drove related industries and created business opportunities by stimulating market for essential commodities like cement, steel, and other building supplies. Furthermore, the industry helped bring in money for the state via various taxes and levies.

4.2. Indian Construction Industry: During COVID-19

There have been enormous changes and problems in the Indian construction industry as a result of the COVID-19 outbreak. The industry had been growing steadily before the pandemic, but it had to adapt and be resilient to overcome all the obstacles it encountered.

4.2.1. Construction Halts and Project Delays

There was a nationwide halt to building as a consequence of the restrictions and lockdown put in place to contain the virus. Manpower deficits, supply network interruptions, and movement restrictions caused projects to come to a standstill and extended timelines. For a lot of construction companies, this meant more time and money spent on the project.

4.2.2. Labour and Migrant Worker Crisis

The construction industry heavily relies on a vast workforce, including migrant laborers. With the sudden halt in construction activities, many laborers were left unemployed and faced challenges in accessing basic necessities. Migrant workers, facing uncertainties, started returning to their hometowns, leading to a labor crisis. The subsequent shortage of skilled and unskilled workers further hampered project execution.

4.2.3. Financial Challenges and Project Funding

The pandemic impacted the financial stability of construction companies. Many projects faced cash flow issues, as payments were delayed or disrupted. Additionally, accessing project financing and bank loans became more challenging due to economic uncertainties. The financial strain forced some companies to downsize or halt operations, causing the termination of jobs and the postponement of projects.

4.2.4. Supply Chain Disruptions

Building supplies and machinery were in short supply because of problems with international and domestic supply chains. Essential materials could not be delivered on time due to transportation restrictions and lockdown measures, which led to higher costs and project delays. Border closures and trade disruptions posed additional challenges for materials that rely on imports.

4.2.5. Safety and Health Measures

The construction industry had to adopt stringent safety and health measures to protect workers from the risk of COVID-19 transmission. This involved implementing social distancing protocols, providing personal protective equipment (PPE), conducting regular sanitization, and adhering to guidelines issued by health authorities. These measures added to the operational costs and required additional coordination and planning.

4.2.6. Embracing Technology and Digital Solutions

The pandemic accelerated the adoption of digital tools and technologies in the construction industry. Remote collaboration, virtual meetings, and Building Information Modeling (BIM) gained prominence to facilitate project management and communication. Companies also explored automation and robotics to minimize human contact and improve productivity.

4.2.7. Government Support and Policy Reforms

During the global outbreak, the Government of India took many steps to help the construction industry. Some of these measures aimed to revive infrastructure development, loosen compliance standards, and provide financial relief packages. Also, in an effort to make it easier for businesses to operate in the construction industry, policy changes were made to expedite the approval process.

India's construction sector has shown remarkable resilience and adaptability in the face of the pandemic's challenges. There will be a significant increase in infrastructure development and employment opportunities in construction industries as the nation begins to recover from the effects of COVID-19. This, in turn, will help the economy recover and grow.

4.3. Indian Construction Industry: Post-COVID-19 Scenario

A cautious recovery and adaptation to the new normal characterize the post-COVID-19 scenario that the Indian construction industry is progressively transitioning into. In the first six months of 2022, the construction industry's value add increased by eight percent year over year, as reported by the Ministry of Statistics and Program Implementation (MoSPI). On the other hand, if inflation and building material prices continue to rise, the industry's expansion could stall in the second part of this year. The construction industry's trimesters FY23 Gross Value Added (GVA) rose from 225,166 crore in 2021–2022, to 262,918 crore in 2022–2023, a 16.8 percent growth over the previous year's relatively normal GVA.

As the nation emerges from the impact of the pandemic, the construction sector faces both challenges and opportunities, requiring resilience, innovation, and strategic planning

4.3.1. Resumption of Construction Activities

With the easing of lockdown restrictions and the resumption of economic activities, the construction industry is gradually recovering. Construction projects that were put on hold are now being resumed, albeit with adherence to strict safety protocols and guidelines. The sector is witnessing a renewed focus on project execution and meeting delayed timelines.

4.3.2. Emphasis on Health and Safety Measures

The post-COVID-19 era has underscored the importance of health and safety measures in the construction industry. Companies are implementing robust protocols to safeguard workers' well-being and minimize the risk of COVID-19 transmission. This includes regular sanitization, provision of personal protective equipment (PPE), temperature screening, and adherence to social distancing norms.

4.3.3. Digital Transformation and Technology Adoption

The pandemic has accelerated the digital transformation of the construction industry in India. Companies are increasingly embracing technologies such as Building Information Modeling (BIM), virtual collaboration tools, and project

management software. Remote work and virtual meetings have become more prevalent, enhancing communication and efficiency in project execution.

4.3.4. Focus on Sustainable and Green Construction

A focus on sustainability and environmental consciousness has been amplified in the construction sector following the COVID-19 scenario. Energy efficiency, renewable materials, and green construction practices are becoming more important. Businesses are looking into green building practices to lessen their impact on the environment and make the industry more resilient.

4.3.5. Shift in Project Requirements and Design

Due to the pandemic, project requirements and design considerations have been revised. Making adaptable settings that can meet health needs and social distancing measures has become more important. In order to create spaces that are both safe and healthy, designers are incorporating touch-less technologies, better ventilation, and flexible layouts.

4.3.6. Government Stimulus and Infrastructure Development

When it comes to restoring the economy and building new infrastructure, the Indian government knows exactly who to call: the construction industry. The expansion of the sector, the recruitment of investors, and the acceleration of project approvals are all targets of current stimulus packages and legislative reforms. Infrastructure projects are being propelled by initiatives like the National Infrastructure Pipeline (NIP).

4.3.7. Skilled Workforce Development and Training

The post-COVID-19 period highlights the need for a skilled and adaptable workforce in the construction industry. Companies are focusing on up-skilling and re-skilling programs to equip workers with the necessary competencies for the evolving industry landscape. Training initiatives are aimed at promoting safety, digital literacy, and sustainable construction practices.

4.3.8. Collaboration and Partnerships

With COVID-19 behind us, it is more important than ever for the construction ecosystem to work together. Strategic alliances, collaborative businesses, and consortiums are becoming increasingly common as a means for companies to reduce risk, increase efficiency, and share resources. In order to drive sustainable growth and overcome challenges, it is crucial for market participants, government authorities, and financial institutions to collaborate.

With an annual growth rate of 7.1%, the country's construction market is projected to become the third most important in the world by 2025. Cement, technology, steel, and other related industries will feel the effects of any improvements made to the construction sector. A developed country is easily recognizable by its well-developed infrastructure. Foreign direct investment (FDI) in North India's construction sector will open up exciting new opportunities for the sector's growth.

V. CONCLUSIONS

Despite the ongoing difficulties caused by the COVID-19 pandemic, the construction industry in India is seeing opportunities for expansion, inventiveness, and resilience. The key to the industry's recovery and success in the post-COVID-19 era will be to adapt to the changing landscape, embrace digitalization, prioritize health and safety, and implement environmentally friendly methods. Although there are indications of improvement in the Indian construction industry, it is important to remember that different regions and segments may experience varying degrees of recovery at different rates. A number of variables, including ongoing government support, infrastructure development, technology adoption, and the requirement for inexpensive housing, will determine the character of the construction industry's recovery in India following COVID-19.

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Internal Labour Migration and Economic Sustainability in India

Nithin Thomas

Assistant Professor and Head, Department of Economics, Bharata Mata College, Thrikkakara, Kerala, India.

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Abstract

Purpose: Economic sustainability denotes practices that foster enduring the growth of the economy while preserving the societal, ecological, and cultural dimensions of community life. Kerala has experienced a significant influx of migrant laborers from diverse regions of India in the past several years. Kerala presents an appealing marketplace for external workers due to elevated wages, abundant possibilities for work, and a deficiency of resident workers. This article's objective is to examine the labor market in Kerala and the effects of temporary migrant workers on the economic health of the state. Additionally, we examined how migration raises the societal and financial situation of migrants and how domestic labor flow can lead to financial stability.

Design/Methodology/Approach: This research, which relies on secondary sources of information, used descriptive research methods. Public and private organizations' websites, as well as scholarly publications, daily newspapers, and journals publications, are sources of secondary data.

Originality/Value: The study will facilitate the evaluation of the socio-economic advancement of migrant workers resulting from migration by examining the liquidity of migrant workers, workforce participation rate, labor population ratio, and the rate of pay.

Findings: Recruiting migrants helps to regulate the workforce availability in these fields and avert ambiguities resulting from manufacturing and unoccupied positions. When it comes to industries that require labor, the monetary advantages of migration are especially noticeable. Migrants also fix marketplace breakdowns caused by ambiguity regarding manufacturing output. The study concludes that businesses are more likely to hire migrant workers to fill untrained open positions when they experience manufacturing hours lost due to job delays and halts.

Keywords:- Migrant workers, Economic sustainability, internal migration, labour market, financial upliftment.

I. INTRODUCTION

Economic sustainability denotes practices that foster enduring growth in the economy while preserving the societal, ecological, and cultural dimensions of community life. Internal labor migration, the relocation of individuals within a nation, leads to a more effective distribution of human resources to sectors and areas in which people are optimally employed. Now a days, internal labour migration is an overwhelming reality that underscores India's developmental landscape. Millions of people are on the move across the country in search of a livelihood and adequate means of survival. While migration opens up new areas of work and employment and creates new opportunities for many, it also pushes people into unequal and highly exploitative work regimes (Borhade, 2016).

II. REVIEW OF LITERATURE

A literature review is a description of the literature relevant to a particular field or topic. It gives an overview of what methods and methodologies are appropriate and useful. For easier comprehension, the researcher classified the problematic factors into different groups; reviews are organized according to their international, national, and regional importance (Cooper et al., 2018).

Table:1 Literature Review on Migration and Economic Sustainability

Sl. No.	Area	Contribution	Authors
1.	Migration and Sustainable Livelihoods	Looking specifically at the organisational elements which connect migration and long-term prosperity, this article emphasizes the relationships between the two. The article contends that a large body of developmental research incorrectly presumes that stagnant social structures are typical, whereas in reality, migration is far more frequently the norm than the alternative.	McDowell & De Haan
2.	Youths on labour market .	An empirical analysis regarding the migratory tendency of graduates is offered in this article, along with an analysis of the youth labour market characteristics. A well-rounded strategy for the free movement of young workers that benefits their home country is proposed.	Vasile & Vasile
3.	Labour migration	To begin, the paper weighs the financial benefits and drawbacks of migrating to and around Thailand. Then, it proposes strategies for migration of workers with the goal of optimizing benefits while limiting expenditures. To fill in pertinent shortcomings in effective policymaking, evaluating the costs and benefits of worker migration is essential.	Pholphirul
4.	Labour force migration and sustainable socio-economic migration	The research seeks to examine the impact of human capital investment on international migration patterns and its effect on socio-economic development in the EU New Member States over the last years.	Liana & Noja
5.	Impact of labour migration	This article examines the extent to which labour migration to and from Central Asian countries affects the socio-economic dimensions of sustainable development in the region. Following the formation of the Eurasian Economic Union in 2015 and the region's cultural and historical ties, there has been a significant influx of Central Asian labor migrants to Russia and Kazakhstan.	Ryazantsev& Ochirova
6.	Migration- poverty and development.	This book contains the findings from the third wave of a migration-focused panel survey in Bangladesh. It examines the interrelationships between labour migration, poverty, and development based on 6,100 interviews including international labour migrants, internal migrants and non-migrant households spanning 20 districts of Bangladesh.	Sarker et. al.

Source: Prepared by the author

While cross-border migrants in India are more likely to move from the countryside to the city, all internal migrants in Ghana tend to stay put in their hometowns, according to research by McKay and Castaldo. Based on the data on internal migration, which shows that individuals shift from poor to rich areas, the research suggests that the plan for development should take internal migration into account (Awumbila et al., 2015).

According to Prakash & Alwin, the impoverished and industrially underdeveloped sector of Kerala has seen remarkable financial shifts since the mid-1970s as a result of the significant volume of fund transfer and spending coming from the Persian Gulf. As a whole, poverty in Kerala has decreased thanks to the migrant communities' increased income, consumption, and asset acquisitions made possible by the Gulf migration. On the flip side, non-migrant families from the working class, middle class, and stable income brackets have been hit hard by the increased costs of land, building supplies, consumable foodstuffs, and medical care, education, and commutation caused by transfer of funds from Gulf countries (Prakash & Alwin, 2018)

III. RESEARCH GAP

There is a significant demand for comprehensive and policy-focused studies regarding internal migration, emphasizing the workforce marketplace, reducing inequality, and socio-economic advancement through migrant's shift. Workers market issues encompass the characteristics of migration, its seasonal fluctuations, and its impact on work scheduling, recruitment trends, and the work practices of migrant workforce.

IV. RESEARCH AGENDA

- What are the trends and patterns of internal migration in India?
- What are the costs and benefits of internal labor migration?
- What is the correlation between internal workforce migration and economic sustainability?

V. OBJECTIVES

- To ascertain the trends and patterns of internal migration in India.
- To evaluate the costs and benefits of internal labor migration.
- To investigate the correlation between internal labor migration and economic sustainability.

VI. RESEARCH METHODOLOGY

Descriptive research, which relies on previously collected data from other sources, is the foundation of the current investigation. Literature such as books, journals, newspapers, and articles as well as official government webpages provide the secondary facts. Economic development, migrant workers, manual labourer and the rural labour market were the search phrases used to gather this information. The necessary materials were found through an online search and then personally reviewed. The primary objective of this research is to examine the relationship between internal labor migration and economic sustainability in our country, with secondary goals of studying the nature and trajectory of internal migration within the country, as well as its pros and cons.

VII. THEORETICAL OVERVIEW OF THE STUDY

Lewis (1954) contends that agricultural workers migrate from rural to better metropolitan areas due to the higher wages offered by contemporary industries in their destination places (Todaro, 1980).

The Lewis, Fei, and Ranis (1961) migration theory discusses an economy with two sectors consisting of a subsistence agricultural sector marked by excess workforce and underemployment or joblessness alongside a modern industrial sector that experiences full-time work. In the modern sector, salaries are sustained at levels significantly exceeding the mean wage in the agricultural sector (Fields, 2004).

An additional significant theory of rural-urban migration proposed by Harris-Todaro (1970) posits that migration is mainly driven by financial factors. The theory posits that the choice to relocate is contingent upon anticipated greater compensation (real wage differentials) and the likelihood of potentially securing a metropolitan employment opportunity (Amano, 1983)

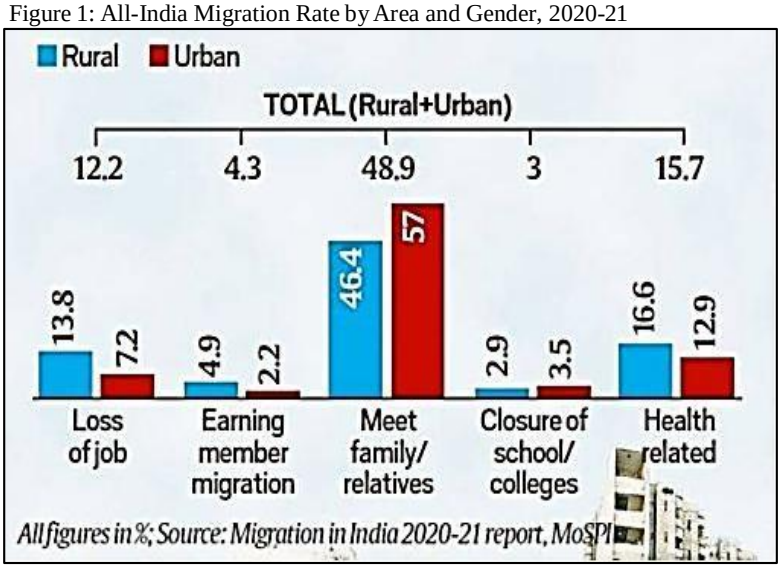
VIII. RESULTS OF THE STUDY

8.1 Trend and pattern of internal migration in india 2021

The Ministry of Statistics and Programme Implementation (MoSPI) (Ministry of Statistics and Programme Implementation [MoSPI], 2020-21) has just published a report titled Migration in India 2020-21.

- Following the commencement of the Covid-19 a global epidemic in March 2020, 0.7 percent of the nation's populace resided temporarily in households from July 2020 to June 2021.More than 84 percent of these relocations were attributable to global outbreak, factors associated include visiting family, loved ones or companions (48.9 percent), being laid off, unit close down or unavailability of job prospects (12.2 percent), migration of the primary income earner (9.2 percent), and the close down of schools and colleges and medical problems (15.7 percent).
- The all-India migration rate was 28.9 percent for the period of July-June 2020-21, comprising 26.5 percent in rural regions and 34.9 percent in metropolitan regions.

Figure 1: All-India Migration Rate by Area and Gender, 2020-21



- The migration rate for women was 47.9%, with 48% residing in rural regions and 47.8% in metropolitan regions. At 86.8 percent, the migration rate for wedding was the maximum ever amongst women.
- Men migrated at a rate of 10.7 percent, with 2.5% residing in cities and 5.9% in rural regions. For 49.6% of the men, the reasons for migrating were job hunting, greater job possibilities, moving closer to their place of employment, or fleeing being laid off, business closure, or an acute shortage of job prospects.
- 17.5 percent of men and 7.3% of women migrated because a parent or other breadwinner in the household moved.

8.1.1. About the migration in india report

- It is predicated on the inaugural collection of supplementary data during the annual cycle of the Periodic Labour Force Survey for July 2020 to June 2021.
- It is disseminated by the Ministry of Statistics and Programme Implementation (MoSPI).
- It distinguishes between the classes of 'short-term visitors' and 'migrants.'
- People who entered a household after March 2020 and remained consistently over a duration of fifteen days or more yet no longer than six months are considered "temporary visitors."
- People are considered migrants if their current spot of enumeration differs from their previous residence, regardless of when that was in the days gone by.
- From July 2020 through June 2021, survey data was collected during the survey duration, which began with the implementation of the survey block in July 2020.

8.1.2. Migration

- Overview of Migration: The term "migration" refers to the process by which individuals leave their permanent dwelling and travel to a new location, either within the same country or to another country altogether (Boyle, 2009).
- Government data on migration: In 2011, 45.6 crore people left India, making up 38% of the population. In 2001, 31.5 crore people left the country, making up 31% of the population. There was a 45 percent spike in the population of migrants between 2001 and 2011 (Census of India 2001, 2022) despite a 18 percent rise in the population. Only 1% of 2011's migrants were foreign nationals; the other 99% were moving within the country.
- Patterns of migration: Both the source and the destination countries allow for the categorization of internal migrant flows. The following is an example of a categorization:
    - rural-rural
    - rural-urban
    - urban-rural
    - urban-urban

Of the total categorized internal migrants, 54% were rural-rural migrants, with 21 crore people making up this category (5.3 crore people were not categorized as coming from rural or urban areas in the 2011 census). The migration patterns of urban-to-rural and rural-to-urban comprised about 8 crore people each.

Reasons for migrating within a country and the total number of migrant workers (Srivastava, Keshri, Guar, Balakrushna, & Jha, 2020).

- Economic migration: The majority of UAE residents are foreign nationals who relocated there in search of employment opportunities; for example, 27 percent of UAE residents are workers from India.
- Migration of social groups: People often relocate in search of greater possibilities or to be nearer to loved ones, for example, Indians living in the United States who are seeking greater job prospects and more advanced degrees.
- Political migration: When fleeing political or military oppression, Consider the newest influx of Rohingya Muslims from Myanmar into neighboring Bangladesh and India, as well as the six million Syrians forced to flee their homeland and the ten million who were compelled to leave within it.
- Reasons for migration related to the environment: Earthquakes and other natural disasters are part of this category. Every year, cyclones and floods in India force a lot of people to leave their homes. Because of the rising seas, residents of the island nations of Kiribati, Tuvalu, and Nauru are evacuating.
- Motives for migration, both external and internal: A migration occurs when the adhesion that keeps people from staying put gets resolved by an apparent relationship of push and pull forces.
    - *Push factors* are aspects of one's home that, when seen adversely, make one want to flee. The drought, malnutrition, joblessness, excess congestion, a national conflict, etc., are all examples of such disasters. Economic migrants in India are driven by agrarian distress.
    - *Pull factors* are attributes of a location that are viewed favorably, resulting in its appeal. These encompass opportunities for improved work, schooling, quality of life, or even a more favorable atmosphere.

Figure 2: Push Factors for Migration in India

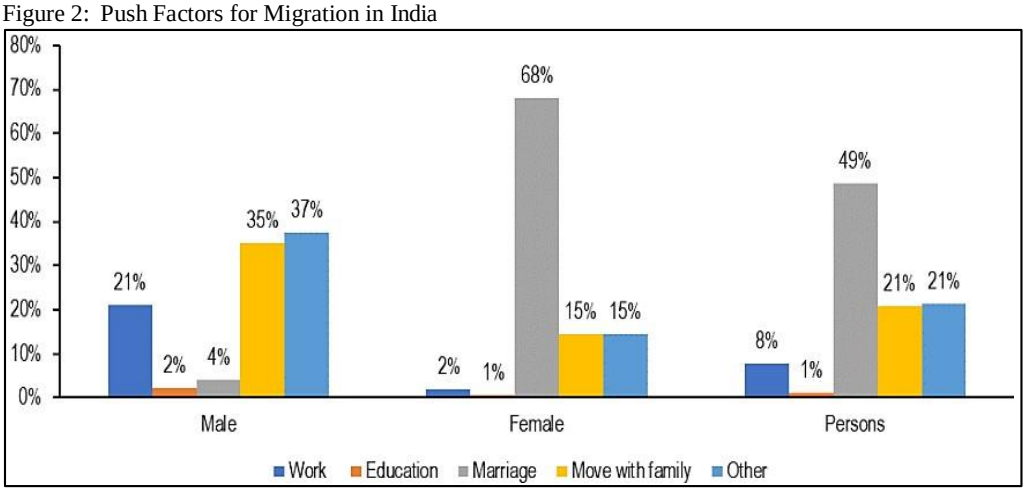
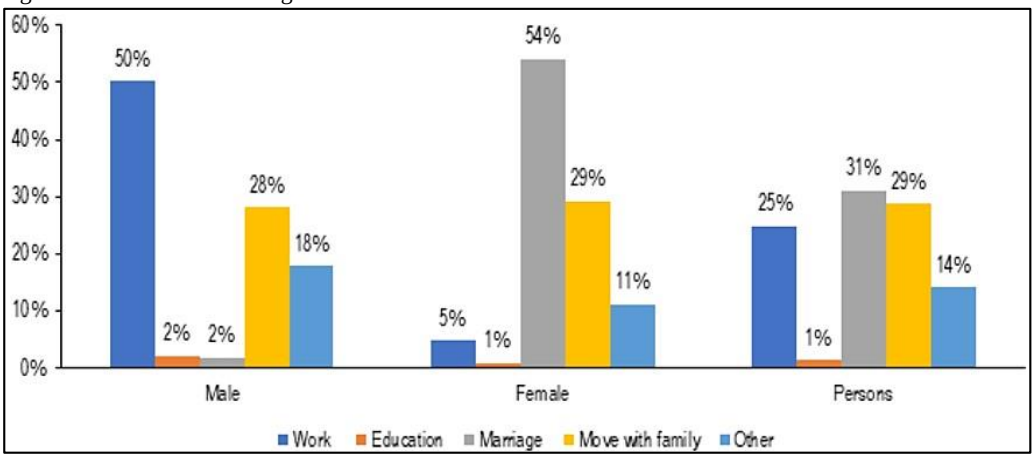


Figure 3: Pull Factors for Migration in India



8.1.3. Effects of migration

- Demographic: It influences the demographic profile of both the origin and endpoint in terms of gender and years of life. It has an effect on growing population rates as well. As a result of an enormous number of youthful men looking for work, the percentages of senior citizens, kids, and women tend to rise in the region of origin and fall in the area where they arrive. A region's fertility rate and birth rate are impacted by the unbalanced sex ratio.
- Social: Migrants serve as catalysts for social transformation, introducing novel perspectives and customs. Although this may result in an integrated tradition, in certain regions it engenders heightened conflict and discontent amongst natives, as evidenced by the acts of violence on Indian citizens in Australia some years earlier. It may induce loneliness, obscurity, despondency, and violent or unlawful inclinations in certain migrants.
- Economic: It is a common misconception that migrants take opportunities away from originally from the area people. The financial advantages of migration accrue to the receiving country when it brings in lower and/or highly skilled workers, but the source country may suffer from a talent shortage as a result.
- Environmental: The congestion of urban areas exerts significant strain on infrastructural facilities. Unregulated expansion, informal settlements, resource depletion, water scarcity, and pollution of air, water, and noise, along with challenges in garbage and waste water management. The infrastructural facilities and environmental challenges in Delhi exemplify the issue.
- Political: The political dynamic of a region can shift when a large migrant group arrives, bringing with them an entirely fresh crop of potential voters. Unauthorized immigration has created demographic inequalities in several states in northeastern India, which could have negative political ramifications.

8.1.4. Issues

- Data: The migrant labor community is undercounted in the Census. Since moving closer to loved ones is the most common reason for women relocation, that is how it is reported. The number of females migrating for work-related reasons fails to account for the fact that a majority of them seek work after migration. The influx of short-term migrant workers is also underreported in the census. Seven crore people, or 29 percent of India's workforce, were considered migrant workers in 2007 and 2008, according to the NSSO (NSSO, 2007-2008). Six crore people migrated across states in search of work between 2001 and 2011, according to the Economic Survey for 2016–17 (Planning Board of India, 2012). On average, 90 lakh people flew to find jobs annually between 2011 and 2016, according to the Economic Survey (Planning Board of India, 2012).

- Challenges encountered by migrant laborers: Contingent upon acceptable limitations for the benefit of the wider community or the safeguarding of each tribe, every Indian national have the freedom and privilege to live and establish a residence in any area of India's territory, as guaranteed by Article 19(1)(e) of the Constitution. Significant challenges individuals face when relocating for work include:
    - Inadequate enforcement of laws establishing minimum safety standards, absence of health and societal safety nets
    - Aid granted by the state, like food from the Public Distribution System (PDS), cannot be portable.
    - Urban areas often struggle to provide reasonably priced housing and fundamental necessities.
- There was a lack of compliance with the Inter-State Migrant Worker Act of 1979 (ISMW Act) and a low percent of labor registration under the Act.

8.1.5. Way ahead

Seeking greater possibilities for life, particularly in regions with stable political environments, is the primary driver of migration. So, it's important to make sure that the region of origin provides ideal circumstances.

- Increasing Developmental Opportunities: When local resources, such as schools and employment opportunities, are adequately supplied, migration rates begin to fall. This is due to an increase in developmental opportunities.
- Addressing the Governance Deficiency: The region of origin requires a more comprehensive legal and regulatory framework.
- Minimizing migrations while setting up Gandhian "village republics" in the years to come, via the widespread and successful execution of programs like Provision of Urban Amenities to Rural Areas (PURA).
- Healthcare, schooling. and housing are examples of fundamental needs that should be addressed through other means. One such initiative is the Prime Minister's Awas Yojna.
- The Development of Skill and the Production of New Jobs: Training that will allow the youth to find gainful employment in their home town.
- Advocate for cultivation as the principal vocation via initiatives such as the Pandit Deendayal Upadhyay Unnat Krishi Shiksha Scheme: Launched in 2016, it fosters agro related training and teaching in India. The Attracting and Retaining Youth in Agriculture (ARYA) project is executed at Krishi Vigyan Kendra (KVKs) and authorized by the Indian Council of Agricultural Research.
- Pro-business policies: To enhance employment and commercial prospects in remote regions, such as the MUDRA scheme and the Make in India initiative.

IX. CONCLUSION

In accordance with the 2011 survey of India, over two-thirds of the population, totaling 1.21 billion individuals, reside in remote regions; however, the nation is undergoing swift urbanization. Mumbai, Delhi, and Kolkata rank among the world's ten most populous metropolitan regions, while India boasts 25 of the 100 most rapidly expanding regions globally. A major contributor to this growth is migration from countryside to cities, as an increasing percentage of individuals encounter inadequate financial prospects in rural areas and subsequently relocate to urban centers. This will ultimately foster revenue generation and facilitate sustainable economic development.

Table 2 : Cost-Benefit Analysis of Internal Labour Migration

Costs of Migration	Benefits of Migration
• It leads to a higher cost of living in the migrated areas. • It involves the cost of transportation. • It involves the psychological cost of living in a foreign culture. • Loss of skilled and educated workers. • Families are choppy as young males tend to migrate. Older people can't see family and no one need to worry about them. • Social tensions • Demand for education, health, and housing rises. • Cultural tensions with a migrant population. • Can cause demand for more housing and thus loss of green space and possible overcrowding.	• Remittances boost the incomes of families. • Contact with other cultures. • Reduces the pressure of a huge population. • Migrants fill low-wage and difficult work • The government may enjoy due to increased economic benefits from migrants.

Source: Compiled by the author

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Status of the Paint Industry in India

Aswani T D

Editor, Eduschool Academic Research Publishers, Angamaly, Kerala, India

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Abstract

The Indian paint industry has experienced significant growth and transformation, propelled by urban sprawl and industrialisation, growing disposable revenue, real estate expansion, and infrastructural growth and expansion. This sector includes both decorative and industrial paint segments, catering to the needs of residential, commercial, automotive, construction, packaging, and manufacturing industries. Leading domestic and international paint companies compete on quality, variety, innovation, and eco-friendliness, introducing low-VOC paints to address environmental concerns. Regulatory compliance, digital integration for marketing and distribution, and a shift toward sustainable practices are shaping the industry's landscape.The purpose of this research is to assess the present situation of the paint industry in India and to draw conclusions about its role in the country's economy. The research focuses on three main objectives: To begin, we will examine the competitive landscape, major trends, and market dynamics to get a feel for the paint industry as a whole. The second objective of the research is to put a number on the industry's impact on the Indian economy in terms of things like export potential, job creation, and income. The study concludes by illuminating the paint industry's critical function in the building and automotive sectors. By delving into the industry's effects on form, function, and security, it highlights the industry's influence on these areas. With these goals met, the study sheds light on the many ways in which India's paint industry contributes to the country's economy and industry.

Keywords:- Paint industry, Indian economy, Employment opportunities, Decorative, automotive paints.

I. INTRODUCTION

One of the most dynamic and influential industries in India, the paint industry is responsible for a great deal of the physical and economic development of the nation. Before India gained its independence, the construction industry and the upkeep of public buildings were the main consumers of paint. This led to the establishment of the paint industry in India. From its humble beginnings to its present-day status as an integral part of many different sectors, it has experienced remarkable change over the years. Rapid urban sprawl and development, increasing disposable revenue, and technological advancements have all contributed to the phenomenal growth of India's paint industry. As a result of this expansion, the paint industry is now divided into several subsectors that serve different markets with specialised requirements. These subsectors include decorative, industrial, and automotive paints. There are opportunities as well as obstacles for the industry. Raw material price fluctuations, regulatory compliance, and environmental considerations are some of the challenges. Innovation, sustainability efforts, and a rising demand for high-quality coatings have kept the Indian paint industry afloat despite these challenges. Its substantial and long-lasting influence on India's development is evident in the fact that it is still an important factor in improving the look of places and helping to ensure that buildings last.

II. OBJECTIVES

This paper's primary objective is to survey the current state and performance of India's paint industries. The particular goals are as follows:

- To review the overall status of the paint industries in India
- In order to see how well the paint industry is doing and how much it has helped the Indian economy.
- That the paint industry's role in the building and automotive industries be better understood.

III. METHODOLOGY

It is an analytical and descriptive paper. In order to grasp the significance of the paint industry to the expanding economy and other ideas connected to these sectors, it is helpful to review the relevant literature. By utilizing secondary data spanning multiple years, an analysis of growth and its impact on the Indian economy is endeavored. In addition, we also tried to improve the performance of major paint industries.

3.1. The status of the paint industry

Over the past 20 years, India's paint industry has grown at a rate of at least double that, thus becoming among the globe's most rapidly expanding primary paint economy. The market is anticipated to experience a significant growth rate of 9.38% from 2023 to 2028, with a valuation of INR 62,000 crores (USD 8 billion) in 2023 and INR 1 lakh crores (USD 12.34 billion) in 2028. Nearly all significant paint manufacturer in the world has a base in this nation, which boasts over 3,000 producers. Its market share in architectural paints is approximately 75 percent and in industrial paints it's about 25 percent. All of its sections are growing at a fair pace, including powder, automobiles general industrial, refinish, wood, packaging, and plastic.

Given the substantial overlap in materials, manufacturing machinery, and supply avenues, as well as the lack of commitment to outstanding occasions for any of these groups, Paint India serves as a procuring and production advocate for the core Paint/Coatings, Printing Inks, Construction Chemical-Based Products and Adhesives-Sealants sections. In a comparable manner the show provides essential procuring options for major and vital areas of industry such as pigments, resins, plastic master batches, and composites, enhancing the advantages and consumer involvement that are on hand. Several factors are propelling the paint industry of India forward, including increasing disposable incomes, more urbanization, more government spending on infrastructure, more demand from the industrial and automotive sectors, and deeper penetration of e-commerce.

The growing middle class in India is spending more on home improvement and decoration, which is driving demand for paints. Additionally, the rapid urbanization in India is leading to the construction of new buildings, which is also creating demand for paints. The demand for paints in the construction and infrastructure sectors is being driven by the heavy investment in infrastructure development by the Indian government. The fast growth of the automotive and industrial sectors in India is also contributing to the expansion of the paint industry. The ease with which consumers can buy paints online is also being enhanced by the rising penetration of e-commerce.

Despite recent currency value fluctuations, and the influence of low crude oil prices, the industry has responded positively to such market changes. This is due to a number of reasons including innovative manufacturing technologies and processes. A commitment to embrace cutting-edge techniques has helped market leaders deal with negative external trends. Newly developed concepts during the last decade have enabled manufacturers to meet the diverse demands of customers. Techniques such as anti-corrosion protection, nano-coatings, and low-VOC coats have paved the way to greater profits. Innovations in nanotechnology have allowed paint developers to formulate products that exhibit self-healing characteristics, conduct electricity, and offer greater protection against UV rays. These products offer greater resistance to wear and tear, corrosion, and scratches. Nano-paints can be integrated with various metals and ceramics that provide beneficial properties. The movement to "go green" has spawned several environmentally conscious coatings and paints. House paints that are hypoallergenic, volatile organic compound (VOC) free, and solar reflectant are all new items on the market. Another way these paints help businesses save money is by being less expensive.

Many different companies compete for customers' business in India's paint industry. Among the leading companies in this industry are Pidilite Industries, Asian Paints, Berger Paints, Kansai Nerolac Paints, and Akzo Nobel India. Efforts by these industry heavyweights to reduce heat transfer during industrial processes have yielded multi-functional coats, thanks to substantial investments in R&D. Growth in the sector, more jobs, and advantages for many consumers are all results of these factors.

3.2. The performance and contribution to Indian Economy

An important part of India's economy, the paint industry has a wide range of effects thanks to its many different products and services. Characterized by consistent growth, the industry comprises two major segments: decorative paints for consumers and industrial coatings for diverse applications. In terms of economic significance, the paint industry's revenue generation fosters substantial contributions to the nation's GDP, while also bolstering tax revenues. This vibrant sector acts as a significant employment generator, spanning a wide spectrum from manufacturing to distribution, encompassing both direct and indirect employment opportunities. With its reach extending beyond domestic boundaries, Indian paint manufacturers are making strides in international markets, fortifying foreign exchange earnings and trade balances. Moreover, the industry plays a pivotal role in the construction and infrastructure sectors, its paints safeguarding structures while simultaneously enhancing their aesthetic appeal. The Indian paint industry has been and will continue to be an important part of the country's development story, meaning it will play an important role in driving innovation, creating jobs, and increasing GDP.

Table 1: Results and impact on India's economic situation from the paint industry

Year	Market Size (INR crores)	Growth Rate (%)	Contribution to GDP (%)
2019	48,000	11.4	0.5
2020	54,000	12.5	0.6
2021	62,000	13.0	0.7
2022	70,000	12.0	0.8
2023(Estimated)	78,000	11.0	0.9
2024 (Forecast)	86,000	10.0	1.0

Source: Statista

Table 1 displays data from the Indian paint market is growing rapidly, with a market size of INR 48,000 crores in 2019 and projected to reach INR 86,000 crores by 2024. The growth rate is also impressive, at 11.4 percent in 2019 and projected to reach 10.0percent in 2024. The contribution to GDP is also significant, at 0.5 percent in 2019 and projected to reach 0.9 percent in 2024.

Due to the difficult economic circumstances felt by a significant part of the internal economic status, the paint industry continued to face unfavorable market circumstances in 2020. The abbreviated festival season, relative to the prior financial year, along with the prolonged rainy weather in various regions of the India, adversely affected paint market in the economy. Furthermore, the national market's requirement for decorative and use of paint for the industry was further compressed due to the restrictive financing situations experienced by real property and infrastructural developers as a consequence of the shortage of funds impacting the non-banking financial services industry. Over the course of the year, the automobile coating industry's major operators felt the effects of persistently falling demand in the vital automobile industry. To further limit the pandemic's spread, the government unexpectedly closed down every source of supply in the last two weeks of the fiscal year. A significantly slower pace of growth for the paint industry was thus recorded at the end of the year relative to the prior year. Despite the challenging economic climate, the paint sector was able to preserve its operational profits and even assist the declining demand by offering reduced rates to consumers. This was made possible by the relatively inexpensive cost of the basic supplies.

To alleviate the complexities of the painting technique for customers, paint firms implemented measures to streamline the procedure by offering painting assistance. Although Asian Paints has provided painting assistance for numerous years, Berger Paints innovated the concept of Xpress Painting. After the COVID-19 pandemic, paint manufacturers responded by implementing new precautionary procedures and measures to allay consumer fears of having strangers (painters) work on their homes. Many paint manufacturers, including industry heavyweights, also developed a line of sanitizers and disinfection agents. The Indian paint and coating industry had a downturn in 2021 and 2022 due to the pandemic, but strong demand for paint and coating products in the construction and automotive sectors contributed to the industry's recovery. Volumes for all of the paint producers soared to new highs. Here, PPCJ presents an overview of the country's paints & coating industry. The Indian paint & coating industry, roughly valued at US$8bn, has registered mixed growth during the last few years. After being affected by COVID disruption in 2020 and the first half of 2021, the industry started to gain momentum during the second half of 2021. In contrast, 2022 has proved to be a year of steady growth for the industry. In terms of volume, the architectural section is responsible for about 69% of the India's paint usage, while the industrial segment is responsible for 31% of them of the paints and coatings produced in this nation. During the last five years, the architectural section's participation has dropped from 73% to 69%, suggesting that industrial sub-segments like automotive have increased their consumption. This bodes well for the forthcoming success of the country's paints and coatings industry as a whole. The paint and coatings industry in India is currently worth INR620bn (US$7.70bn), but according to the Indian Paint Association, it will reach INR1000bn (US$12.34bn) in the subsequent five-year period. With the exception of 2020 and 2021, the industry has maintained a Compound Annual Growth Rate in the double digits, so this makes sense.

The entry of some large-scale paint producers (JSW Paints) and the scaling of operations by some existing mid-scale producers (Indigo Paints and Shalimar Paints) has led to stiff competition in the Indian paint & coating industry during the past two years. It is anticipated that several units in the unorganized sector will be promoted to the mid-segment category in the near future as a result of their modernized operations.

Table 2: Results for the biggest paint manufacturers in India in 2022

Company	April–December 2021 sales revenue (in Indian Rupees)	Total revenue generated from April to December of 2022	Percentage increase in sales revenue compared to the same period in 2021
Asian Paints	18.247 billion	22.363 billion	22.55pc
Berger Paints	5.813 billion	7.281 billion	25.25pc
Kansai Nerolac	4.536 billion	5.475 billion	20.70pc
Shalimar Paints*	1.561 billion	2.205 billion	41.25pc
Indigo Paints*	3.521 billion	4.666 billion	32.51pc

Source: The financial reports of all the specified companies

Displays the performance of all principal paint companies of India in 2022. The table presents the sales revenue of each company for the periods of April to December in 2021 and 2022, along with the percentage increase in sales turnover for the same timeframe in 2021.

Asian Paints is the predominant entity in the Indian paint sector, achieving sales revenue of 22.363 billion INR from April to December 2022, reflecting a 22.55 percent increase compared to the corresponding period in 2021. Berger Paints ranks second, achieving sales revenue of Rs. 7.281 billion during April-December 2022, reflecting a 25.25 percent increase compared to the corresponding period in 2021. Kansai Nerolac ranks third, achieving sales revenue of Rs. 5.475 billion from April to December 2022, reflecting a 20.70 percent increase compared to the corresponding term in 2021. Shalimar Paints occupies the fourth position, while Indigo Paints holds the fifth. The India's paint market experienced a growth of 20.70 percent from April to December 2022, primarily driven by the robust performance of Asian Paints. Berger Paints, Kansai Nerolac, Shalimar Paints, and Indigo Paints all experienced growth exceeding the market average. This growth was propelled by several factors, including robust demand from the constructions and infrastructure sectors, alongside increasing disposable incomes.

The paint industry is encountering difficulties, such as escalating costs for basic materials and intensifying competition from international entities. These challenges are expected to exert pressure on margins in the forthcoming quarters. Nonetheless, the Indian paint market is projected to sustain growth for the foreseeable future, propelled by increasing urbanization and heightened demand for decorative paints.

3.3. Architectural segment continues to dominate the paints in India & coating market

The Indian paint and coating industries have traditionally relied on the architectural sector. The sectors robust expansion in 2022 was fueled by the thriving construction industry. Due to the prolonged rainy season and shortened Diwali duration, the Indian architectural paints industry had a diminished fourth quarter, which is normally a major boom phase for the decorative paints market in the nation at large. Architectural coatings have seen significant demand in India due to the nation's robust construction pipelines, the government's lofty plans like "Housing for All," and the rapid pace of urban sprawl. India's architectural paint consumption is projected to rise in the mid to long period of time, with these aspects playing an integral part.

A nation's consumption of architectural paints is likely to increase in response to rising incomes, urbanization, and consumer spending. When it comes to this, our country is absolutely spot on. In 2022, India experienced a 6.8 percent GDP growth, accompanied by escalating urbanization and an enhancement in the ability to spend of a significant portion of the populace, thereby presenting significant potential for the rise of architectural paints. Urban development will significantly influence the expansion of the coating industry within the architectural sector. At present, 34.0 percent of the population of India inhabits urban regions. The rate of urban development has markedly accelerated in the past twenty years. This trend is expected to persist, with projections indicating that 590 million individuals will reside in urban areas by 2030, increasing to 820 million by 2050. In accordance to a 2022 UN report, by 2035, 43.2 percent of India's population is expected to live in towns and cities at the middle of the year.

Table 3: Automotive production trends in India during the last five financial years.

Category	2017-18	2018-19	2019-20	2020-21	2021-22
Passenger Vehicles	4,020,267	4,028,471	3,424,564	3,062,280	3,650,698
Commercial Vehicles	895,448	1,112,405	756,725	624,939	805,527
Three Wheelers	1,022,181	1,268,833	1,132,982	614,613	758,088
Two Wheelers	23,154,838	24,499,777	21,032,927	18,349,941	17,714,856
Quadricycles	1,713	5,388	6,095	3,836	4,061
Total	29,094,447	30,914,874	26,353,293	22,655,609	22,933,230

Source: Society of Indian Automobile Manufacturers

Automobile paint consumption in India has increased at a rapid pace due to the country's consistently rising car production over the past decade. For the foreseeable future, the country is shaping up to be an important player in the international car industry. In the next years, the demand for automotive coatings in the nation will reach new heights due to these factors. Coating product value has increased in tandem with volume in India's automotive industry, thanks to the rising 'premiumization' of the nation's car segment.

IV CONCLUSION

There has been significant growth in India's paint industry, which has boosted the country's economy, improved its infrastructure, and made it more aesthetically pleasing. The Indian paint industry is poised for great things in the future, thanks to its rapid growth, technological advancements, and more conscientious consumers. The achievement in the industry will be driven by innovation, sustainability, and adaptability. But there are still obstacles, like the ever-changing prices of raw materials, the need to comply with regulations, and worries about sustainability. Stakeholders must maintain investments in R&D, sustainable practices, and strategic partnerships to overcome these obstacles and reach its full potential. There is a fantastic opportunity for the paint industry to influence the visual landscape of India and contribute to the country's economic growth as the middle class expands and individuals become more interested in design and construction.

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Return Migration and Remittance Use in Reshaping Kerala's Rural Economy: An Analysis of Economic Transformation and Rural Development Patterns (1998-2023)

Sinitha Xavier

Assistant Professor, Research Dept. of Economics, P.M Govt. College, Chalakudy, Kerala, India.

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Abstract

This study examines the association between return migration, remittance utilization, and Kerala's rural economic transformation from 1998 to 2023, utilizing data from nine rounds of the Kerala Migration Survey (KMS). Findings reveal that remittances increased from ₹13,652 crores in 1998 to ₹216,893 crores in 2023, representing 23.2% of the state's Net State Domestic Product (NSDP). Return migration reached 1.79 million individuals by 2023, with 38.3% increase from 2018, coinciding with COVID-19 economic disruptions. Remittance utilization patterns have shifted from consumption-oriented spending to productive investments, with 15.8% allocated to housing renovation, 14% to loan repayment, and 10% to education. Rural households with migration experience exhibit superior asset ownership, with emigrant households showing 39.7% motor car ownership compared to 23.7% among non-migrant households. The agricultural sector has transformed from traditional farming toward cash crop cultivation and service sector activities. These findings highlight the complex nature of migration-led development, offering economic benefits while creating challenges for sustainable rural development and agricultural productivity.

Keywords:- Return migration, Remittances, Rural economy, Kerala model, Gulf migration, Agricultural transformation.

I. INTRODUCTION

Kerala's development trajectory, characterized by high human development indicators despite relatively low per capita income, has been closely associated with international migration and remittance flows since the 1970s. The economy of Kerala is the 11th largest in India, with an annual gross state product (GSP) of ₹13.11 lakh crore (US$157.45 billion) in 2024–2025, while approximately 3,000,000 Keralites work abroad, primarily in Persian Gulf countries.

According to Reserve Bank of India remittance surveys, Kerala consistently ranks among India's top recipient states, with its share of inward remittances rising to 19.7% in 2023-24 from approximately 10% in 2020-21 (Reserve Bank of India, 2025). The COVID-19 pandemic introduced new dynamics, with 1.4 million non-resident Keralites returning to the state (Rajan, 2024).

This phenomenon aligns with the Harris-Todaro model of rural-urban migration, extended to international contexts, where expected wage differentials drive migration decisions d

espite unemployment risks in destination areas. In the Harris-Todaro framework, the migration equilibrium condition can be expressed as:

$$w_r = p * w_u$$

where W_r represents rural wage, W_u represents urban (or international) wage, and p represents the probability of finding employment in the destination.

Kerala's rural transformation represents a unique case where international remittances have functionally substituted for domestic capital formation, creating what economists term a "remittance-dependent growth model." The state's experience challenges conventional development paradigms by achieving substantial welfare improvements through labor export rather

than industrialization. Such migration-induced structural transformation raises questions about long-term economic sustainability and the potential for Dutch disease effects in non-tradable sectors. Understanding these dynamics becomes crucial as other developing regions experience similar demographic transitions and seek to harness migration benefits while avoiding dependency traps.

II. LITERATURE REVIEW

2.1. Theoretical Framework and Economic Models

The relationship between migration and economic development has been examined through multiple theoretical frameworks. The New Economics of Labor Migration (NELM) theory posits that migration decisions are made by households rather than individuals, with remittances serving as insurance mechanisms and capital for investment (Stark & Bloom, 1985). In the NELM framework, household utility maximization can be represented as:

$$Max\ U(C, \sigma^2) = U(E(Y), Var(Y))$$

where U represents household utility, C represents consumption, σ^2 represents income variance, E(Y) represents expected income, and Var(Y) represents income variance. Migration occurs when it reduces income variance while maintaining or increasing expected income.

Migration systems theory emphasizes the interconnected nature of origin and destination areas, creating self-perpetuating migration flows through network effects (Massey et al., 1993). Kerala's Gulf migration corridor demonstrates this dynamic, with established networks maintaining migration despite changing economic conditions.

The remittance-development relationship can be modeled through a simple macroeconomic framework where:

$$Y = C + I + G + (X - M) + R$$

where Y represents total output, C represents consumption, I represents investment, G represents government spending, (X - M) represents net exports, and R represents remittance inflows. In Kerala's case, R has become a substantial component of aggregate demand.

Zachariah, Mathew, and Rajan (2001) characterized migration as "the single most dynamic factor in an otherwise dreary development scenario in Kerala during the last quarter of the twentieth century" (p. 58). The literature identifies four channels through which migration impacts economic performance: human capital formation effects, brain drain consequences, diaspora network benefits, and remittance flows (Rajan & Zachariah, 2019).

Kerala's experience corresponds to the "migration-led development" model, where remittances generated by Malayalee migrants in West Asia contributed to state economic growth and led Kerala to a high growth phase by the late 1980s. This transformation was characterized as 'virtuous growth' by the Centre for Development Studies (2005).

2.2. Remittances and Rural Economic Transformation

Empirical studies demonstrate positive associations between remittances and household welfare indicators. Sunny, Parida, and Azurudeen (2020) found that "remittances improved households' per capita income and changed their spending patterns," with remittance-receiving households allocating "a relatively larger share of monthly income on the consumption of non-food durable goods" (p. 352).
The consumption function for remittance-receiving households can be expressed as:

$$C = \alpha + \beta_1 Y_d + \beta_2 R + \varepsilon$$

where C represents consumption, Y_d represents domestic income, R represents remittances, α represents autonomous consumption, β_1 and β_2 represent marginal propensities to consume from domestic income and remittances respectively, and ε represents the error term.

The macroeconomic implications are substantial. Zachariah and Rajan (2010) documented that remittances constituted nearly one-third (31%) of Kerala's Net State Domestic Product (NSDP), highlighting migration's critical role in state economic performance. However, this dependence raises sustainability questions, as noted by the Kerala State Planning Board's recommendation that "the state should look for other reliable sources instead of relying on remittances to finance its expenditure" (Economic Review, 2023).

2.3. Agricultural Sector Transformation

Kerala's agricultural sector has undergone substantial structural changes concurrent with increased migration. The contribution of agriculture to the state's GSDP declined from 52% in 1960-61 to 10.58% in 2016-2017 (Centre for Public Policy Research, 2019). This decline reflects broader economic transformation, with food crops like rice, tapioca, and pulses accounting for only 10.21% of total cultivated area, while cash crops dominate with 62% share.
The agricultural transformation can be modeled through a land allocation function:

$$L_c = f(P_c, P_f, L_r, k_r)$$

where L_c represents land allocated to cash crops, P_c represents cash crop prices, P_f represents food crop prices, L_r represents labor costs, and K_r represents capital from remittances.

The shift toward cash crops and away from food production has been associated with labor shortages in traditional agriculture due to emigration. Studies document that "agricultural activities have ceased in most parts, partly related to the unsustainable labor charges leading to a shift to less labor-intensive cash crops" (Centre for Public Policy Research, 2019).

2.4. Comparative Context

Kerala's experience shares similarities with other major remittance-receiving regions globally. Like the Philippines, Kerala has developed systematic approaches to managing migration through institutional mechanisms. However, unlike Punjab's predominantly North American migration corridor, Kerala's Gulf-focused migration involves different skill profiles and temporary migration patterns.

III. METHODOLOGY

3.1. Data Sources

This study utilizes data from the Kerala Migration Survey (KMS), a longitudinal study conducted since 1998 by K.C. Zachariah and S. Irudaya Rajan. The KMS represents one of the most comprehensive migration datasets available for any developing region, with consistent methodology across nine survey rounds. The KMS 2023 was conducted by the Gulati Institute of Finance and Taxation (GIFT) with technical support from the International Institute of Migration and Development (IIMAD), covering 20,000 households across 14 districts and 77 Taluks using stratified multistage random sampling.

The survey methodology ensures representativeness across rural and urban areas, with each of the 14 districts' rural and urban areas treated as distinct strata, resulting in 28 strata total. A total of 500 localities were selected statewide, with 40 households identified within each locality using systematic random sampling.

Additional sources include Reserve Bank of India remittance surveys and bulletins, Kerala State Planning Board economic reviews, and Census of India demographic data.

3.2. Operational Definitions

Return migrants are operationally defined as individuals who have returned to Kerala after working abroad for at least six months, regardless of whether their return is permanent or temporary. *Remittances* include both formal transfers through banking channels and informal transfers through personal networks, though the latter may be underestimated due to reporting limitations.

3.3. Analytical Approach

The study employs trend analysis for longitudinal patterns, comparative analysis across household migration types, descriptive statistics for demographic profiling, and macroeconomic assessment of remittances' contribution to state domestic product. Given the observational nature of the data, the analysis focuses on associations rather than causal relationships.

3.4. Limitations

This study acknowledges several limitations:

- Cross-sectional survey design limits causal inference capabilities
- Self-reported data may contain response bias
- Informal remittance channels (hawala, cryptocurrency) may be underestimated
- Agricultural impact assessment is constrained by data availability
- Potential endogeneity between migration decisions and economic outcomes is not addressed.

IV. RESULTS

4.1. Evolution of Migration Patterns (1998-2023)

Table 1. Trends in Emigration from Kerala, 1998-2023

Year	Emigrants (millions)	95% CI	Percentage change	GCC destinations
1998	1.36	1.31-1.41	-	93.8%
2003	1.84	1.78-1.90	+35.0%	89.0%
2008	2.19	2.12-2.26	+19.3%	88.6%
2013	2.40	2.33-2.47	+9.4%	86.3%
2018	2.12	2.06-2.18	-11.6%	89.2%
2023	2.15	2.09-2.21	+1.5%	80.5%

Source: Compiled from Zachariah & Rajan (2015); Rajan & Zachariah (2019); Rajan (2024)

A notable shift in destination preferences has emerged, with GCC country preference declining from 89.2% in 2018 to 80.5% in 2023, while non-GCC destinations increased from 10.8% to 19.5%. Student migration doubled from 129,763 in 2018 to approximately 250,000 in 2023, representing 11.3% of total emigrants.

Table 2. Gender and Educational Composition of Emigrants, 2018 vs 2023

Characteristic	2018	2023	Change	Statistical Significance
Female emigrants	15.8%	19.1%	+3.3%	$p<0.01$
Female emigrants with degree+	68.2%	71.5%	+3.3%	$p<0.05$
Male emigrants with degree+	32.1%	34.7%	+2.6%	$p<0.05$

Source: Rajan & Zachariah (2019); Rajan (2024)

4.2. Return Migration Trends

Return migration increased substantially, reaching 1.8 million by 2023, representing a 38.3% increase from 1.2 million in 2018 (Rajan, 2024). This increase coincided with global economic disruptions associated with the COVID-19 pandemic.

Table 3. Primary Reasons for Return Migration, 2023

Reason	Percentage	Category	Economic Impact
Lost job/laid off	18.4%	Economic	High negative
Prefer working in Kerala	16.1%	Preference	Potentially positive
Low wages	13.8%	Economic	Moderate negative
To retire	12.1%	Life cycle	Neutral
Illness/accident	11.2%	Health	Mixed
Homesickness	10.2%	Social	Neutral

Source: Rajan (2024)

4.3. Remittance Flows and Economic Impact

Table 4. Macroeconomic Impact of Remittances, 1998-2023

Year	Remittances (₹ crores)	NSDP (₹ crores)*	% of NSDP	Per capita income (₹)
1998	13,652	53,552	25.5%	16,062
2008	43,288	140,889	30.7%	41,814
2018	85,092	632,093**	13.5%	179,523
2023	216,893	933,564	23.2%	263,945

Source: Kerala Economic Reviews; Rajan (2024) *Note: *2011-12 base year implementation affects comparability

Remittances increased by 154.9% between 2018 and 2023. The average remittance per emigrant household rose from ₹96,185 in 2018 to ₹223,729 in 2023, representing a real increase of approximately 132% (adjusted for inflation).

4.4. Remittance Utilization Patterns

Table 5. Distribution of Remittance Utilization, 2023

Utilization Category	Percentage	Median Amount (₹)	Investment Type
Renovation of house/shop	15.8%	250,000	Capital
Pay off bank loans	14.0%	60,000	Debt reduction
Education	10.0%	10,000/month	Human capital
Savings as cash	9.9%	50,000	Precautionary
Health & medical	7.7%	5,000/month	Human capital
Day-to-day expenses	6.9%	7,000/month	Consumption

Source: Rajan (2024)

Productive investments (capital formation, debt reduction, human capital) account for 49.7% of remittance utilization, compared to immediate consumption (14.6%).

4.5. Rural Economic Transformation

Table 6. Asset Ownership by Household Migration Status, 2023

Asset	Non-Migrant	Emigrant	Return Emigrant	Out-migrant	Chi-square p-value
Motor Car	23.7%	39.7%	33.4%	42.6%	p<0.001
Refrigerator	67.1%	85.2%	82.5%	85.7%	p<0.001
Washing Machine	34.6%	60.8%	49.1%	54.2%	p<0.001
Air Conditioner	7.5%	21.0%	13.4%	15.7%	p<0.001
Computer/Laptop	11.0%	18.5%	15.0%	23.5%	p<0.001

Source: Rajan (2024)

Table 7. Agricultural Land Ownership and Productivity Indicators, 2023

Land Size (cents)	Non-Migrant	Emigrant	Avg. Productivity (₹/cent)	Crop Pattern
<10	61.8%	43.6%	8,500	Mixed/subsistence
10-50	28.7%	44.3%	12,000	Cash crops dominant
50-100	4.8%	5.9%	15,500	Commercial farming
>100	4.7%	6.2%	18,000	Plantation crops

Source: Rajan (2024); Kerala Agricultural Statistics

4.6. Socio-economic Outcomes

Table 8. Income, Expenditure, and Savings by Household Type, 2023

Household Type	Median Income (₹)	Median Expenditure (₹)	Savings Rate	Food Security Index
Non-Migrant	15,000	10,000	33.3%	0.72
Emigrant	30,000	15,500	48.3%	0.89

Return Emigrant	20,000	13,000	35.0%	0.81
Out-migrant	25,000	14,000	44.0%	0.85

Source: Rajan (2024)

V. DISCUSSION

5.1. Migration-Led Rural Transformation

Kerala's rural economy has undergone substantial transformation associated with international migration and remittance flows. This transformation extends beyond simple income effects to encompass structural changes in economic activities, asset accumulation patterns, and social priorities. The shift from consumption-oriented to investment-oriented remittance utilization (49.7% productive investments) indicates maturation in the migration-development relationship, consistent with NELM predictions about household-level investment strategies.

The emergence of student migration as a component (250,000 in 2023) reflects changing household aspirations and may reduce dependency on low-skilled Gulf migration while enhancing human capital formation. This pattern aligns with migration systems theory, where established networks facilitate new forms of mobility.

5.2. Agricultural Sector Transformation and Environmental Implications

The decline in food crop cultivation and shift toward cash crops represents a rational economic response to changing factor costs and market opportunities. However, this transformation raises concerns about food security and environmental sustainability. Kerala's specialization in high-value crops like pepper (97% of national output) and rubber (85% of national area) aligns with comparative advantages but increases vulnerability to global commodity price fluctuations.

The shift from food crops (10.21% of cultivated area) to cash crops (62%) has environmental implications, including increased pesticide use, monocropping practices, and reduced biodiversity. The abandonment of traditional paddy cultivation also affects groundwater recharge and ecosystem services. Value chain analysis reveals that while cash crop cultivation generates higher per-unit returns, it requires greater capital investment and technical knowledge, often accessible only to households with remittance income.

5.3. Return Migration Dynamics

The unprecedented scale of return migration following COVID-19 presents both opportunities and challenges. Return migrants bring accumulated capital and skills that could stimulate local economic development. However, the predominantly job-loss driven nature of recent returns (18.4% citing unemployment) may limit immediate productive investment capacity.

The higher median income of return emigrant households (₹20,000) compared to non-migrants (₹15,000) suggests successful capital accumulation during migration periods. However, reintegration challenges include skill mismatches, limited local employment opportunities, and adjustment difficulties after extended periods abroad.

5.4. Comparative Analysis with Other Indian States

Kerala's experience differs from other major remittance-receiving states. Punjab's migration is predominantly to North America and involves permanent settlement patterns, resulting in different remittance characteristics. Tamil Nadu receives more diverse remittance sources due to its large diaspora across multiple countries. Kerala's Gulf-focused migration involves temporary migration with higher return rates, affecting investment patterns and local economic impacts.

Compared to international cases, Kerala's institutional response through the Department of Non-Resident Keralites Affairs mirrors the Philippines' systematic approach to migration management, but differs from Bangladesh's less coordinated system. Kerala's human development outcomes surpass most comparable regions.

5.5. Policy Implications

The findings suggest policy directions for maximizing development benefits while addressing sustainability concerns:

- *Economic Diversification Strategy*: Reducing over-dependence on Gulf migration through promoting alternative destinations and comprehensive skill development programs
- *Agricultural Modernization and Sustainability*: Supporting technology adoption, sustainable farming practices, and value chain development to maintain agricultural viability despite labor shortages
- *Return Migrant Integration Programs*: Developing targeted entrepreneurship support, skill certification, and investment facilitation mechanisms
- *Rural Infrastructure Enhancement*: Improving connectivity, digital infrastructure, and financial services to support remittance-funded development
- *Financial Inclusion and Investment Channeling*: Strengthening formal financial systems and creating investment vehicles to direct remittances toward productive sectors

5.6. Sustainability and Future Challenges

High dependence on remittances raises long-term sustainability questions. External economic shocks, changing migration policies in destination countries, demographic transitions, and potential automation in Gulf economies could affect future remittance flows. Climate change impacts on both Kerala's agriculture and Gulf economies add uncertainty.

The Kerala State Planning Board's recommendation to diversify the economic base while leveraging migration-generated capital becomes critical. The observed shift toward advanced economy destinations (UK share increasing to 10.8%) may provide more stable long-term prospects but requires different skill profiles and institutional support mechanisms.

V. CONCLUSION

This study provides comprehensive evidence of the complex associations between return migration, remittance utilization, and Kerala's rural economic transformation over 25 years. The 154.9% increase in remittances between 2018 and 2023, reaching ₹216,893 crores, underscores migration's continued importance in Kerala's economy. The evolution toward productive investment utilization (49.7% of remittances) indicates growing sophistication in household financial management.

Return migration, substantially increased during the COVID-19 period with 1.8 million returnees by 2023, presents opportunities for rural development through accumulated capital and skills transfer. However, the predominantly job-loss driven nature of recent returns requires targeted policy intervention to maximize productive potential and address reintegration challenges.

The agricultural sector transformation, while economically rational, necessitates careful management to maintain food security while capitalizing on cash crop specialization. The decline of food crops to 10.21% of cultivated area reflects changing economic priorities but raises sustainability concerns requiring policy attention.

Households with migration experience demonstrate superior outcomes across measured parameters, from asset ownership to income levels. However, these disparities also highlight potential inequality concerns within Kerala's rural society that require policy consideration.

The shift in migration destinations from GCC countries (89.2% in 2018 to 80.5% in 2023) toward advanced economies reflects broader changes in global migration patterns and Kerala's human capital development trajectory. This transition requires adaptive institutional responses and policy frameworks.

While migration-led development has achieved remarkable improvements in living standards and human development indicators, sustainability challenges necessitate economic diversification strategies. Success in managing this transition will determine whether Kerala can maintain its development achievements while building economic resilience for future challenges.

The Kerala experience offers insights for migration and development policy in other regions, demonstrating both the transformative potential and inherent complexities of migration-led rural economic development. Future research should examine long-term entrepreneurship impacts of return migration, assess reintegration program effectiveness, and evaluate sustainable development strategies in evolving global migration contexts.

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Rural Economic Transformation in South Karnataka: An Analysis of Agricultural Diversification, Income Distribution, and Livelihood Patterns (2010-2023)

Shripathi Kalluraya

Research Professor, Institute of Social Science and Humanities, Srinivas University Mangalore, Karnataka, India.

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Abstract

This study examines the rural economic transformation in South Karnataka, focusing on the districts of Bangalore Rural, Ramanagara, Mandya, Mysore, Chamarajanagar, Hassan, and Chikmagalur from 2010-2023. Using comprehensive primary and secondary data, the research analyzes agricultural diversification patterns, income distribution changes, and evolving livelihood strategies among rural households. The study employs econometric analysis including Gini coefficient calculations, diversification indices, and regression modeling to assess economic transformation. Findings reveal significant shifts from traditional crops to high-value agriculture, with coffee and horticulture showing robust growth rates of 4.2% and 5.8% annually respectively. However, income inequality has widened with the Gini coefficient increasing from 0.42 to 0.51 during the study period. Non-farm employment has grown substantially, contributing 38% of total rural household income by 2023, up from 22% in 2010. The research provides evidence-based recommendations for inclusive rural development strategies that can address growing inequality while maintaining agricultural competitiveness.

Keywords:- Rural economics, agricultural diversification, income distribution, South Karnataka, livelihood transformation, non-farm employment.

I. INTRODUCTION

South Karnataka represents one of India's most economically dynamic rural regions, characterised by diverse agro-climatic conditions, proximity to major urban centres, and a legacy of progressive agricultural practices (Rao & Kumar, 2020). The region encompasses seven districts-Bangalore Rural, Ramanagara, Mandya, Mysore, Chamarajanagar, Hassan, and Chikmagalur-covering approximately 45,000 square kilometres and supporting over 8.5 million rural inhabitants whose livelihoods depend primarily on agriculture and allied activities (Census of India, 2011; Karnataka State Planning Board, 2022).

The economic landscape of South Karnataka has undergone substantial transformation over the past decade, driven by multiple converging factors including technological advancement, market integration, infrastructure development, and changing consumption patterns (Nagaraj et al., 2019). The region's strategic location, with Bangalore serving as a major IT hub and industrial centre, has created unique opportunities for rural-urban linkages and non-farm employment generation that distinguish it from other rural areas in India (Reddy & Galab, 2021). Simultaneously, favourable agro-climatic conditions, including diverse rainfall patterns ranging from 600mm in eastern districts to over 3000mm in the Western Ghats region, have enabled agricultural diversification toward high-value crops, including coffee, spices, fruits, and vegetables (Karnataka Agricultural Statistics, 2023).

The study period from 2010-2023 represents a critical phase in the region's economic evolution, marked by significant policy interventions including the implementation of various centrally sponsored schemes, state-specific agricultural reforms, and infrastructure development programs (Planning Commission, 2012; Government of Karnataka, 2018). This period also witnessed major external shocks, including the global economic crisis of 2008-2009, drought years in 2012-2013 and 2015-

2016, and the COVID-19 pandemic of 2020-2021, which provided natural experiments for understanding the resilience and adaptability of rural economic systems (Reserve Bank of India, 2021).

1.1. Research Objectives

To analyse the patterns and determinants of rural economic transformation in South Karnataka from 2010-2023, with a specific focus on agricultural diversification, income distribution changes, and livelihood strategy evolution.

II. LITERATURE REVIEW

The literature on rural economic transformation in Karnataka provides an important context for understanding the broader changes occurring in South Karnataka specifically. Vyasulu (2018) documented comprehensive changes in Karnataka's rural economy, emphasising the role of technological adoption and market integration in driving agricultural productivity improvements. The study highlighted how proximity to urban centres and improved transportation infrastructure have facilitated market access for rural producers.

Krishnamurthy and Rao (2019) analysed agricultural diversification patterns across Karnataka, demonstrating significant shifts toward high-value crops in regions with favourable market access and irrigation facilities. Their research revealed that districts closer to urban centres showed greater diversification success, though benefits were not uniformly distributed across different farmer categories.

Subramanian et al. (2020) investigated income inequality trends in rural Karnataka, documenting widening disparities between different occupational groups and landholding categories. Their analysis revealed that while average incomes increased substantially, the distribution of benefits favoured larger landholders and those with access to non-farm employment opportunities.

Hegde and Kumar (2021) examined non-farm employment growth in rural Karnataka, highlighting the significant contribution of construction, trade, and services sectors to rural household incomes. Their study demonstrated that non-farm activities provided crucial income stability during agricultural downturns and drought years.

However, comprehensive analysis focusing specifically on South Karnataka's unique economic characteristics and transformation patterns remains limited in existing literature. Most previous studies have adopted state-level or crop-specific approaches, leaving gaps in understanding regional dynamics and inter-district variations. This study addresses these gaps by providing a focused analysis of South Karnataka's rural economic transformation with a detailed examination of spatial and temporal patterns.

III. STUDY AREA AND METHODOLOGY

3.1. Study Area Characteristics

South Karnataka encompasses seven districts with distinct geographical, climatic, and economic characteristics that influence rural economic patterns. The region can be broadly classified into three agro-climatic zones: the Eastern Dry Zone (Bangalore Rural, Ramanagara, Mandya), the Southern Dry Zone (Mysore, Chamarajanagar), and the Hill Zone (Hassan, Chikmagalur), each supporting different agricultural systems and livelihood strategies.

Table 1. District-wise Characteristics of South Karnataka Study Area

District	Area (sq km)	Rural Population (2011)	Primary Crops	Irrigation Coverage (%)	Literacy Rate (%)
Bangalore Rural	2,259	815,326	Ragi, Mulberry, Vegetables	15.2	71.8
Ramanagara	3,358	901,680	Ragi, Sugarcane, Sericulture	22.4	66.7
Mandya	4,961	1,645,215	Sugarcane, Rice, Ragi	85.6	68.4
Mysore	6,854	2,512,843	Sugarcane, Rice, Maize	45.3	71.5
Chamarajanagar	5,101	965,462	Ragi, Maize, Cotton	18.7	61.4
Hassan	6,826	1,428,359	Coffee, Arecanut, Coconut	35.8	72.9
Chikmagalur	7,201	985,318	Coffee, Cardamom, Pepper	28.4	78.4

Source: Census of India (2011), Karnataka Agricultural Statistics (2023), and District Statistical Handbooks

3.2. Data Collection and Sources

The study utilizes a mixed-method approach combining primary field surveys with comprehensive secondary data analysis. Primary data were collected through structured household surveys conducted across all seven districts during 2022-2023, covering 2,100 randomly selected rural households using stratified sampling methodology. Secondary data were obtained from multiple authoritative sources including the Directorate of Economics and Statistics (Karnataka), National Sample Survey Office, Agricultural Statistics Division, and various research institutions.

3.3. Analytical Framework

3.3.1. Agricultural Diversification Analysis

The study employs multiple measures to assess agricultural diversification:

Herfindahl Diversification Index (HDI):

$$HDI = 1 - \Sigma(Pi)^2$$

Where Pi is the proportion of area under crop i.

Simpson's Diversification Index:

$$SDI = 1 - \Sigma(Pi)^2$$

Shannon's Diversity Index:

$$H = -\Sigma(Pi \times ln(Pi))$$

3.3.2. Income Distribution Analysis

Income inequality is measured using:

Gini Coefficient:

$$G = (2/(n^2\mu)) \times \Sigma(i \times yi) - ((n+1)/n)$$

Where yi is income of household i, μ is mean income, and n is number of households.

3.3.3. Regression Analysis

Multiple regression models analyze determinants of income and diversification:

$$ln(Yi) = \alpha + \beta_1 Xi + \beta_2 Di + \beta_3 Ti + \varepsilon i$$

Where Y is household income, X represents household characteristics, D represents district dummies, and T represents time variables.

IV. RESULTS AND ANALYSIS

4.1. Agricultural Diversification Patterns

The analysis reveals significant shifts in cropping patterns across South Karnataka, with farmers increasingly moving toward high-value crops and reducing dependence on traditional cereals and millets. The diversification patterns show considerable variation across districts, reflecting differences in agro-climatic conditions, irrigation facilities, and market access.

Table 2: Crop Portfolio Changes in South Karnataka (2010-2023)

Crop Category	2010 Area (%)	2023 Area (%)	Absolute Change (%)	CAGR (%)
Food Grains	48.5	35.2	-13.3	-2.4
Sugarcane	12.8	14.6	+1.8	+1.0
Cotton	8.2	6.8	-1.4	-1.4
Coffee	6.5	9.8	+3.3	+4.2
Horticulture	15.4	24.8	+9.4	+5.8
Sericulture	4.8	5.2	+0.4	+0.6
Other Crops	3.8	3.6	-0.2	-0.4

Source: Directorate of Economics and Statistics, Karnataka (2023)

The data demonstrates substantial agricultural transformation with food grains area declining from 48.5% to 35.2%, while horticulture expanded from 15.4% to 24.8% of total cultivated area. Coffee cultivation showed robust growth with a compound annual growth rate of 4.2%, concentrated primarily in Hassan and Chikmagalur districts. Horticulture crops including fruits, vegetables, and spices exhibited the highest growth rate at 5.8% annually, driven by increasing urban demand and better price realization.

Table 3: Agricultural Diversification Indices by District (2010 vs 2023)

District	Herfindahl Index 2010	Herfindahl Index 2023	Simpson's Index 2010	Simpson's Index 2023	Shannon Index 2010	Shannon Index 2023
Bangalore Rural	0.52	0.68	0.52	0.68	1.24	1.58
Ramanagara	0.48	0.63	0.48	0.63	1.18	1.51
Mandya	0.35	0.42	0.35	0.42	0.89	1.04
Mysore	0.58	0.71	0.58	0.71	1.38	1.72
Chamarajanagar	0.61	0.74	0.61	0.74	1.42	1.79
Hassan	0.72	0.78	0.72	0.78	1.68	1.84
Chikmagalur	0.69	0.76	0.69	0.76	1.58	1.81

Source: Author's calculations based on district-wise agricultural statistics

All districts show increased diversification over the study period, with Chamarajanagar demonstrating the highest diversification levels by 2023. Hassan and Chikmagalur, traditionally coffee-dominated districts, maintained high diversification due to their mixed cropping systems combining coffee with spices, arecanut, and other plantation crops. Mandya shows the lowest diversification indices, reflecting its continued dependence on sugarcane and rice cultivation supported by extensive canal irrigation from the Krishna Raja Sagara reservoir

4.2. Income Distribution Analysis

The income distribution analysis reveals complex patterns of economic growth accompanied by increasing inequality across rural households in South Karnataka. While mean household incomes have increased substantially, the distribution of these gains has been uneven across different socio-economic categories and geographical locations.

Table 4: Rural Household Income Distribution in South Karnataka (₹ per annum)

Income Quintile	2010 Average Income	2023 Average Income	Absolute Change	Percentage Change (%)	Share of Total Income 2010 (%)	Share of Total Income 2023 (%)
Bottom 20%	28,450	45,680	17,230	60.5	6.8	5.9
Second 20%	48,620	78,950	30,330	62.4	11.6	10.2
Third 20%	72,840	125,480	52,640	72.3	17.4	16.2
Fourth 20%	108,560	198,750	90,190	83.1	25.9	25.7
Top 20%	160,230	325,460	165,230	103.1	38.3	42.0

Source: Primary household survey data (2022-23) and NSS 68th Round (2011-12)

The income distribution analysis reveals that while all quintiles experienced income growth, the benefits were disproportionately captured by higher-income households. The top quintile's share of total income increased from 38.3% to 42.0%, while the bottom quintile's share declined from 6.8% to 5.9%. The fourth quintile showed the most consistent growth pattern, maintaining its relative share while achieving substantial absolute income increases.

Table 5: Gini Coefficient and Inequality Measures by District (2010-2023)

District	Gini Coefficient 2010	Gini Coefficient 2023	Change	Palma Ratio 2010	Palma Ratio 2023	90/10 Ratio 2010	90/10 Ratio 2023
Bangalore Rural	0.38	0.48	+0.10	1.42	1.98	4.8	6.2
Ramanagara	0.41	0.52	+0.11	1.58	2.24	5.2	7.1
Mandya	0.35	0.44	+0.09	1.28	1.76	4.2	5.4
Mysore	0.43	0.53	+0.10	1.68	2.38	5.6	7.8
Chamarajanagar	0.46	0.56	+0.10	1.84	2.58	6.1	8.4
Hassan	0.39	0.47	+0.08	1.48	1.88	4.9	6.0
Chikmagalur	0.41	0.49	+0.08	1.56	2.05	5.1	6.5
Regional Average	0.42	0.51	+0.09	1.55	2.12	5.1	6.8

Source: Author's calculations based on primary survey data

All districts experienced increasing inequality during the study period, with Gini coefficients rising by 0.08 to 0.11 points. Chamarajanagar exhibits the highest inequality levels, while Mandya shows the most equitable income distribution despite increasing inequality trends. The Palma ratio and 90/10 ratio confirm these patterns, indicating that income concentration among top earners has intensified across all districts.

4.3. Livelihood Diversification and Non-Farm Employment

The analysis reveals substantial growth in non-farm employment across South Karnataka, representing a major shift in rural livelihood strategies. Non-farm activities have become increasingly important sources of household income, providing both supplementary earnings during agricultural slack seasons and primary employment for households with limited land access

Table 6: Sectoral Composition of Rural Household Income (% of Total Income)

Sector	2010	2015	2020	2023	Change 2010-2023
Crop Production	52.4	48.6	45.2	42.8	-9.6
Livestock	11.8	12.4	12.8	13.2	+1.4
Agricultural Labour	13.6	11.8	9.4	8.2	-5.4
Non-Farm Employment	22.2	27.2	32.6	35.8	+13.6
- Construction	8.4	10.2	12.1	13.4	+5.0
-Trade & Commerce	4.8	6.1	7.8	8.9	+4.1
- Transport	3.2	4.1	5.2	6.1	+2.9
- Services	5.8	6.8	7.5	7.4	+1.6

Source: Primary household survey data and NSS various rounds

Non-farm employment contribution increased from 22.2% in 2010 to 35.8% in 2023, with construction activities showing the most substantial growth. The decline in agricultural labour income reflects both mechanization trends and migration of agricultural workers to better-paying non-farm opportunities. Livestock income maintained steady growth, indicating its continued importance for household food security and as a savings mechanism.

Table 7: Non-Farm Employment Participation by Household Categories (%)

Household Category	2010 Participation Rate	2023 Participation Rate	Income Share from Non-Farm 2010 (%)	Income Share from Non-Farm 2023 (%)
Marginal Farmers (<1 ha)	68.5	84.2	45.8	62.4
Small Farmers (1-2 ha)	54.2	71.8	32.6	48.2
Medium Farmers (2-4 ha)	38.9	52.4	22.4	34.6
Large Farmers (>4 ha)	24.6	35.8	15.2	24.8
Agricultural Labourers	82.4	91.6	52.8	68.2
Other Rural Households	76.8	88.4	65.4	78.6

Source: Primary household survey data (2022-23)

Marginal farmers and agricultural labourers show the highest participation rates in non-farm employment, reflecting their limited agricultural income opportunities. The increasing dependence on non-farm income across all categories indicates structural changes in rural economy, with farming becoming less remunerative relative to other economic activities.

4.4. Regional Variations in Economic Transformation

The analysis reveals significant inter-district variations in economic transformation patterns, reflecting differences in geographical location, resource endowments, infrastructure development, and policy implementation effectiveness.

Table 8: District-wise Economic Performance Indicators (2010-2023)

District	Per Capita Income Growth (% CAGR)	Poverty Reduction (% points)	Non-Farm Employment Growth (% CAGR)	Agricultural Productivity Growth (% CAGR)
Bangalore Rural	6.8	12.4	8.4	2.1
Ramanagara	5.9	10.8	7.2	1.8
Mandya	4.2	8.6	5.1	2.8
Mysore	5.4	9.8	6.8	2.4
Chamarajanagar	3.8	6.2	4.9	1.6
Hassan	6.2	11.5	7.8	3.2
Chikmagalur	5.8	10.2	7.4	3.4

Source: District statistical handbooks and primary survey data

Bangalore Rural shows the highest per capita income growth due to its proximity to Bangalore city and associated employment opportunities. Chamarajanagar demonstrates the slowest transformation, reflecting its rain-fed agriculture dependence and limited industrial development. Hassan and Chikmagalur benefit from coffee cultivation and associated value addition activities.

4.5. Impact of Policy Interventions and External Shocks

The study period encompasses several major policy interventions and external shocks that influenced rural economic transformation patterns. The analysis assesses the differential impact of these events across districts and household categories.

Table 9: Impact Assessment of Major Events on Rural Economy

Event/Policy	Period	Primary Impact	Bangalore Rural	Ramanagara	Mandya	Mysore	Chamarajanagar	Hassan	Chikmagalur
MGNREGA Enhancement	2012-2014	Employment Generation	High	Medium	High	Medium	High	Medium	Medium
Drought Years	2012-13, 2015-16	Income Reduction	Medium	High	Low	Medium	High	Medium	High
Demonetization	2016	Liquidity Crisis	High	High	Medium	Medium	Medium	Low	Low
GST Implementation	2017	Market Integration	Medium	Medium	High	High	Low	High	Medium
COVID-19 Pandemic	2020-2021	Economic Disruption	High	High	Medium	Medium	High	Medium	Medium
Crop Insurance Expansion	2018-2021	Risk Mitigation	Medium	Medium	High	High	High	Medium	Medium

Source: Primary survey data and district administrative records. Impact Scale: Low, Medium, High based on survey responses and economic indicators

MGNREGA enhancement provided significant employment opportunities in districts with higher rural population density. Drought years severely affected rain-fed districts like Chamarajanagar and Ramanagara. The COVID-19 pandemic impacted districts with higher non-farm employment dependence more severely, while coffee-growing districts showed greater resilience due to stable international demand.

V. DISCUSSION

The comprehensive analysis of rural economic transformation in South Karnataka reveals a complex pattern of changes characterised by agricultural modernisation, livelihood diversification, and growing income inequality. The findings demonstrate that the region has experienced significant structural transformation over the 2010-2023 period, with implications extending beyond agricultural production to encompass broader socio-economic development patterns.

The agricultural diversification trends indicate rational farmer responses to changing market conditions and risk perceptions. The substantial shift from food grains to high-value crops reflects improved market access, better price realisation, and changing consumption patterns driven by urbanisation and rising incomes. The growth in horticulture and coffee cultivation demonstrates successful adaptation to comparative advantages, with farmers capitalising on favourable agro-climatic conditions and proximity to urban markets. However, this diversification has not been uniform across districts, with areas possessing better irrigation facilities and market connectivity showing greater success in transitioning to high-value agriculture.

The increasing agricultural diversification indices across all districts suggest that farmers are adopting risk-mitigation strategies through crop portfolio optimisation. This trend is particularly pronounced in districts with variable rainfall patterns, where diversification provides insurance against weather-related crop failures. The higher diversification levels in Hassan and Chikmagalur reflect their traditional mixed farming systems, while the lower but improving indices in Mandya indicate gradual movement away from sugarcane monoculture despite favourable irrigation conditions.

The income distribution analysis reveals concerning trends of increasing inequality despite overall income growth. The widening Gini coefficients across all districts indicate that the benefits of economic transformation have been disproportionately captured by higher-income households, potentially creating social tensions and limiting the sustainability of growth patterns.

The concentration of income gains among the top quintile suggests that access to productive assets, education, and market opportunities remains unevenly distributed across rural populations.

The differential income growth rates across quintiles highlight the importance of asset ownership and human capital in determining household welfare outcomes. Higher-income households have been better positioned to capitalise on new economic opportunities, including high-value agriculture, non-farm employment, and business ventures. Conversely, lower-income households, particularly those dependent on agricultural labour and marginal farming, have experienced slower income growth despite absolute improvements in their economic status.

The substantial growth in non-farm employment represents perhaps the most significant structural change in South Karnataka's rural economy. The increase from 22.2% to 35.8% of total household income demonstrates the increasing integration of rural areas with the broader economy. This transformation reflects both push factors, such as declining profitability of small-scale agriculture, and pull factors, including expanding employment opportunities in construction, trade, and services sectors driven by overall economic growth and urbanization.

The higher participation rates of marginal farmers and agricultural labourers in non-farm employment indicate that these activities serve as crucial livelihood strategies for households with limited agricultural resources. Non-farm employment provides income stability during agricultural slack seasons and offers alternative livelihood options for households facing land constraints. However, the quality and stability of non-farm employment vary significantly, with many activities concentrated in informal sectors without adequate social security coverage.

The regional variations in economic transformation reflect the complex interplay of geographical location, resource endowments, and policy implementation effectiveness. Bangalore Rural's superior performance demonstrates the advantages of proximity to major urban centers, which provides access to employment opportunities, markets, and services. The slower transformation in Chamarajanagar highlights the challenges faced by districts with limited irrigation, poor connectivity, and dependence on rain-fed agriculture.

The differential impact of external shocks across districts reveals varying levels of economic resilience and adaptive capacity. Districts with more diversified economies and better infrastructure showed greater ability to withstand and recover from adverse events. The COVID-19 pandemic particularly highlighted the vulnerability of households dependent on non-farm employment, as many lost jobs during lockdown periods, forcing them to return to agricultural activities.

The policy intervention analysis suggests that while various programs have contributed to rural development, their effectiveness has been limited by implementation challenges and targeting issues. MGNREGA has provided crucial employment support, particularly in districts with limited economic opportunities, but its impact on long-term skill development and economic transformation remains limited. Crop insurance schemes have helped mitigate agricultural risks, though coverage gaps and claim settlement delays continue to constrain effectiveness.

The findings have important implications for understanding rural economic transformation processes in developing countries more broadly. The South Karnataka experience demonstrates that proximity to urban centres and favourable policy environments can accelerate rural economic transformation, but benefits may not be equitably distributed across all population segments. The increasing importance of non-farm employment highlights the need for rural development strategies that extend beyond agriculture to encompass broader economic activities.

The growing income inequality observed across all districts suggests that market-driven economic transformation alone may not ensure inclusive development. The concentration of benefits among higher-income households indicates the importance of complementary policies addressing asset distribution, human capital development, and access to productive opportunities for marginalized populations.

The research also highlights the importance of regional heterogeneity in rural economic transformation. The differential performance across districts demonstrates that one-size-fits-all policy approaches may not be effective, requiring instead context-specific interventions that account for local resource endowments, geographical characteristics, and development constraints.

The sustainability of current transformation patterns remains a critical concern. The increasing dependence on non-farm employment, while providing short-term income benefits, may create vulnerabilities if economic growth slows or if these sectors fail to provide adequate employment opportunities. Similarly, the shift toward high-value agriculture, while economically beneficial, may increase environmental pressures and resource sustainability challenges.

The analysis reveals that successful rural economic transformation requires careful balance between promoting economic growth and ensuring inclusive development. The South Karnataka experience provides valuable lessons for other regions undergoing similar transitions, emphasizing the importance of addressing inequality concerns while maintaining competitive advantages in agricultural and non-agricultural sectors.

VI. CONCLUSION

This comprehensive analysis of rural economic transformation in South Karnataka from 2010-2023 reveals a region undergoing significant structural change characterized by agricultural diversification, livelihood strategy evolution, and growing income inequality. The research demonstrates that while the region has achieved substantial economic growth and development progress, the distribution of benefits has been uneven across different population segments and geographical areas.

The agricultural sector has shown remarkable adaptability, with farmers successfully shifting from traditional crops toward high-value agriculture including horticulture and coffee cultivation. This diversification has been driven by market opportunities, technological advancement, and changing risk perceptions, resulting in improved farm incomes and enhanced agricultural competitiveness. However, the benefits of diversification have been primarily captured by farmers with adequate landholdings, irrigation access, and market connectivity.

The growth of non-farm employment represents a fundamental shift in rural livelihood patterns, with such activities contributing over one-third of total household income by 2023. This transformation has provided crucial income opportunities for marginal farmers and agricultural labourers, reducing their dependence on agriculture and providing alternative livelihood options. However, the quality and stability of non-farm employment remain concerns, with many activities concentrated in informal sectors.

Income inequality has increased across all districts, with Gini coefficients rising substantially during the study period. This growing inequality reflects differential access to productive assets, education, and market opportunities, suggesting that market-driven transformation alone may not ensure inclusive development. The concentration of income gains among higher-income households indicates the need for targeted interventions addressing asset distribution and capability building for marginalised populations.

Regional variations in transformation patterns highlight the importance of geographical location, resource endowments, and infrastructure development in determining economic outcomes. Districts closer to urban centres have experienced faster transformation, while those dependent on rain-fed agriculture have shown slower progress, indicating the need for context-specific development strategies.

The research provides several important policy implications for promoting inclusive rural development. First, agricultural development strategies should focus on improving market access and irrigation facilities for small and marginal farmers to enable their participation in high-value agriculture. Second, skill development programs should be strengthened to improve the quality of non-farm employment opportunities and provide better livelihood options for rural populations.

Third, social protection mechanisms should be enhanced to address growing inequality and provide safety nets for vulnerable populations. Fourth, infrastructure development should be prioritized in lagging districts to improve their integration with broader economic opportunities. Finally, environmental sustainability concerns should be integrated into development planning to ensure long-term viability of current transformation patterns.

The findings contribute to broader understanding of rural economic transformation processes in developing countries, demonstrating both the opportunities and challenges associated with market-driven development. The South Karnataka experience provides valuable lessons for other regions undergoing similar transitions, emphasising the importance of balancing economic growth objectives with social equity concerns.

Future research should focus on longitudinal analysis of household welfare trajectories, environmental sustainability assessment of agricultural diversification patterns, and evaluation of policy intervention effectiveness in addressing inequality and promoting inclusive development. Such research would provide deeper insights into the long-term sustainability and social implications of rural economic transformation processes.

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