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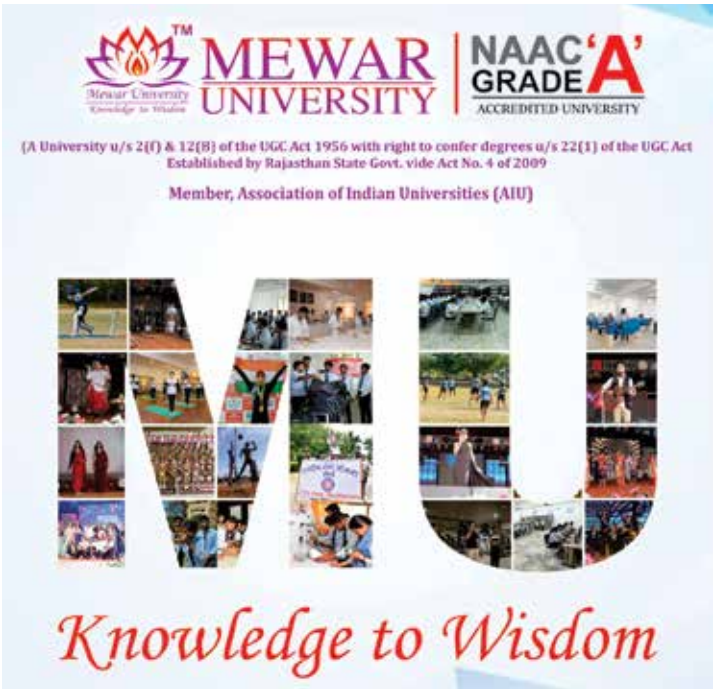

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CHAIRPERSON'S MESSAGE

It is heartening to offer yet another issue of the flagship journal of Mewar University, Journal of Indian Research. The current issue focuses on bridging disciplines for sustainable and equitable development

The research papers presented here offer a compelling interdisciplinary lens on critical issues shaping India's socio-economic and health landscapes. From agrarian history and cinematic representation of rural distress to green finance and the smoking-stress nexus, these studies underscore the interconnectedness of policy, culture, and individual well-being.

Krishna K. Mandal's exploration of the peasant mode of production in early India (600–300 BCE) reveals how iron technology and land ownership catalyzed agrarian expansion, yet also entrenched social stratification. This historical perspective resonates with Jyotsna Pathak's analysis of Bollywood's portrayal of farmers, which critiques the romanticization of rural life post-liberalization, masking persistent agrarian crises. Both papers highlight a recurring theme: the marginalization of farmers despite their foundational role in India's economy. Sandeep Bhattacharjee's study on green lending further amplifies this, showing how weak regulatory enforcement and sectoral imbalances hinder sustainable finance, echoing the systemic neglect depicted in films like *Do Bigha Zamin*.

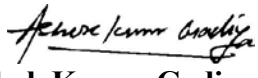
Zaidu Sulaiman's research on smoking and stress shifts focus to public health, revealing a bidirectional relationship where stress perpetuates nicotine dependence. This mirrors the cyclical vulnerabilities seen in agrarian and financial systems—whether farmers trapped in debt or banks lagging in green investments—where short-term coping mechanisms exacerbate long-term crises.

Together, these papers advocate for integrated solutions focusing on policy reforms, cultural accountability, and public health. It is imperative to now strengthen green finance frameworks as the future belongs to green economy. There will be paradigmatic shift towards solar energy, lithium batteries, green hydrogen, wind energy, geothermal energy and so forth. Only by introducing ease of doing business in this emerging sector, one can expect smooth investment flow. Transparency is vital for green lending. Innovative finance framework has been deliberated upon in the current issue.

Agrarian policies too should take into account how to address historical inequities. Media must balance nostalgia with honest narratives about rural distress. These days media have gone completely silent on rural distress and indulge excessively with the new economy and the service sector. Stress management should be central to smoking cessation programs.

For sustainable development and to build happy communities, the path forward demands interdisciplinary collaboration—historians, economists, filmmakers, and health experts. They ought to collaborate to reduce systemic inequities and foster sustainable development. Only then can India bridge the gap between its progressive aspirations and the lived realities of its most vulnerable populations.

I take this opportunity to invite scholars to send their papers in prescribed format. We assure you that the journal will keep its standards of high quality and regular periodicity.



Dr. Ashok Kumar Gadiya
Chairperson, Mewar University

EDITOR

The pursuit of knowledge is rarely confined to a single discipline. True understanding often emerges at the intersections—where economic data meets historical context, where cultural narratives inform public health, and where ancient social structures echo in contemporary challenges. The diverse contributions in this combined issue of the *Journal of Indian Research* exemplify this interdisciplinary spirit, offering a multifaceted examination of core issues that have shaped, and continue to shape, the Indian experience.

There is a significant macroeconomic inquiry by Dr. Vinod Kumar Adwani, who introduces a novel metric, the Gross Domestic Aggregate Consumption (GDAC) and its corresponding index. His study of the world's top ten economies moves beyond traditional production-centric measures like GDP to foreground *consumption* as the ultimate purpose of economic activity. The GDAC Index revealingly categorizes economies as surplus, par, or deficit, measuring their self-reliance. The finding of a strong, positive correlation between production and consumption is intuitive yet powerful. More intriguing is the longitudinal observation that, on average, these major economies have reduced their import dependency over the last eighteen years, a trend that invites deeper analysis into shifting global supply chains and national policies aimed at economic resilience.

This macroeconomic perspective finds a profound historical echo in the paper by Dr. Krishna K. Mandal, which delves into the very origins of organized production and consumption in the Indian subcontinent. Mandal's exploration of the peasant mode of production in the middle Gangetic plains (c. 600–300 BCE) reveals the foundational role of iron technology, private land ownership (*khettasamika*), and key actors like the *gahapatis* and *kutumbins*. This was not a simple subsistence economy; it was a complex system generating a taxable surplus, stratified by social class and reliant on servile labour (*dasa-kammakaras*), which supported the state and the emerging Buddhist *sangha*. The triadic relationship between the land-owning peasantry, the state, and religious institutions established a socio-economic template whose legacies are still discernible today. The struggle for control over produce, the stratification of rural society, and the tension between the landowner and the labourer are not merely historical footnotes but are central to understanding the enduring structures of India's agrarian economy.

It is precisely these enduring structures and their contemporary representations that Dr. Jyotsna Pathak critiques in her analysis of Bollywood cinema. Her paper, "*Negotiating Indianness*," traces the cinematic journey of the Indian farmer from the post-independence realist critiques of *Do Bigha Zamin* and *Mother India* to the post-liberalization romanticism of *Dilwale Dulhania Le Jayenge*. Pathak argues that while early films courageously highlighted agrarian distress, exploitation, and the human cost of nation-building, later narratives often obscured these harsh realities under a veneer of nostalgia and pastoral idealism. This cinematic shift from critical engagement to romantic portrayal raises critical questions about how national identity is constructed and whose stories are valorized or erased in the process. The farmer, once depicted as a victim of systemic injustice, is often reimagined as a symbol of timeless,

virtuous rural life, a transformation that can mask the persistent crises of debt, suicide, and economic vulnerability that plague the agricultural sector.

Finally, shifting from the macro and the historical to the micro and the contemporary, Zaidu Sulaiman and Dr. Sonia Singla present a psychological study on the bidirectional relationship between smoking and stress. While focused on individual coping mechanisms, their research touches on a broader public health crisis. The study finds a moderate, though not statistically significant, correlation between perceived stress and smoking frequency, with qualitative insights confirming that individuals often use cigarettes as a short-term coping mechanism, inadvertently entering a cycle of nicotine dependence that exacerbates long-term stress. This work underscores the importance of integrated public health strategies that address the root causes of stress, particularly in a rapidly modernizing society where economic pressures and social transitions can create significant psychological burdens.

Together, these papers form a compelling, albeit indirect, dialogue. They illustrate a chain of phenomena stretching from the ancient formation of economic systems and their modern measurement, to their representation in cultural narratives, and finally, to their impact on individual well-being and health outcomes. The struggles of the *gahapati* to manage land, labour, and surplus find a distant relative in the modern economic metrics of national self-reliance. The portrayal of the farmer's plight in classic cinema informs our understanding of a national identity that is still grappling with its agrarian roots. And the stress of navigating a complex, often unequal economy manifests in the personal, unhealthy coping strategies of its citizens.

This issue, therefore, stands as a testament to the power of interdisciplinary research. It reminds us that the economic, the historical, the cultural, and the psychological are not separate threads but are tightly woven into the rich, complex, and ongoing story of India. I hope the researchers are benefitted from the current compact issue containing well- researched and articulated papers from scholars from across South Asia!

– Dr. Vinesh Agarwal
Editor

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BEGINNINGS OF PEASANT MODE OF PRODUCTION IN EARLY INDIA : A NOTE (C. 600 BCE – 300 BCE)

Krishna K. Mandal*

ABSTRACT

This paper explores the beginnings of the peasant mode of production in early India (c. 600 BCE–300 BCE), focusing on the middle Gangetic plains. It examines the transformative role of iron technology in agriculture, particularly the use of iron ploughshares, which facilitated land clearance and improved cultivation techniques, enabling the expansion of rice farming and other crops like mustard and sugarcane. The study highlights the emergence of private land ownership, taxation, and social differentiation linked to settlement patterns. Key actors in this agrarian economy, such as the gahapatis (peasant proprietors) and kutumbins (householders), are analyzed for their roles in production, labor exploitation, and interactions with the state and Buddhist sangha. The paper also discusses the stratification of rural society, the use of servile labor (dasa-kammakaras), and the limited surplus generated during this transitional phase. By integrating literary and archaeological evidence, the study situates this period as foundational for the later consolidation of the peasant economy in ancient India.

Keywords: Agrarian economy, peasant mode of production, early India, iron technology, Gangetic plains, *gahapatis, kutumbins*, rice cultivation, social stratification, *dasa-kammakaras*, Buddhist texts, private land ownership, taxation, settlement archaeology, urbanization.

INTRODUCTION

The middle Ganga plain as a "transitional region" ($24^0$30'N $27^0$50'N and $81^0$71'E $87^0$50'E) is a large physical area (1,44,409 km^2.). It has immense human cultural and economic significance that makes the region heartland of India. It is a region of moderate to fair rainfall (100-150cms.) except in the western fringes (where it is less than 100cms.). Towards the north and the east, the amount of rainfall increases gradually. The region has broad alluvial soil cover. The soil contains moisture and heavy clay which are ill-drained.[1] The middle Gangetic plains have a thick vegetation cover on account of heavy rainfall. Settlement on the plains was not possible without clearance which was quite difficult in the clayey area and less in the

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loamy and sandy area.

Ancient settlement founded on the banks of the rivers- Ganga, Gandak, Saryu and Rapti- are well known, but much needs to be explored about settlements situated on the banks of the lakes. Rampurva, Nandangarh and Areraj, where Asokan pillars have been found, are located close to the *char*.[2] Similar is the case with the Pandavgarh and Manglagarh in Samstipur district and Jayamanglagarh in Begusarai district; at all these sites NBP sherds appear above the surface. Jayamanglagarh is situated on the bank of the Kaber Lake which 12 kms long and 3 kms wide.[3] In Muzaffarpur district Katragarh, where the beginnings of settlement is dated to the third century BCE, is situated on the JogNala, an old bed of the river Bagmati.[4] These instances may indicate that the earliest settlements in the alluvial tracts appeared not only on the river banks, but also on the boundaries of the lakes. The alluvial soil found in the water-logged areas is very fertile. But it was difficult to break the *kewal* soil. Though found in abundance in south of the river Ganga, the term *kewal* is also used in some parts of north Bihar. Tillage could not be carried on effectively or extensively with wooden ploughshares. The large amount of clay in soil makes it sticky when wet and hard when dry.[5] The hardness of the soil in the char areas is indicated by the local adjectives *chikat, sakkat* and *kumhrauli* applied to it.

From the middle of the 2nd millennium BCE, one notices a gradual but perceptible, process whereby numerous but separate primitive communities inhabiting the Indo-Gangetic plains were broken down and the foundation was laid for a new society.[6]The beginnings of this social formation can be dated to 600 BCE. Private ownership of land and payment of taxes demarcate this period as one in which peasant economy is evident.[7] A significant feature of this period is the tremendous expansion in agrarian economy. R.S. Sharma[8] analyses the various elements that helped the emergence of a "burgeoning economy" and helped the dissemination of the material culture of the new agrarian economy.[9] Both literary and archaeological evidences suggest the appearance of a new agricultural technology,[10] based mainly on the use of iron to clear land which 'democratized agricultural' and iron ploughshare. This enabled better ploughing, which was required for cultivating crops like mustard, sugarcane and paddy seedlings.[11] The Pali texts detail the process of cultivation and the techniques of irrigation.[12] The large range of crops mentioned in the texts testify to the improved skills and the increase in the botanical knowledge pertaining to agriculture. So common was the practice of agriculture that there are repeated references to it as similes in the teachings of Buddha, thus, references to ploughing, sowing and repeating this as common motif in the sermons. This manifests a typical example of contrasting the advantages of an agricultural society over pastoral one.[13]This does not mean that cattle rearing lost its importance. The importance of cattle for an agricultural economy in terms of the need for draught animals, ensured that cattle rearing remains an intrinsic part of an agricultural economy. The *gopaka* is a familiar figure in the Buddhist texts.[14]Classifying the lands according to the quality of the soil, [15]irrigation and practice of keeping land fallow[16] mark a distinct improvement. Different seasons and *naksatras* were prescribed for sowing different crops and observing agricultural festivals. [17]Above all there was awareness of the importance of time, a reference to the need to perform certain agricultural tasks for success in agriculture.[18]

The expansion of agriculture in the Ganga Valley was essentially a rice cultivation phenomenon, since the area was geographically suitable and congenial[19] for surplus production of rice. For the first time the Buddhist texts[20] suggest the transplanting of paddy indicating thereby intensive cultivation of rice virtually led to a demographic revolution.[21] A definite relationship between rice growing areas and the incidence of high fertility has been suggested since the consumption of rice allows children to be weaned away from mother's milk earlier so that the mother becomes ready to conceive again.[22] Equally important is the fact that rice cultivation is more labour intensive; a Jain text describes careful preparation of the beds and then the transplanting of rice seedlings two or three times.[23] The expansion of agriculture was accompanied by the extension of settlement, not only rural but also urban. The extension of settlements in the mid-Ganga plain is supported by archaeological evidence.[24] The sharp increase in the number of settlements is manifestation of the increase in the number of towns. Literary texts suggest a variety of settlements from *gama*, the smallest unit, to *nagara*, a more complex and frequently fortified unit of settlement, and the *mahanagara*, the largest unit of settlement in the kingdom.[25] The Buddhist texts' suggestion of heavily populated areas as a sign of prosperity is significant.[26] The kingdom of Magadha is described as flourishing as it contained 80,000 *gamas*, indicating a heavily settled rural area even if figure should not be taken literally. These references do reiterate that a crucial demographic development became possible through the use of iron technology and rice transplantation.[27] All these factors paved the way for the emergence of a new relation of production.

Many of the new settlements especially the urban area associated with the use of high grade deluxe pottery, the Northern Black Polished Ware. The Buddhist texts attest to the existence of considerable contact both between the rural and urban centres, and between different urban centres. There were certain well-travelled route *vanipathas* and along with these a number of market towns grew up forming contact points with the regular flow of traffic passing through them.[28] Works done on settlement archaeology in the western peripheries of the middle-Gangetic plains[29] underline the unequal sizes of settlement. But irrespective of their sizes privileged groups appear in those settlements which are advanced in production. These interest groups play the main role in the formation of a stratified society, though chiefs of larger settlements may have subjugated those of the smaller ones. To what extent the social differentiation is linked to settlement sizes in the middle Gangetic plains needs to be worked out. The package of changes in settlement patterns and in the economy has been regarded as constituting what is described as the second urbanization in the age of Buddha. As a consequence of the expanding economy the other factors of the second urbanization were the diversity of craft production, use of metallic money, and corporate and individual activity[30] along with its adjunct borrowing, interest and investment.[31] The texts are also familiar with metallurgy, stable settlements and very wide range of goods implying considerable specialization.[32]

The expansion of the economy, of urbanization, of increased craft production and of commercial activity must be situated in the more extensive and intensive pursuits of agriculture. This resulted in changes in the patterns of landholding. Fields were now regarded

as a very important economic asset.[33] Individual holdings of land definitely appeared by the time of Buddha,[34] and most of the land was being farmed in this manner, at least in the monarchical kingdom as is evident from the *Aggama Sutta*[35] in which kingship originates with the emergence of separate fields under private holdings. According to it, the violation of rights to ownership of the field leads to the intervention of the king. The idea of private land property is reiterated in a parable which decided the fate of a man who neglects his own fields but thinks of weeding the field of his neighbors.[36] The existence of private owners referred to a *khettapati* and *khettasamika* ('owner of a field' and 'owner of cultivated land') is seen during the period.[37] The *Jatakas* provide substantial data relating to small private plots. In likelihood the owners cultivated their land themselves helped only by their family.[38] A *Jataka* refers to restoration of ownership, bypassing right judgement,[39] to a person, who had earlier been deprived of it by a wrong judgement. The *Milindapanho* gives us at least one method by which the rights over land originated. It says when a man clears the land and prepares it for cultivation he establishes rights over it.[40]The statement represents a very important principle in relation to private property in association with that of labor. It suggests that a person becomes entitled to the land primarily because he has invested his labor into it.[41] While a considerable amount of land was in possession of peasant proprietors which according to Rhys Davids represented the bulk of the holdings,[42] the king also appeared to have been in direct control of it. This probably consisted of all the wastelands, forests and mines.[43] From this category of land the kings of Kosala and Magadha began to grant *brahmadeya* lands to the *brahmana*s which is obvious from the Pali texts.[44] Such a view is also supported by Radhakrishna Chaudhary, who argues that *brahmadeya* lands were granted out of the royal domain or the crownlands and they had nothing to do with the lands held by cultivators.[45] The commentary on the *Majjhima Nikaya* explains *brahmadeya* as *setthadeya,* the best gift that could not be taken back.[46] Baudhayana suggests that land is among the main kinds of gift. The pattern of landholding is crucial for understanding of the emerging a new mode of production.

The early Pali texts indicate a mode of production in which the peasants work their fields themselves.[48] The peasant community in essence constitutes a transitional form, from the communal mode of production of the primitive tribal community to small commodity production system which has also been called a peasant mode of production. Certain peasant families had come to possess land at the cost of others, which they had to cultivate with the help of hired laborers, a category which does not exist in the Vedic texts. Laborers were paid in cash or in kind on daily basis, for which it was necessary to measure their labor time. This may have been facilitated by the knowledge of *tithi* or the thirtieth part of a lunar month, of rather its extent over 27 days, which first appears in the *Grhyasutras*. This mode of production can be called peasant mode of production[49] in which the peasant meets the subsistence needs of his household and then provides sufficient surplus for the support of superstructure, this term can be used to describe and analyze the system of production that prevailed in pre-Mauryan times. In the analysis of this mode of production, the *gahapati* and *kutumbika* may provide a clue.

The quantitative distribution of *gahapati* in the early Pali texts attests its importance. The *Digha Nikaya* mentions of *gahapati* 38 times, the *Majjhima Nikaya* 47 times, *Samyutta Nikaya* 47 times, the *Anguttara Nikaya* 88 times, the *Udana* 2 times, the *Itivuttaka* and the *Sutta-Nipata* only once.[50] A notable feature of the term *gahapati* is that it is enumerated as one of the seven treasures of the king and as the symbol of sovereignty.[51] The *gahapati* appears in the list of seven jewels (*ratna*) that belong to a person with thirty-two extraordinary marks when this person becomes a *cakkavattin,* not a Buddha. The *gahapati ratna* is always part of the list.[52] The *gahapati* was clearly regarded as being intrinsic to kingship. Why the *gahapati* was regarded as a crucial element in the king's sovereignty is evident from a symbolic narrative where the king requires the *gahapati* to provide him with wealth for the kingdom.[53] The narrative makes it obvious that the king cannot get this wealth without the effort and the direct participation of the *gahapati*. In another passage various signs indicate that *gahapati* is the most important social group in relation to the king.[54]

An essential concomitant of a *gahapati* was his possession of property. There are many specific references to the management and control of property by the *gahapatis.*[55] Similarly, the relinquishing of control over the property indicated that one can no longer be addressed as a *gahapati*.[56] Individual *gahapati* are often shown as travelling in order to transact business connected with the management and control over their property.[57] Apart from the possession of other assets, such as cattle, gold and silver (mostly in the case of the wealthy *gahapatis*) he is associated with grain and cattle but most fundamentally with land. In this capacity, as owner of property and controller of the land, the *gahapati* was the pivot of the economy and, therefore, the major tax payer. Apart from the implicit representation of the *gahapati* as the source of the king's treasury and the actual locator and provider of wealth in the symbolic narrative referred to earlier, there is also an explicit reference to the *gahapati* as tax payer. The *gahapati* is described here as "one who pays taxes and thus increases the king's wealth."[58] There also occurs the term *brahmana-gahapati* who is the product of the *brahmdeya* grant. The *brahmana-gahapati* performed similar functions in the *brahmana gamas* as the *gahapati* in the rural economy, and they were associated directly with agriculture at least as a manager of agricultural operation. That in this capacity he paid taxes to the king is evident from the *Mahasudassana Sutta* of the *Digha Nikaya* where *brahamanas* and *gahapatis* are described as tax payers.[59] In the oligarchies the position of the *Khattiyas*, though they are not directly involved in agriculture,[60] is the same as that of the *gahapati* in the monarchical system. Thus, the *gahapati* is the foundational economic position in the transformed agrarian economy centered on rural areas now supplying the cities and other developing conurbation. This position makes sense only in the relation to the urban areas even if it is economically centered in the agrarian areas. Whatever his spatial location, he would not have remained untouched by the process of urbanization.

It is significant to demarcate the precise function of the *gahapati* within the larger context of the economy. An important reference describes the *gahapati* as one who cultivates the land and pays taxes, and thus increases the king's wealth.[61] This definitive and unambiguous

association of the *gahapati* with agriculture as cultivator is reiterated in a number of other general references to *gahapati* as agriculturists based on land and performing various cultivating tasks. The *gahapati* is depicted as carrying on various tasks irrigating his lands.[62] The *Milindapanho*,[63] also identifies the *gahapati* with agriculture, with ploughing, sowing and then filling his granary. Mendaka, one of the well-known *gahapatis* of the Buddhist texts, is definitely located in agriculture, and his entire family, including the *dasa*, possesses psychic powers related to the requirements of a land-based agriculture household.[64] Another text tells us that Mendaka's granddaughter, Visakha, was given plough, ploughshares and other farm implements along with cattle at her marriage to the son of another *gahapati.*[65]

The *gahapati* was never described as a *varna* or *jati*, whereas depending upon circumstances, usually in situations where the brahmanas are being addressed, brahmanas and *khattiyas* were described in these terms. The Buddhist themselves use the term *kula* to stratify social groups into high and low. The *gahapati* is always regarded as of a high *kula* (*uchcha kula*). But the most important aspect of the use of the term *kula* for *gahapati* is that as of a social group, their ranks are not yet frozen. In contrast to *brahamanas* and *khattiyas* who claim inherent status based on birth, ranks of the *gahapati* were open. A clan holding of land broken down and a process of an agrarian economy based on individual family holding intensified, there would be new entrants into the ranks of the *gahapati* would swell further. The development of agriculture in the mid-Ganga plain itself may be attributed to the *gahapati*, therefore, the *gahapatis* were key actors in the process of agrarian expansion and consolidation.

Kutumbin or *kutumbika,* like *gahapati*, suggest more or less the same thing that is a house. The *grhapatik* and *kutumbika* can literary be translated as household and one having a household (or one owing a household) respectively. Such terms are often associated with land and agricultural activities, indicating thereby that the two terms essentially denoted peasant in the context of his family unit. The *grhapatik/gahapati* and *kutumbika* seem to have been distinguished from a tiller of the soil, variously called *kinasa*, *krsivala* and more frequently *karsaka*. [66]In fact *kutumbin/kutumbika* is a typical example of an early Indian peasant in preference to *gahapati*. [67]A resident of Dhenukakata, (*kutumbin*), Usabhanka is expressly described as a ploughman (*halakiya*) and mentioned along with his wife and son. [68]It suggests the family unit of the peasant householders. The father's epithets *kutumbika* and *halakiya* are meant for highlighting his social category and his occupation. The son *kutumbika* Usabhanga is called *gahapati* Nanda. It suggests that these terms are synonymous. Fick's suggestion is appropriate that almost in the same sense of *gahapatis* is the expression *kutumbika* used.[69]

The *kutumbikas/kutumbins* figure regularly in the *Jataka* stories.[70] The *Salaka Jataka* narrates that the Buddha was born in one of his previous births in the family of *kutumbikas* or peasant householders and earned his livelihood by selling corn (*kutumbikakule nibbativa vayapatto dhanna vikkayenajivikam vappesi*).[71] The word *dhana* or *dhanya* may stand both paddy and crop in general. The *Jataka* story may be illustrative of the case of a peasant reaching the market. The *kutumbika* may have found it advantageous to diversify his occupation to

that of a corn-dealer, the peasant in *Salaka Jataka* is also described as a trader (*vanija*). The expression *vanija* is obviously used here as a synonym of the corn-dealer. The term *kutumbika* here not only covers the idea of a peasant producer, but also embraces the concept of a merchant selling crop.[72]

The *Satapatha Jataka*[73] highlights another important aspect of the *kutumbika's* function. A *kutumbika* is said to have lent a handsome amount of money to a person, but died without recovering the debt. The wife of the deceased *kutumbika* herself in her advanced years urged upon her son to forthwith collect back the said money, as she apprehended non-repayment of the money by the debtor. It suggests the possibility of the practice of money-lending by peasants. Other Jataka stories viz., the Kakkatta,[74] the Suchchha[75] and the Godha,[76] narrate similar stories of a peasant, accompanied by his wife under-taking a distant journey to recover his loans. All the three *Jatakas* provide a stereotyped but significant information, the *kutumbika* was a resident of Savatthi,[77] one of the major urban centers of early historical India. The *Jatakas* impress upon the fact that these peasants had become urban dwellers. This is particularly evident in the description of his journey to the countryside (*Janapada*) which is clearly distinguished from the urban center. It is plainly visible that some peasant house-holders left their rural milieu with which, however, they maintained regular contacts for material reasons from their urban residences, At least some resourceful peasants were in a position to augment their prosperity by engaging in trade in crops and money lending, in addition to their primary occupation with land, All these may have prompted some rich peasants to prefer a more prestigious urban habitat than a rural settlement. One *Jataka* describes a *kutumbika* as possessing eight crores of wealth.[78] This is an epithet typical of a wealthy merchant (*setthi*). This characteristic function of the *kutumbin* is similar to the *setthigahapati* who represents a person who combined in himself the function of agriculture and accumulated capital, possibly thereof through profits from it, which he then invested in business. There are more references to *setthigahapati* and this might suggest that most moneylenders combined the management of agriculture with usury, that even when they were city based they retained their association with land.[79] It is significant to note that two *brahmana kutumbins* intended to purchase a plot of land as suggested by a late inscription.[80] Thus, the *gahapatis* and *kutumbins* were the owners and controllers of primary means of agriculture production in the form of land, the primary tax payers as well as one of the elements of sovereignty, having individual holdings of land and engaged in agriculture production as manager.

The most important question is that whose labor was exploited in performance of agriculture. That many *gahapatis* actually labored on their own lands is evident from repeated references to *gahapatis* who plough, sow and seed.[81] The typical association of those who perform all these functions, i.e., to begin one agricultural cycle and complete it, is with the category of the *gahapati*. The *gahapati* is linked both with control over the land and with laboring on it. Based on the above characteristic, the *gahapati* could be linked with the peasant. The Pali texts refer to the *khattiya, brahamana* and the *gahapatis* as *mahasala.*[82] It is clear that in the post-Vedic period some princes, priests, and *gahapatis* came to occupy large stretches

of land.[83] In the Pali texts, there are at least two examples of big farm, one each in Magadha and another in Kashi both owned by *brahmana gahapatis.*[84] It is evident from the numerous references in the Pali texts that the *gahapatis* were the lay supports of the Buddhist *Sangha* and are associated with tracts of agrarian lands.[85] These are apparently references to wealthy peasant *gahapatis* and *brahmana gahapatis* who never labored for others. Are they employers of labor of others? Undoubtedly, such a concentration of land entrails additional use of labor. It suggests that this group was well above the level of subsistence holdings compared to the peasant type *gahapatis* who cultivated through family members.

With the breakdown of tribal system due to continuous wars, spread of metallic money and some degree of market economy made many people to sell their labor in order to live. In a predominantly agrarian economy dominated by the *brahmana gahapatis*, *gahapatis* and *khattiyas*, the agrarian activities were carried by *the dasa, kammakara* and *porisa*.[87] According to Gautama, agriculture, trade, and usury are lawful for a *brahmana* provided he does not carry on the work himself .[88] The existence of *dasa, kammakara* and *porisa (dasakammakaraporisa)* is well known but it is notable that they frequently appear with *gahapatis* as their masters. All references to those who plough are to *gahapatis, dasa* and *halikas.*[89]Many references in the early Pali texts speak not of the sudras as such, but of the *dasas* and *kammakaras* as being employed in agricultural operation. In the republican states, the *khattiya* landholders abstained from manual work and exploited the *dasa-kammakaras* instead. It was this category of servile labor that worked the land for their masters, as in evident from the following expression, "It is necessary to get the land tilled, and then have it irrigated…Once the crop is ready it is necessary to get it harvested and get the grain winnowed from the chaff."[90] Chanana has pointed out that these instructions are in the causative and therefore, represent the *khattiya* as supervising work done by others.[91]

Mendaka outlines the internal organization of the larger production units. The narrative mentions that the wife of Mendaka cooked and served food to the *dasa-kammakaras*, the son paid them wages in cash, the daughter-in-law paid them their wages in kind, the *dasa* attached to the household ploughed the lands and Mendaka collected the produce. From the reference to the *dasa-kammakars* being fed and paid wages in cash and kind it is clear that it is they who actually labored.[92] While Mendaka's family is involved with the management of the producing unit, the hard labor is performed by the *dasa-kammakaras*. There is a recognition by one *gahapati* that rather than using the 'surplus' to feed the *bhikkus*, he ought to have given it to the *dasa-kammakaras* who presumably were entitled to it as its generators.[93] The slaves and hired laborers worked even on smaller holdings[94] but often on larger plots. In the early Pali texts there are at least two examples of big farms in Magadha, each of a thousand *karisas,*[95] and another field in Kasi being ploughed with five hundred ploughs,[96] all owned by *brahmans*. Five hundred or thousand may be conventional numbers, but they provide an indication of the tendency towards consolidation of holdings, which reached its climax with the state control of agriculture in the Mauryan period. It is obvious that larger holdings could not have been worked without a considerable number of *dasa* and *kammakaras*. A labor force,

thus, was created in the middle-Ganga basin because of the emergence of households that needed additional hands in order to exploit the resources which were beyond the capacity of the family labor.[97]

In this connection the crucial question to explore is the division of labor within the household in terms of working the land on the basis of gender. We have very few references to actual agriculture tasks being performed by women, whether from among the *gahapatis* or the *dasis* or the *kammakaris*. All references to those who plough are always men *gahapatis, dasas* and *halikas*.[98] Obviously women did not plough. References to sowing, weeding, and transplanting are general and were likely to have been performed by both sexes among those who constituted the ranks of services labor and hired workers. One direct reference describes a *dasi* keeping watch over the ripening fields, and a category of *dasis* is called *vihi-kottika-dasi*, i.e. *dasis* who husked the rice.[99] On the basis of a reference to *dasis* who were loaned out to work for others[100] and were paid wages which they had to turn to their permanent masters, it would be reasonable to conclude that at peak times in the agricultural cycle all hand would be required, and *dasis* and *kammakaris* would be certainly involved in many agricultural tasks. Buddhaghosa's definition of *dasi-bhoga* as work in the fields is important in this context.[101] Alongside the *dasis*, who husk rice, are *dasis* who grind corn and a close association is evident between the *dasi* and the pestle, the mortar and the grinding stone,[102] because when offered a gift a *dasi* asked for a new pestle, mortal and grinding stone.[103] Apart from these more directly visible association with the processes of agricultural production, are the tasks of contributing less visibly to the agrarian economy. An important aspect of the labor team which works on the land is that their food was often in the hands of *dasis*; indeed the *dasi's* drudge labor is frequently concentrated in the kitchen and drawing and hauling water.[104] All these indicate that women were associated directly with the agricultural cycle as well as the total production process. This is apart from their all important contribution to the reproduction of the labor required to keep going the agrarian production itself. Women's participation in the agrarian production are mainly with regard to the *dasis* and *kammakaris*. At the other end there is the example of the prosperous *gahapati* family of Mendaka where two women are involved in organizing production; the wife of Mendaka feeds those who labor and the daughter-in-law maintains and disburses grain from the store. A *Jataka* reference describes a woman, wife of the owner, as overseeing the sowing of the fields. It is only in the case of the ordinary *gahapati* that we have no clear references. However, given the different forms of association of women in the production process at the two extreme ends of the agrarian hierarchy, in each case with women doing more or less what men of their class or social group were doing, it is more likely that the women folk of the ordinary *gahapati* were involved in agricultural production, roughly in the same capacity as the menfolk. It is significant to note that the suggested exclusion of ploughing and limitations imposed by child bearing and rearing upon women during their reproductive years would make continuous labor on the fields difficult during these years. Given also the considerable importance assigned to reproducing the family as a unit of labor, such a division of labor between the fields and the ancillary units was likely to have existed.

On the basis of Buddhist texts, it may be argued that there is a triadic relationship between the *gahapatis*, the state, and the *sangha*, with *gahapatis* functioning as the pivot on which the other two rest. It is in this context that the *gahapati*'s enumeration as one of the seven treasures of the *chakkavatti* or the ideal ruler of the world becomes significant.[105] The *Anguttara Nikaya* mentions only five treasures but even here *gahapati* is included.[106] The seven treasures of the *chakkavatti* appear to be symbols of sovereignty which implies that *gahapati* was regarded as being intrinsic to kingship. The symbolic narrative of the king in *the Mahasudassana Sutta* of the *Digha Nikaya*[107] and the *gahapati* getting treasure from the river makes it clear that it is the *gahapati* who locates the treasure and provides wealth to the king. The king cannot get it except through the effort and direct participation of the *gahapati*. In the course of this long *sutta* there is ample evidence of the *gahapati* being a major asset to the king along with the king's royal treasures and is intrinsic to his sovereignty,[108] the *gahapati* was one of the components of society with whom the king had a close relationship. There are numerous references to the king dealing righteously with the *brahmana*s and *gahapatis* of his territory. Just as a father is dear to his sons, the king is loved by the *brahmana*s and *gahapatis* and is popular with them.[109] The *Lakkhana Sutta* of the *Digha Nikaya* lists the various signs that signify a *chakkavatti* and it depicts the large number of *gahapatis* possessing extremely valuable assets.[110] The fact that the state had a despotic face is evident from references to the coercive powers of the state and its regular exercise in terms of the imposition of heavy punishment for offences. The *gahapatis*, however, seem to be privileged.[111] Since the early state, as presented in the Buddhist texts, was still formulating its social base, it carefully built an alliance with the *gahapatis*. Their existence as social group also moderated the direct impact of the coercive potential of the state upon the *dasa-kammakaras*, whose labor was responsible for at least some of the king's revenue. In turn, ultimately it was with the protection of the state that a section of the *gahapatis* became transformed into prosperous landholders with varied economic interests.

The relationship of the *gahapatis* with the *sangha* was also close. The Buddhist texts depict *bhikkus* who were ill or on their death- beds as being visited by the Buddha and given succor in their afflictions. The custom seems to have been largely restricted to *bhikkus* apart from some very rare exception invariably relate to *gahapatis*. Thus, the *gahapati* Nakulpita was visited by Buddha when he was ailing.[112] Similarly, Anathapindika asked for Anand when he was ill and was visited and reassumed by him.[113] The *gahapati* Sirivaddha and Mandinna also called for Anand when they were ill and specially enquired about their respective future after death.[114] Their possession of wealth and high social status, along with their position as the largest donors to the *sangha*, gave them privileges which clearly belonged to the most important category among the disciples of the *sangha*. The *gahapatis* were major supporters of the *sangha,* feeding the *bhikkhus,* gifting land and residence for them and maintaining them in other ways. But they did this as lay supporters from outside the *sangha* while pursuing their roles in the economy without joining the *sangha* as others did.[115]

As an institution, the *sangha* is unthinkable without the support it received from the *gahapatis*. At the same time the patronage of Buddhism through a support of a *sangha* by

the *gahapatis* became a crucial input for the stratification. By patronizing a new cultural and social order that put a relatively high premium on their capacity to give gift to the pious Buddhist *bhikkus* and appropriating the symbolic resources of this new order for themselves, the wealthier *gahapatis* could mark themselves off from the number of cultivators including the self-exploiting *gahapatis* and others in the countryside. The more settled *gahapatis* were the major supporters of the *sangha* because of their ability to give the *sangha* a portion of their share in "surplus". The early Pali texts suggest that there was only a fixed surplus available in any household, which was placed in the hands of the *samana-brahmana*. The *Samyutta Nikaya* indicates that the share gifted to the *samana-Brahmana* could have gone instead to the *dasa-kammakaras*. A *setthi-gahapati* of Savatthi is described as giving alms to *samana-brahmana* but subsequently regretting his action and arguing that he should have given it to the *dasa-kammakaras* instead.[116] This opposition between *samana-brahmana* on the one hand and the *dasa-kammakaras* on the other, in relation to the *gahapatis* is also noticeable in the *Singalovada-sutta*. The *samana-brahmana* is placed at the zenith (*uparimadisa*) and *dasa-kammakaras* is placed at the nadir (*hatthimadisa*) in a structure of relationship in which the *gahapati* is the nodal point.[117] This appears to imply an opposition based on the principle that *dasa-kammakaras* provided labor and thereby formed the base of the productive system and of society. While the *dasa-kammakaras* produced the surplus, the *gahapati* collected and redistributed it. Buddhism, despite its humanistic ethic, was unable to break the exploitative relationships between *gahapati* and *dasa-kammakaras* constrained by their own status as non-producer.

In the republican states such a contradiction was obvious between the *khattiya* clan holder of the land and their *dasa-kammakaras*.[118] According to Radhakrishna Chaudhary, Kautilya's reference to *vairajaganas* indicates societies where notions of mine and thine were not observed.[119] This would, however, apply to *khattiya* clan members in relation to each other, who collectively exercised power. The only major difference that existed was between the *khattiya* clan members, who jointly held the land, and the *dasa-kammakaras* who jointly worked the land. The sharp differentiation between the two categories created the beginnings of social tension. The *Vinaya Pitaka* refers to the *dasa- kammakaras* of the Sakyas attacking their masters' womenfolk as an act of revenge when the women were alone in the woods.[120] The consciousness about exploitation had seemingly emerged. The *Majjhima Nikaya* relates a very significant incident,[121] i.e. how a *gahapati* called Vaidehi under the strain of an incident, physically assaulted the *dasi*, Kali. It indicates the inner tension that existed within the *gana-sangha*, while there are numerous references to the *dasa-kammakaras* in the Pali texts, this is only example we have of their having resorted to violence against their masters. This attack on the Sakyas is itself an indication of the group consciousness of the *dasa-kammakaras* in relation to their Sakya masters. Since the *dasa-kammakaras* worked as a group on the land of their masters, they took collective action against their joint masters. The group consciousness itself was possible not only because the *dasa-kammakaras* shared the same material interests but because it was possible to translate this into a "We feeling" in a situation in which they

and their masters both represented antithetical collective units in relation to each other. The antagonism suggests that the primary means of production was in the hands of the *gahapatis*, the *brahmana gahapatis*, the *khattiya* and the *kutumbins*.

From the above discussion it becomes evident that the *gahapatis* and the *Kutumbins* were internally stratified in terms of those who possessed land and agriculture tools but did not hire labor of others, and those with all primary assets employing labor of others. While the *dasa-kammakars* were situated on the two extremes of the scale of agrarian relations characterized by exploitation. The emerging peasant mode of production was strengthened by their proximity to the state. But, this emerging peasant mode of production was yet to stabilize. It has been pointed out on the basis of the Pali texts that the surplus generated by this economy was not yet sizeable because the number of *dasa-kammakaras* was small[122] and the *gahapatis* had very often cultivated their lands themselves. It is still debatable as to what extent the household economy is 'surplus' oriented. In the communities with the weakest subsistence base practically every family has to work on the land, and anything which they have in the way of non-agricultural goods or services, i.e. minimum requirements, has to be provided through their own part-time efforts. As production rises, it is possible to sell some of the agricultural output in exchange for imports from a distance or to employ a certain number of full-time craftsmen.[123] On the eve of state formation in early India, the number of taxes was not numerous. In pre-Mauryan times, a more frequently used term in the *Jatakas* is *bali* and not *bhaga.*[124] But Gautama uses the term *kara*[125], while Panini is more emphatic about the words.[126] The punch-marked coins suggest payment in cash but its unavailability in the rural areas indicate its limited use. The Buddhist texts suggest that the payment was made in paddy in north eastern India.[127] Surplus rice could be used in exchange in much the same way as cash, in the first place to buy animals and plough and sometimes to pay additional labor for the harvest or to rent additional land.[128] Remains at Pandurajar Dhibi indicate that domestication and hunting of animals was still prevalent. The supplementation of the rice by vegetables, fish, etc. makes it clear that a considerable number of people in the contemporary society must have been very close to the subsistence level.[129] Evidence of iron agricultural tools is not forthcoming and recent archaeological excavations suggest that the NBP sherds of the mid-1st millennium BCE are fewer than that of the Mauryan phase.[130] A recent study of the excavated NBP sites identifies 32 sites with early NBP culture and 57 sites with late NBP culture.[131] It has also been suggested that it was only after *c*. 350 BCE that iron technology played a decisive role in the transition from pastoral agrarian economy to an established and full-fledged peasant economy.[132] Thus, the period from *c.* 600 BCE to 300 BCE is marked by a process of the gradual strengthening of the peasant mode of production.

REFERENCES

1. Singh, R.L. (ed.)(1994).*India: A Regional Geography,* Varanasi, pp. 183-189.
2. Sharma, R.S.(1993) 'Material Background of the Genesis of the State and Complex Society in the Middle Gangetic Plains, *Social Science Probings*, Vol. **10**(1-4):4; *idem*,

Sharma, R.S. (1983).*The State and Varna Formation in Ancient India*, pp. 93-94; Lal Babu Singh(1998). '*Beginning of Civilization in Champaran (Bihar): A Study of Chours and Maans*', paper presented in Indian History Congress at 59th Session, Patiala.

3. Patil, D.R. (1961). *Antiquarian Remains of Bihar,* Patna, p.191.
4. *ibid.* p.196.
5. Raychaudhari, S.P. (1981). *Land and Soil,* New Delhi, 1981, pp. 1-4.
6. Kosambi, D.D. (1956). *An Introduction to the Study of Indian History,* Bombay, pp. 85-86.
7. Thapar, Romila (1992). *Interpreting Early India,* Delhi, p.120; *idem*, *Recent Perspective of Early Indian History,* Bombay, 1995 p.114; Sharma, R.S. (1983).*Material Culture and Social Formations in Ancient India,* Delhi, p.108.
8. Sharma, R.S. *op. cit.*, p.93.
9. *ibid.* pp 89-103.
10. Chakravarti, Uma (1987). *The Social Dimensions of Early Buddhism,* Delhi, pp. 18-19.
11. Sharma, R.S., *op. cit.*, p.93.
12. *Anguttar Nikāya,* Vol. I, pp 239-240.
13. *Samyutta Nikāya,* Vol. I, p. 10.
14. *Dhaniya Sutta, Sutta Nipāta, Khuddaka Nikāya,* Vol. I, p. 10.
15. *Samyutta Nikāya,* IV, (Nalanda), pp. 314-317.
16. Agrawal, V.S. (1969). *Paninikálina Bharatvarsa* (in Hindi), Varanasi, pp. 212-213.
17. Sharma, R.S., *op. cit.,* p. 99.
18. *Anguttar Nikāya,* Vol. I, pp 239-240.
19. Singh, R.L., *op. cit.,* pp. 183-189.
20. Sharma, R.S., *op. cit.,* pp. 97-98.
21. *Dīgha Nikāya,* Vol. II, p.10.
22. Ling, Trevor (1976). *The Buddha,* Middlesex, p.50.
23. Sharma, R.S., *op. cit.,* p.98.
24. *ibid.* pp. 104-105.
25. Wagle, N.N. (1966). *Society at the Time of Buddha*, Bombay, pp. 13-27.
26. Chakravarti, Uma, *op. cit.,* p.19.
27. Sharma, R.S., *op. cit.,* p.105.
28. *Mahāvagga,* 1956, p.244.

29. Lal, Makhan (1984). *Settlement History and Rise of Civilization in Ganga-Doab from 1500 B.C. to 300 A.D.*, Delhi. Also see Erdosy, George (1988). *Urbanization in Early Historic Ganga Valley,* Oxford.

30. Chakravarti, Uma, *op. cit.,* pp. 20-23.

31. *Anguttar Nikāya,* Vol. II, 1959, p.86; Vol. I, 1959, p. 107; Vol. III, 1959, pp. 65-67.

32. *Chullavagga,* 1956, p. 255; *Anguttar Nikāya,* Vol. II, p. 86; *Dīgha Nikāya,* p.42.

33. *Sutta Nipāta, SBE,* Vol. X, Pt. II, 1977, p.158.

34. Chakravarti, Uma. *The Social Dimensions of Early Buddhism, op. cit.,* pp. 68-70; Thapar, Romila(1990). *From Lineage to State,* Delhi, p.89; *idem* (ed.), *Recent Perspective of Early Indian History,* Bombay, 1995, p. 114; Sharma, R.S. *Material Culture and Social Formations, op. cit.,* p. 108; Mandal, Krishna Kumar. 'Emergence of Peasant Differentiation, in Early Historic India (*c.* 600 BC to 300 BC) in *PIHC*, 70th Session, Delhi, 2009-10, p.46.

35. *Dīgha Nikāya,* Vol. III, pp. 72-73.

36. Bose, A.N. (1970). *Social and Rural Economy of North India,* Vol. I, Calcutta, p.17.

37. Cowell, E.B. (ed.) (1990). *Jataka,* IV, no 484, Delhi; III, no. 390.

38. *ibid.,* III, no. 384; IV, no. 484

39. *ibid.* V, no. 528.

40. *Milindapanho, PTS*, London, 1962, p.219.

41. Rai, Jaymal(1974). *The Rural- Urban Economy and Social Change in Ancient India*, Varanasi, p.15.

42. Rhys Davids, C.A.F. (1968). 'Economic Conditions According to Early Buddhist Literature' in E.J. Rapson (ed.), *Cambridge History of India,* Vol. I, Delhi, p.176.

43. Altekar, A.S. (1949). *State and Government in Ancient India,* Banaras, p.275.

44. *Dīgha Nikāya,* Vol. I pp. 76,96,109; *Majjhima Nikāya,* II, p. 427.

45. Chaudhary, Radhakrishna. 'Ownership of Land in Ancient India', *Journal of Bihar Research Society,* Vol. LIII, p. 32.

46. Horner, I.B. (tr.), *The Middle Length Sayings,* Vol. II, p.354.

47. *Baudhayan Dharmasutra*, III, 10.14.

48. Sharma, R.S., *Material Culture and Social Formations, op. cit.,* p.108.

49. Sharma, R.S. (1995). 'Mode of Production in Ancient India' in Gupta, D.N. (ed.), *Changing Mode of Production in India: A Historical Analysis,* Delhi, p.15; Berdichewsky, Bernardo (1979). 'Anthropology and Peasant Mode of Production' in *Anthropology and Social Change in Rural Areas* (ed.), Bernardo Berdichewsky, The Hague, , pp.

5-39; da Graca, Laura(2015). 'Peasant Mode of Production and Evolution of Clientelar Relations', in Graca, Laura da and Zingarelli, Andrea(eds.). *Studies on Pre-capitalist Mode of Production.* Leiden, pp. 158-203; Hindess, B. and Hisst, P.Q. (2018). *Pre-Capitalist Modes of Production,* Routledge; Wright, Erik Olin (1997).*Classes,* Verso; *idem*, *The Debate on Classes,* Verso, 1998.

50. Freiberger, Oliver (2019). 'Grhastha in the Sramanic Discourse: A Lexical Survey of House Residents in Early Pali Texts', in Patrick Olivelle (ed.). *Grhastha: The Householder in Ancient Indian Religious Culture*, New Delhi, pp. 68-72.

51. *Dīgha Nikāya,* Vol. I, p.27; *Anguttar Nikāya,* Vol. II, p.419.

52. Freiberger, *op. cit.,* p.70.

53. *Dīgha Nikāya,* Vol. II, p. 135.

54. *ibid.* Vol. III, pp. 110-138.

55. *Majjhima Nikāya,* Vol. II, 1958, p. 15; *Chullavagga,* p.32.

56. *Majjhima Nikāya,* Vol. II, pp. 27-28.

57. *Samyutta Nikāya,* Vol. III, p.252; Habib, Irfan (1995). *Essays in Indian History: Towards Marxist Perspective,* New Delhi, pp. 67-68; Sharma, R.S. (2009).*Rethinking India's Past,* pp. 134-135; For more details see, Mandal, Krishna Kumar(2000). *Peasant Formation in Early India*(*c.* 600 B.C. to 200 B.C.), unpublished Ph.D. Thesis, Patna University, Chapter- II, pp. 46-83.

58. *Dīgha Nikāya,* Vol. I, p. 53; also see *Dialogues of the Buddha*, Vol. I, p. 77.

59. *Dīgha Nikāya,* Vol. II, pp. 137-38.

60. *Anguttar Nikāya,* Vol. II, pp. 338-340.

61. "Kassako gahapati ko, karakarako, rasivaddha", cited in *Dīgha Nikāya,* Vol. I, p.53. The Commentary also describes the *gahapati kassaka*, as one who cultivates.

62. *Anguttar Nikāya,* Vol. I, p.222.

63. *Questions of King Milinda*, Vol. I, p.57.

64. *Mahāvagga,* p.255.

65. Malasekhar, G.P. (1960). *Dictionary of Pali Proper Names,* Vol. II, London, p.901.

66. For the connotation of the term *Kutumbika/kutumbin*, see Monier William, *A Sanskrit-English Dictionary,* Delhi, p. 286, column 3. The term *Kināsa* is first encountered in the *Rigveda*. The *Aṣṭadhyāyī* of Pānini uses the word *kṛṣivala.* For further details see Agrawala, V.S. (1953). *India as Known to Panini,* Lucknow, p. 195. The *Arthaśāstra* of Kautilya uses the term *Karsaka.*

67. Chakravarti, Ranbir(1989). 'Kutumbikas of Early India', in V.K. Thakur and A. Aoushuman (eds.) (1996). *Peasants in Indian History-I*, Patna, p.183.

68. *ibid.* p.183.

69. Fick, Richard (1970).*Social Organization in Northern India during the Buddhas Time,* Delhi, p.256.

70. *ibid.* also see Bose, A.N. (1967). *Social and Rural Economy of Northern India,* Calcutta, frequently use the *Jatakas.*

71. *Jatakas, no. 249.*

72. *ibid.*

73. *ibid.* Vol. II, p. 388.

74. *ibid.* p.341.

75. *ibid.* Vol. III, p.66.

76. *ibid.* pp. 106-107.

77. For urbanization at Sravasti, see Ghosh, A. and Sinha, K.K. (1967). *Excavation at Sravasti-1959,* Varanasi.

78. *Jatakas,* Vol. IV, p.232.

79. Chakravarti, Uma, *op. cit.,* pp. 79-80.

80. Fleet, J.F. (1981). *Corpus Inscription Indicarum,* Vol. III, Delhi, 1; also see Chattopadhyaya, B.D. (1990). *Aspects of Rural Settlement and Rural Society in Early Medieval India,* Calcutta, p.37 suggests that *Kutumbins,* the *mahattaras* and the *gramastakula-dhikarana* were approached by the officials as separate social categories.

81. *Pachittiya,* p.241.

82. *Anguttar Nikāya,* Vol. IV, p. 239.

83. Sharma, R.S. (1985).*Sudras in Ancient India,* New Delhi, p.97; Shimada, Akira (2025). *Early Buddhist Architecture in Context: The Great Stupa at Amaravati,* Leiden, pp. 143-144.

84. *Jatakas,* III, 293; IV, 276.

85. Chakravarty, Uma, *op. cit.,* p. 84.

86. Clark, Colin and Haswell, Margaret (1964). *The Economic of Subsistence Agriculture*, New York, p.91.

87. *Dīgha Nikāya,* Vol. I, p.141; *Anguttar Nikāya,* Vol. II, pp. 207-8, Vol. III, p. 37, Vol. IV, pp. 266,293.

88. Sharma, R.S., *Sudras in Ancient India,* p. 115.

89. *Anguttar Nikāya,* Vol. I, p. 222; *Mahavagga*, p. 255; Inscription number 1084, in H. Ludders, *A List of Brahmi Inscriptions,* Varanasi, 1973, p.115.

90. *Cullavagga,* p. 279.

91. Chanana, D.R., *Slavery in Ancient India,* p.43.

92. *Mahavagga*, p. 255.

93. *Samyutta Nikāya,* Vol. I, p. 91.

94. Sharma, R.S., *op. cit.,* p. 105. He refers to both large and small fields. The *dasa* and *kammakaras* of the Sakyas and Koliyas were employed for irrigating their fields.

95. *Jatakas,* Vol. III, p. 93; Vol IV, p. 276.

96. *Sutta Nipāta,* 1.4.

97. Sharma, R.S., *Material Culture and Social Formation in Ancient India,* p. 12.

98. *Anguttar Nikāya,* Vol. I, p. 222; *Mahavagga*, p. 255; Inscription number 1084, in Ludders, H. (1973).*A List of Brahmi Inscriptions,* Varanasi, p.115.

99. *Jatakas,* Vol. III, p. 356; Vol. I p. 484.

100. *Jatakas,* Vol. I, p. 402.

101. Chanana, D.R., *Slavery in Ancient India,* p.51.

102. *Jatakas,* Vol. I, p. 248.

103. *ibid.* Vol. I, p. 428.

104. Chanana, D.R., op. *cit.,* p.49.

105. *Dīgha Nikāya,* Vol. I, p.77.

106. *Anguttar Nikāya,* Vol. II, p.419.

107. *Dīgha Nikāya,* Vol. III, pp.110-38.

108. *ibid.* Vol. III, p.46.

109. *ibid.* Vol. II, p.136.

110. *ibid.* Vol. III, pp. 110-38.

111. Chakravarti, Uma, *op. cit.,* pp.68-69.

112. *Anguttar Nikāya,* Vol. III, p.19.

113. *Samyutta Nikāya,* Vol. IV, p.329.

114. *ibid.* pp. 152-153.

115. For further details see Chakravarti, Uma, *op. cit.,* pp.134, 142-143.

116. *Samyutta Nikāya,* Vol. I, p.91.

117. *Dīgha Nikāya,* Vol. III, p. 147 and for further details see Chakravarti, Uma ,*op. cit.,* pp. 28-29.

118. Chakravarti, Uma, *op. cit.,* pp. 87-89.

119. Chaudhary, Radhakrishna. 'Ownership of Land in Ancient India', *Journal of Bihar Research Society,* Vol. LIII, p. 35.

120. Significantly this is one of the first written records of women being obvious in the case of antagonism between two social groups (*Pachittiya,* p.241).

121. *Majjhima Nikāya,* Vol. I, pp. 167-8.

122. Sharma, R.S. *Material Culture and Social Formation in Ancient India,* p.108; also see Chanana, D.R. *Slavery in Ancient India,* pp. 156-168.

123. Clark and Haswell, *op. cit.,* p. 51.

124. *Jatakas,* Vol. I, p. 378.

125. X. II.

126. Agrawala, V.S. *India as Known to Panini,* pp. 142,197.

127. Sharma, R.S. (1968).*Political Ideas and Institutions in Ancient India,* Delhi, p.280.

128. Clark and Haswell, *op. cit.,* p. 53.

129. *ibid.* p.52.

130. Thakur, Vijay Kumar (1993). *Social Dimension of Technology: Iron in Early India, c. 1300 B.C. to 200 B.C*., Patna, p.37.

131. Roy, T.N. (1986). *A Study of Northern Black Polished Ware Culture: An Iron Age Culture of India*, Varanasi, pp. 89-91.

132. Thakur,Vijay Kumar. *op. cit.,* p. 35; Erdosy on the basis of micro-settlement study confined to Allahabad came to conclusion that the period 350-100 B.C. was marked by the crystallization of trends already emerging in the period 600-350 B.C. He suggested only 21 sites related to Period II (600-350 B.C.), while it increased quantitatively in the III period (350-100 B.C.) as its number went to 45 (*Urbanization in Early Historic India*, pp. 46-65).

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CORRELATION BETWEEN ALCOHOL CONSUMPTION AND VERY HIGH DIABETES AMONG RURAL AND URBAN MEN IN INDIA

A BIBLIOMETRIC, STATISTICAL, AND GEOGRAPHICAL PERSPECTIVE

Priyanka Puri*
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ABSTRACT

Diabetes has become a major global health challenge, with India recording one of the sharpest increases in prevalence in recent decades. This rise is widespread across regions and shaped by multiple determinants. Among them, alcohol consumption has been suggested as a contributor to Type 2 Diabetes, though the strength of this association remains uncertain. This study investigates the relationship between alcohol consumption and Diabetes among men in rural and urban India, drawing on NFHS-5 data and supported by statistical, geographical, and bibliometric methods. Results show higher alcohol consumption among rural men, but a greater burden of Diabetes among urban men. Correlation analysis indicates a weak positive association—0.227 for rural men and 0.163 for urban men—suggesting that very high Diabetes levels cannot be attributed primarily to alcoholism, except in limited cases. Spatial patterns reveal clear regional disparities: southern states report the highest Diabetes prevalence, while urban Diabetes generally falls in medium to high ranges, clustering from western to eastern India. Rural Diabetes presents a more mixed distribution. Bibliographic analysis further indicates a surge in publications on Diabetes from the mid-1990s, with output peaking in 2021. The London School of Hygiene and Tropical Medicine, the Public Health Foundation of India, and AIIMS, New Delhi, were leading contributors. Medicine accounted for 47.5% of publications, and maximum co-authorship occurred between the USA and India. Overall, findings suggest alcohol plays a contributory but not dominant role in Diabetes prevalence, while broader lifestyle and regional factors exert stronger influence.

Keywords: Alcohol consumption, Diabetes, health, lifestyle, males, trends, National Family Health Survey.

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INTRODUCTION

Modernisation with altered lifestyle is attributed as a cause to manifold rise of Diabetes in the Asian subcontinent (Ramachandran *et al.*, 1999). Diabetes is a challenge to modern medicine and an unprecedented concern in modern times (WHO, 2022). India is no exception to this and is called the 'Diabetes capital of the world'(Unnikrishnan *et al.*, 2016; Yesudian *et al.*, 2014; Mohan and Pradeepa, 2001). Alcohol seems to increase the propensity of Diabetes by manifold, though it cannot be taken as the direct contributory factor to the issue (Yadav *et al.*, 2017; Barik *et al.*, 2016; Mohan *et al.*, 2009). Alcohol misuse and abuse comes under an enhanced focus in this category (Deedwania *et al.*, 2014). It can be broadly said that the risk of Diabetes with alcohol consumption is dependent on a number of other factors ranging from weight, metabolism and type of alcohol intake, to name a few (Polsky *et al.*, 2017; Knott *et al.*, 2015).

Alcohol consumption has been largely studied in non-diabetic population (Polsky *et al.*, 2017; Baliunas *et al.*, 2009; Howard *et al.*, 2004; Wannamethee *et al.*, 2002) It is observed that men in general as compared to women, consume more alcohol. Alcohol consumption is found to be a stronger contributor to Diabetes than gender (Bhalerao *et al.*, 2014). While light to moderate alcohol intake is credited to a decrease in risk of Diabetes, heavy drinking seems to do the reverse (Mohan *et al.*, 2008). It is also interesting to note that a limited alcohol intake can lower risk of cardiovascular diseases, other morbidities as well as mortality (Mohan *et al.*, 2008).

As reported in 1970s, Type 2 Diabetes cases in rural India were 1.5 %, and in urban areas 2.3%. Within two decades, these cases have risen three-fold in urban areas and two-fold in rural areas (Singh *et al.*, 1998). Urban areas, in general, have reportedly higher diabetic rate (Sujata and Thakur, 2021). Further, prediabetic condition is also on the rise (Ramachandran *et al.*, 1999).Various studies exhibit the relationship between Diabetes and alcohol consumption in India.

Very few studies exist on the topic of studying rural-urban differentials in Diabetes in India. A research work on urban areas in India correlated Diabetes with high alcohol intake (Singh *et al.*, 1998). A bibliometric study on large population comprising 1,778,706 adults from rural and urban India, indicated an increase in the disease in both rural as well as urban population. This denotes narrowing of rural-urban gap on Diabetes incidences (Ranasinghe *et al.*, 2021). Alcohol consumption has been found to be much higher in rural areas than urban. This rate of increase is alarming for the country; modernisation, altered lifestyle and changed dietary habits being the contributory factors.

In a study in rural Pondicherry, about 50% of the cases of Diabetes were attributed to obesity and alcohol consumption (Ghorpade *et al.*, 2013). A study on 6,196 men in rural and urban areas in Tamil Nadu indicated alcohol consumption grew to 62% in rural areas as compared to 42% among urban men (Oommen *et al.*, 2016). In another study conducted in India on 13,527 rural men, lower diabetic prevalence was found in these areas with fewer reports on the disease incidences (Ramachandran *et al.*, 1999). Besides, it is also very important

to note that broadly the prevalence of Diabetes in rural areas has remained much lower compared to the urban regions (Jonas *et al.*, 2010). Another study of a tribal rural population in South India indicated no correlation between the two parameters (Shriraam *et al.*, 2021). Yet another work considered trends in Diabetes among 61,361 rural and urban men. It showed the prevalence of disease was higher in urban areas, while alcohol consumption remained higher in rural areas (Agrawal, 2015; Pillai *et al.*, 2013). The epidemiology of Diabetes related to alcohol consumption largely studied for adolescent population indicates that the level of the disease varies and no peculiar trend can be outlined. The relationship can be seen as positive, null, U-shaped or even J-shaped (Polsky *et al.*, 2017; Koppes *et al.*, 2005).The current study proceeds with all these considerations in the background to fill the gap in literature and to examine existing correlation between alcohol consumption and very high Diabetes incidences.

DATABASE AND METHODOLOGY

The current analysis is based on National Family Health Survey (NFHS-5) database. Highlighted as a high quality and reliable database, it is a national, multi-round, large-scale survey conducted on a sample of households across the country under the stewardship of the Ministry of Health and Family Welfare, Government of India (MoHFW, GoI) coordinated by the International Institute for Population Sciences, Mumbai. A group of survey organizations and Population Research Centres, selected after following a rigorous process of selection carried it forward. NFHS-5 Survey was conducted and completed during 2019-2021 and its fieldwork for India was conducted in two phases due to the Covid-19 lockdown- one from 17 June 2019 to 30 January 2020 and phase two from 2 January 2020 to 30 April 2021 by 17 Field Agencies. Information was gathered from 6,36,699 households, 7,24,115 women, and 1,01,839 men (NFHS, 2021)

From this pan-India dataset, two parameters are chosen:

1. **ALCOHOL CONSUMPTION-** Which is divided into two categories as-

   a. ALC. RUR. - Alcohol consumption among men in *rural areas* who are above 15 years of age (%)

   b. ALC. URB. - Alcohol consumption among men in *urban areas* who are above 15 years of age (%)

2. **VERY HIGH DiabeteS-** This is divided into two categories as –

   a. **DIAB. RUR. -**Very high Diabetes among men in *rural areas* who are above 15 years of age >160 mg/dl (%)

   b. **DIAB. URB. -** Very high Diabetes among men in *urban areas* who are above 15 years of age >160 mg/dl (%)

   The research objectives of the study are:

   - To observe the relationship between alcohol consumption and Diabetes among urban and rural men in India;

- To outline the strength of this observed relationship;
- To examine and exhibit the statistical findings and supplement those with bibliographic and geographic data.

The target of current attempt is to observe the relationship between alcohol consumption and the incidence of '*very high*' Diabetes cases, without drug intervention among rural and urban men in India. The analysis is supplemented with literature review on the topic through a bibliometric examination. This is done for the purpose of checking the nature of published works on the topic and the detailing of such publications through information on the year, language, co-authorship, co-occurrence, title, and abstract of publications. It can also be useful to check the availability of literature and help in understanding the broad and specific nature of the issue. This is attempted through the two well established publication databases- Scopus and Web of Science (WoS) online through subscription. WoS covers extensive disciplines across academics. Considered as most trusted global citation data, it is provided by Clarivate Analytics with records from 1900 to the present and includes several databases with 1.9 billion cited works from 171 million records (Clarivate, 2024). The WoS Core Collection gives information on more than 115 years of highest quality research works. It includes ten indexes with highly sought indexes such as the Science Citation Index expanded (SCI-EXPANDED), Social Sciences Citation Index (SSCI), Arts and Humanities Citation Index (AHCI) (WoS, 2022). Results are diagrammatically represented and supplemented with tables and text. VOS Viewer software (version 1.6.18) is used to generate and visualize these diagrams.

The generated data is statistically examined for its individual parameters to check the descriptive statistics. The details of the dataset as derived from NFHS-5 database are highlighted below in Table 1. The NFHS provides Diabetes information in three categories for both males and female:

- Blood sugar level *high*: 141-160 mg/dl (%)
- Blood sugar level *very high*: >160 mg/dl (%)
- Blood sugar level *high or very high*: >140 mg/dl or taking medicine to control blood sugar.

On the basis of the information available through NFHS-5, the following data was derived for the mentioned parameters as can be seen in Table 1 and 2.

Table 1: Sample Size of Men Surveyed by NFHS-5

STATE/UT	**No. of Males Surveyed (NFHS-5)**
ALL INDIA	101839
Andhra Pradesh	1558
Arunachal Pradesh	2881
Assam	4973
Bihar	4897

Chhattisgarh	4174
Goa	313
Gujarat	5351
Haryana	3224
Himachal Pradesh	1,477
Jharkhand	3,414
Karnataka	4,516
Kerala	1,473
Madhya Pradesh	7,025
Maharashtra	5,497
Manipur	1,162
Meghalaya	1,824
Mizoram	1,105
Nagaland	1,456
Odisha	3,865
Punjab	3,296
Rajasthan	6,353
Sikkim	469
Tamil Nadu	3,372
Telangana	3,863
Tripura	990
Uttar Pradesh	12,043
Uttarakhand	1,586
West Bengal	3,021
Andaman & Nicobar Islands	2,397
Chandigarh	104
Dadra & Nagar Haveli and Daman & Diu	427
NCT Delhi	1,700
Jammu & Kashmir	3,087
Ladakh	307
Lakshadweep	135
Puducherry	534

Source: *Authors, 2024 (compiled from NFHS-5 reports for respective states/UTs; NFHS, 2021)*

Statistical analysis is based on NCSS Software. Descriptive statistical information is followed by cross-plotting of relevant categories of the data to bring out the trends spatially, statistically, and temporally. Bland Altman Plots are drawn to enhance the analysis followed by Karl Pearson's Correlation to check the degree of strength between the parameters. This plot visualizes relationships between two variables and is taken as a 'gold standard' method (Schoonjans, 2024).The mean difference and the limits of agreement are shown. It is considered as a useful method of displaying the relationship between two paired variables and helps in observing the phenomena. This is a specific scatterplot and is widely used in medical analysis (Riffenburgh and Gillen, 2020). Karl Pearson's statistical technique is a quantitative method which provides a numerical value to identify the strength of linear relationship between variables.

The coefficient of correlation is represented as 'r' and is categorized in the range of -1 to +1. A value of -1 indicates a strong negative correlation while +1 indicates a strong positive correlation (Warner, 2013). The next method of statistical enquiry used is of Odds Ratio (OR). This is defined as a method of association between exposure and outcome. It is a representation that an outcome will take place with an exposure compared to the odds of outcomes in the absence of that exposure. These ratios help in determining if a particular exposure acts as a risk factor for an outcome and can also be used to compare the magnitude of various risk factors for that outcome. It is usually attempted at 95% confidence interval (Szumilas, 2010). The OR can be read as:

- OR=1 Exposure does not affect odds of outcome;
- OR>1 Exposure associated with higher odds of outcome;
- OR<1 Exposure associated with lower odds of outcome.

The findings of Odds Ratio are depicted through a forest plot for meta-analysis of the results . The variables of alcoholism, Diabetes are examined, explored statistically, and plotted. Geographical depiction of the database and findings lead to the spatial distribution analysis and the focal locations that require specific attention. At the All India level, it can provide a useful comparison to pave way for newer research. QGIS software (version 3.26) has been used. It is a free, open source, geographic information system for the analysis and output of geospatial data in multiple forms. A clustered heat map (double dendrogram) is also constructed to visualise the data sets of alcohol and Diabetes categories.

Table 2: Parameters of Analysis

	NFHS-5			
STATE/UT	**URBAN (%)**		**RURAL (%)**	
	ALC. URB.	**DIAB. URB.**	**ALC. RUR.**	**DIAB. RUR.**
ALL INDIA	16.5	8.5	19.9	6.5
Andhra Pradesh	20.5	13.7	24.5	10.4

Arunachal Pradesh	44.3	6.4	54.3	4.3
Assam	21.3	9.5	25.9	5.6
Bihar	14	9.2	15.8	6.5
Chhattisgarh	28.6	4.8	36.7	4.2
Goa	38.2	10.8	34.9	12.9
Gujarat	4.6	7.3	6.8	6.9
Haryana	15.7	6.9	16.2	5.9
Himachal Pradesh	30.4	7.7	32.1	6.5
Jharkhand	24.6	7.9	38.7	5.9
Karnataka	15.3	8.6	17.4	7
Kerala	18.7	14.1	21	13.6
Madhya Pradesh	13.2	5.9	18.6	4.6
Maharashtra	13	6.8	14.7	5.2
Manipur	34.6	10.6	39.2	6.8
Meghalaya	28.5	7.6	33.5	3.5
Mizoram	22.8	6.7	25.2	5.2
Nagaland	26.8	6.9	22.5	4.7
Odisha	22.7	11.1	30.2	7.3
Punjab	19.7	8	24.8	6.4
Rajasthan	9.3	3.6	11.6	3.2
Sikkim	37.6	8.1	41.1	6.4
Tamil Nadu	21.5	12.7	29.2	11.2
Telangana	33.9	11.4	49	8.4
Tripura	26.9	10.8	35.9	6.8
Uttar Pradesh	13.2	6.1	15.1	4.6
Uttarakhand	21.7	9.7	27.5	6.6
West Bengal	18.9	10.6	17.7	9
Andaman & Nicobar Islands	33.8	8.6	41.9	6.6
Chandigarh	18.5	8	31.6	8
Dadra & Nagar Haveli and Daman & Diu	29.1	8.5	26.5	6.9
NCT Delhi	21.6	7.4	22.9	5
Jammu & Kashmir	7.7	2.9	9.2	2.7
Ladakh	21.1	0.8	24.2	2.9
Lakshadweep	0.4	9	0.5	5.3
Puducherry	26.7	13.5	30.1	9.3

Source: *Authors, 2024; NFHS, 2021*

Methodology

The analysis has been conducted as bibliometric, statistical, and geographical. The analysis is divided in three parts:

a. Bibliometric analysis to examine the relationship between alcohol consumption and Diabetes among rural and urban men in India;

b. Statistical examination of the data on alcohol consumption and Diabetes among rural and urban men;

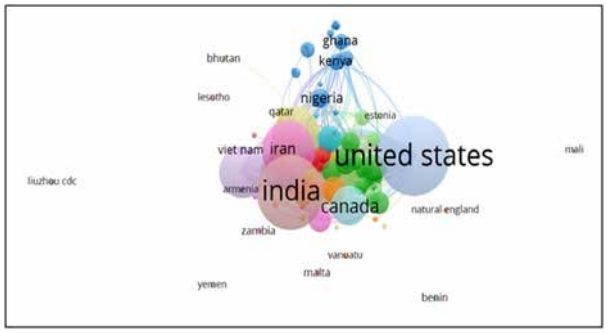
c. Geographical analysis of data on alcohol consumption and Diabetes among rural and urban men.

Results and Findings:

a. Bibliometric analysis to examine the relationship between alcohol consumption and Diabetes among rural and urban men in India

This was initiated by conducting an exact phrase search as 'Alcohol *AND* Consumption *AND* Diabetes *AND* Among *AND* Rural *AND* Urban *AND* Men *AND* India'. The results were generated for research publications on the topic from the Scopus and WoS databases. Scopus database generated 4,879 articles generated in the search from the year 1977 onwards and WoS provided only 10 documents till date on the topic. The nature of works on the topic indicate that publications are limited in number, particularly in the Web of Science database. Scopus generated 4,879 publications and WoS gave only 10 publications on the topic. In the WoS categories, Public Environmental Occupational Health category had the maximum publications.

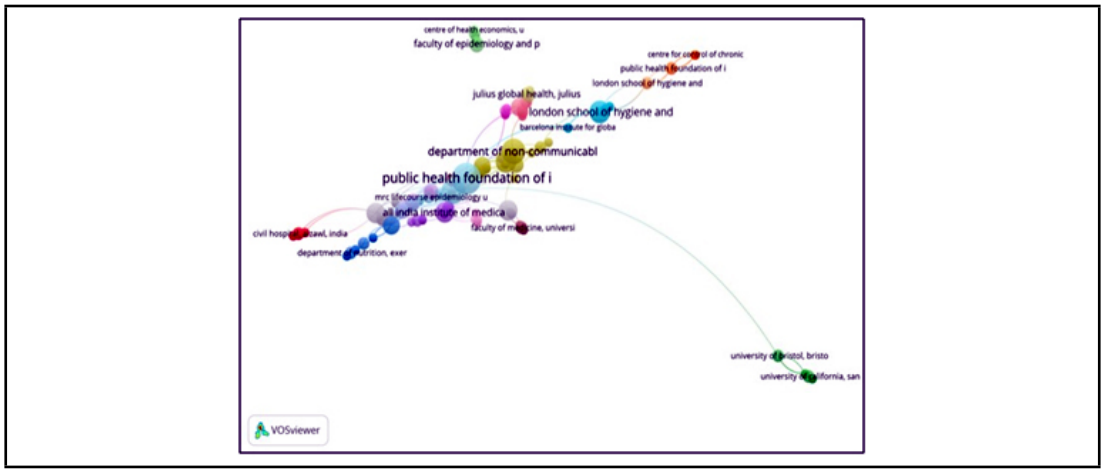
It can be deciphered that these works got a sudden spurt from mid-1990s. United States exhibited a good number of publications. Besides, there is a constant increase in total publications and the highest and maximum can be seen around the year 2021. These were contributed by the London School of Hygiene and Tropical Medicine followed by the Public Health Foundation of India. Third in line was AIIMS, New Delhi. In terms of publications, medicine category had the maximum share at 47.5% followed by 'Other' categories at 11.06%. Maximum co-authorship between countries is observed with the USA and India as distinct clusters as can be seen from Fig.1.



Source:
Authors, 2024

Fig.1: **Co- authorship by Countries on Publications on Alcohol Consumption and Diabetes Among Rural and Urban Men in India (Scopus, 2024)**

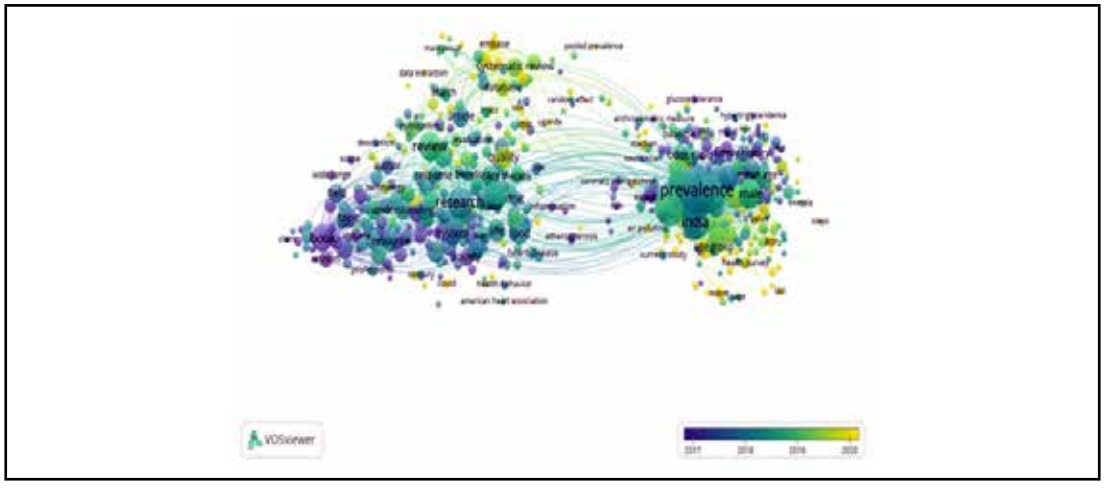
Fig.2. shows the publications by institutions in which a linear clustering can be deciphered with outermost clusters having isolated publications also being visible. The Scopus database results on keywords in abstract and title analysis indicated that there were two distinct clusters on the search. One group highlighted the key words as- prevalence, Kerala, India, age while the other group, which was larger, had the occurrence of research related words as predominant.



Source: *Authors, 2024*

Fig.2: Publications by Institutions and Linkages on Alcohol Consumption and Diabetes Among Urban and Rural Men in India. (Scopus, 2024)

Some of these can be highlighted as- review, research, quality, systematic review and others, as can be seen from Fig.3.



Source: *Authors, 2024*

Fig.3: Title and Abstract Keyword Analysis on Alcohol Consumption and Diabetes Among Urban and Rural Men in India. (Scopus, 2024)

WoS indicates that there were only 10 publications on the topic in the country. The record was generated from 1997 till date. These were cited about 344 times, excluding self-citations and having an h-Index of 9. Table 3 indicates the first 10 author affiliations for publications on the topic. Further scope of publications on the topic is vast for WoS as a very limited research is visible on the topic.

Table 3. Institutes with Publication on the Topic Alcohol Consumption and Diabetes Among Rural and Urban Men in India

Affiliations	% of 10
Christian Medical College Hospital, Vellore	30
London School Of Hygiene Tropical Medicine	20
Navrongo Health Research Center	20
Public Health Foundation Of India	20
University Of London	20
University Of Southampton	20
University Of Witwatersrand	20
African Population Health Research Centre	10
All India Institute Of Medical Sciences , New Delhi	10
Ghana Health Service	10

Source: *Authors, 2024 from WoS, 2022*

b. **Statistical examination of the data on alcohol consumption and Diabetes among rural and urban men**

Results were generated for the data for various parameters selected on multiple statistical aspects using NCSS software. The main aim of this analysis was to observe the correlation between alcohol consumption and '*very high'* Diabetes cases as recorded in the NFHS-5 data.

Table 4: Descriptive Statistics of Alcohol Consumption Rate and Diabetes in Urban and Rural Areas

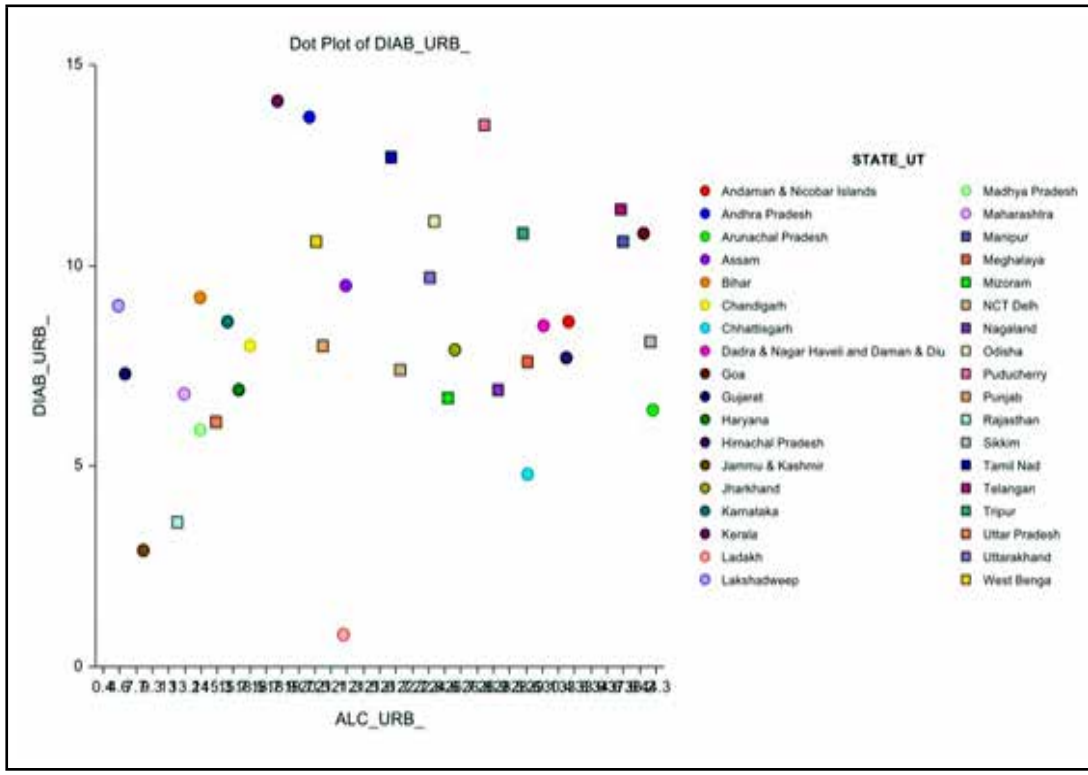
Statistic	ALC_URB	DIA_URB	ALC_RUR	DIA_RUR
Count	36	36	36	36
Sum	799.4	302.2	947	236.3
Mean	22.20555	8.394444	26.30556	6.563889
Standard Deviation	9.690406	2.927988	11.72752	2.543243
Median	21.55	8.05	25.55	6.45
Minimum	0.4	0.8	0.5	2.7
Maximum	44.3	14.1	54.3	13.6
Range	43.9	13.3	53.8	10.9
Variance	93.90397	8.573112	137.5348	6.468087

Source: *Authors, 2024*

The purpose is also to check whether rural- urban scenarios have a significant bearing on Diabetes occurrence as modern lifestyle, sedentary work and other factors associated with urbanity are considered as major trigger behind current day increasing Diabetes cases.

The derivations can be seen as follows:

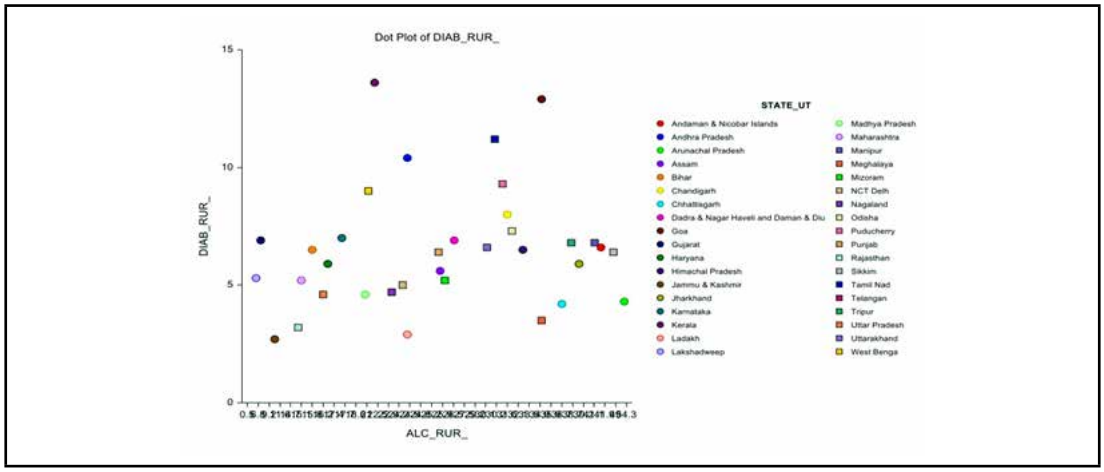
- **Descriptive Statistics:** Table 4 indicates that the mean alcoholism rate in urban regions is 22.2% while in the rural area, it is slightly higher at 26.3%. Interestingly, the range values indicate a wide difference between the lowest recorded and the highest recorded alcoholism rate in both rural and the urban regions. It can be seen from the Table 4, that alcoholism percentage was higher in rural areas as compared to the urban counterpart while '*very high*' Diabetes rate was higher on an average in the urban areas. Fig. 4 and Fig. 5 show the dot plots of alcoholism and '*very high'* Diabetes for the states and UTs of the country for the urban and rural regions, respectively.



Source: *Authors, 2024*

Fig.4: Plotting of Urban Alcoholism and '*Very High'* Diabetes

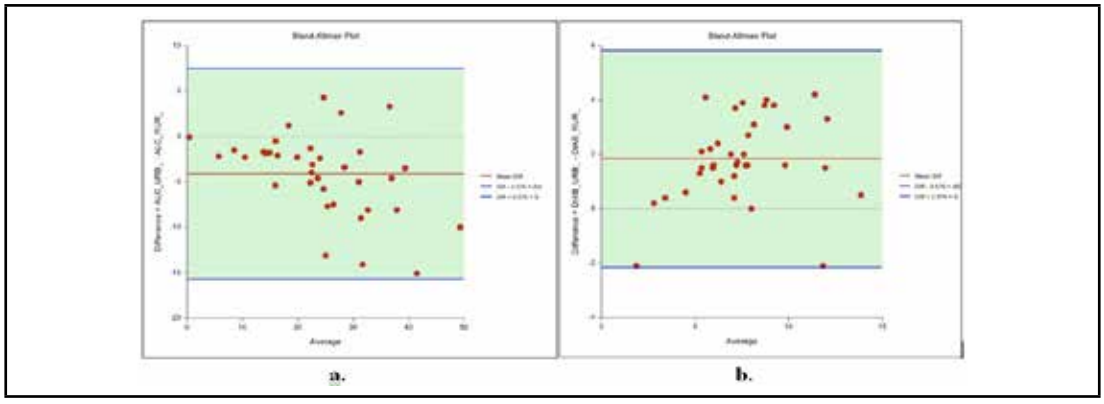
Fig.4. and Fig.5 indicate that no distinct pattern is visible at the state and UT level for both the parameters. However, the values when plotted simultaneously are at the lower end of the spectrum for the rural areas.



Source: *Authors, 2024*

Fig.5: Plotting of Rural Alcoholism and '*Very High*' Diabetes

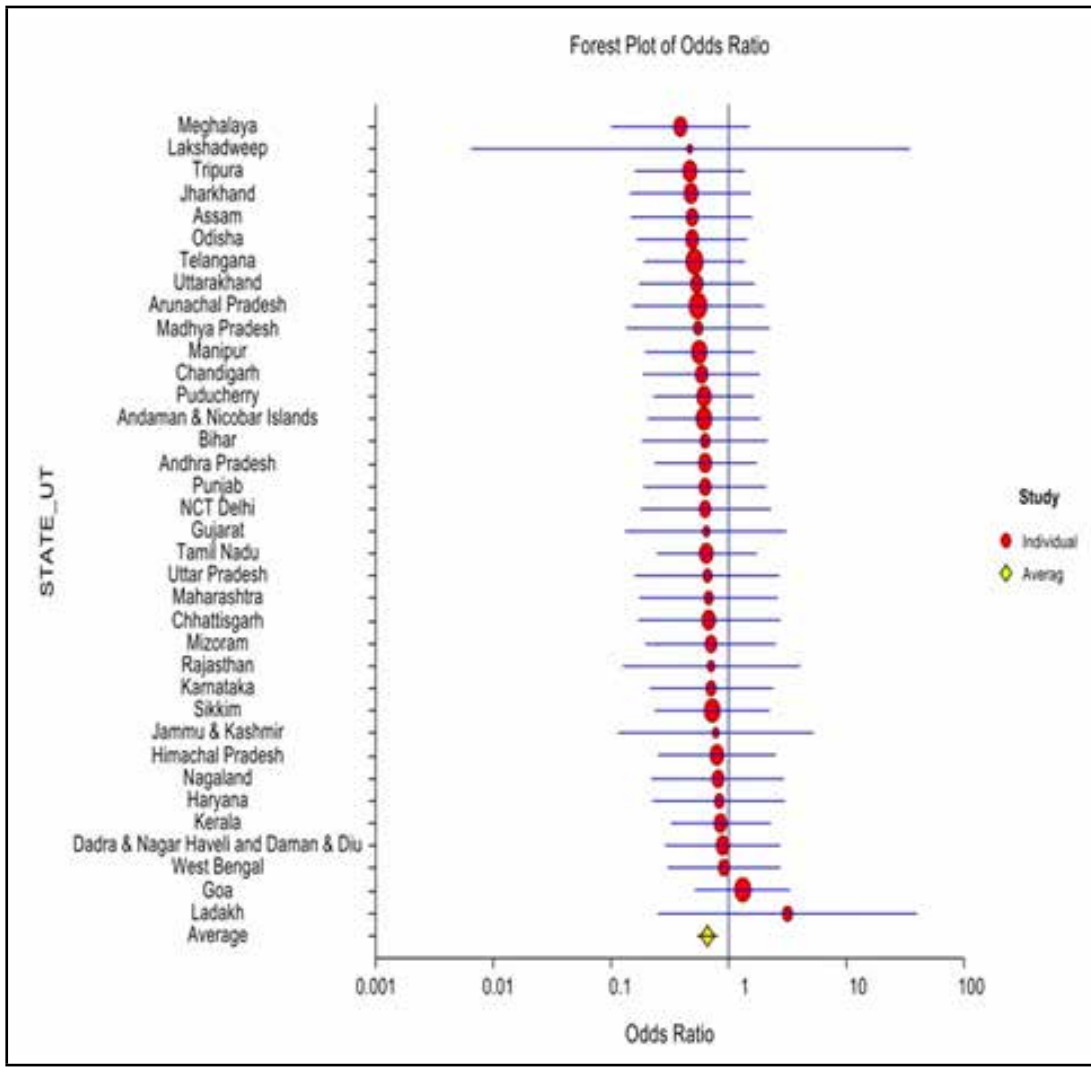
Further examination is done for observing the relationship between the averages and differences through the Bland Altman Plots as can be seen in Fig.6 a. & b. These plots are constructed here for Fig.6 a. Urban and Rural Alcoholism; Fig.6 b. Urban and Rural '*very high*' Diabetes values**.** It can be said that there is again no specific trend for alcoholism and '*very high'* Diabetes for the rural and urban regions. The deviations from the average values with regards to the difference between urban and rural alcoholism, urban and rural Diabetes is again a basic observation. Deviations for mean alcoholism rate is much higher and proceeds towards negative values which indicates that alcohol intake among rural men in India is higher than the urban counterparts. However, for Diabetes, the same cannot be said as these deviations are positive when observed as difference between the urban and rural areas. This supports the average rate findings in which the percentage of '*very high*' Diabetes category is generally higher for the urban areas.



Source: *Authors, 2024*

Fig.6: Bland Altman Plots for a. Urban and Rural Alcohol Consumption, b. Urban and Rural 'Very High' Diabetes

Next examination checks the correlation between the two parameters for the urban and rural regions. The results are shown in Fig.7 and Fig. 8a. & b.



Source: *Authors, 2024*

Fig.7: Plotting of Odds Ratio

It can be calculated that in both the cases there is a weak positive correlation between the two parameters (for alcohol consumption and Diabetes in rural men = 0.2274 and in urban men as 0.1633) which suggests that it cannot be said that '*very high*' Diabetes can be attributed largely to alcoholism except in a few cases.

The examination is enhanced further through the study of measuring association and outcome through meta-analysis of studies by comparing the proportion between the two.

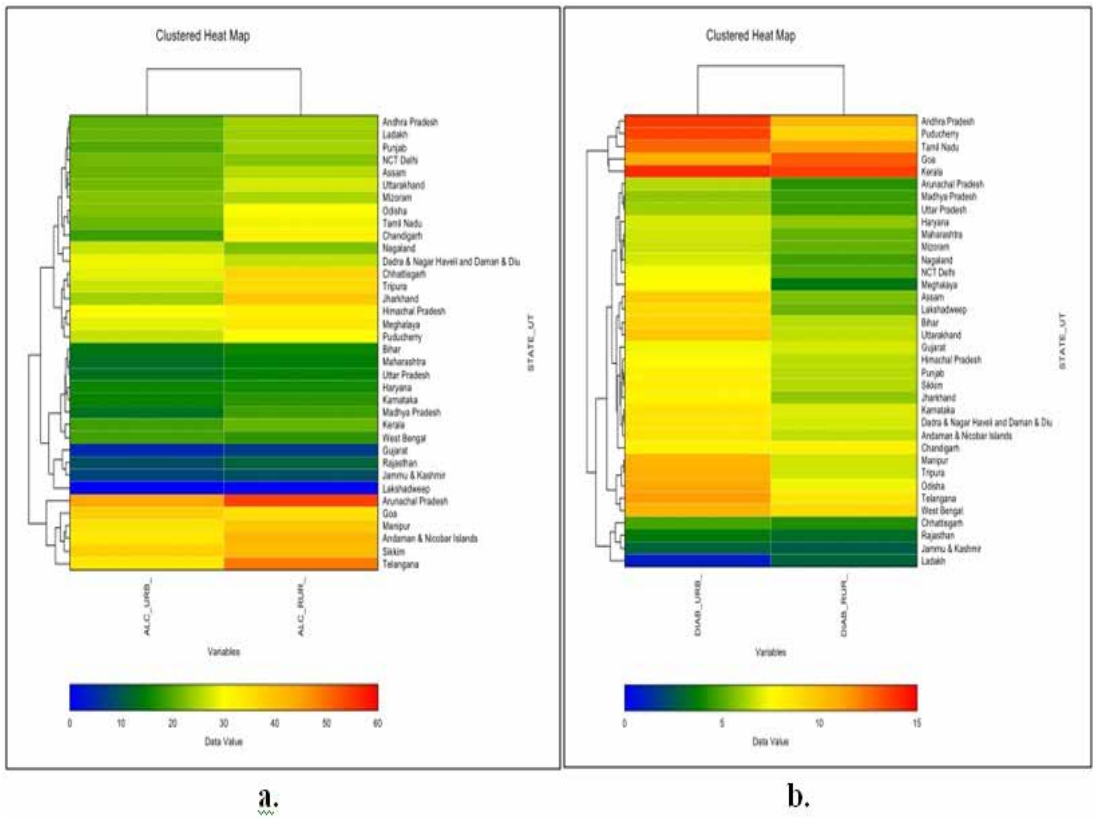
Meta-analysis supports statistical studies by combining all parameters into a single one as is done here through odds ratio and forest plots. The calculations can be seen in Table 5.

Table 5. Odds Ratio of Alcohol Consumption and '*Very High*' Diabetes Among Rural and Urban Men

STATE_UT	**Ratio**	**STATE_UT**	**Ratio**
Combined		**Combined**	
Fixed Model	0.6632	Nagaland	0.8113
Random Model	0.6614	Odisha	0.4943
State/UT	**Ratio**	Punjab	0.6355
Andhra Pradesh	0.6352	Rajasthan	0.7126
Arunachal Pradesh	0.5481	Sikkim	0.7228
Assam	0.4848	Tamil Nadu	0.6493
Bihar	0.626	Telangana	0.5098
Chhattisgarh	0.6819	Tripura	0.4718
Goa	1.3074	Uttar Pradesh	0.6592
Gujarat	0.6394	Uttarakhand	0.5369
Haryana	0.8287	West Bengal	0.9066
Himachal Pradesh	0.7994	Andaman & Nicobar Islands	0.6191
Jharkhand	0.4747	Chandigarh	0.5854
Karnataka	0.7157	Dadra & Nagar Haveli and Daman & Diu	0.8914
Kerala	0.8589	NCT Delhi	0.6373
Madhya Pradesh	0.5533	Jammu & Kashmir	0.7792
Maharashtra	0.6763	Ladakh	3.1606
Manipur	0.5662	Lakshadweep	0.4711
Meghalaya	0.3918	Puducherry	0.6111
Mizoram	0.7022		

Source: *Authors, 2024*

With the exception of Ladakh, it can be interpreted that the Odds Ratio indicates that the exposure is associated with lower odds of outcome beyond the line of no effect as is visible in Fig.7. This supports the other statistical findings that alcohol consumption and Diabetes are not very strongly related although a slight positive correlation is observed between the two and correlation values are more for urban areas. The average OR is also less than 1 providing similar indications and to the generality of the data as having lower outcomes upon exposure. The point estimates indicate the weight assigned to individual units at the 95% confidence interval.



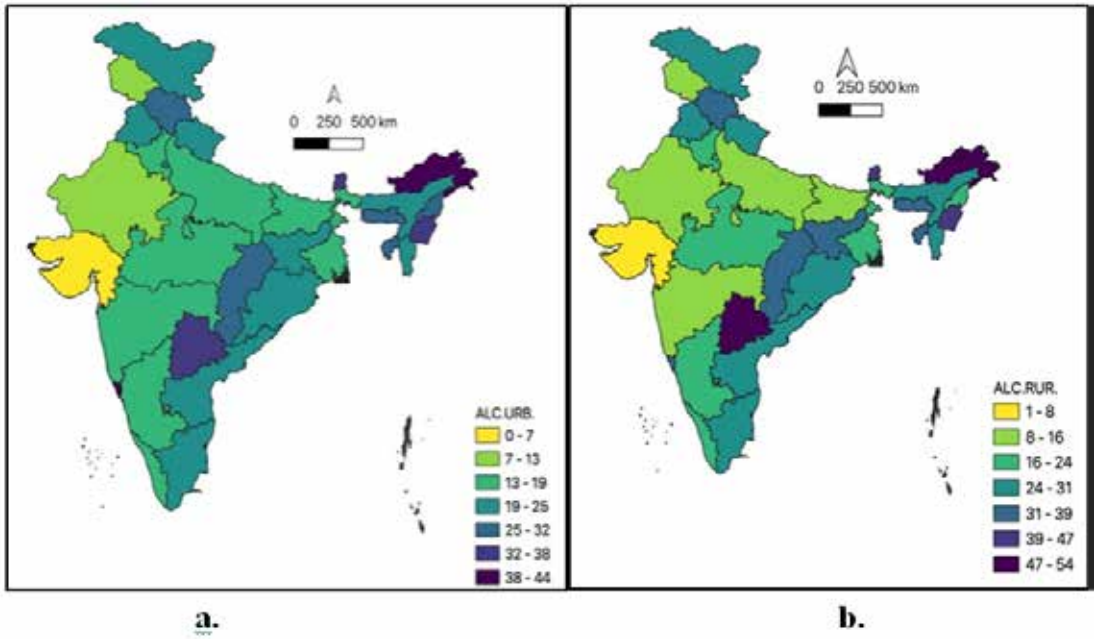
Source: *Authors, 2024*

Fig.8: a. Clustered Heat Map- Alcohol Consumption, b. Clustered Heat Map- Diabetes

The double dendrogram clustered heat maps in Fig.8 a and b., visualise alcoholism and Diabetes respectively. The range of data is much higher for alcoholism. Alcoholism in urban areas ranges from minimum values to average and not reaching the maximum of the range spectrum while for the rural areas this is not so. However, this gets reversed while analysing Diabetes trend, with values ranging from a miniscule to high ranges. For rural areas, it is observed to be from medium to high value ranges in which the maximum is observed for a few states only.

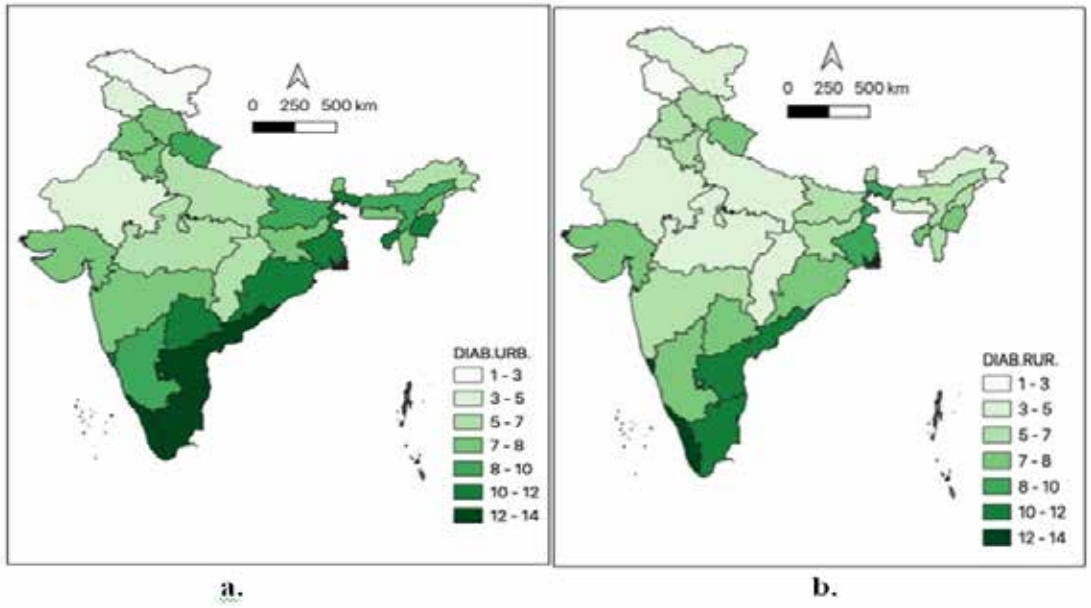
c. Geographical analysis of data on alcohol consumption and Diabetes among rural and urban men

The trends when analysed geographically, seeks to provide a spatial picture of the scenario which well brings out a weak correlation between alcohol consumption and very high Diabetes among men in India. The details can be seen in Fig.9 a. & b. and Fig.10 a. & b. Gujarat shows the minimum alcohol consumption at both the levels. The north-eastern states and Telangana are amongst the highest categories of alcohol consumption. Urban alcoholism is at the higher end for central and south-east India while this is lesser for its rural counterpart.



Source: Authors, 2024

Fig. 9: Geographical Distribution of Alcohol Consumption in India- a. Among Urban Men, b. Among Rural Men (2019-21)



Source: Authors, 2024

Fig.10: Geographical Distribution of 'Very High' Diabetes in India- a. Among Urban Men, b. Among Rural Men (2019-21)

Data for Diabetes indicates that the southern states have the highest values of the disease. With an exception of UTs of Jammu and Kashmir and Ladakh, and Rajasthan, urban Diabetes is prevalent between medium to high ranges. A higher patterning of values can be seen for the states of west to east India. Rural Diabetes, however, shows a mixed pattern but still the southern states and Gujarat move towards higher values.

RESULTS AND CONCLUSIONS

From the above analysis, slightly positive relationship is observed between alcohol consumption and higher levels of Diabetes. The findings are a contribution to literature on the topic and an addition to existing studies which similarly suggest that one cannot point to a single trend over the issue. Type 2 Diabetes poses a severe health risk in current times as numerous studies suggest. It is not only associated with morbidity and mortality but has rather come as a severe concern of present day life. Alcohol is also considered as a source of many diseases and associated mortality as well. However, when the two parameters are combined, there is no evidence of causation and consumption limits in general. But as a good amount of evidence is visible that multiple correlations exist, the current study tends to provide an additional inference of a weak positive correlation between the two elements. Besides, the focus is entirely on the trends observed in urban and rural men, the analysis and findings become specific and peculiar. The NFHS provides information which is first hand, unprecedented, pan-India, authentic and authoritative in the field.

The findings of the current study are indicative of the bibliometric trends, differentials, and geographical distribution. Bibliometric trends show limited publications on the theme and India as being the third most contributor of publications on the topic. Statistical analysis shows the average and correlations of varying degrees, with variations observed for both the parameters. These variations can be explored further for different aspects related to the demographic, dietary, and local variables. The study also stands significant in the light of the fact that India is a signatory to sustainable developmental goals (SDGs) and is committed to reduce its disease burden. The present study contributes to further exploratory analysis on the subject.

Conflict of Interest

The authors declare no potential conflict of interest. Further no funding was received to conduct the research.

REFERENCES

1. Agrawal S. (2015). Frequency of food consumption and self-reported Diabetes among adult men and women in India: A large scale nationally representative cross-sectional study. *J Diabetes Metab,* **6**: 474.
2. Baliunas DO, Taylor BJ, Irving H, Roerecke M, Patra J, Mohapatra S, Rehm J. (2009). Alcohol as a risk factor for Type 2 Diabetes: A systematic review and meta-analysis. *Diabetes Care*. **32**:2123-32.

3. Barik A, Mazumdar S, Chowdhury A, Rai RK (2016). Physiological and behavioral risk factors of Type 2 Diabetes mellitus in rural India. *BMJ Open Diabetes Res Care*; **4**:e000255.

4. Bhalerao SD, Somannavar M, Vernekar SS, Ravishankar R, Goudar SS. (2014). Risk factors for Type 2 Diabetes mellitus in rural population of north Karnataka: a community-based cross sectional study. *Int J Pharm Med Biol Sci*., **3**:1-14.

5. Clarivate (2024). access.clarivate.com.; Available from: https://www.webofscience.com: https://www.webofscience.com/wos/woscc/summary/e8222d5c-74c6-4cf1-b526-1776502c3e83-3d700121/relevance/1.

6. Deedwania PC, Gupta R, Sharma KK, Achari V, Gupta B, Maheshwari A, Gupta A. (2014). High prevalence of metabolic syndrome among urban subjects in India: A multisite study. *Diabetes Metab Syndr.*, **8**:156-61.

7. Ghorpade AG, Majgi SM, Sarkar S, Kar SS, Roy G, Ananthanarayanan PH, Das AK. (2013). Diabetes in rural Pondicherry, India: a population-based study of the incidence and risk factors. *WHO South East Asia J Public Health*., **2**:149-55.

8. Howard AA, Arnsten JH, Gourevitch MN.(2004). Effect of alcohol consumption on Diabetes mellitus. *Annals of Internal Med*., **140**:211-19.

9. Jonas JB, Panda-Jonas S, Nangia V, Joshi PP, Matin A. (2010). Diabetes mellitus in rural India. *Epidemiology*, **21**:754-55.

10. Knott C, Bell S, Britton A. Alcohol consumption and the risk of Type 2 Diabetes (2015). A systematic review and dose-response meta-analysis of more than 1.9 million individuals from 38 observational studies. *Diabetes Care,* **38**:1804-12.

11. Koppes LLJ, Dekker JM, Hendriks HFJ, Bouter LM, Heine RJ. (2005). Moderate alcohol consumption lowers the risk of Type 2 Diabetes: A meta-analysis of prospective observational studies. *Diabetes Care,* **28**:719-25.

12. Mohan V, Mathur P, Deepa R, Deepa M, Shukla DK, Menon GR, Anand K, Desai NG, Joshi PP, Mahanta J, Thankappan KR, Shah B (2008). Urban rural differences in prevalence of self-reported Diabetes in India-The WHO-ICMR Indian NCD risk factor surveillance. *Diabetes Res Clin Pract*., **80**:159-68.

13. Mohan V, Pradeepa R.(2001). Epidemiology of Type 2 Diabetes in India. *Indian J Ophthalmol.* , **69**: 2932-38.

14. Mohan V, Radhika G, Sathya RM, Tamil SR, Ganesan A, Sudha V. (2009). Dietary carbohydrates, glycaemic load, food groups and newly detected Type 2 Diabetes among urban Asian Indian population in Chennai, India (Chennai Urban Rural Epidemiology Study 59). *British J Nutr*., **102**:1498-1506.

15. NFHS (2021) from http://rchiips.org. Ministry of health and family welfare, Government of India; [cited 2024]. Available from: http://rchiips.org: http://rchiips.org/NFHS/NFHS5/

pdf/NFHS%20data%20quality%20assurance.pdf

16. Oommen A, Abraham V, George K, Jose VJ. (2016). Prevalence of risk factors for non-communicable diseases in rural & urban Tamil Nadu. *Indian J Med Res*., **144**:460-71.
17. Pillai A, Nayak MB, Greenfield TK, Bond JC, Nadkarni A, Patel V. (2013).Patterns of alcohol use, their correlates, and impact in male drinkers: a population-based survey from Goa, India. *Soc Psychiatry Psychiatr Epidemiol*., **48**:275-82.
18. Polsky S., Akturk H.K. (2017). Alcohol consumption, Diabetes risk, and cardiovascular disease within Diabetes. *Current Diabetes Reports*.,**17**:136.
19. Ramachandran A, Snehalatha C, Latha E, Manoharan M, Vijay V. (1999). Impacts of urbanisation on the lifestyle and on the prevalence of Diabetes in native Asian Indian population. *Diabetes Res Clin Pract*., **44**: 207-13.
20. Ranasinghe P, Jayawardena R, Gamage N, Sivanandam N, Misra A. (2021). Prevalence and trends of the Diabetes epidemic in urban and rural India: A pooled systematic review and meta-analysis of 1.7 million adults. *Ann Epidemiol*.,**58**:128-48.
21. Riffenburgh R, Gillen D. (2020). *Statistics in Medicine*. Academic Press, London, 795p.
22. Schoonjans F. MedCalc statistical software - free trial available. (2024). Available from: https://www.medcalc.org
23. Scopus Digital Library Platform | College eLibrary | Refread for Digital Libraries.Duelibrary.in. (2024) [cited 2024]. Available from: https://scopus.duelibrary.in/term/analyzer.uri?sort=plf-f&src=s&sid=f196cde87a2887a57ceb6e8bfd03e51b&sot=a&sdt=a&sl=74&s=TITLE-ABS-KEY%28malaria+AND+geography%29+AND+PUBYEAR+%3e+1945+AND+PUBYEAR+%3c+2025&origin=resultslist&count=10&analyzeResults=Analyze
24. Shriraam V, Shriraam M, Arumugam P.(2021). Prevalence and risk factors of Diabetes, hypertension and other non-communicable diseases in a tribal population in South India. *Indian J Endocrinol Metab.*, **25**:313-19.
25. Singh RB, Bajaj S, Niaz MA, Rastogi SS, Moshiri M. (1998). Prevalence of Type 2 Diabetes mellitus and risk of hypertension and coronary artery disease in rural and urban population with low rates of obesity. *Int J Cardiol*.,**66**:65-72.
26. Sujata and Thakur R. (2021). Unequal burden of equal risk factors of Diabetes between different gender in India: A cross-sectional analysis. *Sci Rep*. ,**11**: 22653.
27. Szumilas M. (2010). Explaining odds ratios. *J Can Acad Child Adoles Psychiatry*, **19**:227-29.
28. Unnikrishnan R, Anjana RM, Mohan V.(2016). Diabetes mellitus and its complications in India. *Nat Rev Endocrinol*.,**12**:357-70.
29. Wannamethee SG, Shaper AG, Perry IJ, Alberti KM. (2002).Alcohol consumption and the incidence of Type II Diabetes. *J Epidemiol Community Health*. , **56**:542-548.

30. Warner RM. (2013). *Applied statistics: From bivariate through multivariate techniques*. Sage Publications, Thousand Oaks, California, 1172p.
31. WHO (2022). Who.int. Available from: https://www.who.int:https://www.who.int/news-room/fact-sheets/detail/Diabetes#:~:text=Diabetes%20is%20a%20chronic%20disease,hormone%20that%20regulates%20blood%20glucose.
32. WoS. (2022). https://www.webofscience.com
33. Yadav A, Prasad J, Shekher C, Vishvakarma M. (2017). A study of morbidity pattern among elderly population in urban India. *J Soc Health Diabetes*, **5**:100-6.
34. Yesudian CA, Grepstad M, Visintin E, Ferrario A. (2014).The economic burden of Diabetes in India: A review of the literature. *Global Health*, **10**:80.

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INCOME INEQUALITY AND ECONOMIC GROWTH: A STUDY OF DEVELOPING COUNTRIES

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ABSTRACT

This study examines the complex relationship between income inequality and economic growth in developing countries, focusing on implications for sustainable development. Despite notable economic growth in nations like Brazil, South Africa, and India, rising income inequality raises concerns about social stability and equitable resource distribution. Using the Gini coefficient to measure inequality, the study highlights how socioeconomic factors—such as governance, education, and healthcare access—shape this relationship. Case studies from Bangladesh and Vietnam demonstrate that targeted policies (e.g., social programs, human capital investment) can reduce inequality and foster inclusive growth. The findings underscore the need for comprehensive policy frameworks prioritizing equitable resource allocation and economic diversification to ensure long-term prosperity.

Keywords: Income inequality, economic growth, developing countries, Gini coefficient, sustainable development, poverty reduction, human capital.

INTRODUCTION

Income inequality and economic growth are intertwined phenomena that significantly influence the development trajectories of nations, particularly in developing economies. While economic growth can increase aggregate wealth, it often fails to ensure equitable income distribution, exacerbating poverty among marginalized groups. Growing wealth inequality has raised questions about social stability and long-term economic viability in nations including Bangladesh, Vietnam, the Philippines, India, Brazil, South Africa, Mexico, Indonesia, Nigeria, and Pakistan. According to research, economic expansion does not always result in a fair distribution of income, even if it might raise aggregate wealth (Piketty, 2014). For instance, discussions concerning the inclusiveness of India's growth model have been sparked by the country's fast economic progress and the growing wealth disparity that has followed it (Kumar & Singh, 2020). Similarly, despite notable economic progress, Brazil has struggled to reduce income inequality, underscoring the need for policies that support fair growth (López

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& Servén, 2018). The goal of this research is to examine the intricate connection between economic growth and income inequality in these emerging nations. This study explores these dynamics across aforesaid ten developing countries, analyzing how inequality impacts social cohesion and economic performance.

Conceptual Framework: Comprehending Economic Growth and Income Inequality

Establishing a theoretical framework that captures the processes at work is crucial to understanding the complex link between income disparity and economic development. According to theories of economic growth like the Solow Growth Model, the main forces influencing economic performance are technical development, labour force expansion, and capital accumulation. These models, however, frequently ignore how income distribution affects growth results. For instance, according to the Kuznets Curve, income disparity rises in the early phases of economic growth but gradually falls as a nation gains wealth (Kuznets, 1955). Although this theory suggests that economic expansion may eventually result in less inequality, this hasn't always been the case in reality.

The connection between growth and income disparity seems more nuanced in many emerging nations. By restricting the lower-income population's access to healthcare and education, high levels of inequality might hinder economic growth by lowering the development of human capital (Galor & Zeira, 1993). Furthermore, because the rich prefer to hoard their money rather than spend it, a concentration of wealth in the hands of a few number of people may result in a decline in aggregate demand. In nations like South Africa, where income inequality is still among the greatest in the world, this issue is especially noticeable and contributes to slow economic development even in the face of significant richness in natural resources (World Bank, 2021).

Furthermore, the link between economic development and income disparity is mediated in large part by political and social issues. Political instability may be more likely to occur in countries with extreme inequality because disadvantaged groups may turn to demonstrations or other kinds of unrest to call for a more equitable allocation of resources. Economic growth may be hampered by this volatility since it may discourage both domestic and international investment. For example, economic inequality has contributed to Nigeria's considerable political unrest, which has limited the country's ability to thrive (Adeleke, 2020). Therefore, creating successful policies that support inclusive development requires knowledge of how income disparity, political stability, and economic growth interact.

REVIEW OF LITERATURE

T. Piketty (2014). In his seminal work '*Capital in the Twenty-First Century'*, Piketty explores the changes in income inequality over the past three centuries. He contends that inequality tends to rise when the rate of return on capital outpaces the rate of economic growth. In emerging nations, where capital accumulation frequently outpaces development and widens economic gaps, this idea is especially pertinent. For these impacts to be lessened, Piketty contends that wealth redistribution and progressive taxation are required.

A. De Janvry and E. Sadoulet (2016). Their study of Brazil demonstrates the effectiveness of social programs like *Bolsa Família*, which are designed to lessen inequality and poverty. They discover that by boosting spending among low-income households, these initiatives not only enhance income distribution but also promote economic development. This implies a positive feedback loop in which economic development can be stimulated by lowering inequality.

M. Ravallion and G. Datt (2002). Ravallion and Datt examine the connection between economic growth and poverty alleviation in their study of India. They discover that although India's economy has grown significantly, the advantages have not been shared equally, which has resulted in a rise in inequality. Their results highlight the necessity of focused health and education initiatives to guarantee that progress leads to fair results.

J. Seekings, and N. Nattrass (2005). Seekings and Nattrass investigate how the historical background of South Africa affects the country's economic performance and wealth disparity now. They contend that long-standing disparities brought forth by apartheid impede economic development. According to their research, sustainable growth depends on resolving these inequities through extensive policy changes.

World Bank, 2018. The significance of governance in tackling income disparity is covered in the World Bank's study on Indonesia. It draws attention to the fact that ineffective institutions impede economic progress by causing uneven income distribution. In order to guarantee that economic gains are distributed more equitably, the paper promotes changes targeted at improving governance and accountability.

P. Collier and B. Goderis (2007). The conundrum of resource-rich nations like Nigeria, where richness from natural resources has not resulted in widespread economic progress, is examined by Collier and Goderis. They contend that mishandling oil profits makes wealth disparity worse and that more fair growth may result from resource management that is transparent.

M. Hossain (2016). According to Hossain's research on Bangladesh, social indices like health and education have improved along with economic progress, which has lessened wealth disparity. He stresses that in order to sustain this trend, strong government policies focused on social welfare and infrastructural development are essential.

P. Glewwe and G. Hall (2011). The influence of the Doi Moi reforms, which moved Vietnam towards a market economy, is the main topic of their study. They discover that although these changes boosted economic expansion, these also increased wealth disparity. The authors advise that measures be put in place by the government to guarantee that the advantages of expansion are shared fairly, especially in rural regions.

A. M. Balisacan and H. Hill (2003). Balisacan and Hill investigate how education might help alleviate Philippines' wealth disparity. According to their results, spending on education may greatly improve economic performance and lessen wealth inequality. They support laws

that increase underprivileged populations' access to high-quality education.

A. R. Khan (2019). Khan looks at fundamental issues of Pakistan's economy, emphasizing how development is hampered by economic disparity. He contends that in order to establish a more equal economic environment, improvements in social services, land allocation, and taxes are necessary. According to his research, more sustained economic development may result from resolving these structural problems.

G. A. Cornia (2004). Cornia offers a comparative study of economic development and income disparity in a number of developing nations. He contends that more sustainable economic development is typically seen in nations with more fair income distribution. His findings provide credence to the notion that lowering inequality is both an economic and moral requirement for sustained progress.

International Monetary Fund (IMF) (2015). In its studies on emerging economies, the IMF highlights the significance of inclusive growth. It makes the case that measures that advance income equality can improve economic development and stability. In order to alleviate inequality and promote a more stable economic climate, the group supports tax and social expenditure changes.

S. Klasen (2018). The effect of gender disparity on economic growth in emerging nations is highlighted by Klasen's studies. He contends that reducing the gender gap in labour force participation and education may greatly improve economic performance. According to his results, attaining sustainable development requires policies that support gender equality.

A. Deaton (2013). Deaton talks on the connection between economic development and health inequity. He contends that low-income groups are disproportionately impacted by poor health outcomes, which restricts their access to economic possibilities. His study emphasizes how crucial it is to fund nutrition and health care in order to lessen inequality and spur economic growth.

N. Stern (2007). Stern explores the relationship between income inequality and environmental sustainability, contending that the impoverished are disproportionately impacted by environmental deterioration. According to his research, in order for sustainable development strategies to be successful, income disparity must also be addressed. For emerging nations dealing with the dual issues of environmental sustainability and economic growth, this viewpoint is especially pertinent.

OBJECTIVE

- To examine the connection between economic development and income disparity, particularly in emerging nations;
- To assess the impact of different income distribution levels on metrics of economic performance in emerging countries;
- To determine the socioeconomic elements that influence the relationship between growth

and income disparity in emerging nations;

- To suggest specific legislative measures that might reduce wealth disparity and promote economic expansion in emerging nations.

ECONOMIC GROWTH AND UNEQUAL INCOME IN DEVELOPING COUNTRIES

In many emerging nations, income inequality is still a major problem that affects social stability and economic progress. The inequality in income distribution has been connected to a number of socioeconomic characteristics, such as education, work prospects, and resource accessibility, in countries such as Bangladesh, Vietnam, the Philippines, Mexico, Indonesia, Nigeria, South Africa, India, Brazil, and Pakistan. In these emerging countries, growing income disparity frequently coexists with economic expansion as shown by GDP growth rates. Brazil and India, for example, have had tremendous economic expansion in recent decades, but this progress has not been divided fairly. Large portions of the population live in poverty as a result of the money created tending to concentrate among the wealthiest members of society. Similarly, when underprivileged populations find it difficult to gain from national economic policy, nations like South Africa and Mexico demonstrate how economic progress may coexist with enduring inequality. This dynamics highlights the necessity of focused initiatives meant to lower inequality and encourage long-term, steady economic growth.

The intricate connection between economic development and income disparity is further demonstrated by poverty rates. High rates of poverty coexist with economic progress in nations like Bangladesh and Nigeria, indicating that growth does not always result in higher living conditions for all residents. Comprehensive policy frameworks emphasizing fair resource allocation, improving educational possibilities, and encouraging inclusive economic practices are necessary to address these problems. Policymakers may better understand the relationship between income inequality and growth and put policies into place that support social justice and economic development by looking at these socioeconomic issues.

GINI COEFFICIENT

A statistical indicator of income disparity within a country or group is the Gini coefficient. It goes from 0 to 1, where

- 0 denotes full equality, or that all people make the same amount of money.
- 1 denotes complete inequality, in which one individual receives all income and everyone else receives none.

In this regard, the Gini coefficient aids in our comprehension of the income distribution over time among each nation's citizens. With values ranging from 0 (absolute equality) to 1 (perfect inequality), the Gini coefficient is a crucial metric for measuring income disparity. Significant income gaps are indicated by high Gini coefficients in these nations, which can impede overall economic growth and worsen poverty rates. A thorough analysis of the Gini coefficient statistics for the chosen developing nations between 2011 and 2024 can be seen in Table 1.

Table 1: Gini Coefficient

Country	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
India	0.33	0.34	0.34	0.35	0.36	0.36	0.35	0.35	0.36	0.37	0.38	0.38	0.39	0.39
Brazil	0.52	0.51	0.51	0.49	0.49	0.49	0.48	0.47	0.46	0.53	0.54	0.53	0.52	0.51
South Africa	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.61	0.63	0.61	0.60	0.59	0.58
Mexico	0.48	0.48	0.48	0.48	0.47	0.46	0.45	0.45	0.44	0.46	0.45	0.44	0.43	0.42
Indonesia	0.39	0.39	0.39	0.39	0.40	0.40	0.39	0.38	0.37	0.38	0.39	0.38	0.37	0.36
Nigeria	0.48	0.49	0.50	0.50	0.51	0.51	0.52	0.53	0.54	0.55	0.56	0.56	0.57	0.58
Bangladesh	0.32	0.31	0.30	0.30	0.29	0.29	0.28	0.27	0.27	0.26	0.26	0.25	0.25	0.24
Vietnam	0.37	0.36	0.35	0.35	0.34	0.34	0.33	0.32	0.31	0.30	0.30	0.29	0.28	0.28
Philippines	0.44	0.43	0.42	0.41	0.40	0.40	0.39	0.38	0.37	0.36	0.36	0.35	0.34	0.34
Pakistan	0.30	0.31	0.32	0.32	0.33	0.34	0.34	0.35	0.36	0.37	0.37	0.38	0.39	0.39

Source: World Bank, Global Database on Income Inequality (2011 to 2025)

The data for the chosen developing nations during the last ten years shows a range of income inequality trends, which reflects the intricate socioeconomic factors at work. For example, India's Gini coefficient increased significantly, from 0.33 in 2011 to 0.39 in 2024. This increasing tendency draws attention to a widening income gap that might have been caused by the economy's explosive expansion that hasn't been distributed fairly among the populace. Even if industries like technology and services have advanced significantly, the wealthy have disproportionately benefited, widening the wealth divide. The sustainability of prosperity and social stability are called into question in this scenario because growing inequality might impede general progress and make poverty worse.

Bangladesh and Vietnam, on the other hand, provide more upbeat stories, as seen by the notable drops in their Gini coefficient values. Bangladesh's coefficient dropped from 0.32 in 2011 to 0.24 in 2024, indicating effective measures to reduce poverty and inclusive economic policies that have made it possible for a larger portion of the populace to gain from economic expansion. Comparably, within the same time period, Vietnam's Gini coefficient decreased from 0.37 to 0.28, demonstrating efficient governance and focused measures that have supported growth that is equal. These nations provide examples of undertaking effective policies in promoting economic growth and lowering income inequality, both of which enhance the general standard of living for their populations.

Nigeria and South Africa, on the other hand, are still struggling with high levels of inequality; Nigeria's Gini coefficients have increased from 0.48 to 0.58, while South Africa's has declined from 0.63 to 0.58, but still significantly high. One of the most unequal nations in the world, South Africa, continues to have high levels of inequality, which highlights the problems caused by systematic socioeconomic inequities and the historical legacy of apartheid. The challenges of running a varied economy beset by political unrest, corruption, and poor infrastructure are reflected in Nigeria's growing Gini coefficient. These instances show that

whereas some countries achieve significant progress in lowering inequality, others have long-standing obstacles that impede development and need for specialized strategies to meet their particular problems. Policymakers must comprehend these developments in order to develop successful policies that promote a more fair distribution of wealth, which will eventually promote social cohesion and sustained economic growth.

Another important economic indicator that shows the general health and performance of a nation's economy is the GDP growth rate. Usually given as a percentage, it calculates the rise in the value of all products and services produced during a certain time period. Let us have a look at their respective growth rates.

TABLE 2: GDP GROWTH RATE

Country	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
India	6.6	5.5	6.4	7.2	8.0	8.0	7.0	6.1	4.0	-7.3	8.9	7.0	6.5	6.0
Brazil	3.9	1.9	3.0	0.5	-3.8	-3.6	1.1	1.3	1.1	-4.1	5.2	2.8	2.5	2.0
South Africa	3.3	2.2	2.5	1.6	1.2	0.6	1.4	0.8	0.2	-7.0	4.9	2.0	1.8	1.5
Mexico	4.0	4.0	1.4	2.2	3.3	2.9	2.1	2.0	0.1	-8.2	5.0	3.0	2.5	2.2
Indonesia	6.5	6.2	6.0	5.0	4.9	5.0	5.1	5.2	5.0	-2.1	3.7	5.3	5.0	5.5
Nigeria	4.9	4.3	5.4	6.3	2.7	-1.6	0.8	1.9	2.2	-1.8	3.4	3.5	4.0	4.5
Bangladesh	6.1	6.3	6.0	6.1	5.5	7.1	7.3	7.9	8.2	3.4	6.9	6.5	6.0	6.5
Vietnam	6.2	5.3	5.4	6.0	6.7	6.2	6.8	7.1	7.0	2.9	5.0	8.0	6.5	6.0
Philippines	3.7	6.8	7.2	6.1	6.0	6.9	6.3	5.9	6.0	-9.6	5.7	7.6	6.0	5.5
Pakistan	3.7	3.8	4.4	4.1	4.5	4.6	5.5	5.8	3.3	-0.9	5.6	6.1	5.8	5.5

Source: International Monetary Fund (IMF), World Economic Outlook Database (2011 to 2025)

There are notable differences between the GDP growth rates of the chosen developing nations between 2011 and 2024, which are suggestive of the distinct economic conditions and difficulties faced by each nation. For example, India has seen strong growth, with rates reaching a peak of 8.9% in 2021 after the COVID-19 pandemic caused a steep contraction of (-)7.3% in 2020. Driven by robust domestic demand and government measures to improve manufacturing and infrastructure, this resurgence demonstrates India's resilience and potential for a swift economic recovery. The anticipated drop to 6.0% in 2024, however, raises questions about how to maintain such growth in the face of growing inflation and unpredictability in the global economy.

Brazil, on the other hand, has had an erratic economic path, with notable variations in GDP growth over time. Brazil had a severe recession in 2015–2016, following a peak of 3.9% in 2011, which led to negative growth rates and a gradual recovery. Brazil's challenges with political unpredictability, poor economic management, and outside shocks like shifting commodity prices are reflected in the erratic growth rates, which include a meagre 2.0% projection for 2024. This scenario demonstrates the difficulties resource-dependent countries confront, as their reliance on exports can make them vulnerable to shifts in the global market.

Vietnam and Bangladesh, on the other hand, offer remarkable success stories in terms of steady economic expansion. Over the past ten years, Bangladesh has maintained a stable economic trajectory, with rates ranging from 6.0% to 8.2%, propelled by its booming textile industry and remittances from workers abroad. Living standards have increased and poverty has significantly decreased as a result of this steady rise. In a similar vein, Vietnam's GDP growth rates have been strong, with estimates for 2024 ranging from 6.0% to 6.5%. The nation's economic reforms, which have encouraged foreign investment and export-led development, have been essential in the shift from a centrally planned to a more market-oriented economy. These instances highlight how crucial solid economic policies and structural changes are to attaining sustainable growth, especially in developing nations with substantial economic transformation potential. In order to develop policies that not only encourage economic growth but also guarantee that the advantages are distributed fairly throughout the populace, policymakers must have a thorough understanding of these growth dynamics.

Poverty rates, which represent the proportion of the population living below a specified poverty level, are an important indicator of a nation's economic and social health. When the poverty rates of a few chosen emerging nations are examined throughout 2011 and 2024, important patterns emerge that show both advancements and enduring difficulties.

Table 3: Poverty Rates

Country	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
India	29.8	29.5	29.0	28.5	28.0	27.0	26.0	25.7	25.0	22.0	20.0	19.0	18.5	18.0
Brazil	25.4	24.8	24.5	24.0	24.0	25.0	25.0	25.0	24.0	27.0	28.0	26.5	25.0	24.5
South Africa	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	27.0	27.0	26.0	25.0	24.0
Mexico	23.0	22.0	21.0	20.0	19.0	18.0	17.0	17.0	16.0	30.0	29.0	28.0	27.0	26.0
Indonesia	11.0	10.9	10.7	10.6	10.4	10.0	9.8	9.4	9.2	9.0	8.5	8.0	7.8	7.5
Nigeria	62.6	61.2	60.0	59.0	58.0	57.0	56.0	55.0	54.0	55.0	53.0	52.0	50.0	48.0
Bangladesh	31.5	30.0	29.0	28.0	27.0	26.0	25.0	24.0	23.0	21.0	20.0	19.0	18.5	18.0
Vietnam	14.5	13.5	12.5	11.5	10.5	9.5	8.5	7.5	6.5	5.5	5.0	4.5	4.0	3.5
Philippines	25.0	24.0	23.0	22.0	21.0	20.0	19.0	18.0	17.0	23.0	22.0	21.0	20.0	19.5
Pakistan	35.0	34.0	33.0	32.0	31.0	30.0	29.0	28.0	27.0	26.0	25.0	24.0	23.0	22.5

Source: World Bank, Poverty and Equity Database (2011 to 2025)

From the Table 3 above, it is seen that India has significantly reduced poverty, with rates falling from around 30% in 2011 to about 18% by 2024. Numerous causes, such as economic expansion, easier access to education, and focused government initiatives to enhance social welfare, might be the reason for this decline. Notwithstanding these advancements, the COVID-19 pandemic's aftereffects have presented difficulties and may undo some of the previous advances. The necessity for specialized strategies to overcome regional disparities is further highlighted by the differences in poverty rates throughout India's states.

Positively, during the previous ten years, nations like Vietnam and Bangladesh have been able to drastically lower their rates of poverty. Bangladesh's poverty rate has dropped from over 31% in 2011 to 20% in 2024, due to targeted investments in education, healthcare, and robust economic growth. Vietnam has also made impressive strides, reducing its poverty rate from 20% to around 8% in the same time frame. These achievements show how successful can be focused interventions and inclusive growth tactics that emphasize strengthening underserved groups. These nations' experiences show that significant progress in eradicating poverty is achievable with the correct investments and policies, which will ultimately result in more social fairness and a higher standard of living. Policymakers must comprehend these processes in order to develop long-term policies that alleviate poverty and foster economic resilience.

DISTRIBUTION OF INCOME & ITS IMPACT ON ECONOMIC PERFORMANCE OF NATIONS

Economic performance in developing countries is greatly impacted by income distribution, which also has an impact on a number of socioeconomic indices, including inflation, unemployment, and the Human Development Index (HDI). Because marginalized people frequently lack access to high-quality education and work prospects, wealth distribution discrepancies can result in higher unemployment rates in nations like South Africa, Brazil, and India. Brazil, for example, has a history of limited economic mobility for the lower-income groups due to the concentration of wealth within a tiny fraction of the population, which feeds the cycle of unemployment and poverty. Similar to this, structural unemployment—where some groups are disproportionately impacted by unemployment because of institutional barriers—has been connected to high levels of economic inequality in South Africa and India.

Considering variables like life expectancy, education, and per capita income, the Human Development Index (HDI) provides a thorough assessment of a nation's overall progress. Low HDI ratings are frequently associated with significant income inequality in countries such as Nigeria and Indonesia, suggesting that money is not allocated fairly among the populace. Because a sizable portion of the population is still ill and uneducated, which limits their capacity to make meaningful contributions to the economy, this unequal distribution impedes both social advancement and economic expansion. Additionally, nations like Bangladesh and Mexico serve as examples of how unequal wealth distribution may worsen social unrest and impede economic stability, which in turn impacts these economies' overall performance.

Additionally, average inflation rates are essential for comprehending how income distribution affects economic performance. Since low-income households in developing countries tend to spend a bigger amount of their income on necessities, excessive inflation might disproportionately burden them. For instance, growing inflation rates have reduced purchasing power in Pakistan and the Philippines, making it more difficult for lower-income households to satisfy their basic requirements. Increased social discontent and economic instability may result from this circumstance, making attempts to attain equal growth even

more challenging. In these emerging nations, addressing the issues of income distribution is crucial to promoting long-term economic success.

TABLE 4: UNEMPLOYMENT RATES

Year	India (%)	Brazil (%)	South Africa (%)	Mexico (%)	Indonesia (%)	Nigeria (%)	Bangladesh (%)	Vietnam (%)	Philippines (%)	Pakistan (%)
2011	3.6	6.0	25.0	4.9	6.5	23.9	4.2	4.6	7.0	6.0
2012	3.8	6.4	25.5	5.0	6.2	24.0	4.5	4.5	6.8	6.5
2013	4.0	6.8	25.0	5.1	6.0	24.0	4.8	4.2	7.0	6.8
2014	4.0	6.7	25.0	4.9	5.9	24.0	4.5	4.0	6.5	6.9
2015	4.9	9.0	25.1	4.5	5.5	27.0	4.0	4.0	6.3	6.8
2016	5.0	11.5	26.7	4.5	5.0	33.1	4.5	4.0	6.5	6.7
2017	4.0	12.0	27.0	3.9	4.8	28.0	4.0	2.5	5.5	6.5
2018	3.5	12.0	27.5	3.6	4.5	27.0	4.0	2.4	5.2	6.5
2019	5.0	11.9	32.0	3.5	4.2	27.1	4.0	2.2	5.0	6.4
2020	8.0	13.5	34.0	4.0	7.1	33.5	5.0	2.4	17.7	7.0
2021	7.0	14.7	34.0	4.5	6.5	33.0	4.5	2.5	8.0	6.9
2022	6.5	11.5	33.5	4.0	5.8	35.0	4.0	2.5	5.5	6.8
2023	6.0	9.5	33.0	3.5	5.0	34.0	4.0	2.0	5.0	6.5
2024	6.5	11.9	34.0	4.0	5.5	33.3	4.5	2.2	5.0	6.5

Source: World Bank Data, International Labour Organization and National Statistical Offices (2011 to 2025)

From 2011 to 2024, the unemployment rates in the ten emerging nations that were chosen show notable variances that are a reflection of both labour market dynamics and economic situations. For example, during the COVID-19 pandemic, India's unemployment rate significantly increased, going from 5.0% in 2016 to 8.0% in 2020. The interruption of economic activity and the high reliance on informal work, which left many people jobless and unemployed, are to blame for this surge. The unemployment rate in India, however, stabilized at around 6.5% in 2024, indicating a slow resumption of economic activity and job creation.

Nigeria and South Africa, on the other hand, had consistently high unemployment rates; in 2020, Nigeria's rate was at 33.5%, while in 2024, South Africa's rate remained at about 34.0%. These high unemployment rates are a sign of structural problems in their economies, such as South Africa's systemic inequality and Nigeria's reliance on oil exports. These nations' inability to create work exacerbates poverty and impedes economic progress, underscoring the urgent need for focused policies meant to boost employment through investment and diversification of industries capable of producing long-term jobs.

Over the course of the decade, nations like Bangladesh and Vietnam have maintained comparatively low unemployment rates. In recent years, Vietnam has seen its unemployment rate drop to as low as 2.0%, while Bangladesh has continuously maintained rates below 5%. Strong manufacturing sectors and export-focused policies that boost employment and economic stability are associated with their economic resilience. The disparate patterns of unemployment in these countries highlight how crucial economic diversification, education, and skill development are to influencing labour market outcomes and enhancing overall economic performance in emerging nations. These nations may promote a better just economic climate that benefits their entire population by tackling the root causes of unemployment and emphasizing inclusive growth.

TABLE 5: HUMAN DEVELOPMENT INDEX

Year	India	Brazil	South Africa	Mexico	Indonesia	Nigeria	Bangladesh	Vietnam	Philippines	Pakistan
2011	0.586	0.686	0.629	0.686	0.617	0.527	0.558	0.676	0.629	0.565
2012	0.586	0.688	0.630	0.688	0.618	0.530	0.563	0.678	0.634	0.570
2013	0.586	0.691	0.631	0.693	0.619	0.533	0.565	0.680	0.637	0.572
2014	0.586	0.693	0.632	0.694	0.620	0.536	0.568	0.682	0.640	0.575
2015	0.588	0.694	0.634	0.694	0.621	0.537	0.570	0.684	0.642	0.578
2016	0.590	0.696	0.634	0.695	0.622	0.532	0.572	0.685	0.644	0.580
2017	0.592	0.698	0.635	0.696	0.623	0.535	0.576	0.688	0.645	0.582
2018	0.634	0.699	0.636	0.697	0.624	0.539	0.580	0.690	0.646	0.585
2019	0.647	0.700	0.637	0.698	0.625	0.532	0.583	0.692	0.648	0.588
2020	0.645	0.698	0.637	0.696	0.626	0.540	0.585	0.694	0.649	0.590
2021	0.640	0.695	0.634	0.695	0.628	0.542	0.588	0.695	0.650	0.592
2022	0.642	0.694	0.634	0.696	0.629	0.545	0.590	0.696	0.651	0.593
2023	0.645	0.693	0.635	0.698	0.630	0.548	0.592	0.697	0.652	0.595
2024	0.647	0.692	0.636	0.699	0.631	0.550	0.595	0.698	0.653	0.596

Source: United Nations Development Programme (UNDP) Reports (2011 to 2025) & World Development Indicators

A composite indicator of wealth, education, and health, the Human Development Index (HDI) offers a thorough picture of people's well-being across nations. India's HDI increased gradually between 2011 and 2024, rising from 0.586 in 2011 to 0.647 in 2024. This improvement is a result of improvements in economic growth, educational achievement, and healthcare access. The notable increase in India's HDI in 2018 was due to economic changes intended to raise living standards and productivity as well as more spending in health and education. The unequal rate of improvement, however, suggests that issues like poverty and inequality still exist and must be addressed in order to maintain advancement.

In comparison, the HDI values of Brazil and South Africa have grown more slowly; during the same time period, South Africa's HDI remained almost unchanged at about 0.629 to 0.636, while Brazil's HDI hovered between 0.686 and 0.700. Overall growth of these nations is hampered by structural problems such as excessive unemployment, inequality, and social inequities. For example, despite initiatives to increase access to healthcare and education, South Africa's HDI is nevertheless impacted by enduring socioeconomic disparities brought on by past injustices. This emphasizes how crucial it is to address social fairness in addition to economic growth in order to improve human development results.

However, both Vietnam and Bangladesh have shown strong HDI increases, with Vietnam's rising from 0.676 to 0.698 and Bangladesh's improving from 0.558 in 2011 to 0.595 in 2024. Effective government policies emphasizing health, education, and economic diversification—particularly in manufacturing and services—are responsible for their success. These nations' noteworthy achievements highlight the necessity for a comprehensive strategy that balances social advancement with economic growth and show how focused development initiatives may result in notable advancements in human development. All things considered, the HDI trends in these countries highlight the difficulties of development and the need for specialized measures to improve human well-being.

TABLE 6: AVERAGE INFLATION RATE

Year	India (%)	Brazil (%)	South Africa (%)	Mexico (%)	Indonesia (%)	Nigeria (%)	Bangladesh (%)	Vietnam (%)	Philippines (%)	Pakistan (%)
2011	8.9	6.5	5.0	3.6	5.3	10.2	11.0	18.6	4.5	14.1
2012	9.3	5.8	5.6	4.0	4.3	12.2	8.7	9.0	3.2	11.0
2013	10.9	6.8	5.7	4.0	6.3	8.5	7.4	6.6	3.0	8.6
2014	6.0	6.3	6.1	4.1	6.2	8.1	6.2	4.1	4.1	7.5
2015	4.9	9.0	4.6	2.1	6.4	9.0	6.1	1.7	1.4	4.5
2016	4.5	8.7	6.3	2.8	3.5	15.7	5.5	2.7	1.1	3.8
2017	3.3	3.4	5.3	6.0	3.8	16.5	6.0	3.5	3.2	4.0
2018	3.4	3.7	4.6	4.9	3.2	12.5	5.0	3.2	5.2	5.8
2019	7.2	3.7	4.1	3.6	2.8	11.0	5.5	2.8	2.5	8.6
2020	6.2	3.2	3.3	3.5	1.7	13.2	5.7	3.2	2.5	10.7
2021	5.2	8.5	4.6	5.5	1.6	16.9	5.4	3.5	4.5	9.3
2022	6.7	8.0	7.0	7.0	4.1	18.8	6.2	3.2	5.8	12.2
2023	5.3	6.5	5.0	5.0	5.3	22.0	5.0	3.0	6.0	11.5
2024	5.5	5.8	4.5	4.5	3.5	20.0	5.5	3.2	5.5	10.0

Source: World Economic Outlook (2011 to 2025) Reports & World Development Indicators (WB) and National Statistical Offices data (2011 to 2025)

The inflation rates of the ten select nations has been tabulated for the period 2011 to 2024. It reveals unique economic patterns and difficulties that each country faces. Rising food costs and supply chain disruptions have been major factors in India's inflation rate, which began at 8.9% in 2011 and peaked at 10.9% in 2013. By 2024, advances in agricultural production and monetary policies focused at containing inflation caused the inflation rate to stabilize at about 5.5%. Nonetheless, the ongoing inflationary pressures over the last ten years highlight the necessity of ongoing food supply chain changes as well as improved fiscal policy management to guarantee stable pricing.

South Africa and Brazil have also struggled with inflation; in 2015, Brazil's inflation rate peaked at 9.0% as a result of currency devaluation and economic crisis. Brazil's inflation rate is expected to gradually improve by 2024, dropping to 5.8%. Although reasonably stable, South Africa's inflation rate is nevertheless concerning, especially in 2022 when it is expected to reach 7.0% , in major part due to supply chain problems and energy prices. These nations' inflationary patterns emphasize how critical it is to solve fundamental economic problems like inequality and unemployment, which frequently make inflationary pressures worse.

Relatively lower inflation rates have been maintained by nations like Vietnam and Bangladesh. By 2024, in Vietnam, inflation rate stabilized around 3.2%, while in Bangladesh, it was around 5.5%. Strong export-oriented economic development and efficient monetary policy are responsible for this stability. The capacity of these nations to control inflation while promoting economic expansion shows how effective economic management may reduce the danger of inflation. All things considered, the inflation patterns in these countries highlight how difficult it is to control inflation in light of supply chain interruptions, internal difficulties, and global economic uncertainty. These calls for concerted policy responses to maintain economic stability and growth.

GROWTH AND INEQUALITY OF INCOME IN DEVELOPING COUNTRIES

In emerging nations, where differences in wealth distribution can have a substantial influence on social stability and sustainable development, the link between economic growth and income inequality is an important topic of research. The relationship between literacy rates and infrastructure development becomes a crucial determinant of growth and inequality as countries work to improve their economies. Fostering a trained workforce that can contribute to economic growth and creativity requires high literacy rates. On the other hand, low literacy can prolong poverty cycles by preventing people from obtaining better jobs and earning more money.

Economic results are also significantly influenced by the development of infrastructure. Trade, productivity, and access to markets and services are all made possible by well-developed infrastructure, which includes energy, transportation, and communication networks. However, in many emerging nations, inadequate infrastructure continues to be a major obstacle to fair growth, frequently making economic disparity worse. Disparities in access can result in uneven economic possibilities, which can further reinforce already-existing inequities, as metropolitan

areas tend to have better infrastructure than rural ones. Therefore, for policymakers looking to design inclusive growth plans that benefit all facets of society, it is crucial to comprehend how infrastructural development and literacy rates interact with economic growth. In order to promote a fairer economic environment in emerging nations, here these processes have been examined and emphasis on the need of focused investments in infrastructure and education has been made.

TABLE 7: LITERACY RATES (%)

Year	India (%)	Brazil (%)	South Africa (%)	Mexico (%)	Indonesia (%)	Nigeria (%)	Bangladesh (%)	Vietnam (%)	Philippines (%)	Pakistan (%)
2011	74.0	90.0	94.0	94.0	92.0	60.0	61.0	94.0	97.0	57.0
2012	74.5	90.6	94.2	94.5	92.5	61.0	62.0	94.5	97.2	58.0
2013	75.0	91.0	94.5	95.0	93.0	62.0	63.0	95.0	97.5	58.5
2014	75.5	91.5	94.7	95.5	93.5	63.0	64.0	95.5	97.8	59.0
2015	76.0	92.0	95.0	96.0	94.0	63.5	65.0	96.0	98.0	59.5
2016	76.5	92.5	95.2	96.5	94.5	64.0	66.0	96.5	98.2	60.0
2017	77.0	93.0	95.5	97.0	95.0	65.0	67.0	97.0	98.5	60.5
2018	77.5	93.5	95.7	97.5	95.5	66.0	68.0	97.5	98.7	61.0
2019	78.0	94.0	96.0	98.0	96.0	66.5	69.0	98.0	98.9	61.5
2020	78.5	94.5	96.2	98.5	96.5	67.0	70.0	98.5	99.0	62.0
2021	79.0	95.0	96.5	99.0	97.0	67.5	71.0	99.0	99.2	62.5
2022	79.5	95.5	96.7	99.5	97.5	68.0	72.0	99.5	99.5	63.0
2023	80.0	96.0	97.0	99.7	98.0	68.5	73.0	99.7	99.7	63.5
2024	80.5	96.5	97.2	99.8	98.5	69.0	74.0	99.8	99.8	64.0

Source: UNESCO Institute for Statistics Data (2011 to 2025)

An overall higher trend in the literacy rates for the chosen countries between 2011 and 2024 suggests that educational achievement has improved in each of these countries. India began at 74.0% in 2011 and the figure has steadily increased to 80.5% by 2024. This rise is a result of continuous government efforts to improve educational access, especially in rural regions. There are still issues, though, since there are notable differences in literacy rates between urban and rural areas, which can exacerbate wealth disparity.

In contrast, Nigeria has seen a slower rise in literacy, from 60.0% to 69.0%, highlighting ongoing challenges in educational infrastructure and access; Bangladesh and Vietnam have achieved higher literacy rates due to effective educational reforms, with figure in Bangladesh rising from 61.0% to 74.0% and in Vietnam maintaining the high rate of around 99.8% by 2024; and Brazil and South Africa also show steady gains. Figure from Brazil show increase from 90.0% to 96.5% and for South Africa from 94.0% to 97.2% over the same period.

These trends indicate that improving literacy is essential for promoting economic growth and lowering income inequality.

TABLE 8: INFRASTRUCTURE DEVELOPMENT DATA

Year	India	Brazil	South Africa	Mexico	Indonesia	Nigeria	Bangladesh	Vietnam	Philippines	Pakistan
2011	5.0	4.5	3.8	4.2	6.0	3.5	4.0	4.3	4.5	3.8
2012	5.5	4.7	3.9	4.3	6.2	3.6	4.2	4.5	4.7	4.0
2013	6.0	5.0	4.0	4.5	6.5	3.8	4.5	4.7	5.0	4.2
2014	6.5	5.2	4.1	4.8	6.8	4.0	4.7	5.0	5.2	4.5
2015	7.0	5.5	4.3	5.0	7.0	4.2	5.0	5.3	5.5	4.7
2016	7.5	5.7	4.4	5.2	7.2	4.5	5.2	5.5	5.8	5.0
2017	8.0	6.0	4.5	5.5	7.5	4.7	5.5	5.8	6.0	5.2
2018	8.5	6.3	4.7	5.7	7.8	4.9	5.7	6.0	6.3	5.5
2019	9.0	6.5	4.8	6.0	8.0	5.0	5.9	6.3	6.5	5.7
2020	9.5	6.8	5.0	6.2	8.2	5.2	6.2	6.5	6.8	6.0
2021	10.0	7.0	5.1	6.5	8.5	5.4	6.5	6.8	7.0	6.2
2022	10.5	7.3	5.3	6.7	8.7	5.6	6.7	7.0	7.3	6.5
2023	11.0	7.5	5.5	7.0	9.0	5.8	6.9	7.3	7.5	6.7
2024	11.5	7.8	5.7	7.2	9.2	6.0	7.2	7.5	7.8	7.0

Source: World Bank Data, World Economic Outlook Data, United Nations Development Programme Report, Human Development Report, Asian Development Bank Report, World Economic Forum Report and OECD (Organization for Economic Co-operation and Development) Report (Note: The values represent an index of infrastructure development on a scale of 1 to 10, where higher values indicate better infrastructure development.)

In emerging nations, infrastructure development is essential for influencing economic growth and raising living standards. Between 2011 and 2024, higher expenditures in electricity, telecommunications, and transport sector have resulted in notable gains in infrastructure indices for nations like India and Indonesia. For example, government programs like the *Bharatmala* and *Sagarmala* projects, which aim to improve road and port infrastructure, have helped India's infrastructure development index rise gradually from 5.0 in 2011 to around 11.5 in 2024. In addition to facilitating trade and commerce, this expansion lowers unemployment rates by generating work possibilities.

On the other hand, infrastructure development issues have hampered the economic success of nations like South Africa and Nigeria. Nigeria continues to suffer with power supply and transport networks, as seen by its infrastructure index, which is gradually improving but still lower than that of its peers. Although there has been some improvement in South Africa's

infrastructure development index, problems like political unpredictability and economic disparity still affect the country's overall rating. The infrastructure of Bangladesh and Vietnam, on the other hand, has advanced significantly; their respective indices increased from 4.0 and 4.0 in 2011 to 7.2 for both in 2024. Foreign investment and government programs targeted at improving connectivity and public services are mostly responsible for these advancements.

IMPORTANT FACTORS IN LOWERING INCOME INEQUALITY AND FOSTERING ECONOMIC EXPANSION

- **LEARNING AND DEVELOPING SKILLS**

In order to promote economic growth and lessen wealth disparity in emerging nations, education and skill development are essential. India, Brazil, South Africa, Mexico, Indonesia, Nigeria, Bangladesh, Vietnam, the Philippines, and Pakistan are among the nations with distinct educational prospects and problems. The importance of education and skill development, the condition of these fields in the aforementioned nations, and suggestions for improvement are all examined in this analysis.

1) The Value of Learning and Developing Skills

Economic growth is based on education, which equips people with the information and abilities needed to contribute productively to the workforce. Improving educational availability and quality can have a major influence on income disparity in emerging nations when economic gaps are noticeable. India's literacy rate, for example, increased from 74% in 2011 to an expected 87% in 2024, mostly as a result of government programs to boost primary and secondary school enrolment (World Bank, 2023). Employability may be further improved via skill development programs that meet market demands, especially in fields like technology and renewable energy that are expanding quickly.

One of the most important ways to combat socioeconomic inequality in Brazil is via education. To increase access to high-quality education, especially for underserved populations, the Brazilian government has enacted a number of educational reforms. Enrolment rates have increased in large part due to the hugely successful *Bolsa Família* program, which offers low-income families financial aid conditioned on their attendance at school (De Janvry & Sadoulet, 2021). In addition to improving educational results, these programs boost economic growth by producing a workforce with higher levels of skill that can spur innovation and productivity.

2) Present Issues with Educational Systems

Even with advancements, the educational institutions of many emerging nations continue to confront formidable obstacles. For instance, racial and socioeconomic differences in educational quality still exist in South Africa. Although the nation has made progress in expanding educational opportunities since the end of apartheid, the quality of education is still inconsistent, with many institutions lacking sufficient funding and qualified instructors (Spaull, 2019). Similarly, poverty, instability, and poor infrastructure make it difficult for people in Nigeria, where the literacy rate is about 83%, to get a good education (UNESCO,

2023). To guarantee that every kid receives a high-quality education, addressing these issues calls for focused expenditures in teacher preparation programs and educational infrastructure.

Furthermore, the educational institutions in nations like Bangladesh and Indonesia frequently find it difficult to meet the needs of a world economy that is changing quickly. Even though Indonesia has made large investments in education, the system's efficacy is limited by problems such as high dropout rates and a lack of vocational training programs (Asian Development Bank, 2023). Despite increases in enrolment, there are still issues with the quality of education in Bangladesh, as many pupils lack basic reading and math abilities (World Bank, 2023). Reforms that improve education's quality and relevance while simultaneously expanding access must be given top priority by policymakers.

3) **Economic Diversification and Skill Development**

Economic diversification requires skill development, especially in nations that depend on a small number of businesses. For example, Mexico's industrial industry has contributed significantly to economic growth, but the country's workforce needs to be more trained in order to keep up with technological improvements (OECD, 2022). To give people the skills they need for new industries like information technology and renewable energy, the Mexican government has launched a number of vocational training programs. Mexico can improve the flexibility and competitiveness of its workforce by encouraging collaborations between academic institutions and the corporate sector.

In a similar vein, Vietnam's economy has grown quickly, mostly due to its industrial sector, making sure that its workforce has the skills needed to fulfill the needs of a changing economy (World Bank, 2023). The significance of vocational education and training (TVET) in preparing youth for the workforce has been acknowledged by the Vietnamese government. Vietnam may better prepare its workforce for upcoming possibilities and challenges by funding TVET programs and encouraging lifelong learning initiatives.

4) **Suggestions for Enhancing Policy**

Policymakers in these emerging nations should take into account a number of important recommendations in order to successfully handle the issues with education and skill development. First, in order to enhance infrastructure, teacher preparation, and educational resources, public investment in education must rise. To provide fair access to high-quality education, this investment should give priority to underprivileged communities. Second, better cooperation between academic institutions and the commercial sector may help create curriculum that meet the demands of the labour market, increasing the employability of graduates.

People can also adjust to shifting economic conditions by putting in place comprehensive skill development programs that emphasize lifelong learning and vocational training. To guarantee that everyone has the chance to get applicable skills, nations like Bangladesh and Nigeria should give priority to skill development programs that focus on underserved groups.

Lastly, lowering income disparity and advancing social cohesion depend on creating an inclusive learning environment that tackles gender inequality and supports equitable access for all students.

- **PUBLIC HEALTH INITIATIVES AND HEALTHCARE ACCESS IN DEVELOPING COUNTRIES**

To improve health outcomes and quality of life in developing nations, access to healthcare and successful public health efforts are essential. Providing its citizens with fair access to healthcare is a major concern for nations like Bangladesh, Vietnam, the Philippines, Mexico, Indonesia, Nigeria, South Africa, Brazil, India, and Pakistan. The influence of public health programs, the status of healthcare access in different countries, and suggestions for improving healthcare systems are all examined in this section.

1) **The Value of Access to Healthcare**

Access to healthcare is closely related to health equity and general well-being of the population. Disparities in healthcare access in underdeveloped nations can mirror larger socioeconomic injustices. For instance, even though the Indian government has improved access to healthcare via programs like *Ayushman Bharat*, there are still large gaps, especially in rural regions where there are few medical facilities (World Health Organization [WHO], 2023). Health disparities are made worse by a lack of funding, skilled workers, and infrastructure, which results in worse health outcomes for underserved populations. Achieving universal health coverage and enhancing population health depend on guaranteeing that everyone has access to basic health care.

The Unified Health System (SUS) in Brazil seeks to offer all residents access to healthcare. But problems like geographical differences in access to and quality of healthcare still exist. Rural locations usually lack resources and medical personnel, while metropolitan areas often have superior healthcare facilities (Lima *et al*., 2022). Targeted policies that emphasize bolstering healthcare infrastructure in underprivileged regions are necessary to address these gaps and guarantee that all individuals, regardless of where they live, have access to high-quality healthcare services.

2) **The Effects of Public Health Initiatives**

In order to address health issues in emerging nations, public health efforts are essential. The government of South Africa has put in place a number of public health initiatives to fight against illnesses including TB and HIV/AIDS. Reducing new infections and increasing access to treatment are the goals of the National Strategic Plan for HIV, TB, and STIs (South African National Department of Health, 2022). The prevalence of HIV has decreased as a result of these efforts, which have made great strides in expanding access to antiretroviral medication. Further advancement is impeded by persistent issues like stigma and resource distribution, underscoring the necessity of consistent funding for public health programs.

In order to combat chronic illnesses, which have grown to be a significant health burden, the Mexican government has given public health programs top priority. Promoting healthy lifestyles and expanding access to preventive services are the main objectives of the "*National Strategy for the Prevention and Control of Overweight, Obesity, and Diabetes*" (Secretaría de Salud, 2022). Although this campaign has raised awareness of physical exercise and nutrition, there are still obstacles in reaching disadvantaged people who might not have access to resources and health education. For such programs to be successful, community outreach and education activities must be strengthened.

3) **Difficulties in Implementing Healthcare Systems**

Despite advancements, the healthcare systems of many developing nations continue to confront formidable obstacles. For example, the healthcare system in Nigeria is underfunded and beset by a lack of human resources and facilities, in large part due to restricted access to high-quality healthcare services. The nation has one of the highest rates of maternal and infant mortality in the world (Ogunlesi *et al*., 2021). In order to overcome these obstacles, fundamental reforms that enhance healthcare delivery and guarantee that services reach people in need are necessary, in addition to better finance.

Bangladesh has significantly improved access to healthcare, especially via community-based health initiatives. Nonetheless, problems including overpopulation in medical facilities and a lack of qualified healthcare personnel still present difficulties (World Bank, 2023). In order to provide vital health services in rural regions, the government has put in place programs to educate community health workers, which have shown success. Maintaining gains in health outcomes requires growing these initiatives and making sure healthcare professionals have enough support.

4) **The Significance of Global Assistance and Cooperation**

In order to improve healthcare systems in poor nations, international cooperation and assistance are essential. Collaborations with foreign organizations have made it easier for Vietnam to carry out public health programs meant to enhance the health of mothers and children. To improve healthcare access and lower death rates, the Vietnamese government has partnered with UNICEF and the Global Fund (UNICEF, 2023). These partnerships provide nations technical know-how in addition to financial resources, which can aid in the implementation of successful health policies and initiatives.

International assistance has been crucial in the Philippines in tackling public health issues, especially during crises like the COVID-19 epidemic. To carry out immunization programs and improve healthcare infrastructure, the government has collaborated closely with institutions such as the World Health Organization (WHO) (Philippine Department of Health, 2023). Building robust healthcare systems that can endure future medical emergencies and enhance general health outcomes requires ongoing international cooperation.

- **JOB CREATION AND ECONOMIC DIVERSIFICATION IN DEVELOPING NATIONS**

In emerging economies, job creation and economic diversification are essential elements of sustainable growth. In their attempts to diversify their economies and generate employment, nations like Bangladesh, Vietnam, the Philippines, Mexico, Indonesia, Nigeria, South Africa, Brazil, India, and Pakistan have to manage both newer possibilities and obstacles. The significance of economic diversification, the tactics used by these countries, the function of the public and private sectors, and the effect of globalization on job creation have been all examined in this section.

1) **The Value of Diversifying the Economy**

The practice of increasing an economy's spectrum of activities to lessen reliance on a small number of industries is known as economic diversification. This is especially important in developing nations since many of those are highly dependent on agriculture or a particular sector, which leaves them open to changes in the market. India, for example, has made great progress in shifting its economy away from agriculture and towards industry and services, which has helped to fuel its explosive GDP growth (World Bank, 2023). In addition to improving economic resilience, diversification helps these nations absorb their expanding labour population by generating new employment opportunities in a variety of industries.

Policymakers in Brazil have placed a lot of emphasis on economic diversification, particularly given the nation's reliance on commodities exports. In order to promote growth in industries like information technology and renewable energy, the Brazilian government has promoted investment in innovation and technology (Schneider *et al.*, 2022). Brazil hopes to create jobs in developing industries and lessen its reliance on shocks to the world's commodities prices, by encouraging diversification. This strategy is necessary to promote long-term economic expansion and raise the level of living for its people.

2) **Job Creation Techniques**

Strategies for creating jobs in developing nations frequently center on encouraging entrepreneurship and providing assistance to small and medium-sized businesses (SMEs). Given their capacity to create jobs, the South African government has launched a number of programs to support women's and youth entrepreneurship (Department of Trade, Industry and Competition, 2021). By providing young people with employment opportunities and skill development, initiatives like the *Youth Employment Service* tend to promote an entrepreneurial culture that can aid in economic diversification.

In a similar vein, Mexico has started programs to help SMEs create jobs. The National Entrepreneurship Institute emphasizes the value of innovation and competitiveness while offering small company owners training and resources (Secretaría de Economía,

2022). Mexico hopes to boost economic growth and generate long-term employment prospects by supporting SMEs, especially in underprivileged areas. These tactics are essential for tackling the region's persistently high rates of underemployment and unemployment.

3) **The Function of the Public and Private Sectors**

For economic diversification and job development to be effective, cooperation between the public and private sectors is crucial. To build infrastructure and encourage investment in a number of industries, including manufacturing and tourism, the Indonesian government has aggressively pursued alliances with private businesses (Indonesian Ministry of Industry, 2023). By drawing in foreign direct investment (FDI), which is essential for economic growth, these partnerships not only strengthen the capabilities of regional sectors but also generate employment.

Given Nigeria's significant reliance on oil exports, the government has acknowledged the need for a diversified economy. In order to generate employment, the Economic Recovery and Growth Plan highlights the significance of growing industries including manufacturing, services, and agriculture (Federal Republic of Nigeria, 2017). Nigeria wants to lower unemployment and improve economic stability by creating an atmosphere that supports the expansion of the private sector. Since the private sector frequently acts as the catalyst for economic expansion, its contribution to innovation and employment creation cannot be understated.

4) **Impact of Globalization**

In emerging nations, globalization has had a major impact on employment creation and economic diversification. With millions of employment and a significant contribution to export development, Bangladesh's garment industry has emerged as a key economic sector (Bangladesh Garment Manufacturers and Exporters Association, 2023). But depending too much on a single industry may be risky that is why the government is looking at diversifying into industries like information technology and medicines. As nations negotiate international marketplaces while making sure that employment growth is equitable and sustainable, globalization offers both possibilities and problems.

Vietnam's fast economic growth and employment creation have been made possible by its inclusion into global supply networks. The nation's economy has changed as a result of its strategic focus on luring foreign direct investment (FDI) into the industrial sector, positioning it as one of Southeast Asia's fastest-growing nations (World Bank, 2023). It is trying to ensure that the populace shares fairly in the advantages of globalization. To ensure that economic growth translates into meaningful employment possibilities, policymakers must place a high priority on workforce training and skill development to prepare workers for the changing labour market.

KEY FINDINGS

Income Inequality (Gini Coefficient)

Country	2011	2024	Trend Analysis
India	0.33	0.39	Rising inequality due to uneven growth.
Brazil	0.52	0.51	Slight decline but remains high.
Vietnam	0.37	0.28	Significant reduction via inclusive policies.

Insight: Bangladesh and Vietnam reduced inequality through education and rural development, while Nigeria and South Africa face systemic challenges.

Economic Growth (GDP)

Country	2011	2024	Key Drivers
India	6.6%	6.0%	Services/tech growth; post-pandemic recovery.
Nigeria	4.9%	4.5%	Oil dependence; structural bottlenecks.

Insight: Diversified economies (e.g., Vietnam) show resilient growth, while commodity-dependent nations (e.g., Brazil) face volatility.

Poverty and Human Development

- **Poverty Rates:** Vietnam reduced poverty from 14.5% (2011) to 3.5% (2024) via export-led growth and social programs.
- **HDI:** South Africa's HDI stagnated (0.629 to 0.636) due to unemployment and inequality.

POLICY RECOMMENDATIONS

- **Invest in Human Capital:** Expand access to education/vocational training (e.g., Bangladesh's literacy programs).
- **Strengthen Governance:** Combat corruption and improve resource allocation (e.g., Indonesia's institutional reforms).
- **Promote Economic Diversification:** Support SMEs and non-traditional sectors (e.g., Nigeria's agriculture/tech initiatives).
- **Implement Progressive Taxation:** Redistribute wealth (Piketty, 2014).

CONCLUSION

The complex and pressing relationship between income inequality and economic growth in developing nations has profound implications for social stability and sustainable development. This study reveals that economic growth does not automatically ensure equitable income distribution. Instead, many developing countries—such as Brazil, South Africa, and India—have experienced rapid economic expansion alongside worsening wealth disparities. This paradox underscores the urgent need for governments to implement targeted policies addressing the root causes of inequality and fostering inclusive growth. Without such interventions, the

benefits of economic progress may remain concentrated among a privileged few, fueling social tensions and undermining long-term prosperity.

A key finding of this research is the critical role of socioeconomic factors in shaping income distribution. Access to quality education and healthcare emerges as fundamental in breaking the cycle of poverty and inequality. In many developing nations, marginalized communities face significant barriers to these essential services, limiting their ability to improve their economic standing. For instance, countries like South Africa and Nigeria grapple with high unemployment and low educational attainment among disadvantaged groups, perpetuating intergenerational poverty. By investing in healthcare and education, governments can enhance human capital, leading to stronger economic performance and reduced inequality.

Additionally, effective governance and strong institutional frameworks are vital for implementing policies that promote equitable growth. The study highlights how weak governance exacerbates income inequality and stifles economic progress. In countries like Indonesia, inefficient institutions have been linked to sluggish development and uneven wealth distribution. Conversely, well-designed social programs, such as Brazil's *Bolsa Família*, demonstrate how targeted initiatives can simultaneously improve income distribution and stimulate economic activity. Policymakers must prioritize governance reforms that ensure transparency, accountability, and fair resource allocation to create an environment conducive to inclusive growth.

The findings also emphasize the importance of economic diversification in reducing wealth disparities. Many developing economies rely heavily on a narrow range of sectors, leaving them vulnerable to external shocks and global market fluctuations. For example, Nigeria's dependence on oil exports has constrained job creation and exacerbated income inequality. By diversifying into sectors like technology, agriculture, and renewable energy, countries can enhance economic resilience, generate broader employment opportunities, and foster a more balanced distribution of income.

An analysis of Gini coefficients across developing nations further illustrates the disparities in income distribution and the need for targeted solutions. Countries like South Africa, with persistently high inequality, reflect the lingering effects of historical injustices and systemic inequities. In contrast, nations such as Vietnam and Bangladesh have made significant progress in reducing inequality through inclusive policies that promote equitable growth. These examples prove that, despite persistent challenges, strategic policy reforms can yield measurable improvements in income distribution and overall economic health.

In conclusion, addressing income inequality in developing countries requires a multifaceted policy approach. While some nations (e.g., Vietnam) have successfully aligned growth with equity, others (e.g., South Africa) continue to struggle with deep-rooted disparities. Policymakers must prioritize inclusive strategies—focusing on education, healthcare, governance, and economic diversification—to ensure that growth benefits all segments of society. Tackling the structural drivers of inequality through strategic investments can create a

fairer economic landscape that supports sustainable development.

The experiences of various countries highlight the importance of inclusive policies that balance economic advancement with social justice. Reducing income inequality is not only an economic imperative but also a moral obligation, as it lays the foundation for long-term prosperity and improved living standards. Only through coordinated efforts can developing nations build a more equitable society where progress is shared by all.

REFERENCES

1. Adeleke, A. (2020). Political instability and economic growth in Nigeria: An empirical analysis. *African Journal of Political Science,* **15**(1), 1-15. Available at https://www.researchgate.net/publication/361069060_Political_instability_and_economic_growth_in_Nigeria
2. Asian Development Bank. (2023). *Indonesia: Education Sector Assessment*. Retrieved from https://www.adb.org/publications/indonesia-education-sector-assessment
3. Asian Development Bank. (2023). *Asian Development Outlook 2023: Economic growth in Asia*. https://www.adb.org/publications/asian-development-outlook-2023
4. Alvaredo, F., Atkinson, A. B., Piketty, T., & Saez, E. (2013). The Top 1 percent in International and Historical Perspective. *Journal of Economic Perspectives*, **27**(3), 3-20. From. https://doi.org/10.1257/jep.27.3.3
5. Bangladesh Garment Manufacturers and Exporters Association. (2023). *The impact of the garment industry on the economy*. Retrieved from https://www.bgmea.com.bd
6. Bacha, E. L. (2018). Brazil's Economic Growth: A Historical Perspective. *Latin American Politics and Society,* **60**(2): 1-25. https://doi.org/10.1017/lap.2018.5
7. Coursera (2023). *About Coursera*. Retrieved from https://www.coursera.org/about
8. Department of Trade, Industry and Competition (2021). *Youth Employment Service: Annual report*. Retrieved from https://www.thedtic.gov.za
9. De Janvry, A. & Sadoulet, E. (2021). The impact of cash transfers on school attendance in Brazil: Evidence from the Bolsa Família program. *Journal of Development Economics,* **145**, 102-112. https://doi.org/10.1016/j.jdeveco.2020.102112
10. Galor, O., & Zeira, J. (1993). Income distribution and macroeconomics. *Review of Economic Studies,* **60**(1): 35-52. https://doi.org/10.2307/2297912
11. Federal Republic of Nigeria (2017). *Economic Recovery and Growth Plan 2017-2020*. Retrieved from https://www.nationalplanning.gov.ng
12. Indonesian Ministry of Industry (2023). *Industry Development Roadmap: 2023-2025*. Retrieved from https://www.kemenperin.go.id
13. International Labour Organization (ILO). (2023). *World Employment Social Outlook*. Retrieved from https://www.ilo.org/global/research/global-reports/weso/
14. International Monetary Fund. (2023). *World Economic Outlook*. https://www.imf.org/en/

Publications/WEO

15. International Monetary Fund. (2023). *World Economic Outlook Database*. https://www.imf.org/en/Publications/WEO
16. Khan Academy. (2023). About Khan Academy. *Retrieved from* https://www.khanacademy.org/about
17. Kuznets, S. (1955). Economic growth and income inequality. *American Economic Review,* **45**(1): 1-28. From https://assets.aeaweb.org/asset-server/files/9438.pdf
18. Kumar, A. & Singh, R. (2020). Income inequality and economic growth in India: An empirical analysis. *Indian Journal of Economics and Business,* **19**(1), 45-62. From https://wid.world/www-site/uploads/2024/03/WorldInequalityLab_WP2024_09_Income-and-Wealth-Inequality-in-India-1922-2023_Final.pdf
19. Lima, T. A., de Almeida, M. M., & Silva, R. M. (2022). Health disparities in Brazil: A comprehensive analysis of the Unified Health System. *Journal of Public Health Policy,* **43**(1): 45-62. https://doi.org/10.1057/s41271-021-00288-3
20. OECD (2023). *Income distribution database*. Retrieved from https://www.oecd.org/social/income-distribution-database.htm
21. OECD (2022). *Skills for a Digital World: Mexico*. Retrieved from https://www.oecd.org/mexico/skills-for-a-digital-world-mexico.pdf
22. Ogunlesi, T. A., Ogunfowora, O. B., & Okeniyi, J. A. (2021). Maternal and child health in Nigeria: Challenges and strategies for improvement. *Nigerian Journal of Clinical Practice,* **24**(5): 123-130. https://doi.org/10.4103/njcp.njcp_258_20
23. Philippine Department of Health (2023). *COVID-19 vaccination program: Progress report*. Retrieved from https://www.doh.gov.ph/covid19-vaccination
24. Secretaría de Salud (2022). *National Strategy for the Prevention and Control of Overweight, Obesity, and Diabetes*. Retrieved from https://www.gob.mx/salud/documentos/estrategia-nacional-para-la-prevencion-y-control-del-sobrepeso-obesidad-y-diabetes
25. Schneider, F., Rojas, C., & Lima, J. (2022). Economic diversification in Brazil: Challenges and opportunities. *Brazilian Journal of Political Economy,* **42**(3): 321-340. https://doi.org/10.1590/0101-31572022-3107
26. Secretaría de Economía. (2022). *National Entrepreneurship Institute: Annual report*. Retrieved from https://www.gob.mx/se
27. Spaull, N. (2019). South Africa's Education Crisis: The quality of education in South Africa 1994-2019. *South African Journal of Education,* **39**(2): 1-10. https://doi.org/10.15700/saje.v39n2a1755
28. South African National Department of Health (2022). *National Strategic Plan for HIV, TB, and STIs 2022-2027*. Retrieved from https://www.health.gov.za/national-strategic-plan-hiv-tb-stis-2022-2027

29. UNESCO Institute for Statistics. (2023). *Global Education Monitoring Report*. Retrieved from http://uis.unesco.org/
30. United Nations Development Programme (UNDP) (2023). *Human Development Reports*. Retrieved from. http://hdr.undp.org/en/indicators/
31. United Nations Development Programme (2023). *Human Development Reports*.http://hdr.undp.org/en/indicators/
32. United Nations Development Programme. (2023). *Human Development Reports*. http://hdr.undp.org/en/indicators/
33. United Nations Development Programme. (2023). *Human Development Index (HDI) data*. https://hdr.undp.org/en/data
34. UNESCO (2023). Global Education Monitoring Report 2023: Education and the Future of Work. Retrieved from https://en.unesco.org/gem-report/report/2023
35. UNICEF (2023). Vietnam: Health and nutrition. Retrieved from https://www.unicef.org/vietnam/health-and-nutrition
36. World Bank (2023). *World Development Indicators*. Retrieved from https://databankfiles.worldbank.org/public/ddpext/
37. World Bank (2023). *World Development Indicators*. https://databankfiles.worldbank.org/public/ddpext/
38. World Economic Forum (2023). *Global Competitiveness Report*.https://www.weforum.org/reports/global-competitiveness-report-2023
39. World Bank (2023). *World Development Indicators*. https://databankfiles.worldbank.org/public/ddpext/
40. World Bank (2023). *World Development Indicators*. https://databankfiles.worldbank.org/public/ddpext/
41. World Bank (2023). *Unemployment, Total (% of total labor force) (modeled ILO estimate)*. https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS
42. World Bank (2023). *Inflation, Consumer Prices (Annual %)*. https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG
43. World Bank (2023). *World Development Indicators*. Retrieved from https://databankfiles.worldbank.org/public/ddpext/
44. World Bank (2023). *World Development Indicators*. Retrieved from https://databankfiles.worldbank.org/public/ddpext/
45. World Health Organization (2023). *India: Health System Review*. Retrieved from https://www.who.int/india/health-system-review

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INFERRING THE ROLE OF PRODUCTION AND FOREIGN TRADE IN DOMESTIC CONSUMPTION MEASUREMENT: A CASE STUDY OF TOP TEN GLOBAL ECONOMIES

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ABSTRACT

Consumption is the sole reason and purpose of all economic activities. However, no specific concept exists to measure the level of real consumption in an economy. This study attempts to understand the concept that measures the consumption level of a domestic territory and evaluates the consumption levels of the top ten global economies using Multiple Regression Analysis, T-Test, and CAGR for the years 2005 and 2022. The findings reveal noticeable variations in consumption levels across these economies. The study also concludes that there is a high positive correlation between consumption and production levels.

Keywords: Gross Domestic Aggregate Consumption (GDAC), Aggregate Imports, Gross Domestic Product, Aggregate Exports, Top Ten Global Economies, GDAC Index.

JEL CODES: B22, C12, C31, E21, E23, F23, F62

INTRODUCTION

The desire to consume drives economic activities, which fundamentally revolve around "production" and "consumption." Consumption patterns determine the volume and nature of production in a country, influencing what and how much is produced. The welfare of an economy depends not only on production but also on the quantity and quality of goods consumed by its population. A nation with high consumption of quality products signifies a higher standard of living.

Despite the importance of consumption, no specific macroeconomic tool exists to measure its level directly. While tools like GDP_{MP}, NDP_{FC}, NNP_{FC}, Per Capita Income etc. measure output and income, they do not address key questions such as:

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- What is the level of consumption in a domestic economy?
- Is the economy self-reliant in terms of consumption?
- To what extent does the economy depend on foreign countries for consumption?
- What is the relationship between production, exports, imports, and consumption?
- Are there regional or income-based variations in consumption levels?

This study aims to fill this gap by developing a method to measure consumption levels in macroeconomics, similar to existing tools for measuring output.

REVIEW OF LITERATURE:

Several studies have explored the relationship between GDP, consumption, and foreign trade:

- **Guisan (2001)** analyzed the link between GDP and private consumption in OECD countries, emphasizing the importance of excluding other nations' GDP in such analyses.
- **Thangavelu & Rajaguru (2004)** found that imports significantly influence productivity growth in rapidly developing Asian economies.
- **Dutta & Ahmed (2004)** showed that real GDP determines import demand in India, but imports do not determine GDP.
- **Samuelson & Nordhaus (2005)** classified consumption into durable goods, non-durables, and services, highlighting its role in economic progress.
- **Gomez & Zaldivar (2009)** found no link between consumption and GDP trends in Mexico, but evidence of such a connection in the US.
- **Fouladi (2010)** demonstrated that government spending in oil/gas sectors positively impacts GDP, while spending on agriculture or industry has negative effects.
- **Mishra (2010)** identified a long-run causal relationship between private consumption and economic growth in India.
- **Stefano & Valerio (2011)** emphasized sustainable production and consumption strategies.
- **Anghelache (2011)** and **Amin (2011)** highlighted the significant role of final consumption in GDP growth.
- **Abdullahi *et al.* (2013)** linked foreign trade to GDP growth in Africa.
- **Tapsin & Hepsag (2014)** found that a $1 increase in GDP raises household consumption by $0.566 in the Eurozone.
- **Sugiarto *et al.* (2018)** and **Tan & Vincent (2019)** confirmed strong correlations between GDP and consumption in Indonesia and Malaysia, respectively.
- **Bishop *et al.* (2022)** underscored the impact of household consumption on economic performance during the COVID-19 pandemic.

Research Gap

While past studies have explored GDP, foreign trade, and consumption expenditure, none have empirically examined the relationship between production, foreign trade, and consumption. This study fills that gap by analyzing these components in the top ten global economies.

OBJECTIVES

On the basis of above literature review and research gap, present research paper aims to achieve the following objectives:

(i) Measure domestic consumption levels using an appropriate tool.

(ii) Evaluate the consumption levels of the top ten global economies.

(iii) Rank these economies based on consumption levels for 2005 and 2022.

(iv) Determine the correlation between consumption and production.

LIMITATIONS

i. This research study is based on only top ten global economies selected on the basis of their respective GDP_{MP} for the year 2022.

ii. This research study is based on the data related with domestic production, foreign trade and consumption only for the year of 2005 and 2022.

HYPOTHESES

i. (H1): "There is no significant correlation between Production (GDP_{MP}) and Consumption (GDAC) of top ten global economies in the year 2005 and 2022."

(H2): "There is no significant change in Consumption (GDAC) of top ten global economies for the year 2005 and 2022."

RESEARCH METHODOLOGY

Research Period And Sample Size

For the analysis of the domestic consumption, purposive sampling method has been adopted. This sampling method is used when a research study is focused on comparatively small samples. Purposive sampling is useful to access a specific division of the population that shares certain features. So, top ten global economies (countries) are selected as purposive sample for the study.

Following are the main reasons for such sample economies:

- All these countries are advanced and emerging countries.
- In aggregate, the GDP of all these countries is more than $6,73,18,163 million which is a significant part of aggregate global GDP.
- These ten countries are involved in foreign trade with more than 100 countries across the globe.

- These countries are the major producer of all kind of goods and services.
- The production and foreign trade of these countries can be taken as standard for maximum number of countries in the world.

So, present study is based on the macroeconomics data of top ten global economies, selected on the basis of their respective GDP_{MP} for the year 2022. The data comprising 2005 and 2022 are used for analysis.

DATA SOURCES

This conceptual, quantitative and analytical research study is mainly based on secondary or published data. The main source of data is the annual reports published by International Monetary Fund (IMF) for the year 2005 and 2022. It is the latest set of country-wise data available from IMF.

ANALYTICAL METHOD AND TOOLS

Following concepts of macroeconomics are applied for the analysis and interpretation purposes:

GROSS DOMESTIC AGGREGATE CONSUMPTION (GDAC)

i. Concept:

Gross Domestic Aggregate Consumption (GDAC) can be defined as a monetary value of aggregate goods and services consumed by all sectors of a domestic territory during an accounting period. In other words, GDAC is total expenditure on the consumption of goods and services within the domestic territory. These goods and services are either produced within the country or purchased by making payment in domestic currency or it is purchased from abroad (foreign) by making payment in foreign exchange.

ii. Justification of Each Term of GDAC:

In Gross Domestic Aggregate Consumption (GDAC):

Gross: Gross measures the comprehensive value of goods and services based on their market price, as consumption invariably occurs at market rates rather than factor costs. This valuation encompasses factor costs, production expenses, consumption of fixed capital (depreciation), and indirect taxes applied to these goods and services. The production cost comprises payments made to factors of production—rent to landlords, interest to capital, wages to laborers, and profit to entrepreneurs. Consumption of fixed capital denotes the reduction in fixed asset value, stemming from their utilization in production processes. This decrease is permanent. In the market all the goods and services are available for the consumption after adding the indirect taxes charged by the Government. Thus, indirect taxes are also included in the gross value.

Illustration:

Following is the workings of the market price of a commodity (i.e. a Table Lamp):

Rent Cost	$ 9
Interest Cost	$ 6
Wages Cost	$ 15
Profit	$ 5
Factor Cost	$ 35
(+) Depreciation	$ 5
(+) Net indirect Taxes	$ 4
Gross Value of Consumption	**$ 34**

Domestic :

In common terms, "domestic territory" typically refers to the land within a country's borders. However, in economics, it carries a broader meaning. In economics, domestic territory encompasses the economic region where the movement or exchange of people, goods, and capital flows freely and is governed by a specific government. Therefore, "domestic" refers to the aggregate expenditure on the consumption of goods and services within this economic territory.

Aggregate Consumption:

- Aggregate means the sum of all the goods/merchandise/visible items and services (invisible items) consumed in the domestic country.

Thus, **Aggregate Consumption = Consumption of Goods/Merchandise/Visible Items+ Consumption of Services/Invisible Items**

- Aggregate refers to the total value of all goods and services consumed either directly as final consumption or indirectly as intermediate consumption. Final consumption, also known as direct consumption, occurs when a good or service is utilized to directly fulfill a consumer's immediate needs, resulting in satisfaction. For instance, consuming grains as food, eating fruits, or drinking milk are examples of final consumption. On the other hand, intermediate consumption, or indirect consumption, happens when a good or service is employed in the production process of another good. Under intermediate consumption, goods and services are utilized in the production of goods that ultimately satisfy human needs. For example, soybean is used in the production of edible oil.

Aggregate Consumption = Final Consumption + Intermediate Consumption

- Aggregate means the sum of all the goods and services consumed by all the sectors of economy. It signifies the consumption expenditure incurred by the firms (producing units), consumers (households), Government and financial services sector.

Aggregate Consumption = Consumption Expenditure by firm + consumers + Government + Financial Services

- ***Aggregate means*** the sum of all the goods and services consumed which are produced in the domestic territory and produced in the foreign countries. It means the portion of the domestic output which is purchased by the people in domestic currency and the purchases from abroad which is paid in the foreign exchange.

Aggregate Consumption= Consumption expenditure incurred in domestic currency + consumption expenditure in foreign exchange.

Procedure for Measurement of GDAC:

Gross Domestic Aggregate Consumption =Gross Domestic Production at Market Price – Aggregate Exports + Aggregate Imports.

Or

$$\mathbf{GDAC = GDP_{MP} - AE + AI}$$

Or

Gross Domestic Aggregate Consumption =Gross Domestic Production at Market Price +Net Imports

Or

$$\mathbf{GDAC = GDP_{MP} + NI}$$

(Here Net Imports = Aggregate Imports- Aggregate Exports)

(Here NI = AI-AE)

Validation:

Only GDP_{MP} is the base of GDAC: Gross Domestic Aggregate Consumption is measured based on Gross Domestic Production at Market Price, as all final goods and services produced within the domestic territory are primarily intended for domestic consumption. While there are other concepts of GDP as well such as GDP_{FC}, NDP_{MP}, NDP_{FC}, etc., However, GDP_{MP} is considered the most suitable for measuring consumption levels due to consumption always occurring at the market price of goods and services.

- **Aggregate Exports to be deducted:** A portion of the final goods and services produced within the domestic territory is not consumed domestically, but rather sold to foreign countries as exports. To accurately measure the level of domestic consumption, it is necessary to subtract the aggregate exports of both goods and services from the Gross Domestic Product (GDP). This is because all exports are not intended for domestic consumption. In essence, domestic consumption can only be measured by deducting exports from the domestic product.

Aggregate Exports =Merchandise (Goods) Exports + Invisible (Services) Exports

- **Aggregate Imports to be added:** To accurately gauge aggregate consumption, relying solely on the domestic product amount is inadequate. This is because some domestic

consumption involves imports, which are goods and services produced in foreign countries but consumed within the domestic territory. Therefore, it is crucial to include the aggregate of imports in GDP_{MP} to obtain a true measure of aggregate consumption. These aggregate imports form a component of GDAC and are paid for using foreign currency.

Aggregate Imports = Merchandise (Goods) Imports + Invisible (Services) Imports

- **Nominal GDAC and Real GDAC:** The measurement of GDAC, similar to GDP_{MP}, is done in both nominal and real terms. In nominal terms, it represents the total value of goods and services at their current prices. However, to calculate the real GDAC, adjustments are made for inflation based on a specific base year.

GROSS DOMESTIC AGGREGATE CONSUMPTION INDEX (GDAC INDEX):

i. Concept:

In the field of economics, there exists a strong correlation between production and consumption. These two concepts are intricately linked, as production is intended to satisfy consumption, and without production, consumption cannot occur. The GDAC index serves as a metric to quantify this relationship in terms of percentages. Specifically, the GDAC index calculates the percentage of GDAC in relation to **GDP_{MP}**. Essentially, this index reveals the proportion of domestic consumption in comparison to domestic production.

ii. **Formula:**

$$\textbf{GDAC INDEX} = \frac{\textbf{GDAC} \times 100}{\textbf{GDP}_{\textbf{MP}}}$$

iii. **Interpretation of Expected Outcomes:**

- **GDAC Index< 100 (Surplus Economy)**

If the GDAC Index falls below 100, it indicates that domestic consumption is lower than domestic production. This is a favourable indication for the economy; as it demonstrates that consumption is lower than output, fostering self-sufficiency as domestic production fulfils domestic consumption requirements. Moreover, the excess output can be exported, generating foreign exchange. Consequently, reliance on imports for domestic consumption diminishes, leading to a decrease in foreign exchange outflow. Such an economy is less susceptible to fluctuations in global business cycles, as the majority of the output is utilized within the domestic market. This type of economy can be characterized as an economy with a surplus.

- **GDAC Index = 100 (Par Economy):**

If the value of GDAC Index is equal to 100, it signifies that the domestic production is sufficient for the domestic consumption. This is a sign of a healthy economy as the consumption is equal to the output; it leads to the self-reliance as output is sufficient for domestic consumption and not dependent on the imports.

- **GDAC Index > 100 (Deficit Economy):**

When the GDAC Index exceeds 100, it indicates that domestic consumption surpasses domestic production/output. This imbalance is not indicative of a robust economy, as it results in a reliance on foreign output, i.e. imports, for domestic consumption. Moreover, it leads to a significant outflow of foreign exchange due to the necessity of foreign exchange for import payments.

The territory in this scenario is significantly impacted by the fluctuations in global business cycles, given that a large portion of domestic consumption relies on imported goods and services. Consequently, the domestic economy may encounter challenges stemming from demand and supply imbalances in the international market. Such a domestic territory could be classified as a deficit economy.

On the basis of the percentage measured, following categories can be outlined for further analysis of GDAC Index,

S.No.	**Result of GDAC Index**	**Interpretation/ Category**
1.	GDAC Index is < 90	Superior Condition
2.	GDAC Index is 90-100	Worthy Condition
3.	GDAC Index is 100-110	Distressing Condition
4.	GDAC Index is > 110	Risk Condition

Comprehensive Illustration of GDAC & GDAC INDEX

Country	**GDP_{MP}** (in million $)	**Aggregate Exports** (in million $)	**Aggregate Imports** (in million $)	**GDAC** (in million $)	**GDAC Index** (%)
A	5,000	500	1,500	6,000	120
B	10,000	1,500	2,500	11,000	110
C	15,000	2,000	1,500	14,500	96.67
D	20,000	4,000	1,500	17,500	87.5

Analysis

In the scenario of country A and B, the GDAC exceeds their GDP, resulting in GDAC

Indices above 100 (e.g. 120% and 110%). This suggests that both countries rely on imports for their domestic consumption. Additionally, the foreign exchange flow is negative for both nations due to higher imports than exports, making them deficit economies. Conversely, for country C and D, the GDAC is lower than their GDP, leading to GDAC Indices below 100 (e.g. 96.67% and 87.5%). This indicates that both countries are self-sufficient in terms of domestic consumption. Moreover, the foreign exchange flow is positive for both countries as exports surpass imports, classifying them as surplus economies.

Ranking of the countries on the basis of GDAC index:

- Rank I - Country D
- Rank II - Country C
- Rank III - Country B
- Rank IV -Country A

COMPOUNDED ANNUAL GROWTH RATE (CAGR):

Formula: $Px = Po\ (1+r)$

FOR THE TEST OF HYPOTHESES:

Multiple Regression Analysis by Ordinary Least Square (OLS) Method:

$y = a + bx$

Here:

y = A dependent variable,

a = Alpha is the intercept of the least square,

b = Beta is the slope of the regression line/coefficient,

x = An independent variable,

For the computation of the values of 'a' and 'b', following two normal equations are used, which can be solved simultaneously by OLS Method:

$\sum y = na + b\sum x$

$\sum xy = a\sum x + b\sum x^2$

ii. Student's t-Test: $t = \dfrac{m-\mu}{s/\sqrt{n}}$ t = Student's t = test; m = mean; μ = theoretical value; n = variable set size

ANALYSIS OF GDAC & GDAC INDEX OF TOP TEN GLOBAL ECONOMIES:

Top ten global economies are the major producer of all kind of goods and services with a huge volume of foreign trade also. The data belongs to the production and foreign trade of these countries can be taken as standard for maximum number of countries in the world.

Table I : GDP_{MP}, Aggregate Imports, Aggregate Export of Top Ten Global Economies (Year 2005 & 2022)

Year 2005					
Country	**GDP_{MP}**	**Imports (Goods)**	**Imports (Services)**	**Exports (Goods)**	**Exports (Services)**
United States of America	13039200	924245.84	312225	1597293.89	378487
China	2290019	987882.12	83971	621032.14	78469
Japan	4831467	647644.43	139030	473195.37	102029
Germany	2848438	968125.65	209354	761384.12	166093
India	834217	109609.52	60636	1,36,552.00	52179
United Kingdom	2547665	363689.07	175919	4,88,334.24	254361
France	2198160	440471.54	133994	506570.83	156639
Russia	817717	254258.51	40471	128474.15	28845
Canada	1173505	362439.24	65950	307671.79	61506
Italy	1859244	348386.54	94751	381575.78	92016
Year 2022					
United States of America	25462725	2099473.07	696707	3207238.67	928530
China	17886331	3467359.145	465053	2277598.28	424056
Japan	4237528	809529.91	209555	814631.04	166695
Germany	4085681	1648733.73	459231	1627835.35	411761
India	3389689	457101.72	249522	640755.00	309374
United Kingdom	3081871	460760.14	317066	753096.15	494440
France	2780136	666667.79	285803	836165.61	337189
Russia	2244249	615406.82	70809	224136.42	49098
Canada	2137939	623549.49	136547	562486.88	123317
Italy	2012014	664808.75	134168	678837.01	124083
CAGR	**4.14%**	**4.29%**	**4.73%**	**4.35%**	**5.12%**

Source: International Monetary Fund (IMF) databank.

Analysis:

Over the past 18 years, there has been a noticeable rise in all the mentioned indicators for all ten countries (excluding Japan). The GDP's compound annual growth rate (CAGR) is the lowest among all the mentioned indicators. The CAGR for the import and export of goods is nearly the same. This suggests that during this period, the growth of merchandise exports and imports is equal to or higher than the GDP growth rate. On the other hand, the CAGR for the

export and import of services is significantly higher than the growth rate of goods. The exports of services have the highest CAGR during this period.

Table II: GDP_{MP}, Gross Domestic Aggregate consumption (GDAC) and GDAC INDEX of Top Ten Global Economies (Year 2005 and 2022)

Year 2005				
Country	**GDP_{MP}** (in million $)	**GDAC** (in million $)	**GDAC Index** (%)	**Rank**
United States of America	13039200	12299890	94.33	**II**
China	2290019	2662371	116.26	**IX**
Japan	4831467	5042917	104.38	**VI**
Germany	2848438	3098441	108.78	**VIII**
India	834217	815732	97.78	**IV**
United Kingdom	2547665	2344578	92.03	**I**
France	2198160	2109416	95.96	**III**
Russia	817717	955127	116.80	**X**
Canada	1173505	1232716	105.05	**VII**
Italy	1859244	1828790	98.36	**V**
MEAN	**3243963**	**3238997**	**102.97**	
YEAR 2022				
United States of America	25462725	24123136	94.74	**IV**
China	17886331	19117089	106.88	**IX**
Japan	4237528	4275287	100.89	**VI**
Germany	4085681	4154049	101.67	**VII**
India	3389689	3146184	92.82	**III**
United Kingdom	3081871	2612161	84.76	**I**
France	2780136	2559252	92.05	**II**
Russia	2244249	2657230	118.40	**X**
Canada	2137939	2212232	103.47	**VIII**
Italy	2012014	2008071	99.80	**V**
MEAN	**6731816**	**6686469**	**99.55**	
CAGR	**4.14%**	**4.11%**		

Source Computations on the basis of International Monetary Fund (IMF) databank**.**

Analysis:

All Countries

Over the past 18 years, there has been a noticeable upward trend in terms of GDP_{MP} and GDAC for all countries except Japan. GDP_{MP} has increased by 107.5% and GDAC by 106.4%, resulting in almost similar growth rates for both indicators. In 2005, five countries had deficit economies (GDAC Index > 100), but by 2022, this number had decreased to four countries. China and Russia were considered dicey in 2005, but in 2022, only Russia remains in that category. Both in 2005 and 2022, five countries had surplus economies (GDAC Index < 100), but there has been a significant decrease in the GDAC Index values. With the exception of Russia, the USA, and Italy, the GDAC Index of all other countries has shown improvement. The GDAC Index for the USA and Italy has remained relatively consistent, while for Russia, it has decreased significantly. The UK consistently had a better GDAC Index compared to other economies in both years. The average GDAC Index has decreased from 102.97% to 99.55%, indicating a reduced dependency on imports over the 18-year period.

Table III: Country- wise Summary Analysis of GDAC and GDAC Index (Year 2005 & 2022)

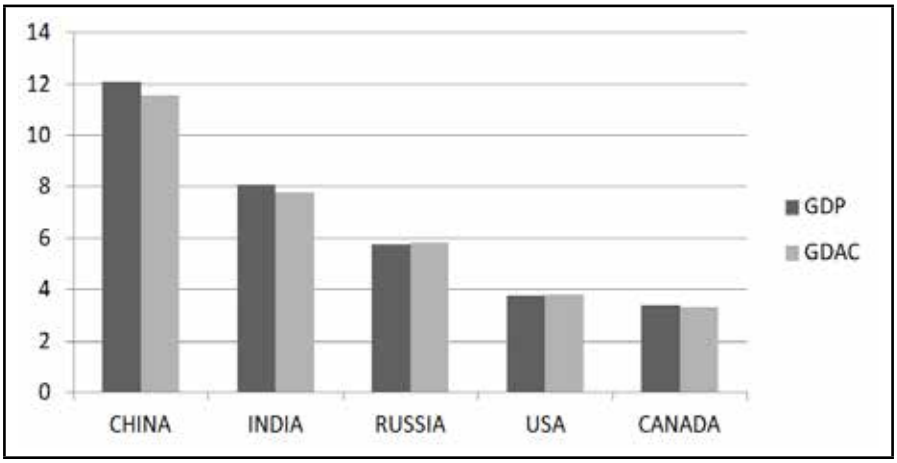
Country	2005	2022	Variation
1. **United States of America**			
GDP_{MP} (In mill $)	13039200	25462725	12423525 (95.28%)
GDAC (In M $)	12299890	24123136	11823246 (96.12%)
GDAC Index (In %)	94.33	94.74	0.41
Global Ranking (Based on GDAC Index)	**II**	**IV**	Decline
2. **China**			
GDP_{MP} (In mill $)	2290019	17886331	15596312 (681.06%)
GDAC (In mill $)	2662371	19117089	16454718 (618.04%)
GDAC Index (In %)	116.26	106.88	-9.38
Global Ranking (Based on GDAC Index)	**IX**	**IX**	No Variation
3. **Japan**			
GDP_{MP} (In M $)	4831467	4237528	-593939 (-12.29%)
GDAC (In M $)	5042917	4275287	-767630 (-15.22%)

GDAC Index (In %)	104.38	100.89	-3.49
Global Ranking (Based on GDAC Index)	**VI**	**VI**	No Variation
4. **Germany**			
GDP_{MP} (In M $)	2848438	4085681	1237243 (43.44%)
GDAC (In M $)	3098441	4154049	1055608 (34.07%)
GDAC Index (In %)	108.78	101.67	-7.11
Global Ranking (Based on GDAC Index)	**VIII**	**VII**	Improve
5. **India**			
GDP_{MP} (In M $)	834217	3389689	2555472 (306.34%)
GDAC (In M $)	815732	3146184	330452 (285.69%)
GDAC Index (In %)	97.78	92.82	-4.96
Global Ranking (Based on GDAC Index)	**IV**	**III**	Improve
6. **United Kingdom**			
GDP_{MP} (In M $)	2547665	3081871	\534206 (20.97%)
GDAC (In M $)	2344578	2612161	267583 (11.41%)
GDAC Index (In %)	92.03	84.76	-7.27
Global Ranking (Based on GDAC Index)	**I**	**I**	No Variation
7. **France**			
GDP_{MP} (In M $)	2198160	2780136	581976 (26.48%)
GDAC (In M $)	2109416	2559252	449836 (21.32%)
GDAC Index (In %)	95.96	92.05	-3.91
Global Ranking (Based on GDAC Index)	**III**	**II**	Improve
8. **Russia**			
GDP_{MP} (In M $)	817717	2244249	1426532 (174.45%)

GDAC (In M $)	955127	2657230	1702103 (178.21%)
GDAC Index (In %)	116.80	118.40	1.6
Global Ranking (Based on GDAC Index)	**X**	**X**	No Variation
9. **Canada**			
GDP_{MP} (In M $)	1173505	2137939	964434 (82.18%)
GDAC (In M $)	1232716	2212232	979516 (79.46%)
GDAC Index (In %)	105.05	103.47	-1.58
Global Ranking (Based on GDAC Index)	**VII**	**VIII**	Decline
10. **Italy**			
GDP_{MP} (In M $)	1859244	2012014	152770 (8.22%)
GDAC (In M $)	1828790	2008071	179281 (9.80%)
GDAC Index (In %)	98.36	99.80	1.44
Global Ranking (Based on GDAC Index)	**V**	**V**	No Variation

Source: Own Computations on the basis of International Monetary Fund (IMF) databank.

Figure I: Top Five Countries on the basis of CAGR of Gross domestic aggregate consumption ((GDAC) (from 2005 to 2022)



Source: Author on the basis of International Monetary Fund (IMF) databank.

TEST OF HYPOTHESES:

Regression analysis is one of standard statistical technique for the forecasting and the measurement of correlation. The main objectives for calculation of multiple regressions are:

i. To describe and understand the relationship between two or more variables.

ii. To forecast (predict) a new observation on the basis of available data.

As per first hypothesis we have to find out the degree of correlation/relationship between correlation between production (GDP_{MP}) and consumption (GDAC) of top ten global economies in the year 2005 and 2022. Therefore, for the testing of this hypothesis, regression analysis is an ideal tool.

T-test is an ideal statistical tool which is used when the data sets follow a normal distribution and have unknown variances. This test is applied as an inferential statistical tool to determine if there is a significant difference between the means of two groups and how they are related. In present study there is need to compare the two samples (GDAC of top ten global economies for the year 2005 and 2022). Thus for the comparison of variance, T-Test is applied in for the testing of second hypothesis:

(H1): "There is no significant correlation between Production (GDP_{MP}) and Consumption (GDAC) of top ten global economies in the year 2005 and 2022."

Table IV: Multiple Regression Analysis by Ordinary Least Square (OLS) Method

Year 2005				
Dependent Variable		Production (GDP_{MP})		
Independent Variable		Consumption (GDAC)		
Sample		Top 10 Global Economies		
Included observations		10		
Multiple R		0.9981251		
R Square		0.9962537		
Adjusted R Square		0.9957854		
Standard Error		236072.58		
Variable	Coefficients	Standard Error	t Stat	P-value
a (Intercept)	-199786.4	105581.6235	-1.892245754	0.09509661
b (Slope)	1.0632145	0.023051037	46.12436951	0.00000005

Year 2022	
Dependent Variable	Production (GDP_{MP})
Independent Variable	Consumption (GDAC)
Sample	Top 10 Global Economies
Included observations	10

Multiple R		0.99685079		
R Square		0.9937115		
Adjusted R Square		0.99292544		
Standard Error		682233.878		
Variable	Coefficients	Standard Error	t Stat	P-value
a (Intercept)	-31547.101	287626.1	-0.10968	0.915364
b (Slope)	1.01149999	0.028449	35.55508	0.00000004

Source: Author on the basis of International Monetary Fund (IMF) databank.

Analysis:

i. R-square:

For both the years, the values of R-square or R-square adjusted are almost the same and express how much independent variables are predicting (impacting) dependent variables. In 2005, the value of R square is 0.996, so 99.6% of GDAC are predicting GDP_{MP}. On other side in 2022 the value of R- square is 0.993, so 99.3% of GDAC are predicting GDP_{MP}. The comparison of both the periods shows that, consumption (GDAC) (independent variable) has a higher degree of correlation with production (GDP_{MP}).

ii. P-Values:

For both the years, $P < 0.05$, for 2005 it is 0.00000005 and in case of 2022 it is 0.00000004. Following the Rule of Thumb which states that if the p-value is lesser than 5%, the relationship is said to be significant if it is greater than 5%, it is insignificant. It means there is a significant correlation between the Production (GDP_{MP}) and Consumption (GDAC).

iii. Regression Equation:

On substituting the results of the coefficients of a (intercept) and b (slope) in the regression equation ($y = a + bx$), it can be established that:

For 2005:

GDP_{MP} = -199786.4 + 1.0632145 (GDAC)

It means when the GDAC in this year is $ 100,00,000, then the amount of GDP_{MP} will be as under:

GDP_{MP} = -199786.4 + (1.0632145 *100,00,000)

GDP_{MP} = -1,99,786 + 106,32,145

GDP_{MP} = $ 104,32,359

For 2022:

GDP_{MP} = -31547.101+ 1.01149999 (GDAC)

It means when the GDAC in this year is $ 100,00,000 then the amount of GDP_{MP} will be as under:

GDP_{MP} = -31547.101+ (1.01149999 *100,00,000)

GDP_{MP} = -31,547 + 101,14,999

GDP_{MP} = $ 100,83,452

Now, to test the second hypothesis, p-value is calculated.

Table V: Students t- Test

Particulars	GDAC (2005)	GDAC (2022)
Sample Size (N)	10	10
Mean (X)	3238997.8	6686469.1
Variance	11653802678990.2	63899234952187.2
Degree of Freedom (DF)	18	
Significance Level	0.05	
T-Test Value	-1.2542	
p-value (Computed)	0.1168	
p-value (Critical)	0.05	
Result	0.1168 > 0.05 H2 is Accepted, as p > 0.05	

Source: Author's computation on the basis of International Monetary Fund (IMF) databank.

iv. Hypothesis Test Result:

The summary interpretation is that in the year 2005, GDP_{MP} was $ 104.32 for every GDAC of $ 100, but now in the year 2022, GDP_{MP} is $ 100.83. In this way a minimal decrease of 3.34% is visible in the GDP_{MP} on GDAC for the comparative period.

So **H1** is rejected and alternative hypothesis **H2**is accepted as:

- **H1 (Correlation** GDP_{MP} **-GDAC):**

○ **Rejected.** "There is a significant correlation between Production (GDP_{MP}) and Consumption (GDAC) of top ten global economies in the year 2005 and 2022."

Regression Equation (2022):

GDPMP =−31,547+1.011×GDAC

- **H2 (GDAC Change 2005–2022):**

○ Accepted . "There is no significant change in Consumption (GDAC) of top ten global economies for the year 2005 and 2022." (p = 0.1168 > 0.05).

MAJOR FINDINGS & CONCLUSION

On the basis of the above analysis and hypotheses testing, following are the major findings of this research study:

- The Gross Domestic Aggregate Consumption (GDAC) represents the overall expenditure on goods and services consumed within a country's borders. These products and services can be either domestically produced, bought using the local currency, or imported from foreign countries with payments made in foreign exchange.
- The GDAC Index represents the proportion of GDAC calculated using GDP_{MP}. Essentially, this index reflects the percentage of domestic consumption in relation to domestic production.
- When the GDAC Index falls below 100, it indicates a self-reliant or surplus economy where domestic consumption is lower than domestic production. Conversely, a GDAC Index exceeding 100 suggests a dependency or deficit economy with domestic consumption surpassing domestic production.
- The initial hypothesis test reveals a strong correlation (99%) between GDP and GDAC, indicating that GDAC can be used as an independent variable to predict GDP as the dependent variable. On the other hand, the second hypothesis test shows no significant change in the consumption levels of the top ten global economies from 2005 to 2022.
- In 2005, there were five countries classified under the category of deficit economies (GDAC Index > 100), but this number has decreased to four countries in 2022. Specifically, China and Russia were among the deficit economies in 2005, with Russia also being categorized as risky in 2002. Interestingly, both 2005 and 2022 witnessed five countries classified as surplus economies (GDAC Index < 100), but the GDAC Index value has significantly decreased. The mean GDAC Index has dropped from 102.97% to 99.55%, indicating a notable decrease in dependency on imports over the span of 18 years.
- Between 2005 and 2022, there was a notable increase in consumption levels across all economies, with the growth rate closely mirroring that of GDP. However, it is important to note that the growth rates varied among countries. China, India, and Russia emerged as the top three economies in terms of Compound Annual Growth Rate (CAGR) for Gross Domestic Product at Constant Prices (GDAC), while the European economies, namely the UK, France, and Italy, found themselves at the bottom three positions. Interestingly, Japan stood out as the only country experiencing a negative growth rate for both GDP and GDAC.

GDAC may become a useful method to determine the consumption level of a domestic territory as well a specific region. It can also be used as a tool to compute the living standard of residents in a domestic territory. In the present study it is effectively used for the comparison and measurement of correlation between production and consumption. The GDAC Index is an appropriate method to determine self-reliance or dependence level of a country on the imports

for domestic consumption. So GDAC is all-inclusive concept for the better understanding of the empirical relationship between the output, foreign trade and consumption level with a logical approach.

In conclusion, one can state that GDAC effectively measures domestic consumption, including imports and excluding exports. The GDAC Index is a useful tool to assess an economy's self-reliance. A strong link exists between GDP and GDAC, with GDAC capable of predicting GDP. Most economies reduced import dependency over 18 years, except Russia. China, India, and Russia led in GDAC growth, while Japan lagged.

GDAC provides a comprehensive framework for analyzing consumption, production, and foreign trade dynamics. It serves as a valuable tool for policymakers to evaluate economic self-reliance and design strategies for sustainable growth. GDAC offers a multifaceted approach to understanding and analyzing economic dynamics within domestic territories. It serves as a valuable method for assessing consumption levels and computing the living standards of residents, providing insights into the overall economic well-being of a region. GDAC emerges as a robust framework for comprehensively understanding and analyzing economic activities within domestic territories. By measuring consumption levels, assessing living standards, and exploring correlations between production and consumption, GDAC offers valuable insights into economic dynamics. Its ability to gauge a country's self-reliance on imports further enhances its utility, providing policymakers with critical information to formulate effective economic strategies. Moreover, GDAC's role in elucidating the empirical relationships between output, foreign trade, and consumption underscores its importance in guiding economic policies towards sustainable growth and stability. As economies evolve and global interdependencies deepen, GDAC stands out as a crucial tool for navigating the complexities of modern economic landscapes, offering clarity and strategic direction for sustainable development.

REFERENCES

1. Guisan, M. C. (2001). Causality and Co-integration between Consumption and GDP in 25 OECD Countries: Limitations of the Co-integration Approach. *Applied Econometrics and International Development,* **1**(1).
2. Thangavelu, S., M. & Rajaguru, G. (2004). Is there an export or import-led productivity growth in rapidly developing Asian countries? A multivariate VAR analysis. *Applied Economics,* **36** (10).
3. Dutta, D. & Ahmed, N. (2004). An Aggregate Import Demand Function for India: A Cointegration Analysis. *Applied Economics Letter*, **11**(10).
4. Paul.A.,S. & William D., N. (2005). *Economics.* Tata McGrew-Hill Publishing Company Ltd, New Delhi, Second reprint.
5. Gomez-Zaldivar, M., & Ventosa-Santaularia, D. (2009). The Bilateral Relationship between Consumption and GDP in Mexico and the US: A Comment, *Applied Econometrics*

and International Development, **9**(1).

6. Mishra, P.K. (2010). Dynamics of the Relationship between Real Consumption Expenditure and Economic Growth in India. *Indian Journal of Economics and Business,* **4**(3).
7. Fouladi, M. (2010). The Impact of Government Expenditure on GDP, Employment and Private Investment a CGE Model Approach. *Iranian Economic Review*, **15**(27).
8. Stefano P. & Valerio M. (2011). Sustainable Consumption and Production. *Society and Economy,* **33**(1).
9. Anghelache, C. (2011). Analysis of the Correlation between GDP and the Final Consumption*. Theoretical and Applied Economics,* **9**(9).
10. Amin, S.B. (2011). Causal Relationship between Consumption Expenditure and Economic Growth in Bangladesh. *World Journal of Social Sciences,***1**(2).
11. Abdullahi, Y.; Sokoto, A.; & Afiyanu, S. (2013). Analysis of the relationship between foreign trade and economic growth in Africa. *Economic and Financial Review,* **3**(3).
12. Tapsin, G. & Hepsag, A. (2014). An analysis of household consumption expenditures in EA-18. *European Scientific Journal.*
13. Turmudi, M. (2017). Produksi Dalam Perspektif Ekonomi Islam. *Islamadina,* **18** (1).
14. Sugiarto, T.; Madu, L.; & Subagyo, A. (2018). International Application Model Short-Long Term between GDP and Consumption: Case Study Indonesia. *Economics-Innovative and Economic Research,* **6**(1): 81-90.
15. Tan, J. H. and Vincent, L. (2019). The Dynamic Relationship between Private Final Consumption Expenditure and Gross Domestic Product. *Journal of Southeast Asian Economies,* **36**(1).
16. Saxena, Himani & Bansal, P.K. (2019). Relationship between Economic Factors and Economic Growth. *Proceedings of 10th International Conference on Digital Strategies for Organizational Success*, Available at SSRN: https://ssrn.com/abstract=3319961 or http://dx.doi.org/10.2139/ssrn.3319961
17. Bishop, R.; Boulter, J. & Rosewall, T. (2022). Tracking Consumption during the COVID-19 Pandemic. *RBA Bulletin, Reserve Bank of Australia*.
18. International Monetary Fund (IMF) Databank.

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AN ANALYSIS OF GREEN LENDING INTENSITY OF INDIAN BANKS USING MACHINE LEARNING TOOLS

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ABSTRACT

Green lending is a vital mechanism for aligning financial systems with sustainability goals, yet its execution varies across institutional and regulatory contexts. This study investigates green lending practices through case studies of China's Green Credit Policy (GCP), the European Central Bank's Green TLTROs, and India's banking sector initiatives, supplemented by empirical data on credit trends, ESG performance, and financial stability indicators in India. Findings reveal that China's GCP reduces credit risk and enhances financial stability, while India's green lending remains constrained by weak enforcement, low public awareness, and sectoral imbalances favoring personal loans over sustainable investments. Private banks leverage fintech and AI for green products, whereas public banks focus on large-scale renewable projects hindered by bureaucratic inefficiencies. Key challenges include greenwashing risks, inconsistent ESG reporting, and a weak correlation (r = 0.099) between green lending intensity and ESG scores, signaling a disconnect between policy commitments and financial flows. The study recommends AI and blockchain for transparency, alongside policy measures like standardized blended finance models and green taxonomies to accelerate sustainable finance adoption. The paper suggests the use of AI and blockchain technologies for improvement in transparency for risk assessments, data gaps, and persisting ethical concerns. Policy recommendations such as standardized blended finance models, green taxonomies, and integrated regulatory frameworks have been made to quicken sustainable finance adoption. This research contributes to the knowledge bank on scaling green finance while balancing financial stability and environmental objectives.

Keywords: Banking sector, credit risk, ESG, fintech, green lending, regulatory policy, sustainable finance.

INTRODUCTION

The conjunction of green lending with financial stability has been deeply explored in literature and empirical studies, exploring benefits and challenges for sustainable finance. A

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study by Cui *et al*. (2018) reveals reduced credit risk and improved financial stability owing to higher indulgence in green lending activities. Relatedly, the relation between China's Green Credit Policy (GCP) based regulations and lower credit risks highlights the alignment of financial and environmental goals (Zhou *et al*.,2022). Del Gaudio *et al.* (2022) emphasized the benefits of adhering to credible sustainability standards as instanced by lead banks in syndicated green loans. Results from studies of BRIC countries further reveal improvement in bank profitability and asset quality as an enhanced benefit of green SME lending. These studies support green lending as a strategic priority for the mitigation of financial risks and long-term performance improvement.

On the other hand, literature studies discover significant barriers to effective green finance implementation. While Gilchrist *et al.* (2021) focused on inconsistencies in green bonds with associated green risks needing verification, Bose *et al*.(2018) underlined the necessity of strong corporate governance and regulatory pressure for transparent green banking disclosure from the South Asian context. The DSGE model by Punzi (2018) illustrated the aspects of stabilization of economies through green lending initiatives, with dependency on policy incentives by banks. From the Indian context, Bihari and Pandey (2015) discussed low awareness and weak regulatory enforcement as the major challenges for Indian banks, limiting the impact of green initiatives. Sharma and Choubey (2022) confirmed the need for standardized frameworks and stakeholder engagement for the expansion of green banking initiatives in India. These findings emphasize the need for harmonized regulations, transparency, and institutional capacity as the building blocks of a green financial framework.

Studies related to the vision of green financing also signify dependency on coordinated policy action and institutional innovation. Volz (2018) supported the role of integrated tools like green bonds and sustainable banking regulations for Asia's climate goals, while Setyowati (2023) figured policy fragmentation and enforcement as the main struggles for the green financing initiative for Indonesia. The role of entrepreneurs as the prime green initiative driver for mission-oriented public investments to de-risk private participation was discussed by Mazzucato (2015). Further study by Maltais and Nykvist (2020) affirmed the need for stringent green bond certification to confirm real environmental impact, to face legal risks using clearer contractual safeguards (Prum and Del Percio, 2009). Pulgam and Charkha (n.d.) stated the role of policy alignment and disclosure requirements for driving corporate environmental responsibility. Similarly, Ozili (2022) and Bahl (2012) underscored the strategic imperative of green banking for ensuring both competitiveness and regulatory compliance. All these studies point to the necessity of global standardization, stronger oversight, and multi-stakeholder collaboration for alignment with existing financial systems, sustainability goals, and making sure that green finance delivers both ecological and economic benefits.

RESEARCH OBJECTIVES

This study aims to achieve the following research objectives: (1) To examine the impacts of financial regulations on credit risk mitigation and bank stability in emerging versus developed

markets; (2) To investigate the institutional contrasts between private and public sector banks in green lending adoption, depending on innovation versus scale trade-offs; (3) To evaluate the efficacy of the current ESG framework (India) for scaling green finance activities concerning sectoral credit allocation imbalances and SME participation barriers; (4) To assess the role of AI and fintech solutions in handling different challenges of greenwashing, for encouraging sustainable lending practices;(5) To analyze the relationship between ESG performance and financial indicators (NPAs, ROA) for the development of integrated risk assessment models; (6) To identify policy interventions for strengthening green taxonomies, disclosure standards, and incentive structures for banks;(7) To propose a harmonized framework using cross-country case studies and banking performance metrics to support alignment of financial practices with SDGs. These objectives jointly address critical gaps in recognizing how regulatory, technological, and institutional factors can work together to re-engineer effective green finance ecosystems.

RESEARCH METHODS

The study employs a mixed-methods approach, combining qualitative case studies, empirical data analysis, and machine learning techniques to assess green lending trends in Indian banks. Below is a structured breakdown of the methodology:

- The study uses an exploratory and analytical research strategy that utilizes qualitative and quantitative methods.
- It contrasts China's GCP, the ECB's Green TLTROs, and India's initiatives regarding regulatory consequences. The RBI and CRISIL offer empirical data (2020-2025) to assess green loan trends, NPAs, and ESG performance.
- Machine learning technologies (Python-based modeling) explore the relationships between green finance and financial stability.

This mixed-method approach provides a thorough overview of India's green lending landscape, integrating policy insights with data-driven analysis to determine gaps and possibilities in sustainable banking practices.

Table 1: Variables with sources

Variable	Measurement	Source
Green Lending Intensity (%)	Proportion of green loans to total loans	RBI DBIE
ESG Scores	CRISIL sustainability metrics	CRISIL Reports
NPAs (%)	Gross non-performing assets	Bank annual reports
ROA (%)	Return on assets	RBI database

DISCUSSIONS

Case studies on Green Lending

Case Study 1: China's Green Credit Policy (GCP)

China's Green Credit Policy (GCP) was launched in 2012, which enabled banks to integrate environmental criteria into lending decisions, limiting financing for high-pollution industries while advocating green projects. Research by Zhou *et al.* (2022) and Cui *et al*. (2018) discussed how the banks adhering to GCP experienced were able to reduce credit risk and improve financial stability, exhibiting the policy's effectiveness in aligning finance with sustainability. Although China's GCP functions as a critical model for emerging economies on a quest to integrate environmental regulation into banking systems, challenges such as unpredictable enforcement and greenwashing continue to impact its economy.

Case Study 2: European Central Bank's Green TLTROs

Green Targeted Longer-Term Refinancing Operations (TLTROs) was established by the European Central Bank (ECB) to intensify green lending with low-interest loan offerings coupled with sustainable investments. Van Tilburg (2020) merged monetary strategy with climate action for boosting funds for renewables and energy efficiency. On the contrary, other critics were wary of the risks associated with fewer eligibility criteria. This approach implicates the relevance of the green transition using innovative monetary policy.

Case Study 3: India's Green Banking Initiatives

Many Indian banks have adopted *green banking* through digitalization, solar-powered branches, and privileged loans for renewable energy projects. Although studies by Bihari & Pandey (2015) and Sharma & Choubey (2022) emphasized the progressions to eliminate carbon footprints during dispersal of green lending funds for SME's, weaker enforcement and low public awareness have slowed scalability. RBI has made considerable efforts for mandatory ESG disclosures, indicating movement towards stronger green finance regulation. India's experience has highlighted the potential for growth and the challenges of green banking in emerging markets.

Green Lending by Banks

Table 2: Green lending in Private Sector Banks vs. Public Sector Banks

Aspect	Private Sector Banks	Public Sector Banks	Key References
Regulatory Pressure	Mostly driven by market demand, investor expectations, and voluntary ESG commitments.	Stronger influence from government policies and Central Bank mandates (e.g., priority sector lending).	Bihari & Pandey, 2015; Zhou *et al*., 2022
Risk Appetite	More flexible in financing innovative green projects (e.g., green bonds, fintech-driven solutions).	More cautious due to bureaucratic processes but support large-scale renewable energy and infrastructure projects.	Mirza *et al*., 2023; Sharma & Choubey, 2022

Green Loan Portfolio	Faster adoption of niche green products (e.g., EV loans, green mortgages).	Higher volume of green loans due to State-backed initiatives (e.g. India's GBI, China's GCP).	Cui *et al*., 2018; Bose *et al.*, 2018
Transparency & Reporting	More advanced ESG disclosures due to stakeholder pressure (e.g., TCFD, SASB compliance).	Lag in reporting quality but improvement due to regulatory mandates (e.g., RBI's ESG guidelines).	Gilchrist *et al*., 2021; Ozili, 2022
Challenges	Greenwashing risks, lack of standardized metrics.	Slower innovation, political interference in lending decisions.	Punzi, 2018; Setyowati, 2023

(***Source***: Author's analysis)

The comparative table highlights the pertinent differences between private and public sector banks based on the parameters of regulatory pressure, risk appetite, green loan portfolio, transparency-reporting, and challenges faced by banks. Innovative green financial products such as green bonds and fintech-driven solutions have been rapidly adopted by private banks. Results from studies (Bihari & Pandey, 2015; Zhou *et al*., 2022) confirm that these are mostly driven by market forces and investor expectations, with challenges related to weaker standardization (Gilchrist *et al*., 2021). In comparison, public sector banks are prioritizing large-scale renewable energy and infrastructure (Sharma & Choubey, 2022) projects with slower innovations prompted by government mandates and central bank policies (Cui *et al*., 2018; Bose *et al*., 2018). While private banks show more transparency and ESG reporting to fulfill stakeholder demands (Ozili, 2022), public sector banks often face quality concerns despite efforts made by RBI for regulatory interventions (Mirza *et al*., 2023). Also, contradictions underscore the role of private banks in leveraging market mechanisms to advance niche green financing, and public banks fulfilling the national sustainability agendas, with relative constraints owing to political and structural limitations (Punzi, 2018; Setyowati, 2023). Together, these findings emphasize the different roles of both sectors in scaling green finance initiatives, and their dependency on intense policy alignment and standardized metrics to manage innate tradeoffs (See Table 2).

Use of Artificial Intelligence as a Green Lending Enabler

The use of intelligence techniques has transformed the advancement of green finance and sustainable development. Research studies indicate the existing and potential of artificial intelligence and machine learning in augmenting financial performance and decision making, particularly risk assessments and impact measurements (Hemanand *et al*., 2022; Kumar *et al*., 2025). Recent studies have witnessed fintech innovations like digital lending platforms

and blockchain being dominant in the reduction of transaction costs are showing signs of further growth with robust regulatory frameworks (Liu *et al*., 2022; Udeagha & Ngepah, 2023) in both developing and emerging economies (Nassiry, 2018; Hasan *et al*., 2024). Technology-aided green lending often suffers from challenges that include data quality, ethical AI use, and institutional barriers that persist (Yigitcanlar *et al*., 2021; Tamasiga *et al*., 2022). This is further supported by the integration of IoT and automated machine learning (AutoML) that optimizes resource efficiency and supports scalable green financial solutions (Bhat *et al*., 2023; Castellanos-Nieves & García-Forte, 2024). The role of multi-stakeholder collaboration and adaptive policies is deemed crucial for utilizing these techniques for inclusive and climate-resilient growth (Thomas, 2023). Collectively, these studies underline the necessity for interdisciplinary approaches, standardized metrics, and policy innovation to align financial systems with global sustainability goals.

Challenges of Green Lending in India

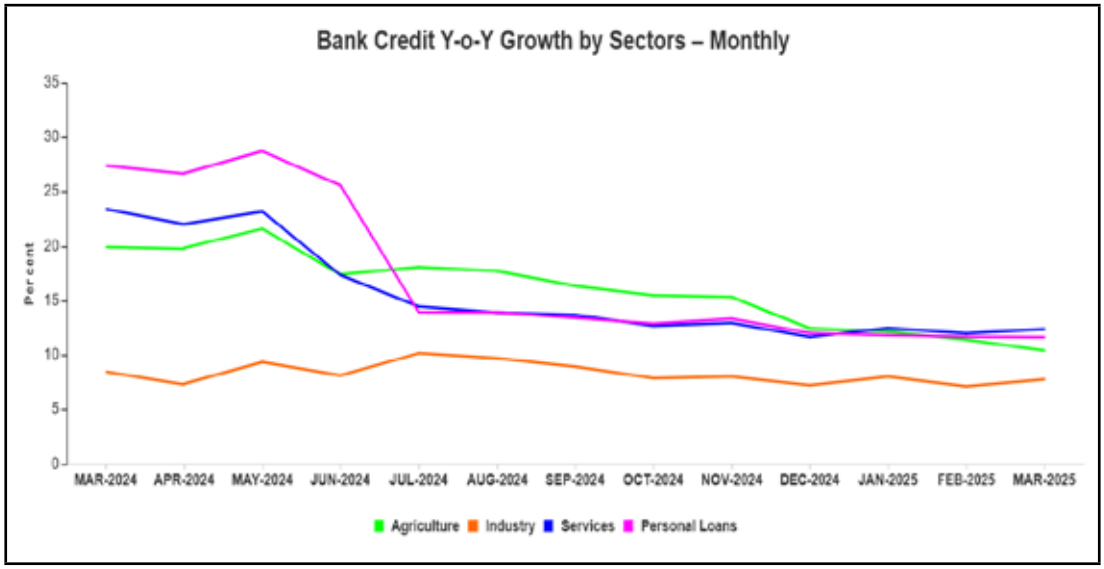
Scalability and effectiveness are the two major challenges of Green Lending in India. Firstly, a lack of a transparent regulatory framework and inconsistent policy frameworks leads to uncertainty for banks and borrowers (Bihari & Pandey, 2015; Sharma & Choubey, 2022). The concept of sustainable finance has been encouraged by the Reserve Bank of India (RBI), although the lack of minimum Green Lending targets signals fragmented adoption. Secondly, market growth of small and medium enterprises (SMEs) for Green Lending has been restricted due to the limited awareness among targets (Mirza *et al.,* 2023). Most businesses normally prioritize short-term impacts over long-term sustainability due to higher initial costs. Thirdly, verification of the environmental benefits of green projects seems difficult due to existing data gaps and inefficient risk assessments, further expanding chances of an increase in risks (Gilchrist *et al*., 2021). Fourthly, persistent bureaucratic delays and the tendency of risk aversion shadow the green lending activities of public sector banks, slowing lending disbursement rates (Sharma & Choubey, 2022). Reporting of 'green projects' is further complicated by the lack of standardized definitions and taxonomies of green terminologies (Ozili, 2022). Therefore, to address the challenges, stronger policy mandates, capacity building, and financial incentives need to be integrated for sustainable finance.

DATA ANALYSIS

For actual analysis, we had taken data for all six banks that include State Bank of India, HDFC Bank, ICICI Bank, Axis Bank, and Kotak Mahindra Bank, for the period 2020 - 2025, from the RBI database (https://data.rbi.org.in/DBIE). Later, this data was analyzed using different statistical tools, such as Microsoft Excel and Python programming version 3.0-based analysis, to identify Green Lending trends, NPA vs ESG performance, and key metric intercorrelation reflecting the actual state of the Green Financing paradigm in India.

Bank Credit Growth in India: The diagram shows the growth of bank credit across different economic sectors, including Agriculture, Industry, Services, and Personal Loans, during the period of March 2024 to March 2025 (year-on-year basis). Personal loans reveal maximum and most volatile growth (~35 %) with strong consumer demand, with some risks of overheating, followed by Services reflecting steady expansion, mirroring India's post-pandemic economic recovery. On the other hand, moderate Industrial growth (15–20%) implies restrained capital investment, whereas Agricultural credit marred by systemic constraints in rural financial inclusion recorded the lowest but steady trajectory (5–10%). These deviations hint at structural imbalances in credit allocation, with inconsistent growth in consumption-driven segments, justifying interventions to balance credit flows toward sustainable economic development (see Figure 1).

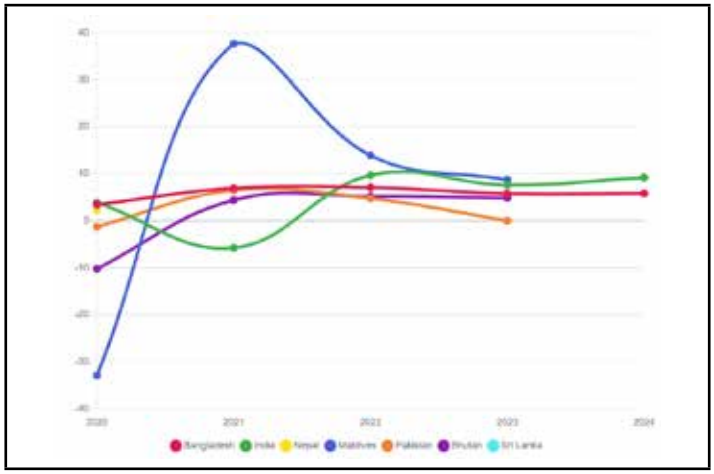
Figure 1: Bank Credit Growth



(***Source:*** DBIE, https://data.rbi.org.in/DBIE/#/dbie/dashboard)

GDP comparison across SAARC Nations: The comparative analysis of India's GDP growth with other South Asian economies during the period of 2020-2024 has revealed different aspects, with India and Bangladesh maintaining resilient growth and steady performance, while Pakistan and Sri Lanka showed cycles of negative values, exhibiting economic shocks or social stress. Both Nepal and Bhutan continue to maintain stable and consistent positions, indicating balanced development. Maldives, on the other hand, showed a differential pattern, relying heavily on tourism. These inequalities reflect the region's heterogeneous socioeconomic landscape, influenced by factors such as external shocks, governance quality, and sectoral vulnerabilities, with India leading the cycle of development despite broader regional uncertainties (See Figure 2).

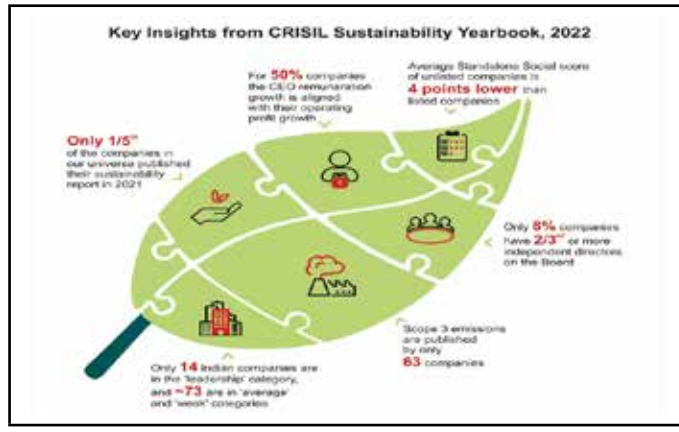
Figure 2: GDP growth of SAARC countries



(***Source:*** RBI CIMS SAARC. https://sfdb.rbi.org.in/#/general/home)

CRISIL Sustainability Report (2022): The *CRISIL Sustainability Yearbook 2022* portrays a contrasting picture where only 20 % of companies publish sustainability reports, 8 % maintain adequate board independence (≥2/3 independent directors). Further, structural inequalities with unlisted companies underperforming listed pairs by 4 points (social metrics), and 14 firms attain leadership' sustainability with 73 in '*averag*e' or '*weak*' categories. Also, 50% of cases with profit growth are aligned with CEO remuneration, representing partial integration of ESG incentives. Only 63 companies performed limited disclosure of Scope 3 emissions, highlighting systemic challenges of comprehensive sustainability reporting. This reflects the need for regulatory reforms and standardized ESG frameworks to improve transparency and accountability in India's corporate sector (see Figure 3)

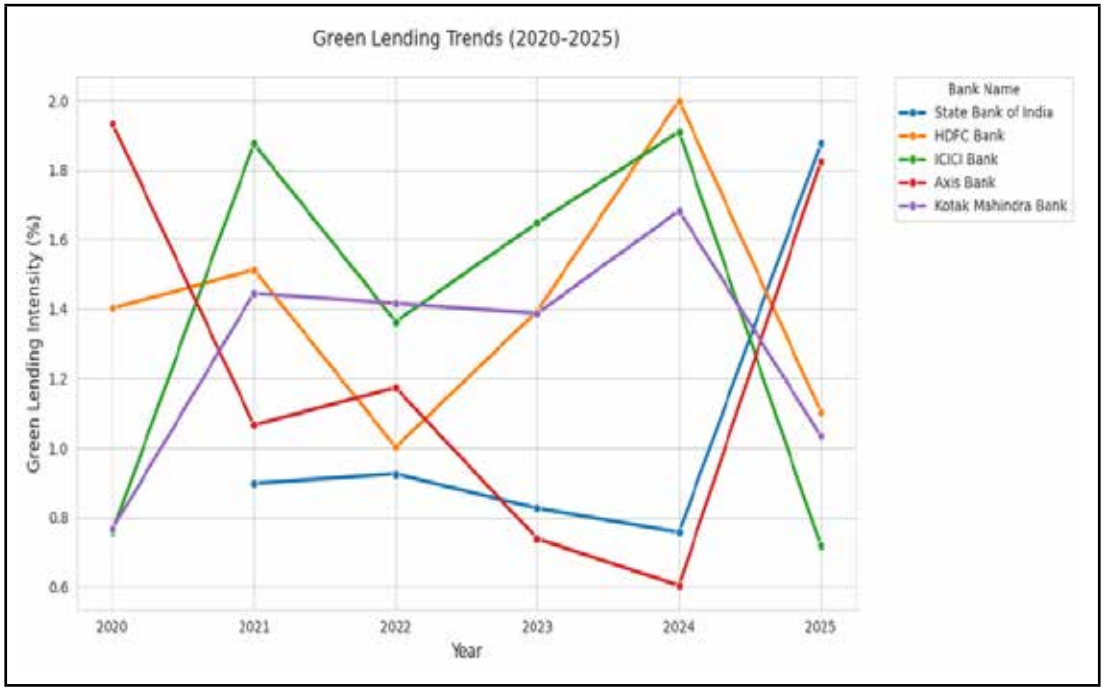
Figure 3: CRISIL sustainability (Year 2022)



(***Source:*** Sustainability Solutions, https://www.crisil.com/content/crisilcom/en/home/what-we-do/financial-products/crisils-sustainability-solutions.html)

Green Lending Trends: The top five banks in India, including the State Bank of India, HDFC Bank, ICICI Bank, Axis Bank, and Kotak Mahindra Bank—covering 2020 to 2025)—show distinct trends in Green Lending Intensity (%). Axis Bank recorded the highest intensity in 2020, while consistent growth, peaking in 2024, was achieved by HDFC Bank, indicating a strategic shift toward sustainable finance. In contrast, ICICI Bank and the State Bank of India displayed volatility, with ICICI's intensity dropping sharply to 0.718% in 2025, highlighting inconsistency in ESG initiatives. Overall intensities (~2%) have declined compared to global benchmarks (e.g., 5–10%), underscoring the need for stronger policy measures or market incentives to promote green financing in India's banking sector (see Figure 4).

Figure 4: Green lending trends

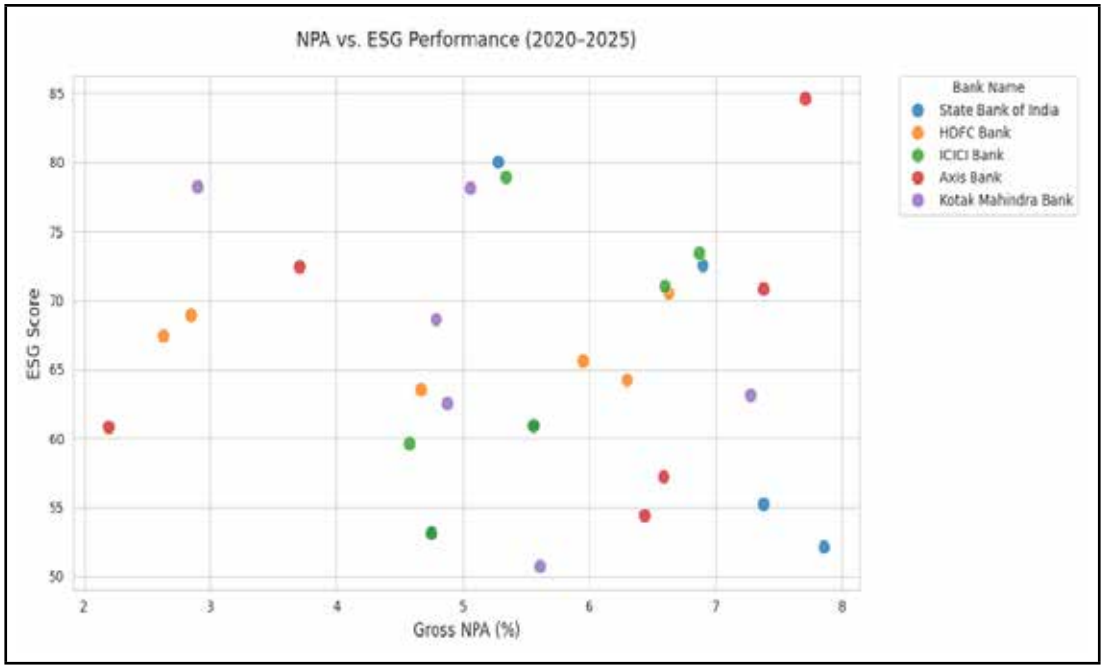


(***Source:*** Author's analysis)

NPA vs ESG performance: The scatter plot depicts the inverse relationship between Gross NPA (%) and ESG Scores for India's top five banks from 2020 to 2025, revealing critical risk-performance dynamics. HDFC Bank emerges as an outlier, combining low NPAs (2.63–6.63%) with consistently high ESG scores (64.2–70.5), suggesting that robust ESG integration may mitigate credit risk. Critical analysis was conducted to identify the inverse relationship between Gross NPA (%) and ESG scores for India's top five banks from 2020 to 2025, highlighting the critical risk dynamics. On the other hand, one can see highly volatile ESG performance (52.1–72.5) related to higher NPAs (peaking at 7.86%) for the State Bank of India, underscoring operational and governance challenges. Also, Axis Bank

displays elevated NPAs (7.71%) regardless of leading ESG scores (84.6 in 2020), which hints at the need for ESG metrics to be combined with other metrics to capture asset-quality risks. Evidence of divergence underlines the need for banks to associate ESG frameworks with core risk management practices to optimize both financial stability and sustainability outcomes (See Figure 5).

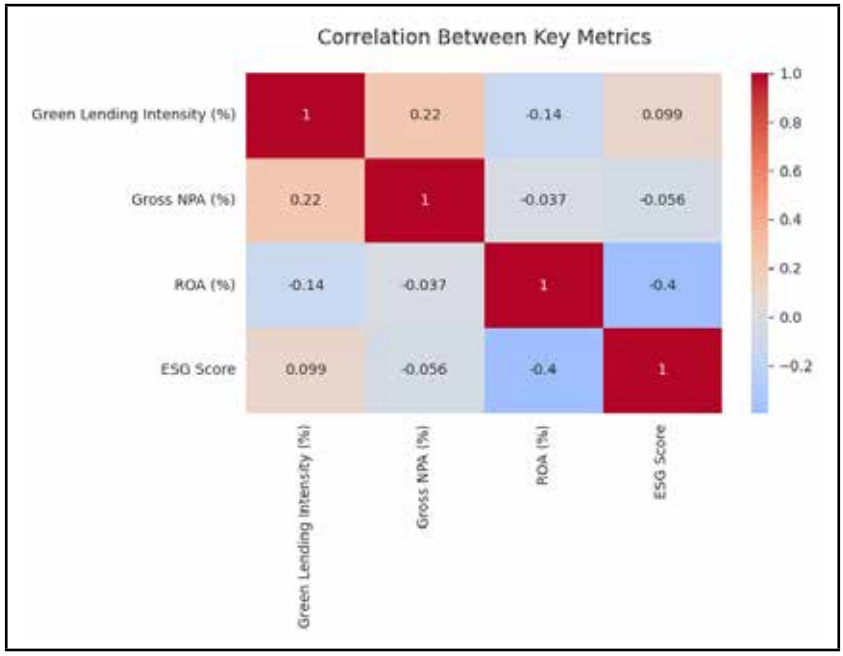
Figure 5: NPA vs ESG performance



(***Source:*** Author's analysis)

Key metrics inter-correlation: The association of Green Lending intensity (%) with Green NPA (%), ROA (%), and ESG score in the banking platform has been highlighted in the correlation matrix diagram. Results suggest minimal association between sustainable lending and credit risk, indicated by weak correlation between Green Lending Intensity (%) and Gross NPA (%) (r=0.22). Evidence suggests short-term profitability trade-offs for ESG investments, with a modest negative correlation between ROA (%) and ESG Score (r=-0.4). The existence of near-zero correlation between Green Lending Intensity and ESG Score (r=0.099) highlights some level of disengagement between banks' sustainability commitments and actual green financing deployment, signaling that ESG scores may only partially capture operational sustainability efforts. The results describe the presence of complexity in the process of alignment of financial performance with sustainability goals, suggesting more structural and regulatory changes for strengthening linkages. The word 'Green' banks doesn't imply higher profits in the short term, especially if they appear more environment-friendly on paper rather than being actively committed in real-life situations.

Figure 6: Correlation between Metrics



(***Source:*** Author's analysis)

RECENT DEVELOPMENTS

- As per the RBI, credit to Agriculture and Allied activities registered a growth of 9.2 per cent (y-o-y) (19.8 per cent in the corresponding fortnight of the previous year). Credit to Industry recorded a growth of 6.7 per cent (y-o-y), compared with 6.9 per cent in the corresponding fortnight of the previous year. Among major industries, outstanding credit to 'Basic Metal and Metal Products', 'All Engineering', 'Vehicles Parts and Transport equipment', 'Textiles and 'Construction' recorded an accelerated y-o-y growth. However, credit growth in the Infrastructure segment decelerated.
- Credit to the Services sector moderated to 11.2 per cent (y-o-y) (19.5 per cent in the corresponding fortnight of the previous year), primarily due to decelerated growth in credit to 'Non-Banking Financial Companies' (NBFCs). Credit growth (y-o-y) to 'Trade' and 'Computer Software' segments remained elevated.
- Credit to the Personal loans segment registered a decelerated growth of 14.5 per cent (y-o-y), as compared with 17.0 per cent a year ago, largely due to a decline in growth of 'Other Personal loans', 'Vehicle loans', and 'Credit Card Outstanding'.

FINDINGS AND CONCLUSIONS

- Available literature indicates that strict obedience to China's Green Credit Policy (GCP) for the attainment of environmental lending criteria reduced credit risk and improved bank stability. Similarly, ECB's Green TLTROs also elucidate the impact of policy incentives

(e.g., low-interest loans) to enhance renewable energy financing.

- Innovative Green products (e.g., fintech-driven EV loans) have been marketed by private banks owing to market forces, in contrast to large-scale renewable projects dominated by public banks through State mandates and typically delayed by bureaucratic rules.
- From India's context, green lending capacity remains below 2% (Figure 4), below global benchmarks (5–10%), affected by fragmented adoption, awareness gaps, and undefined "Green" taxonomies (Ozili, 2022; Gilchrist *et al*., 2021).
- The use of Artificial Intelligence and machine learning can suitably assist decision-making related to risk assessment and transparency in Green Lending (Hemanand *et al*., 2022). Furthermore, the blockchain technology can also reduce SME financing costs (Nassiry, 2018), although data quality and ethical concerns persist (Yigitcanlar *et al.,* 2021).
- Environmental, Social, and Governance (ESG) scores are normally associated with the contribution of NPA (Non-performing assets). As observed during the analysis, HDFC Bank had a high ESG score (70.5 %) with low NPAs (2.63%), and Axis Bank's 84.6% ESG score coexists with 7.71% NPAs (Figure 5), highlighting the need for operational integration to mitigate credit risks beyond ESG metrics coverage.
- India's credit growth is marked by personal loans (35% YoY) that dominate observable growth in sectors such as agriculture (5–10%) and industry (6.7%), indicating the need to incentivize the credit sector in financing (RBI, 2024).
- Calculated weaker correlation (r=0.099) between Green Lending intensity and ESG scores (Figure 6) points towards "cosmetic sustainability," which prefers disclosures over tangible Green financing (Gilchrist *et al*., 2021).

The results of analysis mandate the necessity for standardized definitions, use of blended finance applications, and AI-driven monitoring for upscaling Green finance (Punzi, 2018; Setyowati, 2023).

SUMMARY OF FINDINGS

The findings from this study indicate the relevance of greenwashing and its key contribution to economic growth, with visible benefits of financial stability and risk reduction as per evidence from China's Green Credit Policy (GCP) and the ECB's Green TLTROs. Green financing with the assistance of artificial intelligence tools and blockchain can mitigate challenges, including risk aversion and transparent implementation in both private and public sector banks. On the implementation scale, the use of standardized taxonomies, robust impact measurement frameworks, and integrated policy can lead to higher growth and contribution of green financing in the economic development of India.

RECOMMENDATIONS

- Restructuring of regulatory frameworks to facilitate green lending targets and standardized taxonomies for ensuring impartial implementation mechanisms that reduce policy

fragmentation while mitigating risks;

- Encouraging PPP (public-private partnership) ventures for development and usage of blended finance models that include innovative Green banking products such as fintech solutions, besides long-term infrastructural projects, to be jointly monitored by both private and public sector banks;
- Boosting the adoption rate of AI-driven transparency tools for managing Green loan allocations and ESG impact, with systemic alignment of disclosures and actual sustainability outcomes;
- Reducing awareness gaps with targeted campaigns with subsidized technical assistance for SMEs, for easy access to Green credit with simplified processes of certification.

REFERENCES

1. Bahl, S. (2012). Green: The new strategic imperative. *Asian Journal of Research in Business Economics and Management*, **2**(2): 176-185.
2. Berrou, R., Dessertine, P., & Migliorelli, M. (2019). An overview of Green finance. *The Rise of Green Finance in Europe: Opportunities and Challenges for Issuers, Investors and Marketplaces*, 3-29.
3. Bhat, J. R., AlQahtani, S. A., & Nekovee, M. (2023). FinTech enablers, use cases, and the role of the future Internet of Things. *Journal of King Saud University-Computer and Information Sciences*, **35**(1):87-101.
4. Bihari, S. C., & Pandey, B. (2015). Green Banking in India. *Journal of Economics and International Finance,* **7**(1): 1-11.
5. Bose, S., Khan, H. Z., Rashid, A., & Islam, S. (2018). What drives Green Banking Disclosure? *Asia Pacific Journal of Man*agement, **35**(2): 501-525.
6. Castellanos-Nieves, D., & García-Forte, L. (2024). Strategies of Automated Machine Learning for Energy Sustainability in Green Artificial Intelligence. *Applied Sciences (2076-3417)*, **14**(14).
7. Cui, Y., Geobey, S., Weber, O., & Lin, H. (2018). The impact of green lending on credit risk in China. *Sustainability*, **10**(6): 2008. https://doi.org/10.3390/su10062008.
8. Del Gaudio, B. L., Previtali, D., Sampagnaro, G., Verdoliva, V., & Vigne, S. (2022). Syndicated Green Lending and Lead Bank Performance. *Journal of International Financial Management & Accounting*, **33**(3): 412-427.
9. Durrani, A., Rosmin, M., & Volz, U. (2020). The Role of Central Banks in scaling up Sustainable Finance–What do monetary authorities in the Asia-Pacific region think?. *Journal of Sustainable Finance & Investment*, **10**(2): 92-112.
10. Gershoff, A. D., & Frels, J. K. (2015). What Makes It Green? The role of centrality of Green attributes in evaluations of the Greenness of Products. *Journal of Marketing*, **79**(1):

97-110.

11. Gilchrist, D., Yu, J., & Zhong, R. (2021). The Limits of Green Finance: A survey of literature in the context of Green Bonds and Green Loans. *Sustainability*, **13**(2): 478.
12. Hasan, M., Hoque, A., Abedin, M. Z., & Gasbarro, D. (2024). FinTech and sustainable Development: A systematic thematic analysis using human-and machine-generated processing. *International Review of Financial Analysis*, **95**, 103473.
13. Hemanand, D., Mishra, N., Premalatha, G., Mavaluru, D., Vajpayee, A., Kushwaha, S., & Sahile, K. (2022). Applications of Intelligent models to analyze the Green Finance for Environmental Development in the context of Artificial Intelligence. *Computational Intelligence and Neuroscience*, **2022**(1):2977824.
14. Kumar, S., Sharma, D., Rao, S., Lim, W. M., & Mangla, S. K. (2025). Past, present, and Future of Sustainable Finance: Insights From Big Data Analytics Through Machine Learning of Scholarly Research. *Annals of Operations Research*, **345**(2):1061-1104.
15. Liu, H., Yao, P., Latif, S., Aslam, S., & Iqbal, N. (2022). Impact of Green financing, FinTech, and Financial inclusion on Energy Efficiency. *Environmental Science and Pollution Research*, 1-12.
16. Maltais, A., & Nykvist, B. (2020). Understanding Green Bonds. *Journal of Sustainable Finance & Investmen*t, **10**(2): 93-112.
17. Maltais, A., & Nykvist, B. (2020). Understanding the role of Green Bonds in Advancing Sustainability. *Journal of Sustainable Finance & Investment*, 1-20.
18. Mazzucato, M. (2015). The Green Entrepreneurial State. in Ian Scoones, Melissa Leach and Peter Newell(eds.).*The Politics of Green Transformations*, London: Routledge.
19. Mirza, N., Afzal, A., Umar, M., & Skare, M. (2023). Green Lending in BRICS. *Economic Analysis and Policy*, **77**, 318-335.
20. Mirza, N., Afzal, A., Umar, M., & Skare, M. (2023). The impact of Green Lending on Banking Performance: Evidence from SME credit portfolios in the BRICS. *Economic Analysis and Policy*, **77**, 843-850.
21. Nassiry, D. (2018). *The Role of Fintech in Unlocking Green Finance: Policy Insights for Developing Countries* (No. 883). ADBI working paper.
22. Ozili, P. K. (2022). Green finance research around the world: a review of literature. *International Journal of Green Economics*, **16**(1): 56-75.
23. Prum, D. A., & Del Percio, S. (2009). Green building claims: what theories will a plaintiff pursue, who has exposure, and a proposal for risk mitigation. *Real Estate Law Journal*, **37**(4).
24. Pulgam, M. R., & Charkha, S. L. (2025) Green Credit and Lending: Driving Environmental Responsibility in the Banking Sector. European Economic Letters. Vol.15(2):110-136.

25. Punzi, M. T. (2018). *Role of bank lending in financing green projects: A dynamic stochastic general equilibrium approach* (No. 881). ADBI working paper.

26. Reserve Bank of India. Data Retrieved from https://data.rbi.org.in/ , https://rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=60554, https://www.crisil.com/content/crisilcom/en/home/what-we-do/financial-products/crisils-sustainability-solutions.html.

27. Setyowati, A. B. (2023). Governing sustainable finance: insights from Indonesia. *Climate Policy*, **23**(1):108-121.

28. Sharma, D., & Choubey, A. (2022). Green banking initiatives: A qualitative study on the Indian banking sector. *Environment, Development and Sustainability,* **24**(2): 293-319. https://doi.org/10.1007/s10668-021-01426-9.

29. Tamasiga, P., Onyeaka, H., & Ouassou, E. H. (2022). Unlocking the Green Economy in African Countries.

30. Thomas, N. M. (2023). Modeling key enablers influencing FinTechs' offering SME credit services: A multi-stakeholder perspective. *Electronic Markets*, **33**(1): 18.

31. Thompson, P. (1998). Bank lending and the environment: policies and opportunities. *International Journal of Bank Marketing*, **16**(6):243-252.

32. Top Indian Banks End FY25 With Stable Margins, Steady Profitability; Key Takeaways Of HDFC Bank, ICICI Bank, Kotak Mahindra Bank, Axis Bank And SBI, https://www.ndtvprofit.com/markets/hdfc-bank-icici-bank-kotak-mahindra-bank-sbi-state-bank-of-india-axis-bank-fy25-results-key-takeaways (02.06.2025).

33. Udeagha, M. C. & Ngepah, N. (2023). The drivers of environmental sustainability in BRICS economies: Do green finance and fintech matter?. *World Development Sustainability*, **3**, 100096.

34. van Tilburg, R. (2020). Targeting a sustainable recovery with Green TLTROs.

35. Volz, U. (2018). Fostering green finance for sustainable development in Asia. In *Routledge Handbook of Banking and Finance in Asia* (pp. 488-504). Routledge.

36. Yigitcanlar, T., Mehmood, R., & Corchado, J. M. (2021). Green artificial intelligence: Towards efficient, sustainable, and equitable technology for smart cities and futures. *Sustainability*, **13**(16): 8952.

37. Zhou, X., Caldecott, B., Hoepner, A. G., & Wang, Y. (2022). Bank green lending and credit risk: An empirical analysis of China's green credit policy. *Business Strategy and the Environment,* **31**(3):1623-1640. https://doi.org/10.1002/bse.2973

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A STUDY OF LABOUR FORCE PARTICIPATION IN RURAL AND URBAN SECTOR OF INDIA

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ABSTRACT

This study investigates the patterns and disparities in Labour Force Participation Rate (LFPR) across rural and urban India, with a focus on gender differences and temporal trends. Utilizing data from the Periodic Labour Force Survey (PLFS), it analyses labour participation dynamics among the working-age population (15–59 years) and highlights key differences in male and female participation across regions. The study finds consistently lower LFPR among women, especially in urban areas, and identifies economic, social, and educational factors influencing these trends. The paper concludes with policy recommendations aimed at improving female participation and reducing rural-urban disparities.

Keywords: Labour Force Participation Rate (LFPR), gender disparities, rural-urban divide, informal employment, female workforce, PLFS data, India.

INTRODUCTION

Labour Force Participation Rate (LFPR) is a vital indicator of economic activity, reflecting the portion of the working-age population either employed or actively seeking employment. LFPR helps in understanding the supply side of the labour market and is influenced by factors such as economic growth, educational attainment, social norms, and demographic trends.

India's labour market is characterized by notable disparities, particularly along rural-urban and gender lines. While economic development has ushered in modernization and urbanization, it has not uniformly increased labour participation, especially among women. Understanding these dynamics is crucial for formulating inclusive and effective labour policies.

OBJECTIVES OF THE STUDY

- To assess and compare labour force participation rates in rural and urban sectors of India.

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- To evaluate gender-based disparities in LFPR.
- To identify trends in LFPR over time and suggest policy interventions.

DATA AND METHODOLOGY

Data Source

The study uses secondary data from the **Periodic Labour Force Survey (PLFS)**, conducted by the National Statistical Office (NSO), Government of India. It covers major rounds (2017–2021) to examine trends and compare participation across sectors and genders.

Key Concepts

- **Labour Force Participation Rate (LFPR):** Proportion of the population (age 15–59) working or seeking work.
- **Worker Population Ratio (WPR):** Percentage of workers in the total population.
- **Unemployment Rate (UR):** Proportion of the labour force that is unemployed.

ANALYSIS AND FINDINGS

Overall Labour Force Participation Rate

The overall LFPR in India remains modest, with a notable divergence between rural and urban areas.

Year	Rural LFPR (%)	Urban LFPR (%)
2017	42.0	36.0
2019	40.7	35.9
2021	41.5	36.8

Note: Derived from PLFS data.

Gender Disparities

A prominent feature of India's labour market is the low **Female Labour Force Participation Rate (FLFPR).**

Sector	Male LFPR (%)	Female LFPR (%)
Rural	76.0	27.0
Urban	73.0	20.0

- **Rural women** are more likely to engage in agricultural or household-based work, often unaccounted for in formal statistics.
- **Urban women** face constraints such as lack of flexible work, safety concerns, and social

stigma.

Youth Participation (Age 15–29)

- Youth LFPR has declined due to increasing enrolment in higher education, especially among urban youth.
- Urban female youth show the steepest drop, reflecting both educational aspirations and limited post-education opportunities.

Educational Attainment and LFPR

- Higher education correlates with **lower LFPR among women**, particularly in urban India—a paradox where educated women exit the labour market due to social expectations, lack of suitable jobs, or marriage.

FACTORS AFFECTING LABOUR FORCE PARTICIPATION

- **Economic Factors:**
  - Informality of rural work.
  - Lack of formal job opportunities in urban areas.
- **Social and Cultural Factors:**
  - Patriarchal norms discouraging female employment.
  - Stigma attached to certain jobs for women.
- **Educational Aspirations:**
  - Increased enrolment in education reduces immediate participation.
- **Safety and Infrastructure:**
  - Lack of safe transportation and workplaces for urban women.
- **Policy Gaps:**
  - Weak implementation of employment schemes.
  - Inadequate childcare or maternity support.

CONCLUSION

This study highlights significant disparities in labour force participation across rural and urban India, particularly among women. Despite policy efforts, female LFPR remains low, with urban areas showing the steepest gaps. Rural India, while exhibiting higher FLFPR, reflects underemployment and informal work structures. Bridging these gaps requires targeted interventions, infrastructure improvements, and societal change.

POLICY RECOMMENDATIONS

- **Promote Skill Development:** Gender-sensitive, demand-driven training programs.
- **Encourage Formal Employment:** Incentivize flexible work arrangements for women.

- **Improve Safety Infrastructure:** Safe transport and workplaces to boost female participation.
- **Supportive Policies:** Expand childcare, maternity benefits, and re-entry programs.
- **Awareness Campaigns:** Challenge norms limiting women's economic participation.

REFERENCES

1. National Statistical Office (NSO). *Periodic Labour Force Survey (PLFS)*, 2017–2021. Ministry of Labour and Employment, Government of India.
2. International Labour Organization (ILO). *Reports on India*.
3. Kapsos, S., Silberman, A., & Bourmpoula, E. (2014). *Why is Female Labour Force Participation Declining in India?* ILO Research Paper No. 10. Available at https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@dgreports/@inst/documents/publication/wcms_250977.pdf

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EXAMINING THE RELATIONSHIP BETWEEN SMOKING AND STRESS

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ABSTRACT

This study investigates the bidirectional relationship between smoking and stress, focusing on individuals experiencing high stress levels. A diverse sample of 100 participants (aged 18–30) completed the Perceived Stress Scale (PSS) and a smoking habits questionnaire. Quantitative analyses revealed a moderate positive correlation ($r = 0.20$) between perceived stress and smoking frequency, though this relationship was not statistically significant ($p > 0.05$). Age showed a significant negative correlation with stress ($r = -0.49$, $p < 0.01$), suggesting stress decreases with age. Qualitative insights highlighted that smokers often use cigarettes as a short-term coping mechanism, despite long-term increases in stress due to nicotine dependence. The findings underscore the need for integrated stress management in smoking cessation programs. This study underscores the need for effective stress control strategies and support inside smoking cessation packages and public health tasks. It emphasizes the significance of targeted interventions to deal with each elements, in the long run promoting healthier lifestyles and improving public health fitness.

Keywords: Smoking, Stress, Coping Mechanism, Smoking Cessation, Mental Health, Nicotine.

INTRODUCTION

Smoking and stress are common problems that affect the human body and mind. These two factors are interrelated and often occur simultaneously, creating a relationship that deserves closer examination. This study aims to investigate the link between smoking and frustration, showing how they affect and worsen each other. Smoking is a longstanding public health problem all over the world, despite the awareness of its dangers. Smoking remains a global problem. According to the World Health Organization (WHO), smoking is the leading cause

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of preventable death worldwide, killing more than 8 million people each year. Millions of people continue to smoke, and this is associated with a range of health risks, including cancer, heart disease and respiratory diseases. Smoking is also associated with many types of stress, including anxiety, depression, and general health. It is an antidote to difficult situations and causes many physical and mental effects. However, stress can sometimes drain a person's energy, and chronic stress can lead to serious illnesses. It is known to cause a number of health problems, including heart disease, weakened immune systems, and mental disorders such as anxiety and depression. Although the negative effects of smoking and stress are well known, the relationship between them is complex and not fully understood.

Research suggests that smoking can be used as a coping strategy for people with anxiety because nicotine can temporarily boost mood, providing short-term relief. Instead, the relationship is two way; increased stress can lead people to start or continue smoking to cope with stress or anxiety. By examining these factors across different population groups, we are attempting to uncover patterns, correlates, and mechanisms that influence high rates of smoking. The results of this study can have important implications for health promotion and quitting smoking. A deeper understanding of the relationship between smoking and stress could help develop intervention plans that simultaneously address smoking and stress management.

LITERATURE REVIEW

Many studies have examined the relationship between smoking and stress, often with mixed results. Some studies suggest that smoking is used as a solution to manage stress and provides temporary relief due to the pharmacological effects of nicotine. However, other studies suggest that smoking can increase stress over time, creating dependence and withdrawal.

Sheldon Cohen and Edward Lichtenstein (1990) in their paper "*Perceived stress, quitting smoking, and smoking relaps*e" investigated smoking cessation. Carbon monoxide and salivary cotinine tests were used to confirm smoking status at six months, and self-reported smoking was assessed using false positives in each case. The findings provide strong evidence for a link between changes in stress levels and smoking. Those who were able to stay smoke-free for more than 24 hours were able to maintain stress and stability over a 6-month period. In contrast, those who remained abstinent throughout the study had lower levels of anxiety as the duration of abstinence increased. In all three periods (before 1 month of abstinence, 1 to 3 months, and 3 to 6 months of abstinence), anxiety increased with relapse, while in both comparable periods, success was seen in reducing stress after abstinence. One explanation for these findings is the assumption that the relationship between stress and smoking is bidirectional.

Michael O. Chaiton (2009) in his research on "*A systematic review of longitudinal studies on the association between depression and smoking in adolescents*" established a link between adolescent smoking and depression. He conducted a search of the PubMed, OVID and Psych Info databases conducted a longitudinal English-language study to investigate the effects of smoking on depression in a non-clinical population (aged 13 to 19 years) between

January 1990 and July 2008. A random-effects meta-analytic pooling technique was used to include a total of 15 studies in the analysis. Across six studies, the estimated odds ratio for smoking predicting depression was 1.73 (95% CI: 1.32–2.40; $p < 0.001$). Across 12 studies, the overall estimate for smoking predicting depression was 1.41 (95% CI: 1.21–1.63; $p < 0.001$). Studies using measures based on assessment of depression were more likely to show a positive association between the two methods, suggesting a positive association between depression and smoking. Longitudinal studies provide evidence for an association between smoking and depression. Future studies should consider (a) more frequent and longer follow-up studies, (b) more comprehensive measures of depression, and (c) better control for confounding issues to clarify these effects.

Keryn E. Pasch (2012) conducted study on "*Longitudinal Bi-directional Relationships between Sleep and Youth Substance Use*". Pasch discovered that there is a potential relationship between sleep and drug use. The purpose of this study was to investigate the long-term positive relationship between adolescent drug use and sleep patterns, routines, and behaviors. The study included 704 participants with a mean age of 14.7 at baseline, and 86.4% were white. Self-reported drug use included drinking, smoking, and marijuana use in the past month. Multiple regression models were used to analyze the longitudinal associations between sleep and substance use, including school integration and social power, older age, pregnancy z-score, and adjustment to depressive symptoms. Findings showed correlation between smoking and overall sleep quality, as well as between cannabis use and sleep quality.

Matthew A. Stults-Kolehmainen (2014) conducted study on "*The Effects of Stress on Physical Activity and Exercise*." Although mental stress and physical activity (PA) are generally thought to be negative effects, most research has focused on the use of exercise or PA as a means of reducing stress. A comprehensive search of PA and exercise markers was conducted using Web of Science, PubMed, and SPORTDiscus with search terms such as "stress," "exercise," and "physical activity." Studies were assessed at various time points using a rating scale (0–9). This search resulted in 168 studies examining how stress affects PA. These studies investigated multiple types of stress, including emotional stress, depression, life events, work stress, stress at work, and family functioning, but excluded life stressors due to differences in theoretical frameworks. In general, most studies suggest that stress will prevent people from being physically active. Future research should focus on developing theories that explain the mechanisms behind stress-related differences in PA behavior.

Lisa Dierker (2006) conducted research on "*The proximal association between smoking and alcohol use among first year college students*". This study examined the relationship between daily drinking and smoking among college freshmen. The authors examined the relationships between alcohol consumption and smoking behavior using a bivariate time series method using 210 days of weekly interval monitoring data. The results showed a positive and significant relationship between alcohol consumption and smoking, indicating that use of one substance can be predicted by past, current, and future use of another substance. Smoking and

drinking had a positive effect on most participants; multiple predictors of daily life (similar relationships). The study found that people who smoked less than one cigarette per day were less likely to perceive an interaction between the two behaviors than those who smoked more. When the proportion of significant effects perceived by individuals according to their smoking or drinking habits was examined, no significant differences were found between alcohol consumption and cigarette smoke. Longitudinal reports of daily behaviors may provide insight into the direct effects of alcohol consumption and smoking on each other, but more research is needed to determine the difference.

Claire I. Groves (2016) conducted research on "*The Bidirectional Relationship between Physical Activity and Stress in Working Parents*." Exercise is widely recognized as having many benefits for the body and mind. However, many elites do not participate in regular physical activity. Stress is often cited as a barrier to exercise, but research also shows that physical activity can help reduce stress. Working parents are particularly at risk of high stress and often have limited time for exercise. However, the interaction between daily physical activity and stress among working parents has rarely been studied. This study aimed to investigate the two associations between daily physical activity and frequency and severity of stress among working parents and also to examine differences from mothers and fathers. Using data from the National Survey of Daily Experiences, a sample of 667 working parents (47.7% female, mean age 43 years, 81% married, and 84.9% single) were assessed using structural equations to measure daily stress and physical activity. Overall, the model fit for the father was poor, while the model for the mother had a reasonably good fit. Given these unprecedented relationships, future research should consider different strategies to reduce the daily stress and strain of working parents.

Philip K. Chan (2019) conducted study on "*Examining the Relationship between PTSD Symptomatology and Cigarette Smoking among Ohio Army National Guard Soldiers*". Evidence suggests that civilians and soldiers are more likely to smoke during post-traumatic stress disorder (PTSD). However, there is some information in the National Guard that this association may be related to health issues rather than workforce. This study used cross-sectional data from a clinical sample of Soldiers (N=1,455) participating in the Ohio Army National Guard Mental Health Program. Soldiers provided self-reports and physician ratings of demographic information, PTSD symptoms, and smoking status. This study examined the association between PTSD symptoms and smoking behavior using logistic regression and multinomial regression techniques. Results showed that the likelihood of being a heavy smoker ($\beta = 0.04$, $p = 0.003$, OR = 1.04) and being a current smoker ($\beta = 0.02$, $p = 0.049$, OR = 1.02) were weakly associated with the severity of PTSD symptoms. Additionally, risk of heavy smoking was associated only with greater reporting of symptoms of irritability or hyper-arousal ($\beta = 0.04$, $p = 0.001$, OR = 1.05; $\beta = 0.03$, $p = 0.03$, OR = 1.03). These findings suggest that addressing PTSD and smoking among National Guardsmen may be important because those with more severe PTSD are more likely to smoke and may have more trouble quitting smoking.

Raymond Niaura (2002) conducted research on "*Response to social stress, urge to smoke, and smoking cessation.*" Motivational theories of drug use suggest that negative experiences may influence drug cravings and relapse. This study aimed to investigate how social stress affects responses to short-term (3 months) cigarette exposure in a controlled laboratory setting. A total of 76 smokers (64% female) were assessed for thoughts, feelings, and physical responses using the Borkovec Social Anxiety Induction Method prior to entering a smoking cessation treatment program. These responses were used to predict smoking immediately after induction and three months later. As expected, smoking anxiety scores and self-efficacy were positively and negatively associated with smoking intentions at baseline. However, only high heart rate and social behavior, as assessed by dissatisfied individuals, predicted smoking after three months.

These findings suggest that emotional and self-efficacy during social stress are associated with intention to smoke, while emotions and this mindset will affect smoking cessation success in many ways.

Michael H. Lawless (2015) conducted study on "*Perceived stress and smoking-related behaviors and symptomatology in male and female smokers*." A retrospective analysis was conducted on 62 smokers (41 males and 21 females) who participated in a smoking cessation program. During screening, participants provided information about their smoking habits, as well as responses to various questionnaires, including the Minnesota Nicotine Withdrawal Scale (MNWS) and the Perceived Stress Scale (PSS). This analysis used multiple linear regression models to analyze the data. The results showed a significant difference between genders ($p = 0.04$). Both male and female smokers showed a positive relationship between perceived stress and nicotine withdrawal symptoms, but women were more affected by this situation. These results highlight the importance of stress management strategies for smokers, as reducing stress can reduce symptoms and improve smoking cessation.

This study highlights the need for gender-based approaches to smoking cessation and confirms that women may need additional support to manage stress during the smoking cessation process. This study examined the relationship between emotional distress, smoking behavior, and nicotine withdrawal symptoms, focusing on gender differences.

Jennifer A. Fidler (2009) conducted research on "*Self-perceived smoking motives and their correlates in a general population sample***.**" The study used data from the Smoking Questionnaire, which included annual interviews with 2,133 smokers, to further investigate the various motivations associated with smoking. Participants were asked to identify the main reasons they continued smoking, including pleasure, stress relief, weight control, energy support, helping relationship, pain relief, enjoyment of smoking, and the absence of negative emotions while smoking. According to the survey results, 51 percent of participants cited pleasure as the main reason for smoking, while 47 percent cited stress reduction. Importantly, gender differences emerged; women were more likely to report reduced stress and weight control as a result of smoking, while men were more likely to report that smoking was fun

and satisfying. Studies have also shown that older smokers are more affective and more likely to smoke than younger smokers. Conversely, younger smokers are less likely to view social and emotional stress as important motivators. This illustrates the complexity of smoking and suggests that strategies for quitting smoking must not only reduce immediate stress, but also address the deeper emotional and self-perception that supports smoking.

Candace C. Nelson (2012) conducted research on "*Assessing the Relationship between Work-Family Conflict and Smokin*g."This study examines the relationship between dietary patterns and work-family conflict among a representative sample of workers in New England nursing homes. Data were collected through face-to-face interviews with staff at four nursing homes. Our findings suggest a positive relationship between smoking and workplace conflict. Workers who experience family work pressures are 3.1 times more likely to smoke than those who do not experience these problems. Workers who deal with work-family conflict are also 1.6 times more likely to smoke than those who do not experience conflict. These results suggest that there is a positive relationship between work-family conflict and smoking behavior. However, this is affected by the organization and the nature of all conflicts encountered.

RATIONALE

The relationship between stress and smoking is complex and bidirectional, with each factor influencing and affecting the other. Understanding this relationship is important for uncovering the mechanisms underlying smoking behavior and developing effective interventions to address smoking. Smoking is a major global health problem because it contributes too many chronic diseases, including heart disease, lung cancer, and respiratory disease. Despite widespread awareness of the harmful effects of smoking, many people still smoke. Many people use smoking as a way to cope with stress. Nicotine, an addictive substance found in cigarettes, has psychotropic effects and can temporarily reduce symptoms of anxiety and depression. For this reason, smoking is often seen as a coping strategy for stress, making people more likely to smoke in stressful situations. Stress levels increase symptoms, making it harder to control. Understanding the link between stress and nicotine can help improve treatment plans by coordinating stress management and providing coping strategies, while the effects of interventions can help people reduce their addiction to smoking by reducing stress. Life situations such as work stress, financial problems, relationship problems, and disasters can lead to smoking. In addition, the relationship between stress and smoking appears to be bidirectional. Noting that smoking can also increase stress due to withdrawal symptoms, researchers used a variety of methods, including surveys, interviews, and longitudinal studies, to understand the smoking behaviors of individuals who are more stressed.

Smoking as a Coping Mechanism

Many people smoke to cope with stress. Nicotine is an addictive substance found in tobacco products that affects the mind by stimulating the release of dopamine in the brain, causing a temporary feeling of relaxation and pleasure. Therefore, people may see smoking as a way to reduce stress and control negative emotions. However, this relief is short-lived and

does not eliminate the cause of the stress. These results may explain why some people turn to cigarettes when they are stressed. Studies show that smokers often feel calmer and more focused after smoking.

Smoking and Increased Stress

Smoking can cause or increase stress levels. The nature of nicotine can lead to a cycle of addiction, causing smokers to experience withdrawal symptoms when they try to quit or are unable to smoke. These withdrawal symptoms, such as irritability, restlessness, and increased anxiety, may suggest a link between smoking and depression. Additionally, the financial cost of purchasing cigarettes and the stigma that comes with smoking can add further stress to smokers' lives. For example, people who grew up in an environment where there was a lot of smoking or who have family members or friends who smoke are more likely to find nicotine a stress reliever. Additionally, socioeconomic status, work-related stress, and mental health may also play a role in the relationship between smoking and stress.

Relationship between Smoking and Stress

Smoking and stress are often linked, and many people turn to cigarettes to cope with the stress in their lives. The relationship between nicotine and anxiety is complex and bidirectional, suggesting that smoking can increase and amplify anxiety. Understanding this connection is important for developing effective smoking cessation and stress management strategies.

METHODOLOGY

This study aims to investigate the relationship between smoking behavior and stress, specifically focusing on whether stressed individuals are more likely to smoke than those who are less stressed. The study investigated the hypothesis of a relationship between stress and smoking, suggesting that greater stress may lead to more smoking. The study used a sample of 100 participants, including those with varying degrees of anxiety. Eligible participants were adults aged 18 to 30 who smoked regularly and viewed stress as an important part of life. All participants were English speakers, and those who were pregnant, had a history of mental illness, or were currently using other tobacco products were excluded from the study. The survey provided a good insight into smokers' personal experiences of coping with stress.

Survey Design

The survey included standard tools and questions, such as the Perceived Stress Scale (PSS) based on the Likert-Lewis scale. Participants were asked about their smoking frequency, smoking habits, and the effectiveness of smoking in reducing stress.

Participant Selection;

Inclusion criteria:

- Adults aged 18-30
- English speaking

Exclusion criteria:

- Individuals with pre-existing mental health conditions
- Individuals currently undergoing stress management therapy

Sample Size:

- 100

Tools /Materials:

1. PSS Perceived Stress Scale based Likert Lewis Scale
2. Questionnaire on smoking habits

- **PSS-Perceived Stress Scale**

The Perceived Stress Scale (PSS) is a self-report measure widely used in psychology and medicine to measure a person's perception of stress. The PSS was developed in 1983 by Solomon Cohen, Ron C. Kessler, and Susan Folkman to measure people's levels of stress in various aspects of life. The Perceived Stress Scale (PSS) consists of several questions that ask participants to rate the intensity and frequency of their feelings and perceptions of stressful situations during the past month. The scale typically includes items related to cognitive impairment, lack of control, and anxiety. These questions are designed to capture direct experience and self-assessment of stressful situations.

- The PSS uses a Likert scale for responses, with options ranging from **"disagree"** to **"strongly disagree**" and **"neutral"** and from **"agree"** to **"strongly agree."**
- The PSS has been used in many ways, including meditation, medicine, and health promotion. It will be particularly useful in investigating the relationship between stress and various health conditions, such as mental health, cardiovascular disease, immunity, and healthy drinking.

In summary, the Perceived Stress Scale provides a standardized and reliable assessment of an individual's perceived stress, allowing for a better understanding of how stress affects the body and mind.

Reason for Choosing PSS Scale

The Perceived Stress Scale (PSS) is frequently used in educational research to measure how people perceive stress in their daily lives. It measures whether life events are considered stressful. Researchers may choose to use the PSS when examining the relationship between smoking and stress for the following reasons:

a) Quantifying Stress Levels:

The PSS provides a convenient and valid tool for assessing perceived stress. Using Likert scales, researchers can generate numerical data that can be compared and analyzed numerically.

b) Subjective Perspective:

Smoking habits and stress are common experiences. The PNS captures an individual's perception of stress, which is important when investigating how stress affects smoking. Understanding how people perceive and experience anxiety can lead to greater insight into smoking behaviors.

c) Holistic Assessment:

The PSS does not focus on specific stressors but measures general stressors. This integrative approach is useful for examining the relationship between stress and smoking because it takes into account the effects of multiple stressors in a person's life.

d) Wide Applicability

The widespread use of the PSS across cultures and settings makes it ideal for comparing and extending research findings, and its versatility makes it a popular choice for examining the relationship between smoking and stress across multiple models.

e) Longitudinal Studies

The PSS can also be used in longitudinal studies to track changes in emotional stress over time. Researchers can track stress levels before, during, and after a smoking cessation intervention or quit to gain insight into the interrelated and multifactorial effects of stress and smoking.

Linking the relationship between smoking and stress provides a standardized, stress-based measure of stress levels that captures the experience of stress, has broad applicability, and facilitates longitudinal studies to better understand the relationship between stress and smoking behavior change.

Variables:

- The independent variable in this study is the Perceived Stress Scale (PSS) score, which is used to measure perceived stress.
- The dependent variable is the Smoking Habits; which is thought to be affected by the person's stress level

Data Collection

Data collection was random and targeted individuals between the ages of 18 and 30. However, participants with medical conditions that would contraindicate the study or those taking antidepressants were excluded. To collect information about smoking habits, participants completed a questionnaire and then administered the Perceived Stress Scale (PSS).

Data Analysis

While analyzing the collected data, statistical methods and data plots based on previous studies were used that established a link between stress and smoking. Since the data were normally distributed, we used parametric tests to assess the relationship between smoking

and stress. We also conducted a correlation analysis to assess the strength and nature of the relationship between these variables.

HYPOTHESES

The relationship between smoking and stress goes both ways, according to research. Smoking may be a coping mechanism for stress; people with high levels of stress tend to smoke more than those with low levels of stress.

RESULTS

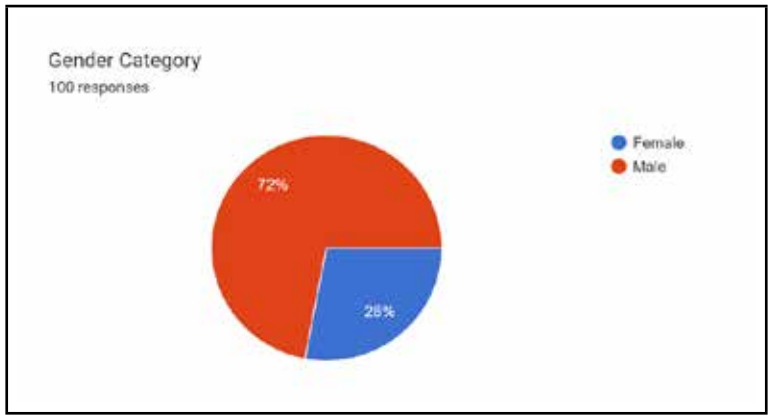

Figure : Response (gender-wise)

The pie chart shows the gender distribution of 100 respondents. The breakdown is as follows:

- 72% Male: This section, represented by the red portion of the pie chart, indicates that 72 out of the 100 responses were males.
- 28% Female: The blue section shows that 28 out of the 100 responses were females.

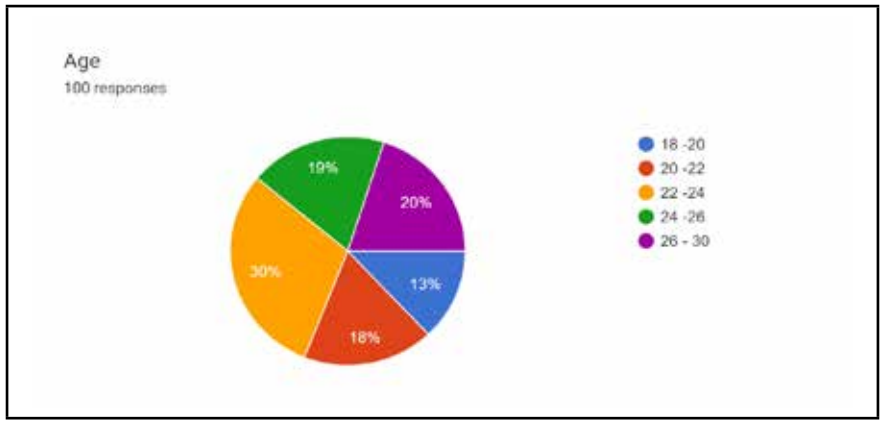

Figure : Response (age-wise)

This pie chart presents the age distribution of 100 respondents. The age groups are divided as follows:

- 30% (22-24 years): This is the largest age group, represented by the orange section, showing that 30 out of 100 respondents fall within this age range.
- 20% (26-30 years): The purple section represents respondents aged between 26-30 years, comprising 20% of the total.
- 19% (24-26 years): The green section shows that 19% of the respondents are between 24-26 years old.
- 18% (20-22 years): The red section represents 18% respondents who are between 20-22 years old.
- 13% (18-20 years): The blue section represents the smallest group, with 13% of respondents aged between 18-20 years.

Correlations

Table 1: Correlation Matrix

	Age	**Sex**	**Smoking Habits**	**Perceived Stress Score**
Age	1	(n.s.)	-0.15	-0.49
			(n.s.)	(p<0.01)
	N= 100	N= 100	N= 100	N=100
Sex	(n.s.)	1	(n.s.)	(n.s.)
	N= 100	N= 100	N= 100	N= 100
Smoking Habits	-0.15	(n.s.)	1	0.20
	N= 100	N= 100	N= 100	N= 100
Percieved Stress Score	-0.49	(n.s.)	0.20	1
	(p<0.01)		(n.s.)	
	N= 100	N= 100	N= 100	N= 100

Key:

- **n.s.**: Not statistically significant ($p > 0.05$).
- **$p < 0.05$**: Significant correlation at the 5% level.
- **$p < 0.01$**: Significant correlation at the 1% level.
- **N=** Number of respondents: 100.

Interpretations

- Age has a negative correlation with perceived stress of -0.49, indicating that perceived

stress decreases as age increases. This relationship is significant at the 1% level.

- There is a negative correlation of -0.15 between number of cigarettes smoked and gender, indicating that smokers are more likely to identify as male. However, this correlation is not significant.
- There was a moderate correlation (0.20) between smoking behavior and perceived stress scores, suggesting that smokers may experience less stress, but this relationship was not significant ($p>0.05$).

Quantitative Findings

Studies have shown that there is a moderate correlation (0.20) between smoking behaviour and perceived anxiety scores, with smokers reporting less anxiety, but this relationship is not significant ($p>0.05$). This means that people with higher PSS scores are more likely to smoke, suggesting a possible link between smoking and stress. However, it is important to realize that this relationship is not very strong and other factors may also influence PSS scores. The data also show a weak correlation (-0.15) between smoking habits and gender differences, suggesting that individuals who smoke more are slightly skewed towards men. The relationship is also non-significant, meaning that the relationship is not strong enough to draw any conclusions.

While there is a link between stress levels, smoking, and grades, more research and analysis is needed to establish a positive relationship. Other factors such as lifestyle, genetics, and personal factors may also contribute to these relationships.

PSS Score:

- Age has a negative correlation with perceived stress of -0.49, indicating that perceived stress decreases as age increases. This relationship is significant at the 1% level.
- PSS score differences and gender differences showed a weak correlation of -0.49, suggesting that individuals with higher PSS scores have a slight male preference. However, this relationship is not statistically significant.
- An average correlation of 0.20 with anxiety scores suggests that smokers may be less anxious, but this relationship is not significant ($p > 0.05$).

In summary, the data presented suggest that age has a positive effect on scores, with males tending to smoke more and scoring higher. Also, those who smoked more frequently had higher PSS scores. The relationship between age, gender, and number of cigarettes was generally weak and did not differ.

Smoking Habits

- Smoking behaviour was found to be positively correlated with age (-0.15), indicating that smokers were slightly older. However, this relationship was not statistically significant.
- There was a negative correlation of -0.15 between smoking and gender variables, indicating that men were the most likely to smoke. This relationship was significant at the

0.01% level.

- There is a moderate correlation of 0.20 between the number of smoking habits and PSS scores, indicating that individuals who smoke more will have higher PSS scores. This relationship is significant at the 0.05% level.

Age:

- There is a negative correlation between age and perceived stress -0.49, indicating that perceived stress decreases as age increases. This relationship is significant at the 1% level.
- There is a weak correlation of -0.15 between age and smoking, suggesting that older people tend to smoke more, but this relationship is not statistically significant.
- Age was weakly associated with the gender gap (-0.15), suggesting that older people were less likely to be male, but this association was not significant either.

Qualitative Insights

The data showed that when most participants started using cigarettes to cope with stress, they generally felt that their stress levels increased the longer they smoked. Participants described a vicious cycle in which temporary abstinence from cigarettes was followed by increased stress-related problems and difficulty quitting smoking.

DISCUSSION

The results of the study are consistent with existing literature indicating that smoking may help reduce stress in the short term but may ultimately lead to increased stress. This dual effect may be attributed to the pharmacological properties of nicotine and the psychological effects of smoking. The relationship between smoking and stress has long been a topic of interest and debate. However, this discussion aims to review the current evidence and theories surrounding this complex organization.

- **Correlation between Smoking and Stress**: Many studies have found a link between smoking and stress. People with high levels of stress often turn to smoking as a coping mechanism or self-medication. Stress can increase the brain's reward system, causing people to crave for immediate relief, and nicotine from cigarettes can provide that relief. This relationship has been found in a variety of populations, including young people, older people, and people with mental health issues.
- **Stress as a Precursor to Smoking Initiation**: There is evidence that stress can lead to smoking. People who are experiencing chronic stress or major life events may turn to cigarettes to relieve stress and manage negative emotions. Additionally, social influences such as peer pressure or influence on smoking habits may also be associated with stress-induced smoking.
- **Smoking as a Source of Stress**: While smoking may initially seem like a solution, it can become a source of stress. Nicotine addiction can cause withdrawal symptoms that lead to anxiety and depression when trying to quit or reduce nicotine intake. Additionally, the

financial pressure to buy cigarettes and the stigma of smoking can add to the stress.

- **Bidirectional Relationship**: The relationship between smoking and stress appears to be bidirectional, with each affecting the other in a continuous loop. While stress can lead to the initiation and continuation of smoking, smoking can also increase stress. This bidirectional nature highlights the importance of addressing both issues in smoking cessation programs and stress management strategies.
- **Psychosocial Factors**: Many psychological factors play a role in the relationship between smoking and stress. People with mental disorders such as anxiety and depression often experience the effects of smoking and stress at the same time. These people may use smoking as a self-medication against stress. In addition, socioeconomic status, educational status, and social status can moderate the smoking-stress relationship in various ways regarding the need for personal intervention.

Implications for Public Health

Understanding the relationship between smoking and stress has important implications for public health interventions. Anti-smoking campaigns should address the misconception that smoking is a long-term solution to stress. Stress management techniques can be incorporated into smoking cessation strategies to provide coping strategies. By exploring these areas further, we can better understand the relationship between smoking and stress and develop better intervention and prevention efforts.

CONCLUSION

This paper suggests that there is a two-way relationship between smoking and stress. People who are more stressed are more likely to smoke. Stress affects people's choices and problem-solving; for some people, smoking can help relieve stress or anxiety temporarily. However, it is important to know that smoking is not a healthy or effective way to manage stress. Instead, healthy choices such as exercise, rest, and support from loved ones can improve overall health and manage stress. Understanding the link between stress and smoking can help people make informed choices and use coping strategies. Smoking may provide short-term relief, its long-term effects are clear and severe. Smoking is a risk factor for many health problems, including heart disease, respiratory disease and cancer, which can lead to stress and poor health. While smoking may offer transient stress relief, it ultimately exacerbates stress through addiction. Interventions must address both stress and nicotine dependence to break this cycle. Future research should explore longitudinal designs and physiological stress markers.

REFERENCES

1. Bergman, H. E., Chan, P. K., Cooper, A. A., Shirley, E., Goto, T., Fine, T., Cohen, G. H., Sampson, L., Ganocy, S., Tamburrino, M., Liberzon, I., Calabrese, J., Galea, S., & Feeny, N. C. (2019). Examining the relationship between PTSD symptomatology and cigarette smoking among Ohio Army National Guard soldiers. *Military Behavioral Health*, **7**(1):46–56. https://doi.org/10.1080/21635781.2018.1556139

2. Chaiton, M. O., Cohen, J. E., O'Loughlin, J., & Rehm, J. (2009). A systematic review of longitudinal studies on the association between depression and smoking in adolescents. *BMC Public Health*, **9:** 1–11. https://doi.org/10.1186/1471-2458-9-356

3. Cohen, S., & Lichtenstein, E. (1990). Perceived stress, quitting smoking, and smoking relapse. *Health Psychology*, **9**(4):466–478. https://doi.org/10.1037/0278-6133.9.4.466

4. Dierker, L., Lloyd-Richardson, E., Stolar, M., Flay, B., Tiffany, S., Collins, L., Bailey, S., Nichter, M., Clayton, R., Abrams, D., Balster, R., Dahl, R., Giovino, G., Henningfield, J., Koob, G., McMahon, R., Merikangas, K., Shiffman, S., & Stroud, L. (2006). The proximal association between smoking and alcohol use among first-year college students. *Drug and Alcohol Dependence*, **81**(1): 1–9. https://doi.org/10.1016/j.drugalcdep.2005.05.012

5. Groves, C. I. (2022). *The bidirectional relationship between physical activity and stress in working parents* [M.A. Thesis]. (University of Arizona). https://openknowledge.nau.edu/id/eprint/5879/1/Groves_2022_bidirectional_relationship_between_physical_activity_stres.pdf

6. Kassel, J. D., Stroud, L. R., & Paronis, C. A. (2003). Smoking, stress, and negative affect: Correlation, causation, and context across stages of smoking. *Psychological Bulletin*, **129**(2):270–304. https://doi.org/10.1037/0033-2909.129.2.270

7. Lawless, M. H., Harrison, K. A., Grandits, G. A., Eberly, L. E., & Allen, S. S. (2015). Perceived stress and smoking-related behaviors and symptomatology in male and female smokers. *Addictive Behaviors*, **51**, 80–83. https://doi.org/10.1016/j.addbeh.2015.07.011

8. Nelson, C. C., Li, Y., Sorensen, G., & Berkman, L. F. (2012). Assessing the relationship between work-family conflict and smoking. *American Journal of Public Health*, **102**(9): 1767–1772. https://doi.org/10.2105/AJPH.2011.300413

9. Niaura, R., Shadel, W. G., Britt, D. M., & Abrams, D. B. (2002). Response to social stress, urge to smoke, and smoking cessation. *Addictive Behaviors*, **27**(2):241–250. https://doi.org/10.1016/S0306-4603(00)00180-5

10. Pasch, K. E., Latimer, L. A., Cance, J. D., Moe, S. G., & Lytle, L. A. (2012). Longitudinal bi-directional relationships between sleep and youth substance use. *Journal of Youth and Adolescence*, **41**(9): 1184–1196. https://doi.org/10.1007/s10964-012-9784-5

11. Stults-Kolehmainen, M. A., & Sinha, R. (2014). The effects of stress on physical activity and exercise. Sports Medicine, **44**(1): 81–121. https://doi.org/10.1007/s40279-013-0090-5.

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NEGOTIATING INDIANNESS: REPRESENTATION OF THE FARMER IN BOLLYWOOD

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ABSTRACT

This paper examines the evolving depiction of farmers and rural India in Bollywood cinema, tracing shifts from post-independence realism to post-liberalization romanticism. Through an analysis of films such as Do Bigha Zamin (1953), Mother India (1957), Dilwale Dulhania Le Jayenge (1995), and Lagaan (2001), the study explores how cinema reflects agrarian distress, socio-economic transformations, and the ideological framing of the farmer's role in nation-building. The Indian countryside with its hegemonic structures has been acknowledged as an area where reform is needed if an equal society can be envisaged in independent India. The depiction of these exploitative conditions and the means of alleviating the same then become an interesting point of study in Indian cinema. The paper argues that while early films critically engaged with rural exploitation and systemic injustice, later narratives often idealized the countryside, obscuring persistent agrarian crises.

Keywords: Farmer, nation, distress, justice, equality, Bollywood

INTRODUCTION

Speaking in the Constituent Assembly in 1948, Shri Satish Chandra Samanta, member of the Legislative Council, in his 'Demand' from the Ministry of Agriculture, used phrases "not looking after them," "cannot get sufficient food to eat," "they are dying," "milch cow," "wretched condition," "wretched lives," (*Constituent Assembly of India (Legislative) Debates Tuesday 16th March 1948 Official Report*, 1948, p. 2217) while talking about plight of Indian farmers in the Parliament. He questioned the effectiveness of the "Grow More Food campaign" launched by the government of the day. Talking about farmers he said, "….they produce milk from their cows but they cannot consume it. They produce the crops but they cannot keep them for themselves or for buying their needs." (*Constituent Assembly of India (Legislative) Debates Tuesday 16th March 1948 Official Report*, 1948, p. 2217). Similarly, Ch Ranbir Singh, a member from East Punjab said that farmers were apprehensive that they would receive a "step motherly treatment" (*ibid.*, p. 2221) from the new Government. According to him, government

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policies of price control favoured urban residents and argued that "nobody takes care of his [the farmer] interests" (*Ibid.*, p. 2221). He went on to note that price decontrol favoured the rich while farmers suffered heavy losses. He mentioned the falling prices of *gur* in his speech to focus on farmer distress. He also brought to the fore the impact of "'black market price'" in "hiring an expeller (*kohlu*)" (*ibid.*, p. 2222) on the strained financial conditions of farmers in the country. Ch. Ranbir Singh's contention was that setting a "fair price" for agricultural products would "set right the agricultural economy" (*ibid.*, p. 2222) and benefit the country. He also pointed out that "a villager who owns neither a car nor any newspaper, has too feeble a voice to make himself heard through the press" (*ibid.*, p. 2221).

The above debate shows that in the early years of independence even as the project of making a strong and self-reliant India was progressing, rural India felt that it was increasingly being ignored, and made invisible. This feeling was exacerbated during the decades of the 50s and 60s when the Five Year Plans were executed and India launched an effort to revitalise its primary sectors and moved towards industrialization. This was a period of great optimism and paradoxically equally great distress. This idealism as well as agony is reflected in the movies of the period.

Bollywood has always been a mirror of society: even as it entertains it has been an agent of cultural change. The forward march of the country as well as the social stresses it created are reflected in the Hindi movies of the 50s and 60s. The New Wave cinema of the 1950s focuses on realism and naturalism and is serious in tone. Movies like *Do Bigha Zamin* (1953, directed by Bimal Roy) and *Mother India* (1957, directed by Mehboob Khan) are searing in their realistic depiction of rural India and the agricultural distress bought about by outmoded modes of production, adherence to limiting social structures and behaviours, and, a rapidly changing economic scenario. These movies show Indian peasantry at the mercy of feudal chieftains and bourgeois leaders and businessmen as agricultural land is converted to industrial uses. The conversion of farmers to migrants in their own land is also the story of India. Movies like these make it apparent that even as the euphoria of independence and the project of nation building had gripped the nation, serious questions were being raised and the 'idea of India' was put under scrutiny.

Do Bigha Zameen is a watershed movie: it lays bare the conflict between "progress" and the rights of the people. Bimal Roy, the director, through the character of Shambhu Maheto (role played by actor Balraj Sahni) depicts the cost that marginal farmers and the socially disadvantaged have to pay in the process of nation making. This movie strips away the romanticised image of the village and asks a fundamental question: can a 'new India' be created on the backs of the destruction of the dreams and rights of its most disadvantaged groups. The economic charlatanism that occurs when the rich deprive small and marginal farmers, landless labourers, tribals and women of their rights is depicted in poignant terms when Shambhu sells all that he can; his household items and his wife's gold earrings to collect 65 rupees he owes the moneylender Harnam Singh. He is shocked to learn that his debt has

ballooned to 235 rupees since the accountant has forged the papers and refuses to consider labour done by Shambhu and his son for Harnam as due payment. The caste angle, as reflected by the names of the characters, is also evident. The trials and tribulations of the family are encapsulated in the scene where Shambhu races another rickshaw puller, almost like horses in a derby, to earn money. The commodification of the farmer and the labourer is complete at this point. The movie ends with him losing his land. He cannot even take a handful of dust from his land since the guard accuses him of stealing.

The movie takes a jibe at romantic Nehruvian socialism. Shambhu's dispossession of his land is a forgone conclusion once it is revealed that Harnam Singh wishes to construct a mill on the land. At the same time the movie takes a hard view of the urban landscape: its impersonality and anonymity leaves the subaltern vulnerable to exploitation and dehumanisation. While Shambhu is reduced to an animal when he participates in the rickshaw race, his son is forced to stealing in order to gather the amount needed to reclaim their land. Bimal Roy highlights the dehumanising influence of the city. The only people who treat Shambhu as an individual are those who themselves have migrated from the countryside: Laloo Ustad and Chachi. Shambhu brings his sensitivity to the urban landscape and is overwhelmed by the din of the imposing city. Similarly when his wife Paro (role played by actress Nirupa Roy) travels to Calcutta in search of her husband, she is accosted and nearly raped. She is injured in a car accident and Shambhu has to make the agonising decision to spend his hard earned money to save his wife.

The court scene where Shambhu goes before the judge to argue his case but is overwhelmed by the judicial process and lingo points to the degree to which the poor and destitute have been removed from the process of justice. Shambhu, working within the confines of his rural morality, assumes that his word would be enough. He truly cannot understand how his claim that he is telling the truth before God is not taken at face value while Harnam's false documents are. The director here is marking a distinction between justice and equity. The driving force behind Shambhu's actions is his desire to reclaim his ancestral land. The movie shows that he cannot eke out a sustainable living from the land, but he is nonetheless emotionally bound to it. This aspect of the movie foreshadows the current scenario of rural distress and unemployment we see in the country currently. With an increasing share of small and marginal farmers, agriculture has long ceased to be a viable profession. In the face of rising costs farmers are slipping into debt and committing suicides in large number.

According to FEED in its Annual Survey of 2023 the average landholding size of marginal farmers in India is mere 0.38 hectares (Dr. Sanjeev Chopra; *Development Intelligence Unit*, n.d., p. 9) with only 37.17% of their income coming from crop production (*ibid*., p. 10). These marginal farmers now own 47% of land area. The share of small and marginal farmers has steadily increased due to further division of land holdings as they pass from father to son. Consequently farming has become unviable. The lives of the peasantry is marked with bankruptcy, indebtedness, family problems, failure of crops, illness and drug abuse/alcohol addiction due to their inability to eke out a livelihood from their small landholding. The

increasing rates of farmer suicides is proof of the same. As per NCRB data ("*Farmer Suicides in India*," 2014, p. 226) a total of 5650 farmers, i.e. 'those who own and work on field as well as those who employ/hire workers for field/farming activities. It excludes agricultural labourers' (*ibid*., p. 226) who have committed suicide during 2014, the first year such data was collected accounting for 4.3% of total suicides in the country. Some 5,563 agricultural labourers died by suicide in 2021. The number of suicides increased by nine per cent from 2020 and by around 29 per cent from 2019. A total of 10,881 persons involved in the farming sector died by suicide during 2021, accounting for 6.6 per cent of total suicides victims (164,033) (*Shagun*, 2022, para. 10) in the country. Nonetheless they are unwilling to let go of their land and move to cities in search of jobs and other livelihood. Land is not simply a means of livelihood, it is also a connect to their roots and history. Therefore their disenfranchisement from their land is done extremely reluctantly and causes extreme trauma and guilt.

Do Bigha Zamin historicises the creation of farmers as internal migrants within India and their alienation from their own homeland. In this movie, there is a scathing attack and critique of Nehru's First Five Year Plan (1951-56) which envisaged 'development of agriculture' as a means of solving the different problems that formed due to the partition of the nation and the Second World War. Rebuilding the country after independence was the vision of this plan. Another main target was to lay down the foundation for industry, agricultural development in the country and to provide affordable healthcare, education in low price to citizens. Since the state was to play an active role in all economic sectors to achieve 'development', Shambhu and his family walking empty- handed into the sunset in the last frame of the movie only serves to highlight its failure. The movie forces the audience to confront the uncomfortable question: *can an equitable country be created if the access to resources, and justice is denied to the marginalised sections of society?-*

Radha, played by Nargis, the central character in *Mother India*, is the epitome of the new nation that is taking shape. Her sacrifices and struggles mirror those of the newly independent India. Even as the audience revels in the project of nation making and acknowledges that it is an active participant in the same; the movie forces us to again take an unvarnished look at the unequal and unremitting sufferings that the rural poor have to face. The opening credits of the movie are a pean to the development of the country: roads, electricity and the construction bridges and dams which herald the inauguration of a modern, industrialised India. This is followed by an aged Radha inaugurating the *nalla* which would bring water, and by extension prosperity to the village. (It should be noted here that hydroelectric power projects were established during the Second Five Year Plan). This inauguration by her hands is both a celebration of her contributions in ensuring the survival of the village despite natural calamities like droughts and floods and also in the face of social unrest brought about by her son Birju (played by Sunil Dutt) who becomes a bandit. She does not hesitate to shoot and kill her own son when he attempts to kidnap the daughter of the very man who is the source of his family's tragedy. Radha forms the moral centre of the movie; therefore when she shoots her son in the final moments of the movie, one can interpret this as a vehement rejection of Birju's

grouse against Sukhilal as well as his desire for 'justice.' This idea is further cemented by the representation of Birju (role played by actor Sunil Dutt) and Ramu (role played by actor Rajendra Kumar) as two moral opposites with no redeeming features in the former.

It is in retrospect that the audience sees Radha as a young bride whose future is stripped away by the greedy moneylender Sukhilal (role played by actor Kahanyialal). We see a young wife reduced to a widow ploughing the field herself. She has literally become the workhorse that will feed the family - it is poignant moment even as it is extremely problematic. The audience pays homage to the mother for her sacrifice in protecting, feeding and creating conditions where we as children and citizens can prosper. In the figure of Radha, the director portrays not only the 'Mother India' who sacrifices for her children, but also all mothers. Radha's depiction flattens the image of the mother to a long suffering figure who strives silently for the creation of a better future for her children. Her economic and psychological struggles are presented as turns of fate which a 'good woman' stoically withstands. Their connection to exploitative social and economic structures is not explored. In addition, a critical viewer cannot but notice the unquestioning acceptance of suffering by the rural poor in the process of nation making. Even as Radha is feted, the movie stops short of asking a fundamental question: does the arrival of modern technology release farmers and women in the countryside from the exploitative clutches of moneylenders and big business that would come with increasing industrialisation.

Both *Do Bigha Zameen* and *Mother India* should be seen as cautionary tales. The directors have shown great insight in foregrounding an issue that that had yet to take centre stage: until the concerns of the rural poor are met, the project of making a new, modern progressive India is incomplete and fundamentally flawed. It is noteworthy that they could pinpoint and examine the looming agricultural crises amidst the euphoria of independence and industrialisation. Though melodramatic, both movies raise questions about the difference between justice and equity. These emphasize the idea that until all citizens are treated equally, justice will evade the diverse populations in the country. Both movies however evade answering the question as to the consequences if this state of affairs were to continue. While Shambhu and his family quietly fade into the sunset without even a handful of soil that was once their own; Radha kills Birju for daring to violate the honour of Sukhilal's daughter. This passive acceptance is problematic since it hints at the deeply accepted and entrenched feudal hierarchies. The central protagonists of both movies believe that hard work is the remedy for their troubles. Shambhu believes that he can earn his way out of an illegal debt. Similarly Radha tells Birju that hard work in the fields will improve their condition, as it has in the past. These responses suggest that the Indian farmer has reconciled himself to a subsistence life of barely able to feed himself even as he feeds the world. These responses also suggest a lack of awareness of systemic exploitation that are a salient feature of the modern industrial complex. Birju's rant against Sukhilal's mistreatment of his mother and other women of the village is the only moment when these issues are addressed. His transformation into a dacoit trivialises them and makes it easier for the audience to view the story through the simplistic moral binaries of good/evil.

The liberalisation of the Indian economy in the 1990s was another moment of profound change in the economic and social set up of the country. It heralded the freedom from the licence raj and raised the possibility of harnessing the youth of the country to create a new India. The term 'population dividend' was often touted during this time. This sense of hope and joy of the times is prevalent in the movie *Dil Wale Dulhaniya Le Jayenge (DDLJ)* (1995, directed by Aditya Chopra). The verdant green fields of Punjab and the happy families tending to their fields is no longer a mirage. This movie presents an India where farmers are appropriately compensated for their work and have found their way into the Indian mainstream. This is evident from the fact that even the non-resident Indians(NRIs) are returning to the motherland. A notable feature of *DDLJ* is that it is targeted at the non-resident Indian population who are nostalgic in their remembrance of the nation that they left years ago. They wish to return to this pristine fields of India which exists only in their memory; even as they are eager to return to their 'real' lives overseas. Raj (role played by actor Shahrukh Khan) proves that he is the ideal 'Indian' virtuous and obedient boy to Chaudhary Baldev Singh (role played by actor Amrish Puri) and marries Simran (role played by actress Kajol) with the latter's approval. The dichotomy between the fact that the couple romance all over Europe but are unable to gather the wherewithal to marry without the approval of the elders is stark. It further highlights the NRI view that Indian children are virtuous and moral, while those raised with western values are corrupted and immoral.

This nostalgia for a nation that existed only in a 'memory' is the reason why the movie romanticises the countryside and presents it a verdant paradise. One never sees the fields barren or ready to be tilled. There is an absolute erasure of the backbreaking work that a farmer performs day in and day out. It is almost as if the fields are miraculously tended. In contrast to this, *Do Bigha Zamin* and *Mother India* focus on the untilled land where the protagonists perform backbreaking work to eke out a living. This pastoral representation in *DDLJ* is accompanied by an erasure of the caste and social barriers that are undeniable feature of life in India.

One can view this movie as young man's hope that the endemic issues plaguing the country would be resolved in the post-liberalisation era. Though the movie was a blockbuster romance musical and cemented the lead actors, it reduces India and its populace, especially those in the villages as virtuous simple-minded people. The upper caste setting of the movie elides over the distress in the villages of India. Liberalisation resulted in the explosion of the Indian middle class. However it was a mixed blessing for rural India. While farmers with large land holdings could benefit from "vertical market integration.…characterised by large retailers or input suppliers controlling technologies, inputs and market access" (Marshall & Randhawa, 2017, p.9). However these proved barriers for small and marginal farmers and pushed them towards debt and insolvency. This eroded the profitability of farming for most farmers and resulted in greater rural distress. While nearly 9000 farmer suicides were recorded in 1998 this figure had ballooned to 12,360 in 2014. (Marshall & Randhawa, 2017, p.9). Clearly the possibility of rural progress and prosperity hinted by economic liberalisation remained a pipe dream.

Lagaan (2001, directed by Ashutosh Gowarikar) needs to be seen as a spatial displacement of farmer unrest and distress. The *othering* of farmer distress and the transference of their frustration at unjust policies towards the British is a noteworthy ploy. The movie unfolds at the height of Britih power in India. The villagers of Champaner are forced to pay tax (*lagaan)* despite drought and failing crops. When they seek redressal from their ruler, Captain Andrew Russell (role played by actor Paul Blackthorne) who leads the regiment stationed at the court challenges them to a game of cricket. He suggests that if they win they would be exempted from all *lagaan* for three years. The movie takes on a nationalistic flavour as the villagers struggle to understand the rules of the game, form a cohesive team and finally emerge victorious at the penultimate moment. However there are notes of dissonance: Raja Puran Singh Chawla (role played by actor Kulbhushan Kharbanda) is an effete ruler who, like many of his ilk during the time, stays on the throne with the British support. Therefore he is a tool of British repression for the villager. He personifies the failure of leadership in protecting their citizens and ensuring equity. The movie is a masterclass of filmmaking because even as it lays bare this fact, it also baldly states that the only way rural India can emerge into its own is if it overcomes its caste and class prejudices to harness talent and work as a unit. One can view the cricket match as a moment of resistance against the status quo and a spark of rebellion: awareness of discrimination is the first step towards a demand for rights. However, this nascent realisation is lost in the face of the 'just' British keeping their word and forgiving the tax. One can see the echoes of Radha's assertion to Birju that if they work hard their future will be better and Shambhu's belief that playing by the rules will bring him justice. In both movies this outcome is negated in the loss of a child and land (akin to the mother) respectively. *Lagaan* is simultaneously escapist and realistic. The positive outcome in the movie is wish-fulfilment and therefore reminds the audience of its falseness. The movie historicises the pathetic conditions of the farmers even as it foretells the form any resistance from them might take. A salient feature of the movie is that is acknowledges that the solutions to the myriad problems the Indian peasantry face lie within it: it has the capacity to innovate and reinvent itself; all it needs is a little support and faith. Bhuvan (role played by actor Amir Khan) succeeds because the village rallies around the team. In this sense even as the Bhuvan and the villagers remind the audience of Sambhu and Radha, it can believe that Indian farmer, and by extension rural India can morph into the prosperous and confident Chaudhary Baldev Singh of *DDLJ*.

Taking a look at these movies it becomes clear that the hopes of reform in the farming sector and possibilities of amelioration of their sufferings have become undone. The farmer and rural India finds itself exactly where it was in the beginning of the 20th century. The contemporary farmer finds his lived reality to be no different from that of Shambhu, Radha or Bhuvan: prone to the vagaries of nature and fickle government policies. They too are losing ownership of their land through changes in land use laws, entry barriers and the advent of commercial farming. Rural India stands at a precipice and needs urgent support and attention. Reforms in the farming sector are the need of the day. They need to be targeted and tailored state- wise and even region- wise as one size will not fit all. Otherwise there is a real risk

that farming will become unviable and more farmers leave it and will be reduced to daily wage workers. It is important that the policy shift from only land holders to improving the livelihoods of small and marginal landholders and the landless labourers. Nevertheless all is not lost and the possibility of a resurgence of Indian farming remains high. This is the final message of *Lagaan*, and hence the importance of the movie.

REFERENCE

1. Analytical reports. (n.d.). PRS Legislative Research. https://prsindia.org/policy/analytical-reports/state-agriculture-india
2. Constituent Assembly of India (Legislative) Debates (Tuesday 16th March 1948). Official Report. (1948). South Asia Commons. https://southasiacommons.net/artifacts/2333358/constituent-assembly-of-india-legislative-debates-tuesday-16th-march-1948-official-report/3095194/
3. Dr. Sanjeev Chopra, Development Intelligence Unit. (n.d.). Annual Survey of State of Marginal Farmers in India. *Development Intelligence Unit*. https://www.developmentintelligenceunit.in/wp-content/uploads/2023/08/3.-Annual-Survey-for-Marginal-Farmers.pdf
4. *National Crime Records Bureau*. (2014). Farmer Suicides in India. In Chapter 2A. *National Crime Records Bureau*. https://www.ncrb.gov.in/accidental-deaths-suicides-in-india-year-wise.html?year=2014
5. Marshall, F., & Randhawa, P. (2017). Economic liberalisation and rural-urban transformation. In India's peri-urban frontier: Rural-urban transformations and food security (pp.8–11). *International Institute for Environment and Development.* http://www.jstor.org/stable/resrep02716.4
6. Shagun. (2022, September 1). An agricultural labourer died by suicide every 2 hours in 2021: NCRB. *Down to Earth*. https://www.downtoearth.org.in/agriculture/an-agricultural-labourer-died-by-suicide-every-2-hours-in-2021-ncrb-84616

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