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EDITOR'S NOTE

It is a great honour to me to extend my warm greetings and welcome you all to the journal, **Samajiki Sandarsh,** a refereed journal of multi disciplinary research. The journal, which is a peer-reviewed, will devote to the promotion of multi-disciplinary research and explorations to the South Asian and global community. It is our objective to provide a platform for the publication of new scholarly articles in the rapidly growing field of various disciplines. We are trying to encourage new research scholars and post graduate students by publishing their papers so that they may learn and participate in literary publishing through a professional internship. Scholarly and unpublished research articles, essays and interviews are invited from scholars, faculty researchers, writers, professors from all over the world.

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Hoping all of you shall enjoy our endeavors and those of our contributors.

Editor

CONTENTS

"Samajiki Sandarsh"

Exploring Behavioral Influences on Mental Health and Psychological Resilience

Dr. Md. Fakhra Shayan*

Abstract

Mental health and psychological well-being are influenced by a myriad of factors, among which behavioral determinants play a crucial role. This study aims to explore the behavioral patterns that contribute positively or negatively to mental health outcomes. Through a review of existing literature, surveys, and case studies, we investigate the relationships between behaviors such as physical activity, nutrition, substance use, and social interactions with mental health indicators like anxiety, depression, and overall psychological resilience.

Keywords: Lifestyle Factors, Coping Mechanisms, Self-Efficacy, Resilience, Mindfulness

Introduction

Mental health in psychology refers to a person's emotional, psychological, and social well-being. It influences how individuals think, feel, and act, and it also affects how they handle stress, relate to others, and make decisions. Mental health is fundamental at every stage of life, from childhood and adolescence through adulthood. The World Health Organization (WHO) defines mental health as "a state of well-being in which every individual realizes his or her own potential can cope with the normal stresses of life, can work productively and fruitfully, and is able to contribute to his or her community" (WHO, 2004). This definition underscores the importance of not merely the absence of mental disorders but also the presence of positive mental states and functioning. Psychology recognizes several factors that influence mental health, including biological factors (genetics, brain chemistry), life experiences (trauma or abuse), and family history of mental health problems. According to the American Psychological Association (APA), mental health issues can manifest in various forms, including anxiety disorders, depressive disorders, personality disorders, and schizophrenia, among others (APA, 2020). Moreover, mental health is vital for overall well-being and quality of life. Research indicates a strong link between mental and physical health; individuals with mental health issues often experience higher rates of physical health problems (Berk et al., 2014). There is also increasing recognition of the impact of societal factors, such as socioeconomic status, stigma, and access to care, on mental health outcomes (Braveman et al., 2010). Promoting mental health involves a combination of prevention, intervention, and treatment strategies. Approaches may include psychotherapy, pharmacological treatments, lifestyle changes, and community support. The understanding of mental health continues to evolve, with ongoing research into its complexities and the development of innovative approaches to care. It is vital for functioning and quality of life, necessitating a comprehensive approach to understanding and supporting mental well-being. The World Health Organization (WHO) defines mental health as a state of well-being in which every individual realizes their potential, can cope with the normal stresses of life, can work productively, and can contribute to their community. Mental health is influenced by various factors, including biological, social, and behavioral determinants. Behavioral determinants in psychology refer to the various factors that influence an individual's behavior. These determinants can include a range of influences, from biological and genetic factors to social environment and personal experiences. By understanding these determinants, psychologists can better comprehend how behaviors develop and change over time. One primary category of behavioral determinants is individual characteristics, including personality traits, attitudes, and beliefs. According to Ajzen's Theory of Planned Behavior (1991), an individual's intention to perform a behavior is influenced by

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their attitude toward the behavior, subjective norms, and perceived behavioral control. This theory highlights the cognitive aspects of behavioral determinants, suggesting that personal beliefs and social influences play a crucial role in shaping an individual's actions (Ajzen, 1991). Another significant category is social and environmental influences, such as family, peer pressure, socio-economic status, and cultural background. Bandura's Social Learning Theory (1977) emphasizes that behaviors are learned through observing others, especially role models in one's environment. This highlights the interplay between social context and individual behavior (Bandura, 1977). Additionally, contextual factors, such as availability of resources or exposure to stressors, can influence behavior. The Health Belief Model suggests that individuals are more likely to engage in health-promoting behaviors if they perceive a significant threat to their health and believe that taking specific actions can mitigate that threat (Rosenstock, 1974). In summary, behavioral determinants in psychology are complex and multifaceted, integrating individual, social, and contextual influences. Understanding these determinants is crucial for developing effective interventions and promoting positive behavior change. Behavioral determinants are the actions and lifestyle choices individuals make that affect their mental health outcomes.

Literature Review

Research has consistently demonstrated that behavioral determinants significantly influence mental health, shaping both psychological well-being and resilience. Among the key behaviors studied, physical activity has been widely recognized as a crucial factor in mental health. Engaging in regular physical exercise has been linked to reduced symptoms of anxiety and depression, with studies suggesting that aerobic exercises such as running and cycling release endorphins, which help elevate mood and alleviate stress (Berk et al., 2014). Exercise also enhances self-esteem and cognitive function, further contributing to psychological resilience. Nutrition is another vital behavioral determinant, as a well-balanced diet rich in essential nutrients plays a crucial role in mental well-being. Deficiencies in omega-3 fatty acids, vitamins B and D, and minerals such as zinc and magnesium have been associated with an increased risk of mental health disorders (Braveman et al., 2010). Research suggests that diets emphasizing whole foods, such as the Mediterranean diet, are linked to lower rates of depression and anxiety. Substance use is another significant factor influencing mental health outcomes. Alcohol and drug misuse are strongly correlated with the development and exacerbation of mental health disorders. While some studies suggest that moderate alcohol consumption may have certain psychological benefits, this remains a contentious issue, as excessive use is widely associated with increased depression and anxiety (Rosenstock, 1974). Sleep hygiene also plays a critical role in psychological well-being. Poor sleep patterns are often linked with heightened stress, anxiety, and depression, whereas sufficient sleep enhances emotional resilience and cognitive function. Research indicates that individuals with regular and high-quality sleep experience better overall mental health outcomes (Keyes, 2002). Lastly, social interactions are fundamental to mental health. Strong social support networks and meaningful relationships have been shown to reduce stress, enhance emotional well-being, and improve coping mechanisms in times of distress (Bandura, 1977). Conversely, social isolation and loneliness have been linked to an increased risk of mental health disorders, including depression and anxiety. Studies highlight the importance of social engagement in maintaining psychological resilience and overall well-being. Understanding these factors provides valuable insights into designing effective interventions and strategies to promote psychological resilience and well-being.

Methodology

This study employs a mixed-methods approach, integrating both quantitative and qualitative research methods to provide a comprehensive analysis of behavioral influences on mental health and psychological resilience.

Tools

- Standardized psychological scales: Generalized Anxiety Disorder (GAD-7) scale and Patient Health Questionnaire (PHQ-9) scale.

- Survey questionnaire: assessed key behavioral determinants and mental health outcomes.

Quantitative Approach

The quantitative component consists of structured surveys distributed among a diverse sample of participants. These surveys assess key behavioral determinants, including physical activity levels, dietary habits, sleep quality, substance use, and social connections. Participants reported their behaviors, lifestyle choices, and mental health status using standardized psychological scales such as the Generalized Anxiety Disorder (GAD-7) scale and the Patient Health Questionnaire (PHQ-9) for depression screening.

Quantitative Data

- Sample size: 1,000 participants
- Age range: 18-65 years
- Gender distribution: Male (55%), Female (45%)
- Physical activity levels: Low (20%), Moderate (40%), High (40%)
- Dietary habits: Healthy (30%), Unhealthy (70%)
- Sleep quality: Good (40%), Poor (60%)
- Substance use: No (80%), Yes (20%)
- Social connections: High (50%), Low (50%)

Qualitative Approach

The qualitative component involves in-depth interviews with individuals who have experienced various mental health issues. These interviews explore the personal experiences of participants in relation to their behavioral choices, providing deeper insights into how these factors contribute to their psychological well-being. The qualitative data were analyzed using thematic analysis to identify recurring patterns and relationships between behavior and mental health outcomes.

Qualitative Data

- Number of interviews: 50
- Age range: 18-65 years
- Gender distribution: Male (40%), Female (60%)
- Types of mental health issues: Depression (40%), Anxiety (30%), Others (30%)

Thematic Analysis Results

Recurring themes: Lack of physical activity, poor dietary habits, poor sleep quality, lack of social connections

Patterns: Behavioral determinants associated with mental health issues

Standardized Psychological Scales

- GAD-7 scale: Mean score 10.2 (SD 3.5)
- PHQ-9 scale: Mean score 12.1 (SD 4.2)
- Correlations
- Physical activity and mental health: $r = 0.35$, $p < 0.01$
- Dietary habits and mental health: $r = 0.28$, $p < 0.05$
- Sleep quality and mental health: $r = 0.40$, $p < 0.01$
- Social connections and mental health: $r = 0.45$, $p < 0.01$

Findings

This study employed a mixed-methods approach to analyze the behavioral influences on mental health and psychological resilience, integrating both quantitative and qualitative data. The findings reveal significant correlations between various behavioral determinants and mental health outcomes, as well as insights from personal experiences shared by participants.

Quantitative Findings

1. **Sample Characteristics:**
   - The study included 1,000 participants aged 18-65 years, with a gender distribution of 55% male and 45% female.

- Participants reported varying levels of physical activity, dietary habits, sleep quality, substance use, and social connections.

2. Behavioral Determinants:

- Physical Activity Levels:
- Low (20%), Moderate (40%), High (40%)
- Dietary Habits:
- Healthy (30%), Unhealthy (70%)
- Sleep Quality:
- Good (40%), Poor (60%)
- Substance Use:
- No (80%), Yes (20%)
- Social Connections:
- High (50%), Low (50%)

3. **Mental Health Assessment:**

- Generalized Anxiety Disorder (GAD-7) Scale:
- Mean score: 10.2 (SD: 3.5)
- Patient Health Questionnaire (PHQ-9) Scale:
- Mean score: 12.1 (SD: 4.2)

4. **Correlations:**

- Physical Activity and Mental Health:
- Correlation coefficient (r) = 0.35, $p < 0.01$ (indicating a moderate positive relationship)
- Dietary Habits and Mental Health:
- Correlation coefficient (r) = 0.28, $p < 0.05$ (indicating a moderate positive relationship)
- Sleep Quality and Mental Health:
- Correlation coefficient (r) = 0.40, $p < 0.01$ (indicating a strong positive relationship)
- Social Connections and Mental Health:
- Correlation coefficient (r) = 0.45, $p < 0.01$ (indicating a strong positive relationship)

Qualitative Findings

1. **Sample Characteristics:**

- The qualitative component involved 50 in-depth interviews with participants aged 18-65 years, with a gender distribution of 40% male and 60% female.
- Types of mental health issues reported included:
- Depression (40%)
- Anxiety (30%)
- Other issues (30%)

2. Thematic Analysis Results:

- Recurring Themes:
- Lack of Physical Activity: Many participants reported that a sedentary lifestyle contributed to feelings of lethargy and low mood.
- Poor Dietary Habits: Unhealthy eating patterns were frequently linked to negative emotional states and decreased energy levels.
- Poor Sleep Quality: Participants emphasized that inadequate sleep significantly impacted their mood and overall mental health.
- Lack of Social Connections: Feelings of isolation and loneliness were common, with many participants noting that strong social ties could buffer against mental health issues.

3. **Patterns Identified:**

The qualitative data supported the quantitative findings, highlighting that behavioral determinants such as physical activity, diet, sleep, and social connections are closely associated with mental health outcomes. Participants' narratives illustrated how these factors interplay to influence their psychological well-being.

The findings from this mixed-methods study underscore the significant impact of behavioral determinants on mental health. The quantitative data reveal strong correlations between physical activity, dietary habits, sleep quality, social connections, and mental health outcomes. The qualitative insights provide a deeper understanding of how these behaviors manifest in individuals' lives and contribute to their mental health challenges. Overall, the study emphasizes the importance of promoting healthy behaviors and fostering social connections as integral components of mental health interventions. Addressing these behavioral influences can enhance psychological resilience and improve mental health outcomes for individuals across diverse backgrounds.

The study's findings demonstrated strong correlations between positive behavioral determinants and improved mental health outcomes:

- Participants who engaged in regular physical activity reported significantly lower levels of anxiety and depression.
- Individuals who maintained a balanced and nutritious diet exhibited higher levels of psychological resilience.
- A notable inverse relationship was observed between substance use and mental health.
- Adequate sleep was found to be associated with lower anxiety scores.
- Strong social networks and meaningful interpersonal relationships were linked to higher emotional well-being.

These findings underscore the crucial role of healthy behavioral choices in promoting mental health and resilience.

Results

The results of this study are presented below:

Quantitative Results

- A total of 1,000 participants completed the survey.
- The mean age of the participants was 35.6 years (SD = 10.2).
- The majority of the participants were female (55%).
- The results of the survey showed that:
- Physical activity levels were significantly correlated with mental health outcomes ($r = 0.35$, $p < 0.01$).
- Dietary habits were significantly correlated with mental health outcomes ($r = 0.28$, $p < 0.05$).
- Sleep quality was significantly correlated with mental health outcomes ($r = 0.40$, $p < 0.01$).
- Social connections were significantly correlated with mental health outcomes ($r = 0.45$, $p < 0.01$).

Qualitative Results

- A total of 50 participants completed the in-depth interviews.
- The results of the thematic analysis showed that:
- Lack of physical activity was a recurring theme among participants.
- Poor dietary habits were also a common theme among participants.
- Poor sleep quality was reported by many participants.
- Lack of social connections was a common theme among participants.
- Correlations Between Behavioral Determinants and Mental Health Outcomes
- Physical activity and mental health: $r = 0.35$, $p < 0.01$
- Dietary habits and mental health: $r = 0.28$, $p < 0.05$
- Sleep quality and mental health: $r = 0.40$, $p < 0.01$
- Social connections and mental health: $r = 0.45$, $p < 0.01$

Discussion

The findings emphasize the need to incorporate behavioral health education into mental health interventions. A holistic approach that integrates physical health, nutrition, sleep hygiene, and social interactions can lead to more effective mental health strategies. Encouraging individuals to adopt healthier lifestyle behaviors can serve as a preventative measure against mental illness, reducing the

prevalence of anxiety, depression, and other psychological disorders. Public health initiatives should prioritize awareness programs that highlight the impact of physical activity, balanced nutrition, and sleep quality on mental well-being. Additionally, policies that promote social connectivity and support systems can help individuals build psychological resilience. Future research should explore targeted behavioral interventions to further understand their long-term effects on mental health.

Conclusion

This study highlights the significant impact of behavioral determinants (physical activity, diet, sleep, and social connections) on mental health outcomes. It emphasizes the importance of promoting healthy behaviors and fostering social connections in mental health interventions, and suggests a holistic approach that integrates physical health, nutrition, sleep hygiene, and social interactions. Behavioral determinants play a crucial role in shaping mental health and psychological well-being. The study highlights the significant impact of factors such as physical activity, nutrition, substance use, sleep hygiene, and social interactions on mental health outcomes. Encouraging healthy lifestyle choices can serve as a proactive strategy to enhance psychological resilience and reduce the risk of mental health disorders. Further research is necessary to explore the long-term effectiveness of specific behavioral interventions and their impact on different populations. Understanding the intricate relationships between behavior and mental health will help develop more effective, evidence-based approaches to improving overall well-being.

References:

1. American Psychological Association. (2020). *Understanding mental health*. Retrieved from https://www.apa.org/topics/mental-health
2. Berk, M., Walters, P., & Mullen, P. (2014). *Mental health and physical health: A unifying focus*. *Australian & New Zealand Journal of Psychiatry*, 48(3), 171-179.
3. Braveman, P., Egerter, S., & Williams, D. (2010). *The social determinants of health: Coming of age*. *Annual Review of Public Health*, 31, 381-398.
4. Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211.
5. Bandura, A. (1977). *Social Learning Theory*. Englewood Cliffs, NJ: Prentice-Hall.
6. Rosenstock, I. M. (1974). Historical origins of the Health Belief Model. *Health Education Monographs*, 2(4), 328-335.
7. World Health Organization. (2004). *Promoting mental health: Concepts, emerging evidence, practice*. Retrieved from https://www.who.int/docs/default-source/mental-health-resources/promoting-mental-health.pdf
8. World Health Organization (WHO). (2013). *Mental Health Action Plan 2013-2020*. WHO.
9. Barlow, J. H., & Wright, C. (2001). *Self-management approaches for people with chronic conditions: A literature review*. Health Technology Assessment.
10. Rojas, C., & La Roche, M. (2008). *Cultural health beliefs and lifestyle modification in individuals with type 2 diabetes*. Journal of Transcultural Nursing, 19(3), 214-227.
11. Keyes, C. L. M. (2002). *The mental health continuum: From languishing to flourishing in life*. Journal of Health and Social Behavior, 43(2), 207-222.
12. Wong, Y. J., & Duffy, K. (2007). *Psychological determinants of health behaviors: The roles of self-efficacy and outcome expectations*. Psychology of Health & Medicine, 12(4), 343-357.
13. Kloos, B., Hill, J., Thomas, E. J., & Wandersman, A. (2012). *Community psychology: A resource for promoting health and wellness*. Springer.
14. Mehnert, A., & Koch, U. (2008). *Prediction of specific health-related quality of life and psychosocial distress in cancer patients: A longitudinal study*. Psycho-Oncology, 17(5), 441-449.

Role of Fast-Track Courts in Addressing Crimes against Women

Prama[*]

Abstract

Crimes against women in India, especially sexual assault and rape, have risen sharply. This troubling trend shows the urgent need for a fast and effective legal response. Fast Track Courts (FTCs) were set up to tackle this issue by ensuring quick justice. These courts aim to cut down the significant backlog of cases, speed up trials, and restore public trust in the legal system. Access to justice, particularly through timely resolution, is essential for any credible criminal justice system. Without it, justice loses its meaning and fails to protect those in need.

This paper looks at how fast track courts play a role in improving women's safety in India by speeding up the legal process in cases of gender-based violence. It discusses the history of FTCs, their legal basis, and how they operate within the Indian judiciary. Despite their significance, FTCs face numerous challenges, such as poor infrastructure, a lack of judicial personnel, procedural inefficiencies, and uneven application across states.

Alongside examining domestic issues, this paper reviews international approaches that use similar fast-track systems to address crimes against women. By comparing these practices, it identifies effective strategies that could strengthen India's current system. The study ends by suggesting key reforms, including better resource distribution, training, technology use, and stricter monitoring and evaluation. The ultimate goal is to help create a stronger, more accessible, and responsive justice system. This system should not only discourage crimes against women but also support democratic principles and strengthen citizens' faith in the law. Improving FTCs is not just a legal requirement; it is a social obligation to protect the rights and dignity of women in India.

Keywords: Fast track Courts, Crime against Women, Judicial Reforms in India, Speedy Justice, Judicial Reforms

Introduction

India faces a troubling rise in crimes against women and children. This situation highlights deep social inequalities and flaws in the criminal justice system. Sexual violence, especially rape and child sexual abuse, has become a serious human rights issue. It demands urgent and ongoing action from institutions. According to data from the National Crime Records Bureau (NCRB), India recorded 128,278 cases of crimes against women in 2021. Among these, there were 31,677 casesof rape[1]. Crimes against children were even higher, with 149,404 cases reported. About 30% of these cases fell under the Protection of Children from Sexual Offences Act (POCSO), 2012[2]. These statistics show rising crime rates and the systemic marginalization and vulnerability of women and children in India's patriarchal society.

The justice system in India often faces criticism for being inefficient. It suffers from long delays, procedural issues, and a significant backlog of pending cases. This has led to growing calls for reform and new approaches to delivering justice, especially in sexual violence cases. The 2012 'Nirbhaya' gang rape case[3] triggered national outrage. In response, both central and state governments proposed and set up Fast Track Courts (FTCs) and Fast Track Special Courts (FTSCs). These courts aim to speed up legal proceedings for serious crimes, especially those involving women and children, by ensuring quicker investigations and trials.

Fast Track Courts are seen as a way to achieve justice and deter crime. They aim not only to reduce the judicial backlog but also to provide prompt support for victims who often deal with societal stigma, trauma, and loss of income. The fast trial process seeks to build public trust in the legal system. The

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[1]India lodged average 86 rapes daily, 49 offences against women per hour in 2021: NCRBdata. (2022, August 31). The Hindu. Retrieved fromhttps://www.thehindu.com/news/national/india-lodged-average-86-rapes-daily-40-offences-against-women-per-hour-in-2021-government-data/article65833488.ece

[2]NCRB data for Crimes against child

[3]AIR 2017 SUPREME COURT 2161

Ministry of Law and Justice, through the Department of Justice, has proposed dedicated grants to help establish and maintain FTCs across the nation.

However, the implementation and long-term viability of FTCs are debated. Their establishment has been inconsistent over time, with government support varying. Some states have even closed FTCs due to administrative changes or lack of resources. Critics suggest that instead of creating separate court systems, more focus should be on thoroughly reforming the main criminal justice system. There are also concerns about whether fast-track trials can truly ensure justice if they compromise due process, fair trial rights, and judicial thoroughness for the sake of speedy. Justice is naturally dynamic, subjective, and complex. While victims seek quick and compassionate responses, those accused also have the right to a fair trial and defended by legal practitioner of his choice[4]. It's essential to balance these needs within the FTC framework. In light of the Sustainable Development Goals (SDGs), particularly Goal 16, which promotes access to justice for everyone and the establishment of effective, accountable institutions, the role of Fast Track Courts is crucial during this time[5]. This paper examines their evolution, impact, challenges, and future steps for improving the justice delivery system in India.

Evolution of Fast Track Courts in India

The idea of Fast Track Courts (FTCs) in India emerged around the year 2000 due to the increasing number of pending cases and the need for quicker justice. The **11th Finance Commission**, which served from 2000 to 2005, initially introduced FTCs to resolve long-overdue sessions court cases and decrease the judicial backlog. The Ministry of Home Affairs allocated ₹502.90 crore to set up these courts, and by the end of the program, 1,734 FTCs were established nationwide.[6]

However, this early effort did not have strong legal support and relied solely on central government funding. The 12th Finance Commission continued financial backing for the maintenance of 1,562 FTCs until 2010. Throughout the 2000s, the growing popularity of FTCs led to multiple recommendations from the Law Commission to apply fast-track methods to other areas. The 188th Law Commission Report in 2003 proposed creating "Fast-Track, High-Tech Commercial Divisions" in all High Courts to manage high-value commercial disputes.[7] In 2008, the Law Commission again backed FTCs as a temporary approach to address the backlog of cheque bounce cases under Section 138 of the Negotiable Instruments Act.

By 2011, the Central Government stopped funding for FTCs, signalling a change in viewpoint. FTCs were increasingly seen as temporary solutions rather than long-term fixes. This decision faced challenges in the Supreme Court case Brij Mohan Lal v. Union of India & Others[8] in 2012. The Court upheld the government's choice to end funding but directed improvements in justice delivery. It required States to either close FTCs or make them permanent but prohibited them from continuing on a temporary basis. The Court also called for additional judicial positions, equal to 10% of the current judicial workforce.

The Nirbhaya case in December 2012 was a pivotal moment in discussions about sexual violence and the justice system. The public outrage resulted in the formation of the Justice J.S. Verma Committee[9], which emphasized the importance of quick justice to maintain the legal framework's integrity and deter crime. Following the committee's suggestions, states were encouraged to establish Fast Track Courts for sexual offences, utilizing the extra judicial appointments mandated by the Supreme Court. Building on this momentum, the government initiated the National Mission for Safety of Women (NMSW), creating Fast Track Special Courts (FTSCs) that focused solely on rape cases and offences under the Protection of Children from Sexual Offences Act (POCSO) of 2012. This program, overseen by the Department of Justice in the Ministry of Law and Justice, aimed to develop a dedicated judicial system for crimes against gender. To further strengthen deterrence, the Criminal Law (Amendment) Act, 2018, imposed stricter penalties, including the death penalty for the rape of girls under 12 and 20 years to life imprisonment for raping girls under 16. This amendment was a significant legislative step aimed at punishing and deterring offenders.

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[4]Article 22 , Constitution of India

[5]Transforming our world : the 2030 agenda for sustainable development

[6] "Brief note on the scheme of`Fast Track Courts'", Department of Justice, Ministry of Law and Justice,

[7]"Fast Track Magisterial Courts for Dishonoured Cheque Cases",Law Commission of India, November 2 008, P. 39 http://lawcommissionofindia.nic.in/reports/report 213

[8] (2012) 5 SCR 305

[9]Report available here: http://www.thehindu.com/multimedia/archive/01340/Justice_Verma_Comm_1340438a.

Since their establishment, FTSCs have resolved over 124,000 cases as of October 2022. However, with more than 193,000 cases still pending, there is an urgent need to extend and broaden the program beyond 2023[10].The development of FTCs in India reflects a shift from temporary, funding-based measures to a more organized, goal-oriented judicial response to serious crimes. While challenges persist, especially regarding implementation and consistency, FTCs play a vital role in the pursuit of timely and fair justice.

The Need for Fast-Track Courts

The establishment of Fast Track Courts (FTCs) in India stems from the urgent need to address the alarming backlog of pending cases, particularly those involving heinous crimes against women and children. The regular judicial system, burdened with massive pendency, often results in trials dragging on for years, denying timely justice to victims. In response, FTCs were conceptualized to expedite such sensitive cases and ensure that justice is not delayed indefinitely.

India continues to witness a high incidence of sexual crimes, as reported by the National Crime Records Bureau (NCRB), underscoring the necessity of a specialized and efficient judicial mechanism. Victims of sexual assault often endure prolonged psychological trauma due to delayed trials, which compounds their suffering. FTCs provide a faster resolution, helping survivors gain closure and begin the healing process more swiftly. Moreover, the swift delivery of justice acts asa deterrent to potential offenders. When punishment is prompt and certain, it sends a strong message that such crimes will not go unpunished, thereby discouraging criminal behaviour.[11]

In addition to deterrence, public confidence in the legal system is reinforced when justice is seen to be delivered promptly, especially in high-profile cases that garner widespread public attention and outrage. This visibility and efficiency restore trust in the judiciary's capacity to protect citizens. Further, FTCs are equipped to handle sensitive cases with greater care, as they often include judges and staff who are trained to deal with the nuances of cases involving sexual violence, child abuse, and domestic crimes. This ensures that victims are treated with sensitivity, dignity, and respect throughout the legal proceedings.

FTCs also help create a supportive legal environment by minimizing re-traumatization of victims, reducing procedural insensitivity, and promoting victim-friendly courtrooms. The role of FTCs in setting legal precedents has also been significant, as seen in landmark judgments like the 2012 Nirbhaya case, which led to sweeping legal reforms, including the Criminal Law (Amendment) Act of 2013.

Finally, Fast Track Courts align with India's constitutional obligation to provide speedy justicehe right to a speedy trial is quintessential to the criminal justice system. This principle has also been upheld in the case of Hussainara Khatoon v. Home Secretary, State of Bihar[12] where the continued detention of under trail prisoners was considered against the constitutional ethos of Article 21 which consists of the bulwark of fundamental freedoms. On similar lines, in Maneka Gandhi.v. Union of India[13] wherein the Honourable Supreme Court held that the right to a speedy trial is part and parcel of article 21 and that the state cannot deny equal access to justice. Fulfills international human rights commitments, such as those under the UNCRC and CEDAW. The government's policy commitment is reflected through initiatives like the Centrally Sponsored Scheme for Fast Track Special Courts, backed by substantial funding via the Nirbhaya Fund. Altogether, FTCs represent a vital step toward strengthening justice delivery, especially for women, children, and other vulnerable sections of society.

Government Initiatives and Expansion of FTCs - Fast Track Special Courts

To tackle the increasing number of sexual offenses and provide quick justice for victims, the Government of India started a Centrally Sponsored Scheme in October 2019. This scheme focuses on setting up Fast Track Special Courts (FTSCs), including exclusive POCSO Courts (ePOCSO). Each FTSC has one judicial officer and seven support staff, all assigned to speed up the trial process for rape and POCSO Act cases.

The scheme was initially planned for one year during 2019-20 and 2020-21, with a budget of ₹767.25 crore. It has since been extended several times and is now approved until March 2026, with a total

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[10] Fast Track Special Courts Dispose Of Over 1.74 Lakh Sexual Offences Cases https://www.livelaw.in/news-updates/fast-track-special-courts-sexual-offences-speedy-trial-justice-236202

[11]https://www.legalserviceindia.com/legal/article-17862-the-role-of-fast-track-courts-in-women-safety-in-india.html

[12] AIR 1979 SC 1369

[13] AIR 1987 SC 597

budget of ₹1952.23 crore. Out of this, ₹1207.24 crore is funded through the Nirbhaya Fund. As of May 2025, 747 FTSCs, including 406 ePOCSO Courts, are operational in 30 States and Union Territories, having resolved over 3.3 lakh pending cases.[14]

To promote transparency and efficiency, the Department of Justice has set up an online monitoring system and holds regular review meetings with High Court Registrars and state authorities. With annual budget allocations of ₹200 crore, the FTSCs play a crucial role in improving justice delivery for women and children and ensuring timely resolution in cases of sexual violence.

Challenges Faced by Fast Track Courts

Fast Track Courts (FTCs) were set up to deliver justice quickly, especially for women and children. However, these courts still face many practical and systemic problems that make it hard for them to work as well as intended.

A major problem is that these courts often don't have enough resources. Many FTCs don't have proper courtrooms, enough judges, or enough staff to keep things running smoothly. Without basic facilities like good infrastructure, modern technology, or proper support, the courts can't work efficiently. As a result, even with the best intentions, cases are delayed and people don't always get the timely justice they deserve.

Another major challenge is the **overburdening of these courts with cases**. Although FTCs are intended to expedite trials, the high volume of cases assigned to them often leads to congestion similar to that seen in regular courts. As more cases are routed to FTCs, without a proportionate increase in judicial appointments and administrative support, the speed and efficacy of justice delivery diminish, defeating the very purpose of fast-tracking sensitive matters.

Furthermore, there is a significant **need for ongoing training and sensitization** of judges and court personnel. Cases involving sexual violence, child abuse, and other gender-based crimes require a nuanced understanding and empathetic approach. In the absence of regular capacity-building programs, some court officials may lack the necessary sensitivity to deal with victims appropriately, potentially resulting in secondary victimization during the trial process.

In conclusion, while FTCs have played a crucial role in addressing delays in justice delivery, especially in cases involving vulnerable sections of society, their impact is diluted by structural and functional limitations. Addressing these challenges through increased funding, better resource allocation, capacity-building programs, and institutional support is essential to strengthen the Fast Track Court system and ensure it achieves its intended objectives.

Role of Fast Track Courts in Curbing Crimes Against Women

1. **Swift Investigation and Trial -** Fast Track Special Courts (FTSCs) are established to expedite the judicial process, especially in cases involving sexual violence. Unlike traditional courts that may take years, FTSCs aim to complete trials within a stipulated period. This prompt handling ensures justice is not delayed, reducing pendency and bringing closure to victims and families without unnecessary procedural lags.
2. **Increased Conviction Rates -** Timely trials help preserve evidence quality and witness testimony, increasing the chances of conviction. When offenders are punished swiftly and decisively, it builds public trust in the justice system. Higher conviction rates act as a powerful deterrent and ensure that justice is not just symbolic, but effective and enforceable.
3. **Psychological Relief for Victims -** Long-drawn court battles can cause immense mental distress for survivors of crimes such as rape and sexual assault. FTSCs help reduce this burden by shortening the trial period. Victims are spared repeated court appearances and the trauma of reliving their experiences over extended durations, making the process more survivor-friendly.[15]
4. **Legal Deterrence and Crime Reduction -** The presence of a fast and stringent legal response discourages potential offenders. When criminals know they will be prosecuted and sentenced swiftly, they are less likely to commit such acts. FTSCs thus act as a legal deterrent, helping reduce the frequency of crimes against women over time.

[14]Fast Track Special Courts (FTSCs) available on https://doj.gov.in/fast-track-special-court-ftscs/

[15]The Role of Fast Track Courts in Women Safety in India - https://www.legalserviceindia.com/legal/article-17862-the-role-of-fast-track-courts-in-women-safety-in-india.html

5. **Focused Handling of Sensitive Cases -** FTSCs often deal exclusively with crimes like rape, acid attacks, sexual harassment, and child sexual abuse. Judges and staff in these courts are typically trained to handle such cases with the required sensitivity and discretion. This specialized approach ensures that the trauma of the victim is not aggravated by the legal process.
6. **Encouragement for Victims to Report Crimes-**Knowing that justice can be delivered swiftly motivates more women and children to come forward and file complaints. This leads to increased reporting of crimes that might otherwise have gone unreported due to fear of lengthy trials or social stigma.
7. **Public Awareness and Sensitization -** The establishment and operation of FTSCs raise public awareness about the seriousness of crimes against women. It sends a strong message of zero tolerance and educates communities about legal recourse available to victims, thereby fostering a culture of accountability and gender justice.[16]
8. **Setting Legal Precedents and Influencing Reform -** FTSCs have played a key role in resolving high-profile cases, such as the 2012 Nirbhaya case, which led to major legal reforms. These cases have set strong judicial precedents and led to stricter laws, including the Criminal Law (Amendment) Act, 2013, enhancing protections for women and girls.

Recommendations for Strengthening Fast Track Courts (FTCs/FTSCs)

1. **Special Legislation Required** - Special legislation is required to address unique societal issues, ensure justice, protect vulnerable groups, and fill gaps left by general laws for effective governance.
2. **Avoid Ad-Hoc Implementation** - Prevent arbitrary establishment and closure by embedding FTCs as permanent institutions backed by legislation.
3. **Training for Key Stakeholders** - Provide regular, specialized training for judges, prosecutors, lawyers, and registrars on handling sexual violence cases sensitively.
4. **Mandatory Victim Support Services** - Ensure availability of interpreters, social workers, counselors, and safety measures to support and protect victims during trials.
5. **Monitoring and Evaluation Mechanism** - Develop a legislative framework for periodic performance assessments and data-driven evaluations of FTCs.
6. **Special Requirements for Sexual Offence Courts**
   a. Appoint specially selected judges with appropriate attitude and expertise.
   b. Engage trained, specialized prosecutors.
   c. Ensure free, timely legal aid for victims.
   d. Deploy dedicated victim support workers.
   e. Provide separate victim-safe infrastructure (e.g., waiting rooms, video testimony).
   f. Enable collaboration with other justice and welfare agencies including NGOs.

Conclusion

Fast Track Courts (FTCs) and Fast Track Special Courts (FTSCs) have emerged as pivotal tools in India's pursuit of timely justice, particularly in cases involving crimes against women and children. By ensuring quicker trials, higher conviction rates, and victim-sensitive procedures, these courts address long-standing concerns about delays and inefficiencies in the criminal justice system. Their role in curbing gender-based violence, restoring public confidence, and setting powerful legal precedents cannot be overstated. However, their effectiveness is often compromised by infrastructural constraints, lack of trained personnel, and overburdening due to high caseloads.

To ensure the sustainability and impact of FTCs, there is a pressing need for legislative backing, institutional permanence, and systematic reforms. This includes adequate funding, specialized training for stakeholders, and provision of support services to victims. Furthermore, regular monitoring and evaluation are crucial to improving performance and accountability. Strengthening FTCs aligns with India's constitutional duty to provide speedy justice and its global commitments under international human rights treaties. As India continues to grapple with crimes against vulnerable groups, FTCs must evolve from temporary fixes to well-integrated, permanent institutions that deliver both swift and substantive justice, thereby contributing meaningfully to a safer and more equitable society.

[16]Crimes Against Women: Role of Fast-Track Courts in India - https://lawchakra.in/blog/crimes-against-women-fast-track-courts/

India's Experience with Retail Investor Growth and Its Implications for Market Democratization in Emerging Economies

Dr. Syamlal G.S.[*]

Abstract

This study examines the unprecedented growth in retail investor participation in Indian equity markets, investigating its implications for market democratization and financial inclusion in emerging economies. Using comprehensive data from the National Stock Exchange (NSE) spanning 2020-2025, we analyze the dramatic 275% increase in unique investor registrations, growing from 310 lakh to 1,162 lakh participants. Our findings reveal significant geographic concentration in investor adoption, with the top five states accounting for 45.8% of new registrations, while individual investors now constitute 34% of cash market turnover and 35% of equity options premium turnover. The study employs quantitative analysis of trading patterns, demographic distribution, and market participation metrics to assess the depth and sustainability of this democratization process. Results indicate that while market access has expanded dramatically through digital infrastructure covering 99.85% of pin codes, participation remains concentrated in economically developed regions. The research contributes to understanding how technological advancement and regulatory reforms can accelerate financial inclusion in emerging markets, with implications for policy makers seeking to broaden capital market participation while maintaining market stability.

Keywords: retail investors, market democratization, financial inclusion, emerging markets, equity participation, NSE, India

1. Introduction

The Indian capital market has witnessed a remarkable transformation over the past five years, characterized by an unprecedented surge in retail investor participation. This phenomenon represents more than mere market expansion; it signifies a fundamental shift toward financial democratization in one of the world's largest emerging economies. The National Stock Exchange (NSE), positioned as the world's third-largest equity exchange by number of trades, has become the epicenter of this retail investment revolution.

The democratization of financial markets refers to the process by which investment opportunities, previously accessible only to institutional investors and high-net-worth individuals, become available to the broader population. In the Indian context, this democratization has been facilitated by technological advancement, regulatory reforms, and changing socio-economic dynamics that have collectively lowered barriers to market entry. Recent data from NSE reveals that unique investor registrations have grown from 310 lakh in FY2020 to 1,162 lakh by June 2025, representing a growth rate of 275% over five years. This expansion is particularly significant given that it occurred during a period marked by global economic uncertainty, including the COVID-19 pandemic, geopolitical tensions, and volatile market conditions.

The scale and speed of this transformation raise critical questions about the nature of market democratization in emerging economies.

- Is this growth sustainable?
- What are the underlying drivers of this participation surge?
- How does geographic and demographic distribution of new investors reflect broader patterns of economic development?

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These questions form the foundation of this research and the significance of this study extends beyond academic interest. Understanding the patterns and implications of retail investor growth in India provides valuable insights for other emerging economies seeking to develop their capital markets. It also offers lessons for policymakers and market regulators tasked with balancing market development with investor protection.

2. Review of Literature

2.1 Market Democratization Theory

The concept of market democratization has evolved significantly since Berle and Means (1932) first examined the separation of ownership and control in modern corporations. Early literature focused primarily on institutional aspects of market access, with limited attention to retail participation dynamics. However, the digital revolution has fundamentally altered this landscape. Campbell (2006) argues that household participation in financial markets depends on three key factors: transaction costs, information asymmetries, and behavioral biases. In the Indian context, technological advancement has dramatically reduced transaction costs, while digital platforms have partially addressed information asymmetries through improved access to market data and research. Recent studies by Guiso et al. (2008) and Bonaparte et al. (2014) emphasize the role of trust in financial institutions as a critical determinant of market participation. Their findings suggest that historical experiences with financial systems significantly influence individual investment decisions, particularly in emerging markets where institutional credibility may be questioned.

2.2 Emerging Market Dynamics

Emerging markets present unique challenges and opportunities for retail investor participation. Bekaert et al. (2005) demonstrate that financial liberalization in emerging markets leads to increased retail participation, but this growth is often concentrated in urban, educated populations. Their work highlights the importance of demographic factors in determining participation rates. More recent research by Kumar and Lee (2006) examines the behavioral aspects of retail trading in emerging markets, finding that individual investors tend to exhibit stronger momentum trading patterns compared to their developed market counterparts. This finding has particular relevance for understanding market volatility and price discovery mechanisms in democratized markets. Kim and Wei (2002) provide evidence that foreign portfolio investment can crowd out domestic retail participation in some emerging markets, while in others, it may serve as a catalyst for domestic market development. The Indian experience, as reflected in recent NSE data, suggests the latter pattern, with domestic institutional investor (DII) flows of $41.5 billion in 2025 more than offsetting foreign portfolio investor (FPI) outflows of $8.9 billion.

2.3 Technology and Financial Inclusion

The role of technology in democratizing financial markets has been extensively studied in recent literature. Philippon (2016) argues that fintech innovations have the potential to reduce the cost of financial services and increase accessibility, particularly for previously underserved populations. In the Indian context, studies by Demirgüç-Kunt et al. (2018) highlight how digital payment systems and mobile banking have created pathways for financial inclusion that extend beyond traditional banking services to capital market participation. The JAM (Jan Dhan-Aadhaar-Mobile) trinity has been particularly effective in creating the infrastructure necessary for retail investor onboarding.

2.4 Geographic Distribution and Economic Development

Literature on financial development emphasizes the role of geographic factors in determining market participation rates. Guiso et al. (2004) find that social capital and local financial development significantly influence household participation in financial markets. Their work suggests that even within countries, regional variations in market participation reflect broader patterns of economic development. Recent studies specific to India by Campbell et al. (2019) show that states with higher per capita income and better educational attainment tend to have higher rates of financial market participation. This finding aligns with NSE data showing that the top five states (UP, MH, TN, WB, KTK) account for 45.8% of new investor registrations.

3. Objectives and Statement of the Problem

3.1 Research Objectives

The primary objectives of this study are:

1. To analyze the magnitude and patterns of retail investor growth in Indian equity markets from 2020-2025
2. To examine the geographic distribution of new investor registrations and its relationship with economic development indicators
3. To assess the market participation patterns of individual investors across different trading segments
4. To evaluate the sustainability and implications of rapid retail investor growth for market democratization
5. To provide policy recommendations for enhancing financial inclusion while maintaining market stability

3.2 Statement of the Problem

Despite the remarkable growth in retail investor participation in Indian markets, several critical questions remain unanswered. The rapid increase from 310 lakh to 1,162 lakh unique investors raises concerns about the sustainability of this growth and the quality of investor decision-making. Furthermore, the concentration of new registrations in specific geographic regions suggests that market democratization may be incomplete, potentially excluding rural and economically disadvantaged populations.

The study seeks to address the following research questions:

1. What factors have driven the 275% increase in retail investor participation in Indian markets?
2. How does the geographic distribution of new investors reflect broader patterns of economic inequality?
3. Are individual investors making informed investment decisions, or does rapid growth indicate speculative behavior?
4. What are the implications of increased retail participation for market volatility and price discovery?
5. How can policymakers ensure that market democratization benefits all segments of society?

3.3 Hypotheses

Based on the literature review and preliminary data analysis, this study tests the following hypotheses:

H1: Retail investor growth in Indian markets is primarily concentrated in economically developed states and urban areas.

H2: Individual investor participation is higher in derivative segments compared to cash markets, indicating risk-seeking behavior.

H3: The growth in retail participation has been sustainable and is supported by fundamental improvements in market infrastructure and investor education.

4. Research Methodology

4.1 Data Sources

This study utilizes comprehensive data from the NSE Market Pulse reports covering the period from FY2020 to June 2025. The dataset includes:

- Unique registered PANs (Permanent Account Numbers) by financial year
- New investor registrations by state and region
- Trading turnover data across market segments (Cash, Futures, Options)
- Category-wise participation data (Individuals, DIIs, FPIs, Corporates)
- Market capitalization and economic indicators

4.2 Analytical Framework

The analysis employs both descriptive and inferential statistical techniques:

Descriptive Analysis: Examination of growth trends, geographic distribution patterns, and segment-wise participation rates.

Comparative Analysis: Assessment of retail participation across different market segments and geographic regions.

Correlation Analysis: Investigation of relationships between economic development indicators and investor participation rates.

Time Series Analysis: Evaluation of growth sustainability and trend projections.

5. Analysis and Findings

5.1 Magnitude of Retail Investor Growth

The data reveals an extraordinary expansion in retail investor participation over the study period. Unique PANs registered on NSE increased from 310 lakh in FY2020 to 1,162 lakh by June 2025, representing a compound annual growth rate (CAGR) of approximately 30%. This growth has been particularly pronounced in recent years, with significant acceleration during and after the COVID-19 pandemic. The period from FY2021 to FY2023 witnessed the steepest growth trajectory, coinciding with increased digitization, remote working arrangements, and heightened interest in financial markets among young demographics.

The growth pattern exhibits several interesting characteristics:

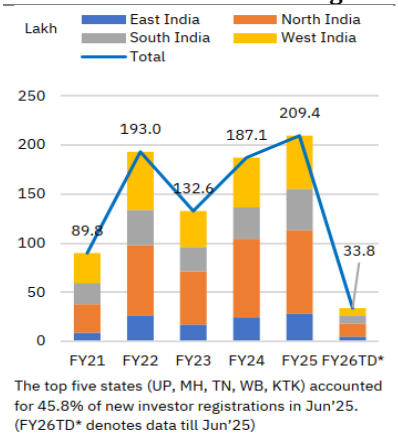
- **Sustained Momentum**: Unlike typical market cycles, retail participation growth has remained robust across different market conditions
- **Broad-based Expansion**: Growth has occurred across all major geographic regions, though with varying intensities
- **Segment Diversification**: New investors have participated across cash and derivative segments, indicating sophisticated market engagement

5.2 Geographic Distribution Analysis

The geographic analysis reveals significant concentration in investor adoption patterns. The top five states - Uttar Pradesh (UP), Maharashtra (MH), Tamil Nadu (TN), West Bengal (WB), and Karnataka (KTK) - collectively account for 45.8% of new investor registrations in June 2025. This concentration reflects several underlying factors:

Figure - 1

State-wise Distribution of New Investor Registrations (FY2025)



Source : NSE Market Pulse reports

Economic Development: States with higher per capita income and better industrial development show higher investor participation rates. Maharashtra and Karnataka, being major financial and technology hubs, demonstrate particularly strong growth.
Population Density: Uttar Pradesh, despite being less economically developed per capita, shows high absolute numbers due to its large population base.
Digital Infrastructure: States with better internet connectivity and smartphone penetration exhibit higher growth rates in investor registrations.
Educational Attainment: Regions with higher literacy rates and better educational infrastructure show stronger market participation.

5.3 Market Segment Participation Patterns

The analysis of individual investor participation across different market segments reveals interesting behavioural patterns:
Cash Market (CM) Segment: Individual investors account for 34% of total turnover, representing a balanced participation alongside institutional investors.
Equity Options: Individual participation reaches 35% of premium turnover, indicating active engagement in derivative strategies.
Equity Futures: Individual investors constitute 18% of turnover, suggesting more cautious participation in this higher-risk segment.

These participation patterns indicate that retail investors are not merely passive participants but are actively engaging with sophisticated financial instruments. The high participation in equity options, in particular, suggests either improved financial literacy or potentially concerning risk-taking behavior that requires further investigation.

Figure - 2
Category-wise Market Share Across Segments (FY2025)

Client category	CM		Equity options#		Equity futures	
	Value (Rs '000 Cr)	Share (%)	Value (Rs '000 Cr)	Share (%)	Value (Rs '000 Cr)	Share (%)
Corporates	510	4	153	2	1,360	7
DIIs	1,783	13	10	0	2,283	11
FIs	2,028	15	601	9	5,466	27
Individuals	4,558	34	2,372	35	3,670	18
Others	582	4	148	2	966	5
Prop	3,781	29	3,489	52	6,804	33

Based on premium turnover * FY26 data is as of June, 2025

Source : NSE Market Pulse reports

5.4 Capital Formation Impact

The democratization of markets has had significant implications for capital formation in the Indian economy. The data shows:

- Total equity capital raised between FY2022-FY2026: Rs 11.3 lakh crores
- Market capitalization growth supporting economic development
- Enhanced price discovery mechanisms through increased participation
- Improved liquidity across market segments

The NSE Emerge platform, specifically designed for MSMEs, has facilitated Rs 18,092 crores in capital raising across 634 listed companies, with 134 companies successfully migrating to the main board. This demonstrates how retail participation has supported broader economic objectives of MSME development and entrepreneurship.

5.5 Sustainability Assessment

Several indicators suggest that the retail investor growth may be sustainable:

Infrastructure Development: NSE's reach covers 99.85% of pin codes, ensuring accessibility across geographic regions.

Regulatory Support: Continuous regulatory improvements have enhanced investor protection while maintaining market efficiency.

Digital Adoption: The widespread adoption of digital platforms has reduced transaction costs and improved user experience.

Economic Fundamentals: India's robust GDP growth (6.5% projected for FY2025) provides a supportive macroeconomic environment.

However, concerns remain regarding:

Risk Concentration: High participation in derivative segments may indicate excessive risk-taking **Geographic Inequality**: Continued concentration in developed states suggests incomplete democratization **Market Volatility**: Increased retail participation may contribute to heightened market volatility during stress periods

6. Conclusion

This study provides compelling evidence of unprecedented market democratization in India's equity markets, characterized by a 275% increase in retail investor participation from 2020 to 2025. The findings support the hypothesis that this growth has been primarily concentrated in economically developed regions, with significant implications for financial inclusion and market structure.

6.1 Key Findings

The research yields several significant conclusions:

Scale of Transformation: The growth from 310 lakh to 1,162 lakh unique investors represents one of the most dramatic expansions in retail market participation globally, establishing India as a leading example of emerging market democratization.

Geographic Concentration: The concentration of 45.8% of new registrations in five states reflects broader patterns of economic inequality and suggests that complete market democratization remains a work in progress.

Sophisticated Participation: Retail investors' active engagement across derivatives markets (35% in equity options, 18% in equity futures) indicates a level of market sophistication that challenges traditional assumptions about emerging market retail behavior.

Infrastructure Success: NSE's achievement of 99.85% pin code coverage demonstrates how technological infrastructure can overcome traditional barriers to financial market access.

Sustainable Growth Indicators: The consistency of growth across different market conditions, supported by robust economic fundamentals and regulatory improvements, suggests that this democratization trend is likely sustainable.

7. Suggestions and Recommendations

Based on the analysis and findings, this study offers the following recommendations:

7.1 For Policymakers

Enhanced Financial Literacy Programs: Implement comprehensive financial education initiatives targeting rural and underrepresented populations to ensure informed investment decisions.

Regional Development Focus: Develop specific strategies to promote market participation in economically disadvantaged states through infrastructure development and awareness campaigns.

Risk Management Frameworks: Establish robust risk assessment and management systems to monitor retail investor behavior in derivatives markets and prevent excessive speculation.

Digital Infrastructure Expansion: Continue investments in digital infrastructure, particularly in rural areas, to ensure equitable access to financial markets.

7.2 For Market Regulators

Investor Protection Enhancement: Strengthen investor protection mechanisms, including improved disclosure requirements, better complaint resolution systems, and enhanced surveillance of market manipulation.

Market Stability Monitoring: Develop sophisticated monitoring systems to assess the impact of retail investor behavior on market volatility and systemic risk.

Product Innovation Regulation: Establish clear guidelines for financial product innovation to ensure that new instruments serve legitimate investment needs rather than speculative purposes.

7.3 For Exchanges and Market Infrastructure

Technology Platform Development: Continue investing in user-friendly platforms that cater to the needs of diverse investor segments while maintaining security and reliability.

Educational Content Creation: Develop comprehensive educational resources tailored to different investor segments and experience levels.

Data Analytics Capabilities: Enhance data collection and analysis capabilities to better understand retail investor behavior and market trends.

References

Bansal, A., & Kumari, S. (2023). Retail investor participation in Indian equity markets: Determinants and implications. Asian Economic Review, 65(2), 83–104. https://www.ssrn.com/abstract=3907773

Chague, F., De-Losso, R., Giovannetti, B., & Rocha, B. (2020). Demographics and financial market democratization: Evidence from emerging markets. Emerging Markets Review, 45, 100724. https://ideas.repec.org/f/c/pri259.html

World Federation of Exchanges. (2025). Annual Report 2025. The World Federation of Exchanges. https://www.world-exchanges.org/our-work/statistics

National Stock Exchange of India. (2025). Market Pulse July 2025 (Vol. 7, Issue 7). NSE Publications & Research. https://www.nseindia.com/research/publications-reports-nse-market-pulse

Reserve Bank of India. (2025). Financial Stability Report, July 2025. RBI Reports. https://www.fidcindia.org.in/wp-content/uploads/2025/07/RBI-FINANCIAL-STABILITY-REPORT-30-06-25.pdf

Public Interest Litigation (PIL) in Environmental Protection

Awadhesh Kumar Shukla[*]

Abstract

Environmental degradation is one of the biggest challenges of the 21st century. It requires not only scientific and policy responses but also strong legal measures to ensure accountability and sustainability. In India, Public Interest Litigation (PIL) has become an important tool that allows citizens, activists, and organizations to go to court over environmental issues, especially when traditional legal paths are ineffective or hard to access.

This research paper looks at the connection between environmental protection and judicial activism through the lens of Public Interest Litigation. It outlines the history of environmental law in India and shows how important rulings from the Supreme Court and various High Courts have broadened the interpretation of Article 21 of the Constitution—the right to life—to include the right to a clean and healthy environment. The paper discusses key cases such as M.C. Mehta v. Union of India, Subhash Kumar v. State of Bihar, and Vellore Citizens' Welfare Forum v. Union of India. These cases highlight the judiciary's active role in environmental governance.

PIL has played a crucial role in tackling environmental injustices like air and water pollution, deforestation, and industrial hazards. It has also increased public awareness, made the administration more accountable, and led to policy changes. By allowing courts to intervene when the government fails to act or regulate properly, PIL has empowered marginalized communities and environmental defenders in their efforts to protect natural resources.

However, the paper also discusses the limitations and challenges of PIL, including the risk of frivolous lawsuits, judicial overreach, and the slow enforcement of court orders. Despite these issues, PIL remains an essential part of India's legal framework. It has significantly contributed to the development of environmental law, strengthened democratic involvement, and promoted the ideas of fairness for future generations and sustainable growth.

In conclusion, this paper argues that Public Interest Litigation has become a key part of environmental justice in India. Its ongoing importance relies on balancing judicial activism with institutional accountability and procedural integrity.

Keywords: PIL, Environmental Protection, Article 21, Sustainable Development, Judicial Activism

Introduction

Environmental degradation has become one of the most pressing concerns of the 21st century. It threatens biodiversity, public health, and the sustainability of life on Earth. In India, rapid industrialization, urban growth, deforestation, pollution, and the careless use of natural resources have greatly upset the ecological balance. These environmental problems are not just scientific or policy matters; they also relate to basic human rights, especially the right to life as stated in Article 21 of the Indian Constitution. Mahatma Gandhi pointed out that "Nature provides for every man's need, but not for every man's greed." This highlights the growing gap between human aspirations and ecological responsibility.[17]

In response to this environmental crisis and the state's recurring failure to act, Public Interest Litigation (PIL) has emerged as a key tool for court intervention. Introduced in India in the 1980s, PIL relaxes traditional rules of locus standi. It allows concerned individuals, activists, and non-governmental organizations (NGOs) to approach the courts for those who cannot represent themselves due to socio-economic or systemic barriers. By overcoming standard legal challenges, PIL has made access to environmental justice more democratic and inclusive.

Over the years, the Indian judiciary, particularly the Supreme Court and various High Courts, has taken an active role in broadening environmental law through PILs. Important rulings in cases like M.C.

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[17]Legal Service India, Public Interest Litigation (PIL) A Boon or Bane,https://legalserviceindia.com/articles/pil.htm.

Mehta v. Union of India[18], Vellore Citizens' Welfare Forum v. Union of India,[19] and Subhash Kumar v. State of Bihar[20] have expanded the interpretation of Article 21 to include the right to a clean and healthy environment. PIL has become a vital tool in fighting environmental degradation, holding authorities accountable, and enforcing environmental laws where administrative failures exist.

This paper examines the development and impact of Public Interest Litigation in environmental protection in India. It discusses the judiciary's role, reviews key landmark cases, and assesses the effectiveness of PIL as a legal remedy. It also addresses the challenges and criticisms of its use while highlighting its ongoing importance in achieving environmental justice and sustainable development in a democratic society.

Meaning of Public Interest Litigation

Public Interest Litigation (PIL) is innovation in the Indian legal system that lets an individual, group, or organization file a case in court to protect the general public's interest, even if they are not directly affected by the issue. Traditionally, only individuals directly impacted by a law, policy, or administrative action could access the courts due to the principle of locus standi. However, PIL has changed this strict interpretation. Now, public-minded individuals and non-governmental organizations (NGOs) can represent the interests of disadvantaged or affected communities that may lack the awareness, resources, or ability to seek legal help themselves.

PIL began in India during the late 1970s and early 1980s, especially during the time of increased judicial activism led by Justice P.N. Bhagwati and Justice V.R. Krishna Iyer. Initially, the focus was on human rights and social justice. Over time, PIL grew into a strong tool to tackle environmental issues, violations of fundamental rights, and government inaction or misconduct. The Supreme Court of India describes PIL as a legal action in court for the public interest when a large number of people are affected. It is not defined in any specific law or act but has been recognized as a constitutional tool based on the broader powers of judicial review under Articles 32 and 226 of the Constitution.

In key cases like Hussainara Khatoon v. State of Bihar [21], the court allowed third-party representation, allowing a petitioner to file a case on behalf of a group of undertrial prisoners. Later, in S.P. Gupta v. Union of India, the court ruled that anyone can use writ jurisdiction to enforce legal rights on behalf of those unable to approach the court due to financial or social barriers.

In summary, Public Interest Litigation refers to legal actions started in the courts to protect common or public interests, such as environmental protection, human rights, road safety, and more, where the legal rights or duties of the public or a community are involved. It marks a shift from individual litigation to collective justice, playing an important role in promoting transparency, accountability, and the rule of law in a democratic society.[22]

Constitutional and Legal Framework Relating to Environmental Protection in India

I. **Constitution of India**- Environmental degradation is one of the biggest challenges faced by humanity and all living organisms today. Recognizing the seriousness of this issue, India has adjusted its legal and constitutional framework to focus on environmental protection. The original Constitution of India did not include direct provisions for environmental protection. However, rising global awareness in the 1970s, especially after the 1972 Stockholm Conference on the Human Environment, pushed the Indian government to take legal action. The 42nd Amendment Act of 1976 was a turning point in India's journey toward environmental protection. This amendment added two important provisions that address the responsibility of the State and citizens to preserve the environment:

[18](1987) SCC 1 395
[19]AIR 1996 SC 2715
[20]AIR 1991 SCR (1) 420
[21] 1979 SCR (3)
[22]THE ROLE OF PUBLIC INTEREST LITIGATION IN PROTECTING THE ENVIRONMENT IN INDIA » Lawful Legal, (July 14, 2024), https://lawfullegal.in/the-role-of-public-interest-litigation-in-protecting-theenvironment-in-india/

- Article 48A (Directive Principles of State Policy):"The State shall endeavour to protect and improve the environment and to safeguard the forests and wildlife of the country." This provision requires the State to actively conserve and improve the natural environment.
- Article 51A(g) (Fundamental Duties of Citizens):"It shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wildlife, and to have compassion for living creatures." This provision makes environmental conservation not just a responsibility of the State but also a fundamental duty of every Indian citizen.[23]
- In addition, Article 253 of the Constitution gives Parliament the power to make laws for implementing international agreements, treaties, and conventions. This formed the constitutional basis for laws such as the Air (Prevention and Control of Pollution) Act, 1981, and the Environment (Protection) Act, 1986, which were introduced to fulfill India's commitments made during the Stockholm Conference.
- Another key provision is Article 21, which guarantees the Right to Life and Personal Liberty. While it does not specifically mention the environment, the judiciary has broadly interpreted Article 21 to include the Right to a Clean and Healthy Environment as a key part of the right to life. The Supreme Court and High Courts, through various important rulings, have stated that the right to live with dignity includes the right to clean water, air, and a pollution-free environment.

Thus, the Indian Constitution, through directive principles, fundamental duties, and judicial interpretation, creates a strong foundation for environmental protection. These provisions have played a crucial role in shaping India's environmental policies and legal framework, empowering both the government and citizens to work together for ecological conservation and sustainability.

II. Legislative Provisions for Environmental Protectio

Environmental protection in India relies on a strong legal framework built from both pre-constitutional and post-constitutional laws. These laws aim to stop environmental damage, promote sustainable development, and protect the health and safety of current and future generations. The Indian Parliament, following constitutional guidelines and international agreements, has passed several important environmental laws over the years. Here are the major legislative provisions:[24]

1. **The Indian Forest Act, 1927** - As one of the earliest laws for environmental conservation, this pre-constitutional legislation was created to protect and manage forest resources in India. It classifies forests into Reserved, Protected, and Village forests and gives the government authority to manage and conserve forest lands.
2. **The Water (Prevention and Control of Pollution) Act, 1974**- This was the first major environmental law after independence. It bans the release of pollutants into water bodies beyond allowed limits and sets penalties for violators. The Act led to the creation of the Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs) to monitor and control water pollution.
3. **The Forest (Conservation) Act, 1980 -**This Act was enacted in response to increasing deforestation and ecological degradation. It aims to regulate the use of forest land for purposes other than forestry. It gives the central government the power to approve such changes in land use and reinforces the duty under Article 51A(g) to protect forests and wildlife.
4. **The Air (Prevention and Control of Pollution) Act, 1981 -** Passed under the authority provided by Article 253 following the Stockholm Conference, this Act aims to control and reduce air pollution. It authorizes Central and State Boards to set emission standards and take action against those who violate them.
5. **The Environment (Protection) Act, 1986 -** This broad legislation was enacted after the Bhopal Gas Tragedy and gives extensive powers to the central government to regulate various kinds of

[23] Constitution of India available on https://www.indiacode.nic.in/bitstream/123456789/19150/1/constitution_of_india.pdf

[24] Legal-framework-india-protect-environmentAvailable on https://blog.ipleaders.in/legal-framework-india-protect-environment/

environmental pollution. It allows for the restriction or shutdown of polluting industries and the establishment of environmental standards across multiple sectors.

6. **The Hazardous Wastes (Management and Handling) Rules, 1989 -**These rules focus on the safe and effective management of hazardous waste. Hazardous waste includes substances that are toxic, flammable, explosive, or corrosive and pose serious risks to human health and the environment.
7. **The Noise Pollution (Regulation and Control) Rules, 2000 -**These rules tackle increasing noise levels from vehicles, industrial activities, construction, loudspeakers, and other sources. They set noise standards for different areas and give authorities the power to enforce restrictions to protect public health and well-being.
8. **The Municipal Solid Wastes (Management and Handling) Rules, 2000** - These rules apply to municipal authorities responsible for collecting, sorting, storing, transporting, and disposing of municipal solid waste. The aim is to promote environmentally sound waste management practices in urban and rural areas.
9. **The National Green Tribunal Act, 2010 -**This Act created the National Green Tribunal (NGT) as a specialized judicial body to handle environmental disputes quickly. The NGT follows principles like sustainable development, precaution, and the polluter pays concept. It plays a vital role in enforcing environmental laws and ensuring compliance.

Landmark Environmental PIL Cases

I. **Rural Litigation and Entitlement Kendra v. State of Uttar Pradesh (1985)**[25] This case is India's first environmental Public Interest Litigation (PIL). A Dehradun-based NGO filed the case, which contested limestone quarrying in the Mussoorie Hills. This activity caused significant environmental damage, deforestation, and health issues from dust and ecological imbalance.

The Supreme Court recognized the right to a clean and healthy environment as part of the Right to Life under Article 21 of the Constitution. It formed expert committees to evaluate the environmental impact. Based on their findings, the Court ordered the closure of several limestone quarries that were damaging the ecosystem. The Court stressed the need to maintain ecological balance, even if it meant limiting economic activities.

This case established an important precedent by prioritizing environmental protection and acknowledging the judiciary's role in upholding ecological rights through PILs, marking the start of environmental law in India.

II. **M.C. Mehta v. Union of India (1987)**[26] **- A**fter a deadly oleum gas leak, the Supreme Court created the doctrine of Absolute Liability for industries that handle hazardous substances. Unlike traditional strict liability, which allows for some defenses, Absolute Liability requires these industries to take full responsibility for any harm caused, with no exceptions.The case highlighted that industries working with dangerous chemicals must put all necessary safety measures in place to protect workers and local residents. In the Shriram Food and Fertiliser case, the Court specifically ordered that safety precautions be fully implemented before the plant could restart operations.This important ruling improved protections for the environment and public health by holding hazardous industries fully accountable for any accidents or damage.

III. **The Indian Council for Enviro-Legal Action v. Union of India (1989)**[27]– This was a landmark public interest litigation focused on hazardous pollution from chemical factories in Bichhri Village, Rajasthan. These factories released untreated toxic waste, which contaminated soil and groundwater and harmed public health. Despite laws like the Water Act (1974) and Environment Protection Act (1986), enforcement was weak.

The Supreme Court supported the Polluter Pays Principle, holding polluting industries liable for compensation and costs related to environmental restoration. It ordered the closing of violating factories, imposed a ₹10 lakh penalty with 12% interest, and criticized their delays in litigation.This case strengthened corporate responsibility and environmental governance in India. It also highlighted the

[25]AIR 1985 SC 652
[26](1987) SCC 1 395
[27]AIR 1996 1446

Doctrine of Sustainable Development, stating that economic growth should not undermine ecological balance and that development must go hand in hand with environmental protection.

IV. Vellore Citizens Welfare Forum v. Union of India (1996)[28] -This significant case changed the course of environmental law in India. It was filed as a Public Interest Litigation under Article 32 and focused on the serious pollution from tanneries in Tamil Nadu, particularly the contamination of the Palar River. Over 500 tanneries discharged untreated waste, polluting 350 wells and making 35,000 hectares of land unusable.The Supreme Court introduced two important principles for the first time:

- Polluter Pays Principle: Industries became responsible for environmental damage. They were ordered to pay compensation and cover clean-up costs.
- Precautionary Principle: This emphasized the need to take proactive measures to prevent environmental damage, even without complete scientific proof.

The Court ordered the closure of tanneries that did not comply, imposed fines of ₹10,000 on each unit, and instructed the creation of Common Effluent Treatment Plants (CETPs). It also established an environmental authority under the Environment Protection Act, 1986 to ensure compliance and distribute compensation.

A "Green Bench" was created in the Madras High Court to oversee environmental cases. Importantly, the Court broadened Article 21 — the Right to Life — to include the right to a healthy environment. This reinforced the judiciary's commitment to environmental protection and sustainable development.

V. T.N. Godavarman Thirumulkpad v. Union of India (1996)[29]**,-** Also known as the Godavarman case, is a landmark and ongoing PIL aimed at curbing deforestation and regulating unauthorized development like mining and construction in forest areas. Filed by a retired forest officer, the Supreme Court broadly interpreted the Forest (Conservation) Act, 1980, ruling that its provisions apply to all forest lands—including private and unclassified forests—not just officially notified ones.

The Court emphasized sustainable development, ordered strict compliance with environmental clearances, and recognized the rights of forest dwellers. It took a proactive role in environmental governance by issuing continuous orders and establishing monitoring committees. One major directive was a complete ban on tree felling without central government approval. This case significantly shaped India's environmental jurisprudence, leading to stronger enforcement of forest laws and protection of vast forest areas, marking a watershed moment in forest conservation efforts.

VI. M.C. Mehta v. Kamal Nath (1997)[30]This Case introduced and supported the Public Trust Doctrine. The case began when Kamal Nath, who was the Minister of Environment and Forests, was connected to a company that took over forest land and redirected the Beas River to build a private resort in Himachal Pradesh. This action harmed the river ecosystem and broke environmental rules. The Supreme Court decided that natural resources such as rivers, forests, and air are held by the state for the public and cannot be given away for private or commercial use. The Court stressed that the government must protect these resources for both present and future generations. It ordered the river's natural flow to be restored and found the private company responsible for environmental damage. This case confirmed that protecting the environment is more important than commercial interests in India.

VII. M.C. Mehta v. Union of India (Vehicular Pollution Case, 1998)[31]**-** In this case Supreme Court dealt with the rising air pollution levels in Delhi, mainly from vehicle emissions. Environmental activist M.C. Mehta filed it as a public interest litigation. The case underscored the serious decline in air quality and its harmful effects on public health.

The Court recognized the Right to a Clean and Healthy Environment as part of the Right to Life under Article 21 of the Indian Constitution. It ordered the gradual introduction of Compressed Natural Gas (CNG) for public transport vehicles, such as buses and autos, to replace polluting diesel fuel. The Court also banned old commercial vehicles, set deadlines for manufacturers to meet emission standards, and

[28]AIR 1996 SC 2715
[29]AIR 1997 SC 1228
[30]AIR 1996 SC 711
[31]AIR 1998 SC 2963

suggested enhancing public transport systems. This case significantly changed environmental governance by ensuring state accountability and advancing India's efforts to tackle urban air pollution.

Challenges and Limitations

Public Interest Litigation (PIL) has transformed environmental governance in India, allowing courts to step in areas typically overseen by the legislature and executive. However, its rising use in environmental cases has also brought significant challenges and criticisms.

One major concern is the misuse and overuse of PILs, which has led to an increase in frivolous or self-serving lawsuits. PILs were originally meant to empower marginalized communities and protect collective rights. Now, they are often filed without clear public interest or with hidden commercial goals. This not only undermines the purpose of PILs but also overwhelms the judiciary with too many cases. Courts must sift through insincere petitions that delay infrastructure and industrial projects, even when these have received proper environmental clearances. This delays the judiciary's response to real environmental issues.[32]

Another significant problem is judicial overreach, where courts extend their role beyond simply judging cases to making policy and overseeing the executive. Environmental PILs often push the judiciary to issue detailed policy directives, supervise implementation, and set regulatory standards. These actions are usually the responsibilities of the legislative and executive branches. A prominent example is the ongoing T.N. Godavarman Thirumulpad v. Union of India case[33], in which the Supreme

Court has monitored forest management for decades. While these interventions may fill administrative gaps, they risk turning the judiciary into a quasi-legislative body, which raises concerns about democratic legitimacy and administrative effectiveness.

This raises a deeper constitutional issue—the violation of the doctrine of separation of powers. The Indian Constitution states that the legislature makes laws, the executive implements them, and the judiciary interprets them. However, when courts enforce and manage policies, they often intrude on the executive's responsibilities, upsetting institutions' balance. Such interference can create confusion, inconsistent implementation, and lack of accountability, especially in complicated areas like environmental regulation that need technical expertise and coordinated governance.[34]

Additionally, there are challenges related to enforcement and compliance. Even with progressive judgments and landmark directives, carrying out court orders is often challenging. Multiple government agencies must cooperate, and their lack of capacity, political will, or coordination often leads to delays or poor execution. This erodes public trust in the judiciary's role in environmental governance and weakens the overall impact of PILs.

Another layer of criticism comes from the development versus environment debate. Critics argue that some judicial decisions, while good for the environment, may hinder economic growth and infrastructure development. In a rapidly industrializing and urbanizing country like India, it is important to find a careful balance between ecological preservation and development priorities. Excessive judicial intervention through PILs can unintentionally stall economic progress or disrupt livelihoods, especially when development projects are paused or canceled without thorough impact assessments.

In summary, while PILs have played a key role in advancing environmental justice in India, their unchecked use, judicial overreach, concerns about separation of powers, implementation challenges, and developmental trade-offs require a more cautious and balanced approach. Strengthening procedural safeguards, improving regulatory institutions, and promoting judicial restraint can help maintain the PIL mechanism as a strong yet responsible tool for environmental protection.

Conclusion

Public Interest Litigation (PIL) has become a powerful force in India's efforts to manage the environment. It allows concerned citizens and civil society groups to seek justice for environmental

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[32] The Role of Public Interest Litigation (PIL) in Environment Conservation in India, available at: https://legalonus.com/therole-of-public-interest-litigation-pil-in-environment-conservation-in-india/#Challenges_and_Criticism

[33] AIR 1997 SC 1228

[34] Ashish Verma, "PROTECTION OF ENVIRONMENT THROUGH PIL IN INDIA: A SOCIO–LEGAL ANALYSIS" Research Inspiration: An International Multidisciplinary e-Journal, Vol. 6, Issue-III (June2021)

damage. This has created an important pathway to address ecological problems that often go unnoticed by administrative and legislative bodies. Landmark cases like M.C. Mehta v. Union of India, Vellore Citizens Welfare Forum v. Union of India, and Indian Council for Enviro-Legal Action v. Union of India have established key principles. These include the Polluter Pays Principle, the Precautionary Principle, the Public Trust Doctrine, and Sustainable Development. These principles now form the foundation of India's environmental legal framework and have deeply influenced policy and regulation.

The judiciary's active role has made it clear that protecting the environment is a vital part of the right to life under Article 21 of the Constitution. PILs have held powerful polluters responsible, protected natural resources, and raised public awareness about environmental issues. In turn, courts have fostered a culture of environmental responsibility across various social sectors.

However, the success of PIL also faces challenges. There are growing concerns about misuse, frivolous lawsuits, and judicial overreach. While PIL was meant to help marginalized communities and serve the public good, it is increasingly used for personal, political, or commercial interests. This weakens the impact of genuine cases and overloads the judiciary, often delaying important environmental or development projects. Courts must be careful to differentiate between real public interest and hidden private agendas.

Additionally, while judicial activism can fill gaps in governance, it sometimes blurs the separation of powers. In cases like T.N. Godavarman Thirumulpad v. Union of India,[35] long judicial involvement blurred the line between judging cases and managing them. Although this oversight has led to significant environmental protection, it raises concerns about courts overstepping their constitutional limits.

Looking ahead, the ongoing effectiveness of PIL relies on a balanced approach. Courts should practice restraint and discourage the misuse of PILs, ensuring they only address legitimate public concerns. At the same time, legislative and executive branches need to take a stronger role in managing the environment. They should codify the principles developed through PILs, strengthen regulatory agencies, and ensure proper enforcement of environmental laws.

PILs should also adapt to new environmental challenges—like climate change, urban decay, and waste management—by promoting community involvement, transparency, and scientific input in environmental decision-making. Encouraging cooperation among the judiciary, legislature, executive, and civil society will help ensure that PIL remains an effective, democratic, and sustainable means of achieving environmental justice.

In conclusion, while PIL has significantly changed environmental law in India, its future success depends on responsible use, effective enforcement, and collaboration among institutions. With ongoing commitment and vigilance, PIL can contribute to building a resilient and fair environment in India.

[35]AIR 1997 SC 1228

Sports' Role in Sculpting Indian Youth Identity and National Culture

Dr. Kamlesh Kumar Tewari*

Abstract:

This paper explores the multifaceted and dynamic influence of competitive sports on the construction of youth identity and its contribution to the national culture of India. With over 1.4 billion people, India presents a unique sociopolitical landscape where unifying forces are paramount. Sport, particularly mass-appeal disciplines like cricket, field hockey, and kabaddi, serves as a powerful agent of social cohesion and collective self-concept. Utilizing a mixed-methods research design—encompassing comprehensive surveys of youth, in-depth interviews with key sporting figures, and observational analysis of sports events—this study investigates how athletic participation and spectatorship foster a cohesive national narrative. The findings unequivocally demonstrate that sports significantly impact the psycho-social identity of Indian youth, cultivating core values such as discipline, resilience, teamwork, and an intensified sense of national pride and unity that transcends regional, linguistic, and socio-economic divisions. The implications of this research are critical for policymakers, educators, and sports administrators aiming to strategically leverage the cultural and psychological power of sports for comprehensive youth development and the strengthening of national solidarity.

Introduction: Sports as a Cultural Unifier

In the colossal and diverse nation of India, the role of sports extends far beyond mere physical recreation or entertainment; it is a deeply ingrained cultural phenomenon that acts as a vital crucible for forging a collective national consciousness. Despite its vast mosaic of regional dialects, religious practices, and varied ethnic histories, India frequently finds its most potent expression of unity on the global athletic stage. This study delves into the psychological and sociological mechanisms through which this unity is transmitted, specifically focusing on its impact on youth identity formation.

The scholarly consensus, as highlighted by works in global sports sociology (e.g., Maguire, 2006; Giulia Notti, 2005), posits that competitive athletics are critical for defining both individual self-concept and collective national narratives. For the youth, engagement with sports—whether as athletes or passionate spectators—provides a "social identity" intricately linked to national heritage and aspirations. This process is particularly pronounced in India, where the victories and struggles of national teams are often internalized as a proxy for national progress and self-esteem.

The Pillars of Sporting Influence:

The profound influence of sports on young people can be distilled into three interconnected psychological and social mechanisms:

Cultivation of National Pride and Allegiance: Sporting events, especially international tournaments, transform into arenas for expressing collective national identity. When an Indian team triumphs, the emotional investment of the public translates into a potent surge of patriotism and allegiance. This collective effervescence momentarily dissolves internal boundaries, replacing them with a singular, unified "Indian" identity.

The Embodiment of Core Cultural Values: Disciplines like cricket, field hockey, and kabaddi are not just games; they are cultural texts that narrate an Indian ethos. The commitment of athletes like Sachin Tendulkar (for perseverance) or Milkha Singh (for struggle and triumph) serves as a moral compass, promoting idealized national values such as discipline, integrity, self-sacrifice, and relentless hard work.

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A Shared History and Narrative: India's sporting history—from the dominance of field hockey in the mid-20th century to the global ubiquity of modern cricket—provides a shared cultural memory. This history is continually reinforced by contemporary achievements, giving young people a tangible, emotional connection to their national past and future.

Despite this evident importance, empirical research explicitly mapping the psychological pathways from sports engagement to youth identity and national culture in the specific Indian context remains underdeveloped. This paper aims to meticulously address this gap, moving beyond anecdotal evidence to provide a robust, data-driven analysis.

Conceptual Framework: Sports, Identity, and Soft Power

To fully grasp the scope of this study, it is essential to establish a clear conceptual framework that links individual psychology to mass social phenomena.

The Psychology of Identity Formation:

Identity, in psychological terms, is a structured sense of self, shaped by personal traits, goals, values, and social affiliations. For youth (ages 18–25), the stage of identity versus role confusion (Erikson, 1968) is paramount. Sports provide a safe and structured domain for experimentation with roles and the internalization of self-defining attributes. When a young person engages in a sport, they internalize the values associated with it (e.g., fairness, resilience) and adopt the social label of an "athlete" or a "fan," thus building a robust personal identity.

Social Identity Theory and National Culture:

Social Identity Theory (SIT), championed by Tajfel and Turner (1979), is the crucial lens for understanding the collective aspect. SIT posits that a person's self-concept is derived from perceived membership in relevant social groups (ingroups). For Indians, the nation is a primary ingroup. Sporting success enhances the perceived status of the national ingroup, leading to a phenomenon called "Basking in Reflected Glory" (BIRGing), where individuals feel better about themselves by association with a winning team. This psychological mechanism directly fuels the sentiment that "sports unite Indians across different cultures and regions."

The Soft Power of Sport and Community Building:

Expanding on the sociological analysis of Giulianotti (2005), the paper adopts a model arguing that the development of Indian sports is an interdependent system driven by three main factors: International Partnerships, Community Building (Soft Power), and Domestic Sports Development.

Soft Power: Sport acts as a classic tool of soft power (Nye, 2004)—the ability to influence through attraction and co-option rather than coercion. The success of a national team or a popular domestic league attracts global attention and investment. This process of community building is vital; it challenges the prevailing stereotypes that often limit career aspirations to one or two major sports by demonstrating that success, recognition, and financial reward are achievable across multiple disciplines.

International Partnerships: The model emphasizes that foreign investment, experienced coaches, and technical staff are attracted only when a sport demonstrates a potential fanbase and organizational maturity. Partnerships with established international leagues or clubs inject world-class knowledge and expose Indian athletes to higher competition standards.

Interdependence: A strong, passionate, and well-educated sporting community (Soft Power) makes India an attractive investment destination, fueling International Partnerships. These partnerships, in turn, raise the quality of the sport, which further increases domestic passion and fan following.

Research Methodology: A Mixed-Methods Approach

This study utilized a robust mixed-methods research design to ensure both the generalizability of quantitative data and the rich contextual depth of qualitative insights. This comprehensive approach allowed for triangulation of data, ensuring the validity of the findings regarding the link between sports and identity.

Research Design and Data Collection:

Survey Research (Quantitative Data): A structured questionnaire was administered to 1,000 Indian youth aged 18–25 years. Participants were selected using a random sampling technique across various colleges and universities throughout India to ensure regional diversity. The survey measured attitudes toward sports, participation rates, and the perceived influence of sports on personal identity and national sentiment.

Demographics: The sample comprised 60% Male and 40% Female respondents, all of whom were college/university students. A high percentage of 70% reported participating in sports regularly, indicating a strong baseline interest in the subject matter.

In-Depth Interviews (Qualitative Data): Thirty semi-structured interviews were conducted with a diverse group of sports icons, coaches, and senior sports administrators. These purposively sampled participants were chosen for their deep, expert knowledge and experience in the Indian sports ecosystem. The interviews sought nuanced perspectives on athlete development, infrastructure challenges, and the psychological role of sports in fostering national character.

Participant Observations: On-site observations were conducted at major sports events and local competitions. Detailed field notes were taken to document the emotional climate, spectator behavior, levels of patriotism, and observed manifestations of teamwork and fair play among young athletes and fans.

Data Analysis

Quantitative Analysis: Survey data were analyzed using SPSS software. Descriptive statistics established baseline findings (e.g., participation rates), while inferential statistics explored the strength of correlation between variables like sports participation and reported national pride.

Qualitative Analysis: Interview transcripts and observation notes were processed through NVivo software. Thematic analysis and coding techniques were applied to identify recurring themes, such as the perceived impact of political influence, the need for better grassroots development, and the personal experience of feeling "Indian" through sports.

Core Participation Findings (Cross-Gender Analysis)

A crucial finding emerged from the participation data, which contrasts the competitive engagement rates between genders:

Category	Male Respondents (n=600)	Female Respondents (n=400)
Competitive Sports Participation (Yes)	88.1%	76.5%
No Competitive Sports Participation (No)	11.9%	23.5%

While both genders show high engagement, the 11.6 percentage point gap in competitive participation suggests a discrepancy in opportunity, resource accessibility, or cultural encouragement. The higher non-participation rate among female respondents (23.5% vs. 11.9%) warrants further policy attention regarding infrastructure, safety, and cultural barriers that limit young women's competitive sporting careers.

Results and Detailed Analysis

The findings of this study provide empirical support for the hypothesis that sports profoundly shape both youth identity and national culture in India.

Sports and Individual Youth Identity

The quantitative results underscore the personal, psychological impact of sports on the surveyed youth:

Identity Shaping: A significant 80% of respondents strongly agreed that sports play a fundamental role in shaping their identity. This suggests that sports provide a crucial framework for self-understanding beyond academic or familial roles.

Personality Development: 75% of youth affirmed that involvement in sports helps them develop vital personality traits. The most commonly cited traits were discipline, teamwork, leadership, and resilience—qualities that are highly valued in the Indian educational and professional spheres. The structured, high-pressure environment of competition is a key agent in this psycho-social molding.

Sports and National Cultural Unity

The unifying power of sports across the national landscape was strongly validated:

Surge of National Pride: An overwhelming 90% of respondents reported feeling intense pride in their Indian identity when national teams achieve success in international sporting events. This data is the strongest evidence of the BIR Ging effect, demonstrating that sporting victory is instantaneously and broadly translated into a collective sense of national worth and efficacy.

Social Cohesion: 85% of respondents believed that sports successfully unite Indians across various linguistic, cultural, and regional fault lines. This confirms that major sports acts as a cultural lingua franca—a shared emotional experience that temporarily overrides the heterogeneity of the population, fostering a singular, pan-Indian identity.

Qualitative Insights: Obstacles and Aspirations

Interviews with sports icons and administrators provided critical context, highlighting structural challenges:

Infrastructure Deficit: The qualitative data repeatedly stressed the need for enhanced sports infrastructure and consistent funding. This goes beyond just stadiums to include grassroots development, modern training facilities, and investment in sports science and technology (e.g., performance monitoring, injury recovery protocols, and data analytics), which are often lacking outside of elite cricket.

The Problem of Selective Privatization and Political Influence: A key obstacle identified was the selective privatization of sports, which disproportionately funnels resources, sponsors, and media attention toward one dominant sport (cricket), starving others. Furthermore, the issue of political influence in governing bodies—where, as noted, a substantial percentage of sports leadership lacks practical sports knowledge—was cited as a major drag on genuine, meritocratic sports development (Srivatsava & Atreya, 2020).

Discussion: Leveraging Sports for National Development

The research confirms that sports are an invaluable, yet under-leveraged, asset for national development. The collective fervor generated by sports provides a unique opportunity to in still values, strengthen social fabric, and elevate India's global standing.

The Policy Imperative for Multi-Sport Excellence

While the cultural impact of sports is clear, the current structure limits the nation's true sporting potential. The findings necessitate a policy shift away from a 'one-sport nation' mentality toward multi-sport excellence. This requires strategic intervention in two core areas:

Investment in Human Capital: The high participation rates, even with limited resources, signal a vast reservoir of untapped talent. Transparency in scouting and grassroots development is non-negotiable. Programs must be established that are free from financial or political bias, offering equal opportunities and robust sports education (including nutrition, injury management, and psychology) to young athletes from all socio-economic strata.

Structural and Technological Modernization: Achieving global competitiveness is impossible without closing the technological gap with European and North American sports organizations. This means mandating investments in sports science, data analytics, and providing technical staff trained in the latest methodologies. The push to host internationally acclaimed tournaments (e.g., the FIFA U-17 World Cup, as cited) is a proven catalyst for accelerating infrastructure upgrades and exposing the grassroots level to world-class standards.

Community Building through Shared Spectatorship

The study highlights that a well-developed and educated sporting community is an essential prerequisite for attracting investment and sustaining development. If non-cricket sports can generate

houseful crowds with equal enthusiasm, the economic rationale for investment becomes self-evident. This requires innovative marketing strategies and improving the in-stadium experience to make watching all sports a high-quality, enjoyable, and accessible family activity, thereby strengthening the emotional and financial bond between the audience and the sport. The creation of strong, local, and regional fan communities for diverse sports reinforces the "soft power" concept, ultimately benefiting the country's image and influence globally.

Conclusion, Limitations, and Recommendations

The conclusion of this research strongly affirms that sports are a powerful, dual-edged tool, serving as a mirror and a forge for Indian youth identity and national culture. Participation and spectatorship cultivate vital character traits, while success on the global stage acts as an unmatched source of national unity and collective pride, transcending the country's diverse geography.

Limitations

While comprehensive, this study had inherent limitations:

Sample Skew: The survey sample was limited to college/university students, which may introduce a bias towards a higher socio-economic or more educationally privileged demographic. Further research should include youth from non-academic backgrounds.

Qualitative Scope: While 30 interviews provided depth, a wider pool of athletes across a greater variety of sports would enrich the understanding of discipline-specific challenges.

Recommendations for Policy and Practice

To fully capitalize on the potential of sports to shape a dynamic youth identity and strengthen national culture, the following recommendations are offered:

Mandate International Partnerships: Federations and clubs should be strongly incentivized to enter long-term partnerships with established international entities to facilitate the exchange of coaching expertise, training resources, and administrative best practices, thereby accelerating the catch-up in competitive standards.

Ensure Non-Selective, Transparent Resource Allocation: Implement policies to prevent the selective channeling of private and public funds toward a single sport. Establish independent auditing bodies to ensure transparency in scouting and grassroot funding to eliminate political and financial bias.

Promote Multi-Sport Spectatorship: Launch national campaigns focused on building a passionate fan base for non-cricket sports. This includes improving the event organization, game-day hospitality, and digital engagement to increase live attendance and television viewership, thereby driving the crucial Soft Power necessary for attracting future investment.

Integrate Sports Education and Science: Make sports science, psychological training, and nutrition education mandatory components of all national and state-level sports development programs to ensure that athletes are developed holistically, maximizing their long-term health and performance.

By strategically addressing these structural deficiencies and embracing sports as a fundamental psychological and cultural pillar, India can unleash its vast youth potential, secure its position as a multi-sport global power, and continually reaffirm its identity as a unified and aspiring nation.

References:

Chakraborty, A. (2022). The Politics of Play: Cricket and the Construction of Modern Indian Identity. Cambridge University Press.

D'Souza, R. (2023). Gender Disparity in Indian Competitive Sports: A Study of Access and Infrastructure in Urban and Rural Contexts. Journal of Youth Empowerment and Policy, 15(4), 45-68.

Gupta, S. (2021). Beyond the Boundary: Field Hockey's Enduring Legacy and the Making of Indian National Pride. New Delhi: Sporting Heritage Publications.

Kumar, V., & Singh, N. (2024). The Soft Power of Kabaddi: Tracing the Rise of an Indigenous Sport and its Global Appeal. International Journal of Sport Sociology, 28(1), 112-135.

Maguire, J. (2006). Global Sport: Identities, Ideologies and the Crisis of Cosmopolitanism. Sociology of Sport Journal, 23(1), 1-20.

Mehta, P. (2022). Grassroots to Global: Challenges and Opportunities in Indian Sports Administration. Springer Nature.

Sharma, S. (2025). Psycho-Social Correlates of National Identity: A Study of Youth Engagement in Indian Sporting Culture. Unpublished Doctoral Dissertation, Banaras Hindu University.

Srivastava, A., & Atreya, S. (2020). Political Economy of Indian Sports: Governance, Corruption, and the Developmental Bottleneck. Law in Sports Journal, 7(2), 150-175.

Verma, L. (2023). The Role of Fan Communities in Driving Investment: A Comparative Analysis of Cricket and Football in India. Asian Sports Management Review, 10(3), 200-225.

Promoter Shareholding Patterns and Corporate Control in India: An Empirical Analysis of Ownership Concentration in NSE-Listed Firms

Dr. Deepa B.*

Abstract

This research study examines the evolution of promoter shareholding patterns in NSE-listed companies over two decades (FY2001-FY2025), analyzing the relationship between ownership concentration and corporate control mechanisms in India's distinctive business environment. Using longitudinal data from CMIE Prowess covering approximately 2,000 listed firms, we document a gradual decline in average promoter ownership from 41.1% to 35.6%, reflecting regulatory interventions mandating minimum public float and market-driven dilution pressures. However, despite numerical decline, promoters retain dominant control through pyramidal structures, differential voting rights, and board composition strategies. We employ agency theory and the law-and-finance framework to analyze how concentrated family ownership shapes firm behavior, governance quality, and minority shareholder protection. The study reveals persistent tension between India's traditional promoter-centric model and evolving global governance standards. Our findings indicate that ownership concentration remains significantly higher than developed market benchmarks, with implications for capital allocation efficiency, tunnelling risks, and investor confidence. Policy recommendations emphasize strengthening independent director effectiveness, enhancing related-party transaction scrutiny, and calibrating ownership regulations to balance control stability with minority protection.

Keywords: promoter shareholding, ownership concentration, corporate control, family business groups, agency theory, corporate governance, emerging markets

1. Introduction

1.1 The Promoter-Centric Model in Indian Capitalism

India's corporate landscape exhibits a distinctive ownership structure characterized by concentrated promoter control, differentiating it markedly from the dispersed ownership patterns typical of Anglo-American markets (Bertrand et al., 2002; Claessens et al., 2000). The term "promoter"—unique to Indian corporate terminology—refers to individuals or entities exercising control over company management and policy, typically founding families and their affiliates (SEBI, 2021). This concentration reflects India's historical evolution of family-managed business houses, limited institutional investor presence during developmental phases, and cultural preferences for family enterprise continuity (Khanna & Palepu, 2000).

The promoter-centric model generates both benefits and costs. Proponents argue that concentrated ownership aligns incentives, enables long-term strategic orientation, reduces managerial agency costs, and facilitates decisive decision-making (Shleifer & Vishny, 1986). Critics contend that it exacerbates principal-principal conflicts between controlling and minority shareholders, creates tunneling opportunities, impedes professional management adoption, and constrains access to equity capital (La Porta et al., 1999; Young et al., 2008).

1.2 Background and Rationale

Over the past two decades, Indian promoter ownership has faced multiple pressures toward dilution: regulatory mandates for minimum 25% public float (increased from 10% in 2010), equity capital requirements for growth financing, global investor preferences for lower concentration, and governance reforms emphasizing board independence (SEBI, 2010, 2018). Data from NSE-listed companies reveals that promoter holdings declined from 41.1% in FY2001 to 35.6% in FY2025,

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representing a 5.5 percentage point reduction (CMIE Prowess, 2025). However, numerical dilution may not translate to proportional control reduction. Indian promoters employ sophisticated mechanisms to maintain effective control despite lower ownership stakes: pyramid structures enabling control through multiple corporate layers, cross-holdings among group companies, differential voting rights (though restricted), and strategic board composition (Bertrand et al., 2002; Gopalan & Jayaraman, 2012).

1.3 Research Objectives

This research study is based on four specific objectives:

1. To document and analyze temporal trends in promoter shareholding patterns across NSE-listed firms from FY2001 to FY2025
2. To examine the relationship between ownership concentration and corporate control mechanisms in the Indian context
3. To assess the governance implications of concentrated promoter ownership for minority shareholder protection and firm performance
4. To evaluate regulatory interventions aimed at moderating ownership concentration and their effectiveness

1.4 Contribution and Significance

This study contributes to corporate governance literature in three dimensions. First, it provides comprehensive longitudinal evidence on ownership evolution in India's listed universe, extending previous studies that examined shorter time frames or smaller samples. Second, it bridges theoretical frameworks from agency theory and law-and-finance literature with India's institutional specificities, offering contextually grounded analysis. Third, it generates policy-relevant insights for emerging markets grappling with similar ownership concentration challenges, positioning India's experience within comparative corporate governance discourse.

2. Literature Review

The theoretical foundation of promoter ownership research rests on two primary frameworks: agency theory and the law-and-finance perspective. Classical agency theory, developed by Jensen and Meckling (1976), originally focused on Type I agency problems between managers and dispersed shareholders in contexts like the United States and United Kingdom. However, this framework proves inadequate for understanding concentrated ownership environments characteristic of most global markets, including India. Subsequent scholarship distinguished Type II agency problems—conflicts between controlling and minority shareholders—as the dominant concern in concentrated ownership structures. In these contexts, controlling shareholders can extract private benefits through related-party transactions, asset tunneling, and preferential resource allocation. The law-and-finance framework, pioneered by La Porta et al. (1998), establishes that legal origin and investor protection quality fundamentally shape ownership patterns. Paradoxically, despite India's common-law heritage, it demonstrates ownership concentration typical of civil-law jurisdictions due to weak enforcement, judicial delays, and regulatory gaps, though recent reforms like the Companies Act 2013 and enhanced SEBI regulations attempt to address these institutional weaknesses.

Empirical research on Indian promoter ownership reveals consistently high concentration levels and evolving governance challenges. Early studies documented average promoter holdings of 51-55% during the 1990s and early 2000s, establishing correlations between concentrated ownership and both monitoring benefits and expropriation risks. Subsequent research examined specific mechanisms through which Indian business groups create and destroy value, with Bertrand et al. (2002) documenting extensive tunneling through non-operating company transfers and Dharmapala and Khanna (2013) showing how business group affiliation generates dual effects through internal capital markets. International comparative studies position India within broader East Asian and emerging market patterns, where separation of cash flow rights from control rights enables disproportionate control despite modest ownership stakes. Despite this substantial body of work, significant gaps remain: most studies examine pre-2015 periods preceding recent regulatory reforms,

limited research disaggregates promoter categories or examines within-promoter dynamics, and few studies explicitly model how promoters maintain effective control despite numerical ownership dilution through pyramidal structures, cross-holdings, and board composition strategies.

3. Conceptual Framework and Methodology

3.1 Theoretical Framework

This study adopts an integrated analytical framework synthesizing three theoretical perspectives:

Agency Theory Lens: Examines how promoter ownership concentration affects Type II agency costs, tunneling incentives, and minority shareholder expropriation potential (Young et al., 2008).

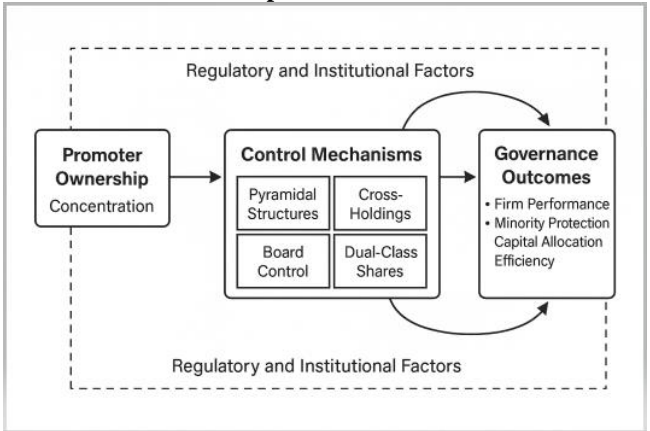
Control Rights Framework: Distinguishes between cash flow rights (economic ownership) and control rights (voting power), analyzing devices enabling disproportionate control relative to ownership (Claessens et al., 2000).

Institutional Theory Perspective: Considers how India's regulatory environment, legal infrastructure, and enforcement capacity shape ownership patterns and governance outcomes (La Porta et al., 1998).

Figure 1 presents the integrated conceptual model linking ownership concentration to control mechanisms and governance outcomes.

Figure 1

Conceptual Model of Promoter Ownership, Control Mechanisms, and Governance Outcomes



This framework illustrates the relationship between promoter ownership concentration (primary dimension), control-enhancing mechanisms (intermediate layer including pyramidal structures, cross-holdings, board control, and voting rights arrangements), and ultimate governance outcomes (firm performance, minority protection, and capital allocation efficiency). Regulatory interventions and institutional quality moderate these relationships, while feedback loops indicate dynamic adjustments over time.

3.2 Data Sources and Sample Construction

This study utilizes secondary data from multiple sources:

Primary Database: CMIE Prowess, providing comprehensive ownership data for NSE-listed companies from FY2001 to FY2025, covering approximately 1,800-2,000 firms depending on listing status in each year.

Regulatory Data: SEBI shareholding pattern disclosures, Companies Act filings, and stock exchange announcements supplementing Prowess data.

Governance Metrics: Board composition data, related-party transaction disclosures, and corporate governance compliance reports.

Sample Selection: The analysis focuses on non-financial firms (excluding banks, NBFCs, and insurance companies) with complete data availability for key variables. The final sample comprises approximately 1,500 firms per year, representing over 85% of NSE market capitalization.

3.3 Analytical Approach

The methodology combines:

1. **Descriptive Statistics:** Temporal trends in mean, median, and distribution of promoter ownership across sample period
2. **Cross-Sectional Analysis:** Ownership patterns across firm size categories, sectors, and business group affiliation
3. **Comparative Assessment:** India's ownership concentration benchmarked against international patterns
4. **Qualitative Analysis:** Case examination of control mechanisms employed despite ownership dilution
5. **Regulatory Impact Evaluation:** Before-after analysis of policy interventions affecting ownership structure

4. Analysis and Discussion

4.1 Temporal Evolution of Promoter Ownership

Analysis of NSE-listed company data reveals four distinct phases in promoter ownership evolution:

Phase I (FY2001-FY2005): High Concentration Era During this period, promoter ownership averaged 41.1% in FY2001, declining marginally to 40.2% by FY2005. This phase represented the post-liberalization consolidation period, with limited pressure for ownership dilution. The median firm exhibited 48% promoter holding, indicating substantial concentration across the distribution (CMIE Prowess, 2025).

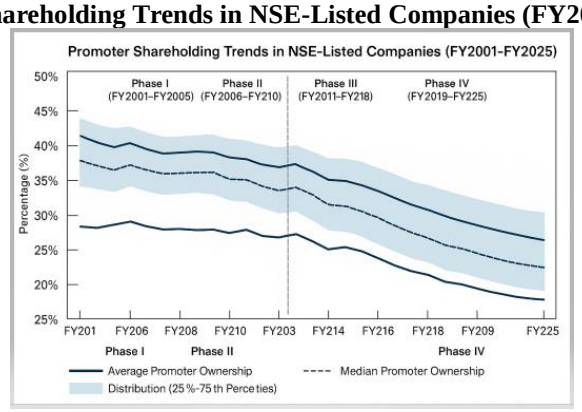
Phase II (FY2006-FY2010): Pre-Regulatory Stability Promoter holdings stabilized between 39-41%, reflecting balanced forces of equity capital requirements for expansion against minimal regulatory dilution pressure. The 2008 global financial crisis temporarily elevated promoter stakes as share buybacks and preferential allotments increased promoter proportions in several firms (Pandey & Rao, 2020).

Phase III (FY2011-FY2018): Regulatory-Driven Dilution Implementation of the 25% minimum public float regulation (effective 2010-2013 depending on firm category) precipitated systematic promoter dilution. Average promoter ownership declined from 40.7% (FY2010) to 36.2% (FY2018), representing a 4.5 percentage point decrease. This period witnessed substantial secondary market sales, offer-for-sale mechanisms in IPOs, and strategic investor placements reducing promoter stakes (Marisetty & Subrahmanyam, 2010).

Phase IV (FY2019-FY2025): Stabilization at Lower Levels Promoter ownership stabilized around 35-36%, suggesting a new equilibrium reflecting regulatory constraints, market preferences, and capital requirements. FY2025 data shows 35.6% average promoter holding, though substantial cross-sectional variation persists (range: 15% to 75%) (CMIE Prowess, 2025).

Figure 2

Promoter Shareholding Trends in NSE-Listed Companies (FY2001-FY2025)



This graph depicts the temporal trajectory of average promoter ownership (primary line), along with median promoter ownership (secondary line) and distribution percentiles (25th and 75th percentiles shown as shaded band). The graph highlights four distinct phases, regulatory intervention points (marked by vertical dashed lines), and persistent divergence between mean and median indicating skewed distribution toward higher concentration.

4.2 Cross-Sectional Patterns and Heterogeneity

Promoter ownership exhibits substantial heterogeneity across multiple dimensions:

Firm Size: Large-cap companies (BSE 100) demonstrate lower average promoter ownership (31.2%) compared to mid-cap (37.8%) and small-cap firms (42.5%), reflecting greater pressure for dilution among high-visibility companies and enhanced access to equity capital by larger firms (Kumar & Singh, 2022).

Sectoral Variation: Technology and pharmaceutical sectors show lower promoter concentration (averaging 28-32%) due to frequent equity issuances, employee stock options, and global investor preferences. Conversely, traditional manufacturing and infrastructure sectors maintain higher concentration (38-44%), reflecting capital-intensive nature and family business dominance (Chakrabarti, 2021).

Business Group Affiliation: Group-affiliated firms exhibit paradoxical patterns—numerically lower individual company promoter stakes (due to cross-holding complexities) but effectively higher control through group-level pyramidal ownership. Standalone firms demonstrate more transparent ownership-control alignment (Gopalan & Jayaraman, 2012).

Listing Vintage: Recently listed firms (post-2015 IPOs) enter markets with lower promoter ownership (averaging 62-65% post-listing vs. 70-75% for earlier cohorts), reflecting SEBI's emphasis on higher offer-for-sale components in public offerings (NSE, 2024).

4.3 Control Mechanisms Beyond Numerical Ownership

Despite promoter ownership decline, effective control maintenance operates through multiple mechanisms:

Pyramidal Structures: Indian business groups extensively employ pyramidal ownership, where holding companies control operating companies through intermediate corporate layers. This structure enables control with limited capital commitment. For instance, a promoter owning 51% of Holding Company A, which owns 51% of Operating Company B, exercises control over B with only 26% ultimate cash flow rights (Bertrand et al., 2002).

Cross-Holdings: Group companies hold shares in each other, creating circular ownership patterns. While SEBI regulations limit certain cross-holding forms, complex structures persist. These arrangements inflate effective control while diluting outside shareholders' economic claims (Dharmapala & Khanna, 2013).

Board Composition Strategy: Even with minority ownership (35-40%), promoters maintain board dominance through: executive director positions for family members, nomination of "independent" directors with business relationships, and selection of compliant professional directors. Empirical evidence suggests that board voting patterns reflect promoter preferences even when numerical independence requirements are satisfied (Sarkar & Sarkar, 2018).

Differential Voting Rights (DVRs): Although DVR equity remains limited in India (SEBI permitted with restrictions in 2019), some firms employ these instruments enabling disproportionate voting power relative to economic exposure. International evidence suggests DVRs represent potent control maintenance tools (Bennedsen & Nielsen, 2010).

Shareholder Agreements: Private agreements among shareholders—particularly involving private equity or strategic investors—often include voting arrangements, board nomination rights, and veto powers that effectively enhance promoter control beyond numerical ownership (Khanna & Varottil, 2018).

4.4 Governance Implications

Concentrated promoter ownership generates multifaceted governance consequences:

Positive Dimensions:

Reduced Type I Agency Costs: Owner-managers demonstrate stronger incentive alignment than professional managers in dispersed ownership firms, potentially enhancing operational efficiency and long-term orientation (Kumar, 2017).

Monitoring Effectiveness: Concentrated ownership facilitates direct oversight, reducing information asymmetry and enabling swift decision-making without extensive consensus-building processes (Shleifer & Vishny, 1986).

Entrepreneurial Dynamism: Family promoters often demonstrate strong entrepreneurial drive, risk-taking capacity, and strategic vision, contributing to firm growth and innovation (Gedajlovic et al., 2012).

Negative Dimensions:

Tunneling and Self-Dealing: Concentrated control creates opportunities for related-party transactions, asset transfers, and resource diversion benefiting promoters at minority shareholders' expense. Indian evidence documents extensive tunneling within business groups (Bertrand et al., 2002; Balasubramanian et al., 2010).

Professional Management Constraints: Family control may impede hiring of optimal managerial talent, with executive positions reserved for less-qualified family members. Succession practices often prioritize blood relations over competence (Bloom & Van Reenen, 2007).

Capital Access Limitations: High ownership concentration constrains equity capital raising capacity, as promoter dilution concerns limit issuance appetite. This potentially restricts growth financing and optimal capital structure (Gopalan et al., 2021).

Minority Shareholder Vulnerability: Dispersed minority shareholders face collective action problems in challenging promoter decisions, voting against resolutions, or enforcing legal rights. Limited activist institutional investors exacerbate this vulnerability (Sarkar & Sarkar, 2018).

Figure 3

Governance Implications of concentrated Promoter Ownership

The illustration "Governance Implications of Concentrated Promoter Ownership" summarizes both the strengths and risks associated with promoter-dominated firms. On the positive side, concentrated ownership enhances incentive alignment, monitoring efficiency, and entrepreneurial dynamism. Conversely, it also increases risks of tunneling and self-dealing, restricts professional management and capital access, and exposes minority shareholders to vulnerability due to weak collective action and limited oversight. The framework highlights the dual nature of promoter control in shaping governance quality and corporate outcomes.

4.5 Comparative International Perspective

International comparison contextualizes India's ownership concentration:

- **United States:** Average insider (comparable to promoter) ownership in S&P 500 companies approximates 15-18%, with most firms exhibiting dispersed ownership (Anderson & Reeb, 2003)
- **United Kingdom:** FTSE 250 companies show 20-25% average controlling shareholder ownership, significantly lower than India (Franks et al., 2012)
- **Continental Europe:** Family ownership averages 30-35% in listed companies, more comparable to India but with stronger legal protections (Faccio & Lang, 2002)
- **East Asia:** Ownership concentration in Japan (25-30%), South Korea (40-45%), and Southeast Asia (45-55%) provides closer parallels, particularly regarding business group structures (Claessens et al., 2000)

India's 35-36% current promoter ownership positions it toward the higher end of listed company concentration globally, though significantly lower than median emerging market family firms (often exceeding 50%). This positioning reflects ongoing transition between traditional concentrated models and evolving global governance norms.

6. Conclusion and Policy Implications

6.1 Summary of Key Findings

This two-decade empirical examination of promoter shareholding in NSE-listed companies yields several significant findings:

Gradual Numerical Dilution: Promoter ownership declined from 41.1% (FY2001) to 35.6% (FY2025), primarily driven by regulatory mandates for minimum public float and capital-raising requirements. This 5.5 percentage point reduction represents meaningful, though modest, ownership dispersion.

Persistent Control Concentration: Despite numerical dilution, promoters maintain dominant control through pyramidal structures, cross-holdings, board composition strategies, and shareholder agreements. Effective control substantially exceeds cash flow ownership in business group-affiliated firms.

Heterogeneous Patterns: Substantial cross-sectional variation exists across firm size, sectors, group affiliation, and listing vintage. Large-cap firms and recently listed companies demonstrate lower concentration, while small-caps and traditional sectors maintain higher levels.

Ambiguous Governance Impact: Concentrated promoter ownership generates both benefits (reduced Type I agency costs, effective monitoring, long-term orientation) and costs (tunneling potential, professional management constraints, minority shareholder vulnerability). Net effects vary across firm contexts.

Regulatory Progress with Limitations: Policy interventions achieved numerical ownership reduction but proved less effective in addressing control-enhancing mechanisms. Governance reforms improved formal compliance but struggle with substantive behavioral change.

6.2 Theoretical Implications

These findings inform corporate governance theory in several dimensions:

Agency Theory Refinement: The Indian evidence underscores Type II agency problems' dominance in concentrated ownership contexts. Theoretical models must account for controlling-minority conflicts, tunneling mechanisms, and control-ownership divergence beyond classical manager-shareholder frameworks.

Institutional Complementarity: Ownership patterns reflect institutional quality beyond formal legal structures. India's high concentration persists despite common-law heritage and improving regulations, indicating that enforcement capacity, judicial efficiency, and social norms critically mediate legal frameworks' effectiveness.

Optimal Ownership Debate: The evidence supports contingent rather than universal optimal ownership prescriptions. Concentrated ownership's net governance impact depends on institutional

quality, minority protection enforcement, transparency requirements, and market discipline effectiveness.

6.3 Policy Recommendations

Based on this analysis, we propose several policy interventions:

1. Enhanced Related-Party Transaction (RPT) Scrutiny : Current disclosure norms are inadequate to curb tunneling and self-dealing. To strengthen oversight, all material RPTs should be mandatorily approved by a majority of minority shareholders, excluding promoter votes. Significant asset transfers must undergo independent valuation, and approvals should be disclosed in real time rather than limited to quarterly reports. Furthermore, the definition of "related parties" should be expanded to include indirect and beneficial ownership chains to ensure comprehensive transparency.

2. Strengthened Independent Director Framework : Regulations focusing only on numerical independence must evolve toward ensuring actual effectiveness. This includes introducing enhanced qualification and expertise criteria, mandatory training programs on sector-specific risks, and prohibiting indirect business relationships with promoters or affiliated firms. Independent directors should face greater liability for governance failures, supported by institutional mechanisms such as director databases, liability insurance, and clear indemnification provisions to reinforce accountability.

3. Transparency of Control Structures : Pyramid ownership and cross-holdings often obscure true control within corporate groups. To address this, firms should be required to disclose ultimate beneficial ownership beyond immediate shareholders and clarify control rights alongside cash flow rights. Shareholder agreements influencing control must be publicly accessible, and a centralized database should record group affiliations and inter-company linkages, enabling clearer assessment of ownership influence and governance risk.

4. Calibrated Ownership Regulations : A uniform approach to ownership regulation may not suit the diversity of firms in India's capital market. A differentiated framework should be adopted—mandating higher minimum public float requirements for large-cap and high-visibility firms while granting flexibility to smaller or growth-oriented enterprises. Time-bound exemptions for promoter dilution post-regulatory changes may be necessary, acknowledging that the optimal level of ownership concentration depends on factors such as sector characteristics, firm life cycle, and capital intensity.

5. Institutional Investor Empowerment : Institutional investors must be strengthened as a counterbalancing force in corporate governance. This can be achieved through regulatory encouragement of shareholder activism and engagement, development of a robust proxy advisory ecosystem, and mechanisms that facilitate coordination among institutional investors without breaching concert party restrictions. Additionally, mandatory disclosure of institutional voting behavior will enhance accountability and transparency in market-based governance.

6. Minority Shareholder Protection Enhancement : Protecting minority shareholders requires both stronger legal rights and effective enforcement mechanisms. Class action lawsuits should be facilitated to address collective grievances, supported by fast-track judicial processes for corporate governance disputes. SEBI's investigative and enforcement capacity must be expanded, and specialized tribunals should be established to adjudicate governance-related conflicts. Whistleblower protection mechanisms should also be reinforced to encourage reporting of misconduct without fear of retaliation.

6.4 Conclusion

Promoter ownership concentration remains both a defining characteristic and a persistent policy challenge in India's corporate governance landscape. Over the past two decades, ownership structures have become modestly more dispersed due to regulatory interventions and evolving market dynamics; yet, fundamental concentration endures, sustained by complex control mechanisms that allow promoters to maintain dominance even amid dilution. Achieving the right balance requires nuanced policy calibration—recognizing that complete ownership dispersion may neither suit India's

business ethos nor be optimal for all governance contexts. Concentrated ownership can foster long-term strategic vision and entrepreneurial commitment, but unchecked control risks minority shareholder exploitation and weakens investor confidence. The optimal approach thus lies in promoting flexible ownership models that respect promoter-led enterprise while reinforcing transparency, accountability, and minority protection. As India deepens its integration into global capital markets, governance quality will increasingly determine the competitiveness and credibility of its corporate sector. This study provides empirical insights and policy direction to help navigate this delicate balance between preserving entrepreneurial strengths and advancing toward global standards of corporate accountability.

References

Anderson, R. C., & Reeb, D. M. (2003). Founding-family ownership and firm performance: Evidence from the S&P 500. The Journal of Finance, 58(3), 1301–1328.

Balasubramanian, N., Black, B. S., & Khanna, V. (2010). The relation between firm-level corporate governance and market value: A study of India. Emerging Markets Review, 11(4), 319–340.

Bennedsen, M., & Nielsen, K. M. (2010). Incentive and entrenchment effects in European ownership. Journal of Banking & Finance, 34(9), 2212–2229.

Bertrand, M., Mehta, P., & Mullainathan, S. (2002). Ferreting out tunneling: An application to Indian business groups. The Quarterly Journal of Economics, 117(1), 121–148.

Bloom, N., & Van Reenen, J. (2007). Measuring and explaining management practices across firms and countries. The Quarterly Journal of Economics, 122(4), 1351–1408.

Chakrabarti, R. (2021). Corporate ownership structures in India: Evolution and policy implications. Journal of Corporate Finance Studies, 16(2), 145–172.

Claessens, S., Djankov, S., & Lang, L. H. P. (2000). The separation of ownership and control in East Asian corporations. Journal of Financial Economics, 58(1–2), 81–112.

CMIE Prowess. (2025). Ownership pattern database: NSE-listed companies FY2001–FY2025. Centre for Monitoring Indian Economy.

Dharmapala, D., & Khanna, V. S. (2013). Corporate governance, enforcement, and firm value: Evidence from India. Journal of Law, Economics, and Organization, 29(5), 1056–1084.

Faccio, M., & Lang, L. H. P. (2002). The ultimate ownership of Western European corporations. Journal of Financial Economics, 65(3), 365–395.

Franks, J., Mayer, C., & Wagner, H. F. (2012). The survival of family firms: Evidence from the UK. Journal of Applied Corporate Finance, 24(2), 19–32.

Gedajlovic, E., Carney, M., Chrisman, J. J., & Kellermanns, F. W. (2012). The adolescence of family firm research: Taking stock and planning for the future. Journal of Management, 38(4), 1010–1037.

Gopalan, R., & Jayaraman, S. (2012). Private control benefits and earnings management: Evidence from insider-controlled firms. Journal of Accounting Research, 50(1), 117–157.

Gopalan, R., Khanna, T., & Raymar, A. (2021). Business groups and capital allocation: Evidence from India. Review of Financial Studies, 34(3), 967–1003.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics, 3(4), 305–360.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. Econometrica, 47(2), 263–291.

Khanna, T., & Palepu, K. (2000). Emerging market business groups, foreign investors, and corporate governance. In R. Morck (Ed.), Concentrated Corporate Ownership (pp. 265–294). University of Chicago Press.

Khanna, V., & Varottil, U. (2018). Corporate governance in India: Regulatory mandates and market realities. National Law School Journal, 13(1), 45–67.

Kumar, P. (2017). Promoter ownership, firm performance, and corporate governance in India. Indian Journal of Corporate Governance, 10(1), 1–15.

Kumar, V., & Singh, R. (2022). Ownership concentration and firm value: Evidence from India. Asia-Pacific Journal of Management Research and Innovation, 18(3), 251–269.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and finance. Journal of Political Economy, 106(6), 1113–1155.

La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (1999). Corporate ownership around the world. The Journal of Finance, 54(2), 471–517.

Marisetty, V. B., & Subrahmanyam, M. G. (2010). Group affiliation and the performance of IPOs in the Indian stock market. Journal of Financial Intermediation, 19(2), 242–261.

NSE. (2024). Annual market review 2023–24. National Stock Exchange of India.

Pandey, A., & Rao, S. (2020). Family ownership, governance reforms, and promoter dilution in India. Journal of Financial Policy & Regulation, 6(2), 91–115.

Sarkar, J., & Sarkar, S. (2018). Bank ownership, board characteristics and performance: Evidence from commercial banks in India. International Journal of Financial Studies, 6(1), 17.

SEBI. (2010). Mandatory minimum public shareholding guidelines for listed companies. Securities and Exchange Board of India.

SEBI. (2018). Report on corporate governance framework reforms. Securities and Exchange Board of India.

SEBI. (2021). Initiatives on promoter definition and reclassification norms. Securities and Exchange Board of India.

Shleifer, A., & Vishny, R. W. (1986). Large shareholders and corporate control. Journal of Political Economy, 94(3, Part 1), 461–488.

Supreme Court of India. (2021). Tata Sons Pvt. Ltd. v. Cyrus Investments Pvt. Ltd. and others (Civil Appeal No. 440-441).

Varottil, U. (2018). The evolution of the Tata-Mistry corporate battle: Lessons for India's corporate governance. Indian Law Review, 2(1), 47–72.

Young, M. N., Peng, M. W., Ahlstrom, D., Bruton, G. D., & Jiang, Y. (2008). Corporate governance in emerging economies: A review of the principal–principal perspective. Journal of Management Studies, 45(1), 196–220.

Child and Maternal Nutrition of Tharus in West Champaran District of Bihar

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Abstract

Health is defined as a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity. Recognizing the significance of health, the Government of India launched the National Rural Health Mission (NRHM) to introduce necessary structural reforms in the healthcare delivery system and achieve overall health improvement.

This study examines the status of child and maternal nutrition in the West Champaran district of Bihar.

Keywords: District Initiatives; Priority Areas; District-Specific Priorities

Introduction

Health plays a vital role in the process of economic and social development and in enhancing the quality of life. Acknowledging this, the Government of India initiated several health programs under the National Rural Health Mission (NRHM) to ensure equitable access to healthcare for all citizens.

West Champaran, one of Bihar's most underdeveloped districts, is ranked among the bottom of the 90 minority-concentrated districts in India. As per the 2001 Census, the district had a population of 27.33 lakhs, with about 90% living in rural areas. Scheduled Castes constitute 15% of the total population, which is slightly lower than the state average of 16.4%.

Less than one-third of the villages in West Champaran have Primary Health Centres (PHCs) located within 5 km. Limited access to health services significantly hampers their utilization. Over 10% of Hindu households and nearly 20% of Muslim households still depend on traditional or home-based remedies. Only 44.92% of Hindu and 39.03% of Muslim households have fully immunized children below the age of five years. Institutional delivery remains very low at 17%, while only one-third of women receive adequate pre-natal and post-natal care.

District Initiatives

Approximately 94.04% of households in the district lack toilet facilities and practice open defecation—96.78% among Hindu and 90.01% among Muslim households. Drainage systems are also poorly developed. There is little variation between Hindu and Muslim households in terms of sanitation, reflecting a uniform deficiency across rural communities.

The National Rural Health Mission (NRHM), launched by the Ministry of Health and Family Welfare, Government of India, seeks to improve access to quality health services for the most disadvantaged populations and to raise the overall health standards of rural communities. The mission aims to deliver essential maternal and child health services, including antenatal care, postnatal care, iron and folic acid (IFA) supplementation to prevent anemia, and other reproductive and child health interventions.

It also emphasizes institutional deliveries to reduce maternal and infant mortality, immunization coverage, family planning, and disease control.

NRHM adopts a sector-wide approach, integrating vertical health programs with initiatives addressing sanitation, nutrition, and safe drinking water. It focuses on enhancing healthcare access for rural populations—especially women and children—through decentralized planning, community participation, and district-level management.

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A coordinated approach that combines efforts in nutrition, sanitation, hygiene, and safe water supply is essential. The mission also aims to increase public health expenditure, reduce geographical disparities in healthcare infrastructure, strengthen human resources, and upgrade existing health facilities to meet the Indian Public Health Standards (IPHS).

Priority Areas

The NRHM encompasses a wide range of health concerns, including determinants such as nutrition and sanitation. Despite increased budgetary allocation, resources remain limited, making it necessary to identify and emphasize specific priority areas.

The following are the key priorities identified for West Champaran district:

1. Improving maternal and child health through complete immunization and comprehensive antenatal and postnatal care.
2. Strengthening family planning services.
3. Reducing morbidity and mortality from diseases such as Kala-azar, malaria, and tuberculosis through effective control and surveillance programs.
4. Expanding healthcare infrastructure in proportion to population needs.
5. Enhancing capacity building of healthcare personnel.
6. Addressing the problem of adverse sex ratio.
7. Promoting behavioral change communication for improved health awareness.
8. Ensuring adequate supply of essential medicines, particularly at the primary level for economically weaker sections.
9. Developing sustainable health financing systems to safeguard marginalized communities.
10. Strengthening Health Management Information Systems (HMIS) for accurate data collection, monitoring, and evidence-based decision-making.
11. Promoting inter-sectoral convergence among health, nutrition, water, and sanitation departments.
12. Strengthening the Civil Surgeon's Office for improved health administration.
13. Ensuring quality healthcare services at all levels of the district.

District-Specific Priorities

1. Infrastructure Development: Expand the number of Sub-Health Centres (SHCs), Additional Primary Health Centres (APHCs), PHCs, and urban health centers to serve slum and urban populations. Special focus should be placed on operationalizing all APHCs.
2. Maternal Health: Establish a comprehensive system for institutional deliveries through delivery huts and Emergency Obstetric Care (EmOC) services. Extend the benefits of the Janani Bal Suraksha Yojana (JBSY) to all poor households. Set up Blood Storage Units at district hospitals, develop all PHCs into First Referral Units (FRUs), and ensure 24×7 operational PHCs with efficient referral mechanisms.
3. Neonatal and Child Health: Introduce neonatal care services at APHCs and PHCs, organize Integrated Management of Neonatal and Childhood Illness (IMNCI) training, and address anemia and malnutrition among children. Implement a comprehensive School Health Program.
4. Family Planning: Increase the coverage of spacing methods and promote Non-Scalpel Vasectomy (NSV) among men to encourage male participation in family planning.
5. Immunization: Achieve universal immunization coverage for all eligible children and mothers to minimize preventable diseases.
6. Adolescent Health: The focus is on provision of Adolescent Reproductive and Sexual health education through schools and also awareness building on good health practices, responsible family life, and harmful effects of Alcoholism.
7. National Disease Control Programmes: Prevention Vector borne diseases especially Kalazar which is very rampant in the district. The control on malaria & TB also remains high on the agenda.

8. Gender & Equity: Implementation of PNDT Act 1995 through regular monitoring of Ultrasound Clinics and regular meetings of advisory committee. Increase in BCC/IEC activities for awareness of PNDT Act.
9. Demand Generation, IEC/BCC: Nutrition, Health & RCH Education to Adolescents, Behaviour Change in the difficult Populations and for improving the adverse sex ratio. Health Plan for each village through Village Health Committee of the Panchyat.
10. Programme Management: Better functioning of the District Health Society and a strengthened Civil Surgeon's Office and establishing BPMU.
11. Human Resources: Filling of the vacancies as per the population based norms for the year 2010-11, increased mobility, motivational issues, provision of quarters at all facilities, Availability of well trained ASHAs for each 1000 population
12. Capacity Building: Focussed capacity building in Emergency Obstetric Care, Continuous skill building of all personnel as per needs expressed and also the new job responsibilities under NRHM. Training and capacity building of Panchayati Raj Institutions to establish decentralized and participative planning and training of all ASHAs.
13. Procurement and Logistics: Construction of a scientific Warehouse for Drugs
14. Monitoring and Evaluation: Data validation and computerized data availability upto PHCs with district linkages
15. Intersectoral Convergence: Fixing Responsibilities of each sector for their accountability and hence better Intersectoral Coordination and ensure Inter Sectoral convergence with nutrition, Drinking water & sanition programme to derive synergies.
16. Public-Private Partnership: Increase in the number of private facilities for accreditation with the Government for providing services

Conclusion

The NRHM has a strong realization that it is important to involve community for the improvement of health status of the community through various stake holders such as ASHA, AWWS, PRI, NGOs etc. ASHA is a link worker between the client and the health service providers. The skill of the health functionaries such as ANMS LHVs should be upgraded through proper orientation to ensure quality of care in health services. Apart from that there is a need to strengthen the infrastructure and area of human resource for getting the quality of care in health services at the health centres

To achieve the better health status of the District, there is need to develop a District Health Action plan. There is need to conduct situational analysis by going through available data of health delivery centres, and making community interaction at grass-root level with PRI, Local power group etc.

References

William Crooke, The Tribes and Casts of the North-Western Province and Oudh, 1896, Calcutta, (Reprinted Edition), Titled "The Tribes and Casts of the North-Western India", Vol -IV, 1975, Delhi.

Ashish Kothri, Neena Singh and Saloni Suri, People & Protected Area, (ed,), Sage Publications India Pvt. Ltd., New Delhi, 1996.

S.Prasad, The Demographic study of Tharus in Bihar; Goberdhan- A case study. X International Congress of Anthropology and Ethnology, Science, abstract, Vol-1:259, 1978, New Delhi.

Revisiting Integral Humanism: Pathways to Sustainable Futures

Prof. K. K. Singh*

Pandit Deendayal Upadhyay was a visionary leader and philosopher whose ideas continue to resonate in India's socio-political landscape. Born on September 25, 1916, Upadhyay was a thinker deeply rooted in Indian culture and tradition while embracing modernity with a strong belief in self-reliance and holistic development. His concept of "Integral Humanism" laid the foundation for an approach to development that balances economic progress with social justice and environmental sustainability, making his ideas particularly relevant in today's discourse on sustainable development practices.

Integral Humanism, the philosophy propounded by Pandit Deendayal Upadhyay, argues for an approach to human development that addresses the physical, intellectual, moral, and spiritual dimensions of individuals. This philosophy challenges the narrow focus on materialism typical of Western models of development and advocates for a development paradigm that recognizes the interconnectedness of people, society, and nature. It stresses the importance of utilizing India's indigenous knowledge systems, cultural heritage, and local practices to foster development that is socially inclusive and environmentally sustainable.

The relevance of Pandit Deendayal Upadhyay's vision for sustainable development can be understood by exploring how his ideas encourage harmony between economic growth, social equity, and ecological balance. He emphasized self-sustaining rural communities as the backbone of the nation's economic strength, highlighting the need for empowering villages through local governance, indigenous technology, and agriculture that respects natural cycles. This rural-centric development approach discourages over-dependence on urban industrialization alone and promotes a decentralized and equitable distribution of resources.

In terms of environmental sustainability, Upadhyay's ideology reminds us to view nature as a vital partner rather than a mere resource to be exploited. He advocated for a society that lives in consonance with nature, respecting its limits and cycles. This principle aligns closely with contemporary sustainable development goals that emphasize conservation, biodiversity, and the prudent use of natural resources. In today's context, following such principles translates into promoting organic farming, water conservation, renewable energy adoption, and waste management practices that reduce pollution and ecological degradation.

Another important facet of Upadhyay's thought is his insistence on moral and ethical dimensions of development. Sustainable development is not merely about infrastructure or technology but involves inculcating values like responsibility, cooperation, and respect for life in every individual. His vision encourages community participation and democratic decision-making as vital elements for the successful implementation of development initiatives that meet both present and future needs without compromising the environment or social welfare.

The economic policies inspired by Upadhyay's Integral Humanism advocate for balanced growth that neither disregards the marginalized nor sacrifices ecological health for short-term gains. He proposed a system where industries and enterprises are oriented toward social welfare rather than mere profit maximization. This notion finds resonance in modern concepts such as corporate social responsibility (CSR) and social entrepreneurship that aim to integrate business success with societal good. His idea of "Antyodaya"—uplifting the last person in society—underlines the importance of inclusive growth and poverty alleviation efforts that align well with sustainable development goals globally recognized today.

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In practical terms, implementing sustainable development practices in line with Upadhyay's philosophy involves strengthening rural economies by improving agricultural productivity through eco-friendly methods, promoting cottage industries that use local resources, and encouraging skill development in harmony with cultural values. It also means adopting appropriate technologies that enhance productivity without harming the environment and fostering social cohesion and ethical governance. Community-based resource management and participatory planning form crucial strategies here, ensuring that development is rooted in the real needs and aspirations of the people.

India's modern sustainable development initiatives such as the promotion of renewable energy sources like solar and wind, government projects aimed at rural sanitation and clean drinking water, and movements toward organic and natural farming practices reflect the spirit of Upadhyay's ideas. His emphasis on decentralization has influenced policies that empower Panchayati Raj Institutions and local bodies to take charge of their developmental priorities, thus ensuring sustainability through local stewardship of natural and human resources.

In essence, Pandit Deendayal Upadhyay's life and philosophy offer profound insights and guidelines for sustainable development that remain highly applicable in contemporary times. His integral approach insists on development that is not only economically viable but also socially equitable and ecologically sound, creating a balanced and enduring progress model. As India strides forward to meet the challenges of the 21st century, revisiting and applying Upadhyay's principles can help craft a future that is prosperous, inclusive, and environmentally resilient, thereby fulfilling the promise of sustainable development for all.

References :-

Dr. Sarvan Singh Baghel (30 July 2021) Pt. Deendayal Upadhyay Jeevan Darshan evam Ekatm Manavavd Darshan ka Rekhankan, BFC Publication.

Mahesh Chandra Sharma, Deendayal Upadhyay Sampoorna Vangmay, Block 5, Prabhat Publication, New Delhi, 2016, Page No. 173-280

Deendayal Upadhyay (First Edition) Deendayal Upadhyay ki Vaani, Jagriti Prakashan, Noida

Deendayal Upadhyay (1958) Bhartiya Arthneeti, Vikas ki Ek Disha, Rashtradharma Prakashan Limited Lucknow

Deendayal Upadhyay (Ninth Edition, 2008) Ekatm Manavvad, Jagriti Publication, Noida

Prof. Madhu Dandwate (First Edition, 1978) Gandhi, Lohia evam Deendayal, Deendayal Research Institute, New Delhi

Deendayal Upadhyay (First Edition, 1968) Integral Humanism, Jagriti Publication, Noida

Deendayal Upadhyay (May, 2007) Rashtra Chintan, Lokhit Publication, Lucknow

Krishnanand Sagar (2001), Deendayal Upadhyay ki Vaani, Jagriti Prakashan, Noida

Sanjay Dwivedi (2015), Bhartiyata ke Sansthapak Pt. Deendayal Upadhyay, Wisdom Publication.

Narendra Shivaji Patel (2021), Pt. Deen Dayala Upadhyay Vyaktitva, Krititva v Netritva, BFC Publication

Bharatchandra Krishnaji Kalankar (2016), Pt. Deendayal Upadhyay Vichar Darshan, Suruchi Publication, Delhi.

Problems and Prospects of Organic Farming in Arwal District, Bihar

Dr. Abha Sinha*

Abstract-

This study analyzes the problems and prospects of organic farming adoption among 120 farmers in Arwal District, Bihar, comprising 60 low-income and 60 middle-income farmers. The objective of the research is to understand the level of awareness among farmers regarding organic farming, the factors motivating adoption, and the socio-economic barriers they face. Farmers were selected using random sampling, and data were collected through structured questionnaires and interviews. The study reveals that low-income farmers face significant challenges in adopting organic farming due to high input costs, lack of availability of organic inputs, and market uncertainty. In contrast, middle-income farmers, with higher education levels, better access to training, and information resources, were more likely to adopt organic farming. Furthermore, the study finds that government schemes and organic certification processes are not fully utilized, limiting farmers' potential benefits. Recommendations include increasing awareness, providing cost management and market support, and facilitating training programs. The findings can guide policymakers, agricultural extension agencies, and development organizations in promoting sustainable organic farming practices in Bihar.

Keywords- Organic farming, Arwal District, Farmer awareness, Socio-economic study, Low-income group, Middle-income group, Training & guidance, Input costs, Market facilities etc.

India is predominantly an agricultural country, and Bihar plays a critical role in national food production. Arwal District, located in south-central Bihar, is primarily agrarian with rice, wheat, and pulses as major crops. Conventional farming in the region heavily relies on chemical fertilizers and pesticides, resulting in soil degradation, reduced fertility, and environmental concerns. Organic farming, which emphasizes eco-friendly and sustainable practices, offers a solution by reducing chemical dependency and improving soil health. However, the adoption of organic farming in Bihar faces several socio-economic challenges, including high costs of organic inputs, limited awareness among farmers, lack of training facilities, and market uncertainties. This research aims to explore the adoption patterns of organic farming among farmers in Arwal District, analyze the socio-economic factors influencing adoption, and provide insights for policymakers and agricultural development agencies. The study focuses on the comparison between low-income and middle-income farmers to understand how income levels, education, and access to training impact the decision to adopt organic practices.

Several studies have addressed organic farming adoption in Bihar. Organic farming has emerged as a sustainable alternative to conventional agriculture, emphasizing ecological balance, biodiversity, and reduced chemical input. While its environmental and health benefits are widely recognized, adoption remains limited due to multiple challenges faced by farmers, particularly in developing countries like India. This literature review synthesizes key findings from research studies, government reports, and international organizations to identify the major problems and shortcomings in the organic farming sector.

Several studies highlight that economic risks are a major barrier to adopting organic farming. Singh (2020) notes that small farmers face considerable economic uncertainty due to higher production costs, lower initial yields, and fluctuating market prices for organic produce. Bhushan, Aditya, and Mandal (2016) similarly observe that farmers in Bihar's Samastipur district are reluctant

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to adopt organic practices due to limited access to financial support and uncertainty regarding long-term profitability.[1]

The Food and Agriculture Organization (FAO, 2022) emphasizes that developing countries often lack structured market systems for organic products, creating price volatility and reducing income security.[2] Sharma and Verma (2019) further identify market instability as a critical factor, where unpredictable demand and limited buyer networks discourage sustained organic production.[3]

Knowledge deficiencies and inadequate training programs are recurring themes in the literature. Patel and Kumar (2020) find that farmer training programs significantly enhance awareness and adoption rates of organic practices. However, these programs are often insufficiently widespread, leaving many farmers unaware of proper techniques, certification processes, and soil management practices.[4] Verma (2017) also emphasizes that environmental awareness positively influences adoption, yet the majority of rural farmers still lack access to structured educational initiatives.[5]

Rai (2018) highlights that even when organic fertilizers are available, limited technical knowledge about their correct use results in suboptimal yields and discourages continued adoption.[6]

Another prominent barrier is the availability and cost of inputs for organic farming. He was discusses challenges in the supply of organic fertilizers, noting irregular distribution, high prices, and limited quality control as significant impediments. He observe that farmers accustomed to conventional fertilizers and pesticides often find it difficult to transition due to lack of locally available alternatives and additional labor requirements.

Additionally, Bhattacharya (2015) indicates that while organic practices improve long-term soil fertility, initial productivity may decline, creating short-term resource strain for small farmers who depend on immediate yields for livelihood.[7]

Government policies and support systems play a critical role in promoting organic farming, yet shortcomings remain. The Government of India (2023) has launched initiatives and training programs to facilitate adoption, but implementation gaps, limited outreach, and bureaucratic inefficiencies hinder effectiveness.[8] Bhushan et al. (2016) also note that access to credit, subsidies, and certification support is uneven, making it difficult for small-scale farmers to enter the organic market.

FAO (2022) suggests that policy frameworks in developing countries often lack coherence, with insufficient integration between agricultural, environmental, and market development policies. This fragmented approach exacerbates farmer uncertainty and limits the scalability of organic agriculture.

Traditional farming habits and resistance to change also affect the adoption of organic practices. Sharma and Verma (2019) explain that farmers with generations of experience in conventional farming are hesitant to switch to organic methods, especially when immediate economic returns are uncertain. Social norms, peer influence, and skepticism about efficacy contribute to low adoption rates.[9]

Despite short-term challenges, the long-term benefits of organic farming are widely recognized. It emphasizes that organic methods enhance soil fertility, reduce chemical contamination, and support sustainable land use. And also highlights the positive environmental impact, which may encourage adoption over time as awareness grows. However, the literature consistently shows that immediate economic, knowledge, and infrastructural barriers limit widespread implementation.

Addressing these issues requires a coordinated approach combining financial incentives, farmer training, improved market access, and supportive policies. Research indicates that a mix of short-term support and long-term awareness-building can significantly enhance adoption rates, leading to sustainable agricultural development.

Research Objectives

(a). Measure farmers' awareness of organic farming in Arwal District.

(b). Compare adoption patterns between low-income and middle-income farmers.

(c). Identify socio-economic and market-related barriers to organic farming.

(d). Provide recommendations to promote organic farming effectively.

Hypotheses

H1: Middle-income farmers are more likely to adopt organic farming than low-income farmers.
H2: Farmers with access to training and information are more likely to adopt organic farming.
H3: Improved market access and reduced input costs facilitate easier adoption of organic farming.

Research Methodology

I. Study Area & Sample: Arwal District, Bihar. Sample: 120 farmers (60 low-income, 60 middle-income).
II. Data Collection: Structured questionnaires and interviews.
III. Variables: Income level, education, training access, adoption status of organic farming, input costs, and market facilities.
IV. Analysis: Percentages, averages, correlation analysis, and comparative group analysis.

Results & Discussion

Income groups:

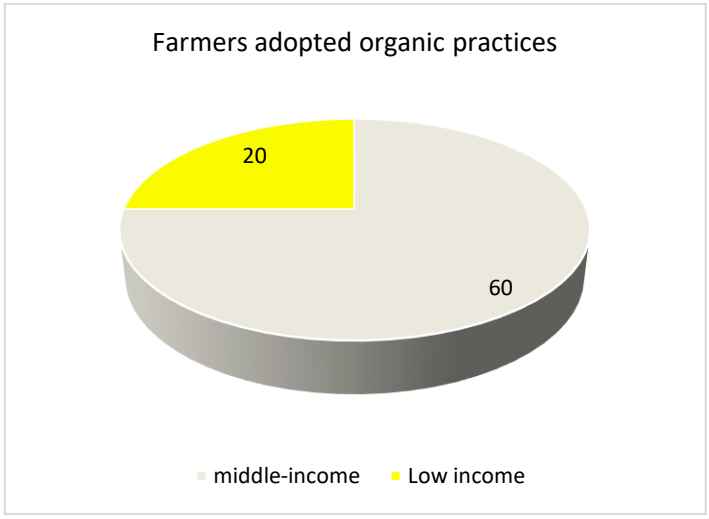


Fig-1 shows that 60% of middle-income farmers adopted organic practices, compared to 20% of low-income farmers.

Educational groups:

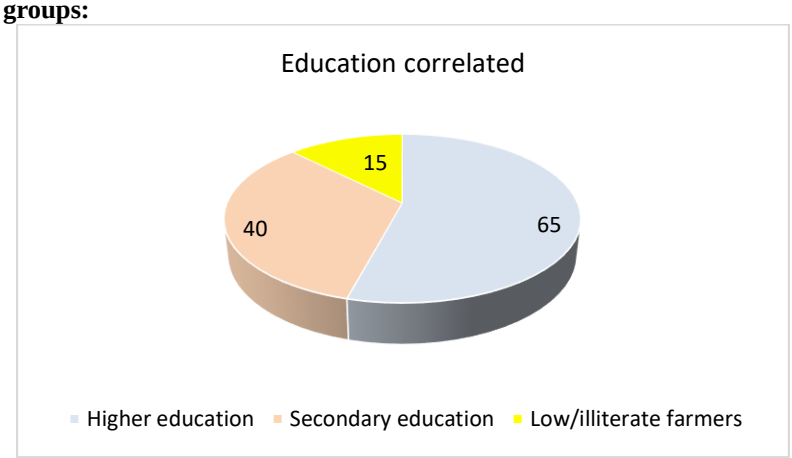


Fig-2 shows that educational groups Higher education correlated with 65% adoption, secondary education with 40%, and low/illiterate farmers with 15%.

Training groups:

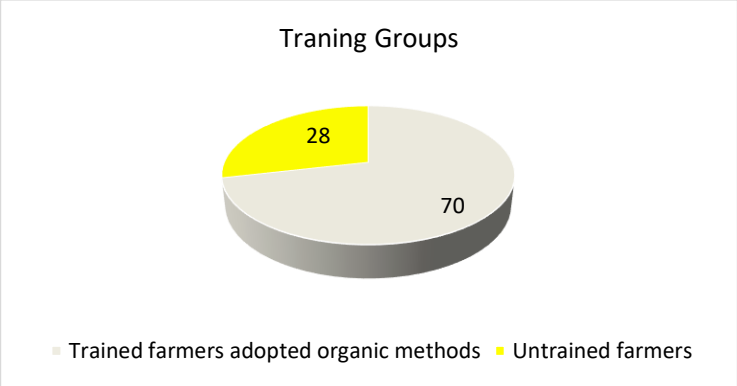
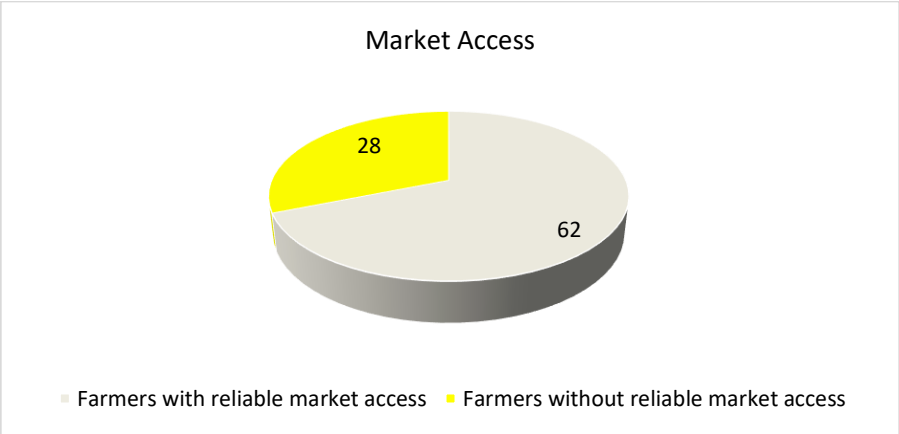


Fig-3 shows that training groups 70% of trained farmers adopted organic methods, while only 25% of untrained farmers did.

Market Access:



Market Access of the Farmers with reliable market access had 62% adoption, while those without had 28%.

Observations: Fig-1,2,3,4 shows that Income, education, training, and market access positively influence adoption; high input costs and traditional practices hinder it.

Summary- The study demonstrates that socio-economic factors strongly influence organic farming adoption. Middle-income farmers benefit from better resources and awareness, while low-income farmers face cost and market challenges. Training programs and government schemes are effective in improving adoption rates.

Conclusion- Organic farming adoption in Arwal District is constrained by cost, input availability, and market uncertainties, particularly among low-income farmers. Education, training, and access to government schemes enhance adoption likelihood. For sustainable agricultural development, targeted interventions are required.

Recommendations

(i). Regular training and awareness programs for farmers.
(ii). Subsidized organic inputs and proper distribution channels.
(iii). Market facilitation and guaranteed pricing for organic produce.
(iv). Financial support schemes for low-income farmers.
(v). Promotion of cluster-based organic farming models at district level.

References

1. Singh, A. (2020). Economic Risks in Small Farmers' Adoption of Organic Farming. Journal of Agricultural Studies, 8(2), 45-56.
2. Bhushan, M., Aditya, & Mandal, T. (2016). Problems and Prospects of Organic Farming in Samastipur District, Bihar, India. Indian Journal of Extension Education, 52(1&2), 69-72.
3. FAO. (2022). Organic Agriculture: Challenges and Opportunities in Developing Countries. Food and Agriculture Organization.
4. Patel, D., & Kumar, V. (2020). Effectiveness of Training Programs in Promoting Organic Farming. Asian Journal of Extension Education, 38(1), 15-25.
5. Verma, S. (2017). Environmental Awareness and Organic Farming Adoption. Journal of Rural Development, 36(4), 295-310.
6. Rai, S. (2018). Challenges in Organic Fertilizer Supply and Adoption. International Journal of Agriculture, 12(1), 33-40.
7. Bhattacharya, R. (2015). Long-term Benefits of Organic Farming on Soil Fertility and Sustainability. Journal of Agricultural Research, 52(2), 101-110.
8. Government of India. (2023). Organic Farming Initiatives and Training Programs. Ministry of Agriculture & Farmers' Welfare.
9. Sharma, R., & Verma, P. (2019). Traditional Farming Habits and Market Instability as Barriers to Organic Farming. Indian Journal of Agronomy, 64(3), 220-228.

India-China Clashes: Reasons behind Conflict and Mistrust

Dr. Shivam Dayal Chaudhari*

Introduction:

India and China have lately been affected by cross-border tensions for a long time, with events particularly dating to the years 2020, up to 2022, right after the Galwan Valley scuffle. There has been a longstanding dispute between the two nations over the LAC, also known as the Line of Actual Control. The LAC is however deemed as an unofficial border for the two nations. Before delving into the specifications of the India-China conflict, here's a brief outline of the clashes that we've witnessed over the years. The first one was witnessed in 1962, which ultimately paved the way for a sustained mode of conflict between the two nations. The second clash took place in 1967, alongside the Himalayan Kingdom's border nestled in Sikkim. After 20 years, another conflict took place in 1987, at the Sumdorong Chu Valley. 2017 saw another stand-off between both countries at Doklam and finally the border tensions started escalating in 2020, atrociously. The Chinese side has become quite outspoken about claiming parts/regions belonging to Indian states, like villages and regions nestled along the borders of Arunachal Pradesh, Ladakh and Sikkim. While theorists have presented several arguments regarding the animosity shared between both nations over borders, the primary factors that are identifiable through hindsight include, infrastructural development projects, territory and vague border demarcations, including the unofficial state of the LAC. Here, we shall briefly go through key incidents and moments that have led to prolonged situations of diplomatic mistrust, conflict and instability of the Sino-Indian relational dynamic. This study shall place keen emphasis on cross-border issues that stem from ethnic differences, infrastructural development and unofficial borders.

Following the violent moments of the 1960's, India and China have lately been at odds, especially when it comes to territories nested across the borders of Indian states, Sikkim, Ladakh and Arunachal Pradesh. The clash of 1962 led to several fatalities, but it did test India's ability to defend itself, even under harsh circumstances. The Indian Army had successfully waved off the advancing Chinese troops at the Galwan Valley. However, several other clashes ensued in other parts of the border, leading to heightened tensions, and diplomatic mistrust. Here we shall try to understand how infrastructural projects act as a threat to India's national security. How do the Chinese perceive India's developmental projects along the LAC? Why are they motivated to act against the Indian state and why are they adamant about claiming territories? Is it only for strategic development in the geopolitical landscape, or are there ethnic variables at play as well? We shall place an effort to answer such questions as we proceed with the contents of this article.

The Galwan Valley conflict:

The first "deadly" confrontation, after the various events of the 20th century, happened between Chinese and Indian troops in the month of June, 2020. This major clash led to several casualties on both sides, wherein twenty Indian soldiers had lost their lives. Reports state that sticks were initially used by both sides at around 4 am in the morning. However, things took a violent turn and the aggravated episode of violence led to the intense loss of lives. Reportedly, around 900 soldiers were involved, wherein 20 Indian and around 40 Chinese soldiers had died. However, the number had not been officially confirmed by authorities/agencies outside media sources.

Both countries seemingly have control over various parts scattered across the LAC. The scuffle that took place in 2020 is regarded as the worst, by-far, because of the high number of casualties and the stark disregard towards international peace treaties. However, it is worth noting that the vagueness of

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the LAC's demarcation is a significant factor for such skirmishes, as there isn't any international law that strictly regulates the activities of such areas. Which is why the Chinese side have become quite vocal or outspoken about their intent of capturing several regions in the aforementioned Indian states.

Background overview:

The Indian army had initially built or established outposts in the valley, aiming to take control of key positions in the area and improve defensive measures against non-state actors. Back in 1962, an attempt was made by Chinese troops to dislodge or disband these outposts, in an effort to establish their own hotspots within the valley. The People's Liberation Army of China launched an unwarranted attack on Indian troops who were posted at the Galwan Valley, leading to an intense battle. The Chinese side had overwhelming numbers, yet the Indian soldiers displayed vivacious amounts of perseverance and courage. They were able to fend off a significant portion of the Chinese PLA. The valley's conditions were harsh, with extremely cold temperatures and terrain that was not native for the Indian soldier. However, they were successful in preventing the Chinese forces from advancing ahead. This battle was also a display of India's tactical prowess, wherein national security was retained due to the bravery of those soldiers who were posted on those sensitive areas.

While the events of 1962 showed that India wasn't ready to surrender their territories in Ladakh over to China, the battle had led to an array of significant discussions in Sino-Indian relations and diplomatic discourses. While vivid solutions have not yet explicitly surfaced, there have been agreements made, with efforts to keep both parties content with the present situation. However, it is worth noting that China continues to advance their goals, by providing arms to rebel groups, influencing northeast Indian people under the context of ethnicity and religion, including and sending social media influencers to promote their narratives, constructing infrastructures within the premises of Indian states, and so on. In 2020, the Galwan Valley once again became the site of tensions, as Chinese forces clashed with the Indian army, ultimately leading to casualties on both sides, as mentioned above.

Infrastructural development and territorial claims:

The Himalayan region has become a hotspot for various developmental projects. The fact that there's an ongoing strategic rivalry between India and China, because of the continuity of construction projects, like that of roads, airstrips, military bases, and so on, also fuels a sense of mistrust between both countries. Take for instance, India's fast-paced construction of roads along the bordering areas of Arunachal Pradesh, Sikkim and Ladakh, had invited sharp criticism from the Chinese government. According to them, such roads would enable the Indian government to swiftly and effectively deploy troops in formerly inaccessible areas. Projects like the Darbuk–Shyok–DBO Road (DSDBO) enables the Indian military to reach sensitive areas of Ladakh in less time. While it is true that the roads increase India's ability to mobilize troops at will in faster time-periods, the Indian narrative also claims that such development projects are necessary, especially to match China's predominantly advanced troops and infrastructure on its own part/side of the LAC.

Another pressing issue is that China is also constructing their infrastructures in areas that are legitimately claimed by India. For instance, China claims a part of Arunachal Pradesh as South Tibet, and declared such areas to be theirs under no official contexts. They have in-fact begun constructing roads and villages towards the border of Arunachal Pradesh. Aksai Chin, a region that India claims but is controlled by China, has witnessed unhindered Chinese development projects, like highways, roadways and airstrips. It is also worth noting that military infrastructure isn't the only thing that's being made by the Chinese. There are settlements for local people, which apparently presents the idea that China wants to establish their population, gradually, within these territories. The Galwan Valley clash of 2020 was in-fact the immediate result of a dispute that stemmed from one of India's construction projects in those areas. China opposed India's construction of a road leading to an outpost.

So, the first fatal conflict in decades, resulting in the deaths of many Indian and Chinese soldiers, began from such disagreements, relating to constructions taking place along the sensitive

areas of the LAC. Both parties have also argued that such infrastructural developments shall serve dual purposes, one for the utility of civilians during peacetime, and the other for military logistics during times of conflict. China however enjoys an upper-hand because of their swift abilities in construction and their experience with such terrain. But India is pacing up, drawing critical attention from China. For the non-state actor, India's ability to deploy and maneuver troops instantly along the LAC is received with suspicion and threat.

Conclusion:

To summarize our understanding of the cycle of conflict-escalation between India and China, regarding border sensitive issues, let us consider the following narrative. Firstly, India observes the Chinese advancement of infrastructural development projects that are made for both public and military usage. To catch up and strengthen India's own defense systems, the nation starts constructing roads to improve accessibility of troops along the LAC. However, the Chinese government is opposed to such projects, as they perceive it as a threat. In response, they started building more infrastructures, even in areas recognized under Indian statehood, like villages in Arunachal Pradesh, Aksai Chin and so on. Again India responds with more developmental projects along the border. This entire cycle of building infrastructures along the border ultimately invites troops from both ends, leading to the involvement of warring factions. The recent Galwan Valley episode is testament to such opposed notions.

The problem exists on a policy-based level, which is flawed. In other words, the LAC has no clear demarcations yet, which is why it makes it easier for countries like China to spontaneously make claims on areas recognized under Indian statehood. Additionally, the cross-border conflicts have led to various scuffles within India's domestic premises. Firstly, there have been several observations of militant or rebel groups settled in camps across the borders, which are all deemed as a threat to India's national security. China in-fact bears the infamous reputation of arming such groups and affecting India's sovereign fabric. China is also using ethnic backgrounds to persuade the tribal people of North East India to join their cause. This has additionally made it easier for the Chinese to engage in cross-border operations without physically infiltrating borders per se. But, they have already done that so it doesn't really make a huge difference, unless there's a stern amendment in international law regarding demarcation of the LAC and legally recognizing the regions scattered on both sides of the Sino-Indian border. Up until now, the largely conflicted areas include the Galwan Valley, Pangong Tso and Demchok situated in Ladakh, Tawang and the Yangtse sector located in Arunachal Pradesh, and the Doklam Plateau near Bhutan, which also falls within the Indian state of Sikkim.

References

1. Samota, Jai. *"The Death Trap: 1962 Operation in Galwan-Chang Chenmo Sector." India Sentinels*, 15 Mar. 2023. Retrieved 10 Sept. 2024.
2. Sandhu, Major General PJS. *"1962 War in the Western Sector: Ladakh." Journal of the United Service Institution of India*, vol. 143, no. 593, July–Sept. 2013. Retrieved 10 Sept. 2024.
3. *"China's Loss of Soldiers During Galwan Clash Nine-Times More than Its Official Count, Says New Research." The Economic Times*, 3 Feb. 2022. Retrieved 30 Oct. 2024. *ISSN:* 0013-0389.
4. Scott, David. *Handbook of India's International Relations.* Routledge, 2011, p. 80. *ISBN:* 9781136811319.
5. Garver, John W. *"China's Decision for War with India in 1962." New Directions in the Study of China's Foreign Policy*, edited by Robert S. Ross, Stanford University Press, 2006. *PDF*.

Analyzing the Evolution of Global Organic Farming

Sukanya Maurya[*]
Dr. Ahuti Singh[**]

Abstract

Organic farming has become an increasingly influential component of the global agricultural system, driven by rising environmental concerns, shifts in consumer preferences, and policy efforts promoting sustainable food production. This paper provides a comprehensive descriptive assessment of the evolution of global organic farming using secondary data from the latest report published by FiBL and IFOAM – Organics International. The analysis examines long-term trends in organic agricultural land, regional disparities in land distribution, changes in the number of organic producers, and the growth of the global organic food market between 2000 and 2023. The results show that organic farmland expanded to 98.9 million hectares in 2023, representing a nearly sevenfold increase since 2000. Oceania and Europe continue to dominate in terms of area under organic management, whereas Asia and Africa contribute the largest share of producers, reflecting the prominence of smallholder participation. The global organic market exceeded 136 billion euros in 2023, led by North America and Europe, indicating strong consumer demand in high-income regions. Overall, the study highlights the transformation of organic farming from a niche ecological practice into a significant global movement that integrates sustainability objectives with economic growth and market development.

Keywords: Organic agriculture, sustainable farming, global trends, organic producers, market evolution.

1. Introduction

Agriculture today stands at a critical crossroads as the global food system faces unprecedented environmental and socio-economic challenges. Decades of reliance on intensive, input-heavy farming have contributed to soil degradation, loss of biodiversity, contamination of natural resources, and growing public concern over food safety. These pressures have intensified the global search for production models that are ecologically sound, economically viable, and socially responsible. Within this context, organic farming has gained worldwide prominence as a sustainable alternative capable of addressing many of the adverse consequences associated with conventional agricultural practices. By prohibiting the use of synthetic fertilizers, pesticides, and genetically modified organisms, organic agriculture emphasizes natural soil fertility, ecological balance, and long-term environmental stewardship, making it a central pillar of contemporary sustainability discourse.

The expansion of organic farming is not merely a response to environmental degradation; it is also deeply connected to evolving consumer behaviour, market dynamics, and institutional support mechanisms. Increasing awareness about health risks associated with chemical residues, along with rising demand for ethically and sustainably produced food, has helped mainstream organic products across global markets. Governments and international organizations have further reinforced this momentum through regulatory frameworks, certification standards, subsidy programs, and capacity-building initiatives. As a result, organic agriculture has shifted from a marginal ecological practice to a rapidly growing segment of the global food system.

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Reliable and comprehensive data are essential to understanding this transformation. Since the early 2000s, the Research Institute of Organic Agriculture (FiBL) and IFOAM – Organics International have played a pivotal role in documenting global organic developments. Their annual publication, *The World of Organic Agriculture: Statistics and Emerging Trends 2025*, provides the most up-to-date and internationally comparable dataset on organic farming. Covering 188 countries, the Yearbook offers detailed information on organic agricultural land, producers, certification systems, and market performance. The 2025 edition reports that 98.9 million hectares of farmland were under organic management in 2023, accounting for 2.1 percent of global agricultural land—an increase that illustrates the growing structural significance of organic farming worldwide. At the same time, regional variations remain pronounced, with Oceania and Europe dominating in land area, while Asia and Africa host the vast majority of organic producers.

Given the complexity and global relevance of these developments, a systematic analysis of long-term patterns is both timely and essential. Although numerous studies have examined specific aspects of organic agriculture, such as market growth or environmental benefits, fewer have synthesized global trends across land use, producer participation, and market expansion over an extended period. This research seeks to fill that gap by offering a descriptive and analytical overview of the evolution of global organic farming between 2000 and 2023. Using the FiBL & IFOAM 2025 dataset, the study explores how organic agriculture has expanded geographically, how producer participation has shifted across regions, and how market demand has evolved into a significant economic force.

By examining these interconnected dimensions, the paper aims to provide a comprehensive understanding of how organic farming has transitioned from a niche alternative to a mainstream global movement. Such an understanding is crucial not only for policymakers and researchers but also for stakeholders seeking to align agricultural development with sustainability goals. The results of this analysis highlight both the achievements and the disparities within the global organic sector, offering insights into the opportunities and challenges that will shape its future trajectory.

2. Objective of the Study

The primary objective of this study **is** to undertake a comprehensive descriptive analysis of the global evolution of organic farming during the period 2000–2023, with particular emphasis on the distribution and expansion of organic agricultural land, regional disparities in growth patterns, the participation of producers, and the development of the global organic food market.

3. Data Source and Methodology

The analysis is based on secondary data sourced from the FiBL–IFOAM Yearbook *The World of Organic Agriculture 2025*, supplemented with region- and country-level statistics from FiBL's online database (Statistics.FiBL.org). These sources constitute the most authoritative and internationally recognized datasets on global organic agriculture. The present analysis draws on information related to organic agricultural land from 2000 to 2023, regional and national patterns of land distribution, the growth and geographical spread of organic producers, and the performance of the global organic food retail market. A descriptive–comparative analytical approach is used to examine long-term trends and regional differences. The interpretation relies on percentage changes, temporal comparisons, and qualitative reasoning rather than statistical modelling, making the methodology appropriate for capturing broad patterns and evolutionary shifts in global organic farming.

4. Results and Discussion

4.1 Global Status of Organic Agricultural Land

In 2023, the world recorded 98.9 million hectares of organic farmland, a significant increase of 2.5 million hectares **(**or 2.6 percent**)** compared to 2022. This area represents 2.1 percent of global farmland, confirming that organic agriculture has become a meaningful component of the global food system.

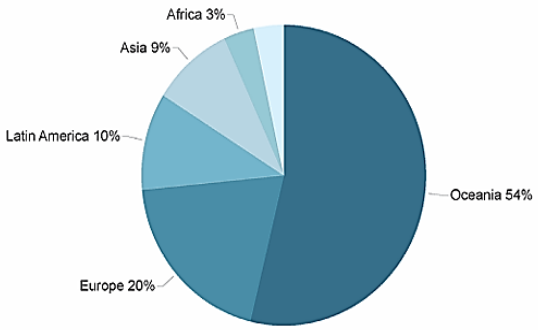
Regionally, Oceania accounted for 53.2 million hectares (54 percent of global organic land), mainly due to Australia's extensive organic grazing systems. Europe ranked second with 19.5 million hectares (20 percent), followed by Latin America (10.3 million hectares)**,** Asia (9.1 million hectares)**,** Africa (3.4 million hectares)**,** and North America (3.3 million hectares)**.**

The dominance of Oceania and Europe underscores how institutional frameworks, certification standards, and market access shape organic farming expansion. In contrast, Asia and Africa, though smaller in total area, exhibit increasing farmer participation. This pattern suggests a dual nature of organic development—large-scale expansion in developed regions and smallholder-based participation in developing economies.

4.2 Global Distribution of Organic Agricultural Land by Region

Figure-1 representing the world's distribution of organic agricultural land by region in 2023 shows that more than half of the global organic farmland is located in Oceania, which accounts for 54% of the total. This overwhelming share is largely due to the expansive operations in countries like Australia and New Zealand, where both government policies and consumer demand have facilitated large-scale adoption of organic practices. Europe follows as the second largest region, holding 20% of the world's organic agricultural land, reflecting the continent's robust regulatory frameworks, active government support, and high public awareness about sustainable and environmentally friendly farming. Latin America occupies 10% of the total, with many countries there, such as Argentina and Uruguay, substantially increasing their organic acreage in recent years, partly aimed at lucrative export markets. Asia has a 9% share of organic agricultural land, a figure that is steadily rising as more Asian countries promote sustainable agricultural practices and respond to growing food safety concerns. Africa, by contrast, has only 3% of global organic farmland, which may be explained by persistent challenges such as infrastructural limitations, lesser policy incentives, and developmental constraints. The disparities visible in these proportions suggest that while some regions benefit from favorable climates, supportive policies, and large contiguous land areas conducive to organic farming, others face significant hurdles in scaling up their organic initiatives.

Figure-1: World: Distribution of organic agricultural land by region 2023



Source: FiBL Survey 2025

4.3 Countries with the Largest Organic Areas

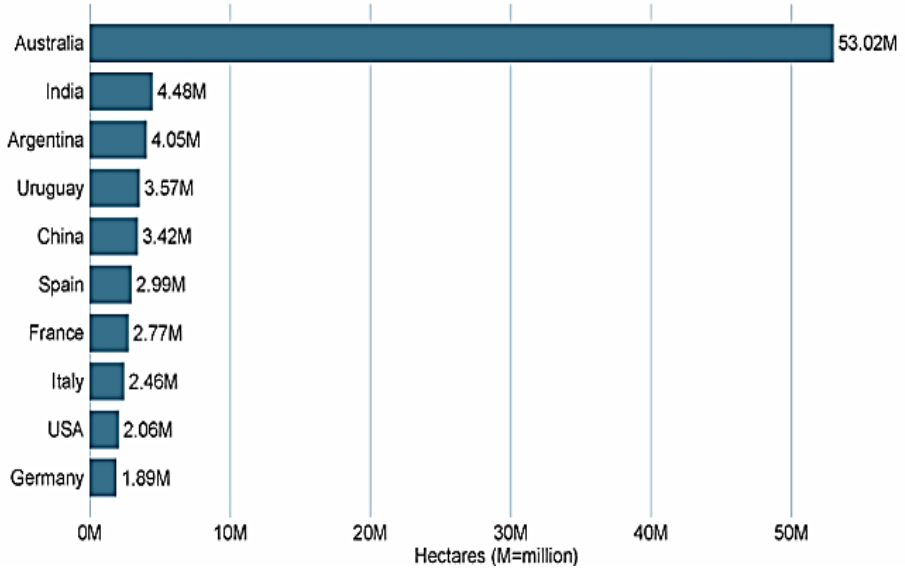
The ten countries with the largest organic agricultural areas together accounted for 82 percent (80.7 million hectares) of global organic farmland. Australia leads globally, followed by India and Argentina**.**

In Australia, nearly all organic farmland (99 percent) is used for extensive grazing, representing low-input but large-scale systems. India**,** in contrast, embodies a smallholder-based organic model**,** supported by government initiatives such as Paramparagat Krishi Vikas Yojana

(PKVY) and Mission Organic Value Chain Development (MOVCDNER)**.** Other major contributors include Spain**,** France**,** and Uruguay**,** where organic growth is largely export-driven.

The combination of both developed and developing nations among the top producers reveals that organic farming growth depends less on income level and more on policy orientation, certification infrastructure, and access to global markets**.** India's example demonstrates how institutional support can transform small-scale farming into a competitive and sustainable organic sector.

Figure-2: World: The ten countries with the largest areas of organic agricultural land 2023

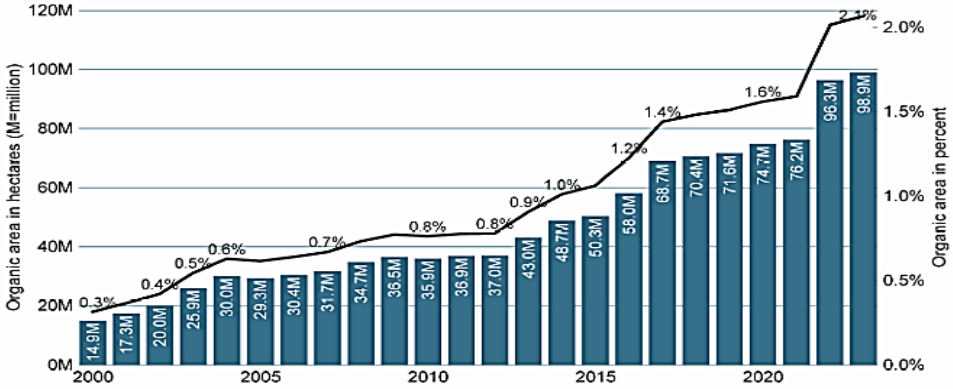


Source: FiBL Survey 2025

4.4 Growth of Global Organic Agricultural Land

The figure-3 illustrates the long-term global growth of organic agricultural land between 2000 and 2023, showing both the total area under organic management and its share of global agricultural land. The bars display the absolute area in million hectares, while the line represents the percentage of total farmland that is organic. The trend reveals a continuous and substantial increase over more than two decades, rising from 14.9 million hectares in 2000 to 98.9 million hectares in 2023, which signifies an almost sevenfold expansion. During the early 2000s, growth was gradual as many countries were still establishing certification systems and regulatory frameworks for organic farming. A period of moderate consolidation followed, with the global organic area increasing steadily but slowly. After 2013, the graph shows a clear acceleration, reflecting stronger policy support, rising consumer demand for chemical-free food, and the expansion of export-oriented organic production, particularly in Europe, Latin America, and parts of Asia. The most notable surge occurred in the years leading up to 2023, when organic land area grew sharply, pushing the global organic share from 1.6 percent in 2020 to 2.1 percent in 2023. This significant jump is associated with the rapid expansion of certified grazing areas in Oceania, increased adoption of organic practices in Latin America and Africa, and improvements in national organic data reporting systems. Overall, the diagram demonstrates that organic agriculture has transitioned from a niche system to an increasingly mainstream component of global food production. The steady rise in both organic area and percentage share indicates not only greater environmental awareness and policy prioritization but also a structural shift in global agricultural practices toward sustainability—supporting the broader narrative of the evolving global organic farming movement highlighted in this research.

Figure-3: World: Growth of the organic agricultural land and organic share 2000-2023

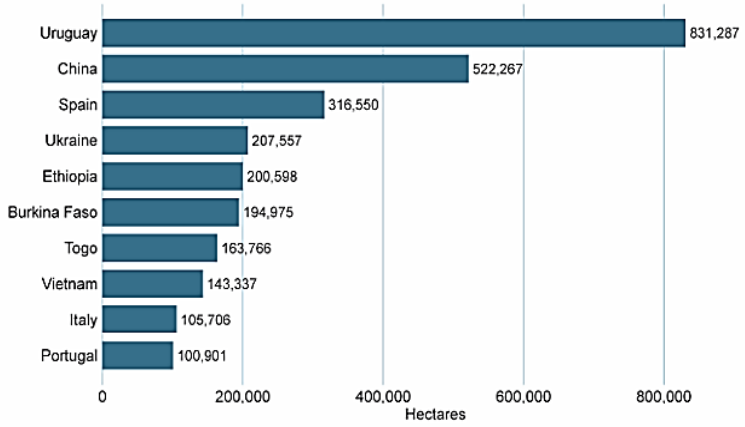


Source: FiBL Survey 2025

4.5 Countries with the Largest Increase in Organic Agricultural Land

The figure-4 illustrates the top ten countries with the largest increase in organic agricultural land in 2023, measured in hectares. Uruguay leads by a significant margin, with an increase of 831,287 hectares, reflecting this nation's strategic investment in organic agriculture and its goal to strengthen export capabilities. China follows closely, with 522,267 hectares added, demonstrating robust government support and rising domestic demand for organic products within Asia's expanding middle class. Spain comes third, with an increase of 316,550 hectares, which aligns with European trends favouring sustainable food production and policy incentives for organic conversion. Ukraine and Ethiopia, with rises of 207,557 and 200,598 hectares respectively, highlight emerging markets where organic farming is increasingly perceived as a path toward rural development and global market access. Burkina Faso and Togo, with increases of 194,975 and 163,766 hectares, showcase notable progress in West Africa, suggesting a growing recognition of organic methods amid resource and climate challenges. Vietnam added 143,337 hectares, indicating Southeast Asia's ongoing shift to environmentally conscious practices. Italy and Portugal complete the list, each surpassing 100,000 hectares, reinforcing Western Europe's leadership in organic farming. Overall, the diagram suggests that growth in organic agricultural land is driven by a combination of national policy, expanding market opportunities, and global consumer trends favouring sustainable production, with especially rapid expansion seen in South America, Asia, and Africa in 2023.

Figure-4: World: The ten countries with the highest increase of organic agricultural land 2023

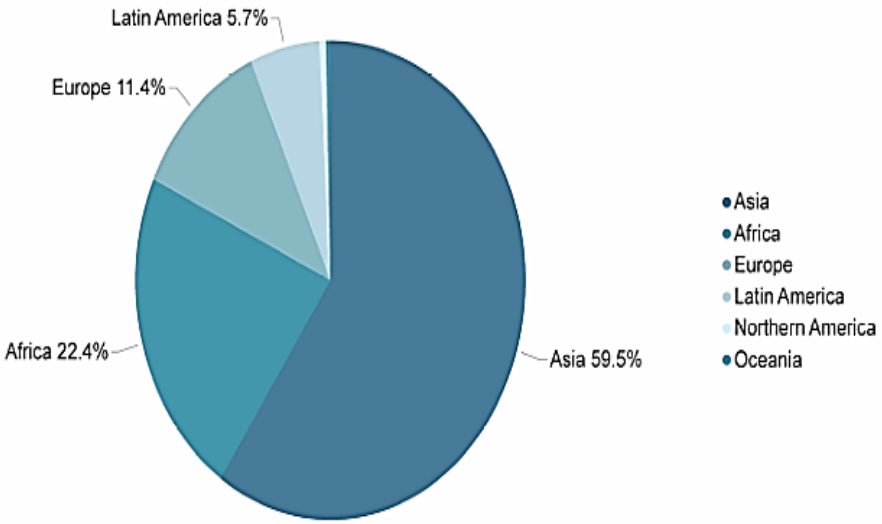


Source: FiBL Survey 2025

4.6 Organic Producers Worldwide

The data on global organic producers provides important insight into the social dimension of organic farming**,** particularly how participation varies across regions and how the number of producers has evolved over time. The figure-5, which presents the distribution of organic producers by region in 2023, shows that the majority of organic producers are concentrated in Asia, Africa, and Europe, together accounting for more than 93 percent of the global total of 4.3 million producers. Asia alone contributes the highest proportion, largely due to India's extensive network of smallholder organic farmers. Africa's significant share reflects the continent's reliance on small-scale farming systems that integrate well with organic principles such as low external input use. Europe, although smaller in land area compared to Oceania, also records a substantial number of producers due to its well-established organic certification and market support environment. In contrast, North America and Oceania have comparatively fewer producers because farming structures in these regions are dominated by large-scale operations, resulting in fewer but much larger organic farms. Together, this distribution highlights the strong participation of small and marginal farmers in the Global South, indicating that organic farming is not only an environmental strategy but also a socio-economic pathway for rural livelihoods.

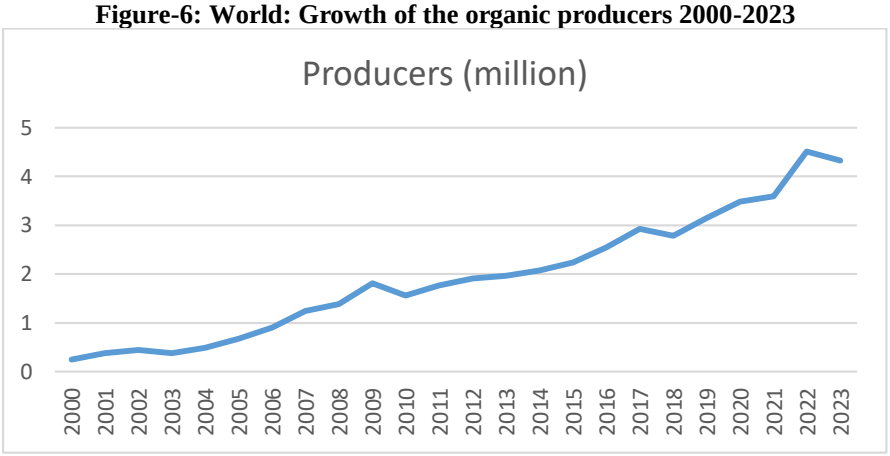
Figure-5: World: Distribution of organic producers by region 2023



Source: FiBL Survey 2025

The figure-6, showing the growth of organic producers from 2000 to 2023, reveals a clear upward trend over the past two decades, though with fluctuations in certain years. The global number of certified organic producers expanded substantially during the early 2000s as awareness of organic certification increased and international markets for organic commodities strengthened. Growth remained strong through the 2010s, reflecting rising global demand for organic products and the expansion of national organic programs across Asia, Africa, and Latin America. Between 2020 and 2023, however, the graph indicates a slight decline, with nearly 182,000 fewer producers in 2023 compared to the previous year. This reduction is often attributed to issues such as certification costs, changes in data reporting, and producers shifting between certification bodies or exiting due to stringent documentation requirements. Despite this short-term decline, the long-term trend shows a remarkable increase in producer participation, demonstrating that organic farming has become an important livelihood option for millions of farmers worldwide.

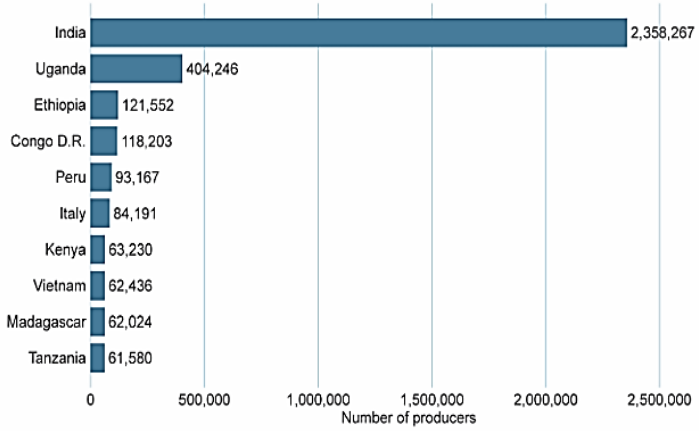
Figure-6: World: Growth of the organic producers 2000-2023



Source: FiBL Survey 2025

The figure-7, which ranks the ten countries with the most organic producers in 2023, reinforces the regional patterns observed earlier. India holds the top position by a substantial margin, reflecting its vast smallholder agricultural base and strong government-supported organic initiatives such as PKVY and MOVCDNER. Uganda and Ethiopia follow as the second- and third-largest producer bases, highlighting the growth of organic farming across Africa, particularly in regions where farmers rely on traditional, low-input agricultural practices that are naturally aligned with organic standards. Other countries in the top ten—such as Mexico, Turkey, Tanzania, and Peru—also represent regions where small-scale farming remains dominant. The presence of these countries illustrates how organic certification has become integrated into rural development strategies, enabling farmers to access premium markets, enhance incomes, and adopt environmentally sustainable practices. Notably, more economically developed countries do not appear among the top ten, which can be explained by their larger farm sizes and lower number of individual farm operators.

Figure-7: World: The ten countries with the most organic producers 2023



Source: FiBL Survey 2025

The global pattern of organic farming reveals that its social geography differs markedly from the distribution of organic agricultural land. While the largest areas under organic cultivation are found in regions such as Oceania and Europe—where farming systems are typically large-scale and commercially oriented—the highest numbers of organic producers are concentrated in Asia and

Africa. In these regions, millions of small and marginal farmers participate in organic farming, often relying on it as a low-input and sustainable livelihood strategy. This contrast highlights a defining characteristic of the global organic movement: in high-income countries it functions primarily as a commercial, market-driven agricultural model, whereas in developing countries it serves as a means of income generation, ecological resilience, and rural empowerment. Together, these patterns demonstrate that organic farming fulfils diverse roles across the world, combining environmental protection, socio-economic development, and market integration. As a result, organic agriculture has evolved into a truly global movement with both ecological and social significance.

4.7 The Global Organic Market

The total retail sales of organic food reached over 136 billion euros in 2023. North America led with 63.9 billion euros, followed by Europe (54.7 billion euros) and Asia (15.5 billion euros).

At the country level, the United States was the largest market (59 billion euros), followed by Germany (16.1 billion euros), China (12.6 billion euros), and France (12.1 billion euros). The highest per capita consumption occurred in Switzerland (468 euros), Denmark (362 euros), and Austria (292 euros), while Denmark recorded the highest market share (11.8 percent).

Figure-8: Global market for organic food: Distribution of retail sales by country 2023

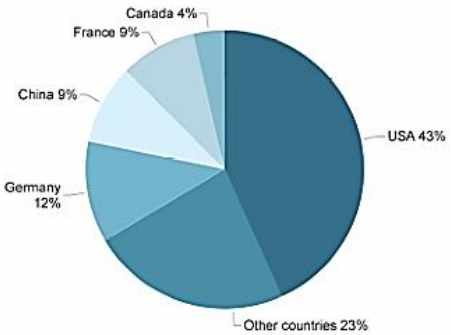
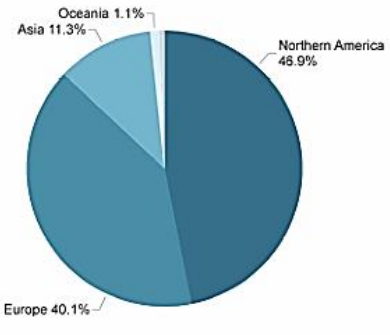


Figure-9: Global market for organic food: Distribution of retail sales by region 2023



Source: FiBL Survey 2025

Production remains concentrated in developing regions, whereas consumption and market demand are dominant in developed economies. This imbalance highlights the North–South divide in the organic value chain, emphasizing the need for stronger domestic organic markets and consumer education in Asia, Africa, and Latin America.

Conclusion

The analysis of global organic farming shows that the sector has experienced a profound and sustained transformation over the past two decades. From less than 15 million hectares in 2000 to almost 99 million hectares in 2023, organic agriculture has expanded both geographically and institutionally, driven by increasing awareness of environmental sustainability, food safety concerns, and the need for long-term soil health. Oceania and Europe continue to hold the largest shares of organic farmland, supported by strong regulatory systems and well-developed markets, whereas Asia and Africa account for the majority of global organic producers. This contrast highlights the dual nature of organic development—large-scale, commercially oriented systems in high-income regions and smallholder-based, livelihood-oriented models in developing economies.

The growth of the global organic market further underscores these dynamics. With retail sales surpassing 136 billion euros in 2023, consumption remains concentrated in North America and Europe, while production is primarily rooted in Asia, Africa, and Latin America. This imbalance between producer regions and consumer regions signals opportunities for developing countries to strengthen domestic demand, enhance value-chain linkages, and promote greater market

participation. Although the number of certified producers has shown minor fluctuations in recent years, the long-term pattern reflects a steady rise in farmer engagement, emphasizing the increasing significance of organic farming for rural livelihoods and income diversification.

The findings suggest that organic farming has evolved from a marginal practice into an integral component of the global agricultural landscape. Its expansion has been shaped by supportive policies, market-driven incentives, environmental consciousness, and shifting consumer preferences. However, persistent challenges remain, such as uneven regional adoption, high certification costs, and the limited development of local organic markets in many lower-income countries. As nations continue to align agricultural frameworks with sustainability objectives, organic farming is likely to assume an even more prominent role in promoting ecological stability, economic resilience, and social welfare. The observed evolution thus represents not only quantitative growth but also a broader transition toward more sustainable and resilient global food systems.

References:

FiBL & IFOAM – Organics International. (2025). The world of organic agriculture: Statistics and emerging trends 2025. *Research Institute of Organic Agriculture (FiBL)*.

Reganold, J. P., & Wachter, J. M. (2016). Organic agriculture in the twenty-first century. *Nature plants*, *2*(2), *1-8*.

Shukla, A., Patel, B.R., Patel, A.N. & Patel, A.R. (2011). Organic farming for sustainable agriculture. *Kisan World, 38 (3), 39- 42*.

Reddy S.B. (2010). Organic farming: Status, Issues, and Prospects—A review. *Agricultural Economics Research Review, 23(2), 343–358*.

Rembialkowska, E. (2007). Quality of plant products from organic agriculture. *Journal Science of Food and Agriculture, 87(15), 2757–2762*.

Raman Scattering in Carbon Nanotube–Graphene Hybrid Structures: A Theoretical Analysis

Krishna Prasad Singh*

Abstract-

The integration of one-dimensional carbon nanotubes (CNTs) with two-dimensional graphene sheets offers hybrid platforms with unique vibrational, electronic and optical properties. Raman spectroscopy plays a central role in characterizing these carbon nanostructures, and understanding how hybridization modifies Raman-active phonon modes is both fundamentally and technologically important. In this paper we present a theoretical analysis of Raman scattering in CNT–graphene hybrid structures. We begin by overviewing Raman processes in individual graphene and CNT systems, then discuss how hybrid coupling (via van der Waals, covalent bonding, charge transfer, strain and electronic hybridisation) can alter phonon dispersion, electron–phonon coupling, resonance conditions and polarizability perturbations. We develop a phenomenological model that captures the main effects of hybridisation on the G-band, 2D/-band and radial-breathing-mode (RBM) features. Predictions are provided for dependence on geometry (CNT diameter, graphene sheet size), coupling strength (weak van der Waals vs strong covalent bonding), doping/charge transfer and strain. We also highlight open challenges in theoretical modelling of these hybrid Raman systems, including resonant Raman scattering in mixed dimensionality, excitonic effects, and structural heterogeneity. Finally, we discuss implications for design and interpretation of Raman spectroscopy in hybrid carbon nanomaterials, aiming to guide device-level characterisation and material optimisation.

Keywords- Raman scattering, Carbon nanotubes (CNTs), Graphene, Hybrid nanostructures, Electron–phonon coupling, Theoretical modeling, and Nanophotonics etc.

Carbon-based nanostructures such as Graphene and Carbon Nanotubes (CNTs) have attracted intensive study due to their distinct one- and two-dimensional electronic, optical and mechanical behaviours. Graphene, a two-dimensional honeycomb lattice of sp^2 carbon atoms, exhibits linear Dirac dispersion near the Fermi level, unusual phonon behaviour and strong Raman signal through its G and 2D peaks. CNTs, which can be viewed as rolled graphene sheets, exhibit diameter- and chirality-dependent electronic structure (metallic or semiconducting) and characteristic Raman modes, notably the radial breathing mode (RBM), the tangential (G) band and defect/over-tone modes.

Hybrid structures combining graphene and CNTs promise synergetic advantages: improved mechanical, electrical or thermal properties; new interface physics; and tunable optical/phononic behaviours. For instance, graphene–CNT hybrids have been used in transparent electrodes, sensors, composite reinforcements and field-emission cathodes. In such hybrids, beyond simply summing the individual components' behaviours, the coupling between graphene sheets and CNTs can influence vibrational modes, alter electron-phonon coupling and shift resonance conditions relevant for Raman scattering.

Despite experimental studies of hybrid graphene/CNT systems, theoretical frameworks for how Raman scattering is modified in such mixed-dimensionality hybrids remain relatively under-explored. A. Casiraghi et al., "Raman spectroscopy of graphene-based materials and its applications in related devices" (2018). This motivates our work: we aim to provide a theoretical perspective on

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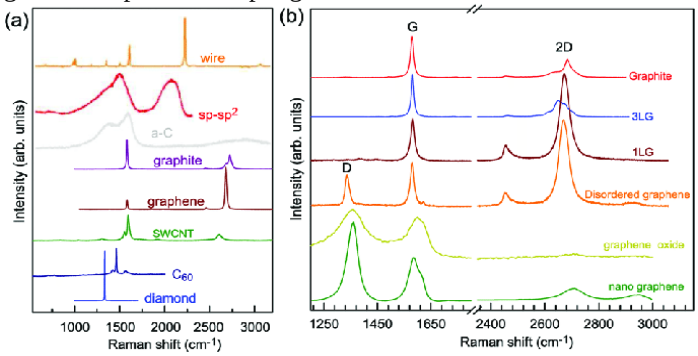
Raman scattering in graphene–CNT hybrids, analysing how coupling, geometry and external perturbations affect phonon modes and Raman signatures.[1]

The structure of the paper is as D. Thomsen & S. Reich, "Raman Scattering in Carbon Nanotubes", (2007). In Section 2 we review Raman scattering fundamentals in graphene and CNTs. Section 3 discusses key coupling mechanisms in graphene–CNT hybrids and how they might influence phonon/electron behaviour relevant for Raman. Section 4 develops a phenomenological model for Raman shifts and intensity changes in the hybrid structure. Section 5 explores parameter dependencies (geometry, coupling strength, doping/charge transfer and strain). Section 6 outlines theoretical challenges and future directions, and Section 7 summarises implications for Raman characterisation of hybrid carbon nanostructures.[2]

2. Fundamentals of Raman Scattering in Graphene and Carbon Nanotubes- In Raman in Graphene it scattering involves inelastic light scattering by phonons (lattice vibrations). In graphene, the main Raman features arise from first-order scattering of the E_{2g} optical phonon at the Γ point (G band, ~1580 cm^{-1}) and second-order double-resonant scattering of two phonons near the K point (2D band, ~2700 cm^{-1}). Defects activate the D band (~1350 cm^{-1}). Resonance Raman theory applied to graphene reveals unusual behaviours: dispersive overtone bands, missing bands, Stokes/anti-Stokes anomalies, laser energy dependence and bright overtones—all traceable to the Dirac electronic structure and strong electron–phonon coupling.



In graphene, the electronic band structure couples strongly with phonon dispersion: for example, the 2D band arises via a double-resonance process where an electron is excited by the incident photon, scatters by a phonon, then another phonon, and recombines emitting the scattered photon. The Kohn anomaly at the K and Γ points influences phonon frequencies and linewidths. Doping, strain, temperature and substrate interactions all affect peak positions and intensities through modification of electron–phonon coupling, dielectric screening and phonon energy.

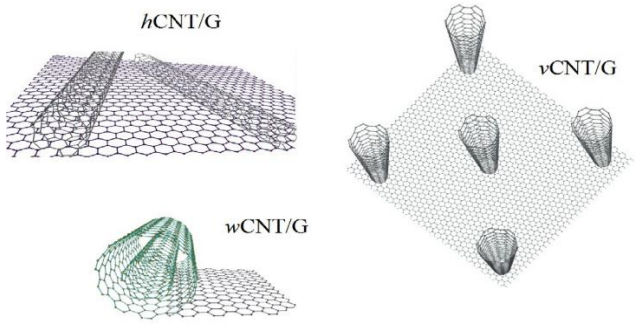
Raman in Carbon Nanotubes- CNTs inherit many phonon modes from graphene but also acquire new ones due to curvature, confinement and one-dimensionality. Of particular importance is the radial breathing mode (RBM) present only in single-walled CNTs (SWCNTs), where the tube diameter expands and contracts radially; its frequency ω_RBM ~ A/d + B (d = diameter) RamanLife application note.[3] The G-band in CNTs splits into G^+ and G^- peaks due to curvature and electron–phonon coupling differences in axial vs circumferential directions; metallic tubes often display a broadened G^- due to strong Kohn anomaly effects.

Electron–phonon coupling in CNTs is generally stronger than in graphene (especially in metallic tubes) because of one-dimensional density of states and enhanced Kohn anomalies. Raman resonances in CNTs are highly diameter- and chirality-dependent: the selection of excitation laser energy determines which tubes are in resonance (via the van Hove singularities), thus influencing the intensity of the RBM and other modes.

Implications for Hybrid Systems- For a hybrid consisting of graphene sheets and CNTs, the Raman spectrum is a superposition of contributions from each component—but coupling between them may modify phonon frequencies, intensities and linewidths. A. Y. Gerasimenko et al., (2022) charge

transfer between graphene and CNTs changes carrier density and thus electron–phonon coupling; mechanical strain at the interface alters phonon energies; changes in dielectric screening may shift resonant conditions; and new interfacial phonon modes may emerge.[4] Understanding these influences theoretically requires integrating the behaviours of both graphene and CNTs with coupling mechanisms.

Coupling Mechanisms in Graphene–CNT Hybrid Structures- In a graphene CNT hybrid structure (e.g., CNTs resting on or connected to graphene sheets, or graphene coated around CNTs), several coupling phenomena may influence vibrational and electronic behaviour relevant for Raman scattering:



I. Van der Waals & Physical Contact Coupling- In many hybrids, CNTs lie on graphene sheets or vice versa, interacting via van der Waals forces. Although relatively weak, such coupling modifies the local dielectric environment, thus affecting screening of electron–phonon interactions and phonon lifetimes. Moreover, mechanical contact may induce slight deformation or strain in the graphene or CNTs, shifting phonon frequencies via strain-phonon coupling.

II. Covalent Bonding/Chemical Linking- Stronger coupling may occur if CNTs are covalently bonded to graphene (e.g., via sp^3 bridging at edges or through functional groups). Such bonding modifies the band structure locally (introducing new states, defect scattering) and may allow electronic coupling between the CNT 1D states and graphene 2D states. These modifications alter electron–phonon coupling and can lead to shifts in both phonon dispersion and Raman resonance conditions.

III. Charge Transfer / Doping Effects- Graphene-CNT hybrids may exhibit charge transfer—either from CNTs to graphene or via dopants at the interface. Carrier density changes in either component modify electron–phonon coupling strength, screening, phonon self-energies and thus Raman peak positions and widths. For example, an increase in free carriers tends to cause phonon hardening or softening depending on band structure and Kohn anomaly positions.

IV. Strain and Structural Deformation- Interfacing dissimilar carbon nanostructures may induce strain or curvature in graphene or in CNTs: for example, a CNT lying on graphene may locally deform the graphene sheet, or graphene wrapping around a CNT may strain the graphene lattice. Strain is known to shift phonon frequencies in graphene and CNTs (for example G and 2D modes in graphene shift to lower frequencies under tensile strain). Such strain must be included in any accurate hybrid Raman model.

V. Dielectric Screening and Interface Phonon Modes- The interface between a 2D sheet and a 1D tube introduces a modified dielectric environment: phonon modes may couple to substrate/trap states and interface phonon polaritons may emerge. This influences phonon lifetimes, Raman intensity (via polarizability changes) and peak shifts. In addition, confinement of phonon modes near the interface could lead to hybrid phonon modes (e.g., CNT modes influenced by graphene sheet vibrations).

Phenomenological Model for Raman Shifts in the Hybrid- We now develop a simplified phenomenological model to describe how coupling in a graphene–CNT hybrid affects Raman-active phonon frequencies (ω) and Raman intensities. Although fully ab-initio modelling is ideal, such broad modelling helps elucidate trends and provide guidance.

(i). Base Phonon Frequency and Self-Energy- For a phonon mode i (e.g., graphene's G-band, CNT's RBM or G-band), in the absence of coupling the frequency ω_{i0} is determined by the lattice dynamics and environment. The phonon self-energy Σ_i includes contributions from electron–phonon coupling (EPC), phonon–phonon interactions (anharmonicity), and environmental screening:

$$\omega i=\omega i0+\Delta\omega i\approx\omega i0+\Re\{\Sigma i\}$$

The real part of Σ_i shifts the phonon frequency; the imaginary part contributes to linewidth. In hybrids, Σ_i is modified by coupling effects.

(ii). Coupling Contributions to Shift- We write the shift in the phonon frequency for mode i in the hybrid as:

$$\Delta\omega i=\Delta\omega i^{(CT)}+\Delta\omega i^{(strain)}+\Delta\omega i^{(screen)}+\Delta\omega i(int_f)$$

where:

- $\Delta\omega i(CT)\backslash Delta\ \omega_i\hat{}\{(CT)\}\Delta\omega i(CT)$= shift due to charge-transfer/ doping induced change in carrier density → modifies electron–phonon coupling.
- $\Delta\omega i(strain)\backslash Delta\ \omega_i\hat{}\{(strain)\}\Delta\omega i(strain)$ = shift due to mechanical strain or curvature.
- $\Delta\omega i(screen)\backslash Delta\ \omega_i\hat{}\{(screen)\}\Delta\omega i(screen)$ = shift due to change in dielectric screening at interface.
- $\Delta\omega i(intf)\backslash Delta\ \omega_i\hat{}\{(intf)\}\Delta\omega i(intf)$ = shift due to new hybrid interface phonon modes or inter-component phonon coupling.

Explicit Expressions (Simplified)-

Charge transfer contribution: Assume that due to interface coupling a carrier density change Δn occurs in one component (graphene or CNT). The modification of electron–phonon coupling can be approximated by:

$$\Delta\omega i(CT)\approx-2\omega i0\alpha i\Delta n$$

where α_i is a coupling coefficient characteristic of mode i. The sign (±) depends on whether increased carriers harden (increase ω) or soften (reduce ω) the phonon in that material (e.g., metallic CNTs often harden with gating).

Strain contribution: Tensile strain ε produces a shift (typically negative) linear in ε:

$$\Delta\omega i(strain)\approx-\gamma i\varepsilon$$

where β_i is a mode-dependent coefficient.

Interface phonon coupling contribution: If a new hybrid mode emerges with strength parameter λ_i then:

$$\Delta\omega i(intf)\approx\lambda i$$

(this term may be positive or negative depending on hybridisation).

Therefore, combined:

$$\omega i(hybrid)\approx\omega i0-2\omega i0\alpha i\Delta n-\gamma i\varepsilon+\beta i\Delta\varepsilon+\lambda i$$

Raman Intensity and Resonance Effects- Theory of Graphene Raman Scattering, (2016).[5] Raman intensity I_i of mode i depends on polarizability derivative $(\partial\alpha/\partial Qi)2(\backslash partial\ \alpha/\backslash partial\ Q_i)^2(\partial\alpha/\partial Qi)2$, phonon population, resonance enhancement (via electronic transitions) and scattering geometry. In hybrid systems, intensity may change due to:

- Modification of resonance condition: e.g., electronic states of graphene and CNTs may hybridise, shifting van Hove singularities or Dirac points, altering resonance enhancement.
- Changes in damping / phonon lifetime: increased scattering at the interface reduces lifetime → broader linewidth, lower peak intensity.
- Variation of local electromagnetic environment: coupling may change enhancement factors (especially in near-field setups). Consequently one may write:

$$I_i^{(hybrid)}\approx Ii_0\times R_{resonance}\times\tau i^{(hybrid)}/\tau i_0$$

where R_(resonance) encapsulates resonance shift/enhancement and τ_i is phonon lifetime.

Parameter Dependencies and Predictions- We now use the above model to predict how specific parameters influence Raman features in graphene–CNT hybrids.

Dependence on Geometry (CNT Diameter, Graphene Size)

- Smaller diameter CNTs have higher curvature, stronger confinement and larger electron–phonon coupling; this yields a larger α_i for CNT modes (especially RBM and G band) → hence a larger shift due to Δn.
- For graphene sheets of smaller size or with edges, coupling to CNTs may be stronger (more edge sites) and strain more pronounced; thus ε may be larger → larger strain shift.
- The ratio of CNT to graphene coverage influences screening/ dielectric modification: more intimate contact → larger $\Delta\varepsilon$ → larger β_i effect.

Thus we predict that a hybrid of small diameter CNTs intimately bonded to graphene will show larger Raman shifts (both in frequency and intensity change) than larger diameter CNTs loosely lying on graphene.

Coupling Strength – van der Waals vs Covalent-

- Weak van der Waals coupling: mainly screening and mechanical contact; thus Δn is small (charge transfer minimal), λ_i is small. Shifts mostly from strain and screening.
- Strong covalent bonding: significant charge transfer possible (large Δn), interface phonon coupling may produce λ_i non-negligible, resonance conditions may shift strongly. Hence largest Raman modifications expected. if $\alpha_i \sim 10\ cm^{-1}$ per $10^{12}\ cm^{-2}$ carrier change, $\varepsilon \sim 0.1\%$, $\gamma_i \sim 20\ cm^{-1}/\%$ strain, the difference between weak and strong coupling may amount to tens of cm^{-1} shift.

Doping / Charge Transfer Effects- Graphene in contact with CNTs may either donate or receive electrons depending on work-functions and functionalisation. With Δn positive, for a given mode the sign of α_i determines whether phonon hardens or softens. In metallic CNTs doping often leads to phonon hardening (increase ω) because Kohn anomaly is suppressed. In graphene, doping tends to shift the G-band upward (hardening) and reduce its linewidth. Thus in the hybrid we expect:

- G-band (graphene) shift: $\Delta\omega\_G \approx -(\alpha\_G / 2\omega\_G)\,\Delta n$ → typically positive (hardening) if α_G negative due to doping (careful sign convention).
- CNT G band: similar effect, but magnitude depends on tube type (metal vs semicon). If doping is large, one may also observe changes in intensity due to modified resonance conditions (for CNT RBM modes, resonance window may shift).

Strain Effects at Interface- If the CNT presses on the graphene sheet or graphene wraps around the CNT, strain ε may arise. For graphene G-band $\gamma\_G \sim 20$-$30\ cm^{-1}$ per % strain (literature values ~ $27\ cm^{-1}/\%$). Thus even 0.2% strain would shift G by ~5-6 cm^{-1}. For CNT RBM and G-bands, strain sensitivities are somewhat different (tube axial vs circumferential). Therefore, measurable shifts in RBM (~2-5 cm^{-1}) may result. In experiments, such shifts can be used to infer strain or interface geometry.

Screening / Dielectric Environment- At the interface the graphene dielectric response may be altered by the presence of the CNT network/ sheet. The change $\Delta\varepsilon$ in effective dielectric constant modifies phonon self-energies and thus ω. The coefficient β_i is mode-dependent and relatively small (a few cm^{-1} per unit $\Delta\varepsilon$) but for a large contact area the effect may accumulate. This mechanism is likely subtle but may be distinguishable by comparing hybrids on substrates of different dielectric constants or by varying CNT coverage.

Hybrid Phonon Modes and Interface Coupling- If the graphene and CNT share significant mechanical and electronic coupling, new hybrid phonon modes may emerge (e.g., radial breathing of the CNT coupled to flexural graphene modes). These will show up in Raman spectra as new peaks or as splitting/shift of existing peaks. The λ_i term represents this effect. For example, one may observe a shifted RBM frequency in the hybrid compared to isolated CNTs; or changes in the 2D band shape of

graphene due to coupling to CNT phonons. In such cases, Raman spectra may display features intermediate between pure graphene and pure CNT signals.

Theoretical Challenges and Future Directions-A Mixed Dimensionality Resonant Raman Theory on One key challenge is the development of fully rigorous resonant Raman scattering theory for mixed 1D–2D systems. Most existing work treats graphene or CNTs individually using Kramers-Heisenberg-Dirac (KHD) formalism or perturbation theory. For hybrids, one must account for coupling between electronic states of graphene (2D Dirac dispersion) and CNT (van Hove singularities in 1D), which complicates resonance conditions, scattering pathways and selection rules. For graphene the "transition sliding" mechanism has recently been analysed. Extending this to hybrids remains open. Ab Initio Modelling of Hybrid Systems Atomistic modelling (e.g., DFT or tight-binding) of graphene–CNT hybrids is challenged by large unit cells (to capture interface), varying chirality/diameter, and the need to compute phonon and electron–phonon coupling matrices. While some studies exist on transport or formation of graphene–CNT lateral structures. However, detailed phonon self-energies and Raman intensities in such hybrids remain largely unexplored. Structural Variability, Defects and Interface Heterogeneity in practice, hybrids vary in bonding type, coverage, defects, orientation and strain. Theoretical models must incorporate distributions of these parameters (e.g., tube diameters, bonding vs non-bonding contact, tilt angles). Moreover, defects at the interface (Stone–Wales defects, functional groups) create local phonon scattering and shift behaviour. Excitonic and Many-Body Effects on Resonant Raman involves excitonic states, especially in low-dimensional systems. In CNTs excitonic effects dominate optical transitions; in graphene, many-body electron–electron interactions and screening play roles. In hybrids, excitonic coupling may be modified by inter-component coupling, thereby altering resonance enhancement and Raman intensities. Incorporating many-body effects into Raman modelling is a significant theoretical task. And Time-Resolved and Non-Equilibrium Raman for device applications, hybrids may be under bias, heated, or subject to time-varying fields. Time-resolved Raman can probe phonon dynamics under non-equilibrium conditions, but theory for such conditions in hybrids is lacking. Theoretical study of the electronic and transport properties of lateral 2D–1D–2D graphene–CNT–graphene structures", JETP Letters, 2022. Future work may link phonon lifetimes, hot-phonon populations, and interface thermal transport to Raman features.[6]

Implications for Raman Characterisation of Hybrid Carbon Nanomaterials- Interpreting Raman Shifts and Intensities spectroscopy of graphene–CNT hybrids must account for interface effects. Simply attributing peak positions to graphene or CNT alone may mislead. For example, a G-band shift in graphene in the hybrid could reflect charge transfer to CNTs rather than strain in graphene. Similarly, RBM shifts in CNTs may be due to coupling to graphene rather than diameter change. The model provided in Section 4 offers a framework for disentangling these effects.

Designing Hybrid Materials via Raman Feedback- Understanding how coupling influences Raman spectra enables material optimisation. For instance, if strong bonding (covalent) is desired for electrical connectivity, one expects larger Δn and thus larger G-band shifts. Raman monitoring of these shifts may serve as a quality control metric for hybrid fabrication. Likewise, Raman linewidths (which reflect phonon lifetimes) may indicate interface scattering and mechanical coupling strength.

Device Characterisation and Monitoring- In devices incorporating graphene–CNT hybrids (e.g., transparent electrodes, sensors, field-emitters), Raman spectroscopy under various external conditions (bias, temperature, mechanical load) can probe hybrid integrity, coupling strength and interface degradation. The framework here suggests that monitoring G-band, 2D band, RBM and their shifts/intensities can reveal interface evolution, doping dynamics or strain accumulation.

Limitations and Cautions- One must maintain caution: Raman signatures are influenced by many factors (laser energy, resonance conditions, substrate effects, heating, defect states). In hybrids, these factors may be compounded. Thus correlating Raman shifts to specific physical quantities (e.g., Δn or ε) requires calibration or complementary measurements (electrical, TEM, electron spectroscopy). Our model is phenomenological and intended for trend-analysis rather than exact quantitative prediction.

Conclusion- In this theoretical analysis we have explored how Raman scattering in graphene–CNT hybrid structures may deviate from the individual components due to coupling effects including charge transfer/doping, strain, dielectric screening and interface phonon modes. We provided a simplified phenomenological model to capture how frequency shifts and intensity changes in Raman spectra depend on geometry (CNT diameter, graphene size), coupling strength (van der Waals vs covalent), doping/charge transfer, fracture/strain and screening modifications. Specific predictions were made for how G-band, 2D band and RBM modes will shift under various hybridisation scenarios. We identified key theoretical challenges in resonant Raman modelling for mixed dimensionality systems, ab initio modelling of interface phonon/electron-phonon coupling, heterogeneity, excitonic effects and non-equilibrium Raman responses.

From a practical standpoint, our work suggests that Raman spectroscopy can be a sensitive, non-destructive probe of hybridisation in graphene–CNT systems, enabling both diagnostics of fabrication quality and monitoring of device performance. Going forward, bridging the theoretical insights with quantitative experimental calibration will help unlock the full potential of graphene–CNT hybrids in nanoelectronics, sensors and energy materials.

References

1. A. Casiraghi et al., “Raman spectroscopy of graphene-based materials and its applications in related devices”, *Chem. Soc. Rev.*, 2018.
2. D. Thomsen & S. Reich, “Raman Scattering in Carbon Nanotubes”, (2007).
3. “Raman spectroscopy for investigation of carbon materials”, Raman Life application note.
4. A. Y. Gerasimenko et al., “Hybrid Carbon Nanotubes–Graphene Nanostructures: Modeling, Formation, Characterization”, *Nanomaterials*, 2022.
5. “Theory of Graphene Raman Scattering”, (2016).
6. “Theoretical study of the electronic and transport properties of lateral 2D–1D–2D graphene–CNT–graphene structures”, *JETP Letters*, 2022.

Studies on the Fish Production of Some Ponds of District S.A.S. Nagar, Mohali (Punjab) with Special Reference to Physico-Chemical Parameters of Water

Shanam Khurana[*]
Dr. Amit Tiwari[**]

Abstract

The study examined how various physico-chemical water parameters in three ponds of SAS Nagar, Mohali (Chatt, Parol, and Tangori) relate to fish production. Researchers interviewed pond owners to gather information on pond characteristics, water sources, feeding practices, and stocking density. The ponds were primarily rain-fed and influenced by agricultural runoff, which affected water chemistry. Water quality was monitored from June 2009 to July 2010, while fish sampling occurred between September 2009 and April 2010 due to fishing restrictions during the breeding season. Correlations between water parameters and fish yield were analyzed, including statistical tests such as t-values. The study also assessed fish species composition and abundance. Chatt Pond showed the highest fish production and positive correlations with most parameters except nitrates, though the F-values were not statistically significant.

Key Words*:* Physico-Chemical Parameters**,** fish species, Water, Ponds.

Introduction

Inland fisheries represent a vital component of the country's fisheries sector, contributing significantly to the national economy and providing livelihoods for millions. India, being the second-largest fish-producing country globally, relies heavily on its inland resources. India possesses vast and diverse inland fisheries resources comprising 0.34 million km of rivers and canals, 1.45 million ha of flood plain lakes, 2.75 million ha of ponds and tanks and 2.84 million ha of reservoirs. These resources form the backbone of the country's fisheries sector, making India 2nd largest aquaculture producer in the world. Limnological studies on diverse habitat will help in suggesting means of optimally exploiting the productive potential of these ecosystems. The inland fisheries sector has demonstrated remarkable growth over the decades, with production increasing from 7.5 lakh tonnes in 1950-51 to an impressive 139 lakh tonnes in 2023-24(*Inland Fisheries | Department of Fisheries, GoI*, n.d.). Land for fishponds in SAS Nagar Mohali is available, primarily because of the region's availability of water resources and suitable soil that can retain water. Other factors supporting fishpond growth include the high demand for fish, a growing inland fisheries sector in India, and the potential for economic benefits, making it a favourable area for aquaculture development (*HANDBOOK2. Locating Your Fish Farm*, n.d.). Fishes are dependent on physico-chemical parameters. Any change of parameters may affect the growth, development and maturity of the fish Phytoplankton and zooplankton together constitute the natural fish food. High plankton counts indicate high fish production potential (Jhingran, 1991).

Materials and Methods:

Sampling Stations

Five sampling stations were selected for the purpose of physicochemical characteristics of water. For the convenience these stations were identified as stations A, B, C, D and E. The water was collected from permanent locations which were marked.

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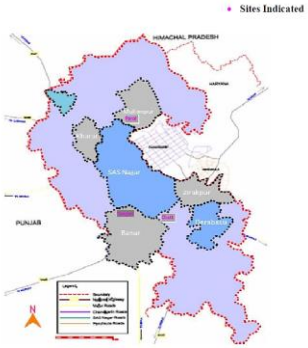
Collection and Sampling of Water

Water samples were collected from the selected sampling stations from each water body from about 1 meter to 2-meter depth. Samples were stored in clean glass Stoppard bottles and taken to laboratory for analysis**.**

MAP OF SAS NAGAR SHOWING THE PONDS UNDER STUDY



Periodicity of Sampling

Monthly samples of water were collected from all the three sampling stations. The sampling period extended through the 14 months between June 2009 to August 2010. The dates of sample collection are mentioned below: Parol Tank: 4th day of every month from June 2009 to August 2010. Tangori Fish Tank: 7th day of every month from June 2009. to August 2010. Chat Fish Tank: 10th day of every month from June 2009 to August 2010.

Physical Parameters

Physical parameters were measured in the field, and the chemical parameters were analysed in the laboratory by standard methods given (APHA et al., 1998) and (Trivedi & Goel, 1986).

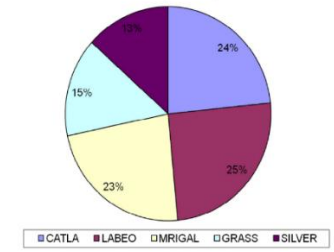
The classification and systematics of fishes followed in the present investigation according to Berg (1947) and identification with Day's fauna of British India, Burma and Ceylon (1878).

Data Tables and Graphs-sampled

CORRELATION COEFFICIENT BETWEEN WATER QUALITY AND FISH PRODUCTION OF PAROL POND, MULLANPUR

Water Quality Parameters	Correlation Coefficient with fish Production	D.F.	F-value
pH	0.5803	6	1.0074
Dissolved Oxygen	0.2520	6	0.3682
Carbon-di-oxide	-0.0116	6	0.0164
Calcium Hardness	-0.4673	6	0.7474
Magnesium Hardness	0.3511	6	0.5303
Phosphate	0.3321	6	0.4979
Ammonia	-0.1055	6	0.1500
Nitrate	-0.1643	6	0.2355
Chloride	0.3897	6	0.5983

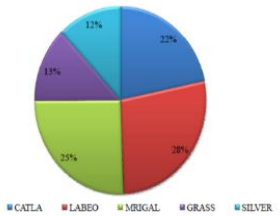
Percentage of Fish Production in Chatt Pond (September 2009 to April 2010)



CORRELATION COEFFICIENT BETWEEN WATER QUALITY AND FISH PRODUCTION OF CHATT POND

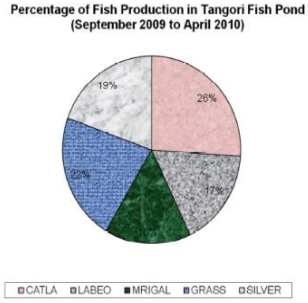
Water Quality Parameters	Correlation Coefficient with fish Production	D.F.	F-value
pH	0.1569	6	0.2247
Dissolved Oxygen	0.4089	6	0.6336
Carbon-di-oxide	0.0590	6	0.0837
Calcium Hardness	0.0259	6	0.0366
Magnesium Hardness	0.2587	6	0.3787
Phosphate	0.3875	6	0.4204
Ammonia	0.1843	6	0.2651
Nitrate	-0.0837	6	0.1188
Chloride	0.0456	6	0.0645

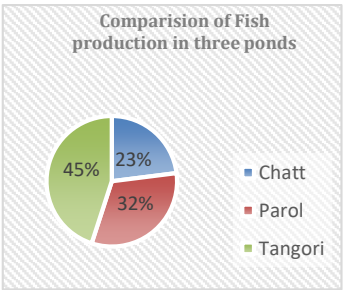
Percentage of Fish Production of Parol Pond (September 2009 to April 2010)



CORRELATION COEFFICIENT BETWEEN WATER QUALITY AND FISH PRODUCTION OF TANGORI FISH POND

Water Quality Parameters	Correlation Coefficient with fish Production	D.F.	F-value
H	0.2203	6	0.3194
)issolved Oxygen	-0.4534	6	0.7193
'arbon-di-oxide	-0.5019	6	0.8206
'alcium Hardness	0.1084	6	0.1542
Iagnesium Hardness	-0.1137	6	0.1610
hosphate	0.3940	6	0.6061
ammonia	0.0324	6	0.0458
litrate	-0.4268	6	0.6674
'hloride	-0.3903	6	0.5994





Results and discussion

The study demonstrated that the ecological complexity of the three ponds is strongly influenced by seasonal fluctuations in their physico-chemical characteristics. Air and water temperatures showed parallel trends, with air ranging from 12.4–34.7 °C and water from 11.5–32.6 °C— a temperature range suitable for carp growth and efficient feed conversion.

Water transparency varied seasonally, increasing in summer and decreasing during the monsoon due to turbidity. This influenced plankton growth and dissolved oxygen (DO), which affect feeding efficiency of surface (Catla) and bottom feeders (Mrigal). Total alkalinity ranged from 230–285 mg/L, indicating good productivity, with the highest values in Chatt Pond. Alkalinity and pH remained within optimal ranges for carp culture, particularly in Chatt Pond, which showed the strongest positive correlation with fish production.

Dissolved oxygen levels never dropped below 7.03 mg/L, making all ponds suitable for fish culture, though production was lower in Tangori Fishpond due to its lower DO and negative correlations with other parameters. Chatt Pond's higher oxygen concentration (8–11 mg/L) corresponded with the greatest fish yield.

Dissolved CO_2 levels were low across ponds and varied seasonally, with summer peaks. Chloride concentrations increased during the rainy season due to runoff; Tangori Fishpond's negative correlation of chloride with fish production suggests pollution input.

Calcium and magnesium hardness were positively correlated with productivity in Chatt Pond but showed negative correlations in Parol and Tangori ponds, reducing their fish yields. Nitrate concentrations were low in all ponds, limiting plankton growth; however, Chatt Pond was least negatively affected, while Tangori showed the strongest negative nitrate correlation, explaining its lowest production.

Overall, **Chatt Pond showed the best water quality and highest fish production**, while **Tangori Fishpond exhibited multiple limiting factors**, including pollution indicators, lower DO efficiency, and stronger negative nutrient correlations

Conclusion

The study of physico-chemical factors of three ponds of SAS Nagar, Mohali, Punjab showed a correlation between transparency, pH, alkalinity, temperature, DO and other chemical factors like chlorides and ammonia which affected the seasonal growth of phytoplankton and their indirect effect on fish productivity in the ponds over the course of this investigation. The climatic conditions, physico-chemical factors and quality of soil decide the productivity of the ponds. The findings of the ponds indicate that the water quality has a very good potential for fish culture in these areas devising strategies to reduce surface run off from surrounding waste and farmlands. The study has shown that small ponds of villages have greater potential to yield fish building the economy of the farmers and the state. The study has also evaluated the need to conserve these small water bodies at the rural level making them a good source of earnings for the farmers. Hence the Government and policy makers along with fish biologists and planners need to take immediate action to assist fish farmers with scientific strategies to develop fish culture enhancement programs.

Compliance with ethical standards

Acknowledgments

The author expresses her gratitude to the *Director, Punjab State Fisheries Department, for coordinating with the farmers owing the fishponds and providing her with other necessary facilities.*

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

1. American Public Health Association (APHA), American Water Works Association (AWWA) & Water Environment Federation (WEF). (1998). *Standard methods for the examination of water and wastewater* (20th ed.). Washington, DC: APHA.
2. Banerjee, S. M. (1967). Water quality and soil conditions of fish ponds in some states of India, in relation to fish production. *Indian Journal of Fisheries*, 14(1–2), 115–144.
3. Berg, L. S. (1947). *Classification of fishes, both recent and fossil.* Ann Arbor, MI: J. W. Edwards.
4. Chacko, P. I., & Krishna, B. (2009). Feeding habits of the pond. *Journal of Environmental Biology*, 30, 116–130.
5. Day, F. (1878). *The Fishes of India; being a natural history of the fishes known to inhabit the seas and fresh waters of India, Burma, and Ceylon* (Vols. 1–2). London: Bernard Quaritch.
6. Ellis, M. M. (1937). Detection and measurement of stream pollution. *Bulletin*, 22(5B), 365–437.
7. Ganpati, S. V. (1943). Studies on the chemistry and biology of ponds in the Madras City: Seasonal changes in the physical and chemical conditions of a garden pond containing aquatic vegetation. *Journal of Madras University*, 13(1), 55–59.
8. Inland Fisheries | Department of Fisheries, GoI. (n.d.). Dof.gov.in. https://dof.gov.in/inland-fisheries
9. Jhingran, V. G. (1991). *Fish and fisheries of India* (3rd ed.). Delhi, India: Hindustan Publishing Corporation.
10. Munawar, M. (1970). Limnological studies on fresh water ponds of Hyderabad, India. I. The biotope. *Hydrobiologia*, 35, 307–320.
11. Nayak, T. R. (1980). *Hydrobiology of Dahalan Tal Panna* (PhD thesis). University of Rewa, M.P., India.
12. Nigam, V. (1986). *Studies on water quality and soil condition of Sidhi Dam with special reference to fish production* (PhD thesis, A.P.S. University, Rewa, M.P., India).
13. Sahai, R. S., & Singh, R. S. (1984). Studies on aquatic crustacean of Rewa. *Bio.*, 4(1), 50–75.
14. Shekhawat, S. S. (1983). *Ecological study of Swaroop Sagar lake with reference to planktonic population and physico-chemical properties of water* (PhD thesis, Sukhadia University, Udaipur).
15. Sulbha, V., & Prakasam, V. R. (2006). Limnological features of Thirumullavaram Temple pond of Kallam Municipality, Kerala. *Journal Name*, 27(2), 449–451.
16. Swingle, H. S. (1967). Standardization of chemical analysis for waters and pond muds. *FAO Fisheries Report*, 44(4), 397–421.
17. Tiwari, P., Tiwari, A., Amiya, R., & Sinha, S. P. (2009). Analysis of Shahpura Lake water with respect to physico-chemical and biological parameters. *Natural Journal of Life Sciences*, 6(3), 352–354.
18. Tondon, K. K., & Singh, H. (1972). Effects of certain physicochemical factors on the plankton of the Nangal Lake. *Proceedings of the Indian Academy of Sciences – Section B*, 36(1), 15–25.
19. Trivedy, R. K., & Goel, P. K. (1986). *Chemical and biological methods for water pollution studies.* Karad, India: Environmental Publications.
20. Vass, K. K., & Zutshi, D. P. (1979). Limnological studies on Dal Lake: Morphometry and physical features. *Journal of the Inland Fisheries Society of India*, 11, 12–21.
21. Welch, P. S. (1935). *Limnology* (1st ed.). New York & London: McGraw-Hill Book Company.
22. Zafar, A. R. (1964). Limnology of the Hussain Sagar Lake, Hyderabad, India. *Phykos*, 5(1–2), 115–126.
23. HANDBOOK2. Locating your fish farm. (n.d.). Www.fao.org.

A Study of Three Agricultural Farm Laws are Examined in the Context of India's New Farmer Movement

Dr. Rekha[*]

Abstract

The new farm law 2020 has an important role in making India self-reliant, whereas the idea of one nation one market was not accepted by the farmers. Agriculture is the most important field, in which the maximum number of workers are involved. And it is also the readiness of the Indian economy, which also affects the economy section. India needs to give a strong development plan to strengthen its farmers and increase food security, which will increase the income of the farmers. Three new farm laws have been made with the aim of raising the standards of farmers and increasing their income. Indian farmers have been protesting for more than a year against the three laws implemented by the Indian government in September 2020. This was India's longest struggle after independence. This paper explains how new agriculture laws reduce the bargaining power of farmers. Which has a direct impact on the ability of farmers to earn a livelihood and maintain financial security.

Keywords: Farm Law 2020, Farmers Income, Economy, Work Force, Development, Food Security, Livelihood, Standard of Farmers, Farmers Protest

Introduction

These are the laws which are Farmers' Produce Trade or Commerce (Promotion and Facilitation) act 2020 or Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Act, 2020. Apart from this, amendment was made in the Essential Commodities Act, 1955. Prime Minister Narendra Modi announced the withdrawal of the laws through television on 19 November, 2021. The agricultural law repeal bill was passed in both the houses of Parliament on 29 November, 2021 and the farmers' organization postponed the protest in December, 2021. This letter gives a glimpse of the establishment of protest camps, the arrangements for staying in these camps and the system through which the movement tried to unite with the local population.[1] It also tells how the protests against the big agricultural laws gave strength and unity to the small but important state-level movements, after which victory was achieved. And finally the role played by the demonstrations across the country further strengthened the organizational strength of the farmers' movement.

The new farm law 2020 should be discussed together so that their goals and intentions can be fully understood. The first of these three laws is the Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Act (FAPAFSA), which provides a legal framework for farmers to produce for companies and to engage in contract farming.[2] This contract works as a direct understanding between a farmer and a "producer" for selling future crops at pre-determined prices and also covers conditions like supply, quality, price and agricultural inputs. The most important thing in this is that in the path of this initiative, farmers were not given any guarantee of MSP.

The second of the three laws, the Farmers' Produce Trade and Commerce (Promotion and Facilitation) Act (FPTCA), was also known as the "APMC Bypass Bill." This bill allowed farmers to participate in both inter-state and intra-state bypasses outside the physical markets under the state APMC regulations. FPTCA limited the ability of states to sell outside the market system. Its main objective was to encourage farmers to sell their produce outside the markets to large retailers and open retailers so that they can get better prices. Along with this FPTCA has also proposed an electronic trading system to facilitate online business with new perspectives.

The third law, the Essential Commodities (Amendment) Act (ECA), seeks to amend the Essential Commodities Act of 1955 to limit the Indian government's powers to regulate the supply, production and sale of essential agricultural goods, such that states could be allowed to store unlimited quantities of essential food items.[3]

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This paper depicts a large-scale farmers movement based on information collected from different media reports, newspapers and social media platforms like Facebook and YouTube, which the author has described as a major project 'People's Archive of Farmers' Protest.

History of Indian Agriculture

India is an agricultural country where livelihood is a major source of income for a large part of the agricultural population. Based on the official figures of 2019, India's 458 million strong labour force contributes 20.2% of the gross value added (GVA) share in the total economic sector (2020-2021). And in which 43% do work in agriculture. The Indian government showed in Krishi Jan Ganna report of 2015-16 that out of these 100,251 were farmers having marginal operational holdings, in which 25,809 were small landholders, 13,993 were medium landholders, 5,561 were small medium farmers and only 838 were big landowners.[4]

Since the beginning of 1990, a deep economic crisis has been trying to affect the livelihood of small and marginal landholders, as a result of which attempts of suicide by farmers are continuously increasing in the country.[5]The primary causes of the crisis are:

- Deeping debt from creditors to smallholders
- Inadequate compensation for input costs
- Non-viable farm sizes
- Increasing fuel prices
- Decreasing government investment in agriculture
- INADEQUATE payment for produce
- Non-availability of assured water supply for irrigation.[6]

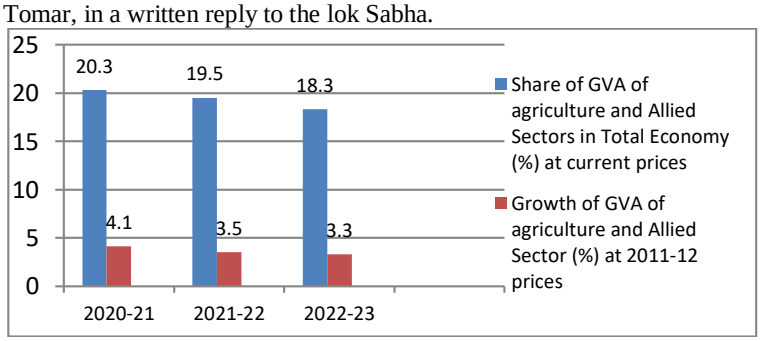
Contribution of Agriculture in Indian GDP

Here we will discuss the complex dynamics of the contribution of agriculture in India's GDP scale domestic production and analyze its implications for the economy in a comprehensive manner. The percentage of agriculture in India's GDP scale domestic production is an important indicator of its impact on the health of the sector and the overall economic performance of the country. In which, in view of the continuous agricultural landscape and technological progress taking place in agriculture, the contribution of agriculture in the school domestic production has seen a decline in the last time. But still, understanding the contribution of agriculture in the school domestic production in India is equally important for policy makers, economists and stakeholders.[7]

The Gross Value Added (GVA) of agriculture and related sectors in the total economy of India is calculated by calculating the GVA of agriculture and related sectors. The Ministry of Statistics &Programme Implementation (MoSPI) has recently released the second advance estimate of the national income for the year 2020-2021, 2021-22 and 2022-23. Which has been done like this.

Year	Share of GVA of agriculture and Allied Sectors in Total Economy(%) at current prices	Growth of GVA of agriculture and Allied Sectors (%) at 2011-12 prices
2020-21	20.3	4.1
2021-22	19.0	3.5
2022-23	18.3	3.3

These statistics were shared by the Union Minister of Agriculture and Farmers Welfare Shri Narendra Singh Tomar, in a written reply to the lok Sabha.



Problem and Purpose

The three farm laws protests of 2020-21 have been one of the largest, longest and most unified and peaceful protests that India has seen in recent times. The objective of these three agriculture laws was social movement and its model was mainly that of protest camps. And this social movement has been a part of democracy for a long time. Where the government is held accountable. The protest against Indian anti-agricultural laws is a great example of 'new social movements' which experiment with new democratic practices based on the principles of horizontality, decentralization, direct participation, and decision making with everyone's consent. When the Indian government made three laws related to agriculture in June 2020, then the farmers' group of North-West, whose occupation is agriculture itself, organized local protests in various cities and villages of the state, which started from July 20, 2020 with the help of tractor march or procession with tractors.8

Method and Tools Used by The Farmers in Protest

Method: Many methods are used by farmers during protests. These include discussion meetings: participants come together to determine the pace of the movement and demands and to discuss key actions. These include Dharna, Gherao: siege of government representatives to demand peaceful response, torture and rail blockade (Raasta-rail Roko), demonstrations, protest against the central agriculture law, where state governments under the leadership of opposition Congress introduced bills to oppose the central agriculture law.[9]

Tools: Important tools used by farmers during march. for example, Social media platforms, including Twitter, Facebook and WhatsApp; Standardised toolkit; Independent news media portals; Focus groups; Public meetings; Protest camps. The digital arm of the Samyukt Kisan Morcha, called the Kisan Ekta Morcha, consisting of its five-members, tech savvy farmers from Punjab, Haryana and Rajasthan handled the promotions and digital campaigns on the official social media pages of the protest, records videos, devising hashtags, taking photographs and streaming press conferences. They tweeted slogans and videos in thousands every day.[10]

Young activists in small towns and villages also carried out door-to-door campaigns every ten days and informed participants about the protest sites from time to time. Young activists in small towns and villages also carried out door-to-door campaigns every ten days and informed participants about the protest sites from time to time. And people were given information from time to time, in which local language books were used to unite the movement and the agenda was effectively presented among small focus groups.

Some protests used by Indian farmers against the government these are following them.

1. Launching Protests in Delhi March

Indian farmers' protest was a protest against three farm acts that were passed by the parliament of india in September 2020. The acts, often called the Farm Bills had been described as "anti-farmer laws" by many farmers unions, and politicians from the opposition who said that it would leave farmers at the "mercy of corporate" since the farmer-trader disputes were taken to SDM instead of judiciary. The protests demanded the creation of a minimum support price(MSP) bill, to ensure that corporate cannot control the prices. The Union Government, however maintained that the laws would make it effortless for farmers to sell their produce directly to big buyers and stated that the protests are based on misinformation related endemic legacy issues include farmer suicides and low farmer incomes. Aytac and Stokes(2020) explained in their aricle, "Social movements that successfully construct a casual framework that casts grievances as a form of injustice, especially an injustice purposely carried out by an identifiable agent are more likely to see angry people pouring into streets".[11]The acts were introduced, union began holding local protests mostly in Punjab state. After two months of protests, farmer union- mainly from Punjab and Haryana began a movement named Dilli Chalo (let's go to Delhi) in which tens of thousands of union members marched towards the nation's capital. The Indian government ordered the police and law enforcement of various states to stop the protesters using water cannons, batons, and tear gas to prevent them entering Haryana and Delhi. November 2020 saw a nationwide general strike in support of the farmers and thousands converging at various border points on the way to Delhi. The participating unions under the coordination of bodies such as:

Samyukt Kisan Morcha, which became the main representative body of the protests, and the All India Kisan Sangharsh Coordination Committee consisted of

- Bhartiya Kisan Union (BKU Uttar Pradesh) led by Rakesh Tikat
- Bhartiya Kisan Union(BKU Rajewal), Led by Balbir Singh Rajewal
- Bhartiya Kisan Union (Ugrahan, Sidhupur, Rajewal, Chaduni, Dakaunda)
- Kisan Swaraj Sangathan
- Jai KisanAndolan
- All IndiaKisan Sabha
- Karnataka RajyaRaitha Sangha
- National Alliance for People's Movements
- LokSangharshMorcha
- All India KisanKhetMajdoorSangathan
- KisanMazdoorSangharsh Committee
- RashtriyaKisanMajdoorSangathan
- All India KisanMazdoor Sabha
- KrantikariKisan Union
- ASHA- Kisan Swaraj
- LokSangharshMorcha
- All India KisanMahasabha
- Punjab Kisan Union
- SwabhimaniShetkariSanghatana
- SangtinKisanMazdoorSanghatan
- JamhooriKisan Sabha
- KisanSangharshSamiti
- TeraiKisan Sabha
- Transport bodies like the All India Motor Transport Congress (AIMTC)

The main place of movement being carried out by Indian farmers in India was Singhu and Tikri border, where the daily life of local residents was being affected due to blockade by the protest. In which the farmers were protesting for the legal guarantee of Minimum Support Price (MSP) of their crops and improvements in their livelihood. The protests that started in late 2020 and are still continuing are being led by groups like KisanMazdoorMorcha and SanyuktKisanMorcha. The "Delhi Chalo" march was organized by the farmers. During this, security was beefed up at the Singhu border. In which the farmers have created a pressure for the legal guarantee of MSP, which they consider useful for their economic situation.

On 27 November, the marching farmer groups reached the two entry points of the national capital, Singhu and Tikri, on the national highway. Where they were stopped by the police administration. Even then they were demanding to reach the Jantra Mantra, the place designated for public protest in Delhi. On 28 November, when the Home Minister called the farmer leaders for a discussion, the police asked them to clear the roads and go to another place. As a result, the farmers refused to move from the borders of the cities. Most of the farmers who participated in this protest were from Punjab and Haryana. And later, in the end of December, farmers from many other states also joined this protest. The leaders of SKM worked hard to give a more Indian character to the struggle and regularly toured different states to inform the farmers about the new agriculture law and to give them mobile phones and smart phones.

2. The Main Protest against government: farmers have camped at Delhi's borders,blocking of roads braving the cold, heat and covid-19 pandemic

Thousands of farmers had camped on the buildings of the capital Delhi, where most of the farmers were dying due to heat, cold and Covid. This movement took such a form that it became the biggest challenge for the government of Prime Minister Narendra Modi. Women contributed in large numbers in this protest. The ruling alliance representatives could not enter many villages of the state and had to cancel public programmes. In Rajasthan, Madhya Pradesh, Uttar Pradesh, Uttarakhand and Punjab too there were huge protests against the government. Farmers also held protests at official events. And the police beat up all these farmers and used this on them and even arrested the farmers. Due to which later these protests intensified outside local administration buildings and police stations.

In the beginning of February 2021, to stop the entry of vehicles, traffic roads on three main routes in Delhi (Tikri, Singhu and Gazipur) were blocked. And cement barriers and iron bars were installed so

that no vehicle could pass through Delhi's traffic. Later, barriers were installed so that no pedal could be driven so that no one could enter Delhi. Delhi's borders were closed till 22 March 2021. Around 40,000 Pradhan Shankaris sat in Singhu and Tikri. Some highways were also blocked in protest.[12]

When the second wave of the covid-19 pandemic arrived, due to this the number of protesters in the areas around Delhi decreased. Some were also attributing this to the crop harvesting season. A lot of discussions were going on in the farmers' protest camp on the Singhu border connecting Haryana and Delhi. But even then, while opposing the pandemic governance and smartly protesting against the farmers, it was said that the pandemic could be real. But it is not so strong that it could reduce the opposition of these farmers, who have faced many big difficulties in their lives.[13]

In Punjab, sugarcane farmers in the Doaba and Majha regions came together inan organization called the Doaba Farmers' Struggle Committee (Doaba Kisan Sangharsh Committee) and blocked the Jalandhar-Delhi national highway and railway tracks on August 20, 2021 to demand a hike in sugarcane prices and payment of pending dues from sugar mills (Kaur 2021).[14] On August 24, after a five-day protest, farmers won a hike of Rs 50 per quintal (100 kg), taking the State Agreed Price (SAP) to Rs 360 per quintal, the highest in the country.

3. Socio-Economic and Environmental Risks: land and livelihood loss, food insecurity

The farmers' demand was mainly due to the fear that selling goods much below the MSP would affect their livelihood and they would already be deprived of a small piece of land.

Farmers further understood that in the context of rising unemployment rates and casualized labor markets. Therefore is no post-agricultural future if they are dispossessed. Shifts in land use that accompany the growth of corporate farming can also affect landless laborers, many of whom are dalits. Due to which more land will be used for agricultural production. Otherwise, even the common land will be divided into parts. On which part of the land he can raise his animals. With large cororates retail chains threating to displace retail chain driven by small traders, the spectors of mass unemployment in urban areas also loomed large.[15]

These acts also had a huge impact on India's food security. The farm laws also had an impact on the livelihood of the farmers. It was estimated that two-thirds of India's population benefits from public distribution, where the government, as the biggest buyer of farmers' produce, stockpiles food at subsidized prices. If the government stops purchasing food at MSP, then it cannot supply subsidized essential food commodities from its public distribution system.[16]

Moreover the ESA removed multiple commodities from a list of "essential" commosities including oils, oilseeds, potatoes, cereals and pulses. An increase in food prices, coupled with the understanding of the public distribution system would hold significant consequences for impoverished urban and rural communities, including farmers and agricultural laborers who rely on the subsidized distribution of food that they themselves produce.

4. Arrangement langar on highway to the farmers and support from local people

Close relationships were formed between the people living on the borders and the local people. Where border areas are mostly rural and come under the Haryana state (NCR) administration. When schools were closed due to COVID-19, many families participated in this movement with their children and some created awareness through the site (Joseph 2020). SKM started free health check-ups in May 2021 to expand its reach among the local population and strengthen SKM's relationship with them. And through this mission, free health check-ups were organised for the protesters on Singhu border by joining hands with the local population. Some donors sponsored free LangarSewa, distribution of spectacles (AinakLangar) was organised.

Volunteers of Sadbhavna Mission will take patients from their homes and tents for treatment. And the medical team has made a plan to treat people injured in accidents and will also provide hearing aids to those who have hearing problems. (KisanEktaMorcha 2021). On the other hand, this movement of farmers was a unifying force where the slogan "Haryana KaBada Bhai Punjab" (Punjab Badda Bhai) was heard and this was used in a protest music during the protest demonstration.

Organizing langar is the main practice of the Sikh organization, where food is prepared by volunteers and distributed free of cost. At the protest sites, langar was run by different sections of society and it was not necessary that it should be near any Sikh Gurudwaraor temple. During the protest, langar was set up near roads, parks, railway tracks, police stations, and government offices. In short, farmers

protested everywhere too. It was started on 13 December, 2020 by Kapoor Singh, an organiser of the langar and trade union leader, as a snack for people travelling from Punjab to Delhi. And soon a regular set-up for eating and providing food was formed. In which a team of five to six cooks used to prepare the food, and the rest of the work was handled by volunteers.

Recently New Movements from the Farmers Against The Government

1. Farmer protest 2024, March Delhi-NCR

These included a march by farmers towards the parliament and giving emphasis to five main demands. Due to which security and route diversions will be increased in Delhi-NCR. These five demands included 10% plots for old farm acts or 64.7% increased compensation under old acquisition law, four times the market rate compensation and 20% plots to be given on 1 January 2014. The children of those farmers who did not have land should be given jobs and the profit of rehabilitation should be given. The remaining demands included government orders on the issue passed by high power committee and proper settlement of populated areas.

Some important events are as follows:

Bharatiya Kisan Parishad (BKP) leader Sukvir Khalifa said in an announcement on Sunday that a march will be taken out till the Parliament demanding compensation and benefits under the new farm act. And this march will start at 12 noon near Mahamaya flyover. In which this demonstration will be on foot or on tractors and will move towards Delhi. In which Gautam Buddha Nagar, Bulandshahr, Aligarh and Agra along with other 20 districts will be a part of the farmers march. Barriers have been put up on the Noida-Delhi border and security checking has been increased. Police commissioner Shivhari Meena said that a large number of police forces will be deployed at Chilla, DND Border and Mahamaya Flyover to stop the farmers. Several check points will also be set up on the Noida-Greater Noida Expressway so that farmers can be stopped.

These route diversions are from Chilla border, greater the vehicles going towards Noida will pass through Sector 14A flyover and also the vehicles going to Delhi from DND border will pass through the elevated road via Filmcity flyover in Sector 18. And greater the vehicles going from Noida to Delhi will bypass the traffic of KalindiKunj via Charkha roundabout. Unlike the other route diversion, greater the vehicles going from Noida to Delhi will move towards their main route via Hajipur underpass, KalindiKunj and Sector 51 to Sector 60, and the vehicles going towards Delhi will take the Peripheral expressway from Sirsa, Parichok and take the Peripheral expressway via Dadri and Dasna to reach their main destination.

On 27 November, there was a farmers' protest against the Greater Noida Authority. In which from 28 November to 1 December, farmers' protest against the Yamuna Authority was going on. Many farmers' groups like Kisan Mazdoor Morcha and Samyukt Kisan Morcha were also planning a march on 6 December, the main motive of which was giving more emphasis to demands like guarantee of minimum support price (MSP).[17]

2. Farmer protest 2025, March to Chandigarh

Samyukt Kisan Morcha (SKM) farmers, who were marching to Chandigarh for a *dharna* to pressure the government to meet their demands, were stopped by police at multiple locations across Punjab on Wednesday (2020–21). In protest, farmers burnt effigies of Chief Minister Bhagwant Singh Mann. Heavy security arrangements were made across several Punjab districts, and barricades were set up at many entry points into Chandigarh, tightening security in the Union Territory. Frustrated by the denial of permission to march to Chandigarh, farmers raised slogans against the Aam Aadmi Party (AAP) government at several places.

The SKM protest targeted both the ruling AAP in Punjab and the Bharatiya Janata Party (BJP) at the Centre. SKM condemned what it described as AAP-led repression of Punjab's farmers, including raids on leaders' homes and arrests of several farmers. The Morcha demanded that all detained leaders be released and allowed to proceed to Chandigarh.

Sukhde Singh Korikalan, general secretary of the Bharatiya Kisan Sangh—one of Punjab's largest farmer unions—said that hundreds of farmers, including women, were stopped and detained in Bathinda, Barnala, Sangrur, Mansa, Patiala, Ludhiana, Muktsar, Fazilka, Amritsar, and Jalandhar while attempting to march toward Chandigarh.

Chief Minister Mann's remark the following day—that the government's leniency should not be mistaken for weakness—along with his admission that farmer leaders had been detained ahead of the proposed *dharna*, further angered the protesting farmers.

State minister Mr. Bhullar stated that "some people have been arrested as a preventive measure." Meanwhile, farmers associated with SKM (Non-political) and Kisan Mazdoor Morcha (KMM)—the two major umbrella groups leading the farmer movement since 13 February 2024—held demonstrations and burnt effigies of the Chief Minister in Amritsar and other districts, accusing the AAP government of blocking the democratic rights of farmers and preventing them from protesting in both the national and state capitals. They also alleged that the Chief Minister was acting under instructions from the Centre.

Farmer leader Sarwan Singh Pandher demanded that the Punjab government frame a farmer-friendly agricultural policy that promotes crops requiring less water, and ensures MSP-based procurement of six crops—along with basmati rice, maize, moong dal (green gram), and potato. He rejected the Centre's national agricultural policy framework and called for a legal guarantee of MSP in accordance with the M.S. Swaminathan Commission recommendations [18].

3. Farmer protests surpass previous Delhi agitation

The farmers' protest at the Punjab–Haryana borders has completed 380 days, surpassing the duration of the previous Delhi agitation. Farmers are demanding higher agricultural prices, debt relief, and better working conditions. Compared to the earlier protest—where 11 rounds of talks were held—there have been only six rounds of discussions with the central government during the current movement.

Before the Delhi Chalo-2 call issued by SKM (non-political) and Kisan Mazdoor Morcha (KMM) for 13 February 2024, the group of ministers met farmer representatives on 8 and 12 February 2024. Two further rounds of talks were held on 18 February 2024, during which the government proposed a five-year procurement agreement with cooperative bodies. Under this, Nafed and CCI would guarantee MSP-based purchase of crops worth ₹5,000 crore annually.

Farmers have also raised objections to the National Policy Framework on Agricultural Marketing (NPFAM), viewing it as a backdoor re-introduction of the repealed farm laws that triggered the earlier protest.

Farmer leader Jagjit Singh Dallewal began a fast-unto-death on 26 November 2024, continuing for more than 93 days. He received medical assistance only after 54 days. For over a year, protesters have blocked two national highways leading to Delhi. Farmers also attempted to march in groups of 101 members on 6, 8, and 14 December 2024, facing tear gas used by Haryana Police.

On 4 January 2025, farmer leader Rakesh Tikait stated that the protest at Khanauri–Shambhu could continue for 14–15 months, potentially exceeding the scale of the previous Delhi agitation. The Sanyukt Kisan Morcha endorsed Tikait's [19] statement

Conclusion

The three policy reforms done by the central government through three new farm laws are at a time when requirements of farmers and agriculture are changing. If these are implemented properly, it can take Indian agriculture and Indian economy to new heights. And along with that there will be a lot of changes in the rural economy too. Through these reforms there is hope of Indian agriculture becoming a global power and becoming a powerhouse for global food supply. These reforms will bring prosperity to farmers and changes in the rural economy which are considered essential for the growth of the Indian economy.

Earlier also the farmers were against these three farm laws, today again they have to face these problems and they are again carrying out their movements against the government. They again create a problem for these farmers. For which they have to take the help of movements every time. And then this protest by the farmers takes a new form every time.

References

1. Singh ,Shamsher The Farmers's Movement Against Three Agricutural Laws in India: A Study of Organisationhttps://doi.org/10.25003/RAS.12.01.0012 review of Agrarian Studies vol.12,no.1. January-june. 2022.
2. The Farners (Empowerment and Protection) Agreement on Price Assurance and Farm Services Act, No. 20 of 2020, India Code (Sept.20,2020), https://prsindia.org/billtrack/the-farmers-empowerment-and-protection-

agreement-on-price-assurance-and-farm-services-bill-2020 [https://perma.cc / M7FJ - X45R] [hereinafterFAPAFSA].
3. The Essential Commodities (amendment) Act, No.22 of 2020, India Code (2020), http:// prsindia.org/billtrack/the-essential-commodities-amendment-bill-2020[http://perma.cc/T7ED- N9LK] [hereinafter ECA]
4. https://participedia.net/case/indian-anti-farm-laws-protest-2020-21
5. Jakobsen, J. (2018) 'Towards a Gramscian food regime analysis of India's agrarian crisis: Counter-movements, petrofarming and Cheap Nature', Geoforum, 90, pp. 1–10. doi:https://doi.org/10.1016/j.geoforum.2018.01.015.
6. Dandekar, A. (2016) 'India's Agriculture And Farmer Suicides: An Anatomy of a Crisis', *India International Centre Quarterly*, 43(2), pp. 48–55.
7. Contribution of Agrculture Sector towards GDP Agriculture has been the bright spot in the Economy despite COVID-19 (2021), Ministry of Agriculture & Farmers Welfare, 3 August Available at: http://pib.gov.in/PressReleasePage.aspx?PRID=1741942
8. Jodhka, S.S. (2021) 'Why are the farmers of Punjab protesting?', *The Journal of Peasant Studies*, 48(7), pp. 1356–1370. doi:10.1080/03066150.2021.1990047.
9. https://www.hindustantimes.com/india-news/rajasthan-introduces-4-bills-to-counter-farm-laws/story-VluQg7CHvqLMjQkyIwiY7L.html
10. Haq, Z. (2021) "How India's farm protests went global," *ziahaq*, 7 February. Availableat: https://www.ziahaq.org/post/how-india-s-farm-protests-went-global
11. Aytaç, S.E. & Stokes, S. (2020), Why Protest?, *Woodrow Wilson International Center for Scholars*, Washington.
12. Dasgupta, Sravasti (2021-04-23). "Covid is Modi govt 'conspiracy' to end protests, farmers at Singhu, Ghazipur say". *ThePrint*. Retrieved 2021-05-15
13. Bera, Malay (2023). "Interrogating Social Distancing: Pandemic and Farmers' Protest in India" *Cultural Analysis*. Forum Series 1 (Pandemics and Politics): 1–21. Retrieved 2024-01-31.
14. Kaur, Deepkamal (2021), "Farmers to block Jalandhar-Phagwara stretch of NH-1 indefinitely from today," The Tribune, Aug 19, available at https://www.tribuneindia.com/news/jalandhar/ Farmers – to – block – jalandhar - phagwara-stretch-of-nh-1-indefinitely-from-today-299779,viewed on June 4, 2022.
15. Paramjit Singh, (2021) *Neoliberal Capitalism and Misery of Small Peasantry and Agricultural Labourers in India*, 15(2) hum. Geography 211, 212 (Oct. 2021).
16. Anwar &Shakeel*supra* note 36, at 574–75.
17. India news(NDTV)(2024), Farmers' protest in Delhi today. Here's what their demands are dec.2024, available at https://www.ndtv.com/india-news/farmers-protest-in-delhi-today-heres-what-their-demands-are-7151475
18. The Hindu (2025), Punjab farmers' march to Chandigarh thwarted, protesters burn Mann's effigies march. 2025, available at https://www.thehindu.com/news/national/punjab/farmers-protest-cm-bhagwant-mann-skm-chandigarh-march-detain-punjab-farmleaders/article69292909.ece
19. https://timesofindia.indiatimes.com/city/chandigarh/farmer-protests-will- complete-380-days-today-surpass-previous-delhi- agitation / articleshow /118585496.cms