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# **DIALOGUE**

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# Editorial Perspective

## A few words for our esteemed readers

As we step into the new year, it is with great optimism that I present this edition of *Dialogue*. This issue brings together an eclectic mix of scholarly contributions that delve into the pressing issues of our time, offering a rich tapestry of perspectives that emphasize the importance of diversity in thought, approach, and understanding. Let us embrace the new year with a renewed sense of purpose, hope, and a commitment to fostering inclusivity and understanding in all our endeavors.

This edition of *Dialogue* brings a collection of thought-provoking articles that focus on both national and regional issues, as well as the dynamics of our neighborhood. From the digitization of payments to rural labor challenges, and the integration of digital literacy in education, this volume highlights diverse perspectives on the forces shaping our world.

By addressing these critical topics, the articles offer valuable insights into how local and global developments impact the country. As we navigate the complexities of a rapidly evolving global landscape, may this edition serve as a source of inspiration, sparking meaningful dialogue and collaborative action. I extend my heartfelt thanks to the contributors for their insightful research and to our readers for their continued engagement.

Wishing our readers, a year filled with growth, learning, and impactful conversations.

**P C Haldar**

President

Astha Bharti





# Radical Islamic forces captured state power in Bangladesh—an abrupt change of Politics

**Bimal Pramanik\***

## Introduction

We have witnessed a people upsurge organized by some Islamic radical student leaders at Dhaka during the month of July-August 2024 and ousted sitting Prime Minister of Bangladesh Sheikh Hasina Wazed from the state power. It was astonishing for the world that Sheikh Hasina rapidly left her Prime Minister residence and fled to India for her personal security. She was four times full term Prime Minister of Bangladesh and won the general election in last January 2024 for the fifth term. Why it so happened? Is it policy lapses or failure to understand people psyche of Bangladesh? Sheikh Hasina led 14-party front – a liberal democratic political alliance of pro-liberation war in 1971. But the common people supported this movement knowingly in spite of its radical Islamic character. Though the leaders of the movement known as Samannayak i.e. coordinator suppressed their real intention and goal of the movement to public, saying it is ‘anti quota’ movement. But hours after Prime Minister left the country and took shelter in India; the real intent of the movement comes to the public. They have started to destroy all the monuments of the liberation war of 1971 including statues of the father of the nation Sheikh Mujibur Rahman all over the country, even the house of Sheikh Mujib—a museum of Bangladesh liberation movement at Dhanmondi, Dhaka was ransacked and burnt. One of the top leaders of this movement opined that Mujib and his associates were the main conspirators to

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dismember the eastern wing of Pakistan that was the real conspiracy of India. It is clear that the real intention of this movement is to divert the Bangladesh ideologically as Pakistan today.

Now they have taken initiative for de-Mujibisation of Bangladesh deleting all kinds of photographs from currency notes, government offices and other places. On the other hand, to implement 'Two Nation Theory' as like Pakistan, all kind of atrocities and discriminations have come down on Hindus for de-Hinduisation Bangladesh. Ground level situations, government as well as Muslim society want to drive out Hindu population from their ancestral land, where they have been living generation after generations. Why and how this kind of socio-political situation gradually developed in independent Bangladesh within a few decades? We can revisit some pages of history of Bangladesh.

From the very beginning since the liberation of 1971, Hindus who had earlier gone to India as war refugees and returned to independent Bangladesh again started migrating from the newly independent country to India, because they failed to retrieve their property and enjoy social security. Bengali nationalism was eroding fast, and anti-India sentiment was growing rapidly. After the assassination of Sheikh Mujibar Rahman (President of Bangladesh) in 1975, the relevance of the very Bangladesh concept of 1971 was lost, and Bangladesh became a state tilting towards Islamisation. All these show that the emergent idea of secular Bangladesh, particularly apparent in 1971, was not only missing but also probably mistaken. Mujib's case of fighting against Pakistan had finally given way to a Bangladesh which never denied its Islamic character. On the surface, while Hindus imagined a new secular-democratic prospect, Muslims suffered from a bankruptcy of leadership, which threw them eventually into the clutches of Mustaq Ahmed, Ziaur Rahman and similar others after Mujib's death. It was a pity that Bangladesh soon came out as a new country and a state with an overt Islamic identity.

The leaders of the Muslim society as a whole are trying to organize and consolidate Muslim masses on the basis of religion and madrasa teachings. The moderate views of a small section of the society are gradually being replaced by the radical concept. As a result, the differences with the other religious and cultural sects have become wider. Now Bangladesh has become the epicentre of India's north-eastern region for propagating and promoting ultra-Islamic fundamentalism and terrorism.

The political behavior fitted fine with the general framework of the political objectives of the Bangladesh Republic after the initial euphoria of Mujib period was over. The liberation of Bangladesh from the yoke of Pakistan could not educate enough not could it have any stable imprint upon the people of Bangladesh to evolve a friendly attitude towards India. The anti-Indian attitude of various political leaders, whether one from Muslim League or from Awami League or from Bangladesh Nationalist Party, remains a common characteristic to shape and influence the complementary relation between the process of minority exodus and demographic expansion of the majority.

During the last four decades it had been possible to imbibe among the rural masses as well as among a large section of urban middle class a belief that Bengali Muslims have to strengthen the Islamic identity in order to maintain the sovereign entity of Bangladesh. There must be an admixture of Islamic culture and social values with the existing Bengali culture. Consequently, Islamisation of Bengali culture is more pronounced among the rich, middle and lower-middle class people than it was during Pakistani rule. The use of hijab, skull cap and burkha is evidently on the rise. Islamization on a gigantic scale is being manifested in the style of keeping beard and preparing dresses, cultivation of Arabic language and culture, and religious fanaticism to cap it all. During Pakistani time, not only the Awami League leaders, but also a section of Muslim League leaders were never seen to use caps, keep beard or recite namaj on an evidently political ground. Public meetings and functions were never in abeyance during the recitation of namaj. Madrassa education was totally neglected and non-acceptable compared to general education. But now political leaders are seen to accept Islamization vigorously on political considerations. One-third of the total student community is passing through madrassa education, and their role in the society cannot be ignored. As a result, the political leaders are trying to win the support of these masses of student in a manner acceptable to them. It is quite impossible that such a large section of madrassa educated students can be absorbed in the mosques and madrassas as imams or teachers. Where they will go? They cannot participate in the planning of activities in a modern age since they are more or less unfit, and as such, suffer from frustration. This is primarily the cause that they are being attracted strongly to terrorist activities. The modern society cannot

accommodate them, and they cannot make themselves suitable for the modern society. Consequently, they hinder the progress of society and try to re-orient society according to their needs and ideas. This is being amply manifested in the cruel and destructive religious fundamentalist activities in recent times in Bangladesh. Apart from that, ISIS and other international radical Islamic terrorist organizations in present day Bangladesh are actively spreading their influence and attraction among the young generation in upper and middle-class society. It is recent phenomenon. The AL led government of Bangladesh has recognized the Madrassa education (degrees) as equivalent to general education (degrees) so that the madrassa students can be eligible for government/semi-government jobs. It will have also a long-term effect in orienting the Bangladesh society towards radical Islamic ethos.

Since the Pakistani days, Islamization of Bangladesh has been going on, which has grown very rapidly after gruesome murder of Sheikh Mujib. Madrassa education is the main plank of nurturing this process, which has been strengthened by certain policies adopted by the Bangladesh government from time to time. Islam has become the State religion according to its constitution. There always existed a propensity in Bangladesh society to hate the Hindus, Buddhists and Christians i.e. non-Muslims. The boys and girls imbibe this propensity from their families in the first instance, which get strengthened through religious teachings and madrassa education supported by the state. In addition, the ill effects of Islamic 'fatwas', coupled with ultra-Islamic militancy of radical Islamists, have complicated, and enhanced the feeling. With this social situation the claim of the politicians and intellectuals that the Muslims of Bangladesh believe in communal harmony, and they are protectors of the minority communities, is nothing but a wisp in the wind.

Till the governments of Bangladesh have been trying to strengthen Islam officially in the social milieu of Bangladesh, suppressing other religious communities. Conversion of members of other faiths to Islam is generally encouraged in the society; there is even a declared budget of the government for conversion of non-Muslims into Muslims. A clear cultural transformation in favour of Islamization has thus been taking place in the society. In this slough of modern Islam,

even the Awami League led government, slow and steady, has been strengthening the very concept of Islamic Bangladesh, and ignoring the ideals of liberation war. So, the people in general cannot come out from the clutches of Islamic fundamentalists. Sheikh Hasina, Prime Minister of Bangladesh, campaigned hard against Bangladesh Jamaat-e-Islam (BJI) and war criminals, but not against Islamic fundamentalists and radical Islamic ideologues (activists), who are killing bloggers and modern thinkers. There are many radical Islamic outfits that are active in Islamization of liberal ideas and the Bengali identity. The Awami League government itself is a party to it. --

Sheikh Hasina, Prime Minister of Bangladesh, decided that the government would build across Bangladesh model mosques and Islamic cultural centre's in all districts and upazilas (sub-district), to facilitate Islamic education, and Islamic cultural activities will be promoted through these mosques. It was a commitment of Awami League in its election manifesto in the last general election of 2014. Even the syllabuses of Primary/Secondary school education have been changed in conformity with the ideological perception. Apart from that, mosque-based child and mass education programmes under the Religious Department (Ministry) of the government are being continued.

Shahriar Kabir, a veteran Bangladeshi Human Rights activist and journalist, has observed that "in a recent judgment, Bangladesh High Court repealed that, 'Fifth Amendment' of the Constitution and has given an order to revive the 1972 Constitution which is also corroborated by the Supreme Court. But the saddest part is that Sheikh Hasina, Prime Minister of Bangladesh, has told a Mahajote (Grand Alliance) meeting that 'Bismillah' will be retained in the Constitution and no embargo will be given on religion-based politics and political parties by the government. Even 'Islam' as State Religion will stay. This stand of the Prime Minister is nothing but a clear disowning / violation of the Supreme Court verdict and mockery of the wishes of thirty lakh martyrs and of the spirit of Bangabandhu and liberation war. It is not reflecting the will of the citizens of Bangladesh who have elected AL to capture power in 2008."

In the absence of deep-rooted liberal democratic practices in the society and politics, these types of developments are easily taking

place since independence of Bangladesh. After capturing power, Ziaur Rahman started unhesitatingly to incline Bangladesh ideologically towards Pakistan. Steps were taken to Islamise the Constitution by shrugging off the ideals of liberation war, and by the rehabilitation of Islamist and pro-Pakistani elements in politics, elimination of pro-liberation officers from the military, distortion of history, Islamization of Bengali culture, and induction of Pakistan oriented Islamic values in education and administration. He did all these to open a door to establish “Bangladeshi nationalism”. As a result, Ziaur Rahman could establish a foothold among the intelligentsia and in the society as a whole. Under the cover of Bangladeshi nationalism, the process of introducing Pakistani/Islamist trends of thought started flourishing smoothly. In the footsteps of General Zia, General Ershad, the then President of Bangladesh, accelerated this process further by introducing and enacting a bill in June 1988, declaring Islam as the State Religion (Eighth Amendment of the Constitution), General Ershad made it legal for the fundamentalist Islamic forces to flourish in the soil of Bangladesh without any hindrance. All the parties, including AL, accepted this amendment, because the people of Bangladesh were eager to find a new identity. The notion of Bengali identity, which was unobtrusively thrust upon them, disappeared, even if gradually, and they rushed towards their real identity. As a result, the growing religious chauvinism in the society attained such a great height that it becomes difficult for the politicians and the common people to go against it. Consequently, a supposed to be democratic and liberal party like Awami League has not shrunk from retaining ‘Islam as State Religion’ and ‘Bismillah-ar-Rahman-ar Rahim’ in the constitution for the purpose of spreading Islam smoothly.

### **Social Changes in Bangladesh:**

Immediately after Bangladesh become independent, a process was set in motion to include the country in the Islamic block. Although mainstream Awami League (AL) tried to establish the freedom struggle on a nationalist pedestal, culturally, there was little transition from the Islamic psyche to the Bengali psyche in post-independence Bangladesh. After the death of Sheikh Mujibur Rahman, the process of Islamization completely overshadowed Bangladesh. Although religion is an important subject-matter for the common people of Bangladesh, there was a great chance of shaping Bangladeshi polity on

the basis of the ideals of democracy and secularism, following the success of the liberation war in 1971, which upheld these ideals. A few people persisted in pursuing these ideals, but the dreadful massacre of liberation war leadership including Sheikh Mujibur Rahman in 1975, drastically changed the fate of the ideal of secularism. Later, even the AL, which adhered to the ideals of Mujibur Rahman, failed to embrace the principle of secular political practice. To a large extent, at the far end of Pakistani rule and the early period of Bangladesh, AL did not try to use religion as the primary source of its political influence. The determined use of religion in Bangladeshi politics started after the killing of Sheikh Mujibur Rahman in 1975. Religious influence flooded the society, like tidal waves. Even Sheikh Hasina, daughter of the Late Sheikh Mujibur Rahaman and presently leader of a professedly liberal democratic party like AL, performed Hajj a number of times and wore hejab. She had to sign a five-point-agreement on religiosity with an Islamic fundamentalist party, Islamic Oikya Jote (IOJ), for the purpose of holding Muslim vote bank. Moreover, she retained such provisions as 'Bismillah-ar-Rahman-ar-Rahim' in the preamble of the Constitution of Bangladesh, and 'Islam as State Religion' (15<sup>th</sup> Amendment in 2011), in spite of receiving the favourable judgment for abolition of the Fifth and Eighth Amendments, which contained these provisions, from the highest court of the country. From all such events, we can easily gauge the overall situation of Bangladesh.

Sheikh Mujibur Rahman and other national leaders were killed due to an army coup. General Ziaur Rahman captured power in connivance with the Islamic and Pakistan lobby. At the time of General Zia, Islamic fundamentalist and radical terrorist outfits rapidly engulfed Bangladesh polity and society. The concept of international Islamic solidarity began to gain ground in the society, and the role of political leadership was important in this regard. In the early 1980s, a lot of madrassa students were recruited as volunteers to fight in Afghanistan and Jammu and Kashmir as a part of international jihad, which is an open secret today. No political parties and social organizations protested against these activities. Actually, most of the people thought that it was an attempt at building Islamic solidarity and unity. Gradually, a large number of students from Bangladeshi Quami Madrassas joined the international radical Islamic terrorist network, and thus Bangladesh got importance in the Islamic countries. Subsequently, a rapid growth



was observed in the sector of Islamic NGOs. During 1982—1990, Maolana Abdul Mannan, former Al Badr leader, i.e. collaborator of Pakistan in the 1971 liberation war, acted as the Minister of Religious Affairs in General H.M. Ershad's cabinet, and also remained the leader of Jamatul Mudarresin (an umbrella organization of Bangladesh Quami Madrassas). Abdul Mannan played a vital role in organizing jihadi cadres (radical Islamist Terrorists) from Quami Madrassas for Afghanistan and Jammu and Kashmir wars, when he enjoyed the patronage of General Ershad.

After the defeat of the Soviet Union in Kabul in 1989, a large number of radical Islamist terrorists started to return to Bangladesh from Afghanistan, Jammu & Kashmir and Pakistan. At this juncture, a number of new terrorist outfits emerged in Bangladesh, e.g. Harkatul Jihad, Harkatul Mujahedin, Jamatul Mujahedin Bangladesh, etc. These organizations gained importance all over the country and abroad. Since the mid-1980s, Bangladesh state and society were getting recognized as a safe haven for all kinds of terrorists. From the 1980s, for about three decades, Bangladesh governments and administration sponsored several terrorist outfits, including radical Islamist and Indian North-East (NE) insurgent outfits, to carry out sabotage on the Indian soil. Nevertheless, Bangladeshi governments and administration always denied these facts. During Sheikh Hasina's tenure, from 2009 onwards, the hidden truth about the activities of radical Islamic outfits, and a group of Indian terrorist organizations from north-east India, came to light.

In spite of concern about the activities of a large number of radical Islamist organizations among the liberal Bangladesh and international countries, there is also a soft feeling towards these Islamist terrorists all over Bangladesh, which helps them to grow inside the country. It is a social dichotomy.

The ground reality of the Bangladesh society changed much during the last five decades, and there are many Islamic organizations in present day Bangladesh. But the present interim government of Bangladesh has constituted with radical Islamic organizations like BJI and Hefajate Islam. Even a good number of ruling front members as well as advisors have close connections with these Islamic organizations through many religio-cultural activities. Now a deep-rooted radical Islamist perception has engulfed the entire polity since independence in 1971.

## **Bangladesh's views towards the Eastern and North-Eastern Region of India:**

After the independence of Bangladesh, the army finally established its roots in the Bangladesh polity through the assassination of President Sheikh Mujibur Rahman and top leadership of the liberation struggle. They are also major beneficiaries of the foreign aid and development fund since then. Gradually, they have expanded their grip over the administration and society. As a result, all the governments succumb to the army even upon a little pressure, and keep the army-related issues out of discussion in parliament or public fora. Policies of all the governments are the same regarding defence and army since the early seventies. Gradually, both the number and strength of the armed forces are 'increasing'.

Major section of the civil and military leadership as well as rank and file feel and express the idea, that 16 crores of people can hardly be accommodated within the present boundary of the country. It must be expanded by hook or by crook; otherwise Bangladesh will not survive in future. Secondly, there is a perception prevailing in Bangladesh that India will occupy Bangladesh in future – Bangladesh should be prepared to resist them. This propaganda has been going on since its inception in 1971. These are the two major thoughts that dominate the defence and foreign policies of all the governments.

The armed forces of Bangladesh always consider and preach the threat perception especially from India because of ninety percent of the international border being with India. They always suffer from this psyche that India is a big powerful neighbour, which may patronize/inspire any group that can create social unrest or anti-government movement if the ruling party acts against India's interest. A few intellectuals think that by suppressing ethnic and religious minorities and following ethnic cleansing policies in the country because of an overwhelming majority of Muslims with a chronic anti-minority psyche, a social situation in the country has already been sufficiently provocative for the neighbour.

General Shafiullah—former chief of army staff and ex-defence advisor of Prime Minister Sheikh Hasina think Bangladesh has to build such an army that the neighbour has to count Bangladesh. India and Pakistan fought three major wars and still they are not good neighbours. But they count each other not for their good relations (!),

but they know both of them have the power to hit back. To earn respect, Bangladesh must have teeth like Pakistan.

Pakistan legacy still haunts Bangladesh. They are failing to come out the inimical perception towards India which was inherited from their predecessors, i.e. Islamic Pakistan. Most members of the Bangladeshi Muslim intelligentsia think, Bangladesh can survive only by the strengthening the Islamist identity of a Bengali Muslim, not by reinforcing Bengali nationalism and Bengali culture. A rapid growth of madrassas and mosques in the country since the mid-seventies to strengthen the cultural and religious orientation as Bangladeshi Muslims are relevant in this context. They feel that most of the contents of Bengali culture are still dominated by Bengali Hindus, and it is also a part of greater Indian culture. For that reason, Muslim social and political leadership have been trying to build up a parallel culture for Bengali Muslims since Pakistan days. Fifty years later, Bengali Muslim identified themselves as Moderate Muslims with more or less a separate cultural identity from that of Bengali Hindus. Of late, this moderate Muslim identity of Bangladeshi Muslims is being preached not only in the country but also abroad.

All the political leadership and elites of the country are pretending themselves to be moderate Muslims. But it is possible to take a different view. Radical Islamic fundamentalists have succeeded in influencing significantly the field of education, culture, society and politics. During the last five decades they have expanded influence not only over Bangladesh but also over the north-eastern region of India, especially West Bengal, Assam and Tripura. The aim is to organize Bengali Muslim masses for the greater interest of the Muslim community. Some features of the growth of madrassas and mosques in West Bengal and Assam are emerging significantly. In the meantime, so many social, religious and political demands of Muslims in West Bengal and Assam are already accepted by the ruling governments during the past three-four decades. Hence a parallel so-called Bangladeshi culture is being practiced in the north-eastern region of India during last two-three decades.

Another important observation is, since the days of the 1947 partition, the Muslim psyche in both the parts of Pakistan is suffering from the injury of losing half of Bengal and Assam. They ruthlessly have been pursuing the policy of 'lebensraum' since the days of partition. Acting perhaps on the philosophy of the great Italian,

Machiavelli, who observed in the 16<sup>th</sup> century, “Sending immigrants is the next effective way to colonize countries because it is less offensive than to send military expeditions and much less expensive.” Bangladesh with a single-minded devotion has been following this policy and to say the least, it has been quite successful in this endeavour. The propagation of the moderate Muslim nationalism in Assam and West Bengal can be faster or slower depending on special political or social developments in the region. One may add that, in the present circumstances, it is hardly possible to launch a greater unity initiative among the Bangla speaking populace in the region on the basis of language, culture and nationalism. This greater unity idea is still haunting some socio-political forces in both the parts of Bengal, despite its lack of feasibility. It is difficult to organize any movement on the basis of narrow Bengali nationalism/chauvinism or provincialism against central government from West Bengal and Assam, sponsored by the local political outfits raising the issues of deprivation by the centre. But there is a speculation on the emerging possibility to being the Bangla speaking Muslims in the region under a moderate Islamic nationalism which may counteract the radical Islamic movement. But there are some new deterrent factors emerging in the political arena of West Bengal and Assam among the left- and right-wing ideological factions, and a group of intelligentsias against the process of radical Islamization.

The major political parties of Bangladesh and their servilely obedient intellectuals would hardly admit, that the Islamization and communalization of Bangladesh society has gone, the full circle during the last fifty years. In present day Bangladesh, what the common Muslim population is doing is grossly soaked in communalism and anti-Hindu sentiment, which precisely is the legacy of Pakistan. It has now become a wishful thinking that the fair wind of communal harmony is blowing in Bangladesh.

Leaders of the Muslim society as a whole are trying to organize and consolidate Muslim masses on the basis of religion and madrassa/religious teachings. The moderate views of the society are gradually being replaced by the radical Islamic concepts. As a result, the differences with the other religious and cultural sects have more and more widened. Now Bangladesh has become the main epicentre of India’s North-Eastern region for the propagation and promotion of the ultra-Islamic fundamentalism and terrorism in spite of the professed

endeavour (!) by the earlier Bangladesh Government (ousted) to eliminate pro-radical Islamist terrorists.

Last but not the least, the present so-called government of Bangladesh headed by Md. Yunus has been working vehemently against India with the inspirational agenda of the ISI of Pakistan to disintegrate north-eastern region of India, West Bengal and Assam in particular by inciting radical Islamic organizations, hard-core militant cadres and dreaded terrorists from Bangladesh and abroad aiming at unstable the regional peace and development programmes.

**Source:** Bimal Pramanik, '*Hindu Decrescent Bangladesh and West Bengal*', Centre for Research in Indo-Bangladesh Relations, Kolkata, 2021.

# Impact of Digital Financial Inclusion on Economic Growth in Rural India

Anita\* and Dr. Yamini Agarwal\*\*

## Introduction

Digital financial inclusion refers to the process of integrating digital technologies into the financial system to enhance access to essential financial services for individuals, particularly in underserved regions. In rural India, where conventional banking infrastructure is usually limited, digital platforms such as mobile phones, Automated Teller Machines (ATMs), and the internet present viable alternatives to enhance financial accessibility. Over the years, digital financial inclusion has been increasingly recognized as an aggregator for economic growth, especially in rural areas where access to banking services remains constrained (Ghosh, 2016; Muralidharan et al., 2017; Sharma & Aggarwal, 2018).

The rural economy in India has faced significant barriers to financial inclusion, including geographic remoteness, a lack of financial literacy, and limited availability of physical banking facilities (Basu, 2013). Technologies like mobile banking and internet-based financial services have proven to be effective solutions, enhancing financial access and streamlining financial transactions (Chakrabarty, 2016; Ghosh, 2020). Research highlights the transformative potential of mobile banking, where services like digital payments, savings accounts, and insurance are becoming more accessible in rural regions, positively impacting economic growth (Das & Singh, 2017; Gupta et al., 2020).

Scholars such as Puhazhendhi (2016) and Singh & Kumar (2018) have suggested that digital financial services not only enhance access to credit and savings but also support rural income generation and

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overall economic activity. Various studies point to a positive correlation between financial inclusion and key economic indicators, including Real GDP and per capita income in rural areas, underscoring the potential of digital financial inclusion in fostering economic prosperity (Dandekar, 2014; Kumar & Sharma, 2019). However, the full impact of specific digital services, such as ATM deployment, mobile usage, and internet penetration, on economic growth remains an underexplored area of research (Bose & Roy, 2021).

This research examines how the adoption of digital financial services, including ATMs, mobile phones, and internet connectivity, impacts economic growth in rural India. Using a regression analysis approach, the study assesses how various elements of digital infrastructure align with critical economic indicators, such as Real GDP and per capita income, in rural areas. These findings contribute to a deeper understanding of the role digital financial inclusion plays in driving economic progress (Rajendran et al., 2020; Kapoor & Joshi, 2018).

Although significant research has been conducted on financial inclusion in urban areas, studies focusing on rural regions are relatively limited, particularly in understanding the role of digital financial services in fostering rural economic growth (Bhattacharya & Rao, 2015). This research aims to fill this gap by presenting empirical evidence on how digital financial inclusion influences rural economic development in India. The study offers valuable insights to guide policymakers in their efforts to enhance rural economic prosperity and improve access to digital financial resources (Pande & Kapoor, 2020).

Furthermore, the study holds relevance in the context of the increasing focus by the Indian government and private organizations on strengthening digital infrastructure as a means to boost rural economic development (Sharma, 2015; Tiwari et al., 2019). The insights from this research will contribute to the expanding literature on the critical role of digital financial inclusion in advancing economic growth, particularly in rural Indian settings.

## **Literature review**

### ***Digital Financial Inclusion in Rural India: Concept and Evolution***

Digital financial inclusion involves integrating underserved populations into the formal financial ecosystem by leveraging digital tools such

as mobile banking, internet banking, and other online financial services (Basu, 2013; Ghosh, 2016). Over the years, India has made notable strides in digitizing financial services, particularly focusing on rural regions where access to traditional banking infrastructure is limited (Chakrabarty, 2016; Tiwari et al., 2019). Initiatives like the government's Digital India campaign and the Pradhan Mantri Jan Dhan Yojana (PMJDY) have played a transformative role in expanding the reach of digital financial services (Sharma, 2015; Kapoor & Joshi, 2018). These efforts have significantly improved the ability of rural communities to access savings accounts, credit, insurance, and government subsidies through mobile phones (Das & Singh, 2017).

In rural India, where formal financial systems were historically inaccessible due to infrastructure challenges, mobile phones have emerged as a crucial enabler of digital financial services (Rajendran et al., 2020). The growing adoption of digital platforms has been fuelled by the rapid increase in mobile phone penetration, which climbed from 26% in 2010 to over 85% in 2020. This surge has facilitated broader access to financial services (Ghosh, 2020; Sharma & Aggarwal, 2020). Additionally, government-supported systems like Aadhaar-based payment mechanisms have proven vital in ensuring biometric-based access to financial services for rural populations (Pande & Kapoor, 2020).

### ***Challenges in Promoting Digital Financial Inclusion in Rural India***

Despite the significant progress in digital financial inclusion, numerous challenges persist. Infrastructure limitations such as unreliable internet connectivity, lack of electricity, and poor network coverage in rural areas remain major barriers to the effective delivery of digital services (Puhazhendhi, 2016). Dandekar (2014) and Muralidharan et al. (2017) highlighted that poor connectivity and inconsistent electricity supply hamper the full adoption of digital financial services. Additionally, a study by Gupta et al. (2020) emphasized that many rural individuals still lack basic digital literacy, making them hesitant to adopt mobile and internet banking solutions.

Moreover, trust remains a significant barrier in rural India. Many rural citizens are sceptical about the security of online transactions, often due to fears of cybercrime, fraud, and data breaches (Ghosh, 2016; Das & Singh, 2017). Gupta et al. (2020) suggest that while



digital financial services have the potential to provide more convenient and cost-effective banking solutions, trust issues significantly hinder their widespread use.

### ***Role of ATMs, Mobile Phones, and Internet Penetration***

ATMs, mobile phones, and internet connectivity are critical components in promoting digital financial inclusion. While ATM penetration in rural areas has improved, the number of ATMs per capita still lags behind urban areas, limiting access to cash and other banking services (Bose & Roy, 2021). Kapoor & Joshi (2018) emphasize that regions with higher ATM density experience more notable advancements in financial inclusion.

The rapid adoption of mobile phones has revolutionized financial access in India. Mobile banking enables users to carry out various financial tasks directly from their devices. Research by Tiwari et al. (2019) highlights that mobile banking has significantly enhanced access to financial services, particularly for rural populations that are geographically distant from traditional bank branches. These systems allow users to transfer money, pay bills, and even access small loans (Das & Singh, 2017).

Regarding internet connectivity, Bhattacharya & Rao (2015) and Muralidharan et al. (2017) argue that high-speed internet is vital for successfully implementing online financial platforms. However, limited infrastructure and low digital literacy in rural areas hinder the widespread adoption of internet-based financial services (Ghosh, 2020).

### ***Impact of Digital Financial Inclusion on Rural Economic Growth***

Digital financial inclusion has been extensively studied for its impact on rural economic growth. It offers rural communities' access to various financial products like savings accounts, credit, insurance, and remittances. These services contribute to improving living standards, reducing poverty, and facilitating entrepreneurial ventures (Rajendran et al., 2020; Sharma, 2015). Puhazhendi (2016) notes that digital credit platforms enable individuals to engage in entrepreneurial activities, thus boosting rural economies.

Research consistently shows that digital financial inclusion leads to higher savings rates in rural areas (Ghosh, 2016; Kapoor & Joshi,

2018). Additionally, mobile banking microcredit services empower entrepreneurs to expand their businesses, further supporting local economic development (Kumar & Sharma, 2019). Singh & Kumar (2018) observed that regions with robust digital financial infrastructure tend to have higher GDP and per capita income, illustrating a strong link between financial inclusion and rural economic progress.

Finally, digital financial inclusion has simplified remittances, an essential income source in many rural households. Rajendran et al. (2020) emphasize that the proliferation of mobile payment platforms has enhanced the efficiency of these transactions.

### ***Policy and Institutional Efforts***

The Indian government has made remarkable progress in advancing digital financial inclusion. Initiatives such as the Pradhan Mantri Jan Dhan Yojana (PMJDY) aim to provide universal access to basic banking services (Sharma, 2015; Kapoor & Joshi, 2018). Other programs like the Digital India initiative and the Aadhaar-enabled Payment System (ABPS) have improved financial service accessibility for rural populations (Tiwari et al., 2019). These efforts have significantly expanded the availability of financial services in rural regions and reduced the costs associated with accessing these services (Das & Singh, 2017).

Nonetheless, further policy refinement is essential to address critical issues such as infrastructure gaps, digital literacy, and cybersecurity concerns. Puhazhendi (2016) and Gupta et al. (2020) emphasize that targeted interventions to improve internet connectivity, provide digital skills training, and strengthen cybersecurity frameworks are necessary to eliminate barriers to financial inclusion in rural areas.

### ***Research Gaps***

Despite the increasing focus on digital financial inclusion, several research gaps persist, particularly concerning its long-term impact on rural economies. One significant gap lies in the lack of comprehensive studies exploring the socio-economic outcomes of digital financial inclusion in rural contexts over extended periods. While numerous studies highlight the short-term benefits of adopting digital services, such as immediate economic gains, limited research has examined their influence on broader social indicators, including education, health, and gender equality.

Another area requiring attention is the intersection of digital literacy and financial inclusion. Most studies examine these factors in isolation and fail to analyze how they collectively shape financial behaviors and economic empowerment in rural areas. Digital literacy is a vital component of financial inclusion, and a deeper understanding of its role can help tailor policies to better serve underserved communities.

Lastly, socio-cultural challenges related to financial inclusion in rural India remain underexplored. While issues like internet connectivity and smartphone access are well-documented, there is limited research on how traditional banking practices and cultural norms influence the adoption of digital financial platforms. Addressing these gaps is essential for creating inclusive financial ecosystems that cater to diverse rural populations.

### ***Research Objective***

#### **To Examine the Effect of Digital Financial Inclusion (DFI) on Economic Empowerment in Rural India.**

This study analysed the impact of DFI on economic empowerment in rural India, with a focus on how digital financial services (DFS) contribute to improving economic opportunities in rural areas. In recent years, digital platforms have become a crucial tool for enhancing financial accessibility, especially for marginalized groups in rural communities. Through the use of mobile banking, digital payment systems, and online lending platforms, rural communities are now able to access credit, savings, and insurance products that were once beyond their reach. The widespread adoption of smartphones and internet connectivity has opened new doors for economic participation, allowing individuals to engage in formal financial systems, improve financial literacy, and reduce dependency on informal financial networks. Despite significant progress, challenges remain in terms of infrastructure, digital literacy, and socio-cultural barriers that hinder full adoption. Therefore, this study aims to assess how digital financial inclusion is shaping economic outcomes in rural India, focusing on its role in enhancing financial independence, fostering entrepreneurial activities, and improving overall living standards. By understanding these dynamics, the research seeks to provide insights into the potential for DFS to serve as driver for sustainable rural economic growth.

## **Research Methodology**

For this study, a data-driven research design is chosen, utilizing secondary data from a variety of credible reports such as the FinScope Survey, Financial Diary, UN Rural Economy Report, The Global Findex Report, Financial Access Survey, and RBI Reports. These reports provide detailed insights into the progress of financial inclusion, digital adoption, and socio-economic development in rural India over time. The data extracted from these sources will include key parameters related to digital financial inclusion, such as access to digital payment systems, internet penetration, mobile banking usage, and overall financial inclusion indices. This secondary data will provide a rich foundation for understanding the trends and developments in rural economic sectors in relation to digital financial services.

To analyse the impact of digital financial inclusion on economic growths, regression analysis will be employed. This statistical method will help identify relationships between DFI and key economic indicators such as income levels, savings rates, and employment opportunities in rural areas. The regression model will quantify the extent to which digital financial inclusion has influenced these parameters over time.

The analysis will be conducted using IBM SPSS and Microsoft Office Software as analytical tools. IBM SPSS will be used for conducting regression analysis, generating descriptive statistics, and ensuring accurate data interpretation. Microsoft Office Software, including Excel, will assist in organizing, cleaning, and presenting the data. The integration of these tools will ensure a thorough, reliable, and systematic analysis of the relationship between DFI and rural economic growth.

## **Data Analysis and Interpretations**

This section focuses on analyzing the relationship between digital financial inclusion and rural economic growth in India. Using secondary data from key reports like the FinScope Survey, Global Findex Report, and RBI Reports, we examine indicators such as mobile and internet penetration, ATM deployment, and access to DFS. The analysis aims to identify trends and patterns in the impact of DFI on economic factors such as income, agricultural output, and financial service utilization in rural areas. Regression analysis will be conducted to

quantify this impact, with IBM SPSS and Microsoft Office Software used as analytical tools. The outcomes will offer valuable insights into how digital financial tools empower rural communities, enhance financial accessibility, and stimulate economic development. These findings will deepen the understanding of the wider socio-economic impacts of digital financial inclusion and inform future policy frameworks aimed at rural advancement.

***Real GDP and ATM Deployment, Mobile Per 1000, Internet Penetration***

HA<sub>1</sub>: ATM Deployment, Mobile Usage (Per 1000 Adults) and Internet Penetration does not significantly impact Real GDP in Indian Rural Economy.

H<sub>1</sub>: ATM Deployment, Mobile Usage (Per 1000 Adults) and Internet Penetration significantly impacts Real GDP in Indian Rural Economy.

Table 1: Descriptive Statistics for H<sub>1</sub>

Descriptive Statistics			
	Mean	Std. Deviation	N
Real GDP	13026291.5000	1995665.83443	10
Mobile per thousand	485.9820	56.22149	10
Internet penetration	30.9110	17.16325	10
ATM deployment	43459.3000	7465.80355	10

Source: Authors own Compilations through data analysis

Table 2: Correlations for H<sub>1</sub>

		Correlations			
		Real GDP	Mobile per thousand	Internet penetration	ATM deployment
Pearson Correlation	Real GDP	1.000	.907	.944	.917
	Mobile per thousand	.907	1.000	.798	.809
	Internet penetration	.944	.798	1.000	.960
	ATM deployment	.917	.809	.960	1.000
Sig. (1-tailed)	Real GDP	.	.000	.000	.000
	Mobile per thousand	.000	.	.003	.002
	Internet penetration	.000	.003	.	.000
	ATM deployment	.000	.002	.000	.
N	Real GDP	10	10	10	10
	Mobile per thousand	10	10	10	10
	Internet penetration	10	10	10	10
	ATM deployment	10	10	10	10

Source: Authors own Compilations through data analysis

Table 3: Model Summary for H<sub>1</sub>

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.978 <sup>a</sup>	.957	.935	508949.82821
a. Predictors: (Constant), ATM deployment, Mobile per thousand, Internet penetration				

Source: Authors own Compilations through data analysis

Table 4: ANOVA for H<sub>1</sub>

ANOVA <sup>a</sup>						
Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	34289959538567.560	3	11429986512855.854	44.126	.000 <sup>b</sup>
	Residual	1554179565808.941	6	259029927634.824		
	Total	35844139104376.500	9			
a. Dependent Variable: Real GDP						
b. Predictors: (Constant), ATM deployment, Mobile per thousand, Internet penetration						

Source: Authors own Compilations through data analysis

Table 5: Coefficients for H<sub>1</sub>

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4121097.590	2880800.322		1.431	.203
	Mobile per thousand	15461.447	5180.664	.436	2.984	.024
	Internet penetration	79585.704	35475.717	.684	2.243	.066
	ATM deployment	-24.595	83.726	-.092	-.294	.779
a. Dependent Variable: Real GDP						

Source: Authors own Compilations through data analysis

## INTERPRETATIONS

Data for ten years have been considered from 2014 to 2023, to explore the relationship between Real GDP (Rural India) and mobile phone usage per thousand people, internet penetration, and ATM deployment (Rural India). A linear regression analysis was conducted using IBM

SPSS to examine the impact of these variables on the Real GDP of Rural India. In this analysis, mobile phone usage per thousand people, internet penetration, and ATM deployment serves as independent variables, while Real GDP is the dependent variable. The significance value (p-value) was tested at the 5% level, and the regression equation was formulated. Detailed interpretations of each table are provided below.

The Correlations table highlights the relationships between Real GDP and the other variables. Real GDP is strongly correlated with mobile usage per thousand people (correlation coefficient = .907), internet penetration (correlation coefficient = .944), and ATM deployment (correlation coefficient = .917). This strong positive correlation suggests that higher levels of mobile usage, internet penetration, and ATM deployment are associated with higher Real GDP. Additionally, internet penetration and ATM deployment are highly correlated with each other (correlation coefficient = .960), indicating that countries with better internet access tend to also have more ATMs.

The Regression Analysis, as presented in the Model Summary, indicates that the model accounts for 95.7% of the variance in Real GDP ( $R^2 = .957$ ), signifying a very robust fit. The Adjusted  $R^2$  value of .935 further validates the model's reliability when considering the number of predictors.

The ANOVA table reveals that the model is statistically significant ( $F = 44.126$ ,  $p < .001$ ), indicating that the predictors, when considered together, have a meaningful impact on Real GDP.

The Coefficients table provides insights into the influence of each independent variable on Real GDP. For mobile phone usage per thousand people, the unstandardized coefficient is 15,461, showing that an increase of one mobile phone per thousand people leads to a rise of approximately 15,461 units in Real GDP, holding all other variables constant. This effect is statistically significant ( $p = .024$ ).

For internet penetration, the coefficient is 79,586, suggesting that a 1% increase in internet penetration correlates with a Real GDP increase of 79,586 units. However, this effect is only marginally significant ( $p = .066$ ). Interestingly, the coefficient for ATM deployment is -24.60, indicating a slight negative effect on Real GDP. Despite this, the effect is not statistically significant ( $p = .779$ ). These findings underscore the critical role of digital connectivity—specifically, mobile usage and internet penetration—in driving

economic growth, whereas ATM deployment appears to have minimal impact.

The regression equation derived from this analysis offers a mathematical representation of the relationship between Real GDP and the three independent variables: mobile phone usage, internet penetration, and ATM deployment. The equation is as follows:

$$\text{Real GDP} = 4,121,097.59 + 15,461.45 \times \text{Mobile per thousand} + 79,585.70 \times \text{Internet penetration} - 24.60 \times \text{ATM deployment}$$

The equation shows that increases in mobile phone usage and internet penetration are associated with higher Real GDP, underscoring the importance of digital connectivity for economic growth. The negative coefficient for ATM deployment is unexpected and likely insignificant, suggesting that ATM deployment may not play a critical role in influencing Real GDP. Thereby, the Alternate hypothesis i.e., ATM Deployment, Mobile Usage (Per 1000 Adults) and Internet Penetration significantly impacts Real GDP in Indian Rural Economy is accepted.

The analysis suggests that enhancing digital connectivity, particularly through increased mobile phone usage and internet penetration, can significantly boost economic growth. As these factors are strongly linked to higher Real GDP, policymakers should focus on expanding access to mobile networks and improving internet infrastructure, especially in regions where penetration is still low. This can lead to greater economic activity, innovation, and overall development. The negligible and potentially negative impact of ATM deployment on GDP suggests that in the digital age, the emphasis should shift from traditional banking infrastructure to digital payment systems and online banking services. Encouraging digital payments and reducing reliance on cash could further drive economic efficiency and inclusion, especially in rural and underserved areas. Overall, investment in digital infrastructure appears to be a crucial strategy for sustaining and accelerating economic growth.

### **Per Capita Annual Income and ATM Deployment, Mobile Per 1000, Internet Penetration**

HA<sub>2</sub>: ATM Deployment, Mobile Usage (Per 1000 Adults) and Internet Penetration does not significantly impact Per Capita Annual Income in Indian Rural Economy.



H<sub>2</sub>: ATM Deployment, Mobile Usage (Per 1000 Adults) and Internet Penetration significantly impacts Per Capita Annual Income in Indian Rural Economy.

Table 6: Descriptive Statistics for H<sub>2</sub>

<b>Descriptive Statistics</b>			
	Mean	Std. Deviation	N
Per Capita Annual	84300.3000	9189.98012	10
ATM deployment	43459.3000	7465.80355	10
Mobile per thousand	485.9820	56.22149	10
Internet penetration	30.9110	17.16325	10

Source: Authors own Compilations through data analysis

Table 7: Correlations for H<sub>2</sub>

<b>Correlations</b>					
		Per Capita Annual	ATM deployment	Mobile per thousand	Internet penetration
Pearson Correlation	Per Capita Annual	1.000	.874	.899	.884
	ATM deployment	.874	1.000	.809	.960
	Mobile per thousand	.899	.809	1.000	.798
	Internet penetration	.884	.960	.798	1.000
Sig. (1-tailed)	Per Capita Annual	.	.000	.000	.000
	ATM deployment	.000	.	.002	.000
	Mobile per thousand	.000	.002	.	.003
	Internet penetration	.000	.000	.003	.
N	Per Capita Annual	10	10	10	10
	ATM deployment	10	10	10	10
	Mobile per thousand	10	10	10	10
	Internet penetration	10	10	10	10

Source: Authors own Compilations through data analysis

Table 8: Model Summary for H<sub>2</sub>

<b>Model Summary<sup>b</sup></b>				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.941 <sup>a</sup>	.885	.828	3816.76845
a. Predictors: (Constant), Internet penetration, Mobile per thousand, ATM deployment				
b. Dependent Variable: Per Capita Annual				

Source: Authors own Compilations through data analysis

Table 9: ANOVA for H<sub>2</sub>

ANOVA <sup>a</sup>						
Model	Sum of Squares	Df	Mean Square	F	Sig.	
1	Regression	672695283.612	3	224231761.204	15.392	.003 <sup>b</sup>
	Residual	87406328.488	6	14567721.415		
	Total	760101612.100	9			
a. Dependent Variable: Per Capita Annual						
b. Predictors: (Constant), Internet penetration, Mobile per thousand, ATM deployment						
Source: Authors own Compilations through data analysis						

Table 10: Coefficients for H<sub>2</sub>

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	33386.809	21603.992		1.545	.173
	ATM deployment	.042	.628	.034	.067	.949
	Mobile per thousand	86.384	38.851	.528	2.223	.068
	Internet penetration	230.255	266.043	.430	.865	.420
a. Dependent Variable: Per Capita Annual						
Source: Authors own Compilations through data analysis						

## INTERPRETATIONS

Data for ten years, presumably from 2014 to 2023, were analysed to explore the relationship between per capita annual income (Rural India) and ATM deployment, mobile phone usage per thousand people, and internet penetration (Rural India). A linear regression analysis was conducted using IBM SPSS to examine the impact of these variables on per capita annual income. In this analysis, ATM deployment, mobile phone usage per thousand people, and internet penetration served as the independent variables, while per capita annual income was the dependent variable. The significance value (p-value) was tested at the 5% level, and the regression equation was formulated.

The Correlations table highlights the relationships between per capita annual income and the other variables. Per capita annual income is strongly correlated with ATM deployment (correlation coefficient = .874), mobile phone usage per thousand people (correlation coefficient = .899), and internet penetration (correlation coefficient = .884). This indicates that higher levels of ATM deployment, mobile usage, and internet penetration are associated with higher per capita annual income. Additionally, ATM deployment and internet penetration are highly correlated with each other (correlation coefficient = .960),

suggesting that countries with more ATMs tend to have higher internet access. Mobile phone usage is moderately correlated with internet penetration (correlation coefficient = .798), indicating that better mobile connectivity often accompanies increased internet access.

The Regression Analysis, as reflected in the Model Summary, shows that the model explains 88.5% of the variance in per capita annual income ( $R^2 = .885$ ), indicating a very strong fit. The Adjusted R Square value of .828 further confirms the model's robustness when accounting for the number of predictors. The standard error of the estimate is approximately 3,817, reflecting the average distance that the observed values fall from the regression line. The ANOVA table shows that the model is statistically significant ( $F = 15.392$ ,  $p = .003$ ), meaning that the predictors collectively have a significant impact on per capita annual income.

The Coefficients table provides detailed insights into the impact of each independent variable on per capita annual income. The unstandardized coefficient for ATM deployment is 0.042, indicating that for each additional ATM unit deployed, per capita annual income is expected to increase by 0.042 units, holding other factors constant. However, this effect is not statistically significant ( $p = .949$ ). The coefficient for mobile phone usage per thousand people is 86.384, suggesting that for each additional mobile phone per thousand people, per capita annual income is expected to increase by approximately 86.384 units, though this result is marginally significant ( $p = .068$ ). The coefficient for internet penetration is 230.255, indicating that for each 1% increase in internet penetration, per capita annual income is expected to increase by about 230.255 units. This effect is not statistically significant ( $p = .420$ ). The intercept, or constant term, is 33,386.809, which represents the predicted per capita annual income when all independent variables are zero. Although this value is theoretical and not practical, it serves as the baseline level of income from which the impacts of the other variables are measured.

The regression equation derived from the analysis provides a mathematical representation of the relationship between per capita annual income and the three independent variables: ATM deployment, mobile phone usage per thousand people, and internet penetration. The equation is as follows:

Per Capita Annual = 33,386.809 + 0.042 × ATM deployment + 86.384 × Mobile per thousand + 230.255 × Internet penetration.

The analysis suggests that mobile phone usage and internet penetration are positively related to per capita annual income, while ATM deployment does not significantly impact per capita income in this model. The strong correlations and significant model fit underscore the importance of mobile and internet infrastructure in driving economic growth. Policymakers should focus on expanding internet and mobile phone infrastructure to enhance economic performance. Investing in these areas could foster greater economic growth and improve income levels. Although ATM deployment appears less impactful in this analysis, it remains a crucial component of financial infrastructure and should not be neglected in broader economic strategies.

## **Findings**

The analysis of the relationship between digital financial infrastructure and economic indicators, such as Real GDP and Per Capita Annual Income in rural India, reveals significant insights into the role of technology in economic growth. Using linear regression analysis, data from 2014 to 2023 was examined to understand the impact of ATM deployment, mobile phone usage per thousand people, and internet penetration on the Real GDP and Per Capita Annual Income of rural India.

### ***Findings on Real GDP:***

The Correlation analysis demonstrated strong positive relationships between Real GDP and mobile phone usage per thousand people ( $r = 0.907$ ), internet penetration ( $r = 0.944$ ), and ATM deployment ( $r = 0.917$ ). These correlations suggest that as digital infrastructure improves, Real GDP in rural areas tends to increase. The regression analysis further highlighted that the model explaining the relationship between these variables accounted for 95.7% of the variance in Real GDP ( $R^2 = 0.957$ ), emphasizing the robustness of the relationship. The ANOVA test indicated a significant collective impact of the predictors ( $F = 44.126$ ,  $p < 0.001$ ). Among the predictors, mobile phone usage and internet penetration had a statistically significant positive impact on Real GDP, with coefficients of 15,461.45 and

79,586.70, respectively. This suggests that increasing mobile usage and internet penetration are positively associated with economic growth. Interestingly, ATM deployment had a negative coefficient (-24.60), though it was not statistically significant ( $p = 0.779$ ). This suggests that ATM deployment does not significantly influence Real GDP, possibly due to the growing shift toward digital payment systems and online banking in rural areas (Deutsche Bank, 2020). Thus, the hypothesis that digital financial infrastructure significantly impacts Real GDP is accepted, with a focus on mobile and internet as key drivers.

### ***Findings on Per Capita Annual Income:***

Similar trends were observed in the analysis of Per Capita Annual Income. The Correlation analysis showed strong positive relationships between per capita income and the same predictors: mobile phone usage ( $r = 0.899$ ), internet penetration ( $r = 0.884$ ), and ATM deployment ( $r = 0.874$ ). The regression model explained 88.5% of the variance in per capita income ( $R^2 = 0.885$ ), again demonstrating a strong fit. However, the coefficients revealed that mobile phone usage per thousand people (86.384) had a marginally significant positive impact ( $p = 0.068$ ), while internet penetration (230.255) did not show statistical significance ( $p = 0.420$ ). Interestingly, ATM deployment had a very small positive coefficient (0.042) but was not statistically significant ( $p = 0.949$ ). This result suggests that, while mobile phone usage positively impacts per capita income, ATM deployment's effect on income is negligible, likely due to the increasing reliance on mobile banking and internet-based financial services in rural areas (Ghosh, 2021).

### **Conclusion**

The research conducted on the relationship between digital financial infrastructure and economic indicators such as Real GDP and Per Capita Annual Income in rural India highlights the growing significance of mobile phone usage, internet penetration, and ATM deployment in influencing economic outcomes. The analysis of data from 2014 to 2023 provides compelling evidence that the digitalization of financial services and infrastructure has a substantial impact on rural economic growth. This conclusion synthesizes the key findings from the study and emphasizes the broader implications for policy and future research.

At the heart of this research is the role of digital financial infrastructure—comprising mobile phones, internet connectivity, and ATMs—in driving economic growth, particularly in rural areas of India. The correlation analysis revealed strong positive relationships between Real GDP and these three predictors, with mobile phone usage, internet penetration, and ATM deployment all exhibiting significant positive correlations with economic output. Notably, internet penetration emerged as the most significant factor, closely followed by mobile phone usage, both of which showed very high correlations with Real GDP ( $r = 0.944$  for internet penetration and  $r = 0.907$  for mobile phone usage). This suggests that the spread of mobile phones and the internet in rural India plays a vital role in stimulating economic activities, thereby boosting the overall economic output.

The regression analysis reinforced these findings, with mobile phone usage and internet penetration emerging as statistically significant predictors of Real GDP. The model explained 95.7% of the variance in Real GDP, underscoring the strong explanatory power of digital financial infrastructure. These results are consistent with previous studies, which have highlighted the role of technology in reducing transaction costs, expanding access to financial services, and enabling economic integration (World Bank, 2020). By facilitating easier access to financial services and markets, digital platforms help boost productivity and economic output in rural areas.

Interestingly, ATM deployment did not show a statistically significant impact on Real GDP despite its positive correlation with the economic indicator. This finding is aligned with the increasing shift toward mobile banking and digital payment systems in rural India. As digital payments become more widespread, the importance of traditional ATM infrastructure is diminishing. While ATMs remain an essential component of financial services in certain contexts, particularly in remote areas with low internet penetration, the growing adoption of mobile banking and internet-based financial services is reshaping the rural financial landscape. This shift is likely to reduce the reliance on physical ATMs and make way for more efficient and accessible digital alternatives.

The relationship between digital financial infrastructure and Per Capita Annual Income mirrored the trends observed with Real GDP. The correlation analysis revealed strong positive relationships between mobile phone usage, internet penetration, and ATM deployment with

per capita income. This suggests that the digitalization of financial services plays a crucial role in improving individual income levels by facilitating greater access to financial resources and opportunities. The regression analysis indicated that mobile phone usage had a significant positive impact on per capita income, though internet penetration did not show statistical significance. This discrepancy can be attributed to the fact that while mobile phones are a fundamental tool for accessing digital financial services in rural India, internet penetration is still uneven, and many areas may not have robust internet connectivity.

Despite the relatively small coefficient of ATM deployment, its lack of statistical significance highlights the growing irrelevance of physical ATMs in the context of digital financial inclusion. This suggests that mobile phones, rather than ATMs, are the primary vehicle through which financial inclusion is being promoted in rural India. Digital platforms offer significant advantages over traditional banking, such as lower transaction costs, faster service delivery, and increased accessibility, which ultimately translate into higher per capita income levels in rural areas.

### **Policy Implications**

The findings of this study have important policy implications for promoting rural economic growth in India. The positive impact of mobile phone usage and internet penetration on economic indicators like Real GDP and per capita income suggests that increasing investments in digital infrastructure should be a key priority for policymakers. Expanding mobile network coverage and connectivity in rural and remote regions could play a significant role in fostering economic growth and enhancing financial inclusion. To maximize the benefits of digital financial infrastructure, it may be necessary to develop policies that support improvements in digital literacy and encourage the use of mobile banking and digital payment systems. Many rural households still **lack the expertise and abilities** needed to fully participate in digital financial systems, which **limits** their ability to take advantage of the opportunities provided by these platforms. While **Programs initiated by the government** such as the Digital India campaign and the Pradhan Mantri Jan Dhan Yojana (PMJDY) are a step in the right direction, continued efforts are needed

to ensure that rural populations are adequately equipped to engage with digital financial services.

Furthermore, the role of traditional banking infrastructure, such as ATMs, could be revisited. While ATMs continue to serve a role in rural India, the rise of mobile banking and internet-based services indicates that a shift in investment priorities is needed. Moving forward, policymakers should consider creating an enabling environment that supports the growth of digital payment systems and mobile banking, while reassessing the emphasis placed on expanding physical banking infrastructure.

### ***Future Research***

This study underscores the importance of digital financial infrastructure in driving economic growth and improving income levels in rural India. Mobile phone usage and internet penetration are identified as the key drivers of economic growth, with significant positive correlations to Real GDP and per capita income. Although ATM deployment remains a useful tool, its role is becoming less critical as **digital financial services continue to evolve**. The findings of this research **contribute to the expanding body of knowledge** on digital financial inclusion and its impact on rural economic growth. However, further research is needed to explore the long-term effects of digital financial inclusion on other socio-economic indicators, such as employment, poverty reduction, and social welfare. Future studies could also investigate the barriers to digital financial inclusion in rural areas, such as **connectivity issues**.

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# Swachchha Bharat Abhiyan (SBA): Its Impact on Caste Equity & Social Transformation

**Dr. Naresh Muljibhai Chauhan\***

## **Introduction:**

The Present paper discusses major findings as an abstract of the research project conducted in Pan Gujarat with the financial assistance of the Indian Council for Social Sciences Research, New Delhi. Under the title of “A Socio-economic Analysis of Programs, Schemes and Policies under Swachha Bharat Abhiyan (SBA) and its Impact on Social Harmony and Caste System: An Empirical Study of Selected Areas of Gujarat” said research project conducted the sample survey and focus group discussion. The primary data collected by the sample survey and the secondary data from multiple sources were used to analyse the issue of “Caste discrimination” like “Untouchability” The worsening characteristics of the caste system and how SBA is affected are examined in the said research project.

## **Purity: One of the Foundation of the rigid Caste system:**

(Dumont, 1970) Impure persons and impure things are untouchables. Literature discussing the Indian caste system delves into these purity concepts, and Dr. B.R. Ambedkar has critiqued them extensively in his works. (Ambedkar, 1948) Ambedkar appealed to the untouchable community to leave the dirty profession. Ambedkar argues that untouchability was a social tool to downgrade so-called “unclean or dirty” work exclusively to oppressed classes in India. Ambedkar outlines that certain groups (So called lower castes) were assigned jobs seen as littering/ unclean, like handling the dead bodies of animals,

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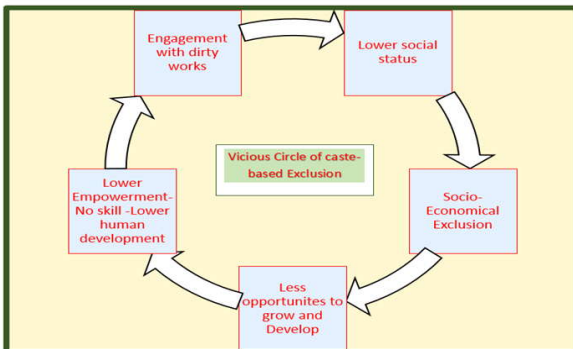
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leather processing, and waste management, which established a caste system where privileged castes (So called upper castes) avoided such tasks. Ambedkar encourages Dalits to strive for occupations that grant dignity. He also argues that performing such dirty tasks is a tool for social oppression that reinforces caste discrimination. In other words, the vicious circle starts with a dirty/messy task and continues with the caste system which is associated with assigning dirty work to the oppressed.

Logic can further argue that if we successfully abolish unclean/dirty work from society, we will have a caste-free society. (Dr.B.R.Ambedkar, 1936) Dr. B.R. Ambedkar effectively appeals to Dalits to reject “dirty work” in his book. *“The Annihilation of Caste”*. He said “Self-respect is a path toward liberation from exploitative roles imposed by the caste system”. (Ambedkar, 1948) He argues that performing such tasks is a tool for social oppression that reinforces caste discrimination. Ambedkar encourages Dalits to strive for occupations that grant dignity, He appeals to emphasize getting an education and self-respect as paths toward liberation from exploitative roles imposed by the caste system.

### Conceptualization of research:

(Ambedkar, 1948) Ambedkar explains that the roles of engaging in dirty work were imposed to maintain social hierarchy and to justify exploitation under the appearance of religious duty. It is our general experience as well as explained by various literature that caste system prevailing today has weakened religious support than that was in past.

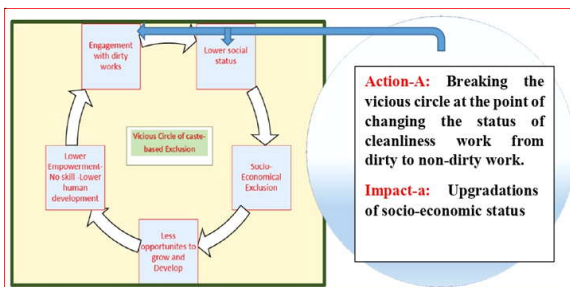


Moreover, Over the period liberal Hindu religious practice in general society also made religious rigidity soften.

Graph-1 Conceptualization of Vicious Circle of caste-based exclusion with the foundation of dirty works. (Naresh Chauhan , Kishor Bhanushali, Nasheman Bandukwala and Sangita Patel, 2024) The study’s conceptualization is based on the argument that unclean/ dirty task is the foundation for the prevailing caste system’s effectiveness. A graphical illustration (Graph-1) shows a vicious circle of the caste system with the foundation of dirty work. Engagement with dirty work resulted in a lower social status that resulted in social and economic exclusion under the shadow of the caste system. Exclusion shows with lower empowered group with lower human development. Without better opportunities such excluded groups are forced to engage in dirty work again. The vicious circle of caste-based exclusion prevails with the foundation of unclean works. Ambedkar effectively appeals to Dalits to reject “dirty work” in this context.

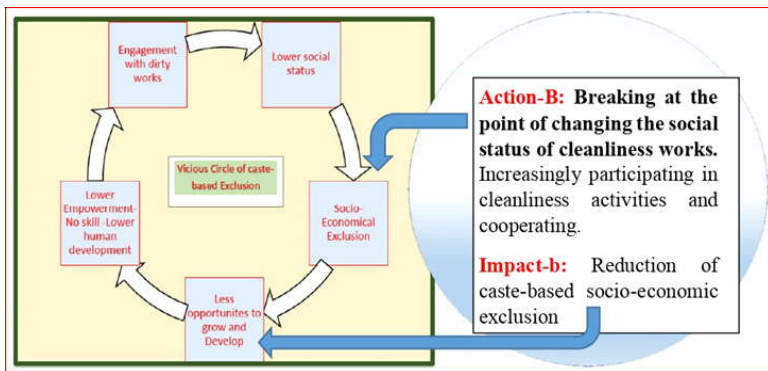
Other steps to break the vicious circle are: To convert dirty work into non-dirty work with the help of technology and better cleanliness practices (that is defined as Action-A), Breaking at the point of changing the social status of cleanliness works (that is defined as Action-B) and Breaking at the point of changing economic status and empowerments of cleanliness worker (that is defined as Action-C). All these three Actions (A, B &C) with their associated Impacts (a, b &c) are explained in separate graphs below. With the help of this hypothetical vicious circle, the said study tries to measure how SBA influences the caste system.

### **(Action-A) Breaking the vicious circle at the point of changing the status of cleanliness work from dirty to non-dirty work.**



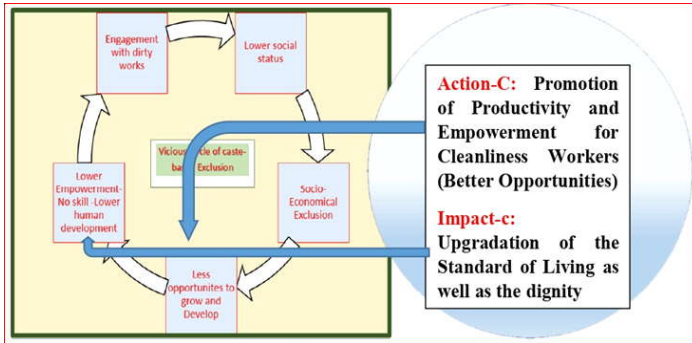
Action-A is about to removal of dirtiness with the help of modern technology. The engagement with dirty work downgrades social status. The same work of cleanliness with modern technology can change the work from dirty to non-dirty. Toilets with proper sanitation facilities go toward the Open defecation-free India. Along with better cleanliness practices, whether the dirtiness form of cleanliness activity is reduced after the SBA or not? Likewise, whether public participation in cleanliness increases or not? And SBA provide a better environment for the empowerment of the weaker class or not? These are the core examination areas of said research. If these actions- A, B & C executed it has resulted in impact a, b & c respectively. The study tries to measure these changes. Action- A, B & C with their respective impact of a, b & c measured by various indicators which are converted into the index in further stages of analysis.

**(Action-B) Breaking at the point of changing the social status of cleanliness works.**



In the second stage said research tries to measure the action-b and impact-b. that is about If cleanliness is no longer so dirty work, as well as regularly maintaining cleanliness and avoiding garbage dumps. People are increasingly participating in cleanliness activities and cooperating with safai kamdars in their regular lives. Action-B and impact-b are about the measurement of the reduction of caste-based socio-economic exclusion hence the promotion of social harmony and more opportunities to grow (Impact-b).

## (Action-C) Breaking at the point of changing economic status and empowerment of cleanliness workers.



Action-C is about the economic and overall empowerment of safai kamdars' families. How SBA plays a role in improving the productivity of safai kamdar which resulted into the improvement of the community. The indicators used to measure actions and impacts are described in the tables below.

### How is SBA breaking the Vicious Circle of caste-based exclusion?

#### *Reduction of dirtiness in Cleanliness Activity by SBA:*

**Removal of dirtiness by technology implementation:** the following action helps to reduce the dirtiness of the cleanliness process.

**Community Toilets with Bio-digester Tanks:** Bio-digester tanks are installed in community toilets to decompose human waste in an eco-friendly manner. These toilets are low-cost and easy to maintain. manual cleanliness activity by safai kamdar deduced.

**SBA Mobile App:** The SBM mobile app monitors the progress of the SBA. Reducing the severity of waste dumping.

**RFID (Radio Frequency Identification) Tags on Dustbins:** RFID tags monitor waste collection and transportation.

**Mechanized Road Sweepers:** Mechanized road sweepers clean streets and roads efficiently.

**Smart Toilets:** Smart toilets equipped with sensors and automated cleaning systems are being installed in urban areas. These toilets provide a hygienic and convenient sanitation solution.

**Decentralized Waste Management Systems:** Decentralized waste management systems, such as composting units and waste segregation at source, are being promoted to reduce the burden on landfills and encourage recycling.

### **Facts and figures about SBA in India:**

(Naresh Chauhan , Kishor Bhanushali, Nasheman Bandukwala and Sangita Patel, 2024) The flagship program of SBA was launched by the Prime Minister of India Hon. Narendra Modi, on 2<sup>nd</sup> October 2014. The mission envisages its completion by 2019 as a fitting tribute to the 150<sup>th</sup> anniversary of Mahatma Gandhi.

SBA was later extended to two missions viz. the SBA (Gramin), and ODF Plus, launched on February 19, 2020, the prime objective was to ensure that Open defecation-free (ODF) behavior is sustained and accepted. Phase - II of SBA -G was moved beyond ODF, and the intervention of safe management of solid and liquid waste management was envisaged. The mission was further extended to SBA (Urban) 2.0. and was launched on 1<sup>st</sup> October 2021, to make cities garbage-free.

The basic objective of SBA was to teach the collective quest for cleanliness and a drive to attempt an effective behavioral change that would work as a mass movement seeking to engage each Indian. Owing to its unique participatory approach the mission ideates an outcome of social and behavior change.

The state of Gujarat implemented the SBA alongside the nation on 2<sup>nd</sup> October 2014. The state took special measures to step up the implementation of SBA and Hence the program was converged with a few other programs like MGNREGA, Mission *Mangalam* and ICDS to make the ODF drive robust and rampant. Moreover, the state has facilitated State and district-level social and Behavioral Change Communication (SBCC) workshops involving key State and district-level functionaries from departments like MGNREGA, Mission *Mangalam*, Water Shed, Education, ICDS, Health, WASMO etc. The workshop focused predominantly on identifying the key bottlenecks in the implementation of acceptance and sustainability of ODF and further strategies and stakeholders to be involved in bringing desired behavioral change.

## **Defied Dirty work nature of public cleanliness by SBA:**

(Naresh Chauhan , Kishor Bhanushali, Nasheman Bandukwala and Sangita Patel, 2024) Under SBA-G, 5,46,299 Individual household latrines (IHHLs) and 12,968 Community Sanitary Complexes (CSCs) were built in the state of Gujarat by 2019- 2020. While IHHLs added in 2020-21 in the state was 2,83,833 and that of CSCs added were 1733. The IHHLs in the Schedule Caste (SC) household were reported to 10316, (3.6% of the total 2,83,833) and that of the Schedule tribe (ST) household is reported to be 85,689 (30% of the total of 2,83,833). In the case of CSCs, 249 were built in SC habitation (14.36% of total 1733) while 624 (36% of total 1733) were built in ST habitation. From 2014 to 2022 the IHHLs built in the state of Gujarat are reported to be 42,06,492 and CSC built were 9416. Moreover, 18261 total villages were covered in the SBM-G Phase II of which 1379 villages are covered in Solid Waste Management (SWM) while 719 villages are covered in Liquid Waste Management (LWM). Under SBM-U total of 5,60,046, IHHLs were constructed in the state of Gujarat. The financial help provided by the Central Government for the construction of IHHLs was 182.55 crores and the mission achieved a 137% target as the targeted IHHLs was 4,06,388 while actually constructed was 5,60,046. The state targeted to build 31,010 CCSs while actually constructed CCSs were 24,149 and hence exhibited underperformance to the tune of 33%. The wards with 100 percent door-to-door garbage collection were 1385 which is 100% coverage and the total generation of waste was 9515 MT/day of which 92% is processed.

Under SBM - Urban 2.0, a project costing 403.77 crores has been formulated for remediating legacy wastes from landfills in Gujarat. To revive the prime land of Gujarat from hazardous landfills, the Ministry of Housing and Urban Affairs (MoHUA) has approved the central share of 144.85 crores for legacy waste remediation.

The SBA promotes sanitation in schools, providing dedicated toilet facilities for girls, and replacing manual scavenging with advanced machinery to prevent human fatalities. Collectively, these initiatives under SBA were aligned with transforming the traditionally stigmatized nature of public cleanliness. That hypothetically influences the caste system that is analyzed in the said study with the help of primary data collected by a sample survey.



## Primary Data Collection and Index Constitution Methodology:

The survey method is major to get the primary data which is collected according to the objectives of the study. The basic objectives of the said research project are as follows.

To examine the efficacy of SBA in the abolition of strict caste discrimination, to evaluate the performance of SBA in eliminating open defecation, to examine the success of SBA in attaining its goal of effective solid waste management and to evaluate the impact of SBA in curbing dropouts (especially adolescent girls) from school.

Various questions regarding their experience were asked in the interview of 3000 respondents.

Two statistical tools:

### (1) The Likert scale:

The description of the methodology of the Likert scale used for the Analysis of the experience of SBA.

Order of Likert Scale	Mean Values satisfaction	Level of agreement	Level of
1 to 5, 1 being the best and 5 being the worst	1 d" MVd" 2	Good performance	Fully agreed or yes,
	2< MVd" 3	Satisfactory performance	Mostly yes
	3 < MVd" 4	Not satisfactory performance	Mostly No
	4< MVd" 5	Unsatisfactory performance	Fully disagreed or no
5 to 1, 5 being the best and 1 being the worst	5 d" MVd" 4	Good performance	Fully agreed or yes
	4< MVd" 3	Satisfactory performance	Mostly yes
	3 < MVd" 2	Not satisfactory performance	Mostly No
	2 < MVd" 1	Unsatisfactory performance	Fully disagreed or no

### (2) The percentage value of respondents:

The percentage value of the respondent is taken into consideration. This applies to questions with two responses, "Yes" and "No."

<b>Measurement</b>	<b>Statistical Technique used for analysis</b>	<b>Number of questions/ Indicators used</b>
Action-A	Percentage of respondents	7
Action-B	Percentage of respondents	10
Action-C	Likert Scale of five points	7
Impact-a	Percentage of respondents	7
Impact-b	Likert Scale of five points	4
Impact-c	Likert Scale of five points	21

Under the SBA multiple schemes, policies and programs are executed. To construct the index for our purpose of measuring Action A, B and C as well as their respective impacts a, b and c, we have collected the responses from five different groups (Stratified sampling) of respondents and asked them about various experiences of SBA.

The five groups of respondents (Moderately Different Questionnaires set for each group) and six geographical zones (Around one crore of the population) of Gujarat are as follows.

<b>Sr. No.</b>	<b>Groups of the Respondents</b>	<b>Number of the Respondents</b>
1	Households	600
2	Students	600
3	Cleanliness workers	600
4	Women (belonging to Antyoday family)	600
5	Tourists at tourist places (18 tourist places: three from each zone)	600
	<b>Total</b>	<b>3000</b>

<b>Sr. No.</b>	<b>Geographical Zone</b>	<b>Number of the Respondents</b>
1	Coastal Saurashtra	500
2	Kachchh and Surroundings	500
3	Middle Zone	500
4	North and Vadodara	500
5	Saurashtra	500
6	South Gujarat	500
	<b>Total</b>	<b>3000</b>

## Measurement of Action and Impacts:

The selected Indices for the construction of indicators for various actions and their maximum and minimum values are as follows.

### Selection of Indices and their max-min values:

The goal post depends on the nature of the indicators, while the actual value is about the responses that we receive from the survey. The minimum value is considered as the worst (Undesirable in the context of action or impact of SBA possible situation), which is zero as per the nature of all indicators. Likewise, the maximum value (goal post) is about the maximum achievable value (Desirable maximum value in the context of action or impact of SBA).

### Indices for Action-A (Removal of dirtiness: Awareness & Implementation of Modern Technology in cleanliness)

Sr. No	Response to question measured by the percentage of respondents: Replied: "Yes"
1	SBA' is a pan-India scheme of Government, Do you experience it?
2	The scheme is about the collection of garbage from households or offices (places of work) Have you experienced it?
3	Under SBA' the local Government distribute more funds. experienced it?
4	Under SBA modern machinery for cleanliness is purchased. Have you experienced it?
5	Under 'SBA' 'the general public is joining in the cleanliness drives, Do you experience it?
6	'SBA' is an attempt to improve public health. Do you experience it?
7	'SBA' 'is a policy to improve the impression of India. Do you experience it?
The average value (Average of mean values) of all 7 indices will be taken as the actual value for the index constituting action-A. Minimum Value is 0 and Maximum Value is 100	

### **Indices for Action-B (Promotion of Participatory Cleanliness):**

<b>Sr. No</b>	<b>Response to question measured by the percentage of respondents: Replied: “Yes”</b>
1	Does SBA Improve the level of cleanliness? (Do you experience it?)
2	Due to SBA public health improvement has been experienced?
3	Due to SBA public participation in cleanliness work increased. Do you experience it?
4	According to SBA “cleanliness is the collective responsibility of all of us and is believed by the people” Public believes that?
5	Due to SBA, the state’s responsibility towards cleanliness workers improved. Do you experience it?
6	The SBA is a step towards freedom from strict division of labour. Do you experience it?
7	Do you experience that SBA is the program towards the abolition of caste system in India?
8	Has SBA eliminated open defecation?
9	Has SBA improved solid waste management? (door-to-door garbage collection with updated facilities)
The average value of all 10 indices will be taken as the actual value for the index constituting Action-B. The minimum value is 0 and Maximum Value is 100.	

### **Indices for Action-C: (Promotion of Productivity and Empowerment for Cleanliness Workers)**

<b>Sr. No</b>	<b>Experiences of SBA regarding upgrading economic status Likert Scale of five points</b>
1	Increase in cleanliness awareness resulting in the possibility of more income
2	Since cleanliness is easier there is the possibility of more work and more income
3	Since cleanliness is now mechanized it results in more productivity and higher income.
4	Since cleanliness is becoming easy. it takes less time and other work can be done in the rest of the time
5	The economic status of Safai Kamdar has improved (comparatively) after SBA

6	After SBA acquired better skills and their living standard improved for Safai Kamdar
7	In the absence of SBA, the above changes were impossible.
The average value of all 7 mean indices will be taken as the actual value for the index constituting Action-C. The minimum value is 0 and the maximum value is 5.	

### **Measurement of Impact:**

#### ***Indices for Impact-a (Upgradations of socio-economic status)***

<b>Sr. No</b>	<b>Details of General Experiences (Impact-a)</b>
1	Due to 'SBA' differences can be seen in the house and public cleanliness, Do you Experience?
2	Has it led to a new awareness of cleanliness in the society?
3	Has it discontinued open defecation, Due to that, has it reduced the dropout rate of girls in the school?
4	Has the social status of cleanliness workers improved due to the (above) changes?
5	Has SBA improved the social empowerment of the families of cleanliness workers?
6	Due to SBA, are other castes joining public cleanliness drives other than cleanliness workers?
7	Has SBA notably resulted in cordial social behaviour toward the safai kamdar?
The average value of all 7 indices will be taken as the actual value for the index constituting Impact-a. The minimum Value is zero and the Maximum Value is 100.	

#### **Indices for Impact-b (Reduction of Socio-economic exclusion of Safai kamdar)**

<b>Sr. No</b>	<b>Scale measurement 0-5 (The worst to the best)</b>
1	After SBA everyone has joined the cleanliness drive overcoming caste barriers
2	The cleanliness work has become more advanced after the implementation of SBA?

3	Has SBA resulted in an improvement in the social status of Safai Kamdar?
4	Has SBA resulted in the improvement of the health of Safai Kamdar and the reduction of accidents in the manhole?
The average value of all 4 indices will be taken as the actual value for the index constituting Impact-B. The minimum value is 0 and the maximum value is 5.	

**Indices for Impact-c (Upgradation of the standard of Living as well as the dignity of Safai kamdar)**

Sr. No	Scale measurement (0 = worst to 1= best)
1	A sweeper who comes to your home to pick up garbage Now a sweeper feels closer to your family than before SBA.
2	Because of SBA, your family has become a personal acquaintance of a sweeper.
3	Because of SBA, our family now appreciates the work of the cleaner (feeling his service directly).
4	Because of SBA, our family is willing to cooperate with the sweeper.
5	As a result of SBA, we have increased our occasional gifts or assistance to the cleaning staff at our home or place of business.
6	The prestige of the closer and intensive sweeper is higher (outcome of SBA) as compared to remote cleaning operations (Earlier situation).
7	“Our waste our responsibility” clarified by SBA our family cooperates in all ways to the cleaner for waste disposal
8	After SBA at public places, public toilets have become more plentiful and cleaner.
9	Sanitation of public places has seen significant improvement as compared to pre-SBA
10	As a result of the SBA, people are less likely to litter the public.
11	SBA makes the tourism experience more enjoyable than ever (In India).

12	A scavenger-Safai kamdar feels prouder while travelling is enjoyable.
13	People have more respect for a scavenger who makes travel enjoyable.
The average value of all 13 indices will be taken as the actual value for the index constituting Impact-c. The minimum value is 0 and the maximum value is 5.	

### **Index calculation methods:**

The average value of all indices will be taken as the actual value for a particular index.

The index calculation method for all the indexes is the same described as below:

$$\text{Index} = (\text{Actual value} - \text{Minimum Value}) / (\text{Maximum Value} - \text{Minimum value})$$

### **Results (Index analysis):**

Group of Respondents	The index value for Action and Impact					
	Action-A	Action-B	Action-C	Impact-a	Impact-b	Impact-c
Household	0.7001	0.8567	0.40048	0.64331	0.4044	0.66838
Tourists group	0.735	0.8347	0.39182	0.64627	0.4125	0.66373
Antyoday	0.3857	0.8024	0.4414	0.6993	0.4568	0.7743
Safai Kamdar	0.6804	0.7941	0.4274	0.6106	0.401	0.5961
Students	0.7569	0.8681	0.3866	0.5837	0.4092	0.4156

Source: Field data

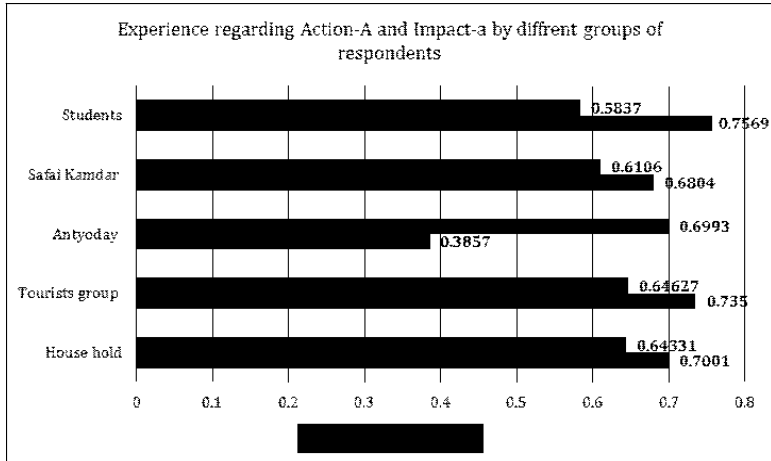
The provided data in the table above outlines the impact of three different actions on five groups of respondents. Each action and impact is measured by an index allowing for a comparative analysis.

### **Experience regarding action and its subordinate impact by different groups of respondents:**

As we already mentioned action and impact do not have one-to-one causality. However, the conceptualization of the entire research depicted above shows that there would be a high level of causality between Action-A and Impact-a and so on. Therefore, Action and its

counterpart impact-c are depicted in the figure below by various group of respondents.

### Index Value for Action-A and Impact-a

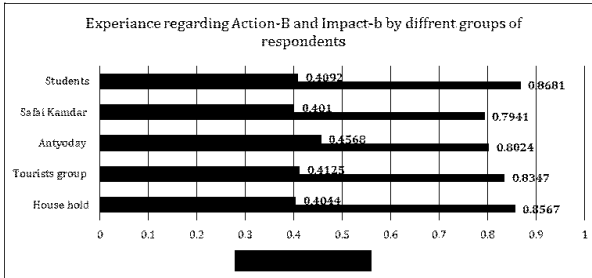


Source: Field data

The graph revealed varying levels of action and impact of Action-A across different respondent groups, with tourists and students showing high engagement but differing impacts, and Antyoday showing low engagement but high impact. Index value ranges between zero to one where 0 is the worst and 1 is the best. The index value for action-A for different respondent groups shows that is more than 0.5 indicates more than half progress. A value closer to 1 indicates complete success. The depicted graph shows that in the direction toward removal of dirtiness by awareness & implementation of Modern Technology in Cleanliness (action-A), SBA has at least more than half success. The same is the result for impact-a with the exceptional case of Antyoday group.



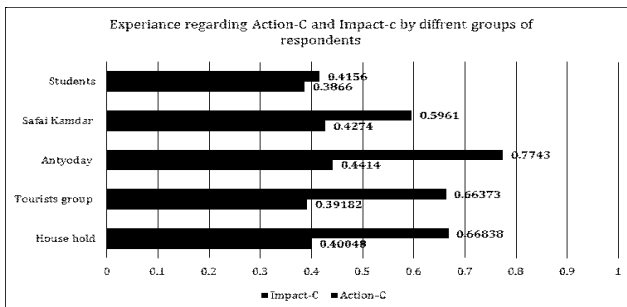
## Action-B and Impact-b



Source: Field data

The provided data demonstrates a trend of high engagement with Action-B across all groups, with scores ranging from 0.79 to 0.86. However, the impact scores are consistently low, ranging from 0.40 to 0.45. This disparity suggests a general inadequacy or ineffectiveness of Action-B across all respondent groups, where high action does not translate into significant positive outcomes. The Antyoday group stands out as having the most efficient engagement-impact relationship, with a relatively high impact score compared to their engagement level. Hence action-B regarding Promotion of Participatory Cleanliness has highest value across all the groups, but the impact-b regarding the Reduction of Socio-economic exclusion of Safai kamdar shows less than half of the success.

## Action-C and Impact-C



Source: Field data

The graph above presents index values for “Action-C” and its coordinated “Impact-C,” across five distinct groups. The data reveals a varied landscape of action and impact across different groups. Antyoday stands out with the highest values for both, suggesting high engagement and significant impact. Safai Kamdar also shows high engagement but lower impact, while households and tourists show moderate engagement with substantial impact. Students, however, reflect the lowest engagement and impact, possibly due to the nature or context of SBA within the measured framework. This data underscores the importance of understanding group-specific dynamics. Action C is regarding “Promotion of Productivity and Empowerment for Cleanliness Workers” The index value shows less than 5 value across all the groups indicating poor performance in this action area which indicates more steps are required to improve the economic conditions of Safai Kamdars. While on the other hand impact-c regarding the “Upgradation of the standard of Living as well as the dignity of Safai kamdar” index shows more than five index value (except students’ group) indicating more than half of the success.

### **Overall Impact of SBA on the caste system:**

During the interaction with special student groups, the prospects for social harmony are promising as students demonstrate a willingness to participate in cleanliness activities, transcending the traditional barriers of the Indian caste system. The students’ experiences and knowledge of the SBA, as well as their active involvement in cleanliness efforts, deserve commendation. Given the positive attitude of these students towards cleanliness initiatives, it is likely that caste barriers will terminate fully over time, with the SBA playing a supportive role in this process.

### **Areas of concern:**

During the said research the integration of case studies and FGDs with quantitative data has provided a comprehensive evaluation of SBA’s impact on the caste system and social harmony. As far as concern with the reduction of caste rigidity through SBA it is recommended to inculcate strongly the message that “cleanliness workers are as pride as soldiers at the fight to protect the nation.” The impact of such a campaign will provide a higher status to cleanliness workers that promotes the inclusion of the entire community of

cleanliness workers. As we observed impact-b regarding the Reduction of Socioeconomic exclusion of Safai kamdar shows less than half of the success. Effective measures should be taken to provide access to better equipment, training programs, and opportunities for skill development. that will directly help to improve the index value of impact-b. in addition, Employers can organize appreciation programs and allocate separate budgets for uniforms and tools for safai kamdar to upgrade their social status.

Morden technology of cleanliness work has been implemented in the developed world. Advanced machinery provides higher productivity with comparatively lower physical efforts. By implementing such advanced machinery, we can also improve the economic status of the cleanliness worker by increasing productivity. With the help of modern technology on the one hand we reduce the physical labour on the other hand we can improve the economic status of cleanliness, both effects together help to upgrade the social status of cleanliness workers. Pleasantly and Satisfyingly engaging with social service of cleanliness would make surrounding people proud of cleanliness workers.

During the entire research as well as our general observations indicate that the SBA itself has an opportunity to reduce caste rigidity, hence in the entire SBA campaign we observed some extent of the gap in this perspective, that should be rectified. There should be a clear objective of SBA mentioning that SBA is the programme to reduce the caste barrier.

SBA should continue to focus on promoting social inclusion and reducing caste-based discrimination. This can be achieved through community-based initiatives that encourage cooperation and respect across different societal groups. SBA has to work in the direction of upgrading the status of cleanliness workers by providing highly disciplined working conditions. Well-disciplined and workers with proper uniforms make surrounding people feeling of pride for cleanliness workers.

As the Supreme Court of India guided that there would not be any casualty in the manhole, hence manual scavenging is an illegal activity. SBA must provide sufficient and appropriate equipment for the cleanliness of drainages. As far as the concern of caste discrimination:

drainage cleaning activity is considered as the dirtiest activity. The caste barrier became more rigid by manual scavenging and other dirty cleanliness activities executed without proper technology. SBA has to take care of all such dirty cleanliness activities going on pan India and prompt actions are suggested to stop all such dirty cleanliness activity illegally executing without proper technology.

Special care is needed for pregnant women engaging in cleanliness, who face risks from lifting heavy garbage, going near to collect the garbage and even eating something from the trash. This issue requires joint attention from the employee and the employer.

In case of an accident by such activities during the cleanliness, the caste barrier widens, so such area requires more attention.

Programs that foster social harmony and collective responsibility for cleanliness should be encouraged. This includes community-based regular cleanliness drives, public awareness campaigns, and initiatives that promote respect and cooperation among different societal groups. Public participation in cleaning the surroundings and maintaining cleanliness should be encouraged more by the government and civil society.

In brief, we can say: that future efforts should focus on sustaining high levels of awareness and public participation, enhancing economic opportunities for sanitation workers, promoting social inclusion, improving public health outcomes, boosting tourism, and fostering social harmony. By addressing these areas, SBA can continue to build on its successes and create a cleaner, healthier, and more inclusive and harmonious Bharat.

### **Conclusion:**

The SBA has successfully raised awareness and improved cleanliness and public health standards among different segments of the population. SBA's broader influence on social dynamics, economic conditions, and tourism highlights its transformative potential. With sustained efforts and targeted interventions, SBA can further consolidate its gains, ensuring a caste-free Bharat, the title of the paper "Swachhha Bharat Abhiyan (SBA): Steep Toward the Annihilation of Caste" indicates the beginning of the process toward the dream of Dr. Ambedkar caste free society.

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# Deceleration of Rural Non-Farm Informal Enterprises in Assam in the 2010s

Dilip Saikia\*

## Introduction

Across the developing economies, although the agricultural sector continues to play a central role, its growth has stagnated over the years limiting the capacity of the sector to generate productive employment and to provide a decent standard of living, and consequently, the rural non-farm sector (RNFS hereafter)<sup>1</sup> has gained significant importance in recent years (Lanjouw and Shariff 2004; Misra, 2013; Imai et al., 2015; Venkatesh et al., 2015). India has also experienced significant increase in the share of RNFS in both employment and income especially after the economic reforms of 1991. The share of RNFS in rural net domestic product (NDP) has increased from 43 per cent in 1993-94 to 48.6 per cent in 1999-2000 and then jumped to 61.7 per cent in 2004-05, while the share of RNFS in rural employment increased from 21.7 per cent in 1993-94 to 27.4 per cent in 2004-05 and to 32.1 per cent in 2009-10 (Misra, 2013). The significance of the RNFS is not just in terms of income generation, employment creation, but also because of its potential roles in poverty reduction (Himanshu et al., 2013; Imai et al., 2015) and its role as a safety net to rural households in times of agriculture distress (Fisher et al., 1997).

The growth of the RNFS is a typical part of the structural transformation that any developing economy undergoes, in which with the decline in the share of agricultural sector in output and employment there must be a corresponding increase in the share of RNFS (Mehrotra

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et al., 2012). The case of Assam, however, offers a contrasting example of this in recent years. While the contribution of the agricultural sector in net state domestic product (NSDP) has considerably declined (from 44 per cent in 1993-94 to 21.7 per cent in 2014-15) and the growth of the sector has been sluggish in the post-reforms period in the state,<sup>2</sup> the RNFS has also shown a declining trend in recent years. Various studies, however, provide contrasting estimates of the share of RNFS in rural employment in the state, although they show a similar trend over time. For example, Misra (2013) finds that the share of RNFS in rural employment in Assam increased from 21.3 per cent in 1993-94 to 25.8 per cent in 2004-05 and to 29.5 per cent in 2009-10. However, Sahu (2012) finds that the share of RNFS in rural employment in the state increased from 20.7 per cent in 1993-94 to 32.2 per cent in 1999-2000 and then declined to 25.3 per cent in 2004-05. The estimates by Venkatesh et al. (2015) show that the share of employment in RNFS in the state was 34.7 per cent in 1999-2000, 28.8 per cent in 2004-05, and 30.6 per cent in 2009-10, whereas Goswami and Bhattacharyya (2014) estimated the share of employment in RNFS at 21.8 per cent in 1993-94, 35.3 per cent in 1999-2000, 30.4 per cent in 2004-05, and 33.4 per cent in 2009-10. While Misra (2013) didn't provide estimates for 1999-2000 and estimate by Sahu (2012) was only up to 2004-05, the estimates by Venkatesh et al. (2015) and Goswami and Bhattacharyya (2014) clearly show that the share of RNFS in rural employment in the state has declined between 1999-2000 and 2009-10.

Against this backdrop, this study attempts to examine the performance of the RNFS in general and the rural non-farm informal enterprises (RNFIEs hereafter) in particular in the state of Assam in the first half of 2010s. While the existing studies discussed above (Sahu, 2012; Misra, 2013; Goswami and Bhattacharyya, 2014; Venkatesh et al., 2015) are basically related to the employment in RNFS or rural non-farm employment, the present study is related to the RNFIEs. Our focus is on the RNFIEs because of the fact that, in India, an overwhelmingly large proportion of rural non-farm activities and employment are engaged in the informal sector; about 71.3 per cent of the rural non-farm workers in India have been employed in the informal sector in 2009-10 (Mitra, 2014).

The article is structured as follows. The second section discusses the data and concepts used in the study. The third section provides a

comparative profile of non-farm informal enterprises (NFIEs hereafter) in Assam with that of other states. The fourth and fifth sections deal with the performance of RNFIEs in Assam across various sectors and by various enterprise characteristics, respectively. The final section concludes.

## **Data and Methods**

The primary source of data on NFIEs in India is the country-wide surveys on unincorporated non-agricultural enterprises (excluding construction) conducted by the National Sample Survey Office (NSSO) of Government of India. The first NSS survey covering the entire unincorporated non-agricultural enterprises (excluding construction) was conducted in NSS 67th round (July 2010 – June 2011)<sup>3</sup> and the next one was in NSS 73rd round (July 2015 – June 2016). The unincorporated or informal enterprises are those enterprises which are not registered under the Companies Act 1956, the Factories Act 1948 and the Bidi and Cigar Workers (condition of employment) Act 1966. The unincorporated enterprises also exclude the public sector enterprises and cooperatives, but they include the self-help groups (SHGs), private non-profit institutions and trusts (NSSO, 2012, 2017). The non-agricultural or non-farm enterprises, on the other hand, include all the enterprises other than agriculture, forestry, fishing, and mining and quarrying, i.e. all enterprises under sections “C” to “S” of the National Industrial Classification (NIC) 2008 (NSSO, 2012, 2017). However, since the above two NSS surveys exclude the construction sector, our analysis of the NFIEs will be exclusive of the construction sector.

There are few compatibility issues between the 67th and 73rd round of surveys relating to activity coverage. The 67th round covers manufacturing, trading and other services (excluding construction), while the 73rd round additionally covers activities related to non-captive electricity generation, transmission and distribution (NIC 2008 codes 35103, 35105, 35106, 35107, 35109) by units not registered with the Central Electricity Authority. Therefore, we have excluded the activities related to electricity generation, transmission and distribution from the later round to make the dataset comparable with the previous round.<sup>4</sup>

We have considered three variables, namely number of enterprises, employment, and output, for analysing the performance of the NFIEs.



Total persons engaged is taken as employment, which includes primary workers, working proprietors and supervisory staff engaging either full time or part time in the activity of the enterprise with or without receiving wages/salaries. The gross value added (GVA hereafter) is taken as output, which refers to the additional value created by the process of production by an enterprise. We have used the sector specific NSDP deflator (at constant 2011-12 prices) for Assam to convert the nominal GVA into real GVA.

The analysis carried out in this paper is descriptive. We have worked out the compound annual growth rate (CAGR) of number of enterprises, employment and output to examine the performance of the rural NFIEs by various sectors and by various operational characteristics.

### **NFIEs of Assam in a Comparative Perspective**

The number of NFIEs in Assam was around 11.51 lakh in 2010-11 (Table 1). In 2015-16, the number of enterprises has reached around 12.14 lakh; an addition of about 63,100 enterprises, or a compound annual growth rate (CAGR hereafter) of 1.1 per cent per annum over 2010-11 to 2015-16. The number of workers employed in these enterprises was estimated to be about 18.45 lakh in 2010-11. By 2015-16, the number of workers declined to about 18.16 lakh; an absolute decline of about 29,000 workers within a period of five years.

**Table 1: Number of Enterprises and Employment in NFIEs in Assam**

	Number of Enterprises (in '000)			Number of Workers (in '000)		
	2010-11	2015-16	Change	2010-11	2015-16	Change
Rural	925	849	-75.8	1398	1162	-236.2
Urban	226	365	138.9	447	654	207.2
<b>Total</b>	<b>1151</b>	<b>1214</b>	<b>63.1</b>	<b>1845</b>	<b>1816</b>	<b>-29.0</b>

Source: Computed from NSS 67th and 73rd rounds.

Assam accounted for a meagre share of the NFIEs in the country. Table 2 provides a comparative profile of Assam's NFIEs with that of the major Indian states for the year 2015-16. Assam accounted for

merely 2 per cent of total number of NFIEs and 1.7 per cent of employment in NFIEs in the country in 2010-11, which further declined to 1.9 and 1.6 per cent, respectively in 2015-16. The share is slightly higher in the rural areas than in the urban areas, but the share in the rural areas has declined while that in the urban areas has marginally increased during 2010-11 to 2015-16. All the major states except Chhattisgarh, Haryana, Himachal Pradesh, Jammu and Kashmir and Uttarakhand have a higher share than Assam in number of enterprises and employment in NFIEs in 2015-16.

**Table 2: Share (per cent) of the Major States in NFIEs, 2015-16**

States	Number of Enterprises			Number of Workers		
	Rural	Urban	Total	Rural	Urban	Total
Andhra Pradesh	10.0	8.9	9.5	9.0	8.4	8.7
Assam	2.6	1.2	1.9	2.3	1.1	1.6
Bihar	7.4	3.4	5.4	6.6	3.3	4.8
Chhattisgarh	1.5	1.2	1.3	1.8	1.3	1.5
Gujarat	3.1	7.5	5.2	3.2	7.3	5.5
Haryana	1.2	1.9	1.5	1.3	2.0	1.7
Himachal Pradesh	1.0	0.3	0.6	1.0	0.3	0.6
Jammu and Kashmir	1.1	1.2	1.1	0.9	1.0	1.0
Jharkhand	3.7	1.2	2.5	3.7	1.1	2.3
Karnataka	5.4	6.7	6.1	5.3	7.3	6.4
Kerala	3.3	4.2	3.8	3.7	4.3	4.0
Madhya Pradesh	4.2	4.3	4.2	4.4	4.4	4.4
Maharashtra	5.9	9.2	7.5	5.9	10.1	8.2
Odisha	4.6	1.6	3.1	4.7	1.6	3.0
Punjab	1.9	2.8	2.3	1.7	2.7	2.2
Rajasthan	3.9	4.6	4.2	4.0	4.4	4.2
Tamil Nadu	4.9	10.9	7.8	5.5	11.3	8.7
Uttar Pradesh	14.9	13.4	14.2	16.7	13.4	14.9
Uttarakhand	0.7	0.7	0.7	0.6	0.6	0.6
West Bengal	17.4	10.4	14.0	16.4	8.8	12.2
India	100	100	100	100	100	100

Source: Computed from NSS 73rd round.

The rural–urban break-up of the enterprises shows that an overwhelmingly large proportion of NFIEs in Assam has been

concentrated in the rural areas (Table 3). In 2010-11, about 80.4 per cent of enterprises and 75.8 per cent of workers were in the rural areas. However, between 2010-11 and 2015-16, the RNFIEs recorded an absolute decline in number of enterprises and workers, while its urban counterpart has recorded significant increase in number of enterprises and workers. The number of RNFIEs and workers in RNFIEs has declined from 9.25 lakh to 8.49 lakh and from 13.98 lakh to 11.62 lakh respectively during 2010-11 to 2015-16, while that in the urban NFIEs (UNFIEs hereafter) increased from 2.26 lakh to 3.65 lakh and from 4.47 lakh to 6.54 lakh, respectively. As a result, the share of RNFIEs in number of enterprises and workers has declined to 70 and 64 per cent, respectively in 2015-16. Yet, the relative size of the RNFIEs in the state is much bigger than that in the national level and in most of the major states (Table 3). Among the major states, only Himachal Pradesh, Jharkhand and Odisha have a bigger relative size of RNFIEs than that in Assam both in terms of number of enterprises and employment.

**Table 3: Share (per cent) of the Rural and Urban Areas in NFIEs across Major States**

States	Number of Enterprises				Number of Workers			
	2010-11		2015-16		2010-11		2015-16	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Andhra Pradesh	58.8	41.2	54.3	45.7	60.1	39.9	46.7	53.3
Assam	80.4	19.6	69.9	30.1	75.8	24.2	64.0	36.0
Bihar	78.6	21.4	69.7	30.3	73.6	26.4	62.4	37.6
Chhattisgarh	61.7	38.3	58.0	42.0	59.1	40.9	53.7	46.3
Gujarat	25.6	74.4	29.9	70.1	23.9	76.1	26.4	73.6
Haryana	41.3	58.7	39.5	60.5	40.4	59.6	34.7	65.3
Himachal Pradesh	79.7	20.3	80.3	19.7	74.9	25.1	73.5	26.5
Jammu and Kashmir	58.7	41.3	48.5	51.5	57.6	42.4	41.8	58.2
Jharkhand	74.5	25.5	76.1	23.9	73.0	27.0	73.1	26.9
Karnataka	50.2	49.8	45.9	54.1	41.0	59.0	37.0	63.0
Kerala	63.5	36.5	45.0	55.0	58.4	41.6	40.9	59.1
Madhya Pradesh	51.2	48.8	50.8	49.2	48.3	51.7	44.9	55.1
Maharashtra	37.3	62.7	40.4	59.6	33.4	66.6	32.0	68.0
Odisha	81.2	18.8	75.0	25.0	81.6	18.4	71.1	28.9

Punjab	38.9	61.1	42.0	58.0	33.7	66.3	33.4	66.6
Rajasthan	51.3	48.7	47.6	52.4	45.5	54.5	42.5	57.5
Tamil Nadu	37.5	62.5	32.2	67.8	33.7	66.3	28.2	71.8
Uttar Pradesh	56.4	43.6	53.9	46.1	52.4	47.6	50.3	49.7
Uttarakhand	63.1	36.9	51.1	48.9	57.3	42.7	48.2	51.8
West Bengal	64.7	35.3	63.9	36.1	59.1	40.9	60.2	39.8
India	53.6	46.4	51.3	48.7	49.3	50.7	44.8	55.2

Source: Computed from NSS 67th and 73rd rounds.

Turning now to the growth rates during 2010-11 to 2015-16, the number of NFIEs recorded an average growth rate of 1.1 per cent per annum, while the number of workers recorded a decline of -0.3 per cent per annum in the state (Table 4). The rural–urban breakup of growth rates shows that the RNFIEs recorded a decline of -1.7 and -3.6 per cent per annum in terms of number of enterprises and workers respectively, while its urban counterpart recorded a considerably high growth rate of 10.1 and 7.9 per cent per annum respectively in the state. For the country as a whole, the number of enterprises has increased in both RNFIEs and UNFIEs (1 and 2.9 per cent per annum, respectively), while the number of workers has increased in UNFIEs (2.3 per cent per annum), but declined in RNFIEs (-1.3 per cent per annum). Across the states, the RNFIEs recorded a decline in number of enterprises and workers in eight and 11 (out of 20) states respectively, while the number of enterprises and workers in the UNFIEs grew significantly in all the major states except Gujarat, Haryana, Maharashtra, and Punjab.

**Table 4: Growth Rate of NFIEs across Major States during 2010-11 to 2015-16**

States	Number of Enterprises			Number of Workers		
	Rural	Urban	Total	Rural	Urban	Total
Andhra Pradesh	-0.3	3.5	1.4	-9.3	1.1	-4.6
Assam	-1.7	10.1	1.1	-3.6	7.9	-0.3
Bihar	5.8	16.2	8.3	5.5	17.1	9.1
Chhattisgarh	3.3	6.6	4.6	2.4	7.0	4.4
Gujarat	1.3	-3.0	-1.8	-0.6	-3.2	-2.6
Haryana	-2.6	-1.1	-1.7	-2.9	1.9	0.1
Himachal Pradesh	2.5	1.7	2.3	1.2	2.8	1.6

Jammu and Kashmir	-0.4	8.2	3.5	-4.7	8.2	1.6
Jharkhand	6.3	4.5	5.9	6.5	6.4	6.5
Karnataka	4.5	8.2	6.4	3.6	7.2	5.8
Kerala	-2.0	14.0	5.0	-3.7	10.9	3.4
Madhya Pradesh	0.5	0.8	0.6	0.6	3.4	2.1
Maharashtra	0.0	-2.5	-1.5	-2.9	-1.7	-2.1
Odisha	-5.6	1.6	-4.1	-10.1	1.2	-7.6
Punjab	1.8	-0.7	0.3	-0.7	-0.4	-0.5
Rajasthan	3.0	6.2	4.6	2.8	5.4	4.2
Tamil Nadu	-1.0	3.7	2.1	-2.2	3.0	1.3
Uttar Pradesh	0.5	2.6	1.4	0.2	1.8	0.9
Uttarakhand	-6.2	3.5	-2.2	-7.1	0.0	-3.8
West Bengal	3.7	4.5	4.0	3.1	2.1	2.7
India	1.0	2.9	1.9	-1.3	2.3	0.6

Note: Growth rate (per cent per annum) is compound annual growth rate  
Source: Computed from NSS 67th and 73rd rounds.

The above findings point to the fact that the RNFIEs in Assam has experienced a sharp decline both in terms of number of enterprises and employment during the first half of 2010s, while its urban counterpart has recorded a high growth rate both in number of enterprises and employment. This leads us to further investigate the deceleration of the RNFIEs in the state across various sectors and by various enterprise characteristics.

### **Growth Rate of RNFIEs by Sectors in Assam**

Looking at the RNFIEs across various sectors, it seems that nearly the entire decline in number of enterprises and employment in RNFIEs in Assam between 2010-11 and 2015-16 was in the services sector, although manufacturing sector also experienced a decline both in number of enterprises and employment, and trading sector experienced a decline in employment (Table 5 and Table 6). Out of the 75,800 RNFIEs which were closed down between 2010-11 and 2015-16, about 72,000 were services enterprises. Similarly, out of the of 2.36 lakh job loss in the RNFIEs during this period, 1.70 lakh were in the services enterprises. That means the services sector accounted for about 95 per cent of the RNFIEs which were closed down and 72.1 per cent of the job loss in the RNFIEs during 2010-11 to 2015-16.

In terms of growth rate, the number of informal services enterprises declined by about -5.3 per cent per annum, while the number

of workers in the informal services enterprises declined by about -8.5 per cent per annum during 2010-11 to 2015-16. The decline in number of enterprises and workers in the rural informal services sector in Assam during 2010-11 to 2015-16, however, is a continuum of the trends visible during 2006-07 to 2010-11. Our estimates with the NSS 63rd round data (NSSO, 2009) show that between 2006-07 and 2010-11 the number of informal services enterprises in rural Assam declined by about 2 lakh (an average annual decline of -11.9 per cent), whereas the number of workers in these enterprises declined by about 4.3 lakh (an average annual decline of -14.9 per cent).

In the manufacturing sector, the number of enterprises was declined by about 26,100 (an average annual decline of -2.9 per cent) and the number of workers was declined by about 39,800 (an average annual decline of -2.4 per cent) over 2010-11 to 2015-16. The decline in number of enterprises and workers in the rural informal manufacturing sector in Assam during 2010-11 to 2015-16 is a continuum of the trends visible during 2005-06 to 2010-11. For instance, in a recent study Saikia and Gogoi (2018) observe that the number of enterprises and employment in the rural informal manufacturing sector in Assam witnessed an absolute decline of about 1.4 lakh and 1.9 lakh respectively between 2005-06 and 2010-11, which translates into an average annual decline of -8.5 and -10.6 per cent respectively.

In the trading sector, as many as 26,100 workers lost their job between 2010-11 and 2015-16 in spite of the addition of about 22,300 enterprises in the sector. The rate of growth of number of service enterprises was about 1 per cent, while employment declined by -0.9 per cent per annum.

**Table 5: Number of RNFIEs by Various Sectors in Assam**

	2010-11				2015-16			
	M	T	S	All	M	T	S	All
Number of enterprises (in '000)	190	432	303	925	164	454	231	849
Share of various sectors (per cent)	20.5	46.7	32.8	100	19.3	53.5	27.2	100
Change in number of enterprises (in '000)					-26.1	22.3	-72.0	-75.8
Growth rate (per cent per annum)					-2.9	1.0	-5.3	-1.7

Note: M- Manufacturing, T- Trade, S- Other Services. Source: Computed from NSS 67th and 73rd rounds.

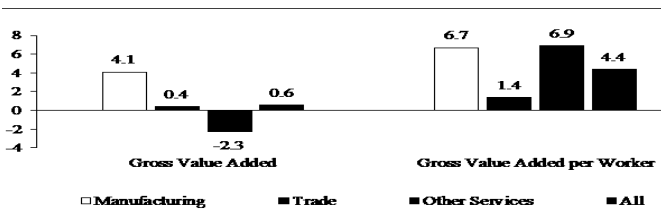
**Table 6: Employment in RNFIEs by Various Sectors in Assam**

	2010-11				2015-16			
	M	T	S	All	M	T	S	All
Number of workers (in '000)	344	580	473	1398	304	554	303	1162
Share of various sectors (per cent)	24.6	41.5	33.9	100	26.2	47.7	26.1	100
Change in workers (in '000)					-39.8	-26.1	-170.3	-236.2
Growth rate (per cent per annum)					-2.4	-0.9	-8.5	-3.6

Note: M- Manufacturing, T- Trade, S- Other Services. Source: Computed from NSS 67th and 73rd rounds.

The growth rate of real GVA in RNFIEs in the state was almost stagnant at 0.6 per cent per annum during 2010-11 to 2015-16 (Figure 1). Across sectors, growth rate of real GVA in the manufacturing sector was relatively high at 4.1 per cent per annum, while that in the trading sector was just 0.4 per cent per annum and in the services sector was negative at -2.3 per cent per annum. The stagnation of growth of real GVA seems to indicate that the deceleration in employment may further be aggravated, especially in the services sector where the growth rate of real GVA was negative and the decline in employment was also very sharp. The relatively high growth rate of GVA in manufacturing sector along with decline in employment tends to indicate the continuum of the “jobless growth” in the sector.

**Figure 1: Growth Rate of GVA and GVA per Worker in RNFIEs by Various Sectors in Assam during 2010-11 to 2015-16**



Note: Growth rate (per cent per annum) is compound annual growth rate.

Source: Computed from NSS 67th and 73rd rounds.

The upshot of the stagnation of output growth and deceleration of employment is that the growth rate of labor productivity, expressed as GVA per worker, has been relatively high in spite of stagnant growth of real GVA (Figure 1). However, the high growth rate of labor productivity needs to be interpreted carefully, since a large part of this increase may be attributed to the decline in employment. The growth rate of labor productivity for the total of RNFIEs was about 4.2 per cent per annum during 2010-11 to 2015-16, whereas that in manufacturing was 6.7 per cent, in services enterprises was 6.9 per cent, and in trading enterprises was 1.4 per cent.

### **Changes in RNFIEs by Operational Characteristics in Assam**

An analysis of the change in number of enterprises and employment by some common characteristics of the enterprises may enrich our understanding about the deceleration of the RNFIEs in the state. However, NSSO (2017) provides information only on the distribution of enterprises by three operational characteristics namely type of ownership, nature of operation, and location for the aggregate NFIEs separately for rural and urban areas at the state level. Therefore, we could not examine the change in employment by the operational characteristics of the enterprises, and so is the change in number of enterprises across sectors by the operational characteristics of the enterprises. Hence, this section analyses the change in the number of RNFIEs in the state by type of ownership, nature of operation, and location of the enterprises.

First, consider the ownership of the enterprises. Nearly the entire RNFIEs in the state are proprietary enterprises. In 2015-16, 98.3 per cent of the enterprises were proprietary enterprises (93.2 per cent male proprietary and 5.1 per cent female proprietary), SHGs accounted for 1.2 per cent of the enterprises and the remaining 0.5 per cent was partnership enterprises (Table 7). Between 2010-11 and 2015-16, the number of enterprises in all ownership categories except female proprietorship has declined; the largest absolute decline was in the male proprietary enterprises, while in percentage terms the biggest decline was in partnership enterprises between members of different households and other enterprises. The number of male proprietary enterprises was declined by about 47,400, partnership enterprises between members of same household by about 17,000, and SHGs by about 9,200.



In terms of nature of operation of the enterprises, almost the entire RNFIEs in Assam are perennial enterprises; 97.1 per cent in 2010-11, which further increased to 99.3 per cent in 2015-16 (Table 8). Between 2010-11 and 2015-16, all the three categories experienced an absolute decline in number of enterprises; number of perennial enterprises declined by 54,900 (-1.3 per cent per annum), seasonal enterprises by 11,600 (-21 per cent per annum), and casual enterprises by 9,000 (-39 per cent per annum).

**Table 7: Changes in RNFIEs by Types of Ownership**

Ownership type	Number of Enterprise (in '000)			Share (per cent)		CAGR (per cent)
	2010-11	2015-16	Change	2010-11	2015-16	
1. Proprietary	881.5	834.8	-46.7	95.3	98.3	-1.1
1.a Male	838.9	791.4	-47.4	90.7	93.2	-1.2
1.b Female	42.6	43.3	0.7	4.6	5.1	0.3
2. Partnership	23.1	4.2	-18.9	2.5	0.5	-28.8
between members of-						
2.a same household	21.3	4.2	-17.0	2.3	0.5	-27.6
2.b different households	1.9	0	-1.9	0.2	0.0	-100
3. SHGs	19.4	10.2	-9.2	2.1	1.2	-12.1
4. Others	0.9	0	-0.9	0.1	0.0	-100

Source: Computed from NSS 67th and 73rd rounds.

**Table 8: Changes in RNFIEs by Nature of Operation**

Nature of operation	Number of Enterprise (in '000)			Share (per cent)		CAGR (per cent)
	2010-11	2015-16	Change	2010-11	2015-16	
Perennial	898.1	843.2	-54.9	97.1	99.3	-1.3
Seasonal	16.7	5.1	-11.6	1.8	0.6	-21.1
Casual	10.2	0.9	-9.3	1.1	0.1	-39.1

Source: Computed from NSS 67th and 73rd rounds.

Turning now to the location of the enterprises, it is evident that the proportion of home-based RNFIEs and mobile markets has declined, while the proportion of RNFIEs located outside the household premise has increased during 2010-11 to 2015-16 (Table 9). Between 2010-11 and 2015-16, the decline in the number of mobile markets was

much larger than the total decline in the number of RNFIEs. The number of mobile markets was declined by about 1.12 lakh (an average decline of -28.7 per cent per annum) and the number of enterprises located within household premise was declined by about 58,400 (an average decline of -2.9 per cent per annum). Part of the decline in these two categories of RNFIEs could be due to the change in the location status of the enterprises from within household premise and without fixed location to outside household premise with fixed location, which is also evident from the fact that number of enterprises located outside household premise with fixed location has considerably increased, especially enterprises with temporary structure and without any structure between 2010-11 and 2015-16. However, the increase in the number of enterprises located outside household premise with fixed location was not enough to offset the sharp decline in the number of mobile markets and home-based enterprises resulting in an absolute decline in the number of aggregate RNFIEs over 2010-11 to 2015-16.

**Table 9: Changes in RNFIEs by Types of Location**

Type of location	Number of Enterprise (in '000)		Change	Share (per cent)		CAGR (per cent)
	2010-11	2015-16		2010-11	2015-16	
1. Within household premises	422.7	364.3	-58.4	45.7	42.9	-2.9
2. Outside household premise with fixed location	296.9	391.5	94.6	32.1	46.1	5.7
2. a Permanent structure	272.9	315.9	43.0	29.5	37.2	3.0
2. b Temporary structure	21.3	50.1	28.8	2.3	5.9	18.7
2. c Without any structure	2.8	25.5	22.7	0.3	3.0	55.8
3. Outside household premise without fixed location	205.3	93.4	-111.9	22.2	11.0	-14.6
3.a Mobile market	137.8	25.5	-112.3	14.9	3.0	-28.7
3.b Street vendor	67.5	67.9	0.4	7.3	8.0	0.1

Source: Computed from NSS 67th and 73rd rounds.

## Conclusion

From the analysis, it is clear that the RNFIEs in Assam have experienced an absolute decline in number of enterprises and employment across all sectors, in particular services and manufacturing, between 2010-11 and 2015-16. The decline in the number of RNFIEs took place across all the ownership categories except female proprietorship, across all the operational categories, and in the home-based enterprises and mobile markets by types of location, while enterprises located outside the household premise with fixed location has increased. For the same period, the growth of real output in RNFIEs was almost stagnant, with negative output growth in the services enterprises. Given the stagnation of output growth it is possible that the deceleration in employment in RNFIEs may further be aggravated in the near future. The deceleration of RNFIEs may continue further also because of the fact that two of the landmark policy changes in the Indian economy in recent time  $\frac{3}{4}$  demonetisation (announced on 8<sup>th</sup> November, 2016) and Goods and Services Tax (introduced on 1<sup>st</sup> July, 2017)  $\frac{3}{4}$  posed serious challenges for the informal enterprises, and there has been growing apprehensions about negative impact of these policy changes on the informal enterprises. This calls for a more systematic and detailed probe on the RNFIEs using primary survey data since the next NSS survey on the sector is due only after five years.

Many explanations may be framed to understand this deceleration. The foremost explanation that comes forth is that the demand for the products produced by these enterprises has been falling over time. The NSS 73rd round data shows that shrinking/fall of demand is the most severe problem faced by the RNFIEs in Assam; reported by 17.2 per cent of total of RNFIEs, 24.7 per cent of manufacturing enterprises, 15.3 per cent of trading enterprises, and 15.6 per cent of services enterprises during 2015-16. The other problems which are reported more acutely by the RNFIEs in Assam were non recovery of financial dues, erratic power supply/ power cuts, and non-availability/high cost of credit. More interestingly, the severity of each of these problems faced by the FNFIEs is considerably higher in Assam than that in the all-India level.

Before we conclude, we must note that the RNFIEs have a significant role to play in rural development, in particular employment

and income generation, especially among the marginalized section of the society, and reduction of poverty and inequality. The deceleration of these enterprises implies that we are diverging from the path of inclusive growth. Therefore, there is urgent need for strategic interventions by both the central and state governments for addressing the fundamental constraints faced by the informal enterprises in the state. Policies relating to provisioning of training facilities, skill development, access to credit, market facilities, uninterrupted power supply, and technology support will not only be effective for the growth of these enterprises, but it will also enhance the productivity of these enterprises.

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### **(Footnotes)**

- <sup>1</sup> The non-farm sector includes all economic activities, apart from agriculture and allied activities.
- <sup>2</sup> The trend growth rate of NSDP from agriculture and allied activities in Assam was negative at -0.21 per cent during 1993-94 to 2003-04 (at constant 1999-2000 prices) and 3.1 per cent during 2004-05 to 2014-15 (at constant 2004-05 prices).
- <sup>3</sup> Prior to that, the NSSO has conducted 13 surveys on non-agricultural enterprises, but those were for a particular sector such as unorganised manufacturing, trade, and services.
- <sup>4</sup> In addition, the 73rd round of survey also includes chit funds and investment club (NIC 2008 codes 64193 and 64921 respectively) which were not covered in the 67th round, whereas the 73rd round excludes insurance, reinsurance and pension funding except compulsory social security (NIC 2008 division 65) and activities of insurance agents (NIC 2008 code 6622), which were covered in the 67th round. However, we could not make any adjustment in respect of chit funds and investment club, whereas the exclusion of insurance, reinsurance and pension funding and activities of insurance agents in the 73rd round is unlikely to affect our analysis since the NSSO report (NSSO, 2017) itself notes that insurance sector in India is only present in the formal sector, which was evident from the findings of 67th round.

# Labor Movements in the Automobile Sector in NCR Delhi: Catalyst for Collective Resistance and Social Transformation

Dr. Archana Prasad\*

## 1. Introduction

Labor movements in India have historically played a crucial role in advancing workers' rights and fighting for social justice, particularly in urban centres where neoliberal reforms have restructured the economic landscape. The rise of the informal economy, coupled with corporate-driven models of growth, has resulted in precarious working conditions for millions of workers. These shifts have given rise to new forms of collective resistance and protest, with labour movements acting as key actors in the formation of what Nancy Fraser (1990) refers to as “counter publics”—spaces for marginalized voices to contest dominant economic and political narratives (Fraser, 1990, 69). The landscape of labour movements in urban India has undergone significant transformations, particularly since the neoliberal reforms of the 1990s. The liberalization of India's economy in the early 1990s intensified these tensions.

According to Jan Breman (2013), the reforms led to the rapid growth of an informal economy, characterized by a lack of job security, inadequate wages, and limited access to social protections (Breman, 2013, 119). The informal labour sector in urban India is symbolic of precarious working conditions, exploitation, and a lack of adequate labour rights (Agarwala, 2021, 15). Informal workers now comprise a substantial portion of the urban workforce, rendering them vulnerable

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to systemic injustices that manifest in low wages, job insecurity, and absence of social protections. These policies aimed to integrate the Indian economy into the global market, emphasizing privatization, deregulation, and reduced state intervention. While this has led to remarkable economic growth and urbanization in cities like Delhi, Mumbai, and Bangalore, it has also exacerbated social inequalities, particularly among informal workers, who constitute a significant portion of the urban labour force.

The informal sector, characterized by precarious employment and lack of social security, has witnessed rapid expansion. Consequently, these workers face harsh working conditions and exploitative practices by employers. As a result, labour movements have emerged as vital advocates for social justice and workers' rights (Bhowmik, 2012, 42).

Moreover, they lack the protections afforded by formal labour laws, making them especially vulnerable to exploitation (Agarwala, 2021, 15). In this context, labour movements have emerged as essential actors advocating for workers' rights and challenging the dominant neoliberal narrative that prioritizes profit over people.

Labor movements in urban India have historically played a vital role in advocating for social justice. However, the neoliberal era has presented new challenges, including the fragmentation of labour markets and the weakening of traditional labour unions. In response, contemporary labour movements have adopted innovative strategies, utilizing both physical protests and digital platforms to organize and mobilize workers (Bhowmik, 2012, 42). This paper examines how labour movements in urban India function as counter publics, offering marginalized workers a platform to voice their grievances and advocate for change. Using the theoretical framework of counter publics proposed by Nancy Fraser (1990), the paper analyses the collective actions of labour movements against the backdrop of neoliberalism. By focusing on two significant case studies—the Honda Workers' Strike of 2005 and the Maruti Suzuki Workers' Struggle of 2011—the paper illustrates how these movements challenge neoliberal policies and create alternative narratives of resistance. The research aims to answer the following questions:

1. How do labour movements in urban India operate as counter publics, providing a voice for marginalized workers?
2. In what ways do these movements challenge the dominant neoliberal economic framework?

### 3. How have digital technologies transformed labour activism in India?

By situating labour movements within the framework of the public sphere and counter publics, this paper contributes to a deeper understanding of collective resistance in urban India and its implications for social change. The paper focuses on formation counter publics due to labour protests in the automobile sector located in the National Capital Region (NCR) of Delhi, particularly in industrial area of Gurgaon, Manesar, and Faridabad. In the last decade the sector has witnessed numerous labour struggles that serve as significant examples of how workers organize and function as counter publics.

## 2. Theoretical Framework

The theoretical framework for this paper draws on three interconnected concepts: the public sphere and counter publics, neoliberalism, and labour movement theories. Each of these concepts provides a lens to analyse the role of labour movements in urban India and their significance in challenging dominant economic structures. By viewing labour movements as counter publics, it becomes possible to understand how workers resist neoliberal economic policies and advocate for social change. Digital technologies and intersectional organizing further enhance these movements, making them critical actors in the ongoing struggle for labour rights in India.

### *2.1 Public Sphere, Counterpublics, and the Role of Labor Movements*

The concept of the public sphere, as articulated by **Jürgen Habermas** (1962), refers to a space where individuals come together to discuss and influence political matters. Habermas traces the development of the public sphere to the rise of bourgeois society in Europe during the 18th century, especially in England, France, and Germany. The growth of capitalist economies, the expansion of literacy, and the emergence of institutions like coffee houses, salons, and newspapers facilitated the formation of a bourgeois public sphere. This was a space where private individuals (mostly property-owning men) could discuss public matters without direct interference from the state.

While Habermas celebrates the emergence of the public sphere in the 18th century, he argues that it underwent a structural transformation in the 19th and 20th centuries, particularly with the



rise of mass media, consumer culture, and state intervention. He believed that the public sphere has been eroded in modern capitalist societies due to the commercialization of the media, such as television and newspapers, became increasingly driven by profit motives, leading to the commodification of information. Instead of facilitating rational-critical debate, the media often prioritize sensationalism, entertainment, and advertising, which dilute the quality of public discourse. Habermas further argues that the public sphere became less independent as the state and large corporations began to dominate public communication, influencing the media and shaping the agenda of public debate. In the modern era, individuals are more likely to be passive consumers of information rather than active participants in critical debate. The culture of mass media encourages passive consumption rather than active engagement in discussions about public affairs.

As a result, Habermas argues that the public sphere has lost its critical function as a space for rational debate, and this decline has negative consequences for democracy. In the 18th century, this bourgeois public sphere flourished and played a key role in holding the state accountable. Citizens could debate policies, criticize governments, and advocate for reforms. Importantly, Habermas emphasizes that this space was not just limited to face-to-face discussions but also included the rise of print media, such as newspapers and pamphlets, which expanded public debate. While Habermas's concept of the public sphere has been highly influential, it has also faced several criticisms, particularly regarding its exclusivity. Some scholars argue that Habermas's focus on rational-critical debate overlooks the importance of other forms of communication, such as emotions, narratives, and cultural expressions, which play a significant role in political activism and public life. Critics such as Nancy Fraser (1990) have pointed out that Habermas's bourgeois public sphere was not truly inclusive. It largely excluded women, the working class, racial and ethnic minorities, and other marginalized groups. Fraser argues that these groups were either completely shut out or relegated to the private sphere, where their voices were not heard. Fraser introduced the concept of counterpublics, highlighting how marginalized communities form their own spaces to articulate grievances and challenge dominant narratives.

Counterpublics are spaces where marginalized groups can resist the hegemonic narratives and norms imposed by the dominant public.

For example, feminist, LGBTQ+, and racial justice movements have created counter publics where they can challenge mainstream ideas about gender, sexuality, and race. Like the public sphere, counter publics involve critical discourse, but their discussions focus on issues that are often ignored or misrepresented in the dominant public sphere. These include matters of social justice, equality, and the lived experiences of oppressed groups. Counterpublics allow marginalized groups to become visible and express their concerns in ways that are not permissible in the dominant public sphere. This visibility is important for influencing broader public debates and challenging established power structures. Fraser emphasizes that counter publics are not isolated or disengaged from the larger society. Instead, they are in constant dialogue with the dominant public sphere, aiming to influence mainstream discourse and policy. Through counter publics, marginalized groups can develop counter-narratives that question dominant ideologies and push for social and political change.

In the context of urban India, labour movements serve as counter publics by providing a platform for informal and marginalized workers to express their concerns. Sharit Bhowmik (2012) emphasizes that informal workers, often excluded from formal labour institutions, rely on labour movements as vital sites of resistance and organization (Bhowmik, 2012, 42). These movements contest the prevailing economic narratives that prioritize capital accumulation and growth while neglecting the rights and dignity of workers. Bhowmik has focused on informal workers, including street vendors, domestic workers, and migrant labourers, who constitute a significant part of the Indian economy but are largely excluded from formal labour rights and protections. In this context, these workers can be seen as forming a counter public, as they organize outside of the mainstream labour movements (which traditionally focused on formal workers) to demand recognition, rights, and reforms. For example, organizations like the National Association of Street Vendors of India (NASVI) and Self-Employed Women's Association (SEWA) represent informal workers, providing platforms where their concerns can be voiced. These spaces, like counter publics, allow marginalized workers to articulate their needs, which are often ignored by mainstream unions and political institutions.

Bhowmik's research underscores how these workers develop alternative discourses and mobilize to challenge the exclusion they

face in the formal labour economy. This is particularly important in a country like India, where informal workers constitute more than 90 per cent of the workforce, yet their struggles are often overlooked in public and policy discourses. Labor movements, especially those representing marginalized groups like Dalits, women, and rural workers, operate as counter publics by providing platforms for marginalized identities and experiences to engage in collective action. For example, Dalit labour unions not only fight for better wages but also challenge the caste-based oppression that shapes their labour conditions. In his studies of urban and rural labour in India, Bhowmik illustrates how labour movements become sites where workers develop a sense of collective identity and engage in political resistance. These movements, often operating outside mainstream political or union frameworks, act as counter publics in the sense that they challenge dominant narratives about economic development, labour relations, and social justice. Labor movements provide a space for workers to articulate their demands for social justice, better wages, and improved working conditions. These counter publics play a crucial role in challenging neoliberal policies that exacerbate social inequalities. By organizing strikes, protests, and other forms of collective action, labour movements resist the marginalization of their voices and assert their right to participate in the political discourse.

### **Neoliberalism and Labor in Urban India**

The neoliberal reforms of the 1990s reshaped the labour landscape in India, leading to the rise of an informal economy characterized by precarious employment and lack of protections. Jan Breman (2013) notes that neoliberalism has led to the growth of an informal labour force, often subjected to exploitation and denied basic rights (Breman, 2013, 115). As formal labour markets shrink and informal employment expands, workers find themselves in increasingly vulnerable positions.

Urban India has witnessed the emergence of industries that heavily rely on informal labour, such as construction, manufacturing, and services. Workers in these sectors frequently encounter unsafe working conditions, low wages, and arbitrary dismissals. Kalyan Sanyal (2007) argues that neoliberal policies have created a dual economy, wherein formal and informal labour markets coexist but operate under vastly different conditions (Sanyal, 2007, 97). This duality underscores the broader inequalities perpetuated by neoliberalism, where a small

elite benefits while the majority of workers face deteriorating conditions.

Labor movements have emerged as critical actors in this context, advocating for better wages, job security, and labour rights. These movements challenge the neoliberal economic framework that prioritizes growth at the expense of social equity. By organizing strikes and protests, labour movements contest the exploitation inherent in India's labour market and demand a fairer distribution of economic gains.

### **Digital Technology and Labor Activism**

In recent years, the proliferation of digital technologies has transformed labour activism in India, providing new avenues for organizing and mobilization. Carol Upadhy (2016) emphasizes that social media platforms such as WhatsApp, Facebook, and Twitter have become essential tools for labour activists, enabling them to coordinate efforts, share information, and build solidarity across geographic boundaries (Upadhy, 2016, 52). These platforms facilitate direct communication among workers, bypassing traditional media that often misrepresents labour struggles. The Maruti Suzuki Workers' Struggle of 2011 exemplifies the role of digital technologies in labour activism.

During this struggle, workers utilized social media to mobilize support, disseminate information about their demands, and challenge state narratives. Srimati Roychowdhury (2015) argues that digital platforms have become critical resources for labour movements, amplifying their voices and enhancing their visibility (Roychowdhury, 2015, 95). However, the use of digital technologies also poses challenges. The state and corporations have increasingly adopted surveillance techniques to monitor labour activists, creating a climate of fear. Rina Agarwala (2021) highlights that while digital tools have democratized access to information, they also expose activists to new forms of repression, such as online harassment and state surveillance (Agarwala, 2021, 71). Despite these challenges, digital technologies remain vital for labour movements, enabling them to organize and resist in ways that were previously unattainable.

### **3. Research Methodology**

This paper employs a qualitative research methodology that combines both primary and secondary data sources. Primary data consists of in-

depth interviews conducted with labour activists, union leaders, and workers in major urban centres such as Delhi, Mumbai, and Gurgaon. These interviews offer first-hand accounts of the motivations, strategies, and challenges faced by labour movements in their struggles for rights and recognition. Fieldwork was conducted over a six-month period, with semi-structured interviews focused on themes related to labour exploitation, neoliberalism, and digital activism. In addition to primary data, secondary sources—including academic literature, labour reports, and media coverage of significant labour movements such as the Honda Workers' Strike and the Maruti Suzuki Workers' Struggle—were analysed to provide a historical and contextual understanding of labour movements in India. This comprehensive literature review highlights the evolution of labour activism and its responses to neoliberal policies.

A thematic analysis of interview data was conducted, allowing for the identification of recurring themes related to collective resistance, counter public formation, and the role of digital technologies in labour activism. This analysis provides insights into how labour movements navigate the complexities of the neoliberal landscape and the strategies they employ to challenge exploitation. Furthermore, a content analysis of social media posts and other digital platforms used by labour activists was conducted. This analysis focused on how these platforms facilitate labour organizing, foster solidarity, and challenge dominant economic and political narratives. The findings from this content analysis underscore the significance of digital technologies in shaping labour movements and amplifying worker voices.

#### **4. Case Studies of Labor Movements as Counterpublics**

Labor movements often function as counter publics, offering marginalized workers a platform to challenge the dominant public spheres that exclude or exploit them. Through these movements, workers organize, voice their grievances, and demand justice, often outside of formal political or economic structures. Below are several case studies of labour movements functioning as counter publics:

##### **Case Study 1: The Honda Workers' Strike (2005)**

The **Honda Workers' Strike** in Gurgaon, Haryana, in 2005 represents a pivotal moment in labour activism in India. Workers at Honda Motorcycle and Scooter India (HMSI) initiated the strike to demand

union recognition, protest unsafe working conditions, and challenge unfair dismissals. The strike escalated into a violent confrontation between workers and the police, drawing national and international attention to the plight of industrial labourers in India (Lakha, 1999, 203). This strike exemplifies the role of labour movements as counter publics, offering a platform for workers to voice their grievances and demand recognition. Despite facing violent state repression, the Honda

Workers' Strike raised awareness about the precarious conditions endured by industrial workers and underscored the urgent need for labour protections. Activists effectively leveraged media coverage to amplify their struggles, mobilizing public support and generating a broader discourse around workers' rights. The strike also catalysed a wave of solidarity among workers across various sectors. Activists from different unions organized rallies and protests to support the Honda workers, demonstrating the interconnectedness of labour struggles. The solidarity built during this period highlights how counter publics can create a united front against exploitation and advocate for systemic change. The impact of the Honda Workers' Strike extended beyond immediate labour concerns, inspiring future movements and emphasizing the significance of collective action. By mobilizing support from other labour organizations, the Honda workers illustrated how diverse struggles can intersect to challenge the dominant economic narratives perpetuated by neoliberalism (Breman, 2013, 120).

### **Case Study 2: The Maruti Suzuki Workers' Struggle (2011)**

The **Maruti Suzuki Workers' Struggle** in Manesar, Haryana, from 2011 to 2012 represents another critical moment in the evolution of labour movements in India. The struggle began when workers demanded better wages, job security, and improved working conditions. The company responded by firing several union leaders and instigating a climate of fear among workers (Breman, 2013, 120). As the struggle unfolded, workers organized mass protests and strikes, utilizing social media to share information and coordinate their efforts. Digital platforms played a crucial role in amplifying their voices, allowing workers to connect with other labour movements across the country. The Maruti Suzuki struggle highlighted how digital technologies can enhance the visibility of labour activism and facilitate solidarity among workers. Moreover, the Maruti Suzuki struggle underscored the importance of counter publics in challenging corporate power. Workers

created alternative narratives that framed their struggles as part of a broader fight for justice, labour rights, and social equity. This framing resonated with various social movements in India, including those advocating for women's rights, environmental justice, and social equity, thereby creating a coalition of counter publics that transcended traditional labour activism.

The Maruti Suzuki Workers' Struggle also illustrated the challenges faced by labour movements in the digital age. While digital tools enhanced mobilization and communication, they also exposed activists to new forms of repression. The state used digital surveillance to monitor labour activists, creating a climate of fear and intimidation. Nonetheless, the struggle exemplified the resilience of labour movements in urban India, demonstrating how collective resistance can forge new spaces for advocacy and activism. The Maruti Suzuki Struggle not only highlighted the plight of workers but also initiated conversations about the role of technology in modern labour movements. The digital strategies employed by workers provided a blueprint for future movements, showcasing how technology could empower marginalized voices in their struggle for justice.

### **Hero MotoCorp Workers' Protest (Gurgaon, 2016)**

Hero MotoCorp, India's largest two-wheeler manufacturer, has faced multiple labour disputes in its Gurgaon plant, with the most significant one occurring in 2016. The conflict arose when workers demanded better wages, regularization of contract workers, and the right to form an independent union. Like other automobile companies in the NCR, Hero MotoCorp relied heavily on contract labour, creating a two-tier system where permanent workers had job security and benefits, while contract workers were left with lower wages and fewer protections.

The workers formed the Hero MotoCorp Workers' Union to represent their interests. The demand for an independent union was central to their efforts to create a counter public sphere, where they could voice their grievances without interference from the management-controlled union. Similar to the Maruti Suzuki struggle, the Hero MotoCorp workers' protest was rooted in opposition to the widespread use of contract labour in the automobile sector. Workers saw this practice as a way for companies to avoid providing benefits and job security. By organizing contract workers alongside permanent employees, the movement sought to challenge the class divide within

the workforce. The workers staged protests, sit-ins, and hunger strikes to push their demands. They also sought to involve local labour unions and civil society organizations to gain broader support for their cause. Although the protests brought attention to the plight of contract workers, Hero MotoCorp did not concede to most of the workers' demands. The company continued to resist the formation of an independent union, and many of the protest leaders were dismissed. Despite this, the movement succeeded in highlighting the exploitation of contract labour and set the stage for further labour organizing in the sector.

These case studies illustrate how labour movements function as counter publics, providing marginalized workers with spaces to organize, resist, and challenge dominant economic and social structures. Each movement created an alternative public sphere where workers could develop collective identities, articulate their demands, and push for social and political change. The workers sought to create an alternative space outside the company's official union, which they believed was controlled by management. Their demand for an independent union was a way to create a counter public where they could articulate their demands freely, without interference from the management-controlled union. The movement challenged the corporate-public sphere, which favoured employers' rights over workers' rights. The workers' strike represented a critique of neoliberal labour practices that prioritize profit over fair working conditions. The workers formed a counter public by building solidarity not only among themselves but also with other labour movements across India. They highlighted issues of precarious employment, demanding the regularization of temporary workers and an end to exploitative contract labour systems.

## **5. Conclusion**

Labor movements in urban India serve as vital counter publics, providing marginalized workers with a platform to challenge the injustices perpetuated by neoliberal economic policies. These movements illuminate the voices of informal workers, whose struggles often remain obscured in mainstream discourse. By organizing protests, strikes, and online campaigns, labour movements contest dominant narratives that prioritize profit over people and highlight the urgent need for social justice.



The case studies of the Honda Workers' Strike and the Maruti Suzuki Workers' Struggle reveal how labour movements not only resist exploitation but also foster solidarity among diverse groups, creating a broader counter public that advocates for systemic change. The integration of digital technologies into labour activism has further transformed these movements, enabling workers to communicate, mobilize, and amplify their demands more effectively. Digital platforms facilitate a wider dissemination of their struggles, drawing attention to the urgent need for labour reforms and enhancing the visibility of worker experiences. However, labour movements face significant challenges in the neoliberal context, including state repression, corporate surveillance, and the fragmentation of labour markets. As the gig economy and platform capitalism continue to reshape labour dynamics, future research should explore how labour movements can adapt their strategies to confront these new realities. Investigating the intersection of labour movements with emerging digital technologies, particularly in the context of gig work and platform-based employment, is essential for understanding the future of labour activism in India.

In conclusion, labour movements in urban India are at a critical juncture, acting as counter publics that challenge neoliberal economic policies and advocate for workers' rights. By highlighting the struggles of marginalized workers, these movements contribute to a more inclusive discourse on social justice and equity, asserting that the fight for labour rights is an essential component of the broader struggle for a just and equitable society.

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# Integrating Digital Literacy into Education: Equipping Students for a Tech-Oriented Future

Dr. Vinod Kumar Kanvaria\* and Sunidhi\*\*

## Introduction

As digital technology changes nearly every industry, providing learners with basic knowledge of essential digital literacy becomes extremely significant. Digital literacy refers to the kinds of skills and knowledge through which users can navigate and evaluate their way to creating and manipulating information using a large set of digital tools, such as search engines (Hague & Payton, 2011). In today's digital world, integrating digital literacy into core curricula is no longer an option but a necessity to prepare students for their future careers and for active participation in society. According to scholars and educators, embedding digital literacy in maths, science, and language arts helps students think critically and be adaptable in the digital environment (Chen, 2020). This article reflects on the successful way of integrating digital literacy into core subjects and what schools can do to prepare a smarter, tech-oriented generation for emerging life.

## Theoretical Framework

It can be understood in terms of various significant theoretical frames associated with the integration of digital literacy in core curricula. All of these discuss the dimensions of learning and technology involved in any educational environment. Three of the most influential theories,

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along with Constructivism, are Technological Pedagogical Content Knowledge (TPACK) and the Digital Divide Theory, which are given below.

## **1. Constructivism**

According to the Constructivist theory, “learning is not merely the recovering of something from one’s memory or past but an act of constructing knowledge itself by experiencing the surroundings and their relations” (Piaget, 1970). This approach focuses on engagement and problem-solving, while the idea also is that students learn better when they can refer new information to their stock of knowledge and apply it in practical ways. The integration of digital literacy in curricula serves to follow constructivist principles in that it encourages active exploration of digital tools and resources by students. For instance, in project-based learning that involves technology, students acquire not only technical knowledge but also critical thinking and collaboration skills to interact within this new digital space (Jonassen, 1999). Constructivism hence provides a basis that education through digital literacy must not stand in isolation but becomes integrated into every subject that students can learn meaningfully within context.

## **2. Technological Pedagogical Content Knowledge (TPACK)**

The TPACK model developed by Mishra and Koehler in 2006 provides an integrated view of how technology can be used to enhance teaching. TPACK is anchored on the fusion of three knowledge areas: content knowledge (CK), pedagogical knowledge (PK), and technological knowledge (TK). For better teaching, educators must fuse these three areas to enhance learning for their students. With digital literacy woven throughout core subjects, teachers can design lessons that are sure to deliver content in an effective, yet technology-enhanced and pedagogically sound, manner.

For example, while introducing multimedia tools during a science lesson, the instructor is teaching scientific concepts (CK), but also incorporating engaging instructional strategies (PK) and appropriate technologies (TK). This will bring better understanding and memorization of knowledge and give the proper digital skills to the students (Mishra & Koehler, 2006).

### **3. Digital Divide Theory**

The term Digital Divide Theory refers to the gaps in access to technology and digital literacy skills between various populations, mainly by socio-economic status, geographical location, and education background (Warschauer, 2004). This theory is essential for knowing why digital literacy should form part of the core curriculum; equity in educational opportunity is an emphasis on this theory. Schools need to ensure that each and every student has access to digital tools and instruction for the proper use of such tools. Reforming curricula based on the divide might just level the scales so that all students will have a chance at success in a world increasingly dependent on digital media. This will empower active use of digital literacy for tackling inequalities and making class-room learning environments more friendly towards all the students learning how to succeed in competency-rich futures (Warschauer, 2004).

In short words, integration of the skills of digital literacy with curricula in core school subjects is not a fad reaction to the relentless nature of technology but an evolutionary imperative for the educational delivery itself. Such an integration based on constructivism, TPACK, and the removal of the digital divide could then be used to design a holistic framework for essential skills development in students. This theoretical underpinning underscores the view that digital literacy is an essential component of modern education, therefore preparing students to navigate a more complex and digital world.

### **The Importance of Digital Literacy in Education**

It involves more than basic computer abilities, such as checking the validity of information from online sources, collaborative ability through digital tools, or being aware of online safety concerns and digital citizenship. According to the European Commission (2020), it means “safe and critical use of Information Society Technology for work, leisure, learning, and communication.”. Students, through mastering these skills, will become best-equipped to succeed in environments where adaptability, problem-solving, and responsible digital engagement are expected.

As of 2022, according to the Pew Research Center (2022), more than 92% of teens in America report going online daily, sometimes for school and sometimes for fun. This statistic underlines how badly

educators need to prepare the students with the skills required to navigate and use digital environments constructively and responsibly. The implementation of digital literacy in schools will have the added advantage of making a student savvy enough to decide on relevant information within their digital setting, engage in meaningful practice with online communities, and provide a technological base on which they could later deploy in the workplace (Ng, 2012).

### **Criticisms facing the Introduction of Digital Literacy into Standard Curricula**

Although the importance of digital literacy is acknowledged, it proves challenging to be included as part of core curriculums. The top barriers include resource and financial gaps. According to an Education Week Research Center report last year, only 54% of teachers in the United States feel that they can adequately prepare their students with effective digital literacy skills, specifically citing professional development and lack of access to technology as critical areas for improvement (2021).

Furthermore, there are often no clear agreements on how to define digital literacy or how to measure it in education systems. While traditional subjects have well-defined standards and assessment tools, digital literacy deals with constantly changing technologies and skills, making the design of a comprehensive curriculum challenging. Apart from these, there are also the issues of “digital divide,” which means uneven access to digital tools. For example, students belonging to low-income backgrounds often cannot rely on the internet or devices for digital learning purposes (Warschauer & Matuchniak, 2010).

### **Digital Literacy in Core Curricula: Strategies**

There are multiple ways through which educators and policymakers can approach this matter of ensuring that digital literacy is integrated into core curricula. Some of them include:

#### **1. Infusion of Digital Literacy in the Main Subjects**

Digital literacy may be acquired as a result of traditional subjects instead of being taught as a stand-alone course. In language arts, for instance, a student may learn how to evaluate online sources critically, produce digital stories, and carry out research on various topics.

Science classes can employ digital tools to conduct simulations and analyze data in an effort to help students understand the concepts and promote inquiry-based learning (Hobbs, 2010).

## **2. Project-Based Learning**

One of the effective strategies in teaching digital literacy is project-based learning as it enables learners to apply digital tools in solving real-world problems. The PBL offers students the chance to undertake projects involving digital research, collaboration, and presentation skills that improve the digital problem-solving experience. For example, the learners can come up with the design of a website, prepare a digital presentation, or cooperate with their fellow students in virtual platforms (Barron & Darling-Hammond, 2008).

## **3. Teacher Training and Support**

Teachers are an integral part of developing digital literacy, but many teachers lack the necessary knowledge. To help integrate digital literacy in schools and districts, the institutions can be offering programs that would allow teachers to learn and work with technology and be updated on matters of online safety, data privacy, and digital citizenship. According to McKnight et al. (2021), a study published in 2021 highlighted the fact that educators who were given opportunities for professional development in terms of digital literacy were much more successful in making use of technology in the classroom.

## **4. Culture for Digital Citizenship**

Education about digital literacy should cultivate responsible behavior in the cyber world, which includes issues such as cyberbullying, online privacy, ethics in communications in the cyber world, among others. Digital citizenship education can be offered by schools across grades to enlighten students as to what rights and responsibilities digital engagement attaches to their actions as well as how to properly contribute constructively to virtual communities (Ribble & Bailey, 2007).

## **5. Collaboration with Companies of Technology**

Schools can collaborate with technology companies to supply resources and train their students and instructors. Companies like Google, Microsoft, and Apple have rolled out educational initiatives

to help integrate digital literacy skills into schools. The collaboration between these schools and technology companies would introduce students to tools practiced in the industry, which would benefit them in meeting the techno requirements of today's economy (Future of Privacy Forum, 2020).

### **Advantages of a Digitally Literate Society**

There are many long-term advantages of integrating digital literacy in all education systems. The students are prepared for today's workplace, where often the competence either in technology or otherwise lies with internet and computer skills. According to a 2019 report by LinkedIn, most tech and non-tech new openings required "foundational skills" in digital literacy (LinkedIn, 2019). By incorporating digital literacy into curricula, educators can bridge skill gaps and train a workforce that is responsive to change.

Besides, digital literacy also fosters active participation in civic life, for example, access to information and expression of causes via the Internet as well as the use of digital spaces for democratic activities. It has been argued that a more enlightened citizenry that is provided with the critical analysis of digital media would be less vulnerable to the manipulative influence of false information and biases. According to Livingstone, "They need education about how information systems operate" (Livingstone, 2011).

### **Conclusion**

There is a great need to make digital literacy an important part of any student's curriculum to equip the youth for the battle in the high-tech world of advancements. While funding, resource distribution, and the digital divide are very real barriers to developing digital skills in students, strategic initiatives can nurture them. Embedding digital literacy across subjects, implementation of project-based learning, providing teacher training, developing and promoting digital citizenship, and collaborating with tech companies in their efforts can create the type of educational environment required for students to acquire competencies in digital literacy in a manner that prepares them not only for professional but also responsible citizenship. In this increasingly digital world, having a solid basis in digital literacy will become as basic as traditional literacy, ensuring that people have the knowledge to thrive in a high-tech future.



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# Effectiveness of Virtual Flipped Classroom in Teaching of Science at Secondary level

**Dr. A.V. Jayalakshmi\* and Bhavisha Solanki\*\***

## **Introduction**

Education plays a vital role in social, political and economic development of the nation. Education at the school forms the foundation an individual's life. The substantial contribution to the education at school is effective teaching there. It is important because teaching is based on helping student's progress from one level to another in a more sociable interactive environment and develops right approach for making them independent learners<sup>1</sup>. The conventional methods of teaching aimed at rote memorize than think and create. In traditional method of teaching researchers directs students through memorization and recitation techniques thereby not developing their critical thinking, problem solving and decision-making skills<sup>2</sup>. While the invent of technology and technology aided learning it has become easy to blend the technology into the conventional classroom teaching and learning. Utility of flipped classroom and virtual flipped classrooms are such blended modes of learning which ensures maximum classroom interaction and student involvement. In the pandemic situation like covid 19, when the researchers and students were forced to conduct teaching learning at home, virtual flipped classrooms (VFC) have helped learners to learn in an effective manner<sup>3,4,5</sup>.

The present study was an effort to find out the impact of VFC in grade 9, for learning science topics.

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Virtual Flipped Classroom (VFC) is an integration of two concepts: The Flipped Classroom and Virtual Classroom. In VFC, students learnt the prerequisite knowledge provided online by the researchers at their own pace, according to their schedule and then interactive activities done in the online classroom<sup>6</sup>. Now days, technology infuses classrooms with digital learning tools and its use supports both teaching and learning. VFC can be used to teach any subjects, but in forbidding situations like covid 19 it was a boon for the researchers and students.

Learning science in school aims at development of scientific ways of thinking, curiosity, critical thinking, creative thinking, problem solving abilities and being aware about things around them. Developing all these attributes requires demonstrations, activity based learning and active involvement in active self-learning. Virtual Flipped Classroom promotes student's scientific ways of thinking, problem solving abilities and active involvement in self-learning, as it involves student's discussion and group activities on the virtual mode. This study was conducted during the covid 19 pandemic conditions, to teach science through VFC for ensure maximum student involvement and self-learning.

### **Virtual Flipped Classroom (VFC) Versus Conventional Classroom**

The main aim of teaching learning process is to involve the students in the process to ensure maximum learning. Flipped Classroom enables self-learning through the learning materials sent online by the researchers, in the classroom discussion of the self-learned material is encouraged. However, when the face-to-face classes are not possible for the discussions of the self learnt material, Virtual Flipped Classroom can be used. The Virtual Flipped Classroom is an integration of two concepts: The Flipped Classroom and Virtual Classroom. It enables researchers to teach and guide students in applying the activities needed to achieve the best learning levels <sup>6</sup>. In Virtual Flipped Classroom researchers provides learning materials related to the content to be taught in the form of recorded videos, power point presentation, PDF documents, word files, links or blogs and other materials prior to the class. Students reads that material before the online class. In the online class researchers would start with a small discussion on the read material. After the discussion to ensure effective

learning students would be given activities like group work, quizzes, concept map making during the online classes.

A Flipped Classroom/ Virtual Flipped classroom works on certain principles like provision of opportunity for students to gain first exposure prior to class, provision of incentive for students to prepare for class, provision of a mechanism to assess students' understanding of the learnt concept, provision of clear connection between in-class and out-of-class activities, provision of clearly defined and well-structured flipped classroom activities, provision of adequate time for students to carry out their assignments, provision of facilitation and guidance that supports a learning community, provision of immediate feedback on group and project work and provision of technologies familiar and easy to access. In a conventional classroom the student learns from the learning material brought by the researchers or from the text book. Usually, the learning takes place in the classroom and no much prior self-learning is encouraged.

In a conventional classroom, the researchers had limited scope to develop the higher order thinking skills given by Benjamin Bloom and Krathwohl in 2005<sup>7</sup>. The higher order thinking skills include analysis, evaluation and creation. Since the learning resources and materials are limited in a conventional classroom and no much self-learning is ensured prior to the class the conventional classes usually help students to understand the concept or topic. While in a Virtual Flipped classroom the students come to the online class with a curiosity to know and discuss more based on their prior self-read material. It might help the students to develop attributes of analysis, self-evaluation and creation. Flipped classroom is a “pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter” (The Flipped Learning Network, 2014).

### **Summary of the Reviewed Research Studies**

When the motivation of students towards learning was compared with the achievement of the sample students after implementing an intervention program on teaching through VFC, findings indicated a significant increase in learning achievement and motivation before and after applying the VFC model<sup>6</sup>. Studies conducted on the

assessment done during flipped classroom were also reviewed. The studies conducted on VFC during Covid 19 pandemic to find the impact of VFC on the students' achievement showed that most of the students liked to give the synchronous computerized exams, most of the students liked the individual assessments done during VFC and collaborative activities done during VFC. Most of the students like the online class discussion conducted during the VFC<sup>4</sup>.

There were other studies which were conducted on the effectiveness of Flipped Classroom and Blended learning compared to the conventional classroom teaching...<sup>3,8,9,10,11</sup>. The findings of these studies showed that flipped classroom teaching improved the achievement of the students compared to the students taught in the conventional classrooms. The learners learnt how to acquire skill, knowledge, and showed a good attitude towards learning in a flipped classroom<sup>8</sup>. The e-learning approaches to teach in a blended mode was used and found that the most appropriate way to carry out Flipped teaching has been to create virtual classes on social media such as Facebook or Edmodo, which are also useful as a sort of on-line repository of lessons and as a discussion forum between the researchers<sup>12</sup>. The use of e learning approach was so effective that the students created their own digital products and post on the virtual platforms. Thus, the students enhanced their digital skills with flipped classroom.

A meta-analysis on the studies done on Effects of flipping the classroom on learning outcomes and satisfaction showed that teaching through flipped classroom gives effective learning outcomes and satisfaction to the learners when it is planned well<sup>13</sup>. A literature review of studies conducted on flipped classrooms showed that learning through flipped classrooms were effective<sup>5</sup>.

Studies related to effects of individual versus cooperative testing in a Flipped Classroom on academic achievement and motivation towards science showed that student's attitude of cooperative testing was quite satisfactory than the individual testing<sup>14</sup>. While majority of the students developed positive attitude towards learning in the flipped classroom. Another study showed that flipped classroom helped to boost learning interests, enhanced learning effectiveness, and the prompting of creativity resulting in a shift from passive learner to active learner<sup>15</sup>. Students had a positive perception about the flipped

classroom and felt they increased self-autonomy in learning after learning through flipped classroom<sup>3</sup>.

A research study on the combination of a Flipped Classroom Format and a Virtual Patient Case to Enhance Active Learning in a required Therapeutics Course showed that combination of a pre-class video lecture with an in- class virtual patient case was an effective active- learning strategy<sup>16</sup>. I was highlighted that by researches that there were difficulties in conducting the flipped classroom like limitations of space in the material attached to the platform, opening the link of the paid journal articles<sup>17</sup>.

Research design used in the reviewed studies were, Quasi-experimental research design<sup>6,10,16,18</sup>. Few Descriptive studies were conducted<sup>3,11</sup>. Meta-analysis of research studies were conducted<sup>12,13,19</sup>. Researchers used Questionnaire as tool in the different studies <sup>20,21</sup>. Achievement test and survey of students motivation/Qualitative and quantitative assessment techniques <sup>4,6,8,10,14</sup>. Most of the studies were conducted on higher education students <sup>3,4,6,8,9,21</sup>. Out of the reviewed studies only two studies were conducted on school students of secondary and higher secondary level <sup>10,13,14,15,19</sup>. Since few studies were done on virtual flipped classroom on the secondary classes the researchers were interested to take up this study.

### **Research Questions**

- 1) What would be the impact to Virtual Flipped mode of instructions, on the learning outcomes of secondary class students in science?
- 2) What is the reaction of the students after learning science through Virtual Flipped Classroom?

### **Objectives of the study**

- 1) To develop Virtual Flipped Classroom lessons in science for class IX.
- 2) To implement Virtual Flipped Classroom lessons in science for class IX.
- 3) To study the effectiveness of Virtual Flipped Classroom lessons in science in class IX.
- 4) To study the Reactions of class IX students about learning through Virtual Flipped Classroom lessons.

**Null Hypothesis** There will be no significant difference between the mean scores of experimental and control groups.

### **Delimitations of the study**

The present study was delimited to the Class IX students (Academic year 2021-22) of Baroda public school (GSEB), Vadodara. Present study was also delimited to the Science subject of class IX.

### **Design of the Study**

As the study was experimental in nature and no randomization was used for the selection of sample, the quasi-experimental research design was used. Pre-test post-test nonequivalent design was used in the proposed study. The researchers did the real time experiment for the present study, where it was difficult to use randomization for selection of sample for experimentation and thus the researchers took the sample purposively. This leads the researchers to take the help of quasi-experimental design. The design of the proposed study is presented as follow:

O1 X O2

O3 C O4

Where, O1 and O3 were the pre-tests O2 and O4 were the post-tests

X stands for experimental group C stands for control group

### **Variables**

The developed virtual flipped lessons were the independent variable of the study. The student's achievement in the topics taught through virtual flipped classroom was the dependent variable of the study.

### **Population**

All the class IX students (academic year 2021-22) of GSEB board schools of Gujarat were the population for the study.

### **Sample**

Sample was purposive in nature. All the students in class IX studying in the Baroda public school Baroda, Vadodara formed the experimental



group for the study and all the students studying in class IX of the SSV-2 School, Vadodara was forming the control group for the study.

## **Tools and techniques**

### ***A. Pre-test and post-test as an Achievement test:***

Pretest were made by the researchers to test the knowledge about the selected chapters of science in class 9th and same would be considered for the posttest also. Objective type (multiple choice questions) and subjective type of questions were prepared. Questions asked were of different level of learning. (i.e., Knowledge, understanding, application etc.). All the questions were framed from the content selected for the study. The Test of science comprises total 40 questions of 1 and 2 marks were there in the achievement test. 20 Objective type of questions carried 1mark each and 20 subjective types of questions carried 2 marks each. So, the test was of 60 marks. Content validity from the experts was ensured.

### **B. Reaction scale:**

Reaction scale was prepared by researchers comprising the area concerned with the implementation of virtual flipped classroom approach. It was five-point Liker scale. In order to get the reactions of the students about the Flipped Classroom Approach, the reaction scale was used. The reaction scale consisted 30 close ended items. The scores were calculated based on SA=5, A=4, UD=3, D=2 and SD=1

## **Phases of the study**

### ***Phase 1: Preparation of the pre classroom instructional materials***

Researchers has prepared Videos by using some applications also has provided link for the 3D videos related to content which help students to make their concept clear. As science comprises some anatomical concepts. PDF Material & PPTs were prepared by researchers which involved many figures, concept maps, highlighted and important points in easy language as per the level of learning of students.

Students were to study by themselves, using video lessons and other E-learning materials prepared by the researchers before coming to the virtual class. WhatsApp was used as a medium for deliver self-

learning materials to the students as all students familiar about it and it also support free voice and video calls so researchers and students can stay in touch, in outside stipulated study periods.

### ***Phase: 2 Administration of Pre-test***

Pre-test comprises 40 questions of 60 marks were developed by the researcher from GSEB-Class IX text book of Science, for selected Science chapters. All the students of class IX from SSV-2 school were assigned as Control group (Traditional instruction) and all the students of class IX from BPS-2 School were assigned as Experimental (Virtual Flipped Instruction) group. The researchers conducted a pre-test for both the experimental and control group for make them equivalent for conducting post-test.

### ***Phase: 3 Implementation of Virtual Flipped Classroom approach***

Various activities carried out during the class Interaction of the students with researchers occurs on WhatsApp for delivering self-learning materials before the class and on the Zoom & NLP (Next learning app) for classroom interactions. In-class sessions, students participated in more interactive and higher order activities such as problem solving, discussions, and debates. Researchers facilitated the classroom interaction and helped in accelerating the learning process. Researchers had also given some demonstrations to the students on structure and working of microscope, Osmosis & diffusion (Hypotonic, hypertonic & isotonic solutions) to provide practical knowledge to the students. Researchers also showed real specimens of plants and animals to provide them better and clear understanding of the concept of physiology and characteristics. After completion of each topic researchers had conducted the quiz in online platform Quizizz for the purpose of evaluating the students' knowledge and learning from the particular session. Virtual Flipped classroom strategy helped in providing differentiated instruction to students.

### ***Implementation schedule of virtual flipped classroom approach for both the chapters***

Researchers had conducted Virtual flipped classroom lectures in different time interval according to the time table of the school. Researchers had conducted various VFC lectures as follows for two

months for the chapters The Fundamental Unit of Life & Diversity Living Organisms. Pre-test was conducted on the first day. After that the students were given pre- instructional materials in the form of Pdfs, Videos & PPTs on the WhatsApp group on regular basis before the VFC class. During VFC class, Researchers taught them different topics through different medias & activities using discussion method, Demonstration method, through animated videos, Concept mapping, Online quizzes, some Creative activities & many more. The Experimental group was taught in a virtual flipped classroom on zoom plat form. The control group students were taught by lecture method on the zoom platform. After the students read the self- learning material the researchers interacted with students, discussed the content, and clarified the students' doubts. At the end of each class, formative assessment in form of quizzes and puzzles were also taken.

#### ***Phase:4 Implementation of the Post-test and reaction scale***

After the two months of intervention, the Post-test was administered on the students of both control and experimental group. Researchers also implemented the reaction scale on the students to get opinion and reactions of the students on the Virtual flipped classroom approach.

Data analysis was done using Mann Whitney U- test for testing the hypothesis. The responses to reaction scale was analyzed using frequency and percentage. The U-value and z-value were found to be 138 and 2.8169 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis ( $H_0$ ) of z, for  $z \leq 5.32$ , the two tailed probability was found to be 0.00003 which was lesser than the significance level ( $\alpha$ ) i.e., 0.01. Hence the null hypothesis was rejected.

#### **Findings of the study**

The intervention program of teaching science using VFC was effective compared to the conventional teaching as the null hypothesis was rejected.

Majority of students (95%) found Flipped Classroom Approach as an innovative and interesting approach of teaching Majority of the students (90.47%) agreed that they will prefer to studying other concepts of science through flipped Classroom

Majority of the students (95.23%) agreed that they enjoyed watching videos and getting prepared for the class in advance. Few of the students (33.32%) found flipped learning to be time-consuming. Most of the students (85.71%) disagreed on the statement that activities done in class were monotonous or repeated.

Most of the students (95.23%) liked to work in groups while in online class.

Majority of the students (95.23%) liked to work in groups while in class.

Majority of the students (90.47%) agreed that Virtual Flipped Classroom Approach enhanced the Classroom teaching-learning process.

All the students (100%) liked to play quiz at the end of completion of each topic.

Majority of the students (90%) agreed that demonstration shown by Researchers was helped them in concept clarity.

Majority of the students (95%) agreed that specimens shown by Researchers during VFC was helped them to develop proper understanding of the characteristics of an organism.

## **Conclusion**

The above findings show that VFC was found effective in teaching science at grade IX, however there were some challenges too during its implementation. In the flipped approach certain students faced technical issues as their mobile have poor network connection. Few students were more comfortable with lecture method and not keen on adopting Virtual Flipped Approach. Some students also found flipped learning burdensome as students need to spend more time at home watching videos, which does not happen in conventional classroom. Despite all the challenges the students enjoyed learning through VFC, in the pandemic time of Covid 19 that is a great achievement for the researchers.

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# The Influence of Green Banking Practices on Environmental Performance: A Study of Indian Banks and the Role of Green Financing

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## Introduction

The relentless quest for economic expansion and the maximization of wealth has frequently been pursued at the expense of environmental sustainability, culminating in pressing global challenges such as climate change, ecological degradation, and pervasive pollution. Climate change, in particular, has emerged as a formidable global challenge, with its impacts being felt through extreme weather events, rising sea levels, and severe disruptions to ecosystems and human livelihoods (Nawaz et al., 2020). These global issues necessitate urgent intervention, prompting governments, financial institutions, and corporations to seek solutions that balance economic development with environmental preservation.

Green finance has become a cornerstone of these efforts, encompassing financial initiatives aimed at fostering environmental sustainability. It includes mechanisms like green bonds, green banking, and other sustainable financing instruments that directly support projects aimed at reducing environmental degradation and mitigating climate change (Ngwenya & Simatele, 2020). Recognizing its importance, international institutions have emphasized green finance as a critical driver for achieving sustainable development goals (SDGs) and transitioning to low carbon economies (Zheng et al., 2021).

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As a key component of green finance, green banking has gained attention for its potential to integrate environmental considerations into financial practices. Green banking involves promoting environmentally sustainable banking activities, reducing the carbon footprint of financial institutions, and encouraging investments in green projects (Sarma & Roy, 2020). Scholars highlight that green banking not only aligns with corporate social responsibility but also enhances financial institutions' long-term resilience and sustainability performance (Hossain, 2018; Liue et al., 2020).

In developing economies, GB is essential for tackling distinctive environmental and economic challenges. Countries like India, India, and Pakistan have adopted green banking policies to align with global sustainability standards, recognizing the sector's potential to drive both economic growth and environmental stewardship (Zheng et al., 2021; Rehman et al., 2021). In India, private commercial banks have played a pivotal role in advancing green finance, actively supporting the nation's initiatives to address climate change and foster sustainable development. (Bose et. al., 2021; Akhter et al., 2018).

India, as an emerging economy, is particularly well-positioned to leverage green banking to tackle its pressing environmental challenges. Rapid industrialization and urbanization have exacerbated issues like air and water pollution, deforestation, and extreme weather events, making it imperative for the financial sector to adopt environmentally responsible practices (Srivastava, 2016). Indian banks are increasingly integrating green banking practices, such as financing renewable energy projects, adopting digital banking to reduce resource usage, and encouraging green loans for environmentally friendly businesses (Vidyakala, 2020; Yadav & Pathak, 2013).

Although green banking is increasingly embraced, its influence on environmental performance and its role in advancing green financing within India remain insufficiently examined in academic research. This lacuna highlights the necessity for in-depth investigations to assess the influence of green banking approaches on the sustainability act of financial institutions & their contribution to achieving environmental goals (Zhang et al., 2022). Existing empirical evidence indicates that, despite its potential to substantially improve environmental outcomes, the widespread adoption of green banking continues to face significant impediments, including regulatory constraints, limited awareness, and resource shortages (Raihan et al., 2019; Islam & Das, 2013).



This research aims to fill the gaps by studying the connection between green banking practices and the environmental performance of banks in India. It explores the role of green financing as a mediator and analyses the views of banking professionals on how effective these practices are. In contributing to the evolving dialogue on sustainable finance, the study offers pragmatic insights for policymakers, financial institutions, and scholars dedicated to advancing sustainable development within India and on a global scale.

## **Literature Review**

Legitimacy theory emphasizes the role of social acceptance in ensuring the long-term sustainability of an organization. This theory suggests that voluntary social and environmental disclosures by corporations are a means to secure, maintain, or restore their legitimacy within society (Suchman, 1995). In the Indian context, legitimacy theory highlights the importance of aligning banking practices with societal expectations, particularly through corporate social responsibility (CSR) initiatives, green banking, and environmentally conscious financing. These efforts contribute to India's sustainable development goals, ensuring alignment with regulatory norms set by the Reserve Bank of India (RBI).

## **Green Banking (GB): Concept and Global Relevance**

GB, which gained significance in the 1980s with the Dutch Triodos Bank's "Green Fund," has grown into a global phenomenon integrating environmental sustainability into financial practices.

The concept aims to combine economic growth with environmental protection and social fairness. In India, it has garnered significant momentum as financial institutions increasingly acknowledge their responsibility in combating climate change and advancing sustainable development. Indian banks have embraced green banking initiatives, including funding renewable energy projects, minimizing carbon emissions, and implementing environmentally sustainable operational practices.

## **Green Banking in India**

The RBI has played a crucial role in promoting GB in India. In 2012, the RBI issued guidelines encouraging banks to integrate sustainability into their operations. Indian banks were advised to adopt practices

such as developing environmental policies, assessing environmental risks in lending, and publishing sustainability reports. Initiatives like the Indian Green Building Council's (IGBC) certification for green branches and investments in renewable energy projects exemplify India's commitment to green banking. The implementation process often follows a phased approach, starting with policy formulation and internal capacity-building, followed by integrating environmental concerns into lending practices, and finally, innovating green financial products such as green bonds and loans for sustainable projects.

## **Green Financing and Environmental Performance in Indian Banks**

Green finance in India focuses on funding projects that yield economic benefits while contributing to environmental sustainability. Indian banks have financed diverse projects, including solar and wind energy installations, waste management systems, and energy-efficient building construction. These efforts align with India's National Action Plan on Climate Change (NAPCC) and its commitment to achieving the United Nations Sustainable Development Goals (SDGs).

Studies have shown a positive correlation between green banking practices and improved environmental performance in Indian banks. For instance, reducing paper usage, investing in energy-efficient technologies, and financing eco-friendly projects have significantly lowered the environmental impact of banks' operations. Rehman et al. (2021) highlighted that Indian banks adopting green policies demonstrate enhanced sustainability performance and improved stakeholder trust.

## **Green Banking Practices and Challenges in India**

Indian banks face unique challenges in implementing green banking practices, such as low public awareness, regulatory hurdles, and initial high costs associated with green projects. However, initiatives like issuing green bonds, incentivizing eco-friendly businesses, and promoting financial literacy about sustainability have gained momentum. Several Indian banks, such as SBI, ICICI Bank, and Yes Bank, have led the charge by actively financing renewable energy projects and adopting green technologies.

Furthermore, empirical research reveals that green banking practices in India exert a profound influence on both availability of

the green financing and the enhancement of environmental performance. For instance:

- Employee-related practices, such as environmental training, enhance internal capacity for green initiatives.
- Daily operation practices, such as energy-efficient office operations and paperless banking, reduce the banks' carbon footprint.
- Policy-related practices, including stringent environmental risk assessments for loans, ensure compliance with environmental standards.

## Hypotheses

Drawing from the insights garnered through the literature review, the following hypotheses are formulated within the Indian context:

H1: Employee-centric green banking practices have a significant impact on the sources of green financing in Indian banks.

H2: Operational practices associated with green banking significantly affect the sources of green financing in Indian banks.

H3: Customer-focused green banking initiatives significantly influence the sources of green financing in Indian banks.

H4: Policy-driven green banking practices significantly shape the sources of green financing in Indian banks.

H5: Sources of green financing play a significant role in enhancing the environmental performance of Indian banks.

H6: Employee-related green banking practices exert a significant influence on the environmental performance of Indian banks.

H7: Operational practices in green banking significantly impact the environmental performance of Indian banks.

H8: Customer-related green banking practices significantly affect the environmental performance of Indian banks.

H9: Policy-related green banking practices have a significant effect on the environmental performance of Indian banks.

Green banking in India has emerged as a vital tool for balancing economic growth with environmental conservation. By adopting green banking practices, Indian financial institutions can play a significant role in achieving the nation's sustainability goals while addressing global climate challenges. Future research should delve into innovative approaches to surmount implementation challenges and accelerate the nationwide adoption of green banking practices.

## **Research Methodology**

This exploratory study uses empirical data to examine the relationship between Green Banking (GB) approaches, sources of green financing, and the banking's environmental impact.

### **Instrument Development**

Research instrument used in this study was a structured questionnaire designed to collect data aligned with the research objectives and the proposed model. Table 2 provides details of the questionnaire items, which were developed based on prior GB-related studies.

#### **The questionnaire was divided into 4 main sections:**

1. **Demographic Information:** Included questions about respondents' age, gender, education level, job responsibilities, and work experience.
2. **Green Banking Practices:** Measured practices like policy adherence, operational efficiency, and employee training on sustainability.
3. **Channels of Green Financing:** Included factors to assess funding mechanisms for environmentally friendly projects.
4. **Environmental Performance:** Measured the impact of green banking initiatives on environmental sustainability.

The preliminary measurement items for constructs such as "Bank Employee-Related Practices (BERP)", "Bank Operations-Related Practices (BORP)", "Bank Customer-Related Practices (BCRP)", and "Bank Policy-Related Practices (BPRP)" were meticulously adapted from extant scholarly works. Similarly, the items designed to evaluate green financing channels and environmental performance were meticulously derived from well-regarded studies (refer to Table 1).

To validate the questionnaire, a pilot study was executed involving 40 randomly selected employees from six prominent Pvt. sector banks in India. Following the "exploratory factor analysis (EFA)" conducted during pilot phase, three statements were expunged due to suboptimal factor loadings ( $<0.5$ ). The final instrument comprised 19 items, each measured on a 5-point Likert scale, with responses stretching from 1 (Strongly Disagree) to 5 (Strongly Agree).

**Table 1: Scalable Items**

<b>Variables</b>	<b>Items</b>	<b>Descriptions</b>
Banks' employee-related practices	BERP1	Provision of environment-related training and education
	BERP2	Sustainable performance evaluation system
	BERP3	Green reward facilities
Banks' operation-related practices	BORP1	Reduction of paper usages
	BORP2	Introduction of energy-efficient equipment, such as ATMs and online banking
	BORP3	Provision of eco-friendly banking services
Banks' customer-related practices	BCRP1	Provision of loans for eco-friendly projects
	BCRP2	Provision of online banking services (i.e., online bills payment, acceptance of remote deposit and provision of e-statements)
	BCRP3	Assessment of clients' environmental risks
Banks' policy-related practices	BPRP1	Establishment of more green branches
	BPRP2	Implementation of a green policy
	BPRP3	Promotion of green partnerships among suppliers and investors
Green financing	GF1	Increase in the amount invested in eco-friendly projects
	GF2	Investment of more resources on recycling and recyclable products
	GF3	Increase in investment on waste management and green brick manufacturing
	GF4	Increase in the amount invested on energy efficiency projects *
	GF5	Increase in the amount invested on green industry development *
	GF6	Increase in the amount invested on green marketing and others *
Banks environmental performance	BEP1	Reduction of energy consumption from banking activities
	BEP2	Minimization of carbon emissions from banking activities
	BEP3	Improving banks' compliance with environmental standards
	BEP4	Provision of training on environmental protection and energy savings to the staff

### 3.2. Sampling and Data Collection

This study focused on private commercial banks (PCBs) in India, given their significant contribution to financing environmentally sustainable projects and promoting green banking initiatives. India has over 30 PCBs, regulated by the Reserve Bank of India (RBI), which have played a critical role in adopting green banking practices.

Primary data was gathered from employees of selected pvt. commercial banks (PCBs) through a non-probability sampling methodology. Between January and March 2023, 370 questionnaires were distributed, and 345 completed responses were received, yielding an impressive response rate of 93.24%. The respondents consisted of individuals engaged in policy formulation, sustainability efforts, and operational functions within the banks.

### Data Analysis Strategy

The study employed a combination of IBM SPSS (Version 24.0) and AMOS (Version 25.0) for data analysis. Key analytical techniques included:

Exploratory Factor Analysis (EFA) was employed to uncover and validate the underlying structure of the research constructs. This process encompassed data screening, eigenvalue extraction, and factor rotation, ensuring that the constructs used in the study were both valid and reliable.

Confirmatory Factor Analysis (CFA) was then applied to assess the reliability and validity of the measurement model. This was achieved by evaluating standardized coefficients, critical ratios, and model fit indices.

Structural Equation Modeling (SEM) was utilized to test the proposed relationships between constructs. Following the two-step approach recommended by Hair et al. (2016), this process included:

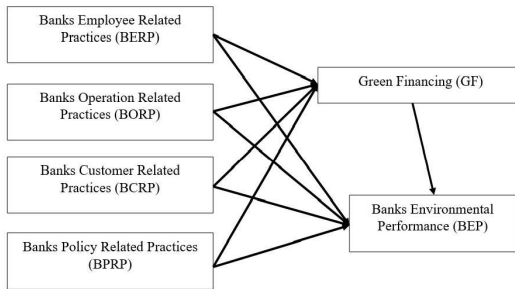
1. Assessing the CFA measurement model,
2. Evaluating the structural relationships among latent variables within the SEM framework.

The reliability of the constructs was assessed through Cronbach's Alpha (CA) and Composite Reliability (CR). Convergent validity was tested using Average Variance Extracted (AVE) and standardized factor loadings, while discriminant validity was assessed using the Fornell-Larcker criterion and the Heterotrait-Monotrait ratio (HTMT). To evaluate the overall model fit, several indices were utilized, including the chi-square/degrees of freedom ratio ( $\chi^2/df$ ), Goodness-of-Fit Index (GFI), Comparative Fit Index (CFI), Root Mean Square Error of Approximation

(RMSEA), and Tucker-Lewis Index (TLI), in accordance with established recommendations from prior studies.

## Conceptual Model

The proposed conceptual framework for this study is depicted in Figure 1, highlighting the interrelationships between Green Banking approaches, channels of green financing, and environmental impact.



*Fig 1: Conceptual Model*

## Findings

The empirical findings section starts with in-depth analysis of the demographic characteristics of the respondents, providing insights into their characteristics and background. This is followed by an exploration of the descriptive statistics, offering a summary of the key data points. Next, the section evaluates the reliability and validity of the constructs used in the study to ensure the robustness of the measurements. The measurement model is then assessed, highlighting how well the theoretical constructs align with the observed data. SEM is applied to test the relationships between the variables, with a thorough discussion of the model fit and significance levels. Finally, the section presents the outcomes of the research hypotheses, interpreting the findings in the context of the study's objectives and drawing conclusions about the implications for theory and practice.

## Respondents' Demographic and Professional Characteristics

The table 2 presents a breakdown of respondents' demographic and professional characteristics, detailing variables.

Regarding gender, majority of respondents were male (68.01%), with females comprising 31.99% of the sample. In terms of age, most respondents were between the ages of 26 and 35 years (45.03%),

followed by those aged 36 to 45 years (31.99%). A smaller percentage of respondents were in the 18–25 years (17.08%) and 46 years and above (5.90%) age groups.

Educationally, a significant portion of respondents held postgraduate qualifications (61.49%), while 23.91% were undergraduates, 4.66% had a PhD, and 9.94% listed other qualifications.

Lastly, regarding work experience, the majority of respondents had between 1 to 4 years of experience (55.90%), followed by those with less than 1 year of experience (32.60%). A smaller group (11.50%) had over 4 years of experience. This demographic profile reflects a relatively young and diverse workforce in terms of gender, age, and education, with significant representation from junior and entry-level staff, as well as those with limited to moderate work experience.

**Table 2: Demographic Profile**

<b>Variable</b>	<b>Items</b>	<b>Frequency (N)</b>	<b>Percent (%)</b>
<b>Gender</b>	Male	219	68.01
	Female	103	31.99
<b>Age</b>	18–25 years	55	17.08
	26–35 years	145	45.03
	36–45 years	103	31.99
	46 years and above	19	5.90
<b>Educational</b>	Undergraduate	77	23.91
<b>Qualification</b>	Postgraduate	198	61.49
	PhD	15	4.66
	Others	32	9.94
<b>Job Position</b>	Officers	59	18.32
	Principal Officers	75	23.29
	Senior Principal Officers	47	14.60
	Junior Officers	82	25.47
	Banking Trainee	42	13.04
	Manager	17	5.27
<b>Working Experience</b>	Less than 1 year	105	32.60
	1 to 4 years	180	55.90
	Above 4 years	37	11.50

Descriptive Statistics (EFA)



**Table 3: Exploratory Factor Analysis**

Variables	Items	1	2	3	4	5	6
<b>Banks' employee-related practices</b>	BERP1	0.862					
	BERP2	0.864					
	BERP3	0.870					
<b>Banks' operation-related practices</b>	BORP1		0.862				
	BORP2		0.791				
	BORP3		0.776				
<b>Banks' customer-related practices</b>	BCRP1			0.855			
	BCRP2			0.830			
	BCRP3			0.750			
<b>Banks' policy-related practices</b>	BPRP1				0.843		
	BPRP2				0.867		
	BPRP3				0.761		
<b>Green financing</b>	GF1					0.868	
	GF2					0.886	
	GF3					0.818	
<b>Banks' environmental performance</b>	BEP1						0.693
	BEP2						0.744
	BEP3						0.823
	BEP4						0.801
<b>Eigenvalue</b>		2.257	1.970	1.981	2.041	2.207	2.353
<b>Variance explained</b>						<b>63.301%</b>	
<b>KMO</b>						<b>0.895</b>	
<b>Bartlett's test of sphericity</b>						<b>p &lt; 0.000</b>	

Table 3 delineates the outcomes of the Exploratory Factor Analysis (EFA) executed using Principal Component Analysis (PCA).

The objective of the EFA was to assess the appropriateness of the data in elucidating six distinct dimensions, derived from eigenvalues, which encompass four facets of green banking practices, green financing, and the environmental performance of the banks within the sample. To evaluate the suitability of the data for factor analysis, the correlation matrix was meticulously examined, revealing sufficient inter-correlations among the variables. The determination of the number of factors to retain was based on the eigenvalue criterion, with Kaiser's criterion applied, yielding a Kaiser-Meyer-Olkin (KMO) value of 0.895, thereby affirming the data's appropriateness for analysis. Additionally, Bartlett's Test of Sphericity yielded a highly significant p-value of <0.000, confirming the robustness of the correlation matrix. The communalities for the 19 items ranged from 0.693 to 0.886, suggesting that the six-factor model accounted for a substantial cumulative variance of 63.301%. Following the EFA, three items (GF4, GF5, and GF6) were excluded due to their low factor loadings.

To ensure the internal consistency of each dimension, coefficient alpha values were computed, ranging from 0.735 to 0.819, thus attesting to the reliability and validity of the instrument employed in this study. For added rigor, the study also calculated the Heterotrait-Monotrait Ratio (HTMT), given its superior performance over the Fornell-Larcker criterion in various contexts (Henseler et al., 2015). The HTMT values, as presented in Table 4, were all below the thresholds of 0.85 or 0.90, indicating no concerns regarding discriminant validity (Gold et al., 2001; Henseler et al., 2015). Based on these results, it can be concluded that discriminant validity is firmly established and considered acceptable among the variables analyzed (Hair et al., 2017; Sarstedt et al., 2014).

**Table 4: Discriminant validity**

Variables	BERP	BORP	BCRP	BPRP	GF	BEP
BERP	1					
BORP	0.581	1				
BCRP	0.645	0.774	1			
BPRP	0.652	0.679	0.659	1		
GF	0.653	0.653	0.728	0.683	1	
BEP	0.677	0.769	0.837	0.754	0.743	1

### Measurement Model and Structural Model

The model fit indices for both the **Measurement Model** and **Structural Model** demonstrate a good fit to the data, as they meet or exceed the commonly accepted cut-off criteria. The  $\chi^2/df$ , **p-value**, **GFI**, **SRMR**, **RMSEA**, **CFI**, **NFI**, **IFI**, and **TLI** values all indicate that the models are statistically significant and provide an adequate representation of the data. Specifically, the values for  $\chi^2/df$ , **SRMR**, and **RMSEA** are within the acceptable range, and the **CFI**, **NFI**, **IFI**, and **TLI** values exceed the threshold of 0.900, confirming the reliability and validity of the models. These results suggest that both models fit well and effectively represent the relationships in the study.

The results presented in Table 6 illustrate the measurement model for various constructs associated with banking practices and environmental impact. The BERP) consisting of items such as BERP1, BERP2, and BERP3, exhibit strong and statistically significant factor

loadings (ranging from 0.762 to 0.826), accompanied by CR values of 14.347 and 13.993, signifying robust associations with the latent construct.

The Cronbach's alpha for this construct is 0.760, indicating solid internal consistency. Likewise, the Banks' Operation-Related Practices (BORP), which include items like BORP1, BORP2, and BORP3, display moderately high factor loadings (from 0.551 to 0.777) along with significant CR values (ranging from 7.943 to 10.978). The Cronbach's alpha of 0.735 demonstrates satisfactory reliability for this construct.

**Table 5: Model Fit Indices**

Model Fit Indices	Measurement Model	Structural Model	Cut-Off Criteria
$\chi^2/df$	2.186	2.324	<0.05
p-value	0.000	0.000	Significant at p < 0.001
GFI	0.920	0.914	>0.900
SRMR	0.027	0.029	<0.08
RMSEA	0.061	0.064	<0.08
CFI	0.943	0.934	>0.900
NFI	0.900	0.891	>0.900
IFI	0.943	0.935	>0.900
TLI	0.927	0.918	>0.900

For Banks' Customer-Related Practices (BCRP), the factor loadings for BCRP1, BCRP2, and BCRP3 range from 0.638 to 0.758, all showing statistical significance (CR values from 10.514 to 11.829). The Cronbach's alpha value of 0.742 further confirms the internal consistency of this construct. Banks' Policy-Related Practices (BPRP), represented by BPRP1, BPRP2, and BPRP3, also show strong factor loadings, especially for BPRP2 (0.829), and the Cronbach's alpha of 0.765 indicates high reliability.

Regarding GF, the items GF1, GF2, and GF3 exhibit significant factor loadings (stretching from 0.720 to 0.781) and high CR values, particularly GF1 with a CR of 14.514, suggesting a strong link to the latent construct. The Cronbach's alpha of 0.819 indicates excellent reliability. Lastly, Banks' Environmental Performance (BEP), consisting of BEP1, BEP2, BEP3, and BEP4, shows significant

loadings stretching from 0.593 to 0.676, with CR values from 9.287 to 10.337. The Cronbach's alpha of 0.760 further confirms the construct's reliability.

In conclusion, all constructs in the model exhibit significant factor loadings, with Cronbach's alpha values stretching from 0.735 to 0.819, confirming the reliability and validity of the measurement model. The results suggest that the items reliably measure the intended c related to banking practices and environmental performance.

**Table 6: Model Estimates and CFA**

Variable	Construct	Item No	SRW	CR	p-Value	CA ( $\alpha$ )
Banks' employee-related practices	BERP	BERP1	0.781	14.347	***	0.760
		BERP3	0.826	*		
		BERP2	0.762	13.993	***	
Banks' operation-related practices	BORP	BORP3	0.777	*		0.735
		BORP2	0.551	7.943	***	
		BORP1	0.672	10.978	***	
Banks' customer-related practices	BCRP	BCRP3	0.638	10.514	***	0.742
		BCRP2	0.722	11.829	***	
		BCRP1	0.758	*		
Banks' policy-related practices	BPRP	BPRP3	0.613	10.536	***	0.765
		BPRP2	0.829	*		
		BPRP1	0.737	12.673	***	
Green financing	GF	GF3	0.750	12.052	***	0.819
		GF2	0.781	*		
		GF1	0.720	14.514	***	
Banks' environmental performance	BEP	BEP3	0.676	10.337	***	0.760
		BEP2	0.667	*		
		BEP1	0.593	9.287	***	
		BEP4	0.662	10.146	***	

## Notes:

- **SRW:** Standardized Regression Weight
- **CR:** Critical Ratio
- **CA ( $\alpha$ ):** Cronbach's Alpha
- **p-Value** significance levels:
  - \*\*\*:  $p < 0.05$
  - \*: Unstandardized regression weights anticipated as 1

## Research Hypotheses Testing

The results of the hypothesis testing reveal that several paths exhibit significant relationships, while others do not. Hypothesis 1 (H1), which explores the connection between Banks' Employee-Related Practices (BERP) and GF, demonstrates a positive and statistically significant standardized estimate of 0.275, indicating that employee-related practices positively influence green financing. As such, this hypothesis is accepted at the 1% significance level. Similarly, Hypothesis 2 (H2), which examines the relationship between Banks' Operation Related Practices (BORP) and GF, shows a stronger positive effect (0.318), significant at the 5% level, leading to the acceptance of the hypothesis.

In contrast, Hypothesis 3 (H3), which posits a relationship between Banks' Customer-Related Practices (BCRP) and GF, yields a weaker and non-significant estimate of 0.170, indicating no statistical support for the relationship, and consequently, this hypothesis is rejected. Hypothesis 4 (H4), investigating the path from Banks' Policy-Related Practices (BPRP) to GF, reveals a positive and significant estimate of 0.252, confirming that policy-related practices significantly impact GF, and thus, hypothesis is accepted at the 1% significance level. Hypothesis 5 (H5), which examines the effect of GF on Banks' Environmental Performance (BEP), reveals a positive but smaller estimate (0.183), significant at the 10% level, suggesting a moderate effect. Therefore, this hypothesis is accepted. On the other hand, Hypothesis 6 (H6), which investigates the association between BERP and BEP, shows a negligible and non-significant effect (0.043), indicating no significant association, leading to the rejection of this hypothesis.

Hypothesis 7 (H7), which explores the link between Banks' Operation-Related Practices (BORP) and Banks' Environmental

Performance (BEP), demonstrates a significant positive estimate (0.335), suggesting that operational practices significantly influence environmental performance. Consequently, this hypothesis is accepted at the 5% significance level. Hypothesis 8 (H8), examining the association between BCRP and BEP, presents a non-significant estimate (0.219), leading to the rejection of this hypothesis. Finally, Hypothesis 9 (H9), which investigates the association between BPRP and BEP, shows a positive and significant estimate (0.204), resulting in the acceptance of the hypothesis at the 5% significance level.

In summary, the findings suggest that certain banking practices, particularly those related to operations and policy, exert a substantial positive influence on both green financing and environmental performance. In contrast, customer-related and employee-related practices do not demonstrate significant effects in the model.

**Table 7: Test of Research Hypotheses**

Hypotheses	Path	Standardized Estimate	Remark
H1	BERP → GF	0.275	*** accepted
H2	BORP → GF	0.318	** accepted
H3	BCRP → GF	0.170	not accepted
H4	BPRP → GF	0.252	*** accepted
H5	GF → BEP	0.183	* Accepted
H6	BERP → BEP	0.043	not accepted
H7	BORP → BEP	0.335	** accepted
H8	BCRP → BEP	0.219	not accepted
H9	BPRP → BEP	0.204	** accepted

Note: \*  $p < 0.10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ .

## Discussions

The results of hypotheses testing provide valuable insights into impact of various banking operations on **GF** and **BEP**. The findings demonstrate that operational and policy-related practices in banks has a more significant influence on both green financing & environmental performance, whereas customer-related & employee-related practices seem to have less of a direct effect. This pattern aligns with prior research, emphasizing the critical role of operational and policy

strategies in promoting sustainable practices within financial institutions.

**Hypothesis 1 (H1)** found that **BERP** significantly influence **GF**, with a standardized estimate of 0.275 ( $p < 0.01$ ), supporting the notion that employee engagement and organizational culture can foster a shift toward sustainability in banking operations (Thompson et al., 2020). This result aligns with previous findings that show employee-related practices, such as training and awareness programs, can directly contribute to an organization's commitment to green initiatives (Langenberg et al., 2017).

**Hypothesis 2 (H2)** also demonstrates a strong and positive association between **BORP** and **GF**, with a standardized estimate of 0.318 ( $p < 0.05$ ), indicating that operational efficiency and resource management are key drivers of green financing. This agree with the findings given by Smith et. al. (2019), who argue that banks with well-structured operational systems, including energy efficient practices and eco-friendly technologies, are better positioned to invest in green projects and initiatives. The results highlight the importance of adopting environmentally conscious operations to facilitate financial support for green projects.

In contrast, **Hypothesis 3 (H3)** did not find a significant association between **BCRP** and **GF**, with a non-significant standardized estimate of 0.170. This finding contrasts with the results of previous studies, which suggest that customer demand for green products and services often encourages banks to enhance their environmental strategies (Homburg & Jozi, 2021). The lack of significance may be due to the fact that customer-related practices, such as offering eco-friendly banking products, might not have been perceived as directly impactful on financing green projects in the context of this study.

**Hypothesis 4 (H4)**, on the other hand, showed a significant positive effect of **BPRP** on **GF** (standardized estimate = 0.252,  $p < 0.01$ ). This finding is consistent with the work of Nguyen and Tran (2022), who argue that clear, environmentally focused policies and frameworks encourage banks to allocate financial resources toward sustainable and green projects. Moreover, regulatory pressures and policies can directly incentivize banks to inculcate sustainability into core business strategies (Graham et al., 2020).

In **Hypothesis 5 (H5)**, the association between **GF** and **BEP** was found to be significant, with a standardized estimate of 0.183 ( $p <$

0.10). This suggests that banks that engage in green financing are more likely to improve their environmental performance. This agrees with the findings of Zhou et al. (2021), who argue that investing in green financing not only benefits external sustainability projects but also enhances the bank's internal environmental strategies.

However, the relatively small effect size suggests that other factors may also contribute to environmental performance, beyond financing initiatives alone.

**Hypothesis 6 (H6)**, which examines the effect of **BERP** on **BEP**, was not supported. The nonsignificant result (0.043) aligns with the findings of previous studies, which argue that while employee-related practices contribute to organizational culture, their direct influence on environmental performance may not always be immediately apparent (Mousa et al., 2018). This suggests that, while important, employee-related practices might need to be supplemented with more direct operational or policy-related initiatives to have a meaningful impact on environmental outcomes.

**Hypothesis 7 (H7)** showed a positive and significant impact of **BORP** on **BEP** (standardized estimate = 0.335,  $p < 0.05$ ), highlighting the importance of operational efficiency in achieving sustainability goals. This is consistent with the findings of Vassileva and Vassilev (2020), who argue that banks with efficient operations, particularly those that focus on reducing energy consumption and waste, tend to perform better in environmental sustainability metrics.

**Hypothesis 8 (H8)**, however, found no significant association between **BCRP** and **BEP**. This result suggests that while customer engagement is important for shaping consumer demand, it may not be as strongly linked to internal environmental performance, as indicated by previous studies (Carter & Easton, 2022).

Finally, **Hypothesis 9 (H9)** revealed a significant association between **BPRP** and **BEP** (standardized estimate = 0.204,  $p < 0.05$ ), supporting the view that policies promoting environmental sustainability directly influence a bank's environmental performance. This finding is in line with the conclusions of Lee et al. (2021), who emphasize that banks with robust environmental policies are better able to improve their environmental activities through the development of sustainable practices & adherence to regulations.



## Conclusion

The current study explored the impact of various banking operation on **GF** and **BEP**. The findings offer valuable insights into the significant roles that **operational**, **policy-related**, and **ERP** play in shaping the sustainable initiatives of banks. The results indicate that operational practices and policy-related strategies are crucial in driving both green financing and enhancing environmental performance. In contrast, customer related and employee-related practices were found to have a more limited impact on these outcomes, with customer-related practices showing no significant effect on green financing and environmental performance.

The positive relationships between **banks' operational practices** and **green financing** (H2), as well as between **policy-related practices** and **green financing** (H4), confirm that efficient operations and regulatory frameworks are essential in promoting sustainability within financial institutions. Furthermore, significant relationship impact of green financing on BEP (H5) underscores the symbiotic association between financial investments and environmental outcomes. This finding give suggestions that the allocation of funds to green initiatives directly enhances a bank's environmental performance, highlighting the pivotal role of green financing in fostering sustainable practices and achieving improved environmental results. The lack of significant relationships for certain practices, such as **ERP** and **CRP**, suggests that while these factors contribute to the organizational culture and customer demand for sustainable products, their direct impact on financing and performance outcomes might not be as substantial as that of operational and policy-related factors. These findings highlight the importance of focusing on structural strategies, including policy frameworks and operational efficiencies, to enhance sustainability in the banking sector.

## Policy Implications

The findings of this study have significant policy implications for financial institutions, regulators, and stakeholders committed to promoting environmental sustainability in banking. The strong influence of **PRP** on both **green financing** and **environmental performance** (H4, H9) underscores the need for robust governmental policies that encourage sustainable banking practices. Policymakers can enhance

the environmental performance of banks by incentivizing green financing through regulations, tax breaks, and environmental standards that prioritize sustainable investments. This would encourage financial institutions to integrate more green initiatives into their portfolios.

Additionally, the impact of **operational-related practices** (H2, H7) suggests that banks can further improve their environmental outcomes by adopting operational efficiency measures, such as reducing energy consumption, minimizing waste, and incorporating eco-friendly technologies. Regulatory bodies should advocate for green banking operations by providing financial support and guidance on implementing sustainable practices.

The limited influence of **customer-related** and **employee-related practices** calls for a reevaluation of how banks can better engage with their customers and employees to promote green financing. Banks could invest in awareness campaigns targeting both employees and customers, focusing on the importance of sustainability in the banking sector. Training programs for employees and customer education initiatives about green products can foster greater support for sustainability efforts.

In conclusion, while these practices remain the primary drivers of green financing and environmental performance, banks can benefit from a more holistic approach that incorporates employee engagement and customer demand for sustainability. Policymakers, financial institutions, and stakeholders should work collaboratively to create an environment that supports and incentivizes green initiatives, thus driving a more sustainable future for the banking industry.

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