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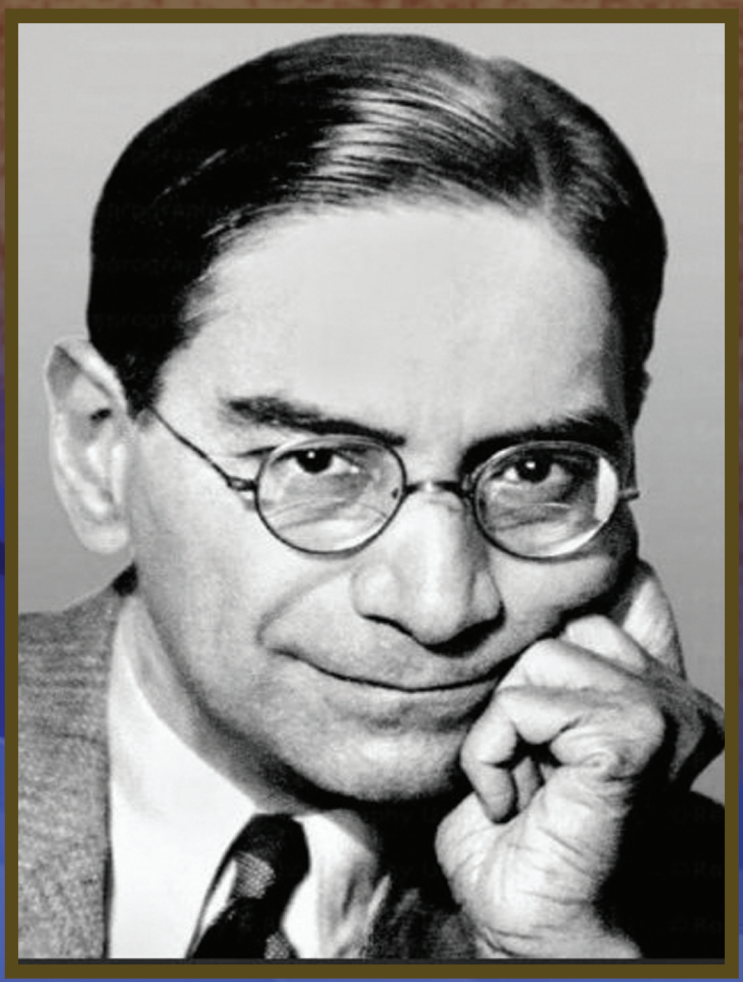
SAMIKSHYA

(*DE & S Journal of Socio-economic Issue*)

19th STATISTICS DAY,2025



Tribute to
Late Prof. P.C. Mahalanobis
Father of Indian Statistics

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PLANNING AND CONVERGENCE DEPARTMENT
GOVERNMENT OF ODISHA.

Volume 14 *June 2025*

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Editorial....

This edition of "***Samikshya"*** is dedicated to the theme of this year's National Statistics Day—"75 Years of the National Sample Survey (NSS): Strengthening Data for Inclusive Governance and Sustainable Development." We take immense pride in commemorating the Diamond Jubilee of the National Sample Survey (NSS), a visionary initiative launched in 1950 by the legendary statistician Prof. P.C. Mahalanobis.

Over the past seven and a half decades, the NSS has become the backbone of India's statistical system—providing high-quality, disaggregated, and policy-relevant data across key areas such as consumption, employment, health, education, and social equity. Its role in shaping evidence-based policymaking and inclusive governance has been unparalleled.

As we celebrate 75 years of this landmark institution, we also reaffirm our collective resolve to strengthen a data-driven, accountable, and inclusive governance ecosystem—aligned with the aspirations of *Viksit Bharat @2047* and *Viksit Odisha @2036*. In this context, the relevance of timely, reliable, and contextual data—particularly in the era of the Sustainable Development Goals (SDGs)—has never been more critical.

This commemorative issue delves into some of the most pressing development themes of our time—employment transitions, informality, women's workforce participation, fertility patterns ,changing consumption trends, and water body mapping—drawing from rich datasets like the NSS, PLFS, and NFHS.

Odisha has marked this historic milestone through a series of initiatives: in capacity-building workshops, and the adoption of advanced tools such as CAPI, GPS technologies, and the e-Sigma portal, in collaboration with the Ministry of Statistics & Programme Implementation (MoS&PI). These steps aim to bolster data integrity, transparency, and timeliness at every level.

While data-driven decision-making enhances accuracy and accountability, it must be balanced with qualitative insights, contextual knowledge, and human judgement. Statistics reveal the 'what', but understanding the 'why' often requires lived experiences and local perspectives. Over-reliance on quantitative indicators alone risks producing incomplete or even misinformed policies.

This edition of "*Samikshya* " stands as both a tribute to the enduring legacy of the NSS and a reaffirmation of the transformative power of statistics in creating a just, inclusive, and data-empowered future for all.

(Dr. Bijaya Bhusan Nanda)
Editor-in-Chief

Acknowledgement.....

My sincere acknowledgement to

- **The Editorial Board,**
- **The Article Contributors.**

Editorial Board

Editors' Pen…

It gives us immense pleasure to present **SAMIKSHYA 2025**, a platform dedicated to advancing the disciplines of economics and statistics through research that is both rigorous and policy-relevant. In an era marked by rapid transformation and growing developmental challenges, this volume captures insightful analysis, empirical evidence, and forward-thinking perspectives aimed at supporting data-driven decision-making and fostering good governance.

This edition brings together a wide range of scholar contributions that delve into pressing sectoral issues, as well as emerging areas in administrative statistics and economic planning. Our aim is to promote research that not only enhances understanding but also provides practical, actionable solutions for inclusive and sustainable development.

We extend our heartfelt appreciation to the eminent professors, expert faculty members, government officers, and professionals from the fields of economics, statistics, and allied social sciences whose valuable contributions have enriched this volume. Their active engagement reflects the essential collaboration between academia, public administration, and policy practice.

We also welcome the continued feedback and suggestions of our esteemed readers, whose insights inspire us to maintain the quality relevance, and impact of **SAMIKSHYA** in the years to come.

– Editorial Board

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Contents

Happy, Healthy, & Wealthy Village: A Vision for Rural Well-Being and Nation Building

Dr. Bijaya Bhusan Nanda

अयं निजः परो वेति गणना लघुचेतसाम्। उदारचरितानां तु वसुधैव कुटुम्बकम्॥
"He is mine, he is another's; such considerations are for narrow-minded people. But for the magnanimous, broad-minded the entire world is one family."

Maha Upanishad

Abstract

The "Happy, Healthy, and Wealthy Village" vision redefines rural Odisha by fostering resilient, inclusive communities through holistic well-being. With 83.3% of Odisha's population residing in 53.8 thousand villages, this approach integrates economic prosperity, social cohesion, and environmental sustainability to uplift rural life. Emphasizing dignity, health, and joy, it moves beyond infrastructure to empower individuals and strengthen community bonds, inspired by the principle of "One Earth, One Family."

Key strategies involve fostering social connectedness, ensuring equitable access to resources for all, and building resilience with sustainable practices. This will lead to creation of an inclusive, thriving villages that empower individuals and communities. Granular, regular village-level surveys are required to facilitate data-driven governance, optimize resource allocation and tailor interventions for happy, healthy, and prosperous villages and communities. In essence, this vision transforms villages into vibrant ecosystems, creating enduring hubs of prosperity and well-being that fortify communities for generations, aligning with India's broader development goals.

Introduction

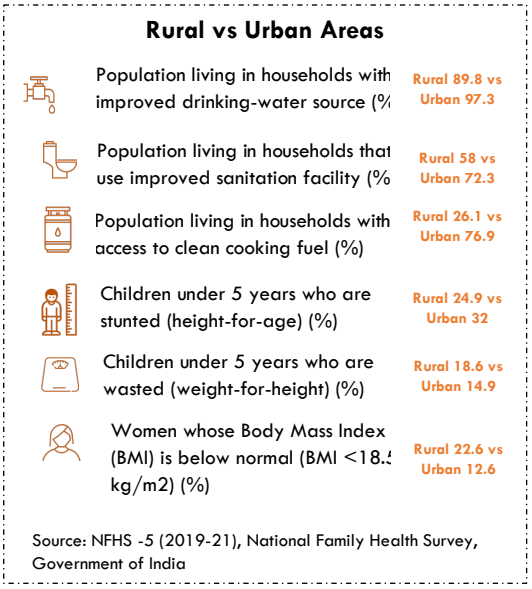
India's 5.9 lakh villages form the backbone of its rural landscape, playing a vital role in the nation's economic vitality and cultural richness. With over 60% of the population expected to remain in rural areas, even in 2030 (Economic Survey 2023–24), rural development is integral to India's future progress. In states like Odisha, rural areas dominate with 53.8 thousand villages housing 83.3% of the state's population[1]. This demographic reality emphasizes the importance of focusing on well-being in rural areas through holistic development, seamlessly blending economic progress, equity in outcomes with infrastructural modernization for sustainable growth.

[1] India Census 2011

[2] Piped water into dwelling/yard/plot, piped to neighbor, public tap/standpipe, tube well or borehole, protected dug well, protected spring, rainwater, tanker truck, cart with small tank, bottled water, community RO plant.

[3] Flush to piped sewer system, flush to septic tank, flush to pit latrine, flush to don't know where, ventilated improved pit (VIP)/biogas latrine, pit latrine with slab, twin pit/composting toilet, which is not shared with any other household. This indicator does not denote access to toilet facility.

At present, there exist rural-urban differences in the state, with gaps in infrastructure, connectivity, sanitation, and access to essential services, impacting the quality of life and economic opportunities available to rural populations. Acknowledging these structural challenges, both the central and state governments have implemented several transformative initiatives aimed at bridging these divides and enhancing rural lives. The flagship Government of Odisha Bikashita Gaon, Bikashita Odisha (BGBO) scheme, launched in 2025 with a Rs 5,000 crore budget. This scheme aims to drive sustainable rural development by enhancing village infrastructure, focusing on construction of pucca roads, bridges, market sheds, educational infrastructure, sports infrastructure, and other community amenities. Complementing these efforts are various central government initiatives like the Jal Jeevan Mission, Pradhan Mantri Awaas Yojana, Pradhan Mantri Gram Sadak Yojana, and Swachh Bharat Mission, improving the quality of life in rural communities.



In order to achieve transformative development in rural areas, it is equally important to focus on social and emotional well-being. By fostering villages that are economically stable, healthy, emotionally connected, and culturally vibrant, we can build resilient communities where every individual thrives. This vision prioritizes dignity, autonomy, social cohesion, and a shared sense of belonging, extending beyond economic growth. Rooted in the principle of "One Earth, One Family," this approach celebrates the interconnectedness of all life, emphasizing that sustainable rural development depends as much on relationships and community bonds as it does on economic wellbeing. Therefore, the concept of a "Happy, Healthy, and Wealthy Village" envisions villages as centers of holistic development, focusing on the need for inclusive policies and robust community engagement to create equitable, joyful, and sustainable rural ecosystems.

Happy, Healthy, and Wealthy Village: A Holistic Approach to Development

The Happy, Healthy, and Wealthy Village concept integrates interconnected domains to cultivate resilient, inclusive, and dynamic villages where every resident—regardless of age, gender, or ability—enjoys robust health, dignified living, and abundant opportunity. The aim is to empower individuals, families, and children to realize their full potential within a nurturing, supportive, and sustainable ecosystem. This vision is rooted in community-driven transformation, where local knowledge and innovation are harnessed to foster holistic well-being and collective prosperity.

Understanding Happiness

Happiness, while inherently personal and subjective, is shaped by and related to life circumstances. According to the World Happiness Report, life satisfaction, a key indicator of happiness, correlates strongly with GDP per capita, life expectancy, social support, generosity, freedom to make significant life choices, trust in institutions, and perceptions of corruption. Thus, happiness emerges from

the interplay of economic prosperity, human capability development, and social cohesion. Therefore, beyond traditional metrics of economic growth, development shall be assessed through progress across these interconnected domains.

I. Connected Villages

Happiness extends beyond material well-being and is deeply rooted in social connections. As per the World Happiness Report, social connectedness is a multifaceted concept, which encompasses quantity, quality, and structure of individual human relationships. Each of these contribute to wellbeing by fostering belonging, support, and meaningful interactions. Further, prosocial behaviors, such as acts of kindness and cooperation, amplify happiness by reducing stress and fostering meaningful interactions. The findings of the Harvard Study of Adult Development[4] , a longitudinal research project, reaffirms this idea and showcased that individuals with strong social connections tend to live longer and healthier lives. In essence, happiness flourishes through shared experiences, underscoring the significant impact of social bonds on well-being.

To nurture vibrant, joyful villages, fostering social connectedness is essential. This can be achieved by developing and maintaining shared spaces like public squares, parks, gardens, playgrounds, and community centers through participatory planning and local ownership. These spaces can act as vibrant hubs for spontaneous gatherings, events, and community activities, fostering inclusivity and strengthening social bonds through cultural festivals, sports, and programs that connect individuals and communities. Over time, these events may also develop into tourist spots, offering engagement with the region's culture, specifically the lifestyle, history, art, architecture, religion and other elements which helped shape people's way of life in those geographical areas, allowing for an authentic and memorable experiences.

Furthermore, to foster sustainable happiness, it is important to promote inclusivity within villages. Ensuring equitable access to resources and opportunities for all - regardless of gender, age, caste, or economic status - through targeted social and economic programs can empower marginalized groups including women, socio-economically disadvantaged groups (SEDGs). This approach can boost and ensure sustainable avenues of happiness, and prosperity, while ensuring a collective sense of belonging.

[4] Good genes are nice, but joy is better, The Harvard Gazette 2017

II. Prosperous & Healthy Villages

Social capital - the strength of relationships and communities – also impacts outcomes ranging from income and upward mobility to health[5] . However, it is equally important to prioritize improvements in fundamental socio-economic and health indicators. Robust socio-economic and health indicators provide individuals with the resources and opportunities they need to engage meaningfully with their communities. Further, improving these indicators strengthens the resilience of social fabric and facilitates cohesive social networks. A community characterized by widespread income inequality, poor health outcomes, or unequal access to education is more likely to experience social fragmentation and weakened social bonds. Thus, while cultivating social capital is essential, it must go hand in hand with tangible improvements in socio-economic and health parameters to ensure the creation of thriving, equitable communities where people have both the capacity and the opportunity to connect and contribute.

Indicators

- Employment opportunities,
- Access to safe drinking water,
- Access to toilets,
- Access to electricity,
- Access to LPG or clean cooking fuel,
- Quality education,
- Access to quality and affordable healthcare,
- Safety net

III. Resilient Villages

To ensure villages thrive as happy, healthy, and prosperous communities, building resilience against challenges like climate change and environmental degradation is crucial. By implementing sustainable practices across various domains, villages can preserve their natural environment and ensure long-term sustainability.

Key initiatives include protecting and rejuvenating natural water sources, such as ponds, tanks, and groundwater recharge zones, while constructing rainwater harvesting systems, check dams, and percolation tanks to secure year-round water availability for household, agricultural as well as industrial needs. Likewise, community-driven conservation efforts to safeguard local forests, wetlands, and biodiversity-rich areas, combined with sustainable farming through agroecological practices and training, can enhance environmental health. Further, adopting eco-friendly practices like composting, reusing, and recycling, supported by awareness campaigns and training, coupled with scientific landfill disposal, as exemplified by the Bhopal Municipal Corporation, can reduce pollution and promote resource recovery. Finally, robust disaster preparedness and adaptation strategies can mitigate the risks of extreme weather events ensuring that villages remain vibrant, sustainable, and thriving for future generations.

[5] Social Capital and Economic Mobility. Chetty, Jackson, Kuchler, Stroebel, et al. *Nature* 2022

Bommasamudram: A Step Towards Happy, Healthy and Wealthy Village[6]

Bommasamudram, a village in Andhra Pradesh's Chittoor district, earned the 2024 Deen Dayal Upadhyay Panchayat Satat Vikas Puraskar as India's Healthiest Panchayat. Its innovative, community-led approach, effectively harnessing state and central government schemes, sets a powerful example for sustainable rural development.

The panchayat achieved universal healthcare access by distributing Ayushman Bharat health cards to every household, removing financial barriers to medical care. Equally vital is the focus on clean water and sanitation. The panchayat ensured that every household enjoys safe drinking water, with water tanks cleaned and chlorinated biweekly. Further, community-driven campaigns, regular fogging, drain cleaning, and handwashing initiatives were undertaken to promote hygiene and sanitation within the panchayat. This grassroots model, driven by community participation, offers a replicable framework for states like Odisha to enhance rural health and well-being.

Nuanced Data for Driving Holistic Development

Data is pivotal for transforming rural Odisha into vibrant, prosperous, and sustainable villages. Beyond numbers, it enables precise, equitable, and impactful governance for sustainable development. High-quality, granular data can help identify underserved communities, ensuring fair resource allocation across domains including healthcare, education, water, livelihoods, and environmental initiatives. It also supports tailored interventions optimizing public spending while delivering measurable outcomes and enables real-time monitoring, allowing swift program adjustments to address evolving needs.

However, the absence of granular, sub-national data collection systems remains a significant barrier, as such data is largely unavailable or inconsistent, undermining targeted resource allocation and policy implementation. Strengthening sub-national data collection is essential to address these gaps and enhance decision-making at the local level. Effective data-driven governance requires robust digital infrastructure, including mobile connectivity, smartphones, and capacity building of frontline stakeholders like ASHA workers, Anganwadi workers, teachers, and panchayat staff among others.

In essence, a robust framework for granular data collection and monitoring is essential to realize happy, healthy and wealthy villages. By gathering village-level data and integrating it with publicly available sources, this framework can support precise, equitable, and impactful governance at the village level. For instance, frontline stakeholders at the village level can collect data and maintain digital *village health registers* to track and monitor health and nutrition status for each individual in the village. Integrating these records with data from Primary Health Centers (PHCs), can facilitate the tracking of disease patterns and potential outbreaks while identifying at-risk populations, enabling swift responses and ultimately improving health outcomes for rural communities.

[6] Chittoor's Bommasamudram Becomes India's Healthiest Village. Deccan Chronicle, 16 December 2024.

Similarly, effective water resource management at the village level can be achieved by integrating demand and supply data. This involves first identifying the existing demand across various categories, such as households, agriculture, and industry. Next, mapping the available supply sources using GPS and GIS tools can provide a clear picture of water bodies, rainwater harvesting structures, and groundwater recharge points. In turn this data can inform the planning, development, and maintenance of water infrastructure, ensuring sustainable access to water resources for all sectors, while supporting long-term water sustainability and improve overall community well-being.

In essence, village-level surveys, when conducted consistently at regular intervals, can yield comprehensive datasets that reveal unique insights into individual village dynamics, variations, and the relative status of specific areas, highlighting transformations over time. Further, the resulting database can support the formulation of targeted rural development plans, addressing diverse challenges and needs of rural communities.

Implementation and Governance

Effective implementation of the concept requires the active involvement of community members in planning, decision-making, and monitoring. Gram sabhas, feedback sessions, and community meetings should be used to align initiatives with local needs and priorities. Multi-stakeholder partnerships—including local government, private sector, and academic institutions—can provide technical support, resources, and oversight. Further, robust monitoring systems should be established to track progress, measure outcomes, and ensure accountability. Regular impact assessments, community feedback mechanisms, and adaptive management approaches will help refine strategies and sustain long-term success.

Conclusion

The "Happy, Healthy, and Wealthy Village" vision reimagines rural Odisha by fostering resilient, thriving communities through holistic well-being. Villages often evoke a deep sense of nostalgia, recalling a time of harmony, simplicity, and joy. However, true progress requires us to move beyond sentiment and invest in the systems and services that uplift rural life.

Various government initiatives have sought to and continue to transform rural India by prioritizing employment, economic empowerment, education, healthcare, and infrastructure. The Sansad Adarsh Gram Yojana (SAGY) aims to convert selected villages into model "Adarsh Grams" by enhancing education, healthcare, infrastructure, and livelihoods through community-driven plans. This scheme leverages existing programs and emphasizes social inclusion, local governance, and eco-friendly practices to create replicable rural development models. Some of the existing schemes range from the Pradhan Mantri Awas Yojana (PMAY-G), which provides affordable rural housing in rural areas, to the Ayushman Bharat scheme, which offers comprehensive healthcare access, significantly improving living standards and community health. Similarly, state government initiatives like the Biksit Gaon, Biksit Odisha program focus on enhancing infrastructure, healthcare, and education to promote rural progress. Additionally, various schemes including the Birsa Munda Agricultural Revolution Scheme and Subhadra Yojana have sought to support and empower the marginalized communities within the state.

Complementing these efforts, the "Happy, Healthy, and Wealthy Village" vision reimagines villages as hubs of social connectedness, nurtured through shared spaces like parks, community centers, and cultural events. Grounded in the principle of “One Earth, One Family,” this approach seeks to foster inclusive, resilient, and joyful rural ecosystems where every individual thrives with dignity and opportunity.

Granular and regular village-level surveys are critical for data-driven governance, ensuring equitable solutions tailored to diverse community needs. Combined with robust community participation, strategic multi-stakeholder partnerships, and dynamic monitoring, this vision drives sustainable, inclusive progress. By redefining rural Odisha, we create enduring hubs of prosperity, social cohesion, and well-being that uplift individuals and fortify communities for generations.

Acknowledgment

Ms. Anupama, Data Analyst from the Strategic Management Support Team (SMST) at DE&S, Odisha made my job simpler by putting my ideas and thoughts in a beautiful format.

Data, Statistics And Knowledge

Jitendriya Sarangi

CLASSICAL SCIENCE: From the days of Sir Isaac Newton, science was an attempt to study the behaviour of nature by observing natural phenomena. The principle of cause and effect dominated these studies. Knowledge was limited to laying down conditions under which a predicted consequence must follow. Laying down necessary and sufficient conditions for a predicted consequence to happen was the ultimate aim of pursuit. Few such findings were proclaimed as Laws of Nature. Such studies were academic with no interface with society.

The principle of cause and effect failed to answer some questions like predicting the sex of a baby to be born or whether it will rain in the afternoon on a cloudy day. Even during the long period of the well-developed Indus-valley civilization, our ancestors believed that these phenomena happened according to the will of NATURE, which was the supreme power.

ERROR IS INEVITABLE: The laws of nature, which claimed to make certain predictions lacked in a 100% precision. Some deviations from these predictions were recorded as errors. Error free experiments were inconceivable in nature, as innumerable natural forces have a combined effect on every consequence. Forces like wind, sunshine, temperature, humidity etc., which constantly change with time have a total effect which vitiate error free prediction. The Gaussian law of errors was a landmark discovery which enabled scientists to compute the margin of error which can be tolerated with a high degree of confidence.

DATA IS KEY TO KNOWLEDGE: Natural forces like sunshine, rainfall, seasonal variation etc. have made life possible in our planet. But these natural forces sometimes go out of control and cause disasters like floods, cyclones, and snow fall from glaciers. Predictions of such disasters can save life and property in a large scale. Recording of natural conditions which precede such disasters is valuable for making predictions. With the discovery of modern high speed computers data regarding natural variables which precede and follow such events can be recorded and stored even for 100 years, which may be used for warning of disasters to follow. Weather forecasting has become an important branch of science. Isolation of conditions which are responsible for calamities like global warming, or depletion of the ozone layer has been possible from our records of past data.

MODELS AND THEIR USE: Modern computers can store data in a large scale, which is collected over a long span of time. This can be used for resolving intricate problems. We take the example of migratory birds which seasonally visit sanctuaries like Chilika Lake. Photographs of birds of all known species can be stored in computers with their names. A bird watcher who observes a different type of bird can take its photograph and match it with the existing photographs to make sure if such a bird visited Chilika since the days of data recording. If the bird is different, such information needs probe and has great ecological value. This technique can be used for studies in wildlife, or life in the sea.

Model equipments are stored in workshops for multipurpose use. A wayside workshop has model equipments which can be used in repairing of auto rickshaws, two wheelers, bicycles and even pressure cookers or electrical gadgets of the kitchen. An appropriate instrument is to be selected for use to rectify a problem.

The model for the structure of a molecule with a nucleus at the centre and electrons, protons, neutrons moving in their orbits has not been observed in any powerful microscope. It has been simulated to confirm to all phenomena that has since been observed. Discovery of a phenomenon which does not confirm to this model will be a landmark finding which will pave way to a new model. This will be a step to enhance our knowledge through observed data. Such knowledge is ever expanding, progressing towards the elusive absolute truth. Thus, data and statistics pave our way to nearer the truth, which may be an endless process.

Univariate numerical data, collected from a large population, can be calibrated by selecting an appropriate model selected from a family of models. Earliest among such families are the Pearsonian curves. Few statistics, computed from observed data are matched to select an appropriate model. Kolmogorov's landmark work on Foundations of Probability gives us a family of multivariate probability distributions from which we can select a model to be used for fitting with actual data observed. Any observation set, recorded afterwards, which does not conform to this model, leads to a change of the selected model. This is a step forward towards the real truth.

Faithful collection of data is the key to SEARCH FOR THE ABSOLUTE TRUTH and this is the progress of knowledge.

von Neumann

"By a model is meant a mathematical construct which, with the addition of certain verbal interpretations, describes observed phenomena. The justification of such a mathematical construct is solely and precisely that it is expected to work."

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From Informality to Aspiration : Unfolding Employment Transitions in Odisha's Labour Market

Dr. Siba Sankar Mohanty

Abstract

Odisha's labour market has undergone significant structural transformations over the past decade, shaped by both long-standing economic vulnerabilities and short-term shocks such as the COVID-19 pandemic. Using data from the Periodic Labour Force Surveys (PLFS) 2017–18 and 2022–23, this study investigates evolving employment patterns across rural and urban Odisha, highlighting a decline in traditional self-employment, a rise in casual and informal labour, and an uneven expansion in regular salaried jobs. While there has been a sharp increase in labour force participation—particularly among rural women—this growth often reflects economic compulsion rather than opportunity-led empowerment. Unemployment rates have declined substantially, yet the quality of employment remains a central concern, with limited access to decent work, weak skilling infrastructure, and widening gender disparities, especially in urban areas. Inter-state comparisons with Bihar, Jharkhand, Chhattisgarh, Uttar Pradesh, West Bengal, and Andhra Pradesh further contextualize Odisha's performance within India's broader employment landscape. The findings underscore the need for policies that not only generate jobs but also improve job quality through education, skilling, formalisation, and gender-sensitive labour reforms. Odisha's demographic advantage risks turning into a liability unless supported by inclusive, capability-driven labour market interventions.

1. Introduction

The employment landscape of Odisha is undergoing a quiet but profound transformation, shaped by long-term structural shifts and short-term shocks, most notably the COVID-19 pandemic. The state's rural and urban economies are both experiencing a reconfiguration of work, marked by a retreat from traditional self-employment—especially in agriculture—and an increasing dependence on casual labour and informal services. This transformation is not unique to Odisha, but it unfolds with particular intensity in the state's context of historical underdevelopment, weak industrialisation, and persistent agrarian distress. The emerging patterns resonate with broader national trends of "informalisation without growth" (Kannan & Raveendran, 2019), but Odisha's experience reflects a sharper contradiction: the shift away from agriculture and small enterprise has not been matched by the emergence of secure or high-quality employment, resulting in rising precarity for a large section of the working population.

Odisha, situated on the eastern coast of India, has undergone noticeable changes in its economic landscape—shifting from a primarily agrarian economy to one where services and mining contribute significantly to state income. Despite this sectoral reallocation, employment generation has not kept pace with the pace of structural transformation. The challenge lies not merely in the creation of jobs, but in ensuring productive, secure, and inclusive employment, especially for rural youth, women, and marginalized communities. Scholars like Papola (2012) and Mehrotra and Parida (2019) have pointed out that the Indian labour market as a whole suffers from a disjuncture between output growth and employment growth,

and Odisha exemplifies this phenomenon in a sharper form. The problem is further compounded by inadequate skilling ecosystems, low industrial diversification, and poor rural-urban linkages.

The COVID-19 pandemic added an external shock to this fragile labour market, exposing the vulnerability of informal workers and highlighting structural weaknesses in social protection. Studies show that in Odisha, the pandemic led to sharp income losses, reverse migration, and a resurgence of informal and low-productivity work, especially for women and tribal communities (Jena & Pradhan, 2021; Ghosh, 2020; Chakraborty, 2020). While there has been a recent increase in labour force participation rates, especially among rural women, it is often attributed to distress-induced entry into informal and low-wage employment rather than to any empowerment or economic mobility (Deshpande, 2022; Agarwal, 2021). Scholars like Breman (2016) and Harriss-White (2018) argue that informalisation is not a residual feature of a transitioning economy but a central tendency in India's political economy, particularly in states like Odisha where industrial growth remains patchy and service-sector expansion is mostly informal and low-end.

In this context, this study seeks to offer a detailed analysis of the changing employment scenario in Odisha using the latest available data from the Periodic Labour Force Survey (PLFS), 2022–23 comparing it with the PLFS findings of 2017-18. Beyond descriptive assessment, it aims to locate Odisha's employment transitions within a broader comparative framework. For this purpose, inter-state comparisons are drawn with Bihar, Uttar Pradesh, Chhattisgarh, Jharkhand, West Bengal, and Andhra Pradesh—states that share with Odisha a set of socio-economic commonalities such as mineral wealth, high tribal population, agrarian base, and comparable development challenges. This comparative framework helps contextualize Odisha's employment trends and illuminate structural constraints and opportunities that define the quality and inclusiveness of job creation. By focusing on dimensions such as informality, gender, youth participation, and sectoral shifts, the analysis intends to contribute to a more grounded understanding of employment transitions in a low-income state navigating the complexities of post-liberalisation economic growth and pandemic-induced disruptions.

2. Demographic Pressures and Employment Scenario in Odisha During the Last Decade

The last decade has witnessed a quiet but sweeping transformation in the way people in Odisha live and earn their livelihoods—especially in its villages. Recent data from the Periodic Labour Force Survey (PLFS) show that rural Odisha is moving away from its long-standing identity as an agrarian society. In 2017-18, nearly 39% of rural households relied primarily on farming for self-employment. By 2023-24, such reliance on farming had fallen dramatically to just 29.4%. This steep decline—over 9 percentage points—outpaces the national average by a wide margin. On paper, it might look like progress or diversification. But when we look closer, a more unsettling story unfolds.

This isn't a tale of rural prosperity where farmers willingly left behind their fields for better opportunities. Instead, it seems to be a forced exit—triggered by worsening agrarian distress, shrinking landholdings, declining returns, and perhaps most tragically, the growing disinterest of rural youth in farming. In a place where the soil once meant life, that connection is fraying.

Figure-1 confirms this grim reality. Between 1954 and 2018, the proportion of marginal farmers (holding less than 1 hectare) has risen steeply from 44.52% to a staggering 76.5%, indicating widespread fragmentation of land and declining viability of agriculture. At the same time, medium and large holdings (>2 ha) have nearly disappeared—dropping from 16.18% to just 3.6%. Alarmingly, even the landless rural households, which rose to 35.7% by 1988, fell to 8.6% in 2018, not necessarily suggesting land acquisition, but rather reclassification, distress migration, or informal leasing without ownership rights.

The shrinking average size of holdings has rendered farming increasingly non-remunerative, further dissuading rural youth from engaging in agriculture. With small holdings (1–2 ha) also declining from 32.95% in 1971 to 11.3% in 2018, it's evident that the rural agrarian economy is no longer providing the economic security it once promised. The figures don't just show land statistics—they narrate the quiet exodus of a generation, disconnected from their land, driven by compulsion rather than choice.

Figure-1: Shrinking size of holding

	1954	1971	1988	2018
Landless	23.19	18	35.7	8.6
Marginal (0.01-1 Ha)	44.52	24.87	41.6	76.5
Small 1-2 Ha	16.11	32.95	15.1	11.3
Medium and large Holdings (> 2 Ha)	16.18	24.18	7.6	3.6

Source: *Compiled by the author from NSSO reports (various rounds)*

While there has been some growth in non-agricultural self-employment—from 14.1% to 18.2%—it hasn't translated into real economic upliftment. Much of this shift is taking place in the informal sector: roadside vending, small shops, or menial services. These are jobs with low pay, no job security, and little dignity. It's a fragile foundation on which to build a future.

Table-1: Percentage distribution of households by household type for rural areas in Odisha and India

Items	Odisha			All India		
	2017-18	2023-24	Change in % Points	2017-18	2023-24	Change in % Points
Self Employed in Agriculture (Rural)	38.5	29.4	-9.1	37.8	36.2	-1.6
Self Employed in Non Agri (Rural)	14.1	18.2	4.1	14.3	17.1	2.8
Total Self Employed (Rural)	52.6	47.6	-5	52.1	53.3	1.2
Regular Wage/Salary (Rural)	10.2	12.5	2.3	12.7	16	3.3
Casual Labour in agriculture (Rural)	7.4	4.4	-3	12.1	8.3	-3.8
Casual Labour in non-agriculture (Rural)	15.6	23.1	7.5	12.9	15.2	2.3
Total Casual Labour (Rural)	23	27.6	4.6	25	23.5	-1.5
Others (Rural)	14.2	12.4	-1.8	10.1	7.2	-2.9

Source: *PLFS 2018 and PLFS 2024*

Even in areas where one would hope for progress—like regular salaried jobs—the picture remains sobering. Rural Odisha has seen only a small increase in households earning regular wages, from 10.2% to 12.5%, still trailing behind the national trend. More stark is the jump in casual labour in non-agricultural sectors—from 15.6% to 23.1%. That's a notable shift, nearly triple the national increase. These are not jobs of choice. They are the kind people take when there is no other option—construction, transport, seasonal migration, daily-wage work—often hard, often insecure, and seldom enough to pull a family out of poverty.

The overall share of casual labour in rural Odisha now stands at 27.6%—a worrying increase, especially when the national trend shows a decline. It suggests a rural economy where unpredictability has become the new normal, where families live from one day's work to the next, and dreams of upward mobility are constantly deferred.

The urban picture, though less drastic, reveals its own kind of quiet distress. The percentage of self-employed urban households in Odisha fell from 32.8% to 28.4%, a sharper decline than observed nationally. Small urban enterprises—run from homes, roadside stalls, or modest shops—are under pressure. Rising costs, competition, and lack of credit are squeezing these livelihoods out.

Table-2: Percentage distribution of households by household type for Urban areas in Odisha and India

	Odisha			All India		
	2017-18	**2023-24**	**Change in % Points**	**2017-18**	**2023-24**	**Change in % Points**
Self employed (urban)	32.8	28.4	-4.4	32.4	32.1	-0.3
Regular wage/salary earning (urban)	34.6	38.1	3.5	41.4	44	2.6
Casual labour (urban)	10.7	13	2.3	11.8	10.2	-1.6
Others (urban)	21.8	20.6	-1.2	14.4	13.7	-0.7

Source: *PLFS 2018 and PLFS 2024*

Yes, there has been some increase in salaried employment—from 34.6% to 38.1%. But Odisha still lags behind the national average. The expansion is real but uneven, mostly in sectors like education, healthcare, and government jobs. At the same time, the share of casual labour in urban Odisha rose from 10.7% to 13%, even as it declined across India. This hints at the rise of a new informal urban underclass—delivery workers, helpers, daily wagers—many of whom migrated from villages looking for a better life. What they found was uncertainty dressed as opportunity.

Taken together, the employment shifts in rural and urban Odisha tell a story not of smooth transition, but of struggle. In both spheres, self-employment is declining. In villages, farming is no longer a reliable means of livelihood; in cities, petty businesses are slowly giving way to a less secure gig economy. While regular jobs are growing, they remain too few and too exclusive. Instead, the dominant trend is casualisation—of labour, of life itself.

Rural distress is spilling over into urban spaces, and urban fragility is feeding back into rural disillusionment. These are not separate challenges; they are two faces of the same problem. The labour market is becoming more volatile, more unequal, and less capable of offering security to ordinary people. Without deliberate policy interventions, these patterns could harden into structural inequalities that are hard to undo.

Nowhere is the strain clearer than in the rising dependency ratio—the number of dependents per 100 working-age people. In Odisha, this ratio has gone up modestly from 45.7 to 47 over the last six years, while the national average has stayed flat. In rural areas, the rise is sharper—from 46.4 to 48.3—implying that fewer people are earning for households with more children and elderly members. The countryside is ageing, yet there is no parallel surge in employment that could support this demographic pressure.

Table-3: Dependency Ratio in Selected States and India during 2017 and 2024

	2017-18			2023-24			Change between 2017 and 2024		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Andhra Pradesh	41.8	41.1	41.5	43.7	36.4	41.4	1.9	-4.7	-0.1
Bihar	61.5	52.6	60.7	67.9	51.4	66.3	6.4	-1.2	5.6
Chhattisgarh	46.9	40.9	45.7	41.5	32	39.6	-5.4	-8.9	-6.1
Jharkhand	60.5	46.2	57.5	59.9	42.1	56.3	-0.6	-4.1	-1.2
Madhya Pradesh	45.9	42	44.9	49.5	43.7	47.9	3.6	1.7	3
Odisha	46.4	41.6	45.7	48.3	39.9	47	1.9	-1.7	1.3
Rajasthan	58.9	46.7	55.9	54.5	38.5	49.9	-4.4	-8.2	-6
Uttar Pradesh	61.9	46.9	58.6	55.2	41.7	52.2	-6.7	-5.2	-6.4
West Bengal	39.9	37	39	42.9	37.4	41.2	3	0.4	2.2
all-India	50.2	41.4	47.5	50.8	40	47.5	0.6	-1.4	0

Note: Dependency Ratio is the share of persons of age 0 to 14 years plus 65 years and above per 100 persons of age 15 to 64 years

Source: PLFS 2018 and PLFS 2024

Interestingly, in urban Odisha, the dependency ratio has fallen slightly. This could be why we see some increase in salaried employment in cities—fewer dependents mean more resources and flexibility. Yet, this alone hasn't been enough to reverse the worrying rise in casual urban labour. Compared to some central and northern states like Bihar and Uttar Pradesh, Odisha has a more balanced demographic profile. But unlike southern states such as Andhra Pradesh or West Bengal, which managed to stabilise or reduce their dependency burden, Odisha seems to be at a demographic crossroads.

What happens next will depend on the policy choices we make today. If we fail to expand rural enterprises, if we don't invest in skilling, if public employment programs are not revitalised, the rising number of dependents will become a heavier burden, not just on families but on the state itself. Conversely, if the right steps are taken, Odisha could turn this demographic moment into a dividend—a time of economic rejuvenation, not despair.

For now, though, the state stands on a precarious edge. A generation of workers—young, hopeful, and mobile—is being pushed into unstable work across villages and cities. They are leaving behind not just their homes but their expectations of secure, meaningful employment. In the following section, we shall delve more into some linkages of the above understanding with the educational profile of the working class in Odisha and India.

3. Education as the Missing Link in Odisha's Employment Journey

The story of employment in Odisha cannot be fully understood without looking closely at the state of education—because what people do for a living is often shaped by what opportunities they had for learning. Between 2017-18 and 2023-24, Odisha witnessed some movement in educational attainment, but a closer reading of the data (Table-4) suggests that the change has been more muted than transformative.

While it is heartening to see a fall in the proportion of people who are not literate—from 28.2% to 24.5%—Odisha still lags behind the national average. This means that nearly one in four persons in the state remains unable to read or write, a staggering reality in an era where even unskilled jobs increasingly demand basic literacy. At the same time, there has been a noticeable increase in the proportion of the population who stopped their education at the primary level (from 18.2% to 21.3%), even as the share of those reaching the middle school level has gone down. This backward movement in the middle rung is concerning—it hints at possible dropouts, learning crises, or disruptions in school continuity, particularly in rural areas.

This educational dip must be seen in the context of growing economic pressures. As rural households face rising dependency ratios (Table-3), declining self-employment (Table-1), and an increase in casual, low-paying jobs, the ability of families to support long-term schooling for their children becomes more constrained. Education, once seen as a ladder to climb out of poverty, begins to seem like a luxury—especially when short-term survival demands that children start contributing to household income early. Girls, in particular, are often the first to be pulled out of school, a reflection of both economic strain and social norms.

Table-4: Distribution of persons by general education level in Odisha and India

	Odisha			All India		
	2017-18	**2023-24**	**Change % Points**	**2017-18**	**2023-24**	**Change % Points**
Not Literate	28.2	24.5	-3.7	26.8	22.3	-4.5
Literate Upto Primary	18.2	21.3	3.1	16.7	16.5	-0.2
Middle	24.4	21.6	-2.8	20.3	20.2	-0.1
Secondary	13.9	14.3	0.4	13.8	13.9	0.1
Higher Secondary	8.2	8.4	0.2	10.8	12.7	1.9
Diploma/Certificate	0.6	1.1	0.5	1.1	1.3	0.2
Graduate	5.6	7.7	2.1	7.9	10.1	2.2
Post Graduate	0.9	1.1	0.2	2.5	2.9	0.4

Source: *PLFS 2018 and PLFS 2024*

When we look higher up the education ladder, the gaps become even starker. Odisha has a much lower share of people attaining higher secondary, graduate, and postgraduate education compared to the national average. While India saw meaningful growth in graduates (from 7.9% to 10.1%), Odisha's numbers

went from 5.6% to just 7.7%. The share of diploma and certificate holders—key indicators of vocational skill development—remains worryingly low, inching up from only 0.6% to 1.1%, barely keeping pace with the national figures. This signals that even as government policies have talked about skilling and employment, the actual delivery on vocational education remains a weak link in Odisha.

These educational shortcomings are not just statistical gaps—they are barriers that hold back individuals from securing better jobs. The modest rise in urban salaried employment observed earlier (Table-2), for instance, is limited in part because the talent pipeline is too narrow. The kinds of jobs growing in Odisha's cities—whether in education, healthcare, administration, or IT services—require qualifications that many in the state simply do not have access to. Without education, young people are pushed into the ever-expanding pool of informal work, trapped in a cycle of low pay and low dignity.

To its credit, recent national and state-level policies have begun to acknowledge these failings. The National Education Policy (NEP) 2020, for example, recognized the historic overemphasis on academic over vocational streams and the lack of integration between schooling and employability. Odisha's state education reforms, too, have started prioritising foundational literacy and school retention. But these efforts are still at an early stage, and they must go hand-in-hand with real investments—in teacher quality, school infrastructure, girls' education, and rural secondary schools—if they are to deliver meaningful change.

In the final analysis, the employment crisis in Odisha is not just about lack of jobs—it is about the erosion of capability. A poorly educated workforce is one that will forever be vulnerable to shocks, dependent on precarious work, and denied the promise of a better future. If the state truly wishes to unlock the potential of its demographic profile, it must treat education not just as a social obligation, but as the single most important economic investment it can make.

4. Beyond the Numbers: Unpacking Odisha's Rising Labour Force Participation

The recent spike in Odisha's Labour Force Participation Rate (LFPR), as shown in Table-5 and Table-6, has drawn considerable attention. Between 2017–18 and 2023–24, the state's LFPR rose substantially from 36.4% to 49.4%—a rise of 13 percentage points, far exceeding the national average increase of 8.2 percentage points. Rural Odisha, in particular, saw an extraordinary jump in female LFPR, climbing from a mere 15.2% to 40.3%, a 25.1 percentage point increase that places it well above the all-India average of 35.5%. Urban Odisha also saw a notable rise in female labour participation, from 13.4% to 24.4%.

While such numbers may appear as progress toward inclusivity and broad-based economic engagement, a closer look—especially in light of employment quality data in Table-1 and Table-2—calls for a more cautious interpretation. The steep increase in female LFPR coincides with a decline in rural self-employment and an increase in casual, non-agricultural labour. Rather than signalling a genuine expansion of economic opportunities, this trend suggests a pattern of distress-driven participation, where women and youth are pushed into the workforce to offset declining household incomes and rising rural dependency burdens (Table-3).

The increase in participation has not been accompanied by a corresponding rise in secure, salaried employment. This disparity is particularly troubling when considered alongside Table-4, which reveals Odisha's limited educational gains and a disproportionate concentration of the population at primary and middle levels of schooling. This educational bottleneck restricts access to skilled employment and curtails mobility into higher-paying, formal sector jobs. With many youth and women lacking secondary or vocational qualifications, they are often funneled into precarious informal sectors with little room for upward movement.

One of the most significant developments during this period has been the expansion of the gig and platform economy, especially in urban Odisha. The rise of digital platforms in food delivery, logistics, ride-hailing, home-based services, and e-commerce has created new employment avenues. For many urban youth and women, these jobs provide entry points into the labour market, sometimes offering greater flexibility than traditional employment. However, these jobs often fall outside formal regulatory frameworks, lacking social security, wage protection, or opportunities for skill enhancement. As such, they contribute to an expansion in quantitative employment, but not necessarily to qualitative improvements in livelihood security.

This is compounded by the fact that Odisha lags in vocational education and skill certification, as evidenced by the negligible increase in the share of population with diploma or certificate-level education in Table-4. Without systematic investment in skilling and digital literacy, Odisha risks becoming a low-end supplier of precarious gig labour rather than a hub for innovation or skilled employment.

The state's comparative performance across Table-6 reveals interesting regional patterns. Odisha has outpaced Uttar Pradesh, Bihar, and Rajasthan in LFPR improvements but still trails Chhattisgarh and Madhya Pradesh—states that have successfully combined modest educational expansion with employment-linked rural schemes and institutional livelihood supports. This contrast points to the importance of employment-enabling policies that go beyond merely opening the labour market to actively shaping the quality of jobs available.

Policy conversations at the national level have also begun to acknowledge these gaps. Recent efforts—such as the proposed National Employment Policy, reforms in the apprenticeship ecosystem, and the emphasis on sectoral skilling missions—reflect a growing recognition that earlier approaches, which heavily favoured capital-intensive and informalised growth, have failed to generate inclusive employment. Odisha must internalise these realisations to avoid replicating past mistakes. An LFPR rise, if not backed by purposeful state action in skill development, job formalisation, and rural livelihood creation, may only widen the gap between work and well-being.

To summarize, the rising labour force participation in Odisha—especially among women—is a complex phenomenon. It is driven not solely by empowerment or expanding opportunities but also by survival imperatives in the face of deepening rural economic stress, educational stagnation, and limited formal job creation. The rise of the gig economy and casual non-agricultural employment has added new dimensions to this evolving labour market, but these developments must be supported by robust institutional frameworks, skilling infrastructure, and policy safeguards to ensure that employment becomes a ladder out of poverty, not a trap

of precarious existence. Odisha stands at a critical juncture: to transform its expanding labour base into a force for inclusive growth, it must go beyond celebrating numbers to addressing the underlying structural realities that define the nature of work in the state.

Table-5: Labour Force Participation Rate (LFPR) (in %) according to usual status (ps+ss) for all age groups in Odisha and India

	Odisha			all-India		
	2017-18	2023-24	Change (% Points)	2017-18	2023-24	Change (% Points)
Rural Male	58	61.9	3.9	54.9	57.9	3
Rural Female	15.2	40.3	25.1	18.2	35.5	17.3
Rural Persons	36.6	50.8	14.2	37	46.8	9.8
Urban Male	57.7	59.1	1.4	57	59	2
Urban Female	13.4	24.4	11	15.9	22.3	6.4
Urban Persons	35.1	42	6.9	36.8	41	4.2
All Male	58	61.5	3.5	55.5	58.2	2.7
All Female	15	38	23	17.5	31.7	14.2
All Persons	36.4	49.4	13	36.9	45.1	8.2

Source: *PLFS 2018 and PLFS 2024*

Table-6: Labour Force Participation Rate (LFPR) (in %) according to usual status (ps+ss) for all age groups in selected states

	Rural persons			Urban persons		
	2017-18	2023-24	Change (% points)	2017-18	2023-24	Change (% points)
Andhra Pradesh	50.2	50.1	-0.1	41	41.3	0.3
Bihar	25.4	34.9	9.5	26.6	30.9	4.3
Chhattisgarh	48.7	57.8	9.1	41	46.4	5.4
Jharkhand	31.5	46.8	15.3	29.8	34	4.2
Madhya Pradesh	43.3	54.6	11.3	37.4	40.7	3.3
Odisha	36.6	50.8	14.2	35.1	42	6.9
Rajasthan	36.8	49.6	12.8	33	40.9	7.9
Uttar Pradesh	30.3	41.5	11.2	32	36.2	4.2
West Bengal	38.9	48.6	9.7	39.6	45.4	5.8
all-India	37	46.8	9.8	36.8	41	4.2

Source: *PLFS 2018 and PLFS 2024*

5. Falling Unemployment, Rising Questions: Interpreting Odisha's Labour Market Dynamics

Table-7 adds a vital dimension to the employment landscape by highlighting trends in unemployment rates (UR) across demographic groups in Odisha and placing them within the broader national context. The numbers indicate a substantial decrease in unemployment across all major age brackets and genders in rural Odisha between 2017–18 and 2023–24. For the critical 15–29 age group—often viewed as a barometer of youth employability—the UR among rural males fell from 25.3% to 10.2%, and among rural females from 16.7% to 8%. These figures outshine the national decline in the same segment, where the overall UR dropped from 16.6% to 8.5%. Among older working-age groups (15–59 years and 15+ years), Odisha also demonstrates marked progress, especially in rural areas where the all-age UR plummeted from 6.9% to 2.6%.

Table-7: Unemployment Rate (UR) (in per cent) according to usual status (ps+ss) in Odisha and India

State	Age group	Year	Rural			Urban		
			male	female	person	male	female	person
Odisha	15-29 years	2017-18	25.3	16.7	23.3	21.9	35.3	25.2
		2023-24	10.2	8	9.3	18.9	31.9	22.9
	15-59 years	2017-18	8.1	5.5	7.5	7.8	13.4	8.9
		2023-24	3.3	2.2	2.9	6.1	10.4	7.3
	15 and above	2017-18	7.3	5.3	6.9	7.3	12.7	8.4
		2023-24	2.9	2	2.6	5.6	9.7	6.8
	All Age groups	2017-18	7.4	5.3	6.9	7.3	12.7	8.3
		2023-24	2.9	2	2.6	5.6	9.7	6.8
All India	15-29 years	2017-18	17.4	13.6	16.6	18.7	27.2	20.6
		2023-24	8.7	8.2	8.5	12.8	20.1	14.7
	15-59 years	2017-18	6.3	4	5.7	7.3	11.3	8.2
		2023-24	3	2.3	2.8	4.6	7.6	5.4
	15 and above	2017-18	5.7	3.8	5.3	6.9	10.8	7.7
		2023-24	2.7	2.1	2.5	4.4	7.1	5.1
	All Age groups	2017-18	5.8	3.8	5.3	7.1	10.8	7.8
		2023-24	2.7	2.1	2.5	4.4	7.1	5.1

***Source**: PLFS 2018 and PLFS 2024*

Yet, this statistical turnaround must be carefully contextualized against prior findings. As Tables 1, 2, and 5 have shown, the nature of job absorption in Odisha has been largely informal, with a steep decline in agricultural self-employment and an accompanying surge in casual wage work. While such shifts explain how more people are finding jobs, they simultaneously raise questions about the quality of these jobs. Declining unemployment, in this case, may represent a quantitative gain without a qualitative upgrade—especially for women and younger workers.

What also stands out in Table-7 is the enduring disparity in urban female unemployment, which—despite some improvement—remains distressingly high at 31.9%. This pattern aligns with Table-4, which showed modest growth in higher education but also highlighted the disjuncture between education and employability. Urban young women, particularly those with educational qualifications, appear to face a "glass funnel," where higher attainment doesn't translate into secure employment. The urban labour market's structural rigidity, gender biases, and lack of family-supportive work environments continue to marginalize this group.

Moreover, the rise in employment does not reflect a commensurate expansion of formal sector opportunities, especially in rural areas. Despite the fall in unemployment, Table-1 indicates that salaried positions remain stagnant or unevenly distributed. This reinforces the notion that the growing absorption of labour is happening primarily in low-earning, unprotected sectors, which may offer work but not dignity, stability, or security.

An additional layer of complexity arises when we consider Odisha's evolving labour market alongside the rise of digital and gig work, which has taken root particularly in urban pockets. Many of the urban youth who might otherwise remain unemployed are now engaging with delivery apps, ride-sharing services, online freelancing, and other forms of platform-based labour. These jobs may reduce unemployment on paper, but their irregular income, lack of benefits, and absence of long-term career progression mean they often fail to provide the foundations for economic security.

The reduction in unemployment must also be seen in light of the shrinking working-age dependency pressure in urban areas (Table-3), which may have provided temporary demographic relief. However, the persistent urban-rural divide, both in terms of employment type and job quality, continues to characterize Odisha's labour structure.

To summarize, Odisha's significant reduction in unemployment rates, particularly among rural youth and women, represents a welcome shift from the high joblessness seen in the previous decade. However, this progress is deeply intertwined with broader patterns of informalisation, underemployment, and gendered exclusion. A shrinking unemployment rate alone cannot capture the depth of employment challenges unless accompanied by expanding formal opportunities, robust skilling ecosystems, and inclusive urban labour policies. If left unaddressed, these structural shortcomings may undermine the sustainability of Odisha's labour market gains, turning apparent success into a fragile and temporary reprieve.

6. Conclusion and Policy Suggestions

Odisha's employment landscape over the past decade reveals a state in transition—marked by rising labour force participation, declining unemployment rates, and a gradual shift from traditional agricultural livelihoods to non-farm and urban work. On the surface, these are welcome developments. Yet, a deeper examination shows that much of this transformation has occurred within the informal and low-paying segments of the economy. The expansion of work has not always translated into the expansion of opportunity. For many, particularly women and rural youth, participation in the labour force is a matter of economic

compulsion rather than choice, and often comes with insecurity, low wages, and poor working conditions.

The state's progress in educational attainment has not kept pace with the demands of a modern labour market. Odisha's working population continues to be characterised by a weak skill base and limited exposure to vocational and digital training. Without addressing this gap, the scope for upward mobility remains narrow, and the state risks locking its workforce into a cycle of low-productivity employment. A renewed emphasis on skill-based, market-aligned education is necessary—not just through government programs, but also through industry partnerships, entrepreneurial exposure, and community-level learning platforms.

The private sector must be recognised as a key engine of employment growth. Odisha's future lies in enabling micro and small enterprises, boosting start-up ecosystems, and attracting responsible investments in sectors like agro-processing, tourism, textiles, and services. Government support should focus on ease of doing business, access to credit, and digital infrastructure rather than subsidies alone. Rural industrial clusters and urban incubation hubs should be promoted to decentralise opportunities and reduce migration pressures.

Urban areas, meanwhile, must adapt to the realities of the platform and gig economy. Rather than treating these jobs as peripheral, policy should aim to enhance their security and social legitimacy. Basic protections like accidental insurance, grievance redressal, and access to digital skill training can improve the working conditions of gig workers while maintaining the sector's flexibility. The integration of women, especially in urban services, will require gender-sensitive infrastructure—such as safe mobility, childcare support, and digital empowerment.

There is also an urgent need for smarter, data-driven governance. Establishing a Labour Market Observatory in Odisha could facilitate regular tracking of employment trends, skill gaps, and migration flows, and serve as a vital input for planning. Public employment programs like MGNREGS must also be re-imagined—not just as stop-gap support, but as pathways for semi-skilled and productive community work linked to asset creation.

Importantly, this moment carries heightened public expectation. The recent reversal of the popular mandate in Odisha's state election reflects a strong desire for change, and with it, a renewed trust in the promise of inclusive development. There is a widespread aspiration—especially among youth and first-generation earners—for dignified, stable, and meaningful employment. The new government carries the responsibility to honour this mandate by crafting policies that translate growth into tangible livelihood opportunities. Employment is no longer just an economic concern; it is a matter of social justice, dignity, and democratic credibility.

To summarise, Odisha's employment challenges are not insurmountable—but they require clarity of vision, political will, and consistent public investment in human capital and local enterprise. A job-rich, inclusive, and forward-looking economy can only emerge when the state shifts its focus from numbers to the lived experiences of workers. The time to act decisively is now.

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Quantifying Informal Employment in Odisha – A NSS Region-wise Study using PLFS

Miss Denipreet Kaur

Abstract

This study looks at the employment scenario in Odisha. Odisha has a significant share of population in the working age group (15 – 64 years) and in the young dependents age group (0 – 14 years). The time is ripe for Odisha to realise its demographic dividend. While the economic structure has made a shift towards manufacturing and services, the same is not reflected in the labour force structure. Agriculture sector continues to be the largest sector in terms of employment, followed by construction sector, and trade & repair of motor vehicles. The study also found that most of the workers in the state are low-skilled (34%) and low-medium-skilled (52%). Using the PLFS 2023-24 data the study found that 87.18% of the workers in Odisha were under informal type of employment.

I. Introduction

India is currently the most populous nation in the world. A large population presents several challenges; however, in case of India, most of this population is quite young. The median age in India is 28.8 years[2]. The dependency ratio for India, according to the PLFS 2023-24 Annual Report, stood at 47.5. Dependency ratio is the ratio of number of dependents to the number of people in the working–age population (15 to 64 years age group). According to an EY Report [3], by 2030 India's dependency ratio will be at 31.2%, the lowest in its history. Therefore, the time is ripe for the country to reap its demographic dividend.

Odisha also has a relatively low dependency ratio. According to the PLFS 2023-24 Annual Report, Odisha's dependency ratio was 47. A large significant proportion of the state's population is concentrated in the 15-64 years and 0-14 years age group [4]. Hence, the "window of opportunity" is present for Odisha to reap the demographic dividend. To capitalize on this potential, it is crucial to ensure adequate employment opportunities, both in terms of the number of jobs and their quality. Providing sufficient and high-quality jobs is essential for this young population to realize their potential and fulfill their aspirations. Adequate jobs are also equally essential for steering the economy's growth in the desired direction. Without enough jobs, an economy cannot engage its population productively and fails to reap its demographic dividend. At the same time, good quality jobs boost the morale of the workforce and enable the growth of human capital in the economy.

India's economic structure has undergone a change by moving away from agriculture and towards manufacturing and services. This change, however, is not reflected in the structure of its workforce. The agriculture sector continues to be the largest employer in the country. The agriculture sector activities are indispensable, but at the same time, they are characterized by low productivity. A report by the Foundation for Economic Development [5] quotes that "46% of India's workforce is engaged in agriculture, which contributes only 18% to the GDP". Hence, it is important to remove these large numbers of workers who contribute very little to agriculture and engage them productively in other sectors/industries.

Employment in India, even in the non-agricultural sector, is generally concentrated in the informal economy. These jobs are characterized by low pay, poor job security, and little or no social benefits.

In light of the employment trends in India, this study aims to provide a snapshot of the current employment scenario in Odisha, and investigate whether informal employment is present in Odisha and measure its extent.

Odisha is a diverse state in terms of both culture and geography. Therefore, a NSS region-wise comparative study is made to visualize the diversity, if any, in the current employment scenario. The state is divided into three NSS-regions - NSS Region codes 211, 212, and 213. Code 211 is assigned to the coastal districts of the state, code 212 is for the southern districts, while code 213 is for the northern districts. The complete composition of each NSS region is given in Annexure A. Therefore, this study aims to analyze the following:

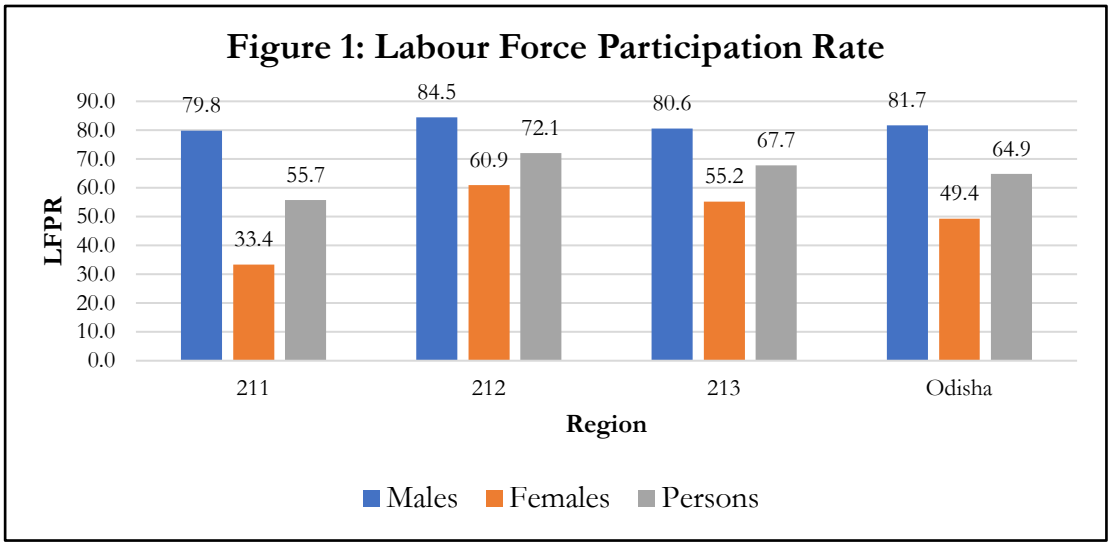
- What do the labour force participation rate and unemployment rate by gender and NSS regions look like in 2023-24,
- Which sectors are the largest employers across NSS regions,
- Visualize the distribution of workers across different levels of skill in each NSS region, and
- Quantify the number of workers in informal employment across NSS regions.

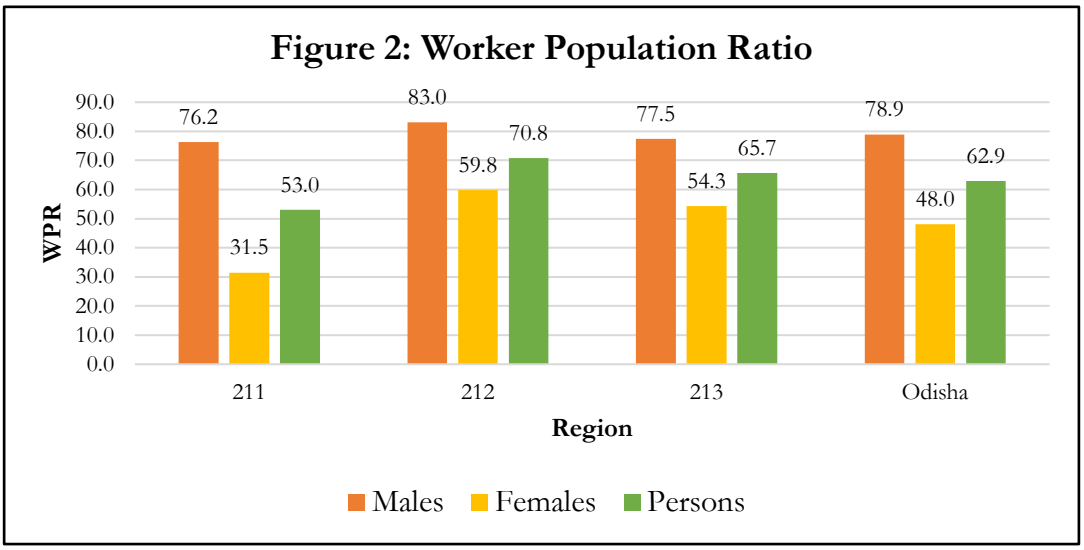
II. Snapshot of Regional Labour Markets: Participation and Sectoral Distribution

This section looks at the labour force participation rate and unemployment rate across genders and NSS regions. The section also presents the sectoral distribution and skill levels of the workforce. This study uses microdata from PLFS 2023-24 for analysis. Only the '15 years and above' age group is considered.

Labour Force Participation Rate (LFPR) is the percentage of number of persons in the labour force to the total population. The labour force includes both employed and unemployed persons. LFPR for the three regions and the state of Odisha is calculated using the usual status (ps +ss), which is obtained by considering the usual principal status (ps) and subsidiary status (ss) together. The Worker Population Ratio (WPR) is the percentage of persons employed among the persons in the population. The unemployment rate (UR) is the percentage of unemployed persons in the labour force.

Figure 1 shows the LFPR, Figure 2 shows the WPR, and Figure 3 shows the unemployment rate for the three NSS Regions and Odisha. NSS Region 212, that is the Southern districts of Odisha, has the highest labour force participation rate and worker population ratio. It therefore has the lowest unemployment rate as well. The coastal districts (NSS Region 211) have the highest unemployment rate in the state. The female LFPR and female WPR are the highest in southern districts (NSS Region 212), while it is lowest in the coastal districts (NSS Region 211). The female unemployment rate is similar in the southern and western districts of Odisha, but it is quite high in coastal districts (5.8%).





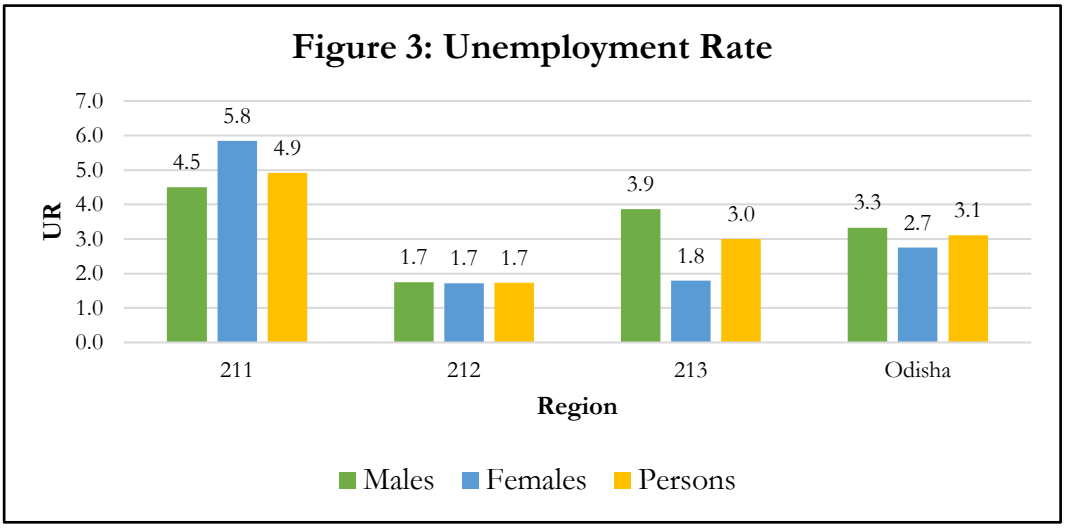


Table 1 shows the industry-wise distribution of workers for each NSS region. Industry-wise distribution of workers was obtained by using the NIC divisions. The agriculture, forestry, and fishing sector is the largest employer in each region. The construction sector is the second largest employer. Both sectors are notorious for being informal. The trade and motor vehicle repair sector is the third largest employer in NSS Regions 211 and 212, while in NSS Region 213 manufacturing sector is the third largest employer. Transport and storage, and education are the fifth and sixth largest employers, respectively. These six sectors together employ more than 85% of the workers in NSS Region 211, while in NSS Regions 212 and 213, they employ more than 90% of the workers.

Any conversation about employment is incomplete without a discussion on skills. In simple terms, skill refers to the ability to perform tasks with efficiency. Skills are further categorized into cognitive skills (i.e., skills related to literacy, numeracy, problem-solving aptitude, reasoning, creativity etc.), technical and vocational skills (physical & mental ability to perform occupation related tasks), and social and behavioural skills (i.e., communication skills, listening skills, working well with others, and being agreeable)[6].

Skills are not directly observable or measurable. However, attempts have been made to measure skills indirectly. One such attempt by Bhattacharya and Bhandari [7] makes use of three types of educational attainment, i.e., general, technical, and vocational, to assign a skill level to a worker. They used data from the Employment – Unemployment Survey conducted by the National Sample Survey Office in its 68th Round for 2011–12 and 66th Round for 2009–10. This study has adapted their framework to the PLFS 2023-24 context. Table 2 presents the framework for assigning a skill level to a worker.

Table 1: Industry-wise Distribution of Workers across NSS Regions

Name of the Industry	211	Name of the Industry	212	Name of the Industry	213
Agriculture, Forestry, and Fishing	39.4	Agriculture, Forestry, and Fishing	57.2	Agriculture, Forestry, and Fishing	47.5
Construction	15.4	Construction	19.5	Construction	18.7
Trade & Motor Vehicle Repair	13.0	Trade & Motor Vehicle Repair	6.7	Manufacturing	9.9
Manufacturing	8.0	Manufacturing	4.4	Trade & Motor Vehicle Repair	8.4
Transport & Storage	5.5	Transport & Storage	2.7	Transport & Storage	4.4
Education	4.8	Education	2.2	Education	2.4
Accomodation & Food Service	2.6	Accomodation & Food Service	1.3	Accomodation & Food Service	1.8
Admin & Support Services	2.4	Other Services	1.2	Other Services	1.1
Other Services	2.1	Human Health & Social Work	1.1	Admin & Support Services	1.0
Human Health & Social Work	1.2	Public Admin & Defence	1.0	Mining & Quarrying	0.9
Financial & Insurance Activities	1.1	Admin & Support Services	0.6	Public Admin & Defence	0.8
Professional, Scientific, & technical activities	1.1	Financial & Insurance Activities	0.5	Human Health & Social Work	0.8
Public Admin & Defence	1.0	Professional, Scientific, & technical activities	0.4	Own use production	0.7
Own use production	0.9	Own use production	0.4	Financial & Insurance Activities	0.6
Arts, Entertainment, Recreation	0.4	Information & Communication	0.2	Water supply, Sewerage, Waste Management, Remediation	0.3
Water supply, Sewerage, Waste Management, Remediation	0.4	Elc,Gas,Steam & Aircon Supply	0.2	Elc,Gas,Steam & Aircon Supply	0.3
Information & Communication	0.4	Water supply, Sewerage, Waste Management, Remediation	0.2	Professional, Scientific, & technical activities	0.2
Elc,Gas,Steam & Aircon Supply	0.3	Mining & Quarrying	0.2	Arts, Entertainment, Recreation	0.1
Mining & Quarrying	0.1	Arts, Entertainment, Recreation	0.0	Information & Communication	0.1
Real Estate	0.1	Real Estate	0.0	Real Estate	0.09

Table 2: Conceptual Framework for Assigning Skill Level to Worker

Skill Level	General Education	Technical Education	Vocational Education
Low Skilled	Not literate to below primary Codes: 01, 02, 03, 04, & 05	None Code: 01	Some vocational education (Codes 01 to 05) **or** No vocational education (Code 06)
Low-Medium Skilled	Up to secondary education Codes: 06, 07, & 08	None Code: 01	Some vocational education (Codes 01 to 05) **or** No vocational education (Code 06)
Medium-High Skilled	Higher secondary or diploma/certificate course Codes: 10, 11	Without technical education (Code 01) **Or** With technical education (Codes: 02, 03, 04, 05, 06, 07, 08, 09, 10, & 11)	Some vocational education (Codes 01 to 05) **or** No vocational education (Code 06)
High Skilled	Graduate and above Codes: 12, 13	Without technical education (Code 01) **Or** With technical education (Codes 12, 13, 14, 15, & 16)	Some vocational education (Codes 01 to 05) **or** No vocational education (Code 06)

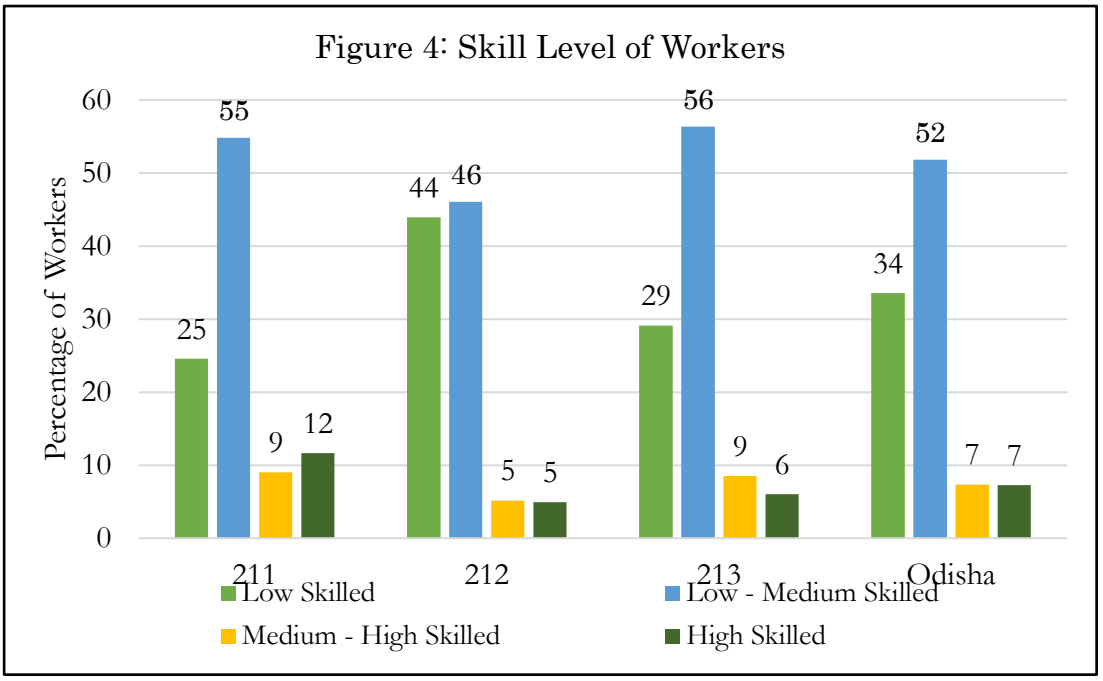


Figure 4 illustrates the skill levels of workers across different NSS Regions. A significant number of workers fall into the low-skilled and low-medium-skilled categories, suggesting that a large majority of the workforce in the state has education only up to the secondary level and lacks technical training. In NSS Region 212, approximately 90% of workers are classified as low-skilled or low-medium-skilled. This situation helps explain why less skill-intensive sectors, such as agriculture and construction, account for roughly 77% of employment in the region.

Given this context, it is crucial to enhance the overall education level within the state to facilitate the delivery of vocational and technical training. From this analysis, one can infer that there is a high degree of informal employment in Odisha. The sections that follow will aim to quantify informal employment in the state by estimating the number of workers engaged in informal jobs.

III. Literature Review:

The Annual Report on PLFS does not take a comprehensive view of informal employment. However, it provides estimates for some indicators associated with informal employment. The report provides estimates on the number of salaried and casual labourers without a written job contract, without paid leave, and without social security benefits. It also provides an estimate of workers working in informal sector enterprises, i.e., proprietorship and partnership firms. As per the PLFS 2023-24 Annual Report, in the non-agricultural sector, 48% of regular wage/salaried employees had no written job contracts, 43.6% were not eligible for paid leaves, and 52.7% were not entitled to any social security benefits from the employer.

The 17th International Conference of Labour Statisticians adopted guidelines concerning a statistical definition of informal employment. The conceptual framework for the same is presented in Figure 5 below.

Figure 5: Conceptual Framework defining informal employment

Production units by type	Jobs by status in employment								
	Own-account workers		Employers		Contributing family workers	Employees		Members of producers' cooperatives	
	Informal	Formal	Informal	Formal	Informal	Informal	Formal	Informal	Formal
Formal sector enterprises					1	2			
Informal sector enterprises[(a)]	3		4		5	6	7	8	
Households[(b)]	9					10			

Source: Guidelines concerning a statistical definition of informal employment, 17th ICLS

As per the guidelines developed during the 17th ICLS, workers categorized in cells 1 to 6 and 8 to 10 fall under informal employment. Informal employment occurs under several circumstances. A worker is considered to be in informal employment if they are an own-account worker or an employer in the informal sector (cells 3 and 4). Additionally, unpaid family workers also fall into this category (cells 1 and 5). Salaried employees or casual labourers who do not have a written job contract or do not receive social security benefits are also classified as informally employed (cells 2 and 6). Those employed in household enterprises (cells 9 and 10) are included in this categorization as well. Household enterprises consist of households that produce goods solely for their consumption, as well as households that employ domestic workers. Members of informal producers' cooperatives are also a part of informal employment (cell 8).

A paper [8] published by the Centre for Policy Research (CPR) in 2020 adapts the conceptual framework illustrated in Figure 5 to the Indian context, utilizing data from the Periodic Labour Force Survey (PLFS) conducted in 2017-18. This study applies the framework outlined in the CPR paper to quantify the number of workers engaged in "informal employment."

IV. Estimating the Number of Workers under "Informal Employment" in Odisha

Using the PLFS 2023-24, the number of workers under "Informal Employment" for the year 2023-24 was estimated. The number of workers was calculated as per the usual activity status (principal status + subsidiary status). For this study, all workers engaged in the 'Agriculture, Forestry, and Fishing' industry, defined by NIC section A, were excluded from the analysis. Therefore, these estimates are for the non-agriculture sector only. As per the Annual Report on PLFS 2023-24, NIC Industry Divisions 05-99 form the non-agricultural sector. Furthermore, all the analyses are made for the age group '15 and above'.

As per the 2020 CPR paper [8], the following enterprises employing less than 10 workers were categorised as informal sector enterprises – proprietorships, partnership with members from same household, partnership with members from

different households, co-operative societies, trust/other non-profit institutions, and enterprises categorised as others. The own-account workers and employers in the informal sector form the first category of "informal employment". All the workers employed in households (NIC divisions 97 and 98) form the second category of "informal employment". All workers having usual activity status of "unpaid family worker" form the third category of "informal employment". Lastly, salaried workers and casual labours who receive no social security benefits from their employers, irrespective of whether they are employed in formal sector or informal sector form fourth category of "informal employment". Table 3 below shows the number of workers in each of the four categories for the three NSS regions as well as Odisha.

Table 3: Percentage of Workers categorized under "Informal Employment"

	Category 1		Category 2	Category 3	Category 4			
NSS Region	Own Account Workers	Employers in the Informal Sector	Household Sector (NIC Divisions 97 & 98)	Unpaid Family Workers	Salaried Workers & Casual Labourers with no Social Security Benefits	Number of Workers with Informal Employment in the Non-Agricultural Sector Cols(2+3+4+5+6)	Total Number of Workers in the non-agricultural sector	Percentage of Workers in Informal Employment in the Non-Agricultural Sector (Col.7/Col.8)*100
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
211	1001743	145163	50349	250042	1511183	2958481	3475865	**85.11**
212	713317	83457	27133	248826	1769296	2842029	3179143	**89.40**
213	843151	117140	40289	238022	1390699	2629301	3014557	**87.22**
Odisha	2558211	345760	117771	736891	4671179	8429811	9669565	**87.18**

Source: Author's Calculation from PLFS, 2023-24

Column 9 of Table 3 shows the percentage of workers in the informal employment in the non-agricultural sector. A large proportion of workers, i.e., 87.18%, in Odisha are in informal employment.

V. Conclusion:

This study looked at various indicators to get a snapshot of current employment scenario in Odisha. In addition to state-wise analysis, we also assessed data across the three NSS regions. The dependency ratio in Odisha is relatively low, with the number of young dependents (ages 0-14) exceeding the number of old dependents (ages 65 and above)4. A significant portion of the population will be entering the workforce in the coming years. To achieve the state's medium-term and long-term economic goals, it will be crucial to ensure the availability of adequate jobs, both in quantity and quality.

This study pointed out that there are both supply-side and demand-side issues. On the supply side, the quality of workers is concerning due to their skill levels, with most workers being low-skilled or low-medium-skilled. On the demand side, informal jobs are plenty, while formal jobs are few. Policy interventions will be necessary to address these challenges.

A news article [9] published in Mint discusses the success of the "Skilled in Odisha" program, which is helping migrant workers from Odisha secure higher wages outside the state. However, this success should also be reflected within the state itself. There is an urgent need to create more employment opportunities locally so these skilled workers can be absorbed within the state.

Currently, most jobs in Odisha are concentrated in the agricultural sector and in informal sectors, such as construction, trade, and motor vehicle repair. Over three-fourths of workers are employed informally, which typically means they earn low wages, lack job security, and receive little to no social security benefits. To address these issues, it is crucial to implement policies that can develop a robust formal job market. There should also be encouragement for entrepreneurial activities in the formal sector within the state.

This study can also be undertaken at the district level, which can assist in policy formulation at the grassroots level.

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9. The Superpower of Odisha's Migrant Workers, Crafted over a Decade,

Odisha's employment scenario

An analysis of the proliferation of gig work in Odisha (with special reference to food delivery and ride-sharing platforms)

Dr. Mousumi Das
Deepali Debasmita

Abstract:-*The rise of digital platforms and its role in shaping the employment scenario of any region cannot be ignored any more .Post Covid, the transformation of work models led to the emergence of Gig work in place of traditional work models but unfortunately their exists lack of database of workforce and few researches in India and fewer still in the state of Odisha. This study involves both a conceptual and exploratory analysis as well as a case study involving two diverse platform gig workers to test the viability and sustainability of such work models in states like Odisha in order to explore the future growth potentials and adaptation strategies.*

Keywords:- gig work, platforms, sustainability

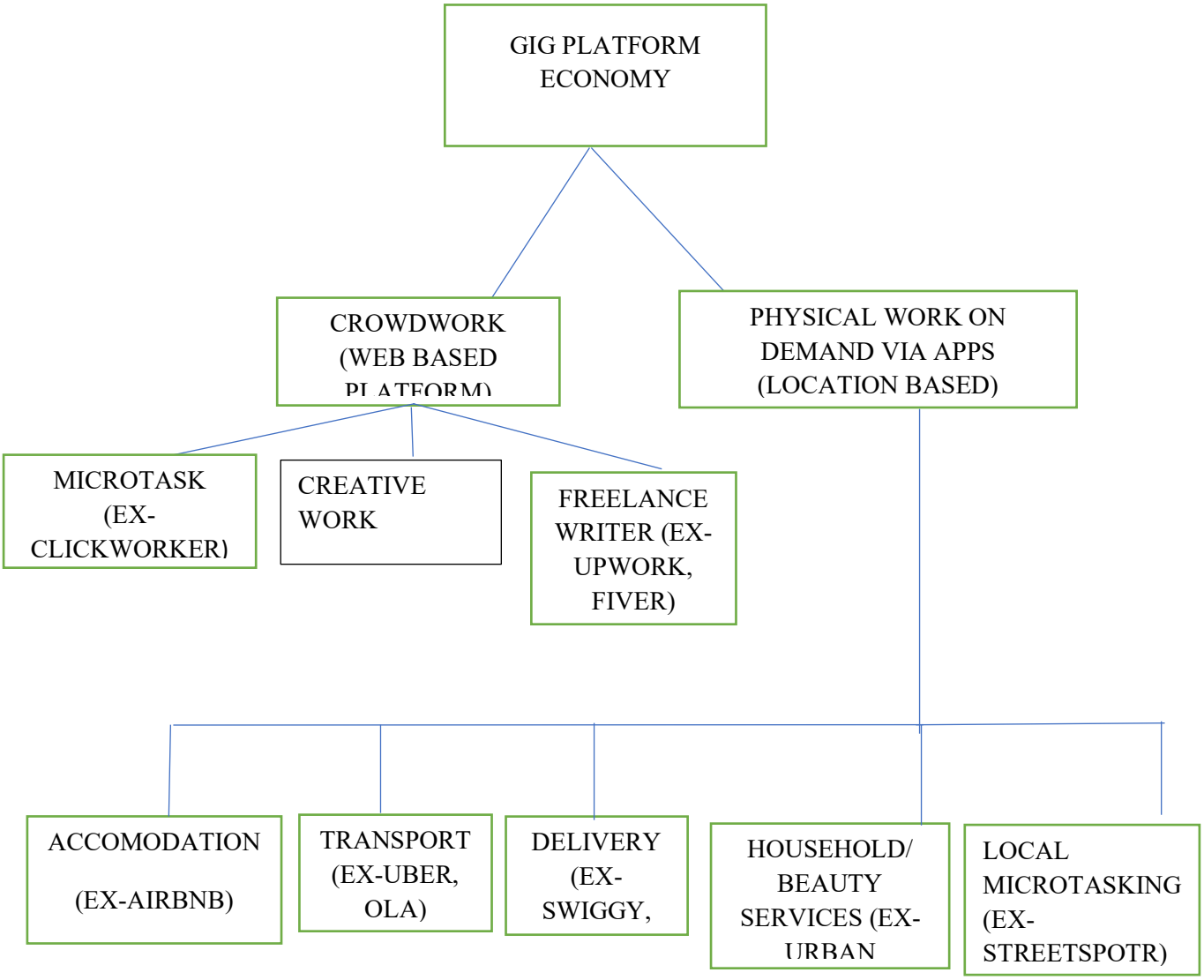
Introduction

The impact of digital technologies is revolutionizing various aspects of human existence, with a notable emphasis on the realm of employment. Post-Covid, the job and employment market has undergone a tectonic change, with works being transformed to 'gigs' or 'tasks' and employees to platforms or platform operators where owners are corporations/business houses. Thus, a two-tier system has transformed into a three-tier system, giving rise to a triangular relationship consisting of capitalists (the platform owners), the platforms, and the employee(gig workers). In this connection, the gig economy would refer to a developing labour market in which companies hire independent workers for temporary contracts, commonly known as gigs," through online platforms that connect workers with customers (Spreitzer et al., 2017; Jabagi et al., 2018). However, within this distinct context, where gig workers are devoid of a designated human supervisor, the mechanisms through which companies can facilitate the "self-motivation of gig workers" remain undisclosed and inadequately explored (Kuhn and Maleki, 2017).

Need of the study-

The digital economy has undoubtedly broadened job opportunities starting from delivery personnel to cab-drivers to beauty professionals to software engineers to data analysts, all working and available online. There's no going back in this type of digital revolution that the employment landscape is facing. Rather, with the identification and exploration of the prime motivating factors, this study can make a valuable contribution in enriching the work environment of gig workers and provide a direction for policymakers to provide a sustainable mode of employment in gig platforms.

Classification of gig-work:-Gig platform economy is broadly divided into two types:- 1) Crowdwork and 2) Physical "work on demand" which are as follows:-



Literature review:-

1.1:-Concept of gig work and its framework:-

Gig platform work broadly consists of crowdwork or online web based platform and physical work on demand via apps. In crowdwork, crowdworkers do "microtasks" (development of projects, creative design etc of requester or crowdsourcer such as individuals, groups or organisations and crowdsourcer or requester financially pay to crowdworkers. Crowdworkers can do this type of work usually at their own location whereas in physical "work on demand" through apps, workers usually have to move to consumer's place to be financially paid and get the consumer's work done. It includes activities like transportation, cleaning, delivery activities (Kittur et al., 2013; Alkhatib et al., 2017; Tony Blair institute for global change, 2022).

1.2:--Features of the gig platform economy

Gig platform economy refers to as mediating work through apps where demand and supply of labour takes place through apps facilitating interaction between them (Lepanjuuri et al., 2018; Taylor et al., 2017). Unlike other work models, it has flexible work arrangements (Friedman, 2014; De Stefano, 2015; Graham et al., 2017; Bellesia et al., 2019; Raman et al., 2021; Lehdonvirta, 2018; Veluchamy et al., 2021; Hunt et al., 2019; The Asia Foundation, 2022; Niti Aayog, 2022). The workers basically regarded as self independent contractor and not as employees (Abkhezr & MacMohan, 2022; Ravenelle, 2019). In India, generally low skilled young workers age ranging between 26-45 years having educational qualifications upto higher secondary level took part in this platform sector jobs (Niti Aayog, 2022). Algorithm control of workers is a key feature in this emerging on-demand platform apps (Heeks et al., 2021; Lata, 2022; Goods, 2019).

1.3:- Differences between gig work and traditional work types

In traditional work type, there is "employer-employee" relationship where employee has to obey the employer. They have stipulated work timings but in gig work type, there is no traditional "employer-employee" relationship where they have flexible work timing. They could independently choose their work timing, location etc. In traditional work type, there is availability of social security programs like insurance, gratuity act etc but it is lack in gig type work. In gig type of work, they enjoy flexibility and could devote time for their family members or for other hobbies. (Friedman, 2014; De Stefano, 2015; Graham et al., 2017

Research Gap:-

Though there is a huge domain of literature trying to capture the increased level of absorption, participation and proliferation of gig work across the globe both in developing and developed economies but there's a confusion of proper understanding of the framework and understanding of gig work.

Moreover, there's a lack of proper theorization in economics to capture the motivation and sustainability of gig work.

Thirdly. except for the data collected from the Niti Aayog report in 2022, there's no official database in India available for it. This also applies to states like Odisha, where no official recorded database of gig workers is available as yet.

And fourthly, though the terminology of 'gig work' has become a common connotation used in the discussion of industrial employment scenarios , yet the lacunae in laws and regulations faced by the workers on this platform in our country and particularly the state of Odisha, is not rightly addressed.

Research questions:-

This study tries to explore the following questions:-

1. What are the basic factors that motivate a gig worker to join a food delivery platform or a ride sharing platform in India, particularly in the state of Odisha?

2. How to evaluate the motivations to join gig work through different economic theories or statistical tools?

3. Does the present working conditions encourage gig work in Odisha ?

4. What regulatory mechanisms can the government undertake to ensure safety and social security for gig workers in our country and state in particular ?

Scope of the study :-

The study is mainly based on secondary data analysis of the newly emerging concept of gig work with a primary data analysis of case study of two platform workers i.e Swiggy food delivery workers(low skilled gig work) and Uber ride sharing platforms operating in Bhubaneswar municipal region(medium skilled gig work). A questioniarre was prepared to capture the demographic profile and the motivations to join gig work .

Objectives of the study :-

- ❖ To study about the demographic features of gig workers involved in Uber & Swiggy platforms in Bhubaneswar.
- ❖ To find out the factors that motivate workers to work in the Uber & Swiggy platform in Bhubaneswar.
- ❖ To identify the difficulties faced by worker in the platform and develop adaptation strategies to make the employment sustainable

Research design:-

The research aims to know about the working conditions of the gig workers and to analyse the factors that motivate them to do gig work. It is quantitative in nature. It analyses the experiences and working conditions of gig workers by examining relevant variables by the help of descriptive statistics.

Population -

The target population here is to study the gig workers in Uber and Swiggy; the former is a mobility sector platform and the latter is a food delivery sector, respectively. Samples here consist of 140 gig workers on the Swiggy platform and 160 gig workers on the Uber platform in the Bhubaneswar area.

Field selection -

Bhubaneswar, being the capital of Odisha, has better infrastructural facilities and stronger economic growth than other regions. The majority of the gig workers are found in the Bhubaneswar region. Also, Bhubaneswar has the main offices of many gig platforms, i.e. Uber and Swiggy Platform services. Bhubaneswar, being a smart city, has quite good access to internet connectivity. Part-time gig workers from the nearby Bhubaneswar region migrate here to avail of other facilities like education, jobs, etc, and entry into the platforms is easy and hassle-free. Very less or even nil gig platforms and workers are found in other regions of Odisha.

Platform selection -

The present study is a comparative analysis between a food delivery platform and a ride-sharing platform very commonly used in Bhubaneswar. A food delivery platform(low skilled gig work) offers an app or service as an intermediary to connect customers to local restaurants through delivery boys(wallets). Most of the big business Food delivery platforms like Swiggy, Zomato, Doordash and Uber Eats but in Bhubaneswar, Swiggy is more popular than Zomato due to the following reasons:-

- Faster delivery:- Many users reported that Swiggy delivered food to their customers in less time than others.
- User experience:- The Swiggy app is known for its user-friendly as it is easy to browse and order food.
- Promotions:- Swiggy offers attractive discounts and coupons to the users
- Reliable service- It is known for its reliability in terms of order accuracy and customer service.

Swiggy is known for its quicker and efficient delivery process than other food delivery platforms due to its advanced logistics process (Wilson, 2024).

In Bhubaneswar, Uber is more popular than any other platform app due to the following reasons:-

- Global reach:- It is an international platform found in numerous countries so people are already familiar with their uses and services.
- Pricing and Promotions:- Uber offers more competitive rates and promotions than other apps.

Uber is an international brand. Its features are standardized globally, providing more user-friendly experiences than any other apps like Ola (Kashyap, 2022).

Sampling strategy & rationale for selection -

The snowball sample technique has been used by identifying the gig workers and encouraging them to refer to other gig workers, creating a chain-like effect.

This technique is useful due to the following reasons:-

It is useful in reaching out to the gig workers as it is challenging to contact them directly as they are dispersed in different regions and also, it is difficult to collect data from them due to their busy schedule during work hours.Due to free entry and exit of the workforce, gig worker population do not remain fixed so there is fluctuations of the population.

-Companies also did not reveal the workforce data for safeguarding the privacy of their jobs and gig workers, which is considered the most challenging for collecting data.

Thus, the snowball technique is useful for collecting data as the traditional method of sampling may not be helpful in reaching out to the gig workers especially in remote and inaccessible locations. The snowball technique overcomes all these limitations.

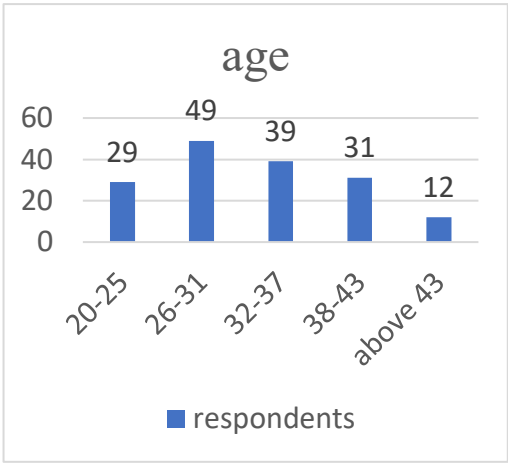
Data collection and analysis:-

Working conditions of Swiggy and Uber delivery workers in Bhubaneswar

There is no official data that has been found for enumerating gig workers, which is considered as the major challenge. This also applies for the state of Odisha, where no official recorded data for gig workers is available yet. Most authentic data about gig workers could be seen in the Niti Aayog report but the data collected mainly from gig workers prevalent in Bengaluru, Mysuru, Jaipur, Jodhpur, Udaipur and New Delhi area only. Recently, in 2024, a report regarding the working and living conditions of gig workers in India have been released by Paigam, University of Pennsylvania, by taking the data from the 8 cities of India – Delhi, Lucknow, Jaipur, Indore, Hyderabad, Bangalore, Mumbai & Kokata only. NCAER has also released a report for gig workers in food delivery platform workers by taking data from three-tier cities. Therefore, the data collected only represents the "snapshot" of gig workers but is not representative of all the individuals. Very little information has yet been collected regarding gig workers in Bhubaneswar. So here, the efforts have been attempted to study the conditions of the gig workers in Swiggy and Uber in Bhubaneswar by collecting around 140 data samples of the Swiggy delivery workers and 160 data samples of Uber delivery workers

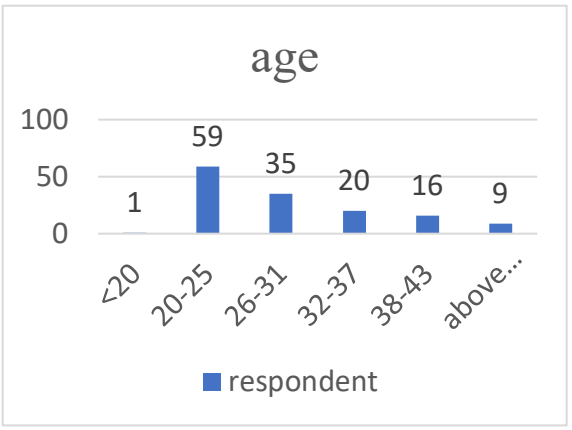
Demographic features:-

UBER

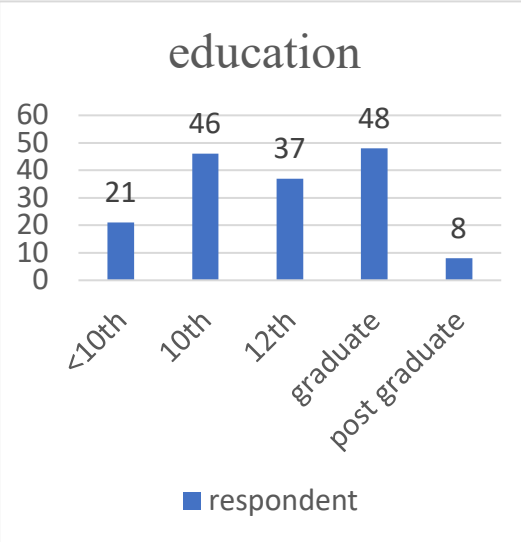


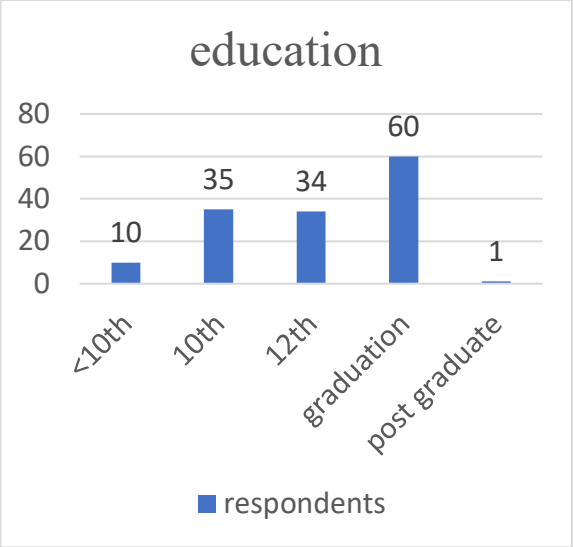
Majority of the respondents are from the age group between 26-31 years of age , generally youth are involved in this type of work and very less number are fr.

SWIGGY



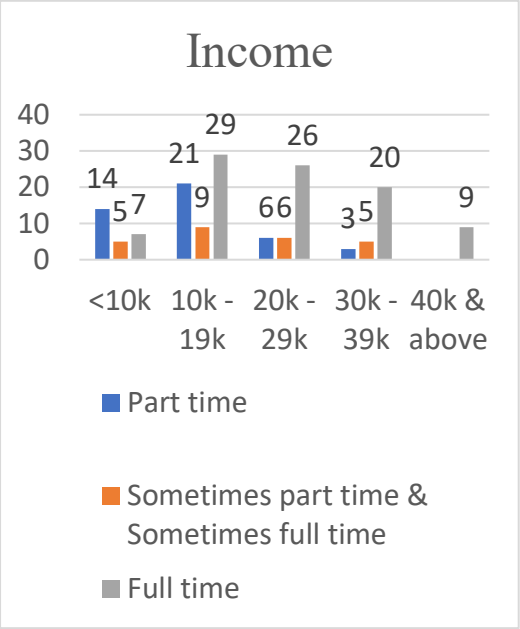
Majority of them are from the age group between 20 – 25 years of age.

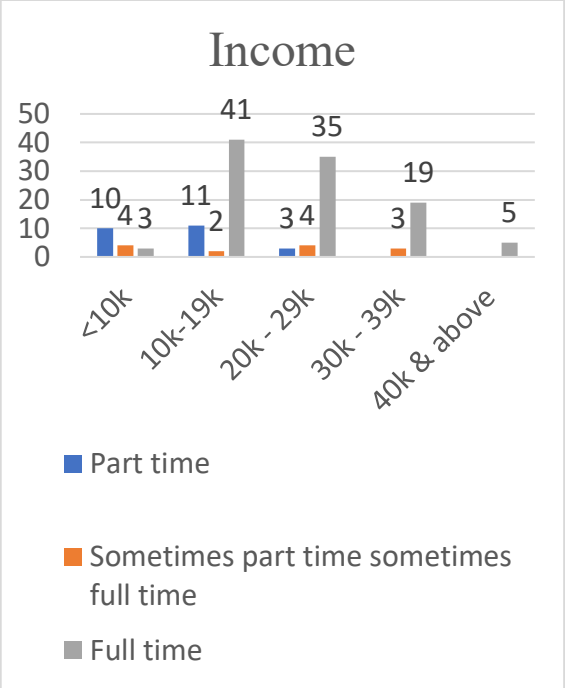




It is found that majority of uber drivers have educational qualification upto graduation level or upto 10th as their educational qualifications.

It is found that majority of swiggy workers upto graduation level. This case study reveals a bizarre trend in Bhubaneswar as majority of food delivery workers are students who opt it as a part time work to collect some additional income



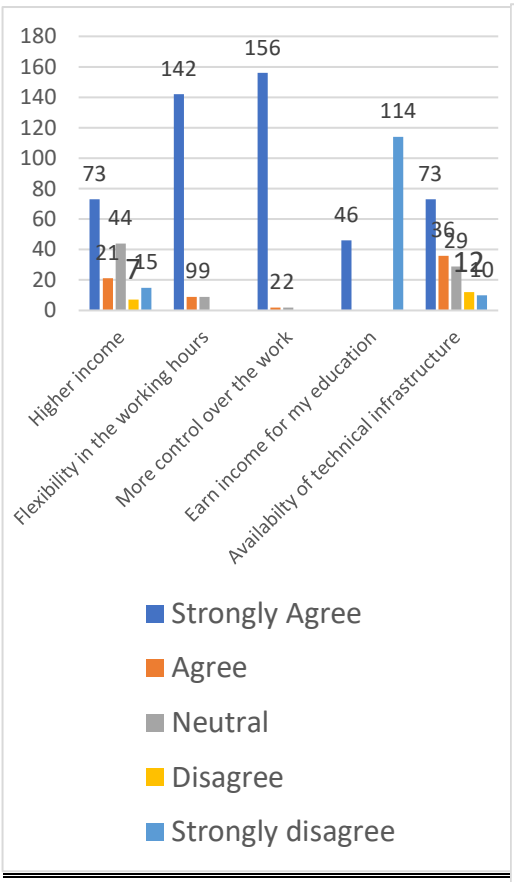


It is found that majority of gig workers working in Uber full time have income range between 10k – 19k and majority of gig workers working in Uber part time have also income range between 10k -19k but full time workers are getting more paid than part time worker but full time workers are getting more paid than part time worker. but full time workers are getting more paid than part time worker

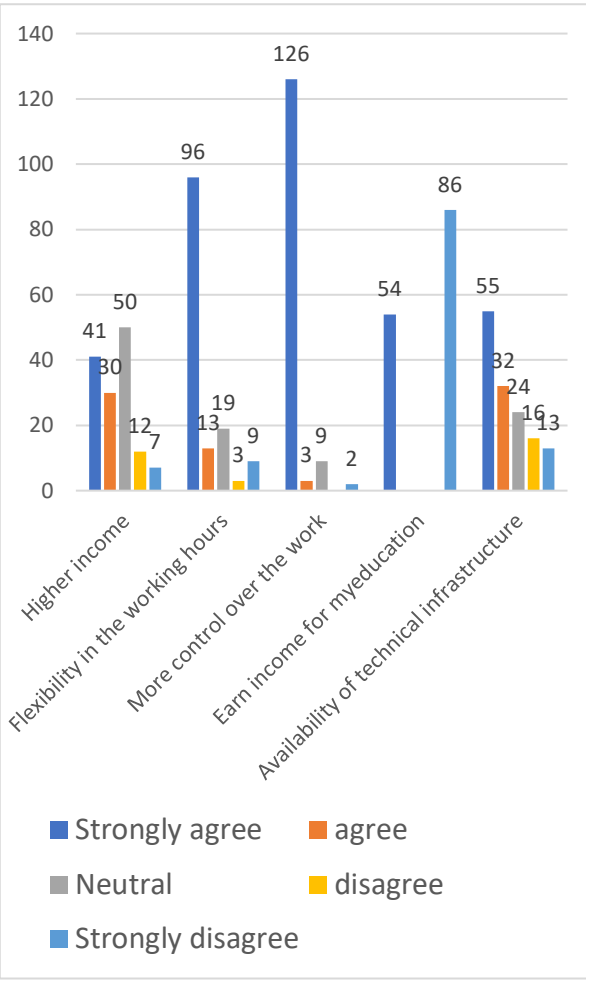
It is found that the swiggy delivery boys who work full time can able to earn around Rs 10,000 to Rs 29,000 around month. Almost all the workers work full time. Very less number of workers work part time

Motivations to work in the platform:

UBER



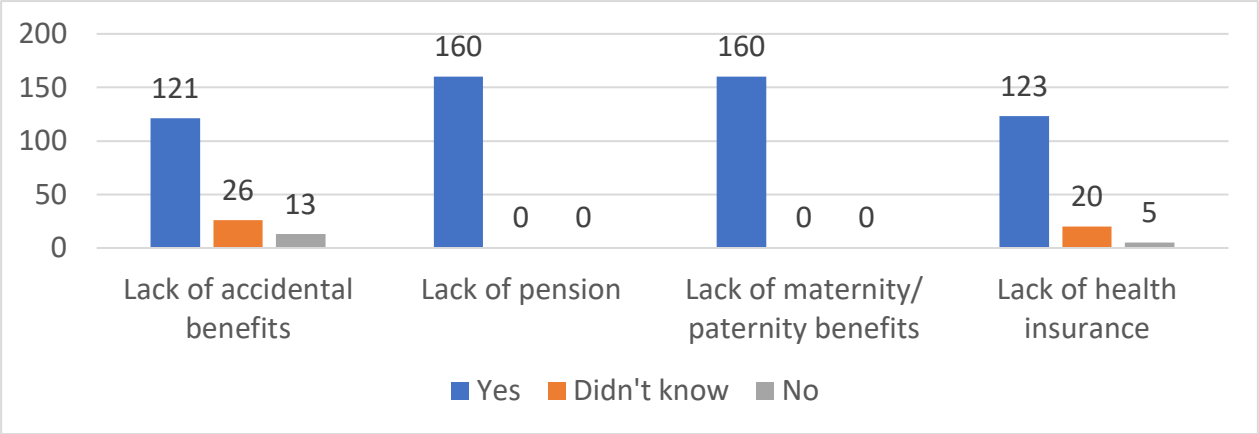
SWIGGY



It is found that flexibility in the working hours and having more control over the work are the major factors that motivate people to work in the Uber

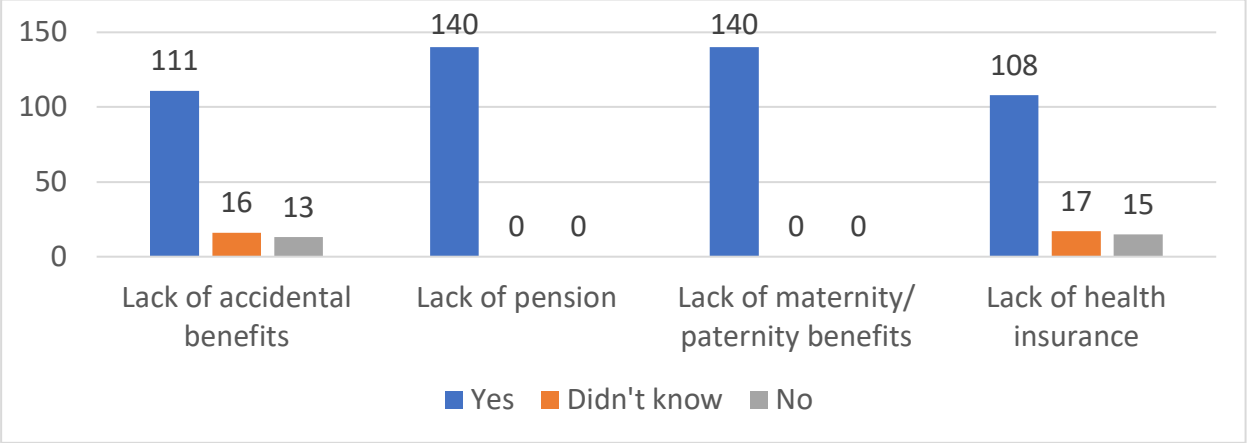
It is found that being able to work independently with more control over the work is the major factor that motivate people to work in the Swiggy

Responses of the Uber gig workers on the availability of social security benefits:-



Most of the workers responded that there is a lack of availability of all sorts of social security benefit in the platform.

Responses of the Swiggy gig workers on the availability of social security benefits:-



Most of the workers responded that there is lack of availability of all sorts of social security benefit in the platform.

CORRELATION BETWEEN HOURS OF WORK AND WAGES IN UBER

		Wages
Hours	Pearson Correlation	,596**
	Sig. (2-tailed)	,000
	N	153

**. Correlation is significant at the 0.01 level (2-tailed).

As $p < 0.01$, there is significant positive correlation between hours worked and wages, it indicates higher works devoted for platform work earns higher incomes in case of Uber.

CORRELATION BETWEEN EDUCATION QUALIFICATION AND WAGES IN UBER

		Edu
Wages	Pearson Correlation	-.249**
	Sig. (2-tailed)	.002
	N	153

**. Correlation is significant at the 0.01 level (2-tailed).

There is negative correlation between educational qualification and wages in case of Uber.

CORRELATION BETWEEN AGES AND WAGES IN UBER

		Ages
Wages	Pearson Correlation	.076
	Sig. (2-tailed)	.418
	N	115

As p > 0.05, it indicates there is no correlation between ages and wages in Uber.

CORRELATION BETWEEN HOURS OF WORK AND WAGES IN SWIGGY

		Wages
Hrs	Pearson Correlation	.661**
	Sig. (2-tailed)	.000
	N	140

**. Correlation is significant at the 0.01 level (2-tailed).

As p < 0.01, there is a significant positive correlation between hours of work and wages in Swiggy.

CORRELATION BETWEEN EDUCATIONAL QUALIFICATION AND WAGES IN SWIGGY

		Edu
Wages	Pearson Correlation	-.044
	Sig. (2-tailed)	.603
	N	140

As p > 0.05, it indicates there is no correlation between educational qualification and wages in Swiggy.

CORRELATION BETWEEN AGES AND WAGES IN SWIGGY

		Ages
Wages	Pearson Correlation	-.066
	Sig. (2-tailed)	.436
	N	140

As $p > 0.05$, it indicates there is no correlation between ages and wages in Swiggy.

Major Findings:-

It's the young population that it more involved in gig work platform in Odisha. The case study in Odisha presents a bizarre picture that even if Swiggy delivery work requires low skill than a Uber driver which calls for medium skilled work yet, in Bhubaneswar most of the students coming from peripheral Bhubaneswar undertake this work to get some additional income/pocket money to meet the high expenses of urban life. However, flexibility in work hours and additional income earnings have emerged as the prime motivations to join the platform. But the workers in this platform are not so much aware of the social security conditions available for them, which poses a serious challenge for the sustainability of such work models.

Challenges and difficulties faced by the worker in the platform:-

Uber

- Customer's problems are heard only for the profit of the company but not to Uber riders' problems.
- Blocking of the id of the riders without even knowing the proper reasons.
- The company did not give petrol free for which they have to born the expenses of travel resulted in very less income at the end of the day.
- For faraway distance, they have to spent more money both for visiting and return trips in form of petrol fees, but in return left with less income.
- They have to face drunkards at night and are sometimes faced with bad customers, including prostitutes.
- Sometimes there is a navigation problems also found in the map.
- There is a lack of accident benefits and a lack of other social security benefits in the platform.

Swiggy

- They have to wait in the long queue and deliver the food to the customers even in harsh weather conditions like in the scorching heat, heavy rain, etc.
- Some of the swiggy workers also said that team leaders in the city office do not solve their problems and are also not ready to listen to any of their problems. They are ignoring the delivery workers and do not listen to their rights.

- Sometimes they are travelling very long distances to deliver the order but in return they are getting less money.
- Some also stated that they have to go 4th or 5th floor of the apartment to deliver the order as a result they became late to deliver for the next order and they also can't go with high speed as they have to follow the traffic safety rules.
- Some also said that new joining delivery workers got more orders than old delivery workers.
- The work environment is such that they have to automatically compromise on flexibility and are forced to work for longer hours.
- Now days, as the petrol price is going up, they have to spend for high petrol prices while delivering the order to the customers.
- Some also stated that they have to face with unnecessary penalties even though they serve the food to the customers honestly.
- Some also stated that sometimes they received the order overtime late at night.
- They also faced with thieves, bad and alcoholic customers late at night. Also they have to suffer rude behaviour of bad customers and restaurants too.
- Companies do such things which are profitable to them only and did not listen the rights of workers.
- The company did not do anything for the delivery workers who faced with accident.
- If the delivery workers did not accept the order due to long distances repeatedly, they face penalty and their ID's are blocked.
- Some delivery workers have spondylitis and neck pain problems even though they were given orders that cover long distances and dangerous zones.
- Thieves, fake customers at night ordering the food and behave badly with the delivery workers and also not giving the money to the delivery workers.

Conclusion and suggestions:-

If we adopt the flexicurity model and analyse the findings, we find flexible work timings and higher wages are major motives of engagement in gig-work, however, lack of security is the main hindrance /challenge for them.

Growth of the gig economy highly depends on the advancement of the technological infrastructure but in developing countries like India, mostly gig economy platforms mostly dominate in urban areas and highly advanced in A+ cities and completely lack access to rural areas.

As far as Odisha is concerned, it's one of the premier states to pre-publish draft rules under code of social security, 2020 but provisions specific to gig workers is yet to come. A comprehensive welfare scheme for Motor Vehicles drivers and Workers was launched in June 2023 to provide 4 lakh to nominee of deceased driver/worker in road accident, Rs.1.5 lakh to persons suffering from from

permanent disabilities due to accidents, Rs 80,000 to drivers with minor injuries and also rs.2 lakh ito nominees in case of natural deaths. Apart from that the coverage of Biju Swasthya Kalyan Yojana(BSKY) and Madhu Babu Pension Scheme also covered the respective beneficiaries. The Union Budget 2024-25 also insists on registration on E-Shram portal to create an official database for the unorganized/organized workforce.

However, this platform gives rise to some drawbacks like an increased number of "reserve army" in urban centres. As the supply of labourers is more than the demand for labourers, it leads to low remuneration of wages, high commission fees. Due to the "blind passenger acceptance" mechanism, workers are harassed as this platform directly interferes with their wages with low profits for the workers. There is also a lack of social security benefits, safe working conditions, untimely accident schemes etc, in this platform. They also face a certain degree of exploitation in this work. The gig platform is still in the infant stage, unlike other developed countries like the USA, UK, Germany etc. Thus government and other labour rights need to regulate this platform just like other traditional jobs as it would help in providing job opportunities for many.

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Bridging the Skill Gap in Odisha: Challenges, Initiatives, and Policy Recommendations

Smt. Kiran Prava Panigrahi

1. Introduction

Defining the Skill Gap and Its Significance in Economic Development

The skill gap refers to the mismatch between the skills possessed by the workforce and the skills demanded by employers. This gap is a critical barrier to economic development, as it limits productivity, innovation, and competitiveness. In developing economies like India, addressing the skill gap is essential for achieving sustainable growth, reducing unemployment, and ensuring inclusive development. According to the World Economic Forum (2020), over 50% of the global workforce will require reskilling by 2025 due to technological advancements and shifting industry demands. In India, the skill gap is particularly pronounced, with only 5% of the workforce formally skilled, compared to 75% in Germany and 96% in South Korea (NSDC, 2021).

Overview of Odisha's Employment Landscape

Odisha, a state in eastern India, has a population of over 42 crore and a workforce primarily engaged in agriculture, manufacturing, and services. Despite its rich natural resources and cultural heritage, Odisha faces significant challenges in employment generation and skill development. The state's unemployment rate stood at 6.1% in 2022, higher than the national average of 5.8% (CMIE, 2022). Key sectors such as information technology (IT), manufacturing, healthcare, and tourism are growing but face a shortage of skilled labor. This skill gap hinders the state's potential to attract investments and create quality jobs.

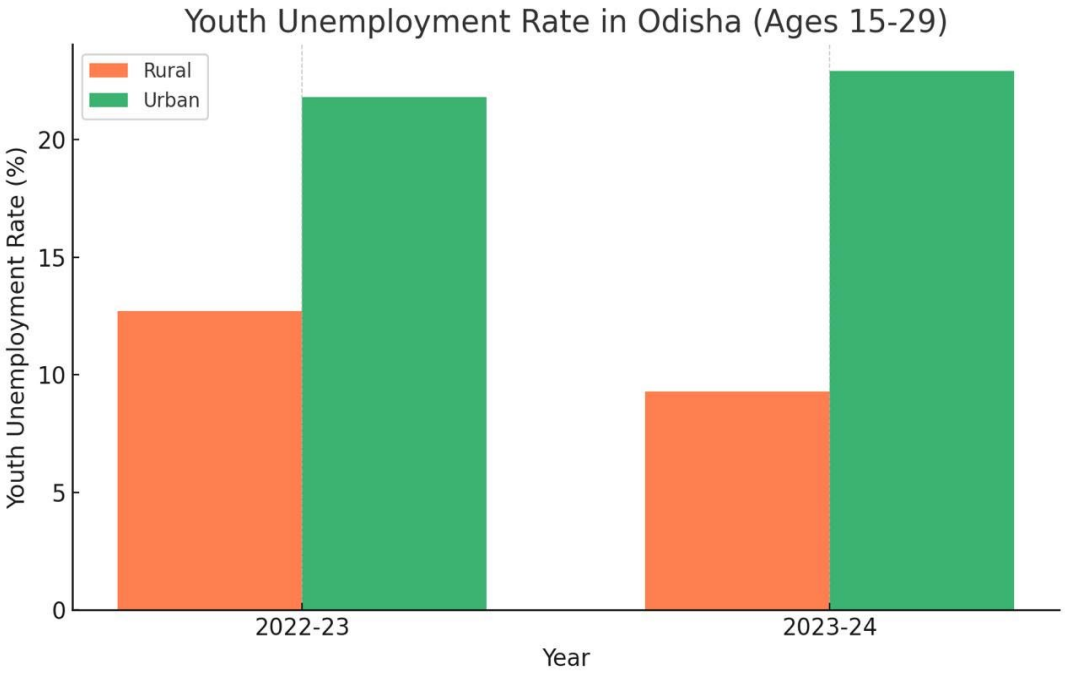
Objectives of the Research

This paper aims to:

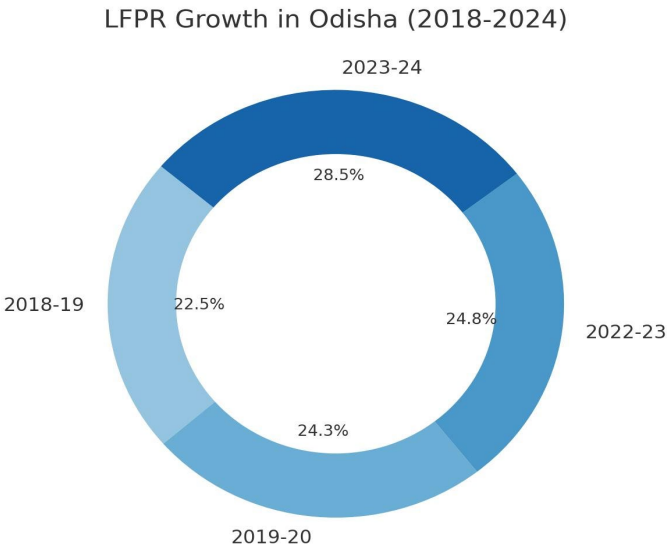
- Analyze the sector-wise skill gaps in Odisha.
- Evaluate existing skill development initiatives and their effectiveness.
- Identify gaps and challenges in current programs.
- Provide recommendations to bridge the skill gap and enhance employability.

Key Employment Statistics of Odisha

Unemployment Rate: Unemployment Rate: The overall unemployment rate in Odisha stood at 3.9%, slightly above the national average of 3.2%. Specifically, youth unemployment (ages 15-29) in rural areas decreased from 12.7% in 2022-23 to 9.3% in 2023-24, while in urban areas, it increased from 21.8% to 22.9% during the same period.



Labour Force Participation Rate: The state's Labour Force Participation Rate (LFPR) improved from 51.2% in 2018-19, 55.3% in 2019-20, 56.5% in 2022-23 to 64.9% in 2023-24 surpassing the national average of 58%. Notably, female LFPR saw a substantial rise from 19.5% in 2017-18 to 44.7% in 2022-23, indicating progress in women's employment.

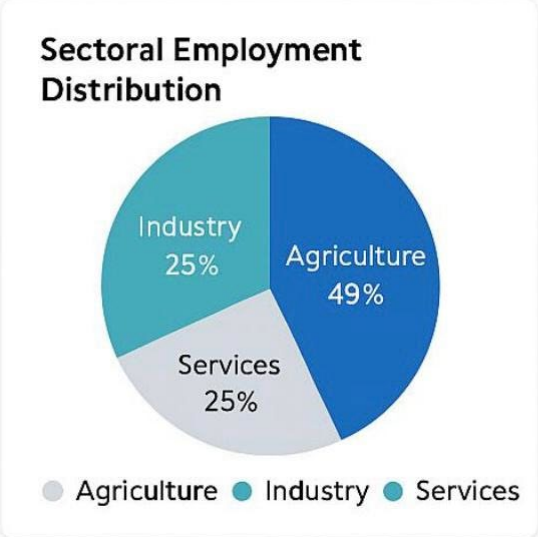


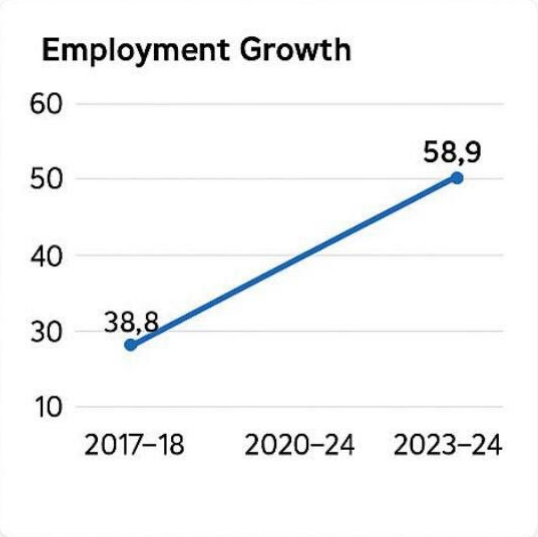
Sectoral Employment Distribution:

- **Agriculture**: Approximately 49% of the workforce is engaged in agriculture and allied sectors.
- **Industry**: The industrial sector employs about 26% of the workforce.
- **Services**: Around 25% are involved in the services sector.

Employment Growth: Between 2017-18 and 2023-24, the industrial workforce in Odisha increased from 38.8 lakh to 58.9 lakh, adding an average of 3 lakh jobs per year over six years.

Migration Trends: Many residents migrate to states like Maharashtra, Tamil Nadu, Kerala, Karnataka, Gujarat, West Bengal, and Andhra Pradesh in search of better employment opportunities, particularly in urban areas where job prospects are more limited.





2. Understanding the Skill Gap in Odisha

In Odisha, skill gaps vary across different sectors, impacting the state's economic development and employment opportunities. Identifying and addressing these gaps is crucial for aligning the workforce with industry needs. Here's an overview of the skill gaps in key sectors:

1. Agriculture and Allied Sectors: Despite agriculture being a primary livelihood source, there's a significant gap in advanced agricultural skills. Traditional farming methods prevail, limiting productivity. Training in modern agricultural techniques, storage, and food processing is essential to enhance efficiency and income. The Odisha government has initiated programs like Nutana Unnata Abhilasha (NUA) Odisha to bridge these gaps by offering high-quality training and fostering industry linkages.

2. Manufacturing and Industrial Sectors: With the growth of industries such as automobile components, chemicals, pharmaceuticals, and construction materials, there's a rising demand for skilled technicians and engineers. However, the supply of workers with relevant skills is insufficient. The NUA Odisha scheme aims to address this by providing training in emerging trades and technologies to at least one lakh youth annually over three years.

3. Services Sector: The services sector, including education, healthcare, IT & ITeS, media, entertainment, tourism, and hospitality, faces notable skill shortages. There's a high demand for skilled professionals, especially in healthcare and IT. For instance, in Cuttack district, significant gaps exist in tourism and hospitality, with a need for both skilled and semi-skilled workers. Initiatives like NUA Odisha are also targeting these areas to enhance employability.

4. Seafood Processing and Export: Coastal regions of Odisha, heavily reliant on seafood processing and export, experience skill deficiencies in this sector. Training programs have proven effective but require enhancements to keep pace with technological advancements. Addressing these gaps is vital for maintaining competitiveness in global markets.

Addressing these sector-specific skill gaps necessitates a collaborative approach involving government initiatives, industry partnerships, and educational institutions. Programs like NUA Odisha are steps toward aligning the workforce with industry requirements, fostering economic growth, and reducing unemployment in the state.

Sector-wise Skill Gaps

Odisha's economy is diversifying, with emerging sectors requiring specialized skills. Below is an analysis of skill gaps in key sectors:

Sector	Skill Gaps	Demand-Supply Mismatch
IT	Lack of advanced programming, AI, and data analytics skills.	High demand for tech professionals; low supply.
Manufacturing	Shortage of technicians, machine operators, and quality control experts.	Growing industrial hubs face labor shortages.
Healthcare	Insufficient trained nurses, paramedics, and healthcare technicians.	Rising healthcare needs outpace skilled workforce.
Tourism	Limited hospitality management and multilingual guide skills.	Tourism potential underutilized due to skill gaps.

Demand vs. Supply Analysis

The job market in Odisha is evolving, with increasing demand for skilled workers in IT, healthcare, and manufacturing. However, the supply of skilled labor remains inadequate. For instance, the IT sector requires 50,000 professionals annually, but only 30,000 are available (Odisha Skill Development Authority, 2023). Similarly, the healthcare sector faces a 40% shortage of trained nurses and paramedics.

Causes of the Skill Gap:

Technological Advancements: As technology evolves, new tools and platforms require workers to gain specialized knowledge. Automation, artificial intelligence, and digital transformation are accelerating the need for updated skills.

Educational Mismatch: In some cases, education systems fail to align with industry needs, producing graduates with outdated or generalized knowledge. This is especially true in sectors where practical, hands-on training is crucial.

Rapid Economic Shifts: Economic changes, such as globalization or the rise of new industries, can create demands for new skills that the existing workforce doesn't possess.

Labor Market Constraints: Geographic or demographic factors might limit the availability of skilled labor. Certain regions or populations may face barriers to accessing education or training opportunities, exacerbating the skill gap.

Education System Limitations: The state's education system emphasizes theoretical knowledge over practical skills, leaving graduates ill-prepared for industry demands.

Lack of Industry Alignment: Training programs often fail to align with industry needs, resulting in a mismatch between skills taught and skills required.

Outdated Curriculum: Many vocational training programs use outdated curricula that do not reflect current technological advancements

3. Existing Skill Development Initiatives

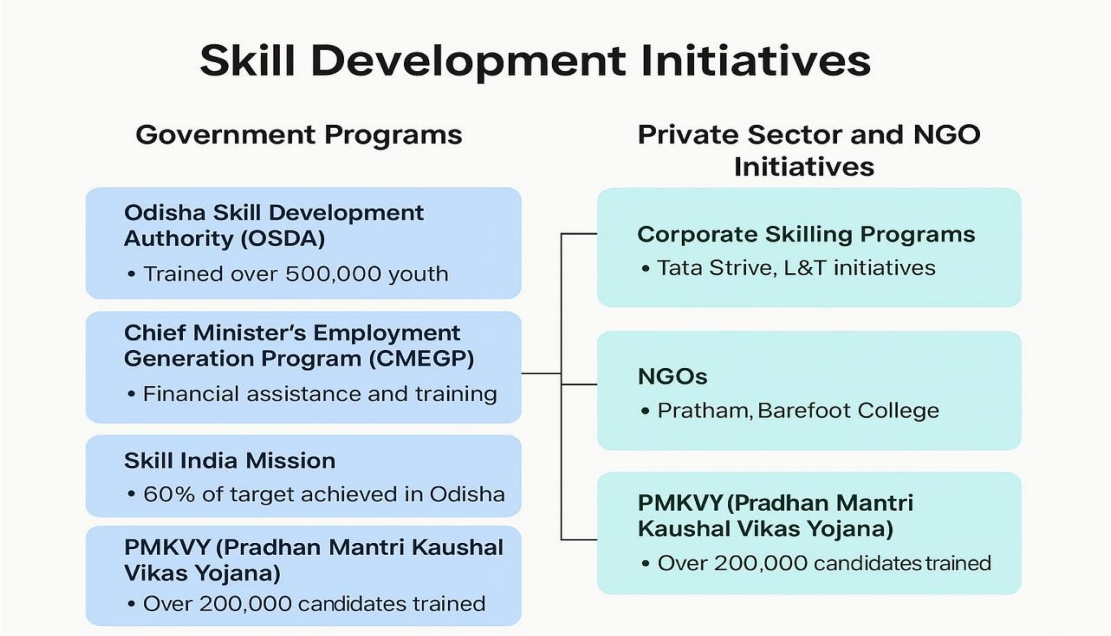
Government Programs

Odisha Skill Development Authority (OSDA): OSDA oversees skill development initiatives in the state, focusing on sectors like IT, healthcare, and manufacturing. It has trained over 500,000 youth since its inception. It collaborates robustly with industry and academic partners to design relevant courses, fostering improved employability in emerging local job markets.

Chief Minister's Employment Generation Program (CMEGP): This program provides financial assistance and training to aspiring entrepreneurs, particularly in rural areas. It offers subsidies, loans, and skill-building workshops, helping small businesses scale up, diversify, and build sustainable livelihoods across different sectors.

Skill India Mission: Implemented in Odisha, this national initiative aims to train 400 million people by 2022. However, the state has achieved only 60% of its target (MSDE, 2023). Under this mission, the government promotes vocational training, on-the-job, and certification courses that align with industry-specific demands for workforce enhancement.

PMKVY (Pradhan Mantri Kaushal Vikas Yojana): PMKVY offers short-term training courses and certification. In Odisha, over 200,000 candidates have been trained under this scheme. It emphasizes practical, hands-on learning in diverse trades, ensuring skill validation through standardized assessments and significantly boosting overall employability prospects.



Private Sector and NGO Initiatives

Corporate Skilling Programs: Companies like Tata Strive and L&T have launched skilling initiatives in Odisha. For example, Tata Strive has trained over 10,000 youth in IT and manufacturing skills. These programs leverage industry expertise to deliver targeted training, modernizing curricula and directly linking skilled graduates with employment opportunities in vibrant markets.

NGOs: Organizations like Pratham and Barefoot College provide vocational training to underserved communities, particularly women and rural youth. They emphasize inclusive education by implementing community-centric training modules, enhancing practical skills, fostering self-reliance, and empowering marginalized groups to transform their lives.

4. Effectiveness of Skill Development Programs

Success Stories and Case Studies

OSDA's IT Skilling Program: A case study of 100 trainees revealed that 70% secured jobs within six months of completing the program.

PMKVY in Healthcare: A survey of 500 PMKVY-trained nurses showed that 80% were employed in hospitals and clinics across Odisha.

Challenges in Implementation

Infrastructure: Many training centers lack modern equipment and facilities, limiting the quality of training.

Outreach: Rural areas often remain underserved due to inadequate awareness and accessibility.

Quality of Training: Some programs focus on quantity over quality, resulting in subpar training outcomes.

Industry Participation and Employment Outcomes

While some industries actively participate in skilling initiatives, others remain disengaged. For instance, the IT sector collaborates closely with training providers, while the tourism sector lags behind. Employment outcomes vary, with IT and healthcare trainees experiencing higher placement rates compared to those in manufacturing.

5. Gaps and Areas for Improvement

Alignment of Training Programs with Industry Needs

Training programs must be tailored to meet the specific needs of industries. For example, IT training should focus on emerging technologies like AI and blockchain.

Adoption of Emerging Technologies in Skill Training

Incorporating technologies such as virtual reality (VR) and augmented reality (AR) can enhance the effectiveness of training programs.

Role of Digital Learning and E-Skilling

Digital platforms can expand access to skill training, particularly in rural areas. For instance, online courses in coding and digital marketing can empower youth to pursue remote work opportunities.

Encouraging MSMEs and Startups to Participate in Skill-Building

MSMEs and startups can play a pivotal role in skill development by offering internships and apprenticeships. Incentivizing their participation through tax breaks and subsidies can enhance their engagement.

6. Recommendations

Strengthening Industry-Academia Collaboration

Establishing industry-academia partnerships can ensure that curricula are aligned with industry needs. For example, IT companies can collaborate with universities to design courses on data science and cybersecurity.

Incentives for Companies to Invest in Skilling

The government should provide tax incentives and subsidies to companies that invest in skilling initiatives. This can encourage greater private sector participation.

Expanding Rural and Women-Focused Skill Development Initiatives

Special programs targeting rural youth and women can address disparities in access to skill training. For instance, mobile training units can deliver skilling programs to remote areas.

7. Conclusion

Summary of Findings

Odisha faces significant skill gaps in key sectors like IT, manufacturing, and healthcare. While government and private initiatives have made progress, challenges such as inadequate infrastructure, limited outreach, and poor industry alignment persist. Furthermore, increasing demand for specialized skills, rapid technological advancements, and evolving market dynamics necessitate enhanced collaboration and continuous upskilling to bridge these gaps effectively.

Future Outlook and Policy Directions

To bridge the skill gap, Odisha must adopt a multi-pronged approach that includes modernizing training programs, leveraging technology, and fostering industry collaboration. By addressing these challenges, the state can unlock its economic potential and create a skilled, employable workforce. Further, targeted investments in infrastructure and continuous up skilling initiatives will empower youth, improve productivity, and ensure that Odisha remains competitive in a rapidly evolving global market.

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Crop Diversification and Substitutability in Odisha: A CES-Based Empirical Analysis (1993–2023)

Dr. Aswini Kumar Mallick

Abstract:

This study investigates the elasticity of substitution between crop areas in Odisha, a key determinant in understanding agricultural land-use dynamics amid changing economic, environmental, and policy conditions. Odisha's diverse agro-climatic zones and reliance on agriculture make it essential to analyse how flexibly farmers reallocate land among crops such as Paddy, Moong, Biri, and others. Estimating substitution elasticity helps quantify this flexibility, which is critical for adaptive responses to climate change, water scarcity, and market volatility. A high elasticity suggests a responsive and adaptive agricultural system, while low elasticity indicates rigid cropping patterns, often shaped by infrastructural, institutional, and cultural constraints. The study fills a critical gap in existing literature by applying the Constant Elasticity of Substitution (CES) production function—a sophisticated econometric method not previously used in this context—to estimate substitution elasticities among 14 major crops across Odisha over the period 1993–94 to 2022–23. The crops are categorized into two groups based on substitution potential, and elasticity estimates are derived separately for each group. This analysis provides evidence-based insights for policymakers to design effective interventions such as price support, crop diversification, and sustainable resource management, thereby enhancing resilience and efficiency in Odisha's agricultural sector. It's important to note that all analyses were conducted using MS-Excel and STATA.

Key Terms: *Elasticity of Substitution (EOS), Constant Elasticity of Substitution (CES), Marginal Product (MP), Marginal Rate of Technical Substitution (MRTS) and Classical Linear Regression Model (CLRM).*

1. Introduction

The study of elasticity of substitution between crop areas in Odisha is crucial for understanding the dynamics of agricultural land use in response to changing economic, environmental, and policy conditions. Odisha, with its diverse agro-climatic zones, relies heavily on agriculture for livelihoods and food security. Farmers in the state often make decisions on crop allocation based on relative prices, input costs, climatic risks, and policy incentives. Estimating the elasticity of substitution—how easily farmers switch land between different crops such as Paddy, Moong, and Biri etc.—helps to quantify this decision-making flexibility. This analysis is particularly important in the context of climate change, water scarcity, and fluctuating market prices. A higher elasticity implies that farmers can readily shift acreage between crops, allowing for adaptive responses to unfavourable conditions or better economic opportunities. Conversely, low elasticity indicates rigid cropping patterns, which could signal structural constraints such as lack of irrigation, limited access to credit or markets, or cultural preferences. Understanding these substitution patterns can guide policymakers in designing effective agricultural policies and interventions, such as price support mechanisms, crop insurance schemes, or extension services

promoting crop diversification. Moreover, insights from substitution elasticity can inform regional planning, ensuring optimal use of land and resources. For example, promoting pulses over water-intensive paddy in water-stressed areas could be encouraged if the substitution is feasible. Thus, analysing crop area substitution elasticity not only supports sustainable agricultural development in Odisha but also enhances resilience and efficiency in the farming sector.

Several studies have highlighted the importance of elasticity of substitution of crop area. **Heady and Dillon (1961)** first introduced the concept in agricultural economics, highlighting how resource allocation, including land, adjusts with changes in relative profitability of crops. **Chambers and Just (1989)** refined the econometric techniques for estimating substitution in production theory. In the Indian context, **Bhalla and Singh (2009)** emphasized that crop substitution is influenced not only by prices but also by institutional and infrastructural constraints. Their findings suggested that substitution elasticity varies significantly across regions due to irrigation, market access, and policy incentives. **Kumar et al. (2013)**, using panel data, observed moderate elasticity between food and non-food crops in India, underlining the role of minimum support prices (MSP) and risk in crop choice. Studies specific to Odisha are limited but relevant. **Nayak and Mishra (2016)** analyzed land-use patterns in Odisha and noted a persistent dominance of paddy despite efforts to diversify. They attributed low substitution elasticity to cultural preferences, irrigation dependence, and lack of adequate support for alternative crops. **Mohanty et al. (2020)** used time series data to assess crop dynamics and found that climatic variability and price instability significantly affect crop substitution, particularly in rainfed regions. Recent literature also emphasizes the importance of climate resilience and sustainability. **Rao and Kumar (2021)** recommended using elasticity estimates to guide policy for promoting pulses and millets in Odisha's marginal lands, suggesting that targeted interventions can improve substitution potential.

In this connection, no other studies have been undertaken to examine the diversification of crop areas among the crops in Odisha using the most sophisticated technique **called Constant Elasticity of Substitution (CES) production function**. Given the constant geographical area and the fact that these crops can serve as substitutes for each other in certain seasons, it is strongly advised to investigate the stability in cropping patterns and their growth at the macro level (across Odisha as a whole). This approach is crucial for the formulation of evidence-based policies regarding agricultural practices. Therefore, to estimate the substitution effect between 14 numbers of crops in Odisha is the primary objective of this study.

2. Data, Variable and Methodology

This study uses annual time series data sourced from EARAS section, DE&S, Odisha during the period 1993-94 to 2022-23 of 14 nos. of crop area (in lakh Ha.) of all district in Odisha such as **Paddy, Wheat, Maize, Ragi, Green Gram, Black Gram, Kulthi, Til, Groundnuts, Mustard, Niser, Potato, Jute and Sugarcane**. The above crops have been categorized in to two different groups namely Group-1 and Group-2 as per their nature of production. For example, it is difficult to substitute rice area by Moong area, but it is possible to substitute Moong area by Biri area. Thus, Blackgram, Greengram, Kulthi, Til, Groundnuts, Mustard, Niser, Potato and Jute are included in Group-1 category crop. Similarly, Maize, Wheat, Ragi, Sugarcane and Paddy are falling under the Group-2 category crop. In this

way, the elasticity of substitution between crops within each group has been estimated through Constant Elasticity of Substitution (CES) production function separately.

The elasticity of substitution refers to how easily land can be switched between different crops in response to changes in relative economic returns (e.g., prices or profitability). It measures how easily one input (e.g., land for Crop i) can be substituted for another (e.g., land for Crop j) while maintaining the same level of output.

$$Y_t = [\beta A_{it}^{\rho} + (1-\beta)A_{jt}^{\rho}]^{1/\rho} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Where,

$Y_t = Total\ Output\ or\ Production\ of\ crops\ (both\ i\ \&\ j) at\ time\ period\ t$

$A_{it} = Area\ of\ ith\ crops\ at\ time\ period\ t$

$A_{jt} = Area\ of\ jth\ crops\ at\ time\ period\ t$

$\rho\ relates\ to\ the\ Elasticity\ of\ Substitution\ between\ ith\ and\ jth\ crop\ (\sigma) = \frac{1}{(1-\rho)}$

$\beta = Parameters\ of\ the\ CES\ function$

Now the marginal products between A_i and A_j can be obtained by taking the partial derivative of Y with respect to A_i and A_j

$$\frac{\partial Y}{\partial A_i} = [\beta A_{it}^{\rho} + (1-\beta)A_{jt}^{\rho}]^{\frac{1}{\rho}-1}\left[\beta\rho A_i^{\rho-1}\right]\ is\ the\ marginal\ product\ with\ respect\ to\ input\ i$$

$$\frac{\partial Y}{\partial Aj} = [\beta A_{it}^{\rho} + (1-\beta)A_{jt}^{\rho}]^{\frac{1}{\rho}-1}\left[(1-\beta)\rho A_j^{\rho-1}\right]\ is\ the\ marginal\ product\ with\ respect\ to\ input\ j$$

Similarly, the Marginal Rate of Technical Substitution (MRTS) between Two Inputs (A_i and A_j) is obtained as follows

$$MRTS_{ij} = \left(\frac{\partial Y}{\partial A_i}/\frac{\partial Y}{\partial Aj}\right) = \frac{[\beta A_{it}^{\rho}+(1-\beta)A_{jt}^{\rho}]^{\frac{1}{\rho}-1}\left[\beta\rho A_i^{\rho-1}\right]}{[\beta A_{it}^{\rho}+(1-\beta)A_{jt}^{\rho}]^{\frac{1}{\rho}-1}\left[(1-\beta)\rho A_j^{\rho-1}\right]} = \frac{\beta A_i^{\rho-1}}{(1-\beta)A_j^{\rho-1}} = \frac{\beta}{1-\beta}\left(\frac{A_i}{A_j}\right)^{\rho-1} \quad \ldots\ldots$$

(2)

Now taking log both the sides

$$\log(MRTS_{ij}) = \log\left(\frac{\beta}{1-\beta}\right) + (\rho-1)\log\left(\frac{A_i}{A_j}\right)$$

Now differentiate both sides with respect to $\log\left(\frac{A_i}{A_j}\right)$

$$\frac{dlog(MRTS_{ij})}{d\log\left(\frac{A_i}{A_j}\right)} = (\rho-1)$$

Now invert the above one to get the elasticity as

$$Elasticity\ of\ Substitution\ (\sigma_{ij}) = \frac{d\log\left(\frac{A_i}{A_j}\right)}{dlog(MRTS_{ij})} = \frac{1}{(\rho-1)} = \frac{1}{(1-\rho)} \qquad \ldots\ldots\ldots (3)$$

Now we need to transform the CES function into an estimable linear form as follows:

From CES theory, the ratio of marginal products equals the marginal rate of technical substitution (MRTS).

$\frac{MP_i}{MP_j} = \left(\frac{\delta_i}{\delta_j}\right).\left(\frac{A_i}{A_j}\right)^{\rho-1}$ Taking log both sides

$$=> log\left(\frac{MP_i}{MP_j}\right) = log\left(\left(\frac{\delta_i}{\delta_j}\right).\left(\frac{A_i}{A_j}\right)^{\rho-1}\right) = log\left(\frac{\delta_i}{\delta_j}\right) + (\rho-1)log\left(\frac{A_i}{A_j}\right)$$

$$=> log\left(\frac{MP_i}{MP_j}\right) - log\left(\frac{\delta_i}{\delta_j}\right) = (\rho-1)log\left(\frac{A_i}{A_j}\right)$$

$$=> \frac{1}{\rho-1}\left[log\left(\frac{MP_i}{MP_j}\right) - log\left(\frac{\delta_i}{\delta_j}\right)\right] = log\left(\frac{A_i}{A_j}\right)$$

$$=> log\left(\frac{A_i}{A_j}\right) = \frac{1}{\rho-1}\left[log\left(\frac{MP_i}{MP_j}\right)\right] + \frac{1}{\rho-1}\left[-log\left(\frac{\delta_i}{\delta_j}\right)\right]$$

$$if\ we\ assume\ \frac{1}{\rho-1}\left[-log\left(\frac{\delta_i}{\delta_j}\right)\right] = \theta\ (i.e\ constant)\ \&\ \left(\frac{1}{\rho-1}\right) = \beta$$

$$log\left(\frac{A_i}{A_j}\right) = \theta + \beta\left[log\left(\frac{MP_i}{MP_j}\right)\right] \quad where\ \beta\ is\ the\ elasticity\ of\ substitution\ as,$$

$$\rho = \frac{\sigma-1}{\sigma} = (\rho-1) = \frac{-1}{\sigma} \quad so\ that, \beta = \left[\frac{1}{\rho-1}\right] = -\sigma.\ Therefore, \beta = -\sigma\ implies\ \sigma = -\beta$$

Flipping both the sides (i.e taking the reciprocal of both sides).

$$log\left(\frac{A_i}{A_j}\right) = \theta + \beta\left[log\left(\frac{MP_j}{MP_i}\right)\right] \qquad \ldots\ldots\ldots\ldots (4)$$

Thus, the regression model can be represented in general as:

$$log\left(\frac{A_i}{A_j}\right) = \theta + \beta\left[log\left(\frac{MP_j}{MP_i}\right)\right] + \epsilon \quad Where, Elasticity\ of\ Substitution(\sigma) = -\beta$$

$$Y = \theta + \beta X + \epsilon \quad Where, Elasticity\ of\ Substitution(\sigma) = -\beta$$

$$Where,\ Y = log\left(\frac{A_i}{A_j}\right)\ \&\ X = \left[log\left(\frac{MP_j}{MP_i}\right)\right]$$

In our case we do not have data of marginal productivities. Therefore, we can use respective yield as the proxies for these.

$$MP_j = \frac{Production_j}{Area_j} \quad \& \quad MP_i = \frac{Production_i}{Area_i} \qquad \ldots\ldots\ldots\ldots\ldots (5)$$

ρ	σ	Interpretation
1	∞	Perfect substitutes (linear function)
0	1	Cobb-Douglas (unitary elasticity)
< 0	< 1	Poor substitutes
→ -∞	→ 0	Perfect complements (Leontief)

A. An EOS > 0 implies that two crops are substitutes—as the relative return of one increase, farmers tend to switch to it.

B. An EOS < 0 suggests complementarity or constraints—area under one crop doesn't increase even if the other becomes less profitable, possibly due to agro-climatic conditions or resource dependencies.

C. An EOS ≈ 0 indicates low or no substitutability, meaning cropping decisions are relatively fixed due to land suitability, market, or tradition.

3. Empirical Results and Findings:

The empirical analysis of this study is based on the group wise estimated elasticity of substitution between crops in Odisha.

Table-1: Estimated Elasticity of Substitution between Category-1 Crops in Odisha

Sl. No.	Variables	Elasticity of Substitution	Remarks
1	Blackgram & Greengram	1.17	Positive Substitution
2	Kulthi & Greengram	0.95	Positive Substitution
3	Til & Greengram	0.41	Positive Substitution
4	Groundnuts & Greengram	1.53	Positive Substitution
5	Mustard & Greengram	-0.80	Negative Substitution
6	Niser & Greengram	-0.49	Negative Substitution
7	Potato & Greengram	0.97	Positive Substitution
8	Jute & Greengram	3.41	Positive Substitution

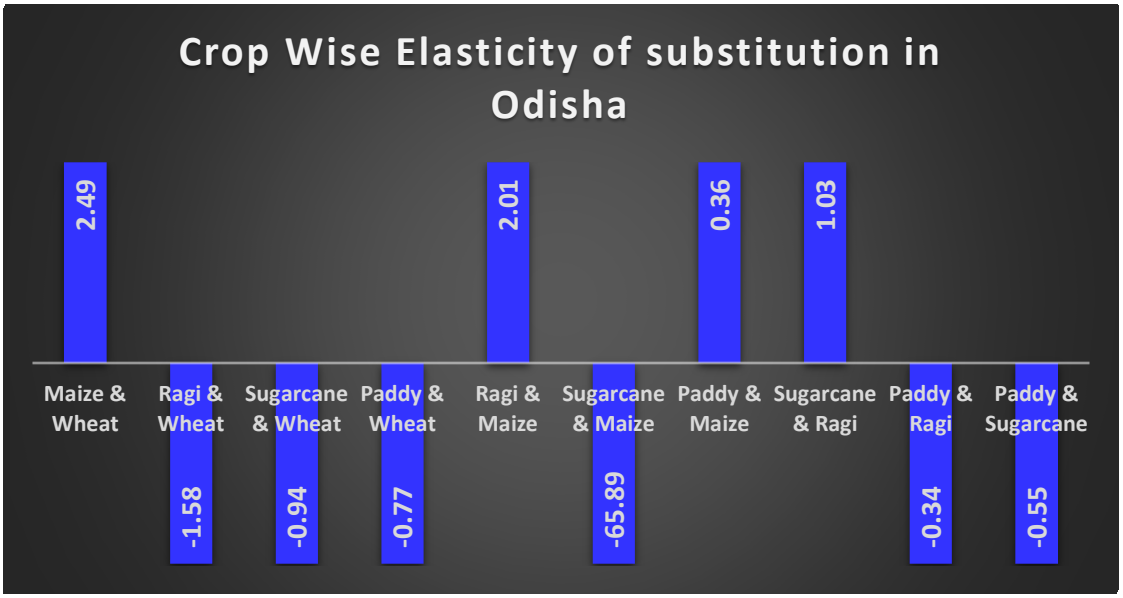
Sl. No.	Variables	Elasticity of Substitution	Remarks
9	Kulthi & Blackgram	-0.89	Negative Substitution
10	Til & Blackgram	-0.45	Negative Substitution
11	Groundnuts & Blackgram	0.51	Positive Substitution
12	Mustard & Blackgram	-0.05	Negative Substitution
13	Niser & Blackgram	-0.19	Negative Substitution
14	Potato & Blackgram	-0.46	Negative Substitution
15	Jute & Blackgram	1.93	Positive Substitution
16	Til & Kulthi	0.11	Positive Substitution
17	Groundnuts & Kulthi	-0.27	Negative Substitution
18	Mustard & Kulthi	0.64	Positive Substitution
19	Niser & Kulthi	-0.29	Negative Substitution
20	Potato & Kulthi	-0.94	Negative Substitution
21	Jute & Kulthi	1.21	Positive Substitution
22	Groundnuts & Til	-0.27	Negative Substitution
23	Mustard & Til	0.64	Positive Substitution
24	Niser & Til	-0.36	Negative Substitution
25	Potato & Til	-0.67	Negative Substitution
26	Jute & Til	0.91	Positive Substitution
27	Mustard & Groundnuts	0.11	Positive Substitution
28	Niser & Groundnuts	-0.22	Negative Substitution
29	Potato & Groundnuts	-1.63	Negative Substitution
30	Jute & Groundnuts	2.64	Positive Substitution
31	Niser & Mustard	0.48	Positive Substitution
32	Potato & Mustard	-0.16	Negative Substitution
33	Jute & Mustard	1.11	Positive Substitution

Sl. No.	Variables	Elasticity of Substitution	Remarks
34	Potato & Niser	-0.83	Negative Substitution
35	Jute & Niser	0.82	Positive Substitution
36	Jute & Potato	-4.09	Negative Substitution

Source: Author's Estimation

The table presents the estimated Elasticity of Substitution (EOS) for 36 crop pairs in Odisha from 1993-94 to 2022-23, highlighting how easily farmers can shift land allocation between crops in response to economic or environmental changes. A positive EOS indicates substitutability, meaning the two crops can replace each other depending on profitability or other factors. In contrast, a negative EOS reflects incompatibility or rigidity, where an increase in one crop's area is not associated with a reduction in the other. Several crop pairs demonstrate high substitutability, such as Jute & Greengram (3.41), Jute & Groundnuts (2.64), and Groundnuts & Greengram (1.53), suggesting that farmers are flexible in reallocating land between these crops based on market or climatic conditions. This flexibility is beneficial for promoting crop diversification and managing risk. Moderate substitutability is observed in pairs like Potato & Greengram (0.97) and Jute & Mustard (1.11), indicating some potential for crop switching with suitable incentives. However, many crop pairs, such as Mustard & Greengram (-0.80), Potato & Groundnuts (-1.63), and Jute & Potato (-4.09), show negative EOS, highlighting limited substitution potential. These patterns may result from agro-climatic incompatibility, fixed crop rotations, or market constraints.

Figure-1: Estimated Elasticity of Substitution between Category-2 Crops in Odisha



Source: Author's Estimation & Compilation

The figure presents the elasticity of substitution between key crop pairs—maize, wheat, ragi, paddy, and sugarcane—indicating how easily farmers in Odisha can switch land allocation between them based on changing conditions. High positive values, such as for Maize & Wheat (2.49) and Ragi & Maize (2.01), reflect strong substitutability, suggesting that farmers can readily shift between these crops depending on price or policy incentives. Sugarcane & Ragi (1.03) also shows moderate substitution potential. Low or negative values, such as Paddy & Wheat (-0.77), Sugarcane & Wheat (-0.94), and Paddy & Sugarcane (-0.55), indicate limited flexibility—likely due to differences in water needs, crop duration, or climatic suitability. Ragi & Wheat (-1.58) and Paddy & Ragi (-0.34) also show poor substitutability. The extremely low value for Sugarcane & Maize (-65.89) suggests a rigid or structurally constrained relationship. From a policy perspective, encouraging diversification among highly substitutable crops (e.g., maize, ragi, wheat) may enhance income stability and resource use. In contrast, crop pairs with low substitutability may require targeted support such as improved infrastructure, crop-specific technology, or risk mitigation strategies.

4. Conclusion and Policy Implication:

This study addresses a gap in research on crop diversification in Odisha by employing the advanced Constant Elasticity of Substitution (CES) production function to analyze substitution effects among 14 major crops cultivated across the state. Given Odisha's fixed agricultural land area and the potential for some crops to substitute for each other seasonally, understanding the stability and growth of cropping patterns at the macro level is essential for developing evidence-based agricultural policies. The research uses annual time series data from 1993-94 to 2022-23 on crop areas (in lakh hectares) for Paddy, Wheat, Maize, Ragi, Green Gram, Black Gram, Kulthi, Til, Groundnuts, Mustard, Niser, Potato, Jute, and Sugarcane from all districts in Odisha. These crops are categorized into two groups based on their production characteristics and substitutability: Group-1 includes Blackgram, Greengram, Kulthi, Til, Groundnuts, Mustard, Niser, Potato, and Jute, while Group-2 consists of Maize, Wheat, Ragi, Sugarcane, and Paddy. The elasticity of substitution within each group is estimated separately using the CES function.

Elasticity of substitution (EOS) measures the ease with which land can be shifted between different crops in response to relative economic returns, such as prices or profitability. A positive EOS indicates that two crops can replace each other, providing farmers with flexibility to reallocate land according to changing market or climatic conditions. A negative EOS suggests rigidity or incompatibility, where increasing the area under one crop does not reduce the area under another. Results reveal that some crop pairs have high substitutability, such as Jute & Greengram (3.41), Jute & Groundnuts (2.64), and Groundnuts & Greengram (1.53). This indicates strong farmer flexibility to switch land between these crops, supporting diversification and risk management. Moderate substitutability is found in pairs like Potato & Greengram (0.97) and Jute & Mustard (1.11), suggesting potential for switching with proper incentives. However, many pairs exhibit negative EOS values, such as Mustard & Greengram (-0.80), Potato & Groundnuts (-1.63), and Jute & Potato (-4.09), indicating limited substitution due to agro-climatic incompatibilities, fixed rotations, or market constraints. Strong substitutability is also observed between Maize & Wheat (2.49) and Ragi & Maize (2.01), with Sugarcane & Ragi (1.03) showing moderate potential. Conversely, pairs like Paddy & Wheat (-0.77), Sugarcane & Wheat (-0.94), and Paddy &

Sugarcane (-0.55) reveal limited flexibility, likely due to differing water needs, crop durations, or climate. Extremely low EOS for Sugarcane & Maize (-65.89) points to structural constraints.

From a policy perspective, promoting diversification among highly substitutable crops (such as maize, ragi, and wheat) could enhance income stability and efficient resource use. Crops with low substitutability require targeted support including infrastructure development, crop-specific technology, and risk mitigation to encourage diversification and sustainable agricultural growth.

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Healthcare Seeking Behaviour and Self-Perceived Health Status of India Elderly: Evidence from 71st NSSO Health Round

Dr. Anirudha Barik

Abstract

This article analyses patterns in self-perceived health status of Indian population by looking at healthcare seeking behaviour and healthcare expenditure of them using latest available unit-record data of National Sample Survey (NSS) 71st round collected in 2014. Our study provides unique concrete evidence that the differing magnitude of education level, consumption groups, place of residence and position in the social hierarchy could have important health implications. It concludes that gap of different socioeconomic spectrum along with age structure is associated with poor self-rated health. More specifically, the age structure change has had significant impact on healthcare expenditure and health status. However, even in our knowledge there is no study to date has examined that what underlies self-perceived health status of persons in India.

Introduction

One of the goals in the United Nations Sustainable Development Goals (SDGs) is to ensure healthy lives and promoting the standard of living and health status of the population at all ages and remained indispensable to sustainable development in recent times. However, health inequity is a greater challenge in developing countries like India due to huge diversities within and betIen classes, castes, gender, resource constraints including lack of awareness and extensive regional variations. A number of social scientists has observed that an individual's health status is strongly correlated in both healthcare seeking behaviour and healthcare expenditure (Montano D, Hoven, Siegrist, 2014; Quon, McGrath, 2014). The factors known as 'social determinant of health' viz., social, demographic, economic, and behavioural risk factors do not exist in isolation rather play an important role in shaping one's health (Berkman L, Kawachi, 2000; Raphael D, 2008).Of course, improved health status has largely remained positive on the strength of healthcare behaviours and healthcare expenditure. One of the previous studies showing association betIen catastrophic health expenditure and age structure change (Dhak, 2014) indicate mainly pathways through demographic change which affects health expenditure and hence health.

With the above backdrop, this article, therefore, aims to examine the likely association of health status is the prime source of healthcare expenditures which is also source of healthcare seeking behaviours in India. It is expected that better health status coinciding with the increasing tendency towards healthcare seeking behaviours and partly healthcare expenditures too. Further, assessment has been extended to understand how socioeconomic status might have had varying impact-in

JEL Codes: *I11, I12, I15 and I18*

Keywords: Healthcare Behaviour, Healthcare Expenditure, Health Status, NSS and India terms of economic status, place of residence, gender, caste, education, state of economic independence and living arrangement settings plays major role in household's overall health status

The hypothesis is that the health outcome in terms of improved self-perceived health status due to healthcare seeking behaviours and healthcare expenditures could be greater for elder section of population in the Indian context.

Therefore, it is essential to discuss broadly three main aspects in this context namely; healthcare seeking behaviour; healthcare expenditure, burden and most importantly the source of financing such healthcare expenditure; and self-perceived health status. The article has been organized in four sections. Section 2 discusses about data and methodology adopted for the analysis. Section 3 presents the results of analysis. Section 4 puts discussions and ends with a few concluding remarks.

2. Data and Methodology

2.1 Data Description

This article analyses 71st round of health survey data, collected by National Sample Survey Office (NSSO) during the period January-June 2014. Ultimately, total number of households, villages/blocks and individuals covered for 71st round of survey Ire 65932, 8297 and 333104 respectively. Out of which elderly population (60 years and more) accounts for total 23,384 household members. The data providing information on health seeking behaviour, expenditure on both inpatient and outpatient services along with the sources of financing of those services taken by the household. The data relating to health status and socio-economic status of Indian population has also been used.

2.2 Methods

I only discuss three main aspects namely; healthcare seeking behaviour, healthcare expenditure and burden and most importantly health status. Each of the estimation method is discussed below. *Firstly*, for healthcare seeking behaviour, the information on particulars of spells of ailment of household members during the last 365 days and 15 days (including hospitalisation) has been used. The variables like; treatment taken on medical advice or not; treatment taken from government hospital or not; reasons for not availing treatment from government source; reason for no treatment and whom consulted have been considered for healthcare seeking behaviour analysis.

Secondly, for healthcare expenditure, I use the data on cost of inpatient of a hospital services as it takes huge share in total health expenditure of a household in India. This is measured by the expenses incurred for treatment as inpatient during the last 365 days. The total inpatient healthcare expenditure comprises both medical expenditure and other expenses incurred by the household including transport charges, lodging charges of ailing person and escort. Healthcare burden (inpatient) is been calculated by dividing household per inpatient healthcare expenditure over consumption expenditure in a year.

Moreover, sources of finance for meeting the inpatient expenses are household income/savings, borrowings, sale of physical assets, contributions from friends and relatives and other sources etc.

Finally, the self-perceived current health status of persons with reference to various socio-economic characteristics of individuals like gender, state of economic independence, living arrangement. Perceived health status, was measured by asking 'How is your current health status?' on a three-point response scale that included the following options 'excellent/very good' (score 1), 'good/fair' (score 2), and 'poor' (score 3) (NSS 71st round). The data provides facts for all India but aged person of India has been taken for our analysis purpose.

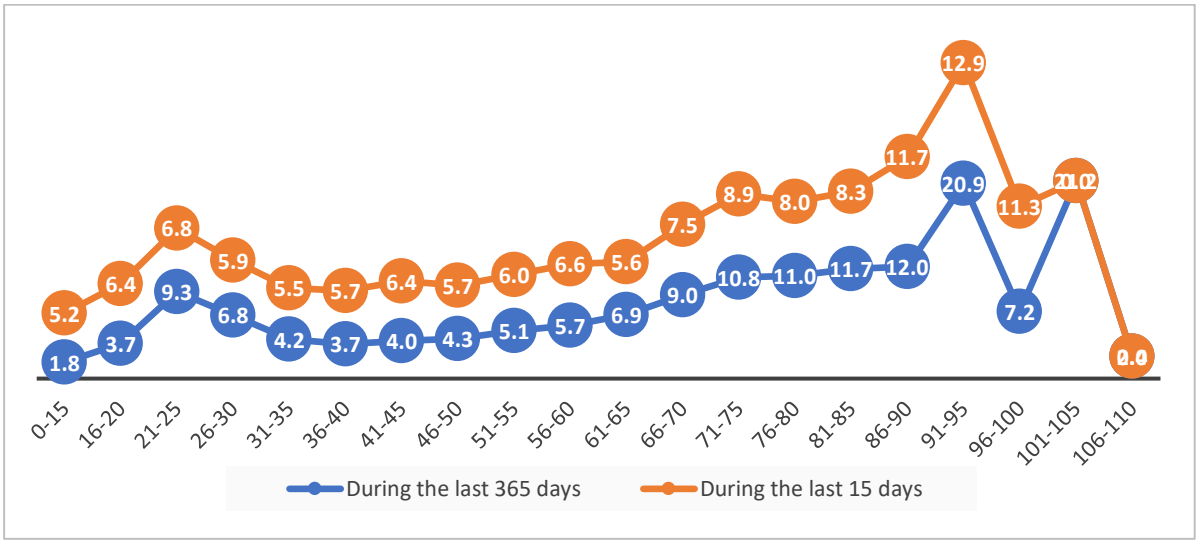
3. Results:

In this section an attempt is made to discuss the issue of healthcare seeking behaviour, healthcare expenditure along with the sources of financing healthcare expenditure with across socio-economic characteristics of households and ultimately health status of persons aged 60 and above.

3.1 Healthcare Seeking Behaviour:

Taking into account the age structure of the Indian population, the rate of hospitalisation occurred is not surprising that problem of medical care should be by far the most urgent concern among the Indian population in general and elderly in particular. Figure-1 focuses on magnitude of person's rate of hospitalisation[5] during last 365 days and last 15 days. But the surprising finding is that the rate of hospitalisation has been exacerbated more during last 15 days as compared to last 365 days with age 60 and more being the most visible of them.

Figure-1: Ratio of Hospitalisation by Age groups



Source: Calculated from NSS 71st Round 2014-15

These situations reflect extreme healthcare seeking behaviour of peoples in India. Out of them persons aged 60 and above accounts by 8.24% who are

[5]Admission as in-patient to a medical institution for treatment of some ailment or injury, or for childbirth, was called hospitalisation.

hospitalised during last 365 days and by 7.04% hospitalised during last 15 days. 41.2% of the households had access to tap water. However, in rural areas only 30% of the households had access to tap water while 68% in urban areas. 47.2% of the households had access to tube-Ill/hand pump water. However, in rural areas 59% of the households had access to tube-Ill/hand pump water as against 21% in urban area.

Table-1 illuminates the aggregate percentage of elderly people seeking any care[6] versus no-care at all across socio-economic groups. Of them 88% have taken medical advice (either government or private), whereas 9% have not taken medical advice but consulted self/friend, medicine shop and others. Ailment[7] not considered serious bases 51% (highest) for no medical advice and 11% due to unavailability of medical facility in the neighbourhood. 3% elderly persons have not taken any care. Most importantly 64.7% shows not availing medical advice from government source. The main reason (46.7%) for is that quality not satisfactory and compelled them to go for private treatment though it's expensive. The second most reason is long waiting for satisfactory quality which accounts by 26.2% followed by required specific services not available (10%).

Table-1: Healthcare Seeking Behaviour of Elderly Across Socioeconomic groups (%)

	During Last 15 days			
	Medical Care[8]	**Self-Care[9]**	**No Care At all**	**Total**
Place of Residence				
Rural	85.91	10.84	3.24	100
Urban	91.78	6.35	1.87	100
Sex				
Male	87.27	10.08	2.65	100
Female	88.72	8.43	2.85	100
Social Group				
ST	77.79	15.18	7.03	100
SC	80.96	15.71	3.33	100
OBC	88.97	8.3	2.74	100
Others	91.36	6.76	1.89	100
Marital Status				
Single	76.46	8.76	14.78	100
Married	88.09	9.24	2.67	100
Educational level				
Not Literate	85.49	11.15	3.36	100
Upto Middle	89.77	7.85	2.39	100
Upto Higher Secondary	94.01	4.66	1.34	100

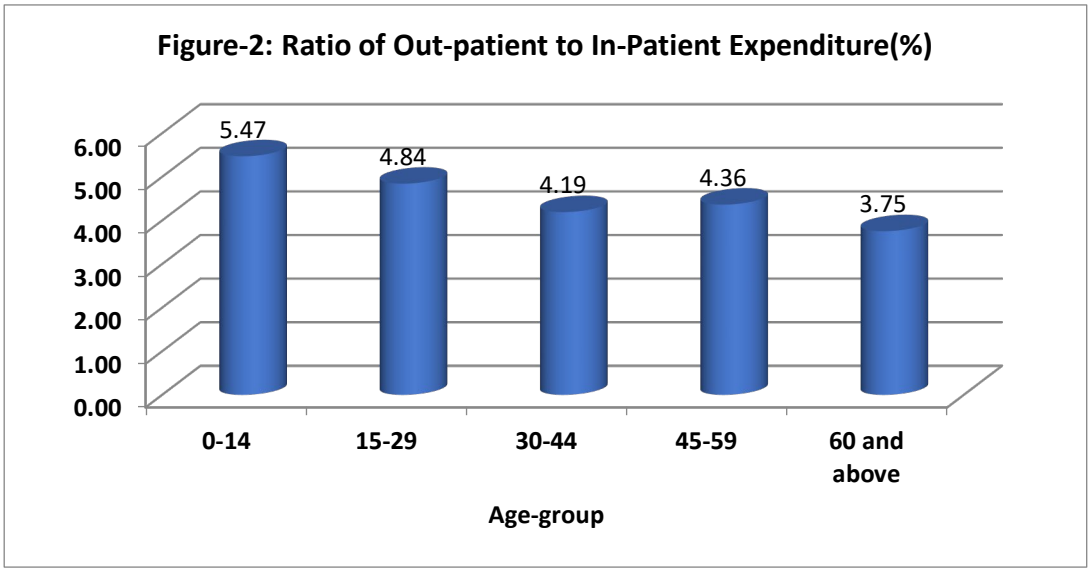
[6] Any care includes medical care and self care.
[7]Ailment, i.e. illness or injury, meant any deviation from the state of physical and mental Ill-being.
[8]Medical care includes either government or private service.
[9]Self care includes consultation from Self/friend, medicine shop and others.

College & Above	90.9	7.47	1.63	100
MPCE (Quintile)				
Poorest	74.8	20.32	4.88	100
2nd	88.15	9.48	2.37	100
3rd	87.66	8.47	3.87	100
4th	90.75	6.58	2.67	100
Richest	93.37	5.54	1.09	100
Total	**88.01**	**9.24**	**2.75**	**100**
Source: Calculated from NSS 71st Round 2014-15				

As far as healthcare seeking behaviour is concerned, the scenario is found to be different across place of residence, social groups, marital status, educational groups and consumption expenditure groups. No gender differences Ire found in how elderly seek healthcare. Individuals with a low level of education and consumption Ire significantly more likely to report no care, compared to individuals with a high level of education. On the contrary, the possibility of an increase in towards medical care increased as education level, consumption level and social group increased from low to high. Moreover, also evident that a very less percentage of people from urban area, higher in social and educational background go for self-treatment.

3.2 Healthcare Expenditure

The phenomenon in figure-2 shows the gradual shift from the out-patient expenditure to in-patient expenditure as the person getting aged which is due to the influence of health care seeking behaviour in the long run.



Source: *Calculated from NSS 71st Round 2014-15*

Table 2 shows health care expenditure as Ill as healthcare burden by age groups, marital status, social groups, literacy groups, consumption expenditure groups and place of residence. Household expenditure on medical care is analysed for those who have sought inpatient (or hospitalised cases) services only, as it takes huge share in both total health expenditure as Ill as total consumption expenditure of the household. In total, a household spent 15% of total household expenditure on health care. It is also seen from the table-2 that there was greater health care expenditure among higher age groups (elderly), highly educated, and higher MPCE group.

On an average a rural household spend 2454 rupees during a year while for urban household it is 4748 rupees (see Table-2). In social groups, others category who are socially advantaged spend almost twice and thrice than SC and ST (disadvantaged groups) respectively. If I segregate the total population into different economic category through various consumption brackets, richest spends highest amount (Rs. 7836) and poorest the lowest amount (Rs. 1432). People availing government hospital spend on an average 4955 rupees against private hospital as 11761 rupees per hospitalisation.

Table-2: Healthcare Expenditure &Burden Across Socio-economic Groups

	During last 365 Days		
	Average Total Expenditure (Rs.) for Hospitalised Treatment	YCE[10] (Rs.)	Health Care Burden[11] (%)
Place of Residence			
Rural	2454	82997	15.0
Urban	4748	132947	16.7
Marital Status			
Single	2778	97237	15.1
Married	3354	99963	15.4
WidoId/divorced	4358	86448	19.9
Social Group			
ST	1746	70845	11.2
SC	2217	79711	15.3
OBC	3031	95505	15.2
Others	4385	123457	17.3
Age group			
0-14	2271	94222	13.3
15-29	2923	99089	15.4

[10]Yearly Consumption Expenditure

[11]Healthcare Burden = [Average total expenditure (Rs.) for hospitalised treatment per hospitalisation case during a period of 365 days/ Yearly Consumption Expenditure (YCE in Rs.)]*100

30-44	3554	98524	16.3
45-59	3798	99901	17.0
60 and above	5088	102968	19.3
Educational level			
Not Literate	2223	82785	13.6
Upto Middle	2826	91907	15.4
Upto Higher Secondary	4161	115390	17.8
College & Above	7531	166100	20.2
MPCE (Quintile)			
Poorest	1432	53871	18.2
2nd	1652	72724	13.4
3rd	2340	89217	14.4
4th	3087	112186	14.0
Richest	7836	181931	17.6
Total	**3151**	**97978**	**15.5**
Source: Calculated from NSS 71st Round 2014-15			

Healthcare Burden:

If I consider health care burden[12] as share of health expenditure (per hospitalisation) to total consumption expenditure during a year, the burden seems to be borne more by socio-economically disadvantaged people. Rural household spend 15% of their total consumption expenditure for inpatient expenditure, while in urban are it is only 16.7%. The poorest spend the highest percent (18.2%) than the rich and richest spend 14% and 17.6 % respectively. Health care burden also deeply concentrated on lower caste people than higher caste. However, a much difference is not found in gender as such. Relative burden of hospitalisation is higher in case of the people availing private hospital.

Source of Financing Healthcare Expenditure:

The total expenditure exclusive of the amount reimbursed was borne by the household. The money needed for this might have been spent from current household income or accumulated household savings. It might have been partly or wholly spent from the proceeds of sale of cattle or draught animals, jewellery or other physical assets or financed by borrowing. Part of it might have been contributed by friends and relatives as outright assistance.

[12]There is no standard threshold level to define healthcare burden. It could be10, 15 % or any percentage of total household consumption expenditure.

Table-3: Sources of Financing Healthcare Expenditure Across Place of Residence, Social Group and Consumption Groups (in %)						
	Income/ Savings	Borrowing	Sale of physical assets	Contribution[13]	Others	Total
Place of Residence						
Rural	76.18	19.22	0.43	3.42	0.75	100
Urban	81.01	14.88	0.28	2.95	0.88	100
Social Group						
ST	81.71	14.59	0.43	2.42	0.85	100
SC	73.59	21.75	0.27	3.4	1	100
OBC	75.79	19.14	0.42	3.88	0.76	100
Others	82.22	14.23	0.41	2.49	0.65	100
MPCE (Quintile)						
Poorest	76.58	18.64	0.67	3.32	0.79	100
2nd	75.56	19.26	0.28	3.77	1.13	100
3rd	77.1	19.17	0.2	2.88	0.66	100
4th	78	18.12	0.31	2.89	0.69	100
Richest	81.46	13.75	0.5	3.63	0.67	100
Total	**77.65**	**17.9**	**0.39**	**3.28**	**0.79**	**100**

Source: Calculated from NSS 71st Round 2014-15

A clear picture of how household across socio-economic groups adopt various coping mechanisms is given in Table-3. On an average, households irrespective of socio-economic stratum meet around 78 percent of total inpatient cost through household income or accumulated savings. Borrowing is the second most important source sharing 18% and contribution by friend and relatives accounts 3.3% and meagre 1% from other sources (include sale of ornaments and other physical assets, draught animals, etc.). *This implies on an average household income/savings and borrowing are common phenomena while financing hospitalization cost irrespective of socio-economic status*. Urban households are less dependent on borrowings (15%) than their rural counterpart (20%). Socially and economically advantaged depend more upon their income/savings sources than borrowings and other sources in comparison to the disadvantaged.

3.3 Self-Perception about Health Status

This section presents an attempt to discuss the issues relating to the actual condition and healthcare of persons with reference to various socio-economic characteristics of individuals like gender, caste, education, marital status, state of economic independence, living arrangement etc. The NSS 71st provides details of healthcare of persons aged 60 and above for the reported 116,268 cases. Out of them around 56.27% (65434 cases) are reported from rural

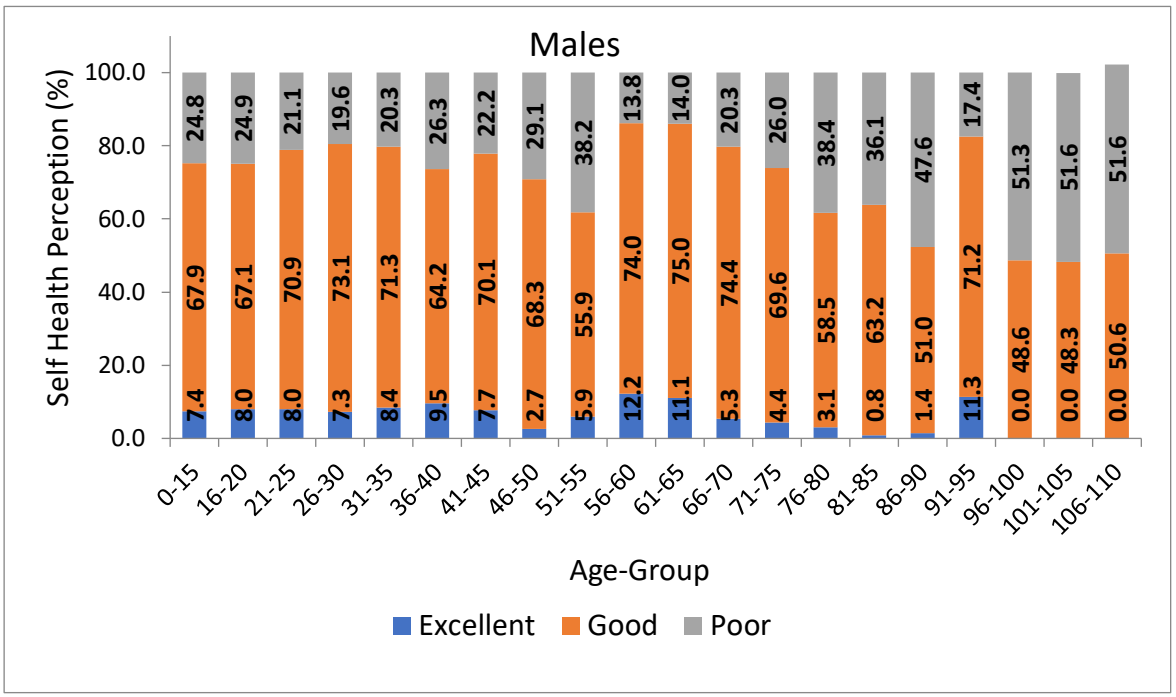
[13]Contributed by friends and relatives as outright assistance

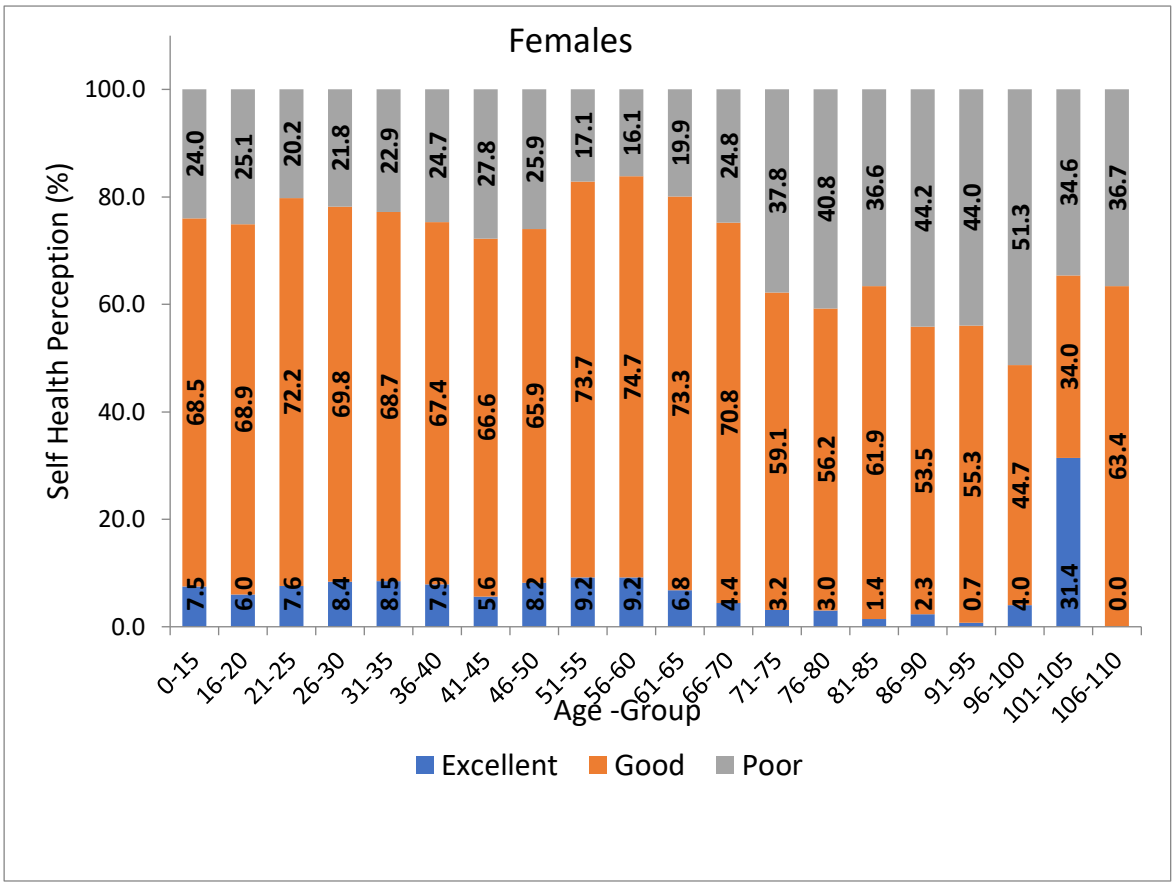
areas, whereas 43.72% (50834 cases) from urban areas. Male persons account 49.29% and females by 50.71%. On all India level, approximately 7.47% have felt excellent/very-good, 69.52% felt good/fair and 23.01% felt poor health status. And 5.2% persons hospitalised during last one year and 94.8 persons have not hospitalised.

Without a doubt, one of the fundamental determinants of health is age. Figure 3 shows the pattern of the condition of health status of persons in various age groups in India at each sex. It is found that the trend of increasing age coinciding with decreasing perception about health status is obvious. This association is plausible because ailments occur more frequently with age and therefore the shift from excellent to good and poor perceived health is more probable. Till the age of 70, 80% of men and 75% of women stated their health as good or fair in 2014. Afterwards the proportion of people who perceive their state of health as poor significantly increases. For the age-group 86-90 years around 47% of men and 44% of women describe their current health status as poor. From the data it is also seen that women view their state of health more positively than men. Overall age-group prevalence ratios of poor self-health perception for females are lower than for males. This is quite gender-differential in the health status in India.

A comparison across gender reveals remarkable phenomena. In the case of males, the age groups 61-65 and 66-70 declared their general health as excellent and fair more often than the age-group 51-55 and 56-60. For females a similar pattern can also be seen, but women view their state of health more positively than men with the same age-group. However, the trend has changed for age groups 71-75, 76-80 and 81-85 that man has better health perception than their female counterpart.

Figure-3: Prevalence Ratio of Self Health Perception (SHP) by Gender in India



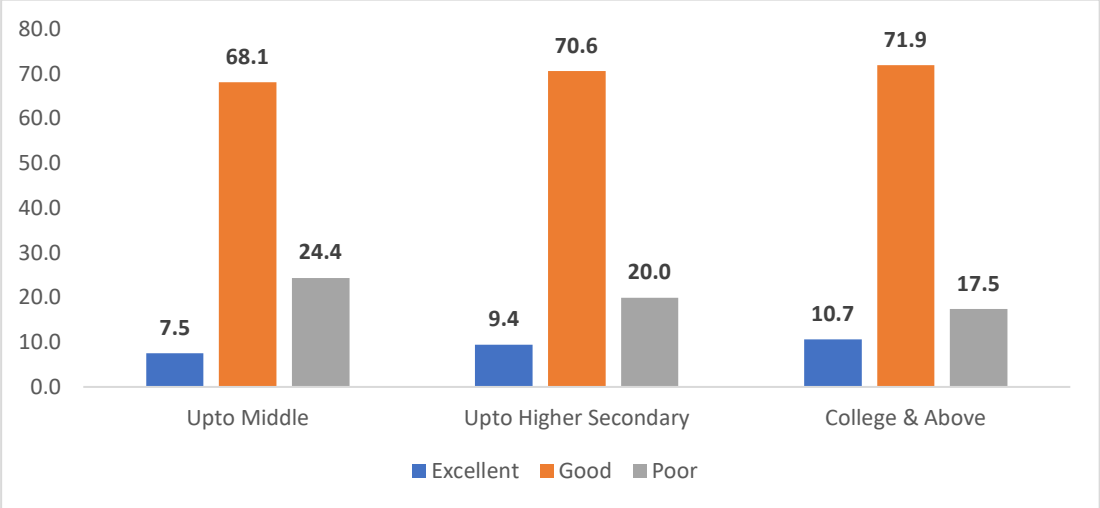


Source: *Calculated from NSS 71st Round 2014-15 (25.0)*

The findings suggest that, taking into account retirement age in the India, individuals at early stages of retirement feel better than those who still have a few years until retirement. The question arises whether insecurity in the labour market could influence this feeling, because in general the unemployment rate of older persons is relatively higher than that of their younger counterparts. Better self-perceived health is present in the age-group of 61-65- and 66–70-year-old men and in the age-group of 51-55- and 56–60-year-old women when compared to the previous age-group. The difference could be caused by changes in the pension system, which has contributed to general economic uncertainty in the case of India. More importantly, among the most aged persons (years 100+) that men have poor health perception (52%) than their most aged female counterpart (23%).

The gender factor as determinants of health do not exist in isolation, but education level determines the health of individuals. The level education is easy to measure and applicable to all persons in India. The level of education is also among the most widely used indicators of socioeconomic status in Indian public health research. Especially, education as traditional measure and is a strong and consistent predictor of health outcome. The condition of person's health status at various education levels is shown in Figure-4.

Figure-4: Prevalence Ratio (%) of Self Health Perception (SHP) by Education in India



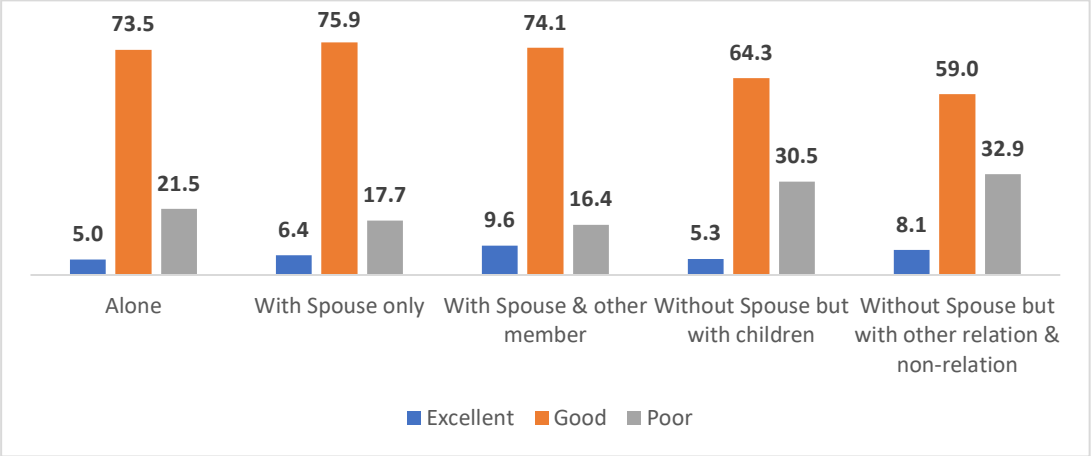
Source: Calculated from NSS 71st Round 2014-15 (25.0)

Analysis of self-health perception by education groups shows that health status found to be better as one moves from lower to higher education. From the figure-4 it is seen that individuals with a low level of education are significantly more likely to report low self-rated health, compared to individuals with a high level of education. For instance, around 7.5% persons with up-to upper primary/middle education felt excellent current health status against 9.4% at higher secondary level and 10.7% with education level at college and above. Similarly, 68.1% persons with up-to upper primary/middle education level felt good/fair health status against 70.6% at higher secondary level and 71.9% at college and above. However, 24.4% persons at up-to upper primary/middle education level felt poor health status against 20% at higher secondary level and 17.5% at college and above. Therefore, while lower proportion of individual shaving poor health status belonging to higher education level and vice-versa. To this scenario, there might be one underlying mechanism played role. That is educated people are exposed to more health practices and behaviour, access to medical care and insurance wisely and ultimately health.

Besides the education level, type of living arrangement could be applicable to all aged persons in India and a strong predictor of their current health status. The living arrangement describes how the physical Ill-being of the aged is taken care of in the family in our society. It is, therefore, pertinent to know the health status by type of living arrangement. This is shown in figure-5. The results show that 14.6% elderly persons living with spouse only and 44.9% with spouse and other member. 33.2% living without spouse but with their children and around 3% living without spouse but with other relation & non-relation. Nevertheless, 4.35% of ages persons still living alone.

From figure-5, as has been observed, a large proportion (30%-32%) of the elderly living without spouses and with their children or lived with other relations and non-relations are reporting low (18%-21%) health status as compared those living either alone or with spouse only. However, a large proportion (60%-65%) of the elderly living either alone or with spouse only are having good/fair (73%-76%) health status as compared those living without spouses and with their children or lived with other relations and non-relations. Hence, it is seen that among aged, a majority had to live either with their spouse or children for a good health status. In Indian society and culture generally children or spouse have shown more health responsibilities towards their parents or spouses.

Figure-5: Ratio (%) of Self Health Perception (SHP) by Type of Living Arrangement



Source: Calculated from NSS 71st Round 2014-15 (25.0)

An interesting gender-differential is observed in the living arrangement among the elderly and the pattern is similar in both rural and urban areas. In terms of proportions, more males than females lived with their spouses. On the other hand, compared to the males, proportionately more females lived alone. But compared to the males, proportionately more females lived without spouses and with their surviving children or lived with other relations and non-relations. Probably, this pattern is the impact of the higher incidence of widowhood among the elderly females than among the elderly males. The incidence of widowhood is higher among women because they live longer, and because in our society, men generally marry women younger than themselves.

4. Discussion and Conclusion

This study shows that gap of different socioeconomic spectrum along with age structure is associated with poor self-rated health. Our study provides unique concrete evidence that the differing magnitude of education level, consumption groups, place of residence and position in the social hierarchy could have important health implications. More specifically, the age structure change has had significant impact on healthcare expenditure and health status. I report eight key findings; i) individuals with a low level of education, consumption and low position in the social hierarchy Ire significantly more likely to report no care, compared to individuals with a high level of counterpart. On the contrary, the possibility of an increase in towards medical care increased as one move from low to high; ii) accepting the strong influence of healthcare seeking behaviour there is a gradual

shift from the out-patient expenditure to in-patient expenditure as the person getting aged; iii) the healthcare burden seems to be borne more by socio-economically disadvantaged people; iv) the health care expenditure is significantly smaller for rural as Ill as for women than urban and men; v) household income/savings and borrowing are common phenomena while financing hospitalization cost irrespective of socio-economic status; vi) trend of increasing age coinciding with decreasing perception about health status and women view their state of health more positively than men; vii) health status found to be better as one moves from lower to higher education; and viii) besides the education level, type of living arrangement could be a strong predictor of health status and a majority had to live either with their spouse or children for a good health status. These results have important implications for future research and policy. As self-rated health capture one aspect of Illbeing, further research using different indicators is needed to check the consistency of findings.

Diverging Consumption Patterns Among Social Groups in Odisha: An Empirical Study

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ABSTRACT

Consumption is a crucial macroeconomic indicator of household welfare and economic progress. This study analyses consumption patterns among different social groups in Odisha—Scheduled Castes (SC), Scheduled Tribes (ST), Other Backward Classes (OBC), and Others—using Consumer Expenditure Survey data from 1999–00 to 2023–24. The findings reveal a steady rise in Monthly Per Capita Expenditure (MPCE) across all groups, with marked improvements in 2022–23 and 2023–24. However, disparities persist: urban households consistently spend more than rural ones, and 'Others' maintain the highest MPCE levels, while STs report the lowest, especially in rural areas. Odisha, along with Chhattisgarh and Jharkhand, continues to show lower MPCE compared to states like Kerala and Tamil Nadu. The persistence of caste-based and rural-urban disparities underscores the need for a dual policy approach combining long-term investments in education, health, and assets with short-term targeted programs such as food security schemes and conditional transfers to reduce inequality and uplift marginalized communities.

Keywords: *Household Consumption, NSO, Social Inequality, MPCE, Scheduled Castes, Scheduled Tribes, Other Backward Class, Rural-Urban Divide*

Introduction

Consumption expenditure is a crucial indicator of economic well-being and social equity. It reflects not only income levels but also disparities across different social strata. According to Thakur (2017), macroeconomic performance is best understood through indicators like national income and household consumption. The Household Consumption Expenditure Survey (HCES) conducted by the National Statistical Office (NSO) for 2022–23 and 2023–24 provides valuable insights into consumption patterns across social groups—Scheduled Tribes (ST), Scheduled Castes (SC), Other Backward Classes (OBC), and Others—in both rural and urban areas.The data reveal persistent inter-social groups ,inter-sectoral and inter-state disparities. In Odisha, the Monthly Per Capita Expenditure (MPCE) for rural ST households rose from ₹284.55 in 1999–2000 to ₹2,940 in 2023–24, while urban ST MPCE increased from ₹489.74 to ₹4,759 during the same period. However, these levels remain below the all-India average, indicating relative deprivation.

This study aims to analyse trends in consumption pattern among different classes ,sector-wise variations with a focus on Odisha. It identifies the states and social groups with the lowest consumption, thereby highlighting areas requiring policy attention. The objective is to reflect inclusive policy frameworks that bridge the socio-economic gaps in consumption expenditure.

Objectives

- To study the trends in consumption pattern among social classes / groups / sector wise in Odisha between 1999–2000 to 2023–24.

- **To compare Odisha's social group-wise MPCE with other major Indian states**, highlighting relative performance and inter-state disparities in consumption

Data and Methodology

The present study is based on **secondary data** drawn from multiple rounds of the **National Statistical Office (NSO)** on Household Consumer Expenditure. Specifically, it utilizes data from the **55th Round (1999–2000), 61st Round (2004–05), 66th Round (2009–10), and 68th Round (2011–12),** along with the latest available estimates for **2022–23** and **2023–24,** published by the **Ministry of Statistics and Programme Implementation (MoS&PI), NSO, Government of India.**

The study primarily analyses **social group-wise variations** in **Average Monthly Per Capita Expenditure (MPCE)** in **Odisha**, focusing on the consumption patterns of **Scheduled Tribes (ST), Scheduled Castes (SC), Other Backward Classes (OBC), and Others.** The analysis covers both **rural and urban sectors** to assess the **inter-sectoral disparities** in expenditure.

The methodology includes **trend analysis** over time, **inter-group comparisons**, and evaluation of **rural–urban gaps** in MPCE. Further, the MPCE levels of Odisha are compared with those of other **major Indian states** to assess Odisha's relative position in terms of household consumption expenditure across social groups. *Rural & urban disparity is in percentage. The increasing ratio in terms of percentage (towards 100) shows a reduction in rural-urban disparity.* ***Rural MPCE as a percentage of Urban MPCE****—which is a common way to indicate* ***relative disparity****.*

Disparity (Rural–Urban Gap as %):

$$\text{Disparity (\%)} = \left(\frac{\text{Rural MPCE}}{\text{Urban MPCE}} \right) \times 100$$

Results and Discussion

The analysis of Monthly Per Capita Expenditure (MPCE) trends in Odisha between 1999–00 and 2023–24 highlights substantial overall growth across all social groups. However, this growth has been **highly uneven**, both in terms of **social identity and rural–urban divide**, suggesting that economic gains have not been equitably shared.

Scheduled Tribes (STs) remain the most disadvantaged group. Their MPCE rose from ₹284 to ₹2,940 in rural areas and from ₹489 to ₹4,759 in urban settings. Despite this progress, they still remain at the bottom of the consumption hierarchy. **Scheduled Castes (SCs)** have shown modest improvement, with urban SCs reaching ₹4,755. Meanwhile, **Other Backward Classes (OBCs)** and **Others** (presumably the general category) have experienced much faster growth, particularly in urban areas. In 2023–24, urban 'Others' reported the highest MPCE

at ₹6,877—more than double the rural ST figure—revealing **deep-seated consumption inequality** along caste and spatial lines.

The **rural–urban divide** has also widened significantly. In 1999–00, the difference in MPCE across locations was less than ₹250, but by 2023–24, it had grown to more than ₹2,400. This reflects **unequal access to markets, services, and employment opportunities** in rural versus urban Odisha.

When compared to economically advanced states, Odisha's relative position remains concerning. For example, the MPCE of urban OBCs in Odisha (₹5,896) is well below that of their counterparts in Telangana (₹8,590). ST MPCE across all locations in Odisha continues to be among the lowest nationally.

This analysis suggests that while overall MPCE has risen due to inflation adjustment, income growth, and welfare schemes, **structural inequalities remain persistent**. These are shaped by **caste-based exclusions, geographical disadvantages, and asymmetric policy impact**—necessitating more **targeted and inclusive policy interventions** to bridge these persistent gaps.

Table -1: Rural-Urban & Inter-social group variation of Average Monthly per-capita Expenditure (in Rs) across different social groups in Odisha from 1999-00 to 2023-24

Social group	**55th Round (1999-00)**			**61th Round (2004-05**			**66th Round (2009-10)**		
	Rural	Urban	Disparity	Rural	Urban	Disparity	Rural	Urban	Disparity
ST	284.55	489.74	58.10	283.97	548.68	51.76	527.7	1014.89	52.00
SC	351.1	440.67	79.67	362.93	500.55	72.51	631.96	972.97	64.95
OBC	394.96	579.8	68.12	434.97	679.84	63.98	759.96	1219.43	62.32
Others	480.04	727.94	65.94	523.24	923.15	56.68	831.8	1728.28	48.13
All	**372.95**	**618.22**	**60.33**	**398.89**	**757.31**	**52.67**	**693.16**	**1374.83**	**50.42**
Social group	**68th Round (2011-12)**			***2022-23**			***2023-24**		
	Rural	Urban	Disparity	Rural	Urban	Disparity	Rural	Urban	Disparity
ST	657.92	929.31	70.8	2423	3609	67.14	2940	4759	6178
SC	827.58	1198.83	69.03	2954	4547	64.97	3406	4755	71.63
OBC	896.93	1775.67	50.51	3305	5086	64.98	3771	5896	63.96
Others	1036.68	2434.36	42.59	3532	6276	56.28	4070	6877	59.18
All	**856.16**	**1897.74**	**45.11**	**2996**	**5223**	**57.36**	**3509**	**5925**	**59.22**

Source: Different rounds of Households Consumer Expenditure surveys , NSO reports :
N.B:* with imputation

N.B: ***Rural & urban disparity is in percentage. The increasing ratio in terms of percentage (towards 100) shows a reduction in rural-urban disparity. Rural MPCE as a percentage of Urban MPCE—which is a common way to indicate relative disparity.***

The HCES 2022–23 , that Table -2 data reflects commendable strides in inclusive development in states like **Kerala, Tamil Nadu, Punjab, and Telangana**, where all social groups exhibit relatively high MPCE, both rural and urban. These states demonstrate stronger social equity and effective public service delivery. **Karnataka and Haryana** also show rising urban consumption. Conversely, **Chhattisgarh, Bihar, Odisha, and Jharkhand** continue to report lower MPCE, especially among

STs and SCs, underscoring structural disparities. Bridging these gaps through targeted, equity-focused policies remains crucial for achieving balanced and inclusive growth nationwide.

Table : 2 Inter Sate Average MPCE (Rs.) by social group in major sates during 2022-23

Major states	Rural					Urban				
	ST	SC	OBC	Others	All	ST	SC	OBC	Others	All
Andhra Pradesh	3,772	4,565	4,824	5,550	4,870	6,335	6,427	6,332	7,637	6,782
Assam	3,289	3,387	3,404	3,523	3,432	5,410	5,173	6,374	6,398	6,136
Bihar	2,927	3,058	3,479	3,691	3,384	3,633	3,665	4,501	6,291	4,768
Chhattisgarh	2,258	2,347	2,665	3,187	2,466	4,068	3,659	3,963	5,847	4,483
Gujarat	3,412	3,592	3,649	4,605	3,798	5,322	5,322	5,870	7,688	6,621
Haryana	4,970	4,299	4,771	5,500	4,859	6,241	5,868	7,077	9,429	7,911
Jharkhand	2,218	2,850	2,997	3,473	2,763	3,767	3,888	4,738	5,998	4,931
Karnataka	4,086	4,258	4,377	4,952	4,397	5,984	6,370	7,516	9,099	7,666
Kerala	4,526	5,058	5,390	7,451	5,924	9,373	5,800	6,443	8,822	7,078
Madhya Pradesh	2,651	2,977	3,302	3,713	3,113	4,436	4,415	4,662	5,929	4,987
Maharashtra	2,726	3,742	4,017	4,705	4,010	5,337	5,492	5,913	7,475	6,657
Orissa	**2,384**	**2,899**	**3,258**	**3,484**	**2,950**	**3,563**	**4,509**	**5,045**	**6,252**	**5,187**
Punjab	5,311	4,583	5,335	6,279	5,315	5,820	5,348	6,294	7,729	6,544
Rajasthan	3,206	3,794	4,527	5,428	4,263	5,811	4,722	5,525	7,174	5,913
Tamil Nadu	4,713	4,898	5,462	5,773	5,310	6,115	6,423	7,791	7,830	7,630
Telangana	4,420	4,526	4,937	5,269	4,802	6,311	6,823	7,824	9,534	8,158
Uttar Pradesh	2,295	2,900	3,191	3,747	3,191	4,644	4,502	4,652	6,073	5,040
West Bengal	2,658	3,152	3,234	3,427	3,239	5,228	4,606	4,306	5,636	5,267
All-India	**3,016**	**3,474**	**3,848**	**4,392**	**3,773**	**5,414**	**5,307**	**6,177**	**7,333**	**6,459**

Source: *HCES report No 591 MoS&PI , NSO*

The HCES 2023–24 data: Table No 3 showing Inter state Average MPCE (Rs.) by social group in major sates given below highlights stark inter-social group disparities in MPCE across major states. 'Others' consistently report the highest expenditure, while ST and SC groups lag behind, especially in rural areas. Urban MPCE is significantly higher across all groups, reflecting better access to resources. States like Kerala, Tamil Nadu, and Telangana demonstrate relatively lower disparities, suggesting inclusive growth. Conversely, states like Chhattisgarh,Odisha, and Jharkhand show persistently low MPCE, indicating the need for targeted socio-economic interventions for marginalized communities.

Table : 3 Inter State Average MPCE (Rs.) by social group in major sates during 2023-24

Major states	*Rural*					*Urban*				
	ST	*SC*	*OBC*	*Others*	*All*	*ST*	*SC*	*OBC*	*Others*	*All*
Andhra Pradesh	*4,404*	*5,373*	*5,605*	*5,886*	*5,539*	*6,384*	*6,843*	*7,282*	*7,677*	*7,341*
Assam	*3,945*	*3,921*	*3,989*	*3,954*	*3,961*	*7,023*	*6,078*	*7,159*	*6,930*	*6,913*
Bihar	*3,459*	*3,498*	*3,853*	*4,115*	*3,788*	*4,337*	*4,280*	*5,210*	*5,703*	*5,165*
Chhattisgarh	*2,663*	*3,228*	*3,089*	*3,509*	*2,927*	*4,219*	*4,570*	*4,800*	*6,300*	*5,114*
Gujarat	*3,802*	*3,895*	*4,073*	*5,183*	*4,190*	*5,893*	*5,984*	*6,445*	*7,985*	*7,198*
Haryana	*5,688*	*4,857*	*5,590*	*5,842*	*5,449*	*11,190*	*6,135*	*7,514*	*10,130*	*8,462*
Jharkhand	*2,584*	*2,950*	*3,386*	*3,454*	*3,056*	*4,817*	*4,053*	*5,394*	*6,572*	*5,455*
Karnataka	*4,760*	*4,793*	*5,090*	*5,720*	*5,068*	*6,050*	*6,697*	*8,071*	*9,668*	*8,169*
Kerala	*5,132*	*5,570*	*6,325*	*7,768*	*6,673*	*7,835*	*6,684*	*7,223*	*9,734*	*7,834*
Madhya Pradesh	*3,105*	*3,506*	*3,655*	*4,021*	*3,522*	*4,522*	*4,782*	*5,279*	*6,597*	*5,589*
Maharashtra	*3,225*	*4,095*	*4,349*	*4,689*	*4,249*	*5,444*	*6,033*	*6,644*	*8,290*	*7,415*
Orissa	***2,940***	***3,406***	***3,771***	***4,070***	***3,509***	***4,759***	***4,755***	***5,896***	***6,877***	***5,925***
Punjab	*5,186*	*5,212*	*5,964*	*6,900*	*5,874*	*4,039*	*6,196*	*7,083*	*8,304*	*7,383*
Rajasthan	*3,522*	*4,319*	*4,963*	*5,335*	*4,626*	*6,157*	*5,157*	*6,127*	*8,042*	*6,640*
Tamil Nadu	*4,996*	*5,528*	*5,999*	*6,362*	*5,872*	*8,278*	*6,851*	*8,493*	*9,290*	*8,325*
Telangana	*5,221*	*5,422*	*5,724*	*6,627*	*5,675*	*9,196*	*7,860*	*8,590*	*10,980*	*9,131*
Uttar Pradesh	*3,084*	*3,324*	*3,576*	*4,043*	*3,578*	*5,469*	*5,001*	*5,120*	*6,577*	*5,474*
West Bengal	*3,330*	*3,705*	*3,825*	*3,975*	*3,815*	*4,937*	*4,858*	*5,158*	*6,285*	*5,903*
All-India	***3,500***	***4,014***	***4,330***	***4,754***	***4,247***	***6,125***	***5,876***	***6,836***	***7,887***	***7,078***

Source: HCES report No 592 MoS&PI, NSO

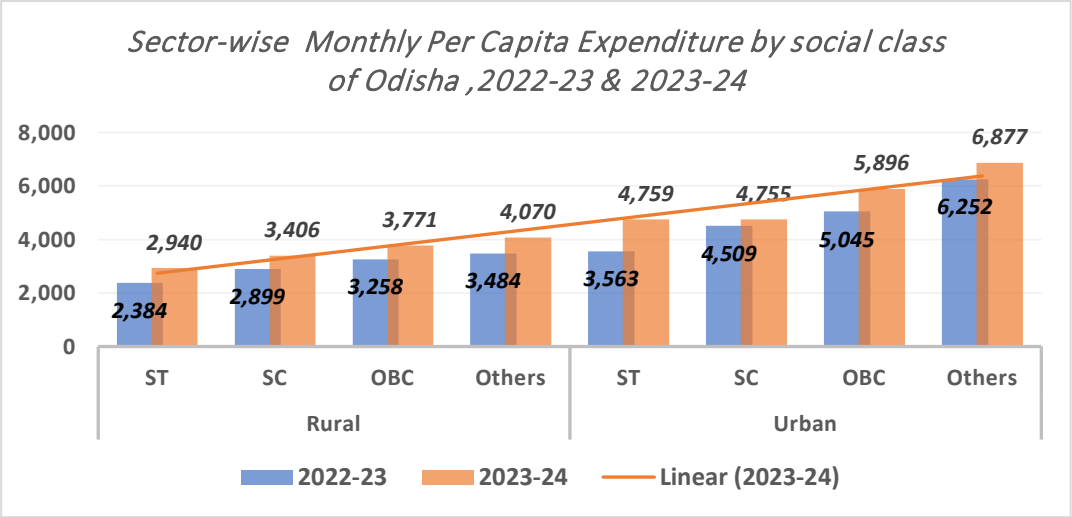
The Figure -1 given below illustrates sector-wise Monthly Per Capita Expenditure (MPCE) by social class in Odisha for 2022–23 and 2023–24, clearly distinguishing between rural and urban populations. Across both years, **urban households** reported significantly higher MPCE than their **rural counterparts**, highlighting the urban-rural consumption divide.

Within the **rural sector**, MPCE grew modestly across all social groups. STs had the lowest MPCE (₹2,384 in 2022–23 rising to ₹2,940 in 2023–24), while the 'Others' group recorded the highest (₹4,070 in 2023–24). The relatively slower growth among STs and SCs reflects persistent socio-economic disparities.

In the **urban sector**, all groups showed stronger gains. Notably, 'Others' crossed ₹6,800, and even STs—typically on the lower end—improved from ₹3,484 to ₹4,759. However, the gap between the highest (Others) and the lowest (STs) urban group widened, indicating growing inter-group inequality.

The **linear trend line** for 2023–24 confirms a consistent rise in MPCE with upward social mobility across broad social groups . However, disparities remain entrenched, emphasizing the need for targeted interventions to uplift marginalised communities, especially in rural Odisha.

Figure : 1 **Indicates sector-wise Monthly Per Capita Expenditure by Social Class of Odisha , 2022-23 & 2023-24**



Conclusion :

The study set out to examine the diverging consumption patterns among social groups in Odisha over the long term, using NSSO Consumer Expenditure Survey data from 1999–00 to 2023–24. The findings reveal a persistent and wide gap in Monthly Per Capita Expenditure (MPCE) between social groups, especially in rural areas. Scheduled Tribes (STs) and Scheduled Castes (SCs) continue to record the lowest MPCE, while OBCs and Others show higher growth, particularly in urban sectors. Odisha's MPCE consistently remains below the national average, reflecting structural inequities and slower inclusive development. Recent HCES data (2022–24) reinforce this trend across India. While some states exhibit strong equity in consumption, Odisha still faces significant challenges. The results highlight the need for targeted, equity-focused interventions to promote inclusive growth and bridge long-standing social and regional disparities.

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Self-Employed Women's Role In Odisha's Employment Scenario

MS Prativa Pradhan

ABSTRACT: This study focuses on Odisha's employment scenario with a special reference to contribution of self-employed women. How the self-employed women are improving the overall employment of Odisha has been portrayed through secondary data from Periodic Labour Force Survey. The government's welfare schemes, improved literacy, financial inclusions have played key roles in bringing the women workforce into the mainstream. As the sex ratio of female to male of India as well as Odisha is improving from time to time, the self-employment of women will not only create economical engagement of their own but for many others who will get associated with the women workforce.

Key Words: *Self-employment, Labour Force Participation Rate (LFPR), Periodic Labour force Survey (PLFS), Center for Monitoring Indian Economy (CMIE), "ps+ss" (refers to the Usual Status (Principal Status + Subsidiary Status)), International Labour Organisation (ILO), OECD (Organisation for Economic Co-operation and Development), Odisha Economic Survey*

1. INTRODUCTION:

1.1 Background:

As per International Labour Organisation, persons in employment or the employed population comprise all those of working age who, in a short reference period, were engaged in any activity to produce goods or provide services for pay or profit. [1] According to CMIE, India's unemployment problem is due to the low employment rate and its discouraged young female labour force. The World Bank reports that in 2023, the female population in India was 48.41% of the total population which is slightly less than half of the total population. India's population also is going to be more feminine as we see an improved sex ratio. As per National Family Health Survey Report 5 (2019-21), Ministry of Health & Family Welfare, India's sex ratio is 1020 females per 1000 males & Odisha's sex ratio is 1063 females per 1000 males which clearly shows a positive trend and more scope for women to come to the forefront as an active economic player. [2] Therefore it is high time to emphasize on female employment to improve the overall employment scenario of the state and foster economic growth.

In a populous country like India, it is an arduous job for the Govt. to offer employment to all its job-seeking citizens. With such a backdrop, self-employment becomes the way in between where citizens can contribute to Country's employment situation by creating opportunities for themselves & others. As the sex ratio is improving, the women will play major role in improvising the employment scenario. Govt. of Odisha is also implementing various developmental programmes & giving subsidies in businesses for upliftment of women.

Organization for Economic Co-operation and Development (OECD) has defined Labour force participation rate (LFPR) as the ratio between the total labour forces divided by the total working-age population. Labour force participation is affected by numerous social, economic, and demographic factors. As these factors change, labour force participation goes up or down. Largely seen as a boon for industrial society, women in the workforce contribute to a higher national economic output as measure in GDP as well as decreasing labour costs by increasing the labour supply in a society.

Odisha the rising land of India is endowed with natural resources and a robust workforce. It has been experiencing a rise in the growth rate of the economy in the recent past years. The female LFPR in Odisha has increased by two times from 2017-18 to 2023-24. The major rise in the self-employed female workers among the female LFPR and the recent surge in the economic growth rate in Odisha shows a positive correlation between the two. **[3]**

1.2 Research objective:

This study aims to:

1. Analyse the trend on the self-employed women over the years of Odisha
2. Identify the determinants of rise in the self-employment of women in Odisha
3. Recommend some policies to augment self-employment of women in Odisha

2. Literature Review:

2.1. Theoretical framework-

The positive discourses on self-employment provides an insight into the post- modern form of employment where the employees are able to choose their work condition, hours of work and leisure, with whom to work, where to work among others. The number of self-employed women and women entrepreneurs has been growing especially since 1990s. **[4]** A great progress has been observed in women empowerment in Odisha after joining SHGs (Self Help Groups) which usually form small and micro enterprise. **[5]** By integrating these frameworks, this study provides a nuanced and comprehensive understanding of the role of self-employed women in improving the overall employment situation of Odisha.

2.2. Determinants of rise in the self-employment:

a) Requires less fund-

A report of the National Commission on Self-Employed Women and Women in the Informal Sector (Government of India, 1988) named 'Shrama Shakti' describes about self-employed as "largely small producers and home-based workers, who either supply their produce to middlemen through informal contractual arrangements and retailing establishments or have their own small vending businesses". With little fund women can start their own home-based business.

b) Upliftment of economic and social status –

The self-employed women not only get engaged in economic activities but also create employment opportunities for others. Traditionally women do not have much say in the household decisions. But due to self-employment they are empowered to manage, organise, run business on their own and tackle everyday business problems. All in all, they are contributing to the nation building and uplifting the socio-economic status of the state and nation. [4] They are taking their own decisions and share opinion about household decisions since they are contributing to the family financially.

c) Low literacy level-

According to the 2011 census data women literacy of Odisha is only 64.01%. lack of education and training with increased competition for job opportunities does not leave much room for women to get into formal employment. Here self- employment is a ray of hope where women can bootstrap and utilize their existing resources and skills to their fuller extent.

d) Augmentation of Family income-

It has been observed that much of women's earnings go to basic family maintenance. Thus, increased disposable income in the hands of women means increased spending on child health, education, nutrition, and family well-being.[4]

e) Non-pecuniary benefits-

Besides monetary benefits women can enjoy other benefits which are non- pecuniary in nature. Self-employment provides them flexible hours of work thus they don't have to pay opportunity cost of sacrificing their family time or household duties. They are their own boss and have other lifestyle conveniences.

[6] In-fact some studies also reveal that self-employed people have higher levels of job satisfaction than wage and salary workers do.[7]

2.3. Challenges to women self-employment:

Women of India face multifarious problems while venturing into their entrepreneurial dream, be it a woman of urban area or rural area. We can discuss them under the following heads.

(i) Squeeze of own-care-

A woman worker may juggle between care work and market work and fail to strike a right balance between the two. Their unpaid care for the family and personal care helps in boosting their own as well as family's productivity. It takes toll on their sleep, rest, leisure time and even their own skill building. [8]

(ii) Social barriers-

A woman taking up a job that is laced with risk is often discouraged in our society. Especially in rural areas cultural inhibitions, casteism, shyness, conservatism etc restricts their growth as entrepreneurs. As per a study by NIESBUD (1986), 81% of women had faced challenges in managing workers in their respective trade.

(iii) Education and training-

Female literacy of Odisha is lower than that of India's. lack of education gets in the way when the technology is evolving day by day. It becomes harder to cope up with this rapid change. Sometimes, the training period is not taken seriously by women and sometimes government fails to reach women to impart adequate training.

(iv) Financial constraint-

The major problem while carrying out a business plan is the financial constraint. Their inability to mortgage security fails them to procure large fund. They turn to banks, other financial institutions, or community-based funds usually a chit fund. Absence of financial inclusion and an urge for hassle- free transaction drives them to raise fund from community-based funds. For any business proposal financial support as well as financial viability are inevitable. [9]

(v) Marketing bottleneck-

Usually, they are unaware of how the markets work. They face heavy competitions from their male counterparts as well as from macro enterprises. Be it raw material or finished product lack of market research, information gap and awareness push them one step backward. Advertisement requires heavy funding and R&D is a distant dream for such a small start-up. Absence of guidance on consumer demand and market mechanism leads women to give up their entrepreneurial dream. [10]

3. Methodology:

3.1. Research design:

In this study different methods such as multiple bar diagram and time series graphs have been used to explore the contribution of self-employed women in reduction of overall unemployment as well as increasing LFPR (Labour Force Participation Rate) of women in Odisha. The composite bar diagram shows the percentage distribution of female workers in different categories in Odisha.

3.2. Data Collection:

Data have been collected from secondary sources i.e., from Periodic Labour Force Survey reports from the year 2017-18 to 2023-24. Various indicators such as total unemployment rate, female unemployment rate of urban and rural, LFPR of women, etc of Odisha have been compiled and assessed over different years.

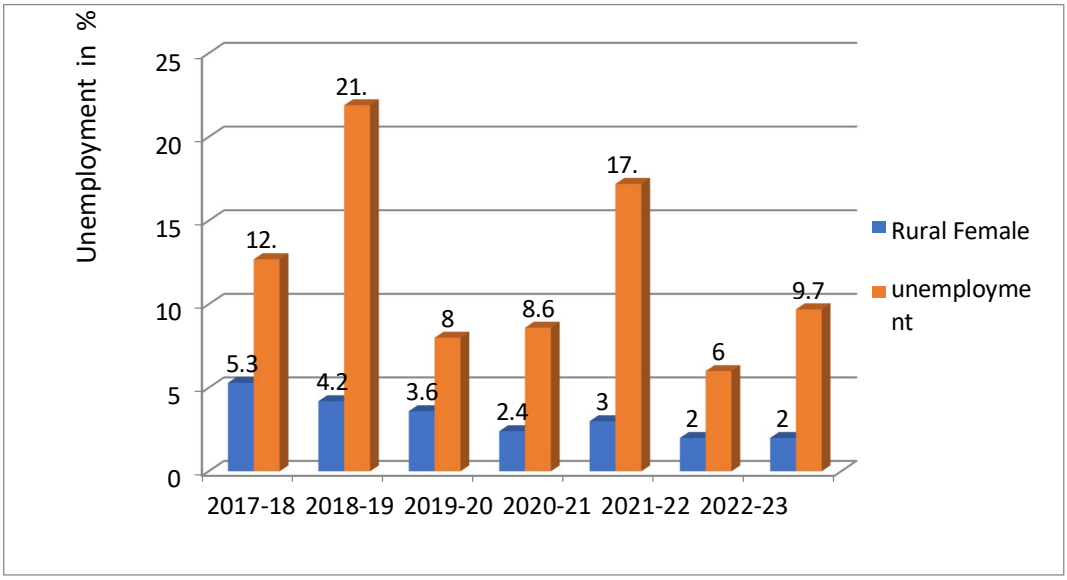
3.3. Data Analysis:

From the Periodic Labour force Survey (PLFS) published by National Statistical Office, Ministry of Statistics & Programme Implementation, the following data are collected from various years. We can clearly see here that there is a declining trend in both the cases of Rural & Urban Female unemployment and the total unemployment i.e., Male unemployment and female unemployment has reduced drastically.

Table 1: Unemployment rate in percentage according to usual status (ps+ss) age group 15 years and above in Odisha **[11]**

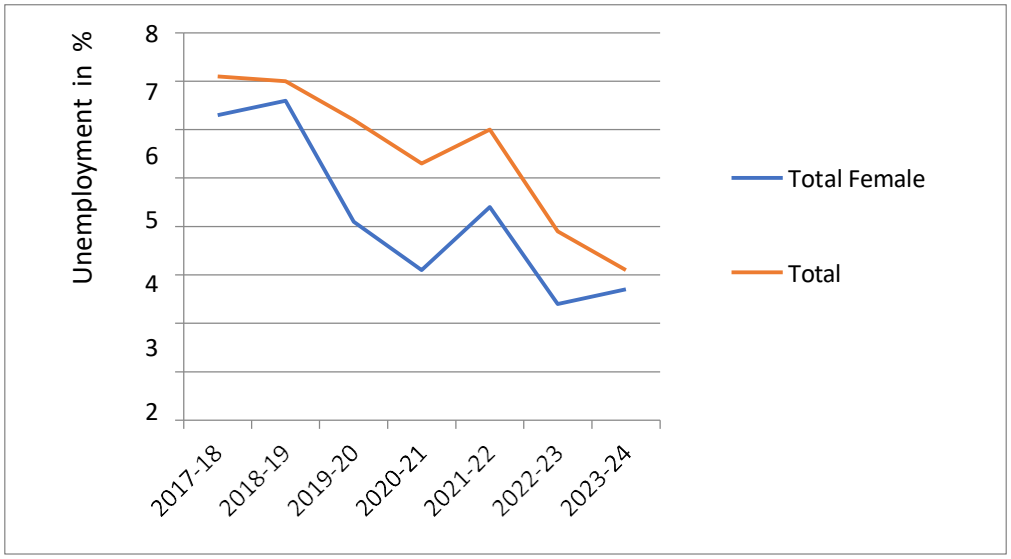
Year	Rural Female unemployment	Urban Female unemployment	Total Female unemployment	Total unemployment (Male+Female)
2017-18	5.3	12.7	6.3	7.1
2018-19	4.2	21.9	6.6	7
2019-20	3.6	8	4.1	6.2
2020-21	2.4	8.6	3.1	5.3
2021-22	3	17.2	4.4	6
2022-23	2	6	2.4	3.9
2023-24	2	9.7	2.7	3.1

Fig 1: Unemployment rate in % according to usual status (ps+ss) age group 15 years and above in Odisha [11]



The tabulated data (Table 1) is shown through multiple bar diagram (Fig.1) for better understanding which is as above. The time series graph given below (Fig.2) suggests that the total unemployment is declining at par with the decline in total female unemployment. This diagram is made from the data of Table 1. Here a conclusion can be drawn that the female employment has huge impact on total employment in Odisha.

Fig. 2: Comparison between Total female unemployment (%) & Total unemployment (%) in Odisha [11]



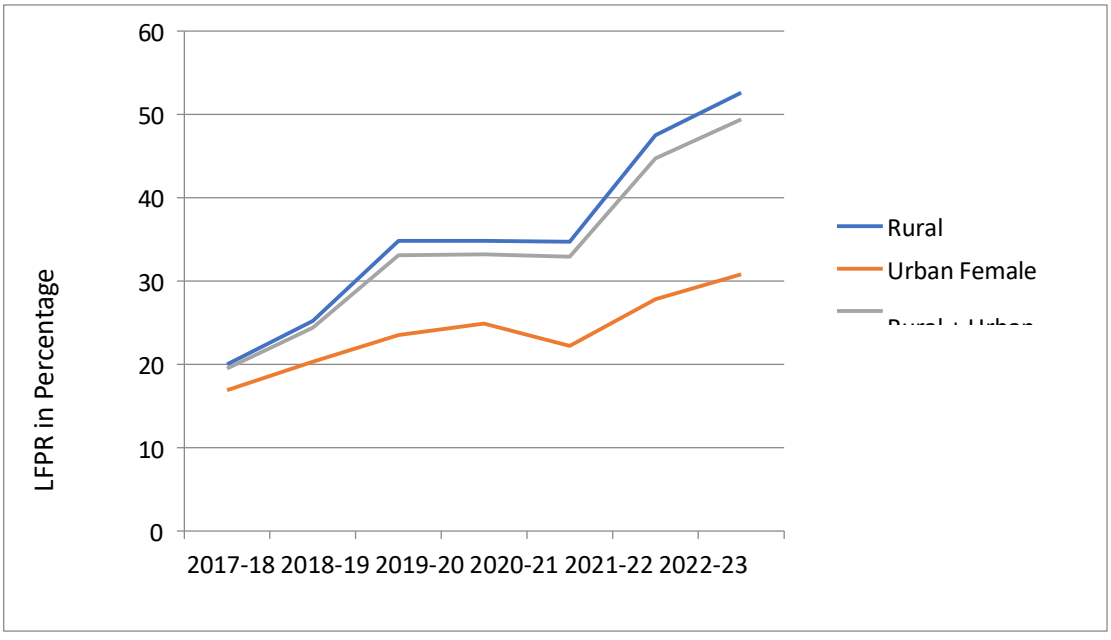
The female unemployment rate of Odisha has been decreasing over the years as we see in 2017 it was 6.3%, then it turned 3.1% in 2020-21 and currently in 2023-24 it is 2.7%. There was a slight rise in the unemployment rate during the pandemic period as there was a decline in share of casual workers, regular wage earners and salaried people during this time. **[12]** A similar pattern can be observed in the total unemployment rate of Odisha. Thus, the female unemployment rate is a major determinant along with the male unemployment rate and cannot be ruled out while considering the state total unemployment rate of the state.

The following Table no. 2 is compiled from Periodic Labour Force Survey of various years. This table comprises of data relating to the Labour Force Participation Rate (LFPR) in percentage with reference to the Rural Female & Urban Female of Odisha.

Table 2 : LFPR in percentage [11]

Year	Rural Female	Urban Female	Rural + Urban Female
2017-18	20	16.9	19.5
2018-19	25.2	20.3	24.4
2019-20	34.8	23.5	33.1
2020-21	34.8	24.9	33.2
2021-22	34.7	22.2	32.9
2022-23	47.5	27.8	44.7
2023-24	52.6	30.8	49.4

Fig. 3 : LFPR in percentage [11]

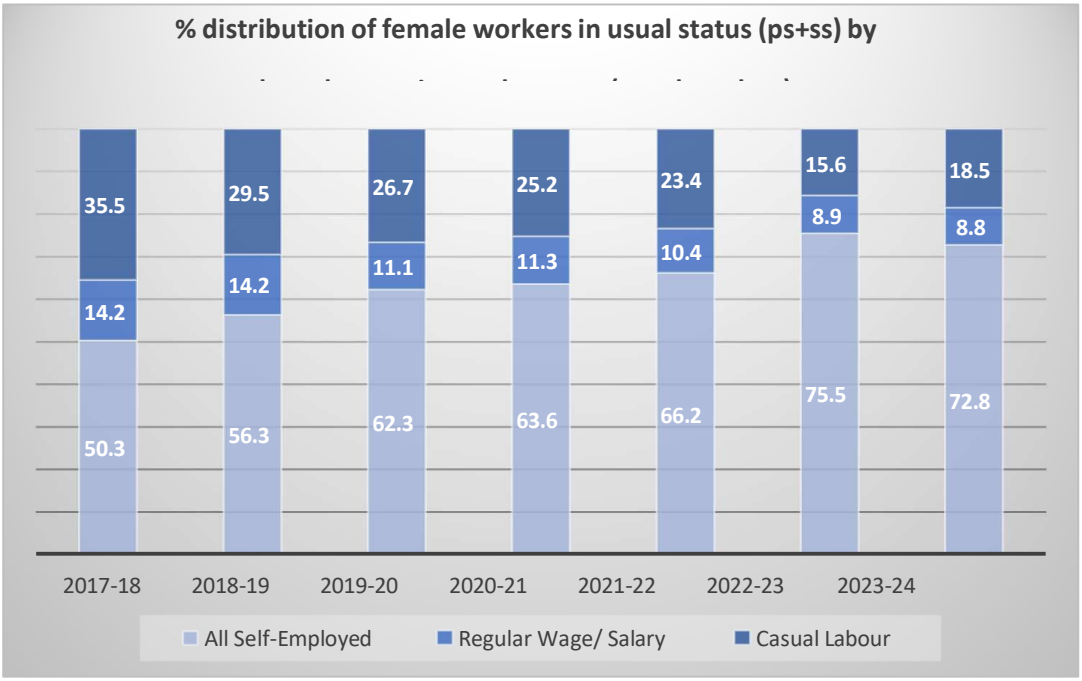


Clearly the Labour Force Participation Rate is increasing over the years in Odisha be it rural or urban and the female labour force is expanding and branching out.

Table 3: Percentage distribution of female workers in usual status (ps+ss) by broad status in employment (Rural + Urban) **[11]**

Year	Self-employed Female	Regular age/ Salary (Female)	Casual Labour (Female)
2017-18	50.3	14.2	35.5
2018-19	56.3	14.2	29.5
2019-20	62.3	11.1	26.7
2020-21	63.6	11.3	25.2
2021-22	66.2	10.4	23.4
2022-23	75.5	8.9	15.6
2023-24	72.8	8.8	18.5

Fig 4: % distribution of female workers in usual status (ps+ss) by broad status in employment (Rural + Urban) **[11]**



One of the major components of percentage distribution of workers in usual status (ps+ss) by broad status in employment is the percentage of self-employed people in Odisha. Among women the percentage share of self-employed people to the total employed people is higher than the regular wage/salaried people and casual labour. Thus, self-employment emerges as a means that offers a lot of scope to women where it enables women to be self-dependent and provide themselves with enough employment opportunities. Moreover, Self-employment is acting as a safety net for workers who do not have access to stable wage employment and it is usually significant in countries that have lower labour productivity. **[13]**

4. Government policies:

Currently there are many government policies that are being carried out in the state Odisha to boost self-employment among women.

a. **Subhadra Yojana** – it intends to benefit over 1 crore women aged 21 to 60 years by empowering them financially. Under this scheme eligible women will receive ₹50,000 over a five-year period. It can have multiplier effect as not only it will increase the consumption expenditure but also it can fund woman pursuing entrepreneurial activities.

b. **Mukhyamantri Mahila Sasaktikarana Jojana (2017)** guarantees financial assistance for women's self-help groups.

c. **Skilled in Odisha-**

The main focus is to skill girls and have at least one third of the ITI graduates as women by 2020. For this woman centric scheme has been launched named *Sudakhya.* a pilot initiative-Nano Unicorn have given entrepreneurship training, access to philanthropic risk capital and mentoring with a special attention to women.

d. Odisha Start Up policy of 2016 envisions 33% of start-ups with women as the founder or co-founder.

e. A separate Department of **Mission Shakti** has been created in 2021 to bolster women SHG. In 2001 the programme "Mission Shakti" was introduced to empower women to take up various socio-economic activities. It provides credit and market linkages to women to carry out gainful activities. Through **women SHGs** under Mission Shakti the Government envisages to empower women and include more women under this flagship programme to have an income multiplier effect in the economy. So far, approximately 70 lakh women have been organized into 6 lakh groups in all blocks and urban local bodies of the State.

5. Policy recommendations-

To promote women's entrepreneurship in Odisha, we can focus on:

a. Education and awareness campaigns for literacy and vocational training.

b. Training programs for capacity building and business management.

c. Market access through digital platforms and fairs.

d. Policy support with financial literacy, tax relaxations, and subsidies.

e. Celebrating successful women entrepreneurs to inspire others.

With these approaches the platform of women is set for empowerment of women, especially in rural areas, to succeed in entrepreneurship and self-employment.

6. Conclusion:

According to International Labour Organization 2020, globally self-employment constitutes about 45 percent of women's employment. It acts as an important source of livelihood for women in low-income households in developing countries across Latin America, Asia, and Africa. This increases discretionary income of women which increases their bargaining power as well as the aggregate savings rate also rises. This also implies the role of women on aggregate savings rate. **[14]** Usually, the self- employed women start with household micro enterprise and its nature is such that they are able to carry out their job during their flexible hours as per their convenience. It has helped them to become financially independent and confident decision maker socially as well as economically. This also is helping women to break stereotypes of the society. All in all, it is boosting the economic growth of Odisha by empowering women to get themselves employed as well as creating more employment opportunities through them.

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Structural transformations in Household Consumption Expenditure Survey (HCES), 2022–23 and 2023–24

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Sri Saroj Mohan Panda

Abstract:

The Household Consumption Expenditure Survey (HCES), conducted by the National Sample Survey Office (NSSO), has undergone landmark methodological and structural transformations in its 2022–23 and 2023–24 rounds. These reforms are designed to improve the accuracy, granularity, and policy relevance of consumption data in India. This article critically examines the key innovations introduced, including the overhaul of data collection instruments, integration of digital technologies, revised item classification, and enhanced imputation techniques. It also explores issues of comparability with earlier survey rounds and the implications of shifting to a calendar-year reporting framework.Taken together, these developments represent a pivotal advancement in India's statistical architecture, aligning it more closely with international standards and strengthening its utility for evidence-based economic planning and social policy formulation.

Keywords: *HCES 2022–23, HCES 2023-24,NSO, consumption expenditure, MPCE, imputation, welfare schemes, CAPI, household survey methodology used in research and welfare policy planning.*

1. Introduction

Since its inception in 1951, the National Sample Survey (NSS) has been the cornerstone of India's statistical system for monitoring household consumption. Through its quinquennial and annual rounds, the NSS has consistently captured critical shifts in living standards, inequality, and expenditure patterns across the nation. The introduction of the Household Consumption Expenditure Survey (HCES) in 2022–23, followed by its continuation in 2023–24, marks a paradigm shift in survey methodology—aimed at capturing the nuances of contemporary consumption behaviour and accounting for the evolving impact of social welfare interventions. Its main objective is to examine the methodological and structural transformations introduced in the Household Consumption Expenditure Survey (HCES) 2022–23 and 2023–24 by MoS&PI, NSO.

2. Historical Context of NSS Consumption Surveys

Household Consumption Expenditure Surveys were conducted in each NSS round until the 28th round (1973–74). From the 42nd round (1986–87), NSSO initiated annual thin-sample surveys while continuing quinquennial large-scale surveys every five years. Major consumption data publications occurred in the 27th (1972–73), 32nd (1977–78), up to the 68th round (2011–12). The latest full-scale HCES was conducted from August 2022 to July 2023, with the 2023–24 round maintaining the revised methodology.

3. Key Innovations in HCES 2022–23 and 2023–24

3.1 Expanded Item Coverage

The number of consumption items increased from 347 in 2011–12 (68th round) to 405 (2022-23) in the latest surveys. The revision reflects evolving household needs, market offerings, and emerging consumption categories. 58 new or classified items like food items of dry fruits, packaged ready to eat , beauty, pet care, digital gadgets, health devices ,fitness equipment personal electronics, goal to capture life style consumption etc The objective is making expenditure measurement more aligned with current household behaviours

3.2 Modular Questionnaire Design

For the first time, separate questionnaires were deployed for different item groups

- **FDQ** (Food Questionnaire),
- **CSQ** (Consumables & Services Questionnaire),
- **DGQ** (Durables Questionnaire), and
- **HCQ** (Household Characteristics & Demographics).

This modular structure provides deeper, focused insights while reducing respondent fatigue during interviews.

3.3 Multi-Visit Interview Strategy

Earlier surveys relied on a single-visit method. The re-vised strategy involves three staggered visits across a quarter to capture temporal variability in household consumption.

3.4 Adoption of Digital Data Collection

The transition from Pen-and-Paper Personal Interview (PAPI) to **Computer-Assisted Personal Interview (CAPI)** has improved data accuracy, ensured real-time validations, and reduced enumerator errors.

4. Changes in Estimation and Sampling Design

4.1 Two Sets of MPCE Estimates in HCES 2022–23

The Household Consumption Expenditure Survey (HCES) 2022–23 has generated **two distinct sets of Monthly Per Capita Expenditure (MPCE)** estimates:

i. **MPCE Using Usual NSS Imputation Practice:** The first set follows the conventional methodology adopted in past NSS surveys. It imputes value figures **at the time of data collection in the field** for items consumed from **home-grown or home-produced stock**, **gifts**, **free collections**, and **goods received in exchange** for other goods or services.

ii. **MPCE Estimates with Enhanced Imputation:** The second set builds upon the first by additionally applying **post-field-level imputation**. It incorporates a more refined method of assigning imputed values to consumption items, combining field-based data with **systematic valuation techniques**. This set is referred to as **'MPCE estimates with imputation'**, aiming to improve consistency and accuracy across diverse consumption categories.

These dual estimates enable a comparative assessment of consumption behaviour and valuation accuracy under different imputation approaches, contributing to more nuanced policy insights.

4.2 Estimation of Monthly Per Capita Consumption Expenditure (MPCE)

The Household Consumption Expenditure Survey (HCES) continues to employ a multistage stratified sampling design. However, in its latest rounds (2022–23 and 2023–24), the survey introduces enhanced stratification using economic proxies—such as land ownership in rural areas and vehicle ownership in urban areas. This refinement ensures a more representative sampling across diverse economic strata.

A revised formula for estimating Monthly Per Capita Consumption Expenditure (MPCE) has been adopted to reflect three dimensions of household consumption collected through three separate visits:

$$\text{MPCE} = \frac{E_1 + \left(\frac{E_2}{P_2} \times P_1\right) + \left(\frac{E_3}{P_3} \times P_1\right)}{P_1}$$

Where:E1,E2,E3 = Expenditure on food items, consumables & services, and durable goods, respectively

- P1,P2,P3 = Household size recorded during each visit corresponding to the Food (FDQ), Consumables & Services (CSQ), and Durable Goods (DGQ) questionnaires, respectively

The **total monthly household consumption expenditure (TE)** is calculated as:

$$TE = E_1 + \left(\frac{E_2}{P_2} \times P_1\right) + \left(\frac{E_3}{P_3} \times P_1\right)$$

Subsequently, the **MPCE** is derived by dividing the total expenditure (TE) by the household size recorded during the food questionnaire (FDQ), i.e., P_1,P2,P3 as number of the household members (size of household) recording during canvassing

$$\text{MPCE} = \frac{TE}{P_1}$$

.

This method ensures that variations in household size across different visits do not distort the per capita expenditure estimation, while retaining consistency by standardizing on the household size at the time of the first visit (FDQ). Only those households that provided complete information across all three instruments (FDQ, CSQ, DGQ) are considered for MPCE estimation. The final estimates are generated using a multiplier derived from the third visit data, ensuring statistical validity in population-level inferences

5. Imputation of Free Goods and Services

With an increasing role of welfare schemes, the survey has included a mechanism to impute the value of goods received **free of cost**, particularly through **PDS, mid-day meals, PMJAY, and educational subsidies**.

5.1 Food Items (Free) Imputed Include:

- Cereals (e.g., rice, wheat, millets),
- Pulses, edible oil,
- Sugar, salt.

5.2 Non-Food Durables Imputed Include:

- Laptops, mobile phones, bicycles,
- School uniforms, footwear, scooters.

5.3 Method of Imputation:

The imputation technique is based on **modal unit values** calculated using **Kernel Density Estimation** at the **Sector × State × Second Stage Stratum (SSS)** level. Where data was limited, the next aggregate level (Sector × State) was used.

No imputation was attempted for healthcare or education services availed under **PM-JAY** or other cashless schemes due to data limitations.

6. Comparability with Previous Surveys

Due to major structural changes, especially in questionnaire design, data collection mode, and imputation, **direct comparison** of estimates with earlier NSS rounds (e.g., 2011–12) should be approached cautiously. Analysts must account for:

- Changes in item classification and coverage,
- New approach to handling free goods,
- Household size consistency,
- Improved digital data quality.

7. Implications for Policy and Research

The innovations in HCES open up new possibilities:

- **More accurate estimation** of real household consumption and inequality,
- **Better targeting** of welfare schemes through free-item tracking,
- Support for **state-specific planning** by allowing granular price and quantity analysis,
- Ability to study **digital and durable penetration** (e.g., access to smartphones, laptops, vehicles).

These changes align with India's **Viksit Bharat @2047** vision by strengthening the statistical system for welfare assessment and policy feedback.

8. Conclusion

The 2022–23 and 2023–24 HCES rounds represent a landmark transformation in India's statistical architecture on household consumption. By adopting technology-enabled data collection, refining questionnaire strategy, and accounting for social transfers, these surveys are not only more relevant to today's socioeconomic environment but also essential for informed policymaking. As the data is analysed further, it will unlock deep insights into the changing dynamics of Indian households in the post-pandemic and digital era.

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Water Bodies and its impact in Odisha

(A spatial Analysis on 1st Census of Waterbodies)

Nirmal Kumar Sahoo

Abstract

Odisha is an agrarian State. Almost 70 percent population of the State are dependent on agriculture. Water management is a crucial factor for development of agricultural output and food security. Distribution of monsoon water is not uniform across the districts of Odisha. Odisha is endowed with diverse and distinct water bodies. In the landscape of Odisha, traditionally, the water bodies have played an important role in the supply of drinking water, for domestic use and agriculture purposes, etc.

The Parliamentary Standing Committee on Water Resources, India deliberated on "Repair, Renovation and Restoration of Water Bodies-Encroachment on Water Bodies and steps required to remove the encroachment and restore the Water Bodies" and recommended to conduct a Census on Water bodies to prepare a sound data base on Water Bodies, capture information on important parameters of the water bodies like number, size, condition, type of use, storage capacity of filling up of storage and encroachments status etc.

In this study, steps have been taken to present the major findings based on the analysis of the data of 1st Census of water bodies in Odisha during 2017-18. This paper also presents on the Water Bodies and purpose of their uses in both rural and urban parts of Odisha, disparities between rural and urban areas and varying levels of encroachment and revealed crucial insights into the Odisha's water resources and suggested to formulate effective strategies action plan to free encroached water bodies and focus on recharge of Ground Water. There are 1.52 Lakh Water Bodies in Odisha during 2017-18. Out of which 79.92 percentage are in rural areas and 89.20 percentage are in use whereas 10.80 percentage are not in use . In Odisha, around 51% Water Bodies are owned by the private entities and 31% are located in tribal areas.

It is observed that the Water Body density in coastal districts are very high and in case of Kandhamal District, the same is very low .

Keywords

Minor Irrigation Census, Ministry of Jal Shakti, Water Body, Drought Prone Area Programme, Desert Development Programme, Billion Cubic Metre

Introduction:

Water plays a major role in every living being's life. It is the home of aquatic animals. From a tiny insect to a whale, every organism needs water to survive. Odisha is endowed with extraordinarily diverse and distinctive traditional Water Bodies found in different parts of the country, commonly known as ponds, tanks, lakes, reservoirs etc. Water Body plays an important role in maintaining and restoring the ecological balance. Artificial water bodies substantially alter the characteristics of aquatic habitats across the landscape. (S.V.Smith, et al.,2002). They act as sources of drinking water, recharge

groundwater, control floods, support biodiversity, and provide livelihood opportunities to a large number of people.

Due to rapid urban sprawl, many of the water bodies have been totally lost and many have been shrunk in size while the waters of several water bodies got polluted with the discharge of untreated domestic and industrial effluents in urban areas. The adverse consequences of the loss of water bodies are felt in the steep decline in water table and the resultant water crisis in several areas. (P Manisha,2018)

climate change is rapidly taking place bringing water scarcity and stress is responsible for generating risk communities climate change is rapidly taking place bringing water scarcity and stress is responsible for generating risk communities

Rapid Climate change is an important factor for water scarcity which encounter acute water stress for agriculture and domestic purposes in waster past of Odisha (Adyasha Sahoo,et al. , 2023)

Odisha is having three major morphological units, i.e. northern and southern hilly regions with uplands, the erosional plains of river basins and coastal plains along the eastern margin. Based upon availability, dependability and low capital cost, Groundwater is the most preferred source of water In India. Ground water is the source for more than 85 percent of India's rural domestic water requirements, 50 percent of its urban water requirements and more than 50 percent of its irrigation requirements and the state of Odisha is no exception. The ever-increasing demand of ground water from different sectors of the state called for judicious and planned exploitation of its ground water resources. Water body plays a vital Role in recharging the Ground Water. As per Dynamic Ground Water Resources of Odisha Report, 2022, Annual Ground Water Recharge is 17.79 BCM and 44.25% of Ground Water are the stage of extraction. The Ground Water Extracted for purpose of Irrigation, Industry and domestic is 5.83 BCM, 0.16 BCM and 1.24 BCM respectively.

Ministry of Jal Shakti, Govt of India has conducted the first-ever census of water bodies in India with reference year 2017-18 and the Survey was completed during March 2022. The census provides a comprehensive inventory of India's water resources, including natural and man-made water bodies like ponds, tanks, lakes, and more, and collects data on the encroachment of water bodies.

The census was launched under the centrally sponsored scheme, Irrigation Census" in convergence with the 6th Minor Irrigation Census to have a comprehensive national database of all water bodies.

Concept & Definition

Water Body is all natural or man-made units bounded on all sides with some or no masonry work used for storing water for irrigation or other purposes (e.g. industrial, pisciculture, domestic / drinking, recreation, religious, groundwater recharge, etc.). The various types of Water Bodies found in Odisha are tanks, reservoirs and ponds, etc.

The water bodies like Ocean, lagoons, Rivers, Stream, springs, waterfalls, canals, Swimming Pool, Water tank created by families for sole consumption,

factories, Temporary Water Body digging for mining, brick kilns, and construction activities, Pucca open water tank created for drinking for cattle are not preview of the analysis.

Objective

The main objective of the study is

i) To analyse the exact position of the Water Bodies both natural & manmade in rural and urban areas of Odisha

ii) To assess the different categories of Water Bodies and their of uses

iii) To estimate the Water Body Density and Water Area Density in Odisha

iv) To analyse the encroachment of Water Bodies in Odisha

v) To furnish the suggestions for improving Water Bodies

Study Area

Odisha is spread over an area of 1,55,707 km^2 and extends for 700 km from north to south and 500 kilometres from east to west. Its coastline is 450 km long. The projected population of Odisha is to be 46.95 million, or 4.70 crore, as of July 1, 2025, as per the report of the Technical Group by the National Commission and is the 11th most populous state in India. The density of population is 269 persons per sq. km. The rural population constitute about 83.32% of the total population. Odisha is having three major morphological units, i.e. northern and southern hilly regions with uplands, the erosional plains of river basins and coastal plains along the eastern margin.

Odisha is one of the few states in the country, which is endowed with abundant water. It is blessed with an excessive network of rivers and streams. The surface water resources of Odisha have their source in major river systems of Mahanadi, Brahmani, Baitarani, Budhabalang, Subarnarekha, Rushikulya and Bansadhara

1st Census data of Water Bodies, Reference year 2017-18 in respect of 50,065 rural villages & 2,024 urban wards in 114 ULBs of Odisha are used for analysis of the study .

Methodology

a) Data Types

- Secondary data included topographic map of Odisha & GIS Odisha
- NITI Ayog report and published papers

b) Data Source

- Data of 1st Census of Water Bodies of Reference year 2017-18
- Composite Water Management Index by NITI Ayog 2016-17

Review of Literature

Water plays an important role for economic growth, wellbeing of its people, and the sustainability of ecosystems. The presence of water in various forms in its natural setting plays an important role in enhancing the quality of physical environment and the socio-economic environment. **(Bindo,CA et al. (2015)).** Preservation, conservation and rejuvenation of water bodies are needed of the hour for both rural and urban areas.

Urban expansion and development usually in an unplanned or haphazard manner recognition needed for urban water bodies in planning policies and process to help protect, conserve and revitalize this precious resource **(Sauni Wan Lenar Laloo, et al.(2019)).**

Urban water bodies include rivers, lakes, reservoirs, and they comprise one of the most important ecological spaces in urban areas (Forman, 2014; Murakawa et al., 1991; Paul and Meyer, 2001).

Mankind has been bound to water bodies and evidence of human life from the very beginning hides under the water level, off the coasts, under shallow seas or deep oceans, but also inland water bodies of countries all around the world **(Fabio Menna , et al. (2018))**

Most of the encroachment of Water Bodies has taken place in the peripheries of Largely populated areas of Urban bodies. **(Sayed Tanveer Ahmed, et al. (2021))**

Despite prevalence of stringent environmental and urban planning regulations, lack of effective implementation has done enormous damage to the Urban ecology ,especially large no of water Bodies are lost due to rapid expansion of Urban area. **(R Chigurpati (2008))**

1) a number of water bodies that acted as storage reservoirs,

2) provided water for irrigation, drinking and helped in recharge of groundwater. A number of these water bodies

3) have been lost due to rapid growth in the city in the last 2–3 decades. Despite the prevalence of stringent

4) environmental and urban planning regulations, lack of effective implementation has done enormous damage

5) to the urban ecology.

Water Bodies in Odisha – a comparison among other states of India

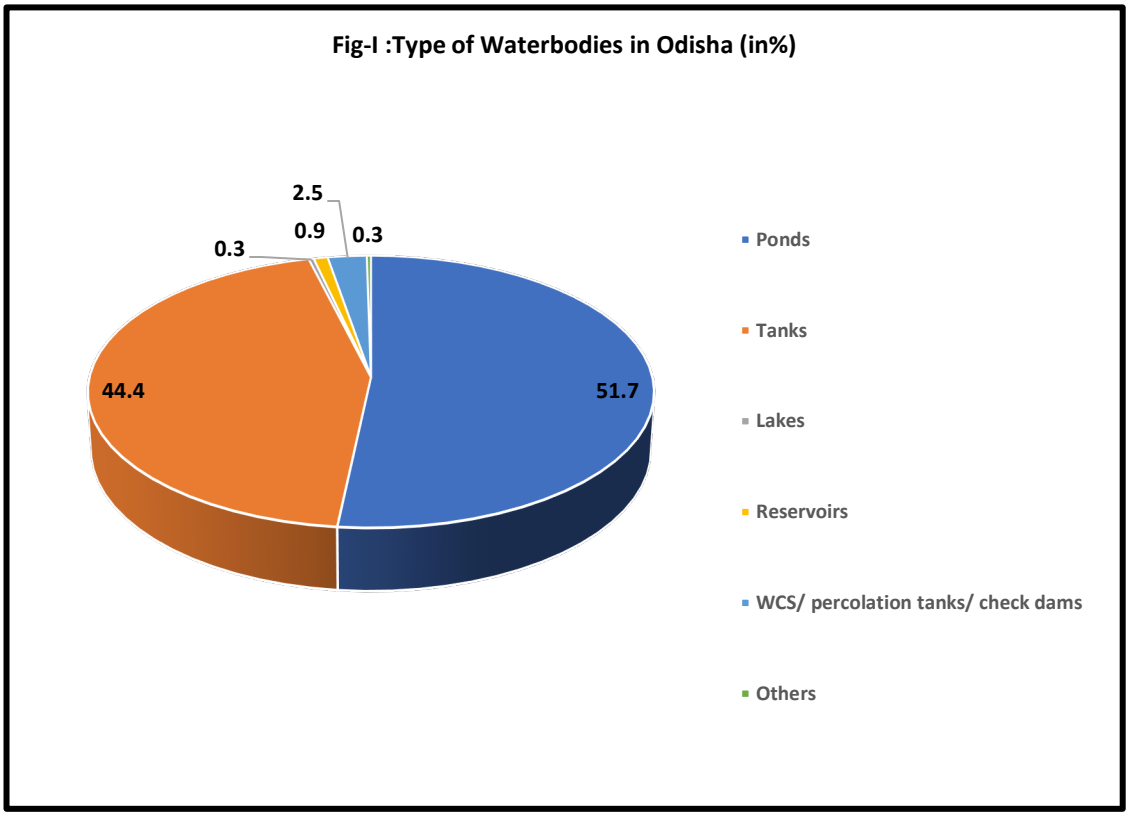
Odisha ranked 4th position with 7.5% of the country's water bodies after West Bengal, Uttar Pradesh and Andhra Pradesh. Odisha's position in terms of tanks (2nd), Ponds & reservoirs (4th) and Lakes (5th) in India. Among top 30 Districts of India, Balasore has been placed at 18th position with 16,804 water bodies, followed by Mayurbhanj with 15,986 and Kendrapara with 12,509. there are 56,900 water bodies in tribal areas, followed by 24,495 in flood-prone areas, 22,735 under drought-prone area programme, 1516 in Maoist-affected areas and

the rest in other areas. Mahanadi and Brahmani-Baitarani basins have the maximum 1,06,755 and 1,00,903 water bodies respectively after the Brahmaputra basin, which has the highest number of 2,22,244 water bodies.

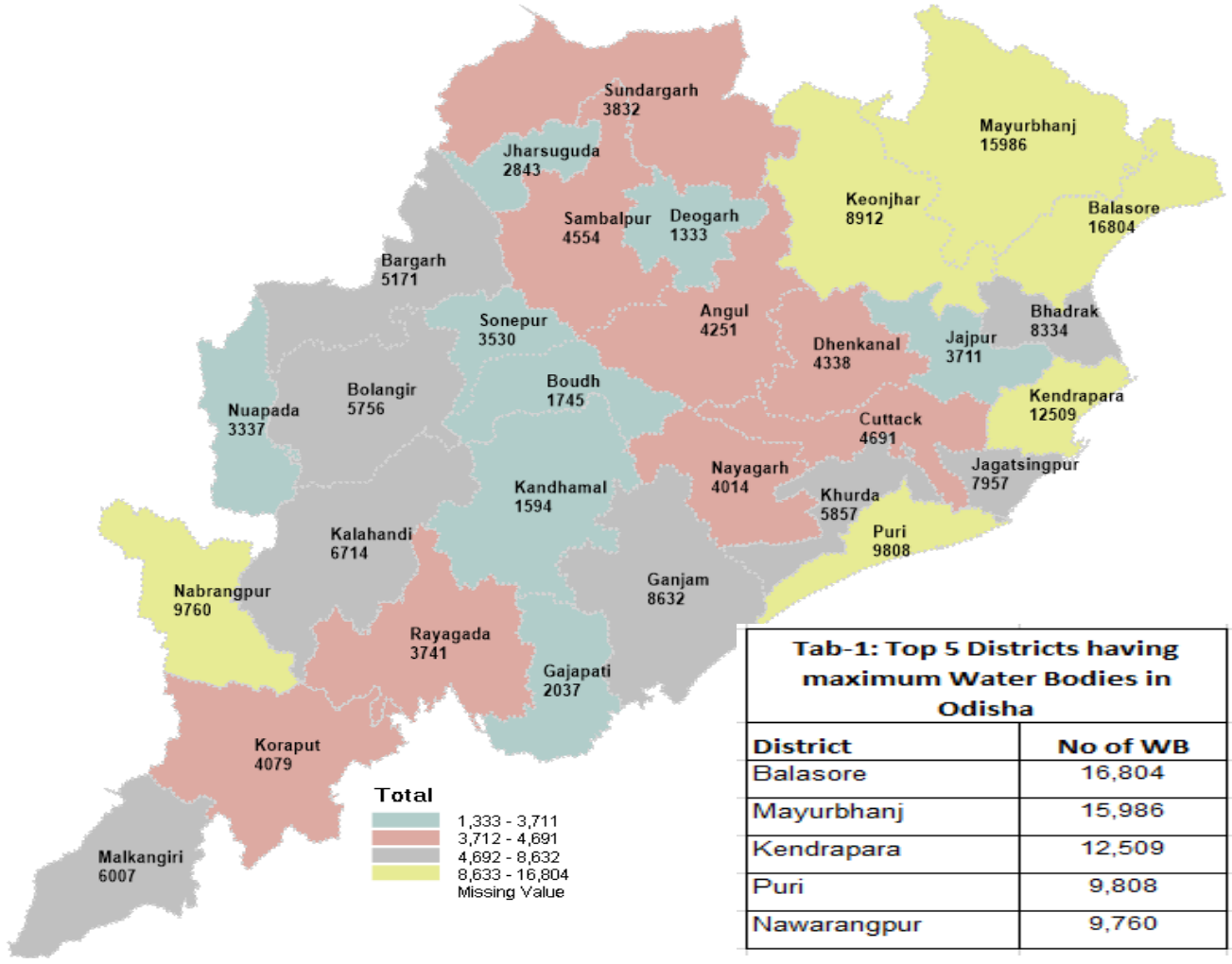
It is observed that 5,600 water bodies have dried up, 1,941 are not in use due to construction activities, 1,154 are beyond repair, 122 are affected due to industrial effluents, 3,564 suffering from siltation and 320 are affected by salinity. Out of 1.81 lakh water bodies, the highest 89.2 per cent (1,61,207) water bodies are being used and the remaining 10.8 per cent (19,630) water bodies are 'not in use'.

A Spatial analysis of water bodies in Odisha

During 1st census of water bodies, 1,81,837 of water bodies have been enumerated in Odisha ,out of which 51.7% (94,025) are ponds,44.36% (80,671) are tanks, 0.32% (579) are lakes, 0.88%(1,606) are reservoirs whereas remaining 2.46% (4,474) are water conservation schemes/check dams/ percolation tanks, lakes and 0.27%(482) are other water bodies. Top five Districts in number of water bodies are as follows



Map-1: Water Bodies in Odisha during 2017-18



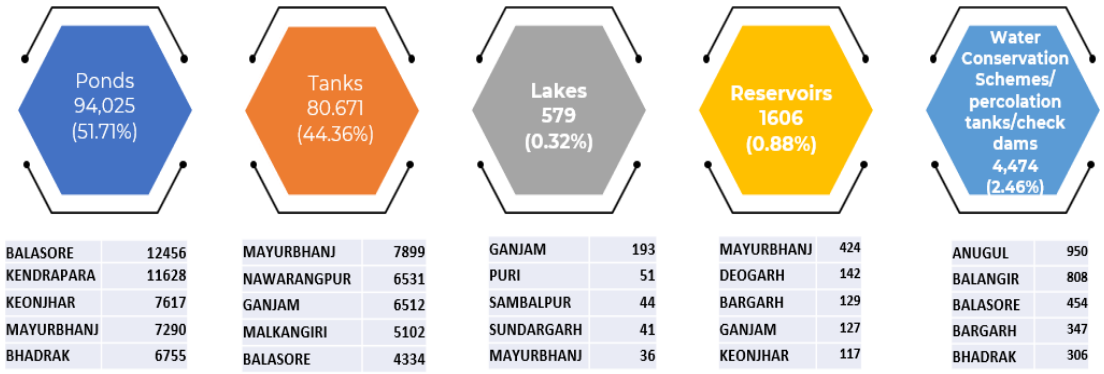
Tab-1: Top 5 Districts having maximum Water Bodies in Odisha

District	No of WB
Balasore	16,804
Mayurbhanj	15,986
Kendrapara	12,509
Puri	9,808
Nawarangpur	9,760

Balasore District has the highest number of ponds whereas Mayurbhanj has highest number of Tanks and reservoirs. **Ganjam** District has the highest number of Lakes and **Angul** is the leading distrDict for water conservation schemes.

The Five (5) leading Districts with maximum number of ponds, tanks, lakes, reservoirs and Water conservation schemes/percolation tanks /check dams are given below:

Table-2:Top 5 Districts on Type of Water bodies



BALASORE	12456
KENDRAPARA	11628
KEONJHAR	7617
MAYURBHANJ	7290
BHADRAK	6755

MAYURBHANJ	7899
NAWARANGPUR	6531
GANJAM	6512
MALKANGIRI	5102
BALASORE	4334

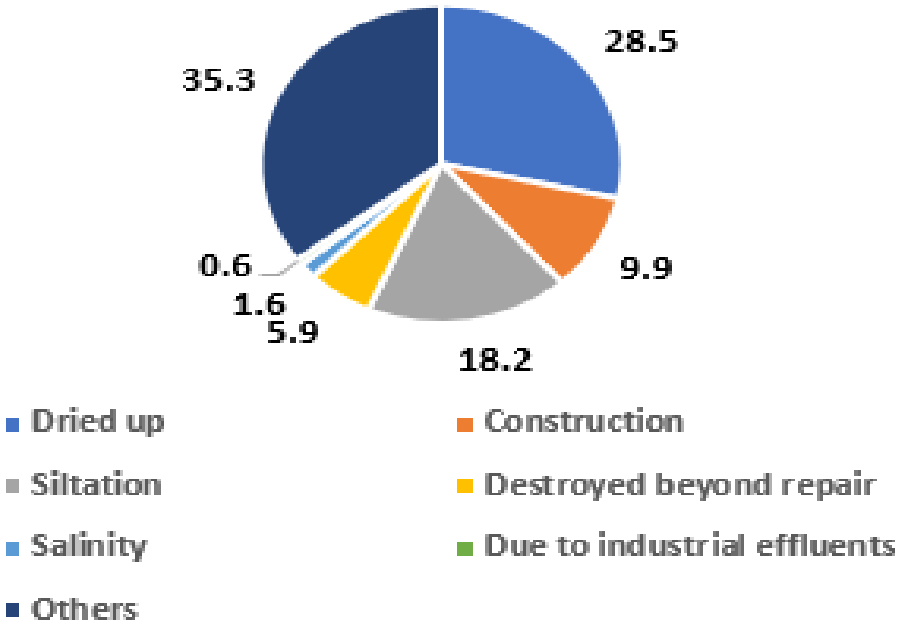
GANJAM	193
PURI	51
SAMBALPUR	44
SUNDARGARH	41
MAYURBHANJ	36

MAYURBHANJ	424
DEOGARH	142
BARGARH	129
GANJAM	127
KEONJHAR	117

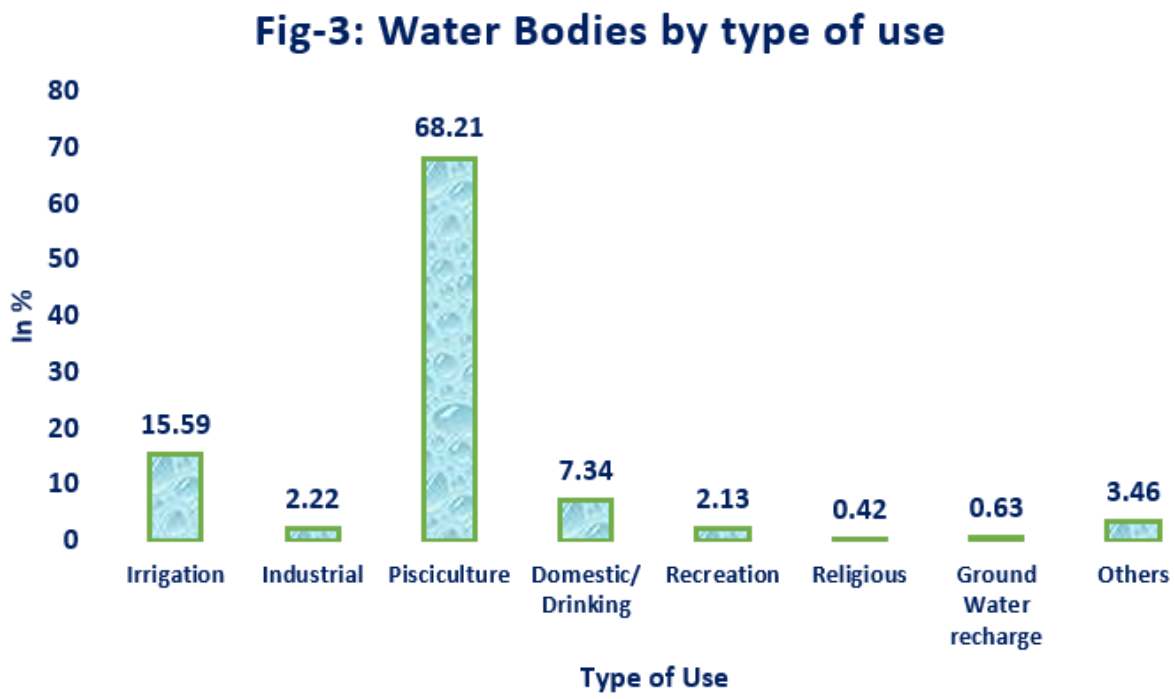
ANUGUL	950
BALANGIR	808
BALASORE	454
BARGARH	347
BHADRAK	306

Out of all the water bodies enumerated, 1,78,054 (97.92%) are in rural areas and only 3,783 (2.08%) are in urban areas in Odisha. Among these water bodies, 89.20% (1,62,207) are 'in use' whereas the remaining 10.80% (19,630) are not in use/non-functional on account of drying up, construction work, siltation, destroyed beyond repair, salinity, industrial effluents etc.

Fig-2: Reasons for not in use



Out of all 'in use' water bodies, major water bodies are reported to be used in Pisciculture followed by Irrigation and Ground water recharge.



In Odisha, 50.9% (92,575) water bodies are owned by private entities whereas 49.1% (89,262) are under public ownership. Among all water bodies, 31.29% are located in Tribal areas, 13.47% in Flood prone areas,12.50 % under Drought Prone Area Programme (DPAP), 0.83% in Naxal affected areas, 0.64% under Desert Development Programme (DDP)and remaining 41.26% water bodies are located in other areas of the State.

96% are man-made water bodies whereas 4% are natural water bodies. Majority of man-made Water Bodies are earthen in nature and have original cost of construction upto Rs. 1,00,000.

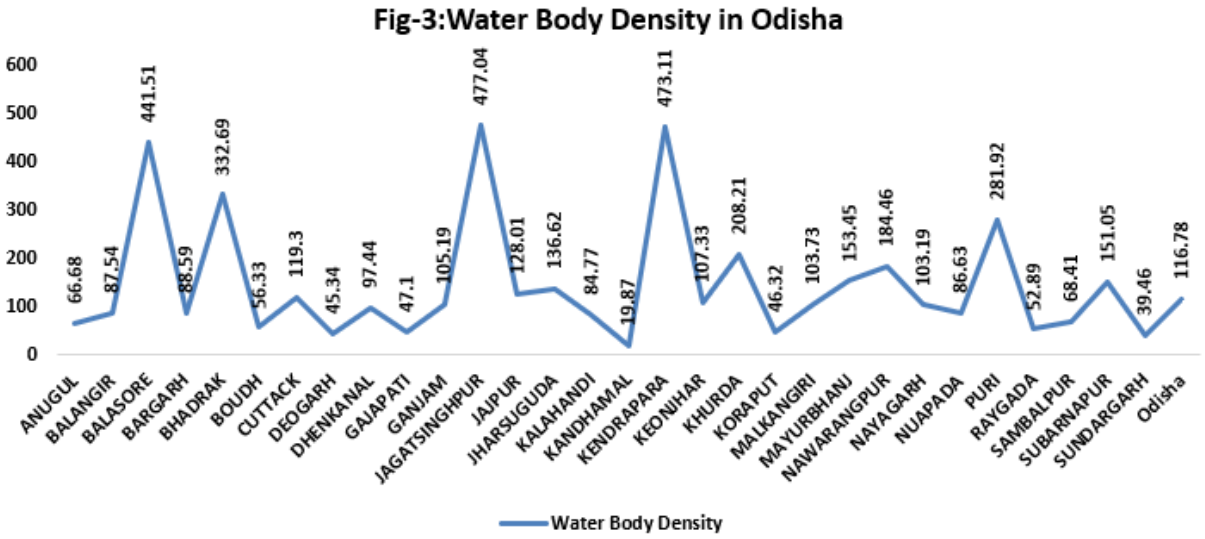
80.72% of the 'in use' Water Bodies are benefitting a single Village and 69.75% Water Bodies are directly benefiting people . Among all, 77.6% Water Bodies are having water spread area less than 0.5 hectare. It is observed that 51.5% of the water bodies have storage capacity between 1,000 to 10,000 cubic metres.

Among all 1,81,837 Water Bodies of Odisha, 0.57% (1,048) water bodies are reported to be encroached. Majority of encroached water bodies are ponds followed by tanks. Out of all those water bodies whose encroachment areas can be assessed (i.e. 198 water bodies), 58.59% water bodies are found to have less than 25% encroached area.

Water User Associations (WUA) have helped to a large extent in preventing encroachments as they are vigilant and alert so that the benefits from the Water Body wouldn't get affected by illegal encroachers. Out of the 94,815 water bodies which are not owned by individual owners, WUA has been formed in case of 2.96% (2,811) water bodies.

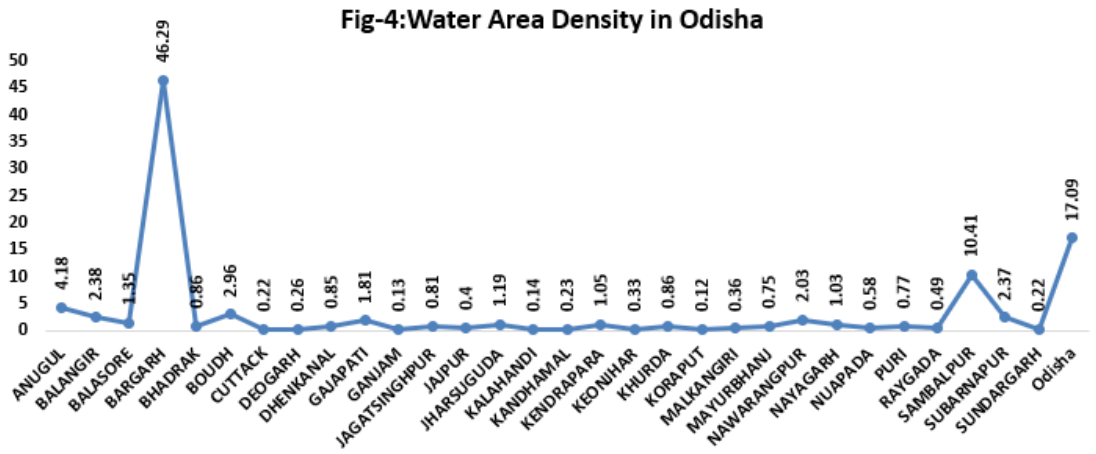
As per Report of NITI Ayog's Comprehensive Water Management Index (CWMI) 2019, Odisha reported the largest decline of 7.27 points have shown improvement in their water management scores over the last three years, but in terms of minimize the IPC-IPU gap, Odisha is among the top performers with utilization rates greater than 85% during FY 2017-18

Water Body units are ubiquitously distributed over the surface of the earth. Water Body Density (WBD) is the number of water bodies existing within 100 sq. km. of the area within the geographical area of a district.



It depicts from the above figure that the Water Body Density in the coastal districts Balasore, Bhadrak, Jagatsinghpur, Kendrapara and Puri are very high and in case of Kandhamal District , it is very Low.

Water area is a vital factor that has an important function in the associated planning process. The changes in water area with variations in seasons mobilize thoughts of supervising resources and farmers, motivating them towards better farm management practices and optimize every opportunity provided by nature. Superior productivity is made possible by efficient and dynamic management of resources brought about by planners, policymakers and decision-makers who can project their views based on such parameters. **Water Area Density (WAD)** within a district has been defined as the ratio of water spread area delineated within the district and geographical area of the district.



It is observed from the above figure that the Water Density of the Bargarh District is highest (46.29) whereas Koraput is Lowest (0.12)

Conclusion:

The state of Odisha is bestowed with plenty of water resources. The coastal territory i.e. 480 km long and 10 – 100 km wide is drained by a number of rivers like Mahanadi, Brahmani, Baitarani, Devi, Budhabalanga, Subarnarekha Rushikulya and some other smaller ones. It receives 231 Billion Cubic Metre (BCM) of rainfall per annum, and the total annual flow through the river basins comes around 96 BCM Odisha. At present, the states like Odisha is gradually progressing towards water scarcity due to increasing population pressure and urbanisation. The availability of water resources is a major issue and a big challenge facing our country. Water is an important aspect of development that is linked with each and every Sustainable Development Goal (SDG).It is essential and fundamental for life itself, and it is a recyclable resource but its availability is limited and the gap between supply and demand is widening over time. Therefore, concerted efforts are needed to conserve and preserve water bodies. Govt. may responsible for laying down policy guidelines and programs for the development, conservation, and management of Water Bodies as a national resource.

Recommendations & suggestions:

i. As regards reasons for not in use out of 19,630 Water Bodies around 30% are dried up due to many reasons. Appropriate steps should be taken by different stakeholders for revival of those Water Bodies for use.

ii. In the Districts like Puri, Kendrapara, Jagatsinghpur, Bhadrak and Balangir have the maximum Water Bodies not in use due to Siltation. A Special attention needed by the Stake holders .

iii. Those Water Bodies not in use due to salinity may be used for pisciculture particularly Prawn cultivation. Out of 19,630 Water Bodies not in used, 122 Water Bodies are not in use due to Industrial Effluence. Central/State Pollution Control Board may take immediate steps to check the Water Pollution in Industrial areas.

iv. 0.58% of Water Bodies were encroached out of 1.82 lakh Water Bodies, maximum number of encroachments have been reported in Ponds & Tanks. Govt should take initiatives to make encroachment free of the water Bodies.

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From Koraput Fields to Startup Dreams : The Shifting Job scape of Odisha

Shri Debabrata Sethi

Odisha, situated on the eastern seaboard of India, is a state rich in natural resources, rich cultural diversity, and a progressively developing economy. The state has made significant strides in infrastructure, education, and public service delivery over the last decade. Yet, despite these advances, the issue of employment remains a serious concern. An increasing youth population, low industrial absorption, and rural underdevelopment continue to define the employment scenario of Odisha.

In recent years, Odisha's employment trends have shown mixed signals. According to the latest Periodic Labour Force Survey (PLFS) 2023-24, the state's overall unemployment rate declined from 3.9% to 3.1%. While this is a promising indicator, a deeper analysis reveals a more complex picture. Unemployment among educated youth, especially in urban areas, remains persistently high, reflecting the mismatch between formal education and the requirements of the job market. This incompatibility not only impacts job outcomes but also causes increasing frustration and migration of job seekers.

One of the most critical issues is overreliance on agriculture, which continues to be the major source of livelihood for close to half the population. Even so, Odisha's agriculture is known for low productivity, poor irrigation, and minimal mechanization. As such, most of the labour force continues to remain underemployed or seasonally employed. In district-majority tribal areas such as Koraput, agriculture is largely subsistence-oriented. Yet developments more recently have brought hope. For example, the Kalajeera rice crop of Koraput, which had its own fragrance and traditional cultivation credentials, was awarded a Geographical Indication (GI) tag in the early months of 2024. This not only boosts the market value of the commodity but also promises new opportunities for agro-based livelihood, rural branding, and income generation.

For instance, a fish market with cost of ₹3 crore is currently under construction in Jeypore town, Koraput. The facility, built on one acre of land, will serve approximately 60 vendors and aims to centralize the region's fish trade, which caters to an annual demand of nearly 17 metric tonnes. This project not only enhances hygiene and infrastructure but is expected to generate formal employment in logistics, maintenance, and operations.

The district has also witnessed substantial growth in agricultural marketing. During the 2023–24 Kharif season, 111 paddy procurement mandis were made operational in Koraput, targeting procurement of approximately 2.13 lakh metric tonnes of paddy. For the Rabi 2024 season, an additional 56,644 MT is planned through 58 mandis, with over 1.70 lakh farmers already registered. These numbers reflect a more structured and assured market system for farmers, supporting income stability and seasonal employment in procurement, transportation, and warehousing.

To diversify employment and address structural gaps, the Odisha government has launched several proactive initiatives. The Odisha Skill

Development Authority (OSDA) has been instrumental in aligning the skills of youth with market demands through programs that partner with industries and training institutions. These initiatives aim to reduce the skill gap, a major factor behind rising educated unemployment.

One of the most important welfare and empowerment initiatives introduced in 2024 is the Subhadra Yojana. Designed to enhance household financial security, this scheme provides direct cash support of ₹50,000 to more than one crore women of the state. Though not a direct employment initiative, it is anticipated to indirectly encourage livelihood generation by allowing women to invest in self-employment ventures, local trade, and micro-businesses. This money support may be a game-changing factor in empowering women's presence in the economy, especially rural economies where money dependence is the major hindrance.

Koraput's coffee sector has emerged as a strong employment generator, particularly for tribal communities. Over 3,500 hectares of land are currently under coffee cultivation, employing more than 4,300 tribal farmers. Around 778 hectares are managed as private plantations. Recognized by NITI Aayog under the "Vocal for Local" initiative, Koraput Coffee is being positioned as a premium agro-brand. The state plans to expand this to another 800 hectares by 2025–26, further boosting rural employment and income generation.

The district also benefits from the Upper Kolab Dam, a legacy project that provides 320 MW of hydroelectric power and irrigation potential across approximately 100 square kilometres. While not a new investment, it remains a critical infrastructure asset that supports agricultural livelihoods, improves cropping intensity, and provides indirect employment through water-based services and small enterprises.

Koraput district stands out as a successful example of how effective implementation of government schemes can drive grassroots employment and development. The efficient execution of MGNREGA has created durable rural assets and provided vital income support to tribal families, earning the district recognition from the Ministry of Rural Development in 2024. In 2025, Koraput received the Prime Minister's Award for Excellence in Public Administration for its holistic approach to development, particularly in implementing schemes like PM Awas Yojana, Har Ghar Jal, Mission Indradhanush, and PM Ujjwala Yojana. While these are not direct employment schemes, these initiatives have generated thousands of local jobs, strengthened the rural economy and reduced migration.

In addition, job fairs and skill training conducted in Koraput in association with the District Employment Exchange have assisted youth in the local area in gaining employment in areas like construction, hospitality, and agro-processing. Organizations like the Central University of Odisha in Sunabeda are also making a positive contribution to human capital development within the district through the provision of higher education, but the divide between education and employability has yet to be overcome.

At the macro level, Odisha is pursuing robust industrialization. Since June 2024, the state has approved investment proposals worth over ₹6.92 lakh crore, cutting across steel, aluminium, renewable energy, chemicals, and food processing. These 125 projects, cleared through state level and high-level clearance authorities are projected to generate 3.18 lakh jobs. Koraput has also begun to attract

industrial interest in agro-processing and logistics sectors, which are expected to generate significant local employment opportunities. On the logistics front, a truck terminal is being developed near Jeypore to enhance freight handling and transport efficiency along NH-26. This project, covering around 5 acres, is expected to generate jobs in loading, warehousing, and fleet services, further integrating Koraput into the regional industrial corridor linked to the expressway. These developments indicate a gradual shift toward inclusive industrial growth, even in traditionally underdeveloped regions.

Promotion of startups and entrepreneurship remains a key strategy in Odisha's inclusive growth agenda. In Koraput, this momentum is now visible on the ground: Dreams Agro International, a Jeypore-based agri-tech startup founded in 2021, is already delivering power weeders, combine harvesters, brush cutters, rice-mill machinery, and more targeted to support local self-help groups. Additionally, an ICRISAT-supported initiative in Semiliguda is setting up community-based finger-millet processing units, under Odisha Livelihoods Mission, to enable tribal women and youth to convert raw millet into value-added food products. These initiatives backed by seed funding, e-commerce access, and capacity-building are shifting Koraput's job narrative from dependency on wage labour to grassroots entrepreneurship and livelihoods-led innovation.

However, the state still grapples with a number of systemic issues. Informality pervades the labour market, with over 85% of employees working informally, often without social security, employment security, and adequate working conditions. Women, despite gradually joining the labour force, are still underrepresented in formal employment, particularly in industry and service sectors. Social norms, absence of transport, and financial dependence still limit their full integration into the economy.

In addition, regional imbalances are still a concern. Coastal districts such as Cuttack, Bhubaneswar, and Ganjam have comparatively more employment opportunities with urbanization and industrialization, whereas interior districts such as Malkangiri, Nabarangpur, and parts of Koraput are plagued by poverty, absence of infrastructure, and fewer job opportunities.

In order to provide for inclusive and sustainable employment expansion, Odisha must pursue a multipronged strategy. This consists of increasing rural industrialization, upgrading vocational training centres, developing women-led business, and embracing modern technology in traditional industries. Linkages between industry and education, increasing digital literacy, and providing last-mile connectivity in tribal tracts will also be very important.

To sum up, Odisha's employment scenario is changing. Through interventions like Subhadra Yojana, skill development programs, and ground-level programs in districts like Koraput, the state is slowly developing the ground for inclusive economic growth. To bring in employment security and prosperity in the long term, though, attention will have to stay on skill gap bridging, formal sectorization of informal workers, and establishing a solid ecosystem to drive entrepreneurship, innovation, and equitable growth. The journey is tough, but with steady policy attention and people's engagement, Odisha can convert its demographic dividend into a development opportunity.

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Mortality and Fertility in Odisha: An Analysis of National Family Health Survey Data

Dr. Bigyanananda Mohanty
Sri Saroj Mohan Panda

Abstract:

This paper presents an analytical review of fertility and mortality trends in Odisha based on National Family Health Survey (NFHS) data from 1992–93 (NFHS-1) to 2019–21 (NFHS-5), with a focus on social group disparities. Odisha, with a large Scheduled Caste (SC) and Scheduled Tribe (ST) population, has achieved replacement-level fertility (TFR of 1.82) and substantial reductions in neonatal, infant, child, and under-five mortality rates. While SCs in Odisha show better health indicators compared to national averages, STs continue to face higher mortality risks. Teenage pregnancies and short birth intervals are also areas of concern. The study highlights Odisha's gradual progress in maternal and child health and underlines the need for inclusive and focused health interventions, particularly in underdeveloped tribal regions. The NFHS data for Odisha from 1992–93 to 2019–21 shows a steady improvement in fertility and mortality indicators. The Total Fertility Rate (TFR) has declined significantly, reaching the replacement level of 1.82, which indicates positive demographic transition. Infant, child, and under-five mortality rates have also shown considerable reduction across all social groups. However, disparities remain, especially among Scheduled Tribes, who consistently exhibit higher mortality and fertility rates compared to Scheduled Castes and other groups. Issues such as teenage pregnancy and short birth intervals persist, indicating gaps in reproductive health education and services. While Odisha's progress is commendable, focused efforts are needed to bridge the social and regional gaps in healthcare access and outcomes

Key words: *Fertility, Mortality, National Family Health Survey (NFHS), Scheduled Castes (SC), Scheduled Tribes (ST), Total Fertility Rate (TFR), Infant Mortality Rate (IMR), Child Mortality, Under-Five Mortality, Teenage Pregnancy, Birth Interval, Health Disparities, Tribal Health, Replacement-Level Fertility, Maternal and Child Healt*h.

Introduction;

Odisha, known for its rich cultural and ethnic diversity, is home to a significant population of Scheduled Castes (SC) and Scheduled Tribes (ST), who together constitute nearly 40% of the state's population (Census 2011). These communities have historically faced socio-economic marginalization, with limited access to education, healthcare, and economic opportunities. Geographic isolation, persistent poverty, illiteracy, and frequent natural disasters—such as floods, cyclones, and erratic monsoons—have further compounded their vulnerabilities, especially in tribal-dominated regions of southern and northern Odisha.

Despite being one of India's economically weaker states, Odisha has made notable progress in health sector reforms over the past two decades, particularly in maternal and child health. However, disparities persist across social and regional lines. While the coastal regions have seen greater development, the tribal regions continue to lag behind due to inadequate infrastructure and health services.

The United Nations Sustainable Development Goal (SDG) 3 aims to ensure healthy lives and promote well-being for all at all ages. It specifically targets a reduction in under-five mortality to at least 25 per 1,000 live births and maternal mortality to less than 70 per 100,000 live births by 2030, along with universal access to healthcare and essential medicines.

In this context, the **National Family Health Survey (NFHS)** plays a crucial role in providing reliable and periodic data on population health and family welfare in India. NFHS rounds—especially from NFHS-2 (1998–99) to NFHS-5 (2019–21)—have tracked comprehensive health indicators across national, state, and increasingly, district levels. NFHS-4 and NFHS-5 marked significant milestones by providing district-level estimates, with NFHS-5 covering over 30,000 households in Odisha alone.

This study utilises data from NFHS-1 (1992–93) through NFHS-5 (2019–21) to analyse the long-term trends in fertility and child health outcomes among SC, ST, and other social groups in Odisha. This analysis aims to inform targeted and inclusive health planning to bridge existing social and regional gaps in Odisha's health outcomes.

Objective:

- To assess the trends in Total Fertility Rate (TFR) and reproductive health indicators across social groups in Odisha from 1992 to 2021.

- To compare child health outcomes—such as neonatal, infant, child, and under-five mortality—between Odisha and the national average, with a focus on SC and ST communities.

Data & Methodology:

This study utilizes secondary data from the National Family Health Surveys (NFHS), Rounds 1 to 5 (1992–93 to 2019–21), conducted by the Ministry of Health and Family Welfare (MoHFW), Government of India. The analysis examines trends in key reproductive and child health indicators, including Total Fertility Rate (TFR), teenage pregnancy, birth intervals, neonatal mortality, post-neonatal mortality, Infant Mortality Rate (IMR), Child Mortality Rate (CMR), and Under-Five Mortality Rate (U5MR).

The population groups studied are Scheduled Castes (SC), Scheduled Tribes (ST), and Other Social Groups. The geographic focus is Odisha and India.

Methodologically, the study applies trend analysis, inter-group and nation -state comparisons. Data were sourced from NFHS national and state reports, fact sheets, and statistical tables.

Review of Literature

The studies on health outcomes basing on NFHS data have been made by different authors in past years. Numerous studies (Bajpai et al., 2019; Mohanty & Mishra, 2017) emphasise the persistent gap in health outcomes among tribal and non-tribal populations in India. Health disparities are rooted in socio-economic exclusion, poor infrastructure, and limited health-seeking behaviour. NFHS data

have been widely used in assessing regional disparities and the effectiveness of public health interventions (IIPS & ICF, 2021).

Odisha's success in reducing maternal mortality and improving institutional deliveries (Das & Panda, 2016) contrasts with the continuing disadvantage faced by its tribal population. Earlier literature has underscored the importance of tailored health strategies under the Tribal Sub Plan and decentralized public health systems.

Results and Discussion

5.1 Fertility Trends;

Odisha reached replacement-level fertility with a Total Fertility Rate (TFR) of 1.82 by 2019–21, below the national average of 1.99. However, fertility among Scheduled Tribes (ST) remains higher at 2.11 compared to Scheduled Castes (SC) at 1.85 and other groups at 3,29. Although TFR has declined significantly for both SC and ST communities, the decline is slower among STs.

5.2 Teenage Pregnancy

Teenage pregnancy among ST girls in Odisha (9.3%) exceeds the state average, mirroring national trends. Early marriage and limited reproductive health awareness contribute to high teenage fertility in tribal areas.

5.3 Birth Intervals:

Only 3.9% of births among SC/ST groups occur within 18 months of a previous birth, lower than national figures, indicating rising awareness. Yet, nearly 30% of tribal births happen within 36 months, increasing maternal and infant health risks.

5.4 Mortality Indicators

- **Neonatal Mortality:** ST neonatal mortality is 41.6 per 1,000 live births, significantly higher than other groups; SC neonatal mortality in Odisha (25.0) is below the national average (29.2).
- **Post-Neonatal Mortality:** Declines observed across groups, but rates remain highest among STs.
- **Infant Mortality Rate (IMR):** IMR among STs is 55.9, higher than SCs (36.0) and others (27.2); Odisha's IMR exceeds national averages except for SCs.
- **Child Mortality Rate (CMR):** ST child mortality remains high at 10.9 per 1,000 despite reductions.
- **Under-Five Mortality Rate (U5MR):** Though overall U5MR has declined, it remains elevated among STs (66.2) compared to SCs (39.7) and others (28.3). SC outcomes in Odisha outperform national figures, but ST disparities continue.

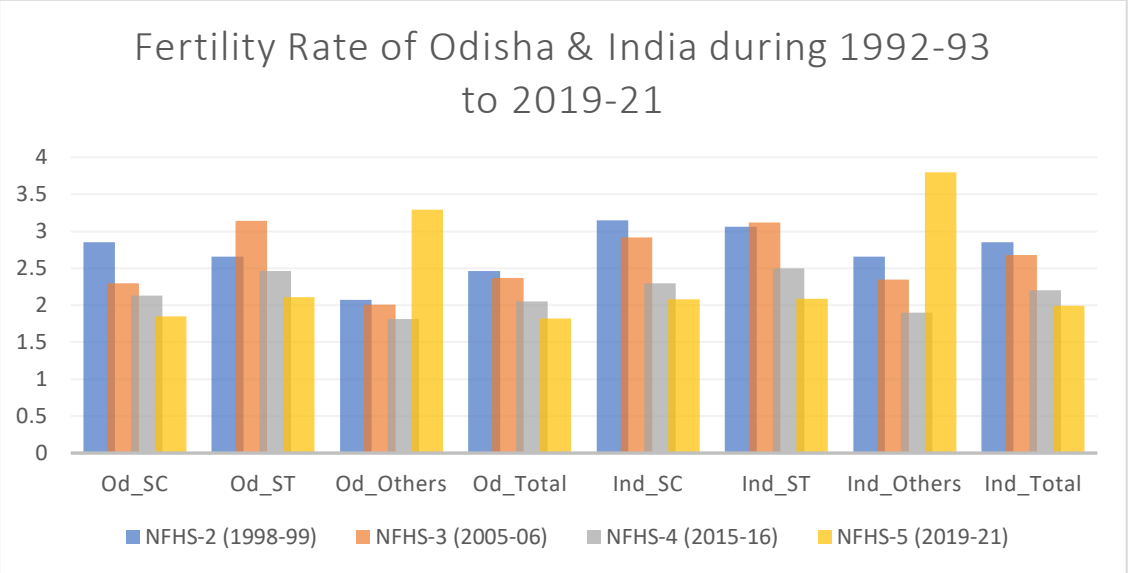
Fertility Level

Table: 1 Total Fertility Rate (TFR) of Odisha and India from 1992-93 to 2019-21

NFHS Round with year	Odisha				India			
	SC	ST	Others	Total	SC	ST	Others	Total
NFHS-1(1992-93)	NA	NA	NA	NA	3.92	3.55	3.30	3.39
NFHS-2 (1998-99)	2.85	2.66	2.07	2.46	3.15	3.06	2.66	2.85
NFHS-3 (2005-06)	2.30	3.14	2.01	2.37	2.92	3.12	2.35	2.68
NFHS-4 (2015-16)	2.13	2.46	1.81	2.05	2.30	2.50	1.90	2.20
NFHS-5 (2019-21)	1.85	2.11	3.29	1.82	2.08	2.09	3.80	1.99

Source: NFHS survey reports ,MH&FW,GoI

Figure-1 Fertility Rate of Odisha & India during 1992-93 to 2019-21



N.B: Od_SC= Odisha Scheduled Castes , Od_ST= Odisha Scheduled Tribes, Od-Others= Odisha Other Social Groups, Od_Total= Odisha Total , In_SC= India Scheduled Castes , In_ST= India Scheduled Tribes, In_Others= India Other Social Groups, In_Total= India Total

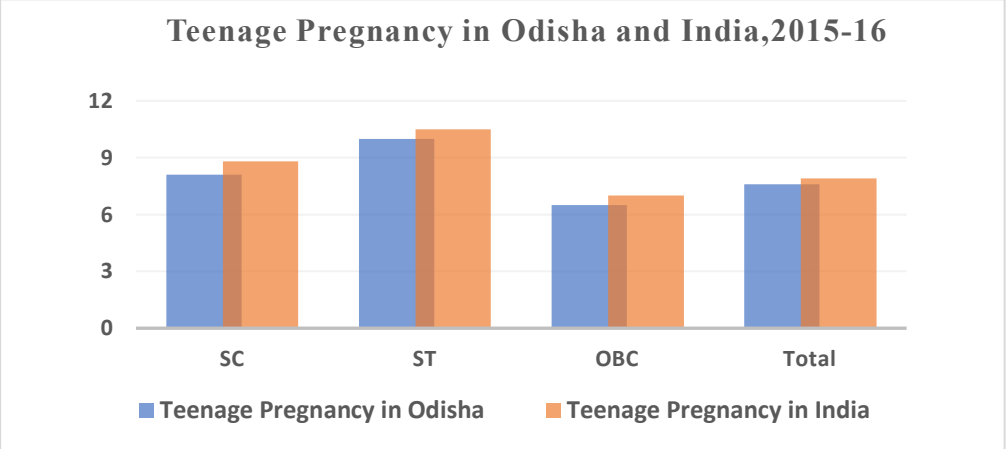
- The TFR for ST in Odisha and India during 2019-21 is 2.11 and 2.09 children per women respectively. In case of SC, it is 1.85 in Odisha and 2.08 in India.
- Fertility has decreased by 0.72 and 0.20 children in case of SC and ST respectively in 17 years between NFHS-2 and NFHS-5 in Odisha. The corresponding figures in India are 1.00 and 0.55 children in case of SC and ST respectively.

- Total Fertility Rate (TFR) in Odisha during 2019-21 is 1.82 children per woman, implying that the State has reached replacement level fertility.
- TFR for SC, ST and OBC in Odisha is 1.85,2.11 and 1.70 children per woman respectively during 2019-21. During this year the TFR of India is

Teenage Pregnancy

- Among young women age 15-19 in Odisha as well as India during 2015-16,7.6 % and 7.9% have already begin child bearing respectively i.e. they had already had a live birth or are pregnant with their first child
- In case of SC, ST and OBC in Odisha during 2015-16, this percentage is 8.1%, 10% and 6.5% respectively. Similarly in India these figures are 8.8%, 10.5% and 7.0% respectively.

Figure-2 Teenage Pregnancy in Odisha and India , 2015-16



Birth Intervals

- During 2019-21, 3.9% of births take place within 18 months of the last birth, 9.2% occur within 24 months and 25.7% occur within three years of the previous birth in case of SC communities in Odisha. In case of India, these figures are 11.8%, 28.7% and 61.3% respectively.
- In case of ST communities, 3.9% of births take place within 18 months of the last birth, 9.7% occur within 24 months and 29.8% occur within three years of the previous births in Odisha during 2015-16. Similarly in India, these figures are 10.3%, 25.8% and 59.7% respectively.
- Similarly during 2019-21, in case of OBC these figures are 3.4%, 6.2% and 19.7% of births take place in Odisha and 11.4%, 28.3%, and 60.5% in India within 18 months, 24 months and 36 months respectively.
- About 43.4%,36.8% and 51.0% of births to all women during the three years preceding the survey by birth order three in case of SC, ST and OBC respectively in Odisha during 2015-16. Similarly, these figures for India are 69.2%, 66.7% and 71.3% respectively.
- Research shows that waiting at least three years between children reduces the risk of infant mortality.

Mortality Level

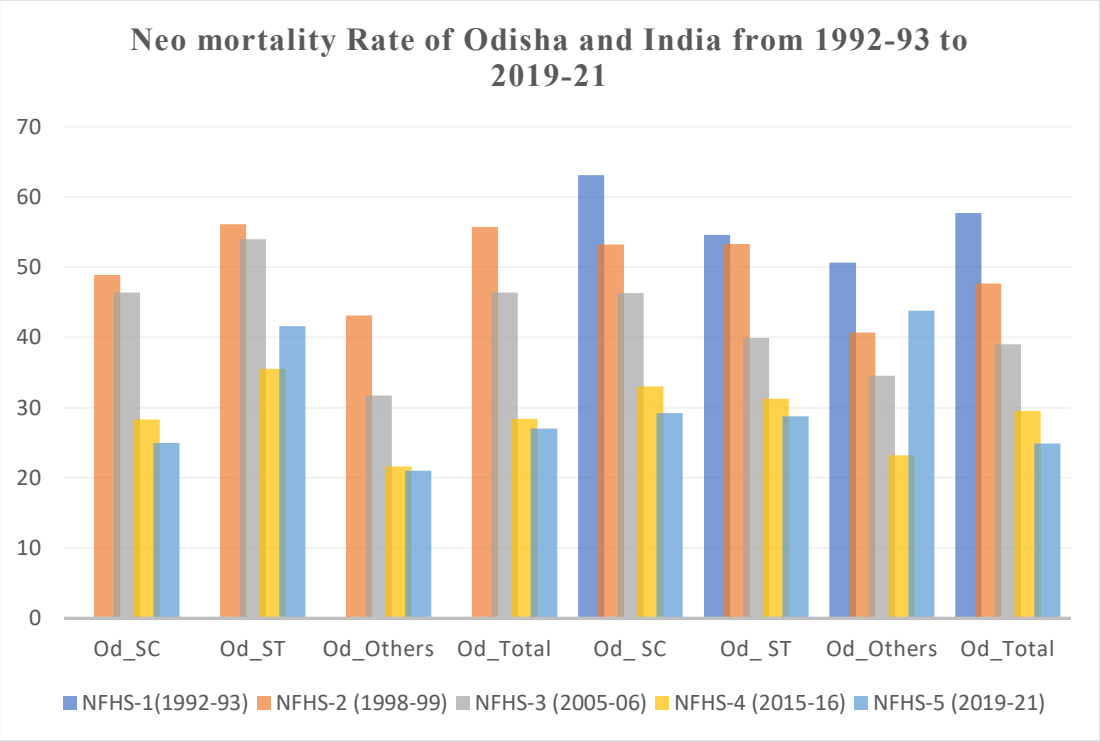
Neonatal Mortality

Table-2: Mortality Rate of Odisha and India in social group from 1992-93 to 2019-21

NFHS Round with year	Odisha				India			
	SC	ST	Others	Total	SC	ST	Others	Total
NFHS-1(1992-93)	NA	NA	NA	NA	63.1	54.6	50.6	57.7
NFHS-2 (1998-99)	48.9	56.1	43.1	55.7	53.2	53.3	40.7	47.7
NFHS-3 (2005-06)	46.4	54.0	31.7	46.4	46.3	39.9	34.5	39.0
NFHS-4 (2015-16)	28.3	35.5	21.6	28.4	33.0	31.3	23.2	29.5
NFHS-5 (2019-21)	25.0	41.6	21.0	27.0	29.2	28.8	43.8	24.9

Source: NFHS survey reports , MH&FW, GoI

Figure-3: **Neo Mortality Rate of Odisha and India from 1992-93 to 2019-21**



N.B: Od_SC= Odisha Scheduled Castes , Od_ST= Odisha Scheduled Tribes, Od-Others= Odisha Other Social Groups, Od_Total= Odisha Total , In_SC= India Scheduled Castes , In_ST= India Scheduled Tribes, In_Others= India Other Social Groups, In_Total= India Total

- Neo-natal mortality for ST in Odisha and India has decreased by 14.5 and 24.5 points from 1998-99 to 2019-21 respectively. For SC communities, these figures are 23.9 and 24.0 points for Odisha and India respectively.

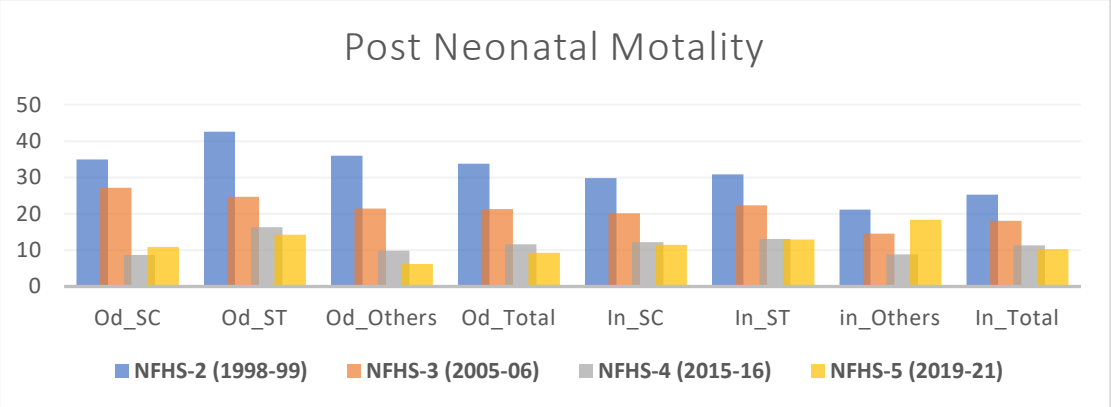
Post Neo natal Mortality

Table: 3: Neo natal Mortality Rate of Odisha and India from 1992-93 to 2019-21

NFHS Round with year	Odisha				India			
	SC	ST	Others	Total	SC	ST	Others	Total
NFHS-1(1992-93)	NA	NA	NA	NA	44.2	35.9	31.6	33.7
NFHS-2 (1998-99)	35.0	42.6	36.0	33.8	29.8	30.9	21.1	25.3
NFHS-3 (2005-06)	27.2	24.7	21.4	21.3	20.1	22.3	14.5	18.0
NFHS-4 (2015-16)	8.7	16.3	9.8	11.6	12.2	13.1	8.9	11.3
NFHS-5 (2019-21)	10.9	14.3	6.2	9.3	11.4	12.9	18.4	10.3

Source: NFHS survey reports ,MH&FW,GoI

Figure-4 : Post neonatal Mortality Rate of Odisha and India from 1998-99 to 2019-21



N.B: Od_SC= Odisha Scheduled Castes , Od_ST= Odisha Scheduled Tribes, Od-Others= Odisha Other Social Groups, Od_Total= Odisha Total , In_SC= India Scheduled Castes , In_ST= India Scheduled Tribes, In_Others= India Other Social Groups, In_Total= India Total

- In case of Post-Neonatal Mortality, there is a sharp decline of around 24 and 28 points for SC and ST communities in Odisha and India respectively.

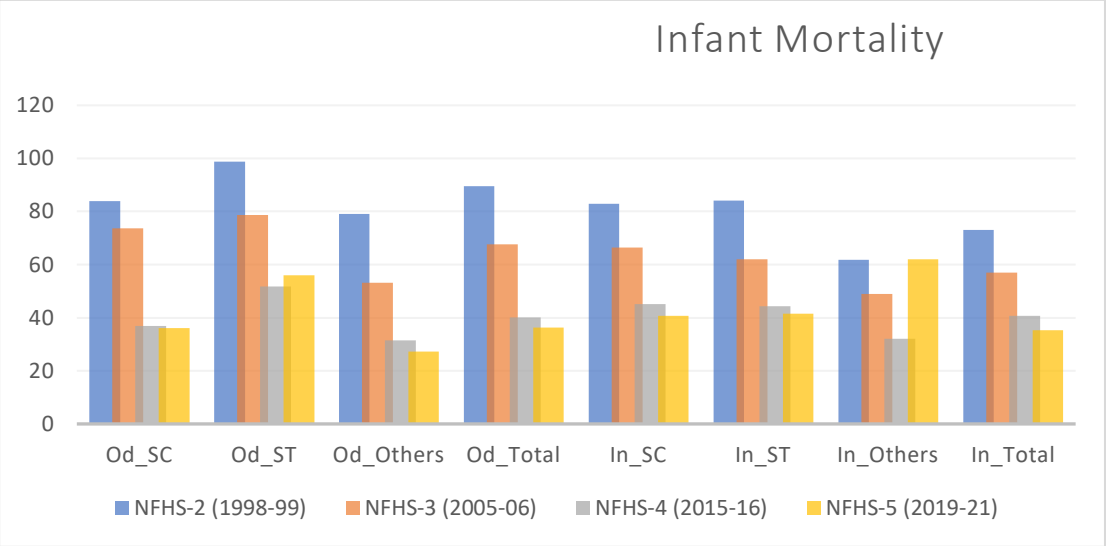
Infant Mortality Rate (IMR)

Table: 4 Infant Mortality Rate (IMR) of Odisha and India from 1992- 93 to 2019-21

NFHS Round with year	Odisha				India			
	SC	ST	Others	Total	SC	ST	Others	Total
NFHS-1(1992-93)	NA	NA	NA	NA	107.3	90.5	82.2	86.3
NFHS-2 (1998-99)	83.9	98.7	79.1	89.5	83.0	84.2	61.8	73.0
NFHS-3 (2005-06)	73.7	78.7	53.1	67.7	66.4	62.1	48.9	57.0
NFHS-4 (2015-16)	37.0	51.8	31.5	40.1	45.2	44.4	32.1	40.7
NFHS-5 (2019-21)	36.0	55.9	27.2	36.3	40.7	41.6	62.1	35.2

Source: NFHS survey reports ,MH&FW,GoI

Figure-5: Infant Mortality Rate of Odisha and India from 1998-99 to 2019-21



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- Infant Mortality Rates (IMR) are higher for STs than for other social groups in all NFHS rounds.
- IMR of Odisha is higher than national average in case of all social groups.
- IMRs for SC and ST social groups in Odisha in NFHS-4 are estimated at 37 and 52 deaths respectively before the age of one year per 1000 live births.
- In case of SC, IMR of Odisha is better than all India level. But in case of ST, this figure is 8 points higher than that of all India level.
- But it is noticed that there is a sharp decline in IMR in all social groups over the period from 1998-99 to 2015-16 in Odisha as well as India.

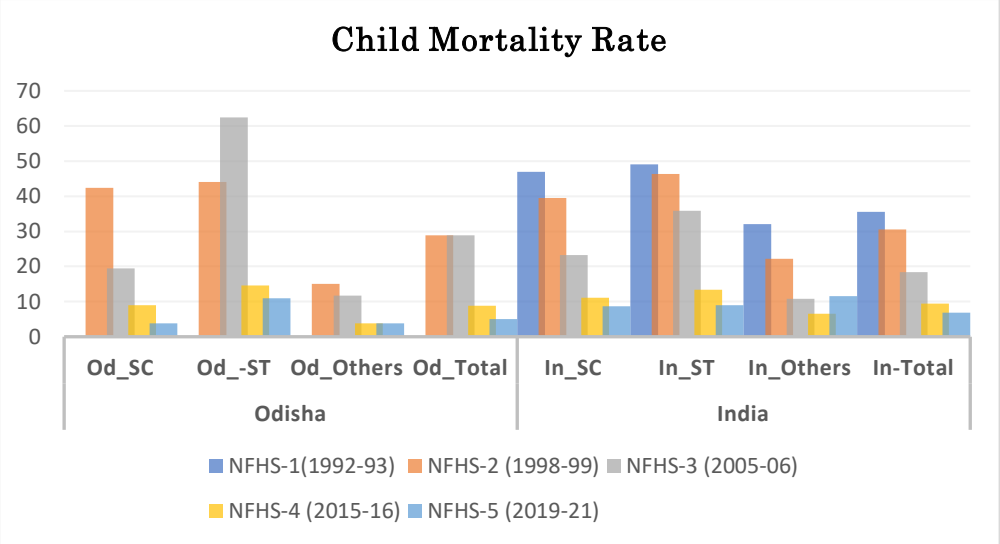
Child Mortality

Table: 5 : Child Mortality Rate of Odisha and India from 1992-93 to 2019-21

NFHS Round with year	Odisha				India			
	SC	ST	Others	Total	SC	ST	Others	Total
NFHS-1(1992-93)	NA	NA	NA	NA	46.9	49.1	32.0	35.5
NFHS-2 (1998-99)	42.4	44.0	15.0	28.8	39.5	46.3	22.2	30.6
NFHS-3 (2005-06)	19.5	62.5	11.7	28.9	23.2	35.8	10.8	18.4
NFHS-4 (2015-16)	9.0	14.6	3.8	8.9	11.1	13.4	6.6	9.4
NFHS-5 (2019-21)	3.8	10.9	3.8	5.0	8.6	9.0	11.5	6.9

Source: NFHS survey reports ,MH&FW,GoI

Figure-6: Child Mortality Rate of Odisha and India from 1998-99 to 2019-21



N.B: Od_SC= Odisha Scheduled Castes , Od_ST= Odisha Scheduled Tribes, Od-Others= Odisha Other Social Groups, Od_Total= Odisha Total , In_SC= India Scheduled Castes , In_ST= India Scheduled Tribes, In_Others= India Other Social Groups, In_Total= India Total

- Child Mortality Rates for SC and ST in Odisha are 9 per 1000 live births and 15 per 1000 live births respectively during 2015-16.
- In case of SC CMR, Odisha's figure is better than all India level in all NFHS rounds. But ST CMR of Odisha is slightly higher than national level.
- It is noticed that CMR in all social groups are declined sharply in Odisha and all India over the period from 1998-99 to 2015-16.

Under Five Mortality

Table: 6: Under Five Mortality Rate of Odisha and India from 1992-93 to 2019-21

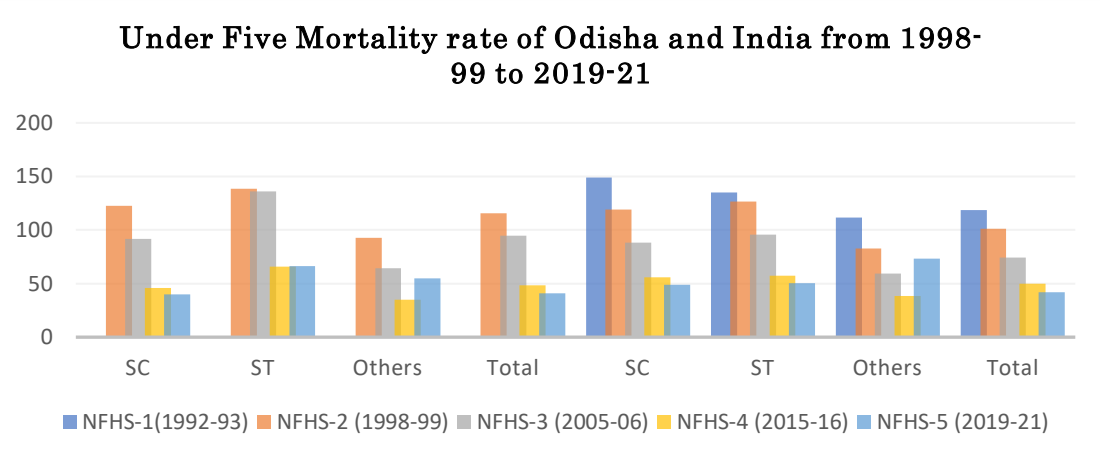
NFHS Round with year	Odisha				India			
	SC	ST	Others	Total	SC	ST	Others	Total
NFHS-1 (1992-93)	NA	NA	NA	NA	149.1	135.2	111.5	118.8
NFHS-2 (1998-99)	122.7	138.4	92.9	115.7	119.3	126.6	82.6	101.4
NFHS-3 (2005-06)	91.8	136.3	64.2	94.7	88.1	95.7	59.2	74.3
NFHS-4 (2015-16)	45.7	65.6	35.2	48.6	55.9	57.2	38.5	49.7
NFHS-5 (2019-21)	39.7	66.2	54.9	41.1	48.9	50.3	73.3	41.9

Source: NFHS survey reports ,MH&FW,GoI

N.B: Od_SC= Odisha Scheduled Castes , Od_ST= Odisha Scheduled Tribes, Od-Others= Odisha Other Social Groups, Od_Total= Odisha Total , In_SC= India Scheduled Castes , In_ST= India Scheduled Tribes, In_Others= India Other Social Groups, In_Total= India Total

- Under 5 Mortality of SC and ST in Odisha during NFHS-4 (2015-16) is 45.7 and 65.6 respectively and for India, this figure is 55.9 and 57.2 for SC and ST respectively during the same period.
- There is a sharp declining in Under-5 Mortality over the period from 1998-99 to 2015-16 for all social groups in Odisha as well as India.
- In case of SC, this figure of Odisha is better than that of India during NFHS-4 (2015-16).

Figure-7 : Under Five Mortality Rate of Odisha and India from 1998-99 to 2019-21



Conclusion & Suggestion :

The analysis of NFHS data indicates that Odisha has made steady progress in improving fertility and child health indicators. The state has achieved replacement-level fertility (TFR 1.82) and witnessed significant reductions in neonatal, infant, child, and under-five mortality rates. Scheduled Caste (SC) communities in Odisha have shown better health outcomes than the national average; however, Scheduled Tribe (ST) communities continue to face disproportionate health challenges. Higher rates of teenage pregnancy, shorter birth intervals, and elevated mortality rates among tribal populations point to persistent disparities rooted in socio-economic and geographic disadvantages in Odisha.

State Government has initiated many socio-economic programmes to improve the health quality of peoples of Odisha. Odisha has initiated several health-related schemes, including the unified health coverage scheme, which integrates Ayushman Bharat and Gopabandhu Jan Arogya Yojana, "NIRAMAYA" scheme provides free essential medicines at government facilities. The State Treatment Fund offers financial assistance for life-threatening illnesses. Further , the Biju Swasthya Kalyan Yojana covers all state government healthcare facilities and provides benefits to vulnerable families in empanelled private hospitals. The scheme MAMATA provides financial assistance to eligible women to encourage them to seek better healthcare and nutrition. Recently, the Odisha state government merged the "Mamata" scheme with the central "Pradhan Mantri Matru Vandana Yojana" (PMMVY) scheme. This merger provides additional financial benefits to women who deliver a girl child.

However, Odisha must strengthen health infrastructure in tribal-dominated districts by ensuring 24x7 delivery services, deploying mobile health units, and upgrading existing facilities. Reducing teenage pregnancies through reproductive health education, awareness campaigns, and strict enforcement against early marriages is critical. Promoting spacing methods and access to family planning services through trained ASHAs can improve maternal and child health outcomes. Nutrition and immunization services must be enhanced by upgrading Anganwadi centres, especially in remote tribal regions. Disaggregated NFHS data should be utilized for targeted, district-specific health interventions. Active involvement of SHGs, PRI members, and community leaders can support behaviour change. Finally, Odisha should consider launching a dedicated Tribal Health Mission under the TSP framework to coordinate inter-departmental efforts for inclusive and equitable health development.

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Strategic Shifting of Periodic Labour Force Survey (PLFS) from 2025: Monthly Estimates, and Rotational Panel Design

Sri Saroj Mohan Panda

Abstract:

In January 2025, the National Statistical Office (NSO), under the Ministry of Statistics and Programme Implementation (MoS&PI), initiated a landmark transformation of the Periodic Labour Force Survey (PLFS). This reform addresses the growing need for high-frequency, geographically granular, and policy-relevant labour data. The new design incorporates monthly estimates, expanded rural quarterly reporting, calendar-year data cycles, enhanced sample size, and a rotational panel system.This article critically examines the strategic shifts and their implications for India's labour market analysis, data accuracy, and policy response mechanisms.

Keywords: *Periodic Labour Force Survey (PLFS), Monthly Estimates, Quartey Estimates, Unemployment Rate (UR) , Sampling Design, NSO, Employment Trends, Rotational Panel sample design, Labour Statistics in India, Dynamic labour market data, LFPR, WPR, Re-visiting , overlap in panel*

Introduction:

1.1 The Periodic Labour Force Survey (PLFS), initiated in 2017 by the National Statistics Office (NSO), Ministry of Statistics and Programme Implementation (MoS&PI), has become India's primary instrument for collecting reliable statistics on employment, labour force participation, and unemployment.

1.2 Since its launch in 2017, the PLFS has served as India's principal instrument for gauging employment and unemployment metrics. Initially designed to provide quarterly data for urban areas and annual estimates for both rural and urban regions, the system faced challenges in offering real-time and localized insights.The COVID-19 pandemic further amplified the need for dynamic labour market data to enable timely policy interventions.

1.3 In response, NSO introduced a comprehensive overhaul of the PLFS methodology starting January 2025. This initiative aims to enhance data granularity, frequency, international comparability, and representativeness at sub-national levels.

These data support planning, policy formulation, and academic research at various levels.

1.4 The PLFS was initially designed with two core objectives:

- ❖ To estimate key employment and unemployment indicators (Worker Population Ratio, Labour Force Participation Rate, Unemployment Rate) in urban areas ,quarterly, using the Current Weekly Status (CWS).

- ❖ To estimate these indicators annually in both rural and urban areas using both the Usual Status (ps+ss) and CWS approaches.

1.5 Until 2024, PLFS generated , 25 Quarterly Bulletins which have been released covering urban areas from December 2018 to December 2024, presenting estimates on CWS-based labour market indicators. In parallel, seven Annual Reports have been published covering July 2017 to June 2024, providing comprehensive estimates for both rural and urban areas. Further , unit-level data for calendar years 2022, 2023, and 2024 have been released separately.

2. Key Enhancements in PLFS (2025 Onwards):

2.1 **Monthly Labour Market Estimates :** From April 2025, the PLFS began releasing monthly estimates for key labour force indicators – Labour Force Participation Rate (LFPR), Worker Population Ratio (WPR), and Unemployment Rate (UR) – for both rural and urban India using the Current Weekly Status (CWS) approach. This offers more timely insights into labour market fluctuations.

2.2 **Quarterly Results Extended to Rural India:** Quarterly labour statistics, previously limited to urban populations, have been extended to rural areas. The first integrated Rural-Urban Quarterly Bulletin (April–June 2025) will be published in August 2025.

2.3 **Calendar-Year Reporting** : The annual cycle of PLFS has shifted from July–June to January–December. This aligns India's reporting with international statistical practices and enhances cross-country comparability

3. Changes in PLFS from January 2025:

3.1 Recognizing the need for high-frequency, disaggregated labour force data, the PLFS has been restructured from January 2025 with the following major revisions:

3.2 (i) Objectives of Revamped PLFS:

- ❖ To produce monthly estimates of key labour indicators (LFPR, WPR, UR) for both rural and urban India based on CWS.
- ❖ To include rural areas in the scope of Quarterly Bulletins.
- ❖ To continue annual estimates using both usual status and CWS across rural and urban regions.

3.3 (ii) Additional Information:

- ❖ New items of data have been added to the First Visit Schedule from January 2025.

4. Sampling Methodology and Rotational Panel Design

4.1 The revamped PLFS adopts a rotational panel sampling method with the following features:

4.2 (i) Panel Duration and Household Visits:

- Each selected household is visited four times over four consecutive months.
- The first visit uses a detailed First Visit Schedule (Schedule 10.4), while the subsequent three revisits use a Revisit Schedule.

4.3 (ii) Monthly and Quarterly Estimates:

- Monthly estimates begin from the fourth month onwards using a composite sample from four overlapping panels.
- Quarterly estimates will start from the third quarter onward.

4.4 (vi) District-Level Representation: Districts have become the fundamental strata for sampling in many states. Rural strata are based on proximity to district HQs or large towns, and urban strata prioritize million-plus cities.

4.5 (iv) Rotational Panel Implementation:

- Every month, one-twelfth of the total annual First Stage Units (FSUs) are selected as a new panel (e.g., P11, P12, ...).
- Panels remain active for four months with one panel introduced monthly.
- Estimates are generated using data from all active panels (75% overlap for monthly, 50% for quarterly).

4.6 (v) Sampling Frame Updates:

- Frames will be updated biennially. In Census years, panels from pre- and post-Census frames will be combined to ensure continuity.

4.7 (vi) Substitution and Splits:

- If households are unavailable during revisits, no substitutions are made. For split households, only the unit with the original head is covered.

5. Expanded Sample Size:

5.1 The revamped survey framework significantly increases sample coverage:

Indicator	Pre-2025	Post-2025
Annual FSUs	12,800	22,692
Households per FSU	8	12
Total Households	1,02,400	2,72,304

5.2 This increase of sample size improves precision and allows for more robust district-level and sub-sectoral estimates.

6. Key Innovations Compared to Pre-2025 PLFS:

- ❖ Prior to 2025, only urban households were revisited quarterly; rural households were visited annually.
- ❖ The new design provides consistent revisit schedules for both sectors.
- ❖ Monthly labour indicators will now be available for rural areas, significantly enhancing the frequency and granularity of rural labour statistics.

Differences from Pre-2025 Design:

Feature	Until 2024	From 2025
Urban sample re-visits	Yes	Yes
Rural sample re-visits	No	Yes
Monthly estimates	No	Yes (rural & urban)
Quarterly estimates	Urban only	Rural + Urban
Panel duration	1 year (urban only)	2 years (rural + urban)
Overlap in panels	N/A	75% monthly, 50% quarterly
Design type	Repeated cross-section	Rotational panel with revisit

7. Rotational Panel Design: An Innovative Approach:

7.1 Conceptual Framework Each sampled household is visited four times over four consecutive months: once with a first-visit schedule and three times with revisit schedules. This rotational structure ensures continuity and overlap in sampling.

7.2 Panel Flow The monthly and quarterly estimates are derived from overlapping sample panels:

- ❖ **Month 1**: Panel P11 (First Visit)
- ❖ **Month 2**: Panel P12 (new First Visit) + revisit P11
- ❖ **Month 3**: Panel P13 + revisits P11, P12
- ❖ **Month 4**: Panel P14 + revisits P11–P13

7.3 Thereafter, Panel P11 is dropped and replaced by P15, and the cycle continues. Monthly estimates are constructed using data from four rotating panels, ensuring a 75% sample overlap between months and 50% between quarters.

8.0 Rotational scheme for PLFS:

8.1 A rotational panel sampling design will be used in the survey. The rotational scheme will be of two years duration to accommodate the changes in the frame in the intercensal period; in the sense that the sampling frames for both rural and urban areas will remain unchanged for every two-year duration. In this rotational panel scheme, each selected household will be visited four times in four consecutive months – one with first visit schedule and other three with the revisit schedule.

8.2 Monthly estimates will be generated for successive months without any break in the series starting from the fourth month, ensuring a 75% matching between two consecutive months.

8.3: In addition, the quarterly estimates will be generated for successive quarters, starting from third quarter, ensuring a 50% matching between two consecutive quarters.

8.4; Model based estimates will not be generated. Instead, usual design based estimates will be generated. The proposed design aims at generating monthly and quarterly estimates of level parameters of key labour force indicators (i.e., LFPR, WPR and UR) based on CWS data only. Annual estimates of level parameters will be generated based on usual status.

9. Rotational panel design:

i. Using Pij to indicate the panel belonging to jth month of the ith year of the two-year period of rotation, the scheme of rotational panel design is described below:

ii. The rotational panel will be fixed for two years, where only one-twelfth of FSUs of annual allocation will be covered in the first month (say, Panel P11) of the first two-year panel with detail listing and canvassing of first visit schedule being undertaken in the selected households.

iii. In the second month, another one-twelfth of FSUs will be covered (say, Panel P12) for canvassing the first visit schedule while the revisit schedule will be canvassed in the selected households of Panel P11.

iv. In the third month, another new panel, say P13 consisting of one-twelfth FSUs will be surveyed with first visit schedule and revisit schedules will be canvassed in the households of the panels P11 & P12.

v. In the fourth month, households of panels P11, P12 & P13 will be surveyed with revisit schedule and those of a new panel, say P14 with one-twelfth of FSUs with first visit schedule.

vi. The monthly estimates at all-India level, separately for both rural and urban sector will be generated using full sample size with panels P11, P12, P13, & P14 from the fourth month and onwards.

vii. In the fifth month, 3 panels – P12, P13 & P14 will be surveyed with revisit schedule and the earlier panel (P11) will be replaced by a new panel (say, P15) for canvassing first visit schedule. This will continue till end of the two-year panel.

viii. In the second quarter of the first two-year panel, the quarterly estimates at state and all-India level, separately for rural and urban sector will be generated using the fourth visit sample of Panel P11, third visit sample of Panel P12, second revisit sample of Panel P13, first revisit sample of Panel P14 and P15; and the first visit sample of Panel P16.

ix. All the FSUs of the panels P11, P12, , P124 (each with one-twelfth of total annual FSUs) will be selected independently before commencement of survey in the first month.

x. At the end of the second year of each two-year panel, updated frame will be used for both rural and urban areas.

xi. FSUs of another set of panels P21, P22, ..., P224 selected from the updated frame will be made ready before commencement of first month of second year of the two-year panel.

xii. In the first month of the second year of the two-year panel, panel P21 selected from the updated frame will be introduced and the panels P122, P123 and P124 of the old frame will be surveyed.

xiii. Since major changes in the rural-urban frame occurs in the Census years, provision is to be made to generate estimates without break in the series of estimates considering panels from pre- and post-census frames.

The schema of the rotation of panel is provided in the Figure- 1.

Figure 1: Panels for the 2-year period: with 3 re-visits of each FSU in three consecutive months

Q1 of Y-1			Q2 of Y-1			Q3 of Y-1			Q4 of Y-1			Q1 of Y-2			Q2 of Y-2			Q3 of Y-2			Q4 of Y-2		
M1	**M2**	**M3**	**M4**	**M5**	**M6**	**M7**	**M8**	**M9**	**M10**	**M11**	**M12**	**M1**	**M2**	**M3**	**M4**	**M5**	**M6**	**M7**	**M8**	**M9**	**M10**	**M11**	**M12**
P_{11}*	P_{11}	P_{11}	P_{11}									P_{21}*	P_{21}	P_{21}	P_{21}								
	P_{12}*	P_{12}	P_{12}	P_{12}									P_{22}*	P_{22}	P_{22}	P_{22}							
		P_{13}*	P_{13}	P_{13}	P_{13}									P_{23}*	P_{23}	P_{23}	P_{23}						
			P_{14}*	P_{14}	P_{14}	P_{14}									P_{24}*	P_{24}	P_{24}	P_{24}					
				P_{15}*	P_{15}	P_{15}	P_{15}									P_{25}*	P_{25}	P_{25}	P_{25}				
					P_{16}*	P_{16}	P_{16}	P_{16}									P_{26}*	P_{26}	P_{26}	P_{26}			
						P_{17}*	P_{17}	P_{17}	P_{17}									P_{27}*	P_{27}	P_{27}	P_{27}		

Figure 1: Panels for the 2-year period: with 3 re-visits of each FSU in three consecutive months																						
Q1 of Y-1			Q2 of Y-1			Q3 of Y-1			Q4 of Y-1			Q1 of Y-2			Q2 of Y-2			Q3 of Y-2			Q4 of Y-2		
M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
							P_{18}*	P_{18}	P_{18}	P_{18}									P_{28}*	P_{28}	P_{28}	P_{28}	
								P_{19}*	P_{19}	P_{19}	P_{19}									P_{29}*	P_{29}	P_{29}	P_{29}
									P_{110}*	P_{110}	P_{110}	P_{110}									P_{210}*	P_{210}	P_{210}
										P_{111}*	P_{111}	P_{111}	P_{111}									P_{211}*	P_{211}
											P_{112}*	P_{112}	P_{112}	P_{112}									P_{212}*

10. Estimation Strategy ;

10.1 Estimates of LFPR, WPR, and UR are calculated using CWS data. Model-based estimates are avoided in favour of conventional design-based estimation to preserve data consistency.

11. Enhanced Survey Instruments:

11.1 Modified Schedules: Survey instruments have been revised to accommodate the panel design. Time references, definitions, and activity status variables have been aligned with international standards, ensuring robust data collection.

11.2 Additional Modules: From January 2025, new modules were added on:

- ❖ Digital employment platforms (gig economy)
- ❖ Migration for employment
- ❖ Access to social protection schemes (e.g., ESIC, PF)
- ❖ Women's time use and unpaid care work (in pilot mode)

11.3 User Advisory: Due to the methodological overhaul, users are cautioned against making direct comparisons between pre- and post-2025 data. Any longitudinal analysis must adjust for structural changes in strata and sample design.

12. Results and Discussion:

The revised PLFS architecture holds promise for:

- ❖ **Timely policy response**: Monthly updates allow for quicker labour market interventions.
- ❖ **District-level planning**: More granular data supports targeted employment schemes.

- **Capturing informality**: Enhanced sample and questions better capture informal sector dynamics.

- **Gender and youth focus**: New indicators facilitate evaluation of women's labour force participation and NEET (Not in Employment, Education, or Training) rates.

- **Global benchmarking**: The calendar-year cycle and CWS emphasis align India's labour metrics with those of OECD and ILO standards.

Conclusion:

The changes implemented in PLFS from January, 2025 mark a major step in enhancing India's labour statistics. By offering monthly, quarterly, and annual estimates for both rural and urban areas with improved sampling methodology and rotational panel design, PLFS strengthens its capacity to inform employment policy and socio-economic planning at national and sub-national levels. The 2025 PLFS reform represents a watershed in India's labour statistics system. Its emphasis on monthly frequency, rural-urban integration, improved coverage, and methodological rigor positions it as a gold standard in developing world labour force surveys. For policy makers, researchers, and administrators, the new PLFS will serve as an invaluable tool for evidence-based employment planning and monitoring of social progress.

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Odisha's Looming Employment Challenge in the Artificial Intelligence (AI) Age: A Strategic Call for New Markets and Leadership

Rashmiranjan Sahu

Understanding the Challenge: The AI Disruption

As artificial intelligence (AI) continues to mature, the world is rapidly transitioning into a phase where machines are not just assisting but actively replacing many roles traditionally performed by humans. Odisha, with its emerging status as a global IT solutions provider, is particularly vulnerable to the wave of automation already underway. A key concern is that AI agents are now capable of designing, developing, testing, and managing complex digital systems with minimal human intervention. Technologies like GPT-4, Claude, and Google Gemini are already being deployed for customer service, legal drafting, coding, and healthcare diagnostics - all without traditional human involvement.

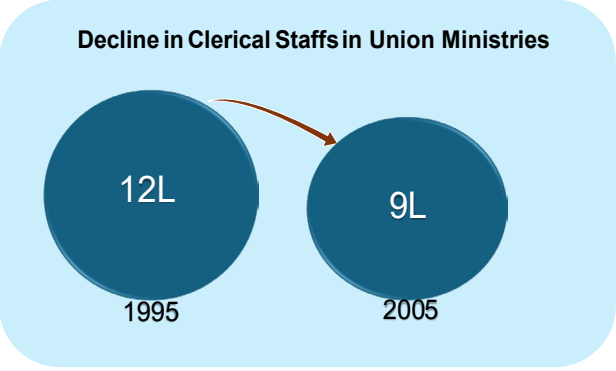
In this context, Odisha's IT ecosystem, heavily reliant on service exports such as backend processing, software testing, and application maintenance, faces a significant threat. While AI is expected to create new jobs, the painful transition from current employment structures to new roles will be intense, especially in states with limited innovation hubs and platform-based economies. If Odisha does not prepare itself for this disruption, it risks widespread unemployment and economic stagnation, particularly among its young and semi-skilled population.

From Clerks to Coders: Lessons from India's First Wave of Tech Disruption

India has already experienced a technological revolution that mirrors the early symptoms of the current AI transition, the shift from manual accounting and data entry to digital enterprise systems in the 1990s and early 2000s. While this transformation disrupted millions of clerical roles, it also seeded an entirely new economy grounded in digital tools, financial analytics, and IT services.

The Disruption: Decline in Clerical Jobs (1990s–2005)

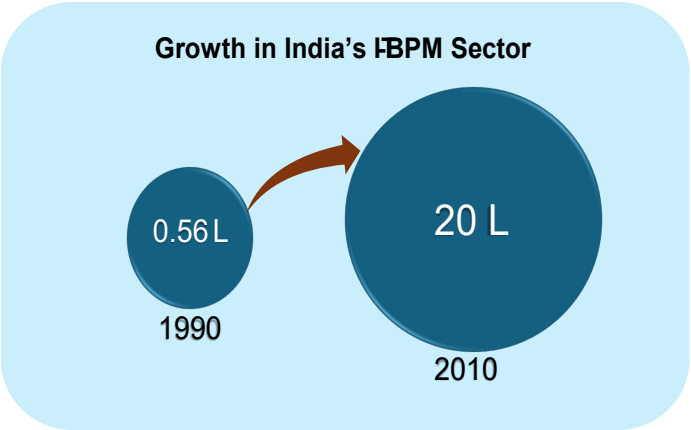
With the adoption of accounting software like Tally, MS Excel, and Oracle Financials, both the public and private sectors began phasing out redundant clerical roles. Government data shows that Group C clerical staff in Central Ministries declined from approximately 12 Lakhs in 1995 to under 9 Lakhs by 2005. This significant drop is attributed to the shift to computer-based accounting and digital records management.



Private enterprises similarly reduced their dependence on manual ledger-entry and administrative work, particularly in finance and HR departments. What had once been the backbone of enterprise operations was rapidly replaced by spreadsheets and enterprise resource planning (ERP) systems.

The Recovery: Growth in IT and Tech-Enabled Services (1990–2010)

According to industry estimates, India's IT-BPM (Business Process Management) sector grew from approximately 0.56 Lakhs employees in 1990 to over 20 Lakhs by 2010. This exponential rise occurred in tandem with the implementation of software tools like Oracle, SAP, and Excel, which drove demand for a new generation of skilled professionals in ERP customization, database management, systems integration, and financial analytics.



Software industry contribution to India's GDP rose from 0.6% in 1990 to 5.8% in 2010. This transformation underscores how technology-driven disruption, when met with proactive skilling and ecosystem development, can yield far greater employment gains in the long run.

A leading consultancy noted that every IT job created led to 2-3 indirect jobs in training, hardware, client support, and local service economies. Training institutions like NIIT and Aptech, and the rise of ERP consulting firms in cities such as Bhubaneswar, are living examples of how innovation replaced disruption with opportunity.

What This Means for Odisha and AI Today

Just as automation tools disrupted low-skilled accounting work but created massive employment in tech services, AI today is set to disrupt back-office roles while opening new demand on various sectors inter alia AI auditors and ethicists, Domain-specific AI developers, Data labeling and fine-tuning professionals, AI-powered governance system operators.

The job losses from Excel and Oracle were real but temporary. In fact, they enabled higher-value employment, stronger GDP contribution, and a globally recognized tech economy. If Odisha prepares strategically, the same can be true in the age of AI. We must see AI not as a job destroyer but as a workforce transformer, just as Excel once was.

Strategic Imperatives for Odisha

Developing Domain-Specific AI Solutions:

Odisha must focus on AI solutions that solve real problems in emerging markets. The Department of Health and Family Welfare could partner with academic institutions and IT firms to develop AI models for detecting tropical diseases. Similarly, AI in agriculture, for weather forecasting, soil analytics, and pest control, can revolutionize productivity for smallholder farmers, who form over 60% of Odisha's agrarian workforce.

Positioning Odisha as a Global Hub for AI Auditing and Governance

With global regulations like the EU AI Act emerging, companies will need to audit AI for bias, safety, and compliance. Odisha can seize this opportunity by training professionals in AI ethics and launching AI audit hubs. These can create tens of thousands of new, high-trust tech jobs.

Building Low-Resource Language Models

Odisha can lead the development of language models for Odia and tribal languages such as Kui, Saora, and Desia, and eventually for African and ASEAN regional dialects. These models would serve millions currently excluded from AI access, opening a new frontier in digital inclusion.

Strengthening AI-Based Public Digital Infrastructure

Odisha can extend India's UPI-Aadhaar model by integrating AI into governance. Real-time dashboards for nutrition, education, and health using AI analytics can inform policies and drive better outcomes. These models align with NITI Aayog's SDG goals and Vision 2047.

Exporting Micro-AI Platforms to the Global South

Odisha can position itself as a leader in exporting decentralized, affordable AI tools for small businesses, cooperatives, and local governments across Asia, Africa, and Latin America. This new market is based on trust, ethics, and affordability, the hallmarks of India's digital diplomacy in the Global South.

The Long-Term Vision: Odisha's Aspirations and Global Role

Odisha has set ambitious economic milestones through its Vision 2036 and Vision 2047 documents, aiming for a $500 billion and $1.5 trillion economy respectively. These goals reflect the state's aspiration to become a national leader in innovation, sustainability, and inclusive development. With its emerging IT ecosystem in cities like Bhubaneswar and its proactive policy environment, Odisha is well-positioned to lead India's efforts in South-South cooperation, particularly in exporting AI-based digital public goods and services to other developing nations. Odisha must not only prepare itself for the AI wave but also embrace its leadership role in ensuring that the benefits of AI reach the last mile - within the state, across India, and throughout the Global South.

Conclusion: Odisha's Opportunity to Lead

Odisha stands at a pivotal moment. The AI disruption is not a distant forecast, it is already happening. But if the State shifts boldly from being a backend service provider to a leader in domain-specific, ethical, and inclusive AI, it can turn this challenge into a generational opportunity. The State's own history with technological transitions, from clerical jobs to IT-enabled services, offers both caution and hope. With strategic investment, policy vision, and institutional agility, Odisha can lead India's next tech wave, this time as a global player in the AI economy.

This is not just an economic necessity - it is a national imperative.

The choice is ours - but the window of opportunity is closing fast.

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