Sustainable Roadmap Development Strategies in India: Paving the Way for a Better Future

Edited by

Bhaskar Bagchi

Biswajit Paul

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Foreword

To me it is a matter of absolute contentment to write the Foreword of this International Edited Volume of the Department of Commerce, University of Gour Banga titled ***'Sustainable Roadmap Development Strategies in India: Paving the Way for a Better Future'.*** This Volume is an assemblage of original and unpublished research works by academicians and scholars across India working in the area of Sustainable Development Goals (SDGs) and its allied domain like environmental sustainability, different sustainable development programmes, ESG reporting and investments, CSR in India. As defined by the UNDP, the SDGs are acknowledged as a call for worldwide action by all the member countries to eliminate poverty, care for our mother earth as well as to make sure that all human beings can survive in opulence and tranquility. Seventeen SDGs have been identified so far by the United Nations in the year of 2015 which are incorporated and clearly defines that development should maintain equilibrium between social, economic and environmental sustainability. Nevertheless, stakeholders lack a common perceptive of how SDGs can be thoughtfully implemented and monitored especially in emerging economy like India. With this backdrop, the select articles of this edited Volume outline an action agenda by providing the recommendations required for designing, implementing and monitoring different sustainability issues into action. I firmly believe that this edited Volume will definitely facilitate the policymakers both at government and private stratum in crafting and executing SDGs transformation. However, acknowledgement is due to entire publication team of ***Lincoln University College, Malaysia*** for publishing this edited Volume. A loud applaud finally, I would like to pat a back of the Editors ***Professor (Dr.) Bhaskar Bagchi and Dr. Biswajit Paul*** of the PG and Research Department of Commerce, University of Gour Banga, India, who have put on their outstanding effort and cogent academic ideas for giving this edited Volume a final shape.

Finally, I hope this Volume forms a valuable addition to the existing literature on sustainability domain and is especially intended for research scholars and students of accounting, finance and economics.

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Editorial

The Department of Commerce, University of Gour Banga, Malda, West Bengal, India started its journey in 2012 primarily to offer M.Com. Course. Later on Ph.D. and M.Phil. Programs have been started and becomes a full-fledged Postgraduate and Research Department. A visible transition in research is taking place at the Department in the last few years. Though the Department is well aware of its situatedness in and around the countryside of Eastern India, in spite of that it has been committed for promotion of research in Commerce, Finance, Management and allied subjects. Presently, our Department is running with six full time faculties.

Our Department of Commerce of University of Gour Banga, Malda strives to integrate the thinking of academics and researchers in the shape of an International Edited Volume titled ***'Sustainable Roadmap Development Strategies in India: Paving the Way for a Better Future'*** in collaboration with Lincoln University College, Malaysia. We are well-aware that acting on its nationally-determined contributions, India has been striving to achieve the set sustainable development goals in all aspects. India is moving forward for achieving a world free from poverty, gender inequality and economic inequality and thereby ensuring a healthy planet for future generations. At this point in time, this multi authored Edited Volume is intended to provide numerous relevant discussions on sustainable development which will definitely be benefited to the policy makers, stakeholders, students and different cross-sections of society.

The Sustainable Development Goals (SDGs) can be regarded as a call for a more sustainable future by all countries across the globe. It has an inclusive approach that offers a total global strategy to encourage dignity, tranquility and holistic prosperity for the people and their planet, for the present and the future. It has been recognized that elimination of global poverty and hunger should be accompanied with policies that can develop resilient economic growth and

can deal with social issues comprising of 17 goals. Furthermore, it is significant to note that the SDGs also represent a critical framework for COVID-19 recovery.

At the core of its spirit are the abovementioned 17 SDGs, which calls for an urgent action by every member countries together, functioning in a universal partnership. Now, an inevitable question in recent times is where we stand in halfway to 2030? After adoption of the SDGs, some earlier favorable trends that have been emerged, reveal a decline in intense poverty, gender inequality and child mortality rates. The share of water bodies under the purview of marine protected areas witnessed a twofold increase in last five years. But, however it is quite evident that much of this advancement was very fragile and excessively slow. From the beginning of 2020, the world has experienced the outbreak of COVID-19 pandemic, the Russia-Ukraine conflict and an assortment of climate-related disasters that has aggravated the global uncertainty.

After that if we look into Asian countries like India, they have been facing huge challenges in the achievement of different SDGs including zero hunger, good health and wellbeing, gender equality and sustainable cities and communities. For reference, in recent times, India had suffered on the fronts of ending hunger and achieving food security, achieving gender equality and building resilient infrastructure, promoting inclusive and sustainable industrialization and fostering innovation.

With this backdrop, this Edited Volume intends to identify and analyse different aspects of sustainable development strategies mainly in the context of India and this Edited Volume makes a humble attempt to assimilate several studies on the SDGs and allied areas of different academic researchers in a nutshell so as to showcase them before wide spectrum of readers across the globe. The objectives of this Edited Volume are to understand the status, impact, problems, policies and prospects of few SDGs, several sustainability issues including environmental sustainability, different sustainable development programmes, ESG reporting and investments, CSR in India.

The materials and discussion made in this multi authored Edited Volume have been presented in a highly organised and lucid manner and it provides a clear and detailed analysis regarding the prevailing issues and recent trends in the context of sustainable development. This Edited Volume contains twenty research chapters (papers) to address their respective research objectives. Several research papers for the book chapters have been collected from academicians and research scholars of different provinces having common research interests to share their insights relating to this area. Contributors like, Amit Kundu examines the asymmetric volatility spillover effect of the Indian stock market to Sri Lanka-CSSE, Bangladesh-DSE. Krishanu Guha Majumder focuses on the notion and measurable aspects of urban social sustainability. Pinky Mistri and Asha Kumari Mistry highlight the sustainable development paradigm of the Blue Economy. Prabin Karkee and Biswajit Das examine the need of bonding for sustainability in community and public libraries. Chandrajyoti Sen Majumder investigates the adoption and implementation of e-governance to achieve sustainable development goals in education and health in state sectors in West Bengal, India. Sandip Majumdar reviews in visualizing sustainable and universal access to scholarly information through the prism of open access. Sudipta Saha Roy empirically assesses the

environmental, social and corporate governance (ESG) disclosures on the select public sector enterprises in India. Sukanya Bhattacharyya studies the ESG Reporting procedures that enable organizations to move towards a sustainable future. Sumi Karmakar & Susanta Kanrar attempts to highlight the students' perceptual variance on entrepreneurship as a sustainable prospect.

While, Devdeep Banerjee studies the poverty eradication in India with special reference to SDG-1, Bappaditya Biswas and Rohan Gupta makes an in-depth study with the issues and prospects of global ESG regulatory framework and sustainability. Authors like, Nilendu Chatterjee, Priyajit Kumar Ghosh, Priyankar Modak, Goutam Bhowmik, Rupak Karmakar and Jyotirmoy Koley throws scholarly light on different facets of achieving sustainable development in India. Again, some allied areas namely, economic sustainability of stock markets, environmental sustainability, role of women empowerment and corporate social responsibility in sustainable development have been deeply investigated by Dipankar Bhaumik, Raktim Ghosh, Rupa Mondal, Debashree Bhattacharya, Sharmistha Acharyya, Sweety Sadhukhan, Lakshmi Das.

The researchers in this Edited Volume have made it clear that at this juncture of accomplishment of the 2030 agenda, the world is not on the right path to achieve majority of the SDGs by 2030. Although, there has been progress in some areas, yet, a number of SDGs still remain neglected and the progress in these sphere are far away from the targets. As per the 2030 agenda, this generation has a last chance of saving the planet and it requires an unprecedented effort and a worldwide alliance by every member countries, local authorities, civil societies, academicians, common people and more. Hope this Edited Volume can cater the needs of the policymakers both at government and at private levels in framing the strategies for successful implementation of 2030 agenda.

We are very much grateful to Dr. Shanti Chhetry, Hon'ble Vice Chancellor, University of Gour Banga, India for his guidance in throughout the process and we would especially like to express our sincere thanks and gratitude to Prof. Sandeep Poddar, Hon'ble Deputy Vice Chancellor (Research & Innovation) Lincoln University College, Malaysia for your continuous support throughout this experience. Prof. Poddar, you have been a tremendous mentor for us in this academic venture. We are also grateful to our Respected Registrar, Respected Finance Officer, Respected University Librarian of University of Gour Banga who were always there to support and encourage us and our Department. We thank Prof. Manas Chakrabarti, Head, Department of Commerce, University of Gour Banga for extending his whole hearted support and assistance during this journey. Besides that we are indebted to all the learned Contributors of this Edited Volume for reposing their faith for this publication. We are thankful to the Advisory Committee which has been constituted with nine members for the said Edited Volume. We are also thankful to all the Respected reviewers for reviewing the articles following double blind review process to assure the quality of the papers according to the global standards and publishers guidelines.

We would like to thank the entire Management and Publication Team of Lincoln University College, Malaysia for composing and designing this Edited Volume. We take this opportunity to give special thanks to Ms. Dipa Saha, Publication Executive of Lincoln University College,

Malaysia for her priceless assistance. Last but not the least we thank to Sri Priyajit Kumar Ghosh, Research Scholar, Department of Commerce, University of Gour Banga to give us editorial assistance whenever necessary. We also thank to the all the team members who are directly and indirectly related to the process of this publication.

This Edited Volume is believed to have a significant socio-economic implication and is intended to cater the large audience which includes academicians, researchers, students, corporates, policymakers, investors and general readers at large.

We have taken great care to ensure that this Edited Volume is error-free. Despite our best efforts, certain accidental errors may occur, for which we take full responsibility. We apologise for any kind of shortcomings.

Bhaskar Bagchi
Biswajit Paul

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Community, Cooperation and Public Libraries: The Need of Bonding for Sustainability

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ABSTRACT

Inter-organizational cooperation represents a process in which organisations believe in interdependence and pool resources in the interest of obtaining common benefits that each partner could not secure independently. This paper is an attempt to understand and evaluate the bonding of community, cooperation, and public libraries for sustainable development. The types of cooperation and community information services (CIS) have been traced by briefly presenting the theoretical aspect of community. Elements of cooperation for sustainability have also been presented. The paper also provides insight on factors affecting cooperation, the public library's cooperation with other organizations, etc.

Keywords: *Community; Public Library; Community Information Services; Cooperation; Elements of Cooperation; Factors Affecting Cooperation; Public Library's Cooperation.*

Introduction

Libraries have been collaborating with the community for a very long time. Shared goals, mutual trust, and a common vision served as the foundation for the collaboration. But, it wasn't simple or efficient to cooperate in delivering information resources. Modern communication advancements enable and promote collaboration between libraries and other information-providing organisations in the community, resulting in an expansion of the library's offerings. Resources for giving information were not quick and efficient. The expansion of the library's services is facilitated and encouraged by current advancements in communication between libraries and other information-providing organisations in the community. Because they have similar goals and objectives for promoting social well-being, community members, libraries, and information-providing organisations become linked in cooperative relationships. As a result, a public library tends to enrich people's lives by providing them with access to the concepts, knowledge, and amusement that can be found in books as well as a range of other resources. The technology of today is being fully utilised by public libraries to collect, organise, store, and disseminate any type of information needed by the community they serve.

In the modern, fast-developing world headed by advancement in information and communication technology (ICT) and with a tremendous explosion of information, one of the agencies to make people aware of the progress in the world is the public library. UNESCO,

in its mission, stated that the public library should ensure access for citizens to all sorts of community information. It also stresses that the public library is the local centre of information, making all kinds of knowledge and information readily available to its users. By doing so, the public library needs various information sources and resources. The varied demands from the user side are continuously increasing, especially concerning the lower socio-economic groups, the disadvantaged, or people with information on a specific problem. It is rare to find a public library that has all of the necessary facilities to meet all of the community's information needs. This forces the public library to enter into cooperation with other information-providing organisations in the community.

Community Information Services

Both sociologists and others have provided ambiguous definitions of the term "community." There are two ways that scholars have characterised communities: first, the "organic" idea highlighted a sense of belonging, strong relationships, and shared interests as the main qualities of communities. The "ecological" conception of community, which emphasises the territorial or spatial nature, is another. We term that common life a community whenever the members of any group, little or large, live together in such a way that they share, not this or that special interest, but the essential condition of a common life (MacIver & Page, 1949).

MacIver and Page have listed two bases of community;

I) Locality (Geographical, linguistic, dress, food habits, etc.)

II) Community Sentiments (thinking, thought, ideologies, common causes of activities, etc.) (Gisbert, 1965).

Information is vital for the development of any society. It has become a basic need of human in all walks of life. Information needed to cope with crisis situations in the lives of an individual and their community is referred to as "community information. It can enable individuals and groups to make informed decisions about themselves and the communities in which they live and participate more effectively in the democratic process. The Library Association’s Working Party on CIS provided a comprehensive definition of Community Information Services (CIS). It defines "community information services" as those which assist individuals and groups with daily problem solving and with participation in the democratic process. The services concentrate on the needs of those who do not have ready access to other sources of assistance on the most important problems that people have to face, problems to do with their homes, their jobs, and their rights" (Library Association, 1980).

Allen Bunch, who was the first to attempt to unify the concept of CIS, claims that it has two aspects: one is concerned with the nature of the information provided, i.e., information in the community to assist people with solving daily problems or improving the quality of their lives; the other is concerned with the nature of the clientele served, i.e., those who are disadvantaged because they do not have access to, or are unable to obtain, unrestricted access to, information (Bunch, 1982).

Public libraries, which are tasked with the fundamental duty of disseminating information, can offer community information services both directly and in collaboration with other information-giving organisations such as government departments, non-governmental organisations, trustees, voluntary bodies, clubs, charitable organisations, etc. With the aim of identifying the real information needs of the community and reaching the underserved, public libraries offer direct community information services to the general public through outreach activities or programmes that are run in addition to or in substitute of regular library services. Information services are also offered by corporate sectors as part of "Corporate Social Responsibility" programmes, demonstrating their commitment to society. The current state of affairs makes it necessary for every public library, particularly those in rural and suburban areas, to establish and maintain spontaneous partnerships with local residents and other organisations that provide information in order to meet the information needs of the community through their Community Information Service programmes.

Literature Review

The available literature showed that public libraries approached the goal of fostering community from various angles, but all agreed that the public library must participate in fostering community and must publicise its activities. According to Sarah Ann Long, ALA President in 1999, libraries were in a good position to significantly contribute to addressing community issues since they are already naturally positioned to serve as community gathering places that encourage debate and collaboration. If the library approaches its outreach and library service initiatives holistically and comprehensively, it can help a community's development efforts (Hillenbrand, 2005). The community must be connected to public libraries, and Partnerships and collaborations in public library communities provide examples of how public libraries can work with other local organisations to develop initiatives, programming, and funding in order to create connection with their communities (Uthmann, 2013). A public library's reputation and borrowing rates can be improved by working with school libraries, hence it is recommended that this collaboration begin on a small scale and be expanded once there is a solid understanding on both sides (Ke & Wen, 2012). One of the main beliefs of public libraries is to promote a sense of community and connection among the people they serve. Collaboration is a practical strategy to unite community members and combine the talents of those who might not otherwise have the opportunity to work together. Collaborations benefit both the collaborators and the library, but they also help to connect people and strengthen the community (Crevasse & Stockdale, 2019). Furthermore, a substantial body of research has demonstrated that community members do have needs and that they require information services for day-to-day living. This research has also described general community information services provided by public libraries in developing countries (Stilwell, 1989; Alemna, 1995; Pettigrew *et al.,* 2002; Mukhopadhyay, 2004; Mahmood, 2005; Satpathy, 2006; Goulding, 2009).

Cooperation

Inter-organizational cooperation creates new value to accomplish a goal or mission of an organization. It brings everlasting relationships, mutual trust, mobilises resources, information flow, and other activities among participating organizations. It has been recognised as an important element in the success of any kind of community information service. Cooperation can be divided into two types: structured and unstructured cooperation. Structured cooperation is based on business activities that typically provide monetary benefits to participating parties. It is characterised by a formal relationship with written agreements and contractual rights. In almost all vertical cooperation relationships, the cooperation appears structured in nature. However, the structured approach is also used in horizontal cooperation, but in fewer cases. Because of its formality, structured cooperation occurs both at a local and a wider level. Communication will typically be formal based on the business activities between participants. Personal relationships are important in developing cooperation, but they are not seen as a prerequisite for its establishment. While unstructured cooperation occurs in horizontal and cross-sectoral cooperation relationships. The communication could be either very lively or relatively casual, but it is typically very informal. The role of personal relationships is very important and highlighted. The unstructured cooperation model is usually successful among local or regional participants.

Cooperation is constantly fostered as a valued activity for library professionals. The elements of cooperation for the sustainability of public library services may be summarised as follows:

Collective Vision

All the stakeholders share a common and recurrent idea known as a collective or shared vision. The reasons why each of the stakeholders "joined together" was to better serve the community by pooling resources and efforts to deliver better information services. Invite possible partners to participate first. By starting with no preconceived conceptions of a goal and establishing goals jointly, it is possible to create a shared vision. The vision statement was created by the entire planning team. The approach begins with discussions at meetings to determine the challenges local residents encounter in receiving information and to produce potential solutions to those challenges. The meeting's aims and objectives for providing services are clearly stated, with particular attention paid to deadlines, resource sharing, and implementation strategies for service delivery programmes. Through collaboration across organisations, the program's goals are produced. Open dialogue and trust are the foundations for shared visions. A community need led to the creation of shared vision, which is crucial to the programmes' success.

Reciprocal Trust

Reciprocal or mutual trust is focused on conditions leading to personal feelings of trust. Collective vision builds trust. A different thing that builds trust is the type of relationship

enjoyed. This was significant for all participants and contributed to a lasting trusting relationship. Existing actor relationships influence inter-organizational cooperation. Social capital, i.e., the development of bonding, trust, and norms of reciprocity, facilitates cooperation. The desire to establish trust, commitment, engender norms of reciprocity, and encourage future interaction is a significant factor in initiating and maintaining collective action. So bonding social capital, which exhibits strong ties, is important to facilitate and sustain interaction.

Distinctive Goals

Each organisation will have special resources that are available for the community. Collaboration demands the dedication of organisations and their leaders. Instead of just joining forces, two or more organisations develop a new set of shared objectives. A unique purpose or set of objectives for the project to be carried out is consistently identified by several studies for successful cooperation. They should be distinct from the goals and objectives that contributing agencies, organisations, or people have previously identified. The participants should "come together" to create a clear objective statement for the programme in order to deliver excellent community information services. Each participant should have their own specific goals. To successfully cooperate and collaborate is the partnership venture's one-of-a-kind and distinctive goal.

Cooperation is more likely to be successful if the participants perceive that the attainment of expected benefits is not in the whole. It provides justification for interaction and an incentive for future work. The anticipation of benefit reduces ambiguity and the apparent risks of investing in a cooperative relationship. The participants therefore feel that they have gained something from collective action, even if these benefits are different to those originally envisaged by the initiatives.

Factors Affecting Cooperation

There may not have been enough time set up for planning by the partners concerned, which results in a lack of resources and other inputs. Obstacles include a lack of time and time management techniques. The open lines of communication and follow-up with all parties engaged prompted a second worry. The lack of time by one or more participants within the partnership was a recurring theme in comments relating to open communication. A lack of ongoing motivation was also mentioned, which would indicate that partners are more likely to remain enthusiastic and committed when they are fully and regularly informed of all the specifics of the programmes. Informal communication that serves as a reminder of the parties' shared objectives may be enough to keep partners motivated to continue contributing to the enterprise. Informal communication that serves as a reminder of the parties' shared objectives may be enough to keep partners motivated to continue contributing to the enterprise.

Public library's Cooperation with Organizations

In general, informal, unstructured, typically local-level cooperation is likely to be prominent in establishing and maintaining the public library's cooperation with other agencies in providing community information services. Usually, the cooperation is mutual adjustment or voluntary in nature. With its CIS program, the primary objective of a public library is to cater to the information needs of its users. For example, information on occupation, employment, health, transport, consumer problems, entertainment, housing, banking system, education, governmental agencies, legal information, etc. should be included under CIS, which will help to increase the quality of life. So, to provide comprehensive community information services, a public library should enter into cooperation with other agencies. To achieve the goal, the library should prepare and maintain a detailed list or directory of all information-providing agencies, including their area of operations, locations, activities, person in charge, addresses, branches, contact numbers, publications available, and so on.

The next step is to establish cooperation, which is characterised by a dialogue with the organizations. Sometimes the dialogue calls for an agreement, usually in written form, indicating the willingness to share resources, information, expertise, etc. The public library, collaborating with these governmental and non-governmental agencies, can perform services such as collecting and sharing resources; expertise sharing; referral service; practical help; advice; advocacy; community education; follow-up service; escort services etc. The library should maintain constant interaction with the personnel of these organizations. The direct linkage with these agencies or groups helps the library to provide effective community information services to the public.

Conclusion

Sharing resources and responsibilities can result in lower costs and successful outcomes for a cooperative project. This can result in libraries offering more services and becoming more well-known in the neighbourhood. No one organisation or institution can own all the information required by our society due to the growth of digital information. We also need to ensure that everyone, including those with impairments, those living in rural or isolated areas, and those who are economically disadvantaged, has full access. Young people have the chance to explore a diversity of resources, skills, and viewpoints thanks to the friendly cooperation. Also, community-based programmes introduce a variety of viewpoints that can improve the standard of the collection in public libraries and draw more people to them.

In the modern world, there are numerous online information services that have had a significant and long-lasting impact on the legacy of human knowledge. Where there is a public repository and portal for disseminating knowledge, the new notion of online information service and virtual information service appears. It describes a network of knowledge, human intermediation, and resources offered to users in an online setting. Social networking platforms are quickly overtaking email and phone as the most efficient means of exchanging information. Today, almost every information service provider has a

presence online on sites like Flickr, Twitter, Facebook, YouTube, LinkedIn, and MySpace, among others.

The new forms of communication have emerged as a result of the rapid advancements in information technology, which have also changed the ways in which information was previously handled, stored, and transmitted. The traditional approach to delivering information services will continue, but it will need to be modified. A well-managed type of collaboration with other information-providing organisations in the community will undoubtedly strengthen the public library's social sustainability.

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The Asymmetric Volatility Spillover Effect of The Indian Stock Market to Sri Lanka-CSSE, Bangladesh-DSE

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ABSTRACT

This article focuses on the effect of spillover from the Indian stock market to the Sri Lankan and Bangladeshi stock exchanges. The major goal of this research is to determine whether investing in these two markets offers suitable prospects for diversification. The degree of economic interconnectedness between the economies of India and Asia is examined using Granger causality tests and dynamic conditional correlation (DCC)-MGARCH. India, Sri Lanka, and Bangladesh are not found to be causally related. Using DCC-MGARCH, it was found that while there was no short-term volatility spillover from India to Sri Lanka or Bangladesh, there was long-term volatility spillover from India to the other nations examined in this study. By taking into account the pattern of volatility transmission from the Indian stock market to the stock markets in Bangladesh and Sri Lanka, the study's findings may help market managers formulate regulations.

Keywords: *Granger Causality; Unit Root Test; DCC–MGARCH*

JEL Codes: C32, G10, G11

Introduction

Cross-border trade has increased as a result of emancipation in developed and developing nations. Global financial markets became intertwined as a result of globalization. Since the 1990s, many investors have begun to invest in securities outside of their home countries. Investors are interested in market linkages because they can increase returns and serve as a kind of hedging. Therefore, understanding volatility spillover is crucial for investors to adopt minimum-risk strategies (Natarajan, Singh & Priya 2014).

Experience has demonstrated that financial market crises in developed countries have a disproportionately negative impact on developing and emerging nations. Examples of how stock market volatility in one country affects stock market volatility in other countries include the Great Depression of 1930, the Mexican Crisis of 1994, the Asian Currency Crisis of 1997, and the Global Financial Crisis of 2008, to name a few. The two methodologies for analyzing volatility spillovers are domestic volatility and cross-border volatility spillovers. The connection between current and earlier volatility shares in the same market is investigated in the former, whereas spillover between other markets is investigated in the latter.

The study and analysis of volatility spillovers using various tests from the category of autoregressive conditional heteroskedasticity (ARCH) has generated a lot of interest in developing and emerging countries whose capital markets have been impacted by shocks in industrialized countries. Worldwide portfolio managers have been forced to invest in these markets to diversify their holdings because of their high return potential. These markets include China, India, Malaysia, South Korea, Malaysia, and Taiwan, among others. Global portfolio managers have been driven to diversify their holdings by the high return potential of emerging markets like India, China, South Korea, Malaysia, and Taiwan.

Literature Review

To confirm volatility transmission in financial markets, a number of studies have been carried out.

Savva, Osborn and Gill, (2004) focusing on dynamic correlation, examined the spillovers between the markets of the United States, Germany, London, and France and found that only the London and Germany markets are affected by the United States. It was concluded that since the introduction of the euro, the correlation between European markets has increased.

Bartram, Taylor and Wang, (2007) examined market pairings between Euro-European and non-Euro-European countries using a broad time-varying copula dependency model. They examined the influence of the euro on stock market dependence in Europe and found that, as a result of greater European integration, market dependence within the euro region only increased for some countries, such as Italy, France, the Netherlands, Germany, and Spain.

Bekaert and Harvey (1997) considered the volatility of rising equity markets and found that global variables drive volatility in integrated markets, but local factors influence volatility in fragmented markets.

He looked at the distribution of volatility among nations in others (2001), which was conducted during the 1997–1998 Asian financial crisis. They discovered that there are mutual spillover effects between Korea and Hong Kong. Asian stock market movements were analyzed by Jang and Sul (2002) before, during, and after the Asian financial crisis. They discovered that during the financial crisis, Asian market activity increased. The movements of the Asian stock markets prior to, during, and following the Asian financial crisis were studied by Leong and Felmingham in 2003. They found that the financial crisis had increased the synchronization of Asian markets. The stock markets of Malaysia, Australia, Hong Kong, China, New Zealand, and Singapore—all of which have close ties to the Japanese stock market—were studied by Johnson and Soenen in 2002.

Miyakoshi (2003) examined the degree of return and volatility carryover from Japan and the United States to seven Asian stock markets using a bivariate EGARCH model and

discovered that the United States had a massive impact on regional integration between Asian nations.

Premaratne and Balasubramanyan (2003) examined the impact of volatility on stock markets in Hong Kong, Singapore, the United States, Japan, and the United Kingdom.

In the synchronicity between the stock markets of Singapore, Hong Kong, Japan, the US, and the UK, they found significant volatility. When Rao and Naik (1990) looked at the correlation between the US, Japanese, and Indian stock markets, they discovered that the latter had weak ties to international markets. They came to the conclusion that the Indian market's stringent regulations and restrictions on trade and capital movements in the 1970s were to blame for the poor integration of the Indian market with the US and Japanese markets.

Hansda and Ray (2002) also examined price correlations between ten stocks listed on both the BSE/NSE and the Nasdaq/NYSE. They found two-way causality between dual-listed stock prices using VAR models. The authors concluded that markets efficiently receive and integrate price data.

Nandy and Chattopadhyay (2019) investigate the relationship between the National Stock Exchange of India and the domestic financial system, including the money market, FII, FOREX, the gold market, and other markets represented by the S&P500, such as the Japanese Nikkei and India. You'll notice that the Indian and international financial markets are very interdependent. There has also been evidence of an asymmetric transmission of volatility between domestic and foreign markets.

The price and volatility correlations between the prices of international securities traded in London and the underlying stocks listed on the Bombay Stock Exchange were studied by Madhavan and Ray (2019). Exchange rates, international and local indices, DCC from GARCH models for volatility links, and VAR for price analysis were used to evaluate the relationship. While DCC-GARCH demonstrated a high dynamic correlation, the prices of DDR and their underlying securities in Mumbai explained a high level of agreement in the VAR results.

Worthington and Higgs (2004) identified the presence of confirmatory mean and volatility transmission in nine Asian equity markets.

Vardar, Coşkun and Yelkenci (2018) fond that the volatility spillover affects ten countries' stock market indices and the spot price of five major commodities, which evolve depending on market conditions.

In summary, there is enough literature to evaluate the effect of instability spillovers across different financial institutions, including foreign and domestic markets. Portfolio directors, who are constantly on the lookout for diversification methods, are drawn to the literature. International investment managers are interested in India because it has one of the fastest-growing economies in the world. Therefore, it would be interesting to watch how India and Bangladesh in particular, as well as India and Sri Lanka, are affected. Since no sizable

studies have been done to evaluate these markets, as suggested by the literature, the authors were motivated to conduct this study.

Methodology

This study looked at how non-symmetric Indian stock market volatility affected Asian stock markets. The stock exchanges shown in this study are the Nifty 50, the CSSE in Sri Lanka, and the DSE in Bangladesh. The Nifty 50 represents the Indian stock market, whereas the S&P Sri Lanka 20 (SPLK20LP) and Bangladesh-DSE, respectively, stand in for the Sri Lankan and Bangladeshi stock markets. For these stocks, the daily-adjusted closing market indices were compiled from December 2, 2017, to January 30, 2022. The data's log difference was used to calculate the performance of the series. To investigate the effects of the transmission of volatility from the Sri Lankan stock market to the Indian stock market, Causation Granger, VAR, and DCC were used.

The cause of an event can be found using Granger's causality method. In order to determine the direction of causality (one-way, two-way, or none), they generally want to know whether a change in one series affects a change in another series. Investigating the causal connection between variables is a common practice known as Granger causality (Granger, 1969). Since it is used with stationary series, it will be applied to I(0) if two or more strings with level values are immobile. To determine whether lagged returns of Indian stock indices or lagged returns of stock indices from six other countries are driving stock returns, vector autoregression (VAR) is used. This would clarify how reliant Indian stock markets are on international stock markets.

VAR

In VAR models, a variety of tools or strategies are available to help determine the relationship between two variables. A reduced variant of VAR that does not differentiate between exogenous and endogenous variables is one of the approaches. The VAR method has been proven to be a credible and cogent strategy, according to the body of available literature. (Stock & Watson, 2001). The VAR model can be presented as follows:

$$Y_t = \beta_1 Y_{t-1} + \beta_2 Y_{t-2} + \beta_3 Y_{t-3} + \cdots + \beta_n Y_{t-n} + \varepsilon_t$$

In this equation, Y_t is the asset return and Y_{t-1},Y_{t-2} and Y_{t-3} are lag variables. β_1, β_2 and β_3 are the coefficients of the lagged value of assets return. A VAR model bases the variable's treatment as a dependent variable on the lagged value of the variable. The VAR model is used on stationary series and calls for the right amount of lag. Variance decomposition can be used to determine how variable a dependent variable is when lagged by its own variance. Knowing which of the variables is more potent can help explain the variability in dependent variables. It is also known as forecast error variance decomposition. Finally, they examine the transmission impact between the economies of India and Bangladesh, as well as between India and Sri Lanka, using the dynamic conditional correlation (DCC) model. The DCC approach was utilized to look into volatility's short- and long-term persistence.

Results

The findings, which are based on descriptive information about stock returns in the countries under study, are shown in Table 1. The Jarque-Bera test indicates a rejection of normality among the series. From Table 2, it is clearly visible that the correlation among the Stock Exchanges is highly positive.

In this study, the stationarity of the return series for each country is examined using the unit-root test of the Augmented Dickey Fuller Test (ADF). Table 3 demonstrates that the P value for each series is less than 5%. Because of this, the log return series for each nation is stable at I(0), supporting the Granger causality test's application. The Granger causality findings for various series are presented in Table 4. It is found that rNifty does not cause rCSE or rDSE. Therefore, the findings depicted in Table 4 show that the Indian stock market does not outperform Sri Lanka's CSE and Bangladesh's DSE.

Table 1: Descriptive Statistics

	Nifty	**CSE**	**DSE**
Min. :	7034	4383	3704
Median	10886	6442	5466
Mean	11342	6677	5459
Max	18802	14464	7468

Source Author's Estimation

Table 2: Correlation Matrix of ASIAN Stock Exchanges

	Nifty	**CSE**	**DSE**
Nifty	**1**		
CSE	0.6332	**1**	
DSE	0.6394	0.683	**1**

Source Author's Estimation

Table 3: Jarque-Bera & ADF test

	Nifty	**CSE**	**DSE**
Jarque-Bera (P value)	0.0000	0.0000	0.0000
ADF test	Dickey-Fuller = -11.119, Lag order = 11, *p*-value = 0.02	Dickey-Fuller = -12.744, Lag order = 11, *p*-value = 0.01	Dickey-Fuller = -9.4774, Lag order = 11, *p*-value = 0.01

Source Author's Estimation

Table 4: Granger Causality Test

Null Hypothesis	F Statistics	Probablity
rNifty does not Granger cause rCSE	0.6562	0.546
rCSE does not Granger cause rNifty	0.6671	0.5573
rNifty does not Granger cause rDSE	2.1368	0.1407
rNIKKEI does not Granger cause rDSE	0.1209	0.905

Source Author's Estimation

AIC must be used to estimate the appropriate lag duration in the VAR model. Because Lag 8 has the lowest AIC value, it is the best latency to use for VAR. In Table 5, the lag selection criterion is displayed. The multivariate VAR results are summarized in Table 6. because examining the relationship between the Indian stock market and other stock returns is the goal. Based on the lag selection criterion shown in Table 5, the interlinking of the Indian and Sri Lankan stock markets and the Indian and Bangladesh stock markets is shown in Table 6. The VAR's findings unequivocally show how dependent the Stock exchange is on its lags. It has been discovered that Dhaka, Sri Lanka is connected to the Indian stock market. Indian stock markets are impacted by the stock markets in Sri Lanka (at lags 3, 4), and Dhaka (at lags 2).

Table 5: Lag Selection Test

VARselect(data.frame(Nifty, Srilanka,Dhaka)				
AIC(n)	**HQ(n)**	**SC(n)**	**FPE(n)**	
8	1	1	8	
	AIC	**HQ**	**SC**	**FPE**
Lag 1	6.11E+01	6.12E+01	6.13E+01	3.34E+26
Lag 2	6.11E+01	6.12E+01	6.13E+01	3.17E+26
Lag 3	6.11E+01	6.12E+01	6.16E+01	3.18E+26
Lag 4	6.11E+01	6.12E+01	6.17E+01	3.14E+26
Lag 5	6.11E+01	6.12E+01	6.19E+01	3.16E+26
Lag 6	6.11E+01	6.12E+01	6.21E+01	3.11E+26
Lag 7	6.11E+01	6.12E+01	6.22E+01	2.97E+26
Lag 8	6.11E+01	6.12E+01	6.09E+01	2.99E+26
lag9	6.11E+01	6.15E+01	6.26E+01	2.98E+26
lag10	6.11E+01	6.16E+01	6.28E+01	2.99E+26

Source Author's Estimation

Table 6: Outcomes from VAR Estimation

Estimation results for equation rNifty:				
	Estimate	**Std. Error**	***t* value**	**Pr(>|t|)**
rNifty.l1	-0.105	0.0269	-3.89	0.0001***
rSrilanka.l1	0.022	0.0325	0.68	0.494
rDhaka.l1	-0.015	0.0352	-0.42	0.675
rNifty.l2	-0.012	0.0271	-0.43	0.665
rSrilanka.l2	-0.017	0.0333	-0.50	0.615
rDhaka.l2	0.086	0.0353	2.44	0.014*
rNifty.l3	0.046	0.0268	1.71	0.087
rSrilanka.l3	-0.087	0.0333	-2.60	0.009**
rDhaka.l3	-0.036	0.0353	-1.02	0.306
rNifty.l4	0.055	0.0266	2.08	0.0381*
rSrilanka.l4	0.080	0.0334	2.39	0.0171*
rDhaka.l4	0.004	0.0355	0.10	0.919
rNifty.l5	-0.110	0.0262	-4.20	2.82e-05***
rSrilanka.l5	0.008	0.0334	0.24	0.807
rDhaka.l5	0.010	0.0355	0.28	0.777
rNifty.l6	-0.040	0.0259	-1.55	0.1216
rSrilanka.l6	0.028	0.0335	0.83	0.4043

Source Author's Estimation

Table 7: Spillover Effect from Nifty To Others Asian Stock Markets

Variables	**Estimate**	**Std. Error**	**t value**	**Pr(>|t|)**
[rNifty].mu	0.001128	0.000267	4.2247191	0.00012
[rNifty].omega	0.000006	0.000004	1.5	0.100235
[rNifty].alpha1	0.12969	0.02008	6.4586653	0
[rNifty].beta1	22.57341	0.034331	657.52265	0
[rSrilanka].mu	-0.00017	0.000139	-1.2230216	0.275493
[rSrilanka].omega	0.000002	0.000002	1	0.260393
[rSrilanka].alpha1	0.240737	0.043562	5.5263073	0
[rSrilanka].beta1	0.766258	0.037389	20.49421	0
[rDhaka].mu	0.000353	0.000294	1.2006803	0.122449
[rDhaka].omega	0.000002	0.000002	1	0.275341
[rDhaka].alpha1	0.27793	0.055098	5.0442847	0
[rDhaka].beta1	0.758481	0.053579	14.156311	0
[Joint]dcca1	0.0009872	0.000799	1.2355444	0.223975
[Joint]dccb1	0.980257	0.004358	224.93277	0

Source Author's estimation

Findings

They make use of the DCC-MGARCH model to check the spillover of volatility from the stock market of India to the stock market of Sri Lanka and from the Indian stock market to the Bangladesh stock market. It is found to be positive and negligible *dcca1*, whereas they have found positive and substantial dccb1, indicating that there is no amalgamation and disproportional effect from the economy of India to the other two economies in the short period, but there is amalgamation in the long period. Therefore, in the long run, there is a dynamic conditional correlation or transmission of volatility from the Indian market to the Sri Lankan and Bangladeshi markets.

Discussion

Han, Kordzakhia and Truck (2020) examine the volatility spillovers among five regional electricity markets in the NEM and conclude that the volatility of electricity markets is significantly higher than that of other comparable financial or commodity markets, and the pattern of spillover effects may be influenced by the market structures and specific events.

Wen *et al.,* (2021) in their article, they found that there was a highly dependent relationship between the Chinese stock market and Chinese commodity markets, and the level of total volatility spillover varied in different periods.

Ahmed and Huo (2021) suggested that there was a significant unidirectional return spillover effect from the oil market to the Chinese stock market, while there was no return spillover between gold and these two markets.

Reboredo, Ugolini and Hernandez (2021) investigated connectedness spillovers among six stock indices and three blocks of markets. They believed that the risk effect of stock markets needed to be hedged with other asset classes or financial derivatives.

There are global leading and trailing correlations between various economies, according to research on volatility spillover. Ebrahim (2000), Jaiswal-Dale and Jithendranathan (2009), Natarajan, Singh and Priya (2014) and Alfreedi (2019) all conducted studies on the spillover between various stock markets (2019). Over the past 20 years, India has attracted the attention of international portfolio managers as one of the fastest-growing economies.

However, given the various risks in the Indian market, including currency risk, political risk, and interest rate risk, as well as the current recession, it would be beneficial to look at other rapidly developing economies. Which offer investors a variety of opportunities. Some commentators are predicting the rise of Asia and the advent of a Pacific Century as a result of Asia's incredible economic success since the 1980s. The four developing Asian countries have made great strides in high-tech industrialization. There study focuses on the three tiger states of Japan, South Korea, and Taiwan, followed by the Chinese "dragon" and the Indian "elephant". As a result, it will be fascinating to study India's ripple effect on these economies. They could offer portfolio management options to portfolio managers investing in India due to their geographic advantage, similarity to India and growth prospects. As far as the authors are aware, there is no previous evidence of the interconnections between

India and these economies. Therefore, this study fills the gap by focusing on the interconnections between the Indian stock market and the equity markets of the other six countries to reduce the volatility spillover. This research adds to existing knowledge by determining whether portfolio managers investing in emerging markets can benefit from global portfolio diversification.

The results of the present study point to evidence of long-term volatility spillover from India to these markets, even if there is no evidence of short-term volatility spillover from the Indian stock market to the Sri Lankan and Bangladeshi stock exchanges. These results have significance for market managers developing laws and offer information to investors looking for chances for diversification in these two markets.

Conclusion

According to modern portfolio theory, portfolio managers must increase or diversify their holdings in low- or negatively correlated asset classes in order to maximize returns and lower risk. Due to highly coordinated swings and strong spillovers from volatility across several equity markets, fund management's outlook for diversification is constrained. To profit from the benefits of global diversification across multiple markets, portfolio managers are constantly looking for equities markets from other nations that are not integrated with one another. The degree of market integration can be assessed via the transmission of volatility. In the present research, They analyze whether fund managers investing in Asian economies may diversify their portfolios into other comparable nations by examining the spillover effects of volatility between the Indian and Asian economies. There evidence indicates that the Indian markets are more frequently affected by their own delays. Granger causality provides additional evidence that there is no correlation between the Indian and Sri Lankan markets. Finally, they evaluate if volatility from the Indian market is transferred to the other two stock markets (Sri Lanka and Bangladesh) using the DCC-MGARCH model. The value of Dcca1 is negligible and positive, while dccb1 is significant and also positive. This implies that there is no integration and an asymmetric effect of the Indian economy on the economies concerned in the short term, but there is integration in the long term. As a result, portfolio managers who invest long-term in the economies of Sri Lanka and Bangladesh benefit from the diversification of these economies. This research also suggests that global portfolio managers with investments in Asian countries should consider Asian economies as a possible diversification option.

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Global ESG Regulatory Framework and Sustainability: Issues and Prospects

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ABSTRACT

Environmental, social, and governance (ESG) issues and reporting have emerged as a core challenge for businesses and have a significant impact on investing patterns. The ESG reporting framework provides for the collective reporting of the environmental, social, and governance aspects of the corporation. ESG is a framework that aids stakeholders in understanding how a company handles opportunities and risks related to sustainability issues. ESG has developed from earlier movements that prioritized corporate generosity, pollution reduction, and issues of health and safety. ESG has altered various capital allocation and investment decisions. This article examines the changing environment of ESG reporting rules and analyzes ESG global regulatory reforms and developments in the recent years. This study is descriptive and exploratory, utilizing secondary data to gain insights into ESG reporting and critically evaluate its frameworks and advancements. The analysis of various reporting requirements and frameworks reveals the absence of a standardized reporting standard for ESG disclosures worldwide. The study indicates that there is a need for international collaboration and coordination to unify the disclosure requirements and enhance the quality, accessibility, and comparability of the ESG framework.

Keywords: *ESG; Reporting; Responsibility; Sustainability; Framework*

Introduction

Environment, society, and governance are the three key pillars of a company's sustainability practices. The words "ESG reporting standards" and "ESG reporting frameworks" are sometimes used interchangeably. They are connected to a company's financial risk exposure (outside-in approach). They have both the favourable and unfavourable implications for a company's global ecosystem. It includes the Sustainable Development Goals (SDGs), ESG targets, and stakeholder expectations (inside-out approach). Being able to provide relevant data that can be compared to the figures from other firms within an industry or investment portfolio is one of the main factors in ESG reporting (Darnall, Iwata, & Arimura, 2022).

However, in order to do apples-to-apples comparisons, one must start from the same branch, or in this case, the same ESG reporting framework. These frameworks standardize reporting. Investors are unable to recognize the companies that are taking steps to achieve their sustainability goals and lessen their negative effects on the environment and

community without them, and firms may pick and choose the indicators that best portray them (Bose, 2020).

Improving traceability and data access about ESG risks and impacts through compliance and disclosure regulations, standards, and markings is critical for stakeholders. It helps stakeholders recognize and confiscate sustainable investment opportunities around the world, as well as understand the business environment and wider ESG risks in their investment and financial decision-making.

ESG reporting has huge implications for both corporations and investors. In recent times, regulatory bodies and institutions have been concerned about ESG reporting to establish a sustainable and accountable corporate environment (Arvidsson & Dumay, 2022). On the backdrop of the significance of ESG, the paper attempts to understand the changing environment of ESG reporting rules and to analyze the recent ESG global regulatory reforms and developments with special reference to India. The present article intends to examine the changing environment of ESG reporting rules and analyze ESG global regulatory reforms and developments in recent years. Along with the global scenario, recent developments in ESG reporting in the Indian context are also analyzed.

Literature Review

ESG investment is a significant and powerful sector of the financial market. Academic study might shed light on, evaluate, and enhance its operations. Unfortunately, research up to this point has mostly emphasized return metrics (Daugaard, 2020). Businesses were more likely to provide environmental information if their stakeholders, particularly those in the financial markets (investors) and/or customers, wanted it. Therefore, disclosure may be viewed as a function of stakeholder pressure or demand; in the absence of such pressure, corporations may disclose little or say nothing (Sutantoputra, 2022).

Companies should allocate resources appropriately to internal control activities in order to incorporate ESG issues and add value, as internal control provides the first level of assurance for ESG integration. Companies should consider both the cost of the internal control system and the ESG rating as strategic corporate tools for value enhancement (Harasheh & Provasi, 2022). Environmental disclosures have a detrimental impact on corporate financial profit (CFP). The social component of ESG's operational efficiency is influenced by stakeholder participation in management. Provisions relating to board of directors and shareholder rights have a favorable effect on CFP in the governance dimension (Saygili *et al.,* 2022).

ESG funds invest in companies whose average ESG scores are higher. ESG scores are not associated with a company's compliance history or its actual carbon emissions levels but rather with the volume of voluntary ESG-related disclosures. Finally, ESG funds appear to demand greater fees and underperform financially in comparison to other funds within the same asset manager and year (Raghunandan & Rajgopal, 2022).

Regulations need to be changed in order to incorporate ESG practices. In order to advance sustainable industrialization, the regulatory agencies will raise the bar for ESG standards in the corporate sector (Zahid *et al.*, 2019). If left to market forces as more and more businesses embrace the Integrated Reporting (IR) practice, IR will eventually become the standard for reporting. When integrated reporters' behaviors are viewed as desirable, suitable, or acceptable, IR will eventually be considered a genuine practice (Stubbs & Higgins, 2018). The frequency of ESG disclosure is influenced by ownership status and membership in particular stock markets. ESG reporting thus affects both financial and environmental performance. Accountability is the primary motivator for ESG disclosure, and firms are coming up in terms of both the quantity and quality of ESG reporting (Weber, 2014).

Objectives of the Study

The study is based on the following objectives:

1. To analyse the different ESG frameworks used across the globe
2. To understand the global scenario of ESG reporting
3. To understand the Indian prospective of ESG reporting and the way ahead

Methodology

The present study is exploratory and descriptive in nature and is based on secondary data, which aims to provide insight into ESG reporting and critically analyze the frameworks and developments in ESG reporting. Along with the global scenario, the Indian perspectives as well as the way ahead for ESG reporting are also discussed in this study. Different working papers, case studies, analytical reviews, journals, newspaper reports, magazines, and websites are being consulted and reviewed to fulfil the objectives of the study.

Results and Discussion

ESG Reporting and Its Benefits

An ESG report is a document that outlines the environmental, social, and governance (ESG) implications of a firm or organization. It allows the business to become more open about the threats and opportunities it confronts. It is a means of communication that is crucial for persuading skeptics that the company's actions are genuine. The importance of ESG (Environmental, Social, and Governance) factors in business decision-making and investing has significantly increased in recent years. Stakeholder capitalism has gained traction, and businesses are increasingly being held accountable for their impact on society and the environment. Climate change and the COVID-19 pandemic have further highlighted the need for long-term thinking and sustainability. ESG integration is critical for risk management strategies and can also serve as a new driver of financial development. Companies that prioritize ESG factors are likely to perform better in the long run and attract more socially conscious investors. Moreover, businesses that take their social and environmental impact seriously can boost their reputation and appeal to a broader range of stakeholders. Regulations and policies aimed at promoting sustainability and corporate

responsibility are also putting pressure on companies to improve their ESG efforts. In summary, ESG integration is not just a moral imperative; it is also becoming an essential business strategy to ensure long-term success and sustainability. There are various parameters used for evaluating a company in terms of ESG. The parameters are depicted below:

Table 1: Parameters of ESG Reporting

Environment	Society	Governance
Climate Change	Human Capital	Governance Structure
Carbon Emissions	Health and Safety	Executive Pay
Greenhouse gases	Personal Development	Ant bribery and Corruption
Pollution and Waste (toxic waste, electronic waste, effluents)	Labour Management	Business Ethics
Natural resources	Workforce and Diversity	Anti-Competitive Behaviour
Environmental opportunities	Product Safety	Tax Transparency and Reporting
	Data and Privacy Security	Financial and Operational Risk
	Financial Product Safety	Stakeholder Engagement
	Stakeholder Opposition	Audits
	Involvement with Community	
	Social Opportunity	

Source: Collected from various reports and compiled by the researchers

The table above shows the different parameters available and used for ESG reporting, but there is no such uniform ESG reporting framework available across the globe. Some of the financial service providers have selected the major reporting parameters for ESG reporting. They assist companies with ESG reporting. The parameters that are adopted by the financial service providers are given below:

Table 2: ESG Parameters Adopted

Pillar	Thomson Reuters	Morgan Stanley Capital International (MSCI)	Bloomberg
Environmental	Resource Use	Climate Change	Carbon Emissions
	Emissions	Natural resources	Climate change effects
	Innovation	Pollution & waste	Pollution
		Environmental opportunities	Waste disposal
			Renewable energy
			Resource depletion
Social	Workforce	Human Capital	Supply Chain
	Human rights	Product liability	Discrimination
	Community	Stakeholder	Political contributions

	Product Responsibility		Diversity
			Human Rights
			Community Relations
Governance	Management	Corporate governance	Cumulative voting
	Shareholders	Corporate behaviour	Executive compensation
	CSR Strategy		Shareholders' rights
			Takeover defence
			Staggered boards
			Independent directors

Source: Collected from various report sand compiled by the researchers

ESG disclosure made mandatory enhances the access and reliability of ESG reporting, especially among enterprises with low ESG performance. ESG reporting benefits a firm's information environment as well. Moreover, when ESG disclosure is enforced, analysts' profit estimates become much more accurate and less fragmented (State and trends of ESG disclosure policy measures across IPSF jurisdictions, International Platform on Sustainable Finance, 2021). Furthermore, when mandatory ESG disclosure is implemented, negative ESG occurrences become less frequent, lowering the risk of a stock market crash. According to the study, mandatory ESG disclosure provides both educational and practical benefits.

ESG Framework: Global Scenario

Despite numerous reporting requirements and no uniform framework to govern company disclosures, the ESG reporting environment is fragmented. Investors argue that they wouldn't have the consistent, decision-useful information they need to appropriately include ESG issues in their investment choices since companies' ESG disclosures vary greatly.

As the ESG reporting landscape evolves, the reporting frameworks have also evolved across the globe. The table below depicts the leading ESG reporting frameworks that are accepted globally:

Table 3: Leading ESG Reporting Frameworks

Sl. No.	Global Reporting Initiative (GRI)	Sustainability Accounting Standards Board (SASB)	United Nations Sustainable Development Goals (UN-SDGs)	Task Force on Climate-related Financial Disclosures (TCFD)
1.	A global, independent standards-setting body that aids in understanding and communicating the effects of corporations,	A sector-based, industry-specific guideline framework that is primarily used to aid publicly listed corporations in determining the	A mechanism for businesses to promote and advance the Sustainable Development Goals of the UN, which	A set of voluntary guidelines for financial disclosures relating to climate change those are relevant to businesses in all

	governments, and other organisations on topics including corruption, climate change, and human rights.82% of the 250 largest firms in the world report using the GRI Standards, making it the most popular reporting framework.	financial significance of sustainability-related data for disclosure to the SEC and the general public.	have been ratified by all UN member states. A voluntary project based on CEO promises to apply universal sustainability principles.	industries and regions. The guidelines can be used by organisations to assist in the preparation of disclosures that are more uniform and comparable.
2.	There are two main primary categories: Universal standards and topic-specific standards. The requirements for creating a sustainability report are part of the global standards, often known as the "100 Series of the GRI Standards."	The SASB standards are segmented by industry, allowing SASB indicators to be compared amongst businesses in a given peer group. The SASB Standards include 77 industries over 11 separate Sectors.	The ten principles of the Global Compact or the SDGS are meant to be incorporated into organisations' value systems and business practises. The SDG programme outlines 17 ambitious targets with a 2030 deadline for completion.	Instead of imposing new reporting obligations, the TCFD suggestions are intended to assist companies in complying with current mainstream reporting requirements.
3.	Reports will be company- or organization-specific, but they will also have the notation "in compliance," indicating that they adhered to GRI Standards while being created.	The sustainability, impact, CSR, or ESG report of a reporting firm should include sustainability data and performance measures that are "financially relevant" as well as the company's scheduled SEC filings.	CoP, that is, Communication on Progress Companies is required to report key information about their Global Compact-related activities to the CoP on an annual basis.	Businesses are urged to include important climate-related problems in their regular financial disclosures, whether they are submitted to the SEC, other regulatory bodies, or sustainability or ESG reports.

Source: Collected from various reports and compiled by the researchers

According to a study conducted in the year 2019 by the European Corporate Governance Institution (ECGI), 25 countries have mandated social responsibility and sustainability reporting for their corporations, later named ESG disclosures (2007-2019) including the major ones, that is, the United Kingdom, European Union, United States of America, China, India, Australia, Japan, and South Africa. The study also reveals that mandatory

sustainability reporting is restricted only to some large corporations, listed companies, and some state owned companies (Christensen *et al.,* 2021).

The ESG disclosure requirements and regulations of some of the countries are analyzed below:

Table 4: ESG Framework Followed by Different Countries

Sl. No.	Country	ESG Framework
1.	United Kingdom (UK)	• ESG Reporting on greenhouse gas emissions, workplace diversity, inclusive corporate culture, and human rights. • Implementation of Corporate Governance Code, 2018 with respect to accountability, leadership, remuneration, effectiveness, and shareholders' relationship. • Companies listed in London Stock Exchange are mandatorily required to publish ESG report in accordance with the ESG reporting guidelines 2020. • The mandatory ESG reporting in UK includes the greenhouse gas reporting, energy use, gender pay gap and modern slavery.
2.	European Union (EU)	• Non-Financial reporting directives and disclosures mandatory for EU member states since 2018. • Companies required to compulsorily reporting on matters such as environmental, social, and human resource management. • Further, separate disclosures with respect to anti-bribery, corruption and human rights performance is also required. • The Sustainable Finance Disclosure Regulation (SFDR) has mandated the ESG disclosure for financial service providers also. • Further all corporations are required tointegratethe recommendations of the Task Force on Climate related Financial Disclosures in their reporting.
3.	United States of America (USA)	• The U.S. Securities and Exchange Commission (SEC) require all public limited companies to report on material matters such as ESG related risks, transparency, and accountability with respect to directors' appointment, human capital management, etc. • Companies listed in New York Stock Exchange (NYSE) are mandatorily required toimplement and publicize code of corporate behaviour and ethics. • NASDAQ listed companies' needs to disclose the composition of the board of directors. Along with other characteristics such as the gender, racial characteristic, and LGBTQ status of the companies' board.
4.	China	• Chinese Corporations are required to disclose and publish environmental performance and contribution to the social up gradationaccording to the Environmental Information Disclosure

		Act, 2015. • Companies listed in Shanghai Stock Exchange are required to mandatorily report environmental disclosures. • Since June 28, 2021, the China Securities Regulatory Commission (CSRC) revised the ESG disclosure framework with respect to provide better transparency and accountability in reporting. • Annual reports of such companies must contain the parameters such as annual resource consumption, pollution levels, carbon emissions, waste generation and disposal methods, etc. in order to receive additional grants and public support rights.
5.	Japan	• The Corporate Governance Code of Japan introduced the ESG reporting requirements on a mandatory basis in June 2021. • The Task Force on Climate-related Financial Disclosures (TCFD) guidelines must be followed by all the companies. • Compulsory reporting on global warming counter measures by specified companies. • Compulsory reporting on energy use by large energy consuming companies. • All companies with more than 300 employees are required to report the female participation in management and career advancement opportunities available to them.

Source: Collected from various reportsand compiled by the researchers

As it is witnessed that there is diversity in ESG reporting practices, in February 2021, the International Financial Reporting Standards (IFRS) Foundation harmonised the reporting framework and standardized the sustainability disclosure requirements. Other standard-setting bodies and institutions across the globe, such as the Carbon Disclosure Project (CDP), Climate Disclosure Standards Board (CDSB), Global Reporting Initiative (GRI), International Integrated Reporting Council (IIRC), and Sustainability Accounting Standards Board (SASB), have come forward to support the initiative of the IFRS Foundation. It is the first attempt by these bodies to integrate their current standards frameworks to provide a unified way to report the effect of sustainability challenges on corporate value (Afolabi et al., 2022).

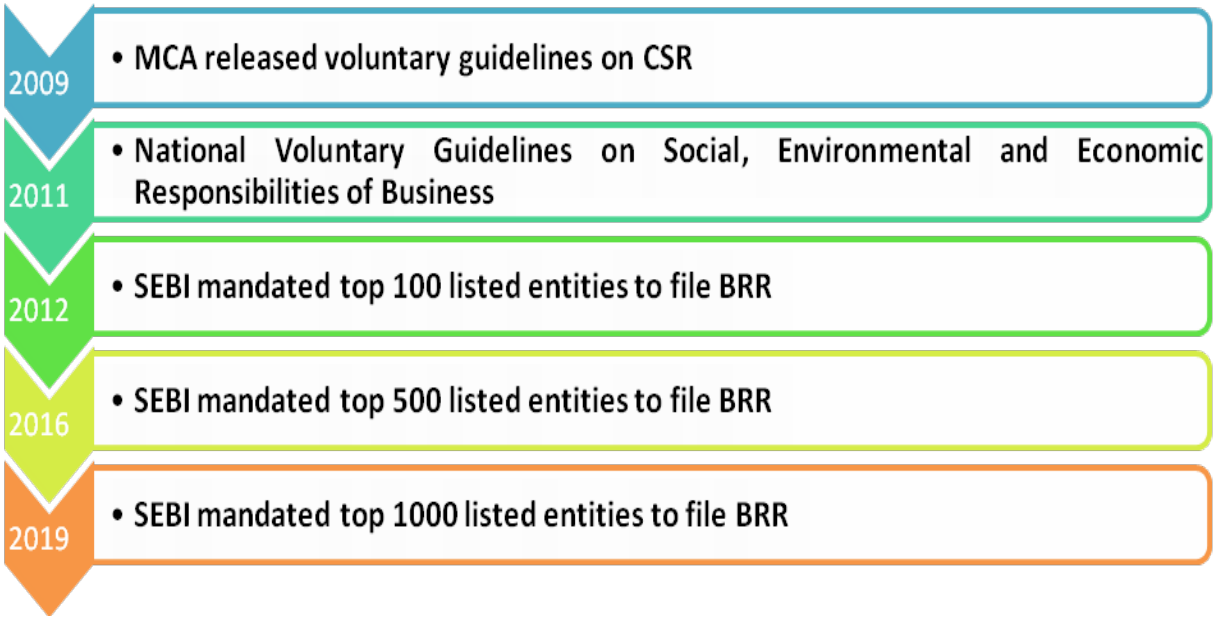
There has been a sharp rise in interest in ESG in recent years, and so far in 2022, there is no indication that this trend will slow. However, more than just ESG fund inflows have been rising. Asset managers are under growing pressure to offer more information and consistent reporting about environmental, social, and governance initiatives as legislators focus on these issues. The strengthening of regulations is producing new market opportunities while also presenting asset managers with new data and reporting difficulties that must be handled (ESG Investing: Practices, Progress, and Challenges, OECD 2020).

More than a quarter of international investors, up from 24% in 2021 to 28% in 2022, think that ESG is essential to their investing strategy. However, a larger percentage this year indicates that an "approval", (34% in 2021 vs. 32% in 2022) and "conformity" (29% in 2021

vs. 24% in 2022) depend on ESG reporting. Additionally, the percentages of non-adopters (3%) and "side-line" observers (13%) have decreased. As a result, the percentage of ESG users worldwide has increased from 84% in 2021 to 89% now in 2022. Reflecting the more developed European ESG market and regulatory environment, Europe continues to lead the ESG push. Contrarily, the North American area has the lowest level of support for ESG and the lowest usage rates. The result that just 13% of global investors think ESG is a transitory trend that will go out of style further emphasizes investors' belief in ESG. This illustrates how the majority of investors see ESG as an essential and enduring component of the financial environment (Harvard Law School Forum on Corporate Governance, 2022). The chance to create new fund vehicles that can properly address environmental, social, and governance issues and satisfy the needs of today's ESG-aware investors is increasing in the present business environment. Investors are becoming more demanding of increased transparency, and as a result, the regulatory environment is becoming more stringent.

ESG Reporting in India

India has covered a lot of ground in social responsibility and sustainability reporting, and the reporting requirements are still evolving to integrate themselves with global benchmarks and provide more transparent information to the users of such reporting. The timeline below shows the development of ESG reporting in India:



Source: Collected from various reports and compiled by the researchers

CSR: Corporate Social Responsibility
BRR: Business Responsibility Reporting
SEBI: Securities and Exchange Board of India

Figure 1: Development in ESG Reporting in India

The ESG disclosure requirements and regulations followed in India are given below:

- The Ministry of Corporate Affairs (MCA) mandated the Business Responsibility and Sustainability Report (BRSR), which includes the ESG factors for the top 1000 listed entities (by market capitalization).
- All industries must mandatorily file an environmental audit report annually.
- Mandatory CSR reporting for specified classes of companies according to Section 135 of the Companies Act, 2013.
- Disclosures with respect to the conservation of energy are mandatory for specified companies.
- All scheduled commercial banks (excluding RRBs) are required to prepare and report Sustainable Development and Non-Financial Reporting in their annual reports.
- Voluntary Integrated Reporting for ESG Parameters (Top 500 companies by market capitalization). It includes factors such as biodiversity and energy consumption, carbon emersions, waste management, societal impacts, protection of consumers and human rights, sustainable governance practices, business ethics, culture, human resource management, and many more (Sustainability reporting landscape in India, The Reporting Exchange, 2020).

Various governing bodies, including the MCA and the Securities and Exchange Board of India (SEBI), notify the ESG disclosure guidelines from time to time to strengthen the reporting framework in India and increase the quality of the reporting.

While SEBI announced the necessity for a Business Responsibility and Sustainability Report (BRSR) in its May 2021 circular, SEBI specified that the reporting would be optional for the financial year 2021-2022 in order to give firms time to adjust to the new standards. However, BRSR is required for the top 1000 listed firms starting with the fiscal year 2022-2023. The epidemic, the Paris Agreement's passage, and other efforts to tackle climate change have all played a significant role in accelerating the significance of ESG issues to investors. ESG-related studies give stakeholders comparable data on the best businesses to aid in making wise investment decisions. Socially responsible investors evaluate possible investments using ESG criteria (Karmase, 2021).

An outline of the three factors used to assess businesses for ESG investment identified by SEBI is provided below:

- **Environment:** What type of environmental effect does the firm have? How does it secure or protect the environment? A company's carbon footprint, harmful chemicals used in its manufacturing processes, corporate policies addressing climate change, and sustainability initiatives that make up its supplier chain may all be included in this.

- **Social:** How can the business strengthen its social influence both internally and externally? Social variables range from recruiting procedures and inclusion initiatives to ethnic diversity in the executive suite and across the whole staff. Social criteria look at how an organization handles its connections with its workers, vendors, clients, and the communities in which it works.
- **Governance:** How do the board and management of the organisation promote good change? Governance covers a wide range of topics, such as CEO compensation, leadership diversity, how well that leadership reacts to and engages with shareholders, auditing, internal controls, and shareholder rights.

SEBI's aforementioned disclosure rules through BRSR have been implemented to keep up with such investment methods and rising concerns about ethical corporate governance and climate change as ESG investing becomes more widely used.

In the Indian context, the way ahead is to integrate the ESG reporting regulations by bridging the awareness gap among the preparers and the analysts and to inculcate the best practices followed globally. SEBI and MCA must seek to resolve the operational loopholes existing in the reporting framework and must step in to improve the data collection, accessibility, and reliability of the ESG parameters.

Integrated Reporting: The Way Ahead

A key tool for better understanding how a firm generates sustainable value over the long term and the interplay between financial and non-financial elements that affect performance is integrated reporting. Organizations are more likely to lose sight of their long-term goals when there are no defined expectations for performance. One of the main justifications for reporting on sustainability by businesses is to show how they manage opportunities and risks related to ESG concerns in addition to their financial performance. By addressing both business performance indicators and ESG considerations, integrated reporting assists companies in telling a whole story about what motivates their success. It gives investors a better understanding of how ESGs contribute to the generation of corporate value. It is swiftly gaining acceptance throughout the world (Boffo & Patalano, 2020).

Integrated thinking, which helps show how strategy, strategic objectives, performance, risk, and incentives are interconnected, is the foundation of integrated reporting and aids in locating sources of value generation. The idea of integrated reporting was developed to more clearly express the wide variety of metrics that contribute to long-term value and the function that organizations serve in society (Bloomberg, 2018). The idea that value is increasingly determined by elements other than financial performance, such as dependency on the environment, social reputation, human capital abilities, and others, is at the core of this. Integrated reporting is built on the idea of value generation. Integrated reporting evaluates five other capitals in addition to financial capital that should direct an organization's decision-making and long-term performance, as well as its value generation broadly construed. Even though a wide variety of stakeholders benefit from integrated reports, long-term investors are their primary target audience.

Integrated reporting assumes that any value produced as a consequence of a sustainable strategy will, at least in part, translate into performance, regardless of whether it becomes a tangible or intangible asset. As a result, market value will be affected. The practice of integrated reporting, which puts yearly financial and sustainability information together in one report, is one step ahead of sustainability reporting. An integrated report's goal is to provide readers with a clear, succinct picture of the organization, its strategies, and its risks by connecting its financial and sustainability performance in a way that gives readers a comprehensive understanding of the firm and its prospects for the future.

Conclusion

It is important to note at the outset that directors of Indian firms have obligations not just to shareholders but to all stakeholders. This offers Indian corporations a strong legal basis for making ESG disclosures and creates an opportunity for more legislative and regulatory reform. Directors' obligations under company law are often due to the corporation or its shareholders, as is the case in numerous Asian nations. The movement toward mandated disclosures, as opposed to optional ESG disclosures (or disclosures on a "comply or explain" basis), is progressively gaining momentum.

The path forward for ESG reporting across global corporations appears to be becoming more effective in the context of legal requirements and regulations. On analyzing the different reporting requirements and frameworks, it is evident that no such uniform reporting standard exists for ESG disclosures throughout the globe. In this scenario, international cooperation and coordination are required to harmonize the disclosure requirements as well as increase the quality, accessibility, and comparability of the ESG framework.

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Disclosure of Sustainable Water Management Practices: A Comparative Study Between NTPC and Tata Power

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ABSTRACT

Introduction: Disclosure of sustainable water management practices by Indian power-generating companies has become crucial on two grounds: the power sector accounts for 75% of total industrial water withdrawals, and GRI-based sustainability reporting will become mandatory from 2022–23. The issue is also important to realise the UNO's SDG 6. Summary of objectives: The study tries to compare the sustainable water management reporting patterns of two selected Indian power-generating companies that are part of 'Responsible Business Ranking 2021'. **Methods:** Considering GRI guidelines, a content analysis technique has been used to analyse the reporting inputs for sustainable water management. **Results:** Individually, both companies have been found to perform well in reporting sustainable water management information in their respective reports. A comparison of disclosure quality, however, revealed substantial differences. While Tata Power Ltd. was found to outperform NTPC Ltd. in terms of quality of reporting on 'Management of Water as a Resource', NTPC Ltd.'s disclosure performance has been far better in reporting water-specific information. **Conclusion:** Both companies have been found to have voluntarily disclosed water management practices as per GRI standards to a large extent. But there remains some scope for improvement.

Keywords: *SDG-6; GRI; Corporate Reporting; Voluntary Disclosure; Sustainable Water Management; Indian Power Generating Companies*

Introduction

Traditionally, corporate reporting was confined to communicating the financial performance of the entity to various stakeholders. But the notion started to change with the popularity of 'Sustainable Development' concept. As a result, many new ideas like triple bottom line reporting, sustainability reporting, integrated reporting, etc. have become popular and advocate the inclusion of social and environmental parameters in the annual reports of companies. According to Farneti and Guthrie (2009), the primary goal of sharing social and environmental impressions is to inform internal stakeholders about the organisation's sustainability efforts.

The Global Reporting Initiative (GRI) and Sustainability Accounting Standard Board (SASB) are global bodies that issue guidelines for reporting social and environmental performance by companies. In India, the Securities and Exchange Board of India (SEBI) has come up with Business Responsibility Reporting (BRR) to communicate the non-economic matters of some top-listed companies in 2012. With the changing business scenario, modifications have been made to the BRR to expand the non-economic reporting horizon. Therefore, the BRR was changed to the Business Responsibility and Sustainability Report (BRSR) in March 2019.

SEBI has moved further and made BRSR mandatory for listed Indian companies from the financial year 2022-2023.

Water, being a natural resource, plays a very important role in sustainable development. According to the United Nations' Sustainable Development Goal 6 (SDG 6), "the demand for water has outpaced population growth, and half the world's population is already experiencing severe water scarcity at least one month a year". So, the judicious use of water, both in community life and industrial production, assumes greater significance than ever before. In India, the industry ranks second after agriculture in terms of water use. Out of the total industrial water withdrawals, nearly 75% are used for energy production (WWAP, 2014). Thermal power plants consume 88% of the total water used by industries (Chourey, 2012). IRENA, (2018) mentioned that the rapid growth in thermal power generation will lead to higher consumption of fresh water, and consequently, a water crisis is going to knock on the door sooner or later.

So, industrial players in general and power-generating units in particular must understand the importance of managing water resources sustainably. Sustainable water management, therefore, becomes the need of the hour. Thus, power-generating companies need to fulfill twofold responsibilities: the adoption and implementation of policies that ensure sustainable use of water and the disclosure of those measures in their annual reports so that stakeholders may get a 360-degree view of the state of affairs. The present study aims at capturing voluntary disclosure practices on 'Sustainable Water Management' by two renowned power generation companies: National Thermal Power Corporation Limited (NTPC Ltd.), belonging to the public sector, and Tata Power Ltd., in the private sector. The last two financial years, i.e., 2019–2020 and 2020–2021, were used as periods of study.

Consequently, some national and international studies have been reviewed and presented in a tabular format.

Table 1: National Scenario

Year	Name of the Author(S)	Objectives of the Study	Key Outcomes
2022	Bhowmik and Dutta	The study analysed the nature and pattern of water management reporting practices of top five Indian companies during the voluntary disclosure regime.	It was found that there was no standard structure for the disclosure of qualitative and quantitative data, and there was also no suitable authentication process like water auditing, etc. to lend credibility to the enterprises' tall claims.
2019	Aggarwal and Singh	To check out the current picture of sustainability reporting practices in India.	The reporting on sustainability in respect of quantity was higher than quality. Furthermore, dimension, type of industry, and size of the firm do have influence on sustainability reporting except ownership structure. However, it was failed to highlight any linkages between sustainability and profitability.
2018	Poddar and Narula	To investigate the status of Indian companies concerning disclosing the sustainability indicators and to explore the level of adherence by the Indian	The trends of the companies in depicting the sustainability reports were judged and it offers that they have started it in a very slow manner but as the time passes the companies have

		companies to the GRI sustainability framework.	developed in reporting and it has the potentiality to give much better in future too.
2017	Kumar, Pande and Afreen	The study analysed how the banking companies have reported sustainability facts by using a GRI-G4 frameowrk.	Firstly, selected banks have not yet adopted adequate disclosure and transparency practices. Secondly, despite the facts that environmental and social goals are generally provided, some indicators, such as “equal remuneration”, “occupational health and safety”, and “customer privacy”, were left out. Thirdly, a weak stakeholders’ engagement was found.
2016	Chaklader and Gulati	It analysed the practices of Indian companies in communicating environmental information and relationship of independent variables with environmental disclosure index.	The study reported that size of the company and environmental certification matters in disclosing more environmental information by an external agency.
2016	Jain and Winner	The study examined CSR/Sustainability reporting behaviour of some largest state-owned and private companies in India.	The companies used their website to communicate Sustainability information. However, a positive sign can be seen in India relating to sustainability reporting.

Table 2: International Scenario

Year	Name of the Author(S)	Objectives of the Study	Key Outcomes
2019	Talbot and Barbat	It assessed the quality and compliance of water management information disclosed by mining companies and to explore the impression management strategies used to justify their performance.	The tendency of the companies to report the facts which do not follow GRI guidelines. Moreover, it also highlights several neutralization and obfuscation techniques used to justify negative information related to water performance.
2018	Gnanaweera and Kunori	It measured the corporate sustainability disclosure guidelines determination (CSDF rate) and the relationship between CSDF rate and corporate sustainability performance.	The firms listed on Tokyo Stock Exchange disclose to some extent on environmental, social, and economic information but the level of disclosure was varied.
2017	An, Davey and Harun	By using a longitudinal perspective it examined the extent and trend of sustainability reporting by a New Zealand public university.	Less attention was paid to economic and social disclosures in sustainability reporting, which was mainly focused on environmental reporting. Additionally, the reporting for the time period shows a general upward tendency, even though the

			aggregate level is still low and there are no financial disclosures in the report.
2017	Kleinman, Kuei and Lee	To examine the water reporting of companies in the US Food and Beverage industry.	They have revealed that water consumption and water withdrawal were cited more often in the firm's CSR Report. Also, the FCA results that the major focus of the firms was setting sustainable water management goals and water quality strategy.
2016	Botha and Middelberg	They have evaluated the adequacy of water-related reporting and disclosure by high-impact users in South Africa considering Socially Responsible Investment-indexed (SRI-indexed) JSE-listed companies.	It showed that most of the companies illustrate commitment towards water stewardship by reporting on water-related aspects. They added a more compact guidelines is needed to report water related facts in depth.
2016	Dissanayake, Tilt and Lobo	To empirically examine the sustainability reporting practices of publicly listed companies in Sri Lanka.	It showed that despite the nation's weak environmental record, there was a strong emphasis on reporting the social factors. The economic context, therefore, appears to be a significant factor influencing how sustainability reporting develops in Sri Lanka.

After reviewing both national and international pieces of literature on reporting sustainable water management, it was found that, nationally, only one article addressed the status of Indian companies in reporting sustainable water management practices. Moreover, the level of reporting of water management by power generating units, which consume the lion's share of the total water used by the corporate sector, has not been taken up for study. So, the principal aim of the study is to compare the sustainable water management reporting patterns of the selected Indian power generating companies, i.e., NTPC Ltd. and Tata Power Ltd., which are part of the 'Responsible Business Ranking 2021'. To reach the main theme of the article, the path is classified as follows:

(i) To analyse the sustainable water management reporting pattern of NTPC Ltd. for the financial years 2019–20 and 2020–21.

(ii) To analyse the sustainable water management reporting pattern of Tata Power Limited (TPL) for the financial years 2019–20 and 2020–21.

To compare the reporting practices between NTPC Ltd. and Tata Power Ltd. in terms of sustainable water management for the aforesaid accounting period.

Methodology

Research Design: Both explorative and analytical research designs have been used. It is explorative as it explores the pattern of reporting on sustainable water management by the companies, and it is analytical because it analyses the collected facts reported by the selected companies.

Sampling: A purposive sampling technique has been followed to select the two Indian power-generating companies that are part of the Responsible Business Ranking 2021. Out of the

two selected companies, one (Tata Power Ltd.) has no governmental stake in its ownership structure, and another (NTPC Ltd.) has a full governmental stake in its ownership, which facilitates a better comparison between them regarding the voluntary reporting of sustainable water management. The logic behind selecting these two power-generating companies is that they are the top CSR-ranked power-generating companies, and both are part of prominent indices of the Indian Stock Market.

Data Collection Tool: GRI Standards 103 (Management Approach) and GRI standard 303 (Water and Effluents) have been used to better compare the voluntary reporting performance of the selected Indian power-generating companies.

Analytical Tool Used: Taking the support of content analysis technique,data and facts are collected from integrated reports and websites of respective companies.

Study Period: 2019–20 and 2020–21 have been chosen on the pretext that these two years correspond to not only the most recent periods but also the end of the loop of the voluntary reporting domain.

Results and Discussion

The analysis has been presented in two sections. The first section reflects a company specific analysis whereas the second represents the comparative analysis.

Company Specific Analysis:

Here, the sustainable water management reporting of NTPC Ltd. and Tata Power Ltd. has been analysed individually. By using the GRI sustainability reporting standards for both the ‘Management Approach’ and ‘Topic-Specific Approach’ the reported facts of the companies have been presented in "Disclosed (D)" and "Not-Disclosed (N.D.)" format for the selected years.

Table 3: Disclosure of Management Approach of NTPC Ltd.(GRI 103)

GRI Standards	Reporting Requirements	Facts Reported	
		2019-20	2020-21
103-1 Explanation of the Material Topic and Its Boundary	(i) An Explanation of why water is material	D	D
	(ii) The boundary for the material topic	D	D
	(iii) Specific limitation regarding the topic boundary (if any)	N.D.	N.D.
103-2 The Management Approach and Its Components	(i) An explanation of how the organization manages water as a material topic	D	D
	(ii) A statement of the purpose of the management approach	D	D
	(iii) A description of the policies relating to the material topic	D	D
103-3 Evaluation of the Management Approach	(i) An explanation of how the organization evaluates the management approach, including:	D	D

Source: Authors’ compilation from the Annual Report based on GRI Standard 103

Table 4: Disclosure of Management Approach of Tata Power Ltd.(GRI 103)

GRI Standards	Reporting Requirements	Facts Reported	
		2019-20	2020-21
103-1 Explanation of the Material Topic and Its Boundary	(i) An Explanation of why water is material	D	D
	(ii) The boundary for the material topic	D	D
	(iii) Specific limitation regarding the topic boundary (if any)	N.D.	N.D.
103-2 The Management Approach and Its Components	(i) An explanation of how the organization manages water as a material topic	D	D
	(ii) A statement of the purpose of the management approach	D	D
	(iii) A description of the policies relating to the material topic	D	D
103-3 Evaluation of the Management Approach	(i) An explanation of how the organization evaluates the management approach, including:	D	D

Source: Authors' compilation from the Annual Report based on GRI Standard 103

Tables 3 and 4 clearly portray the degree to which NTPC Ltd. and Tata Power Ltd. have been adopting GRI 103 on "Management Approach". It reveals that the companies disclosed information behind the selection of water as a material topic that has an impact on the environment. Again, both the companies have also disclosed other necessary requirements.

Table 5: Management Approach Disclosure on Water and Effluents by NTPC Ltd.

GRI Standards	Reporting Requirements	Facts Reported	
		2019-20	2020-21
303-1 Interactions with water as a shared resource	(i) How and where water has been withdrawn, consumed, and discharged	N.D.	N.D.
	(ii) A description of the approach used to identify water-related impacts	D	D
	(iii) A description of how water-related impacts are addressed	D	D
	(iv) An explanation of the process for setting any water-related goals and targets	D	D
303-2 Management of Water Discharge- Related Impacts	(i) A description of any minimum standards set for the quality of effluents discharged, and how these minimum standards were determined	D	D

Source: Authors' compilation from the Annual Report based on GRI Standard303 (1 & 2)

Table 6: Management Approach Disclosure on Water and Effluents by Tata Power Ltd.

GRI Standards	Reporting Requirements	Facts Reported	
		2019-20	2020-21
303-1 Interactions with water as a shared resource	(i) How and where water has been withdrawn, consumed, and discharged	D	D
	(ii) A description of the approach used to identify water-related impacts	D	D
	(iii) A description of how water-related impacts are addressed	D	D
	(iv) An explanation of the process for setting any water-related goals and targets	D	D
303-2 Management of Water Discharge- Related Impacts	(i) A description of any minimum standards set for the quality of effluents discharged, and how these minimum standards were determined	D	D

Source: Authors' compilation from the Annual Report based on GRI Standard 303 (1 & 2)

The above two tables have shown the 'Management Approach Disclosure' after selecting water as a material topic that has a major impact in the value creation process of the companies.

Table 7: Water-Specific Disclosure Pattern of NTPC Ltd.

GRI Standards	Reporting Requirements	Facts Reported	
		2019-20	2020-21
303-3 Water Withdrawal	(i) Total water withdrawal from all areas	D	D
	(ii) Total water withdrawal from all areas with water stress	N.D.	N.D.
	(iii) A breakdown of total water withdrawal from each of the sources mentioned in 303-3 (i) and 303-3 (ii).	N.D.	N.D.
	(iv) Any contextual information needed to understand how the data have been compiled	D	D
303-4 Water Discharge	(i) Total water discharged to all areas	D	D
	(ii) A breakdown of total water discharge to all areas.	N.D.	N.D.
	(iii) Total water discharge to all areas with water stress and a breakdown.	N.D.	N.D.
	(iv) Any contextual information necessary to understand how the data have been compiled	D	D
303-5 Water Consumption	(i) Total water consumption from all areas	D	D
	(ii) Total water consumption from all areas with water stress	N.D.	N.D.

	(iii) Change in water storage	N.D.	N.D.
	(iv) Any contextual information necessary to understand how the data have been compiled	D	D

Source: Authors' compilation from the Annual Report based on GRI Standard 303 (3, 4 &5)

Table 8: Water-Specific Disclosure Pattern of Tata Power Ltd.

GRI Standards	Reporting Requirements	Facts Reported	
		2019-20	2020-21
303-3 Water Withdrawal	(i) Total water withdrawal from all areas	D	D
	(ii) Total water withdrawal from all areas with water stress	N.D.	D
	(iii) A breakdown of total water withdrawal from each of the sources mentioned in 303-3 (i) and 303-3 (ii).	N.D.	D
	(iv) Any contextual information needed to understand how the data have been compiled	N.D.	N.D.
303-4 Water Discharge	(i) Total water discharged to all areas	D	D
	(ii) A breakdown of total water discharge to all areas.	N.D.	D
	(iii) Total water discharge to all areas with water stress and a breakdown.	N.D.	N.D.
	(iv) Any contextual information necessary to understand how the data have been compiled	N.D.	N.D.
303-5 Water Consumption	(i) Total water consumption from all areas	D	D
	(ii) Total water consumption from all areas with water stress	N.D.	N.D.
	(iii) Change in water storage	N.D.	N.D.
	(iv) Any contextual information necessary to understand how the data have been compiled	N.D.	N.D.

Source: Authors' compilation from the Annual Report based on GRI Standard 303 (3, 4 & 5)

Tables 7 and 8 summarised the disclosure and non-disclosure of necessary information relating to water-specific activities (withdrawal, consumption, and discharge) from all areas, including water stress areas, as enshrined in GRI standards.

Comparative Analysis:

In this part, two companies have been compared in terms of their reporting patterns on sustainable water management practices. The comparison has been done using a side-by-side approach to better understand the differences in reporting. If a company disclosed any reporting requirements, then a right tick (✓) has been plotted, and if they were not disclosed, then a cross mark (X) is assigned.

Table 9: Comparison of Management Approach Disclosure

GRI Standards	Sub-Requirement	NTPC Ltd.		Tata Power Ltd.	
		2019-2020	2020-2021	2019-2020	2020-2021
103-1	(i)	✓	✓	✓	✓
	(ii)	✓	✓	✓	✓
	(iii)	X	X	X	X
103-2	(i)	✓	✓	✓	✓

	(ii)	✓	✓	✓	✓
	(iii)	✓	✓	✓	✓
103-3	(i)	✓	✓	✓	✓

Source: Authors' compilation

From table 9, it can be seen that both the companies have reported almost all the required information in an identical way. Only one optional requirement was missing from both companies' reporting.

Table 10: Comparison on Management Approach Disclosure under Water & Effluents

GRI Standards	Reporting Requirements	NTPC Ltd.		Tata Power Ltd.	
		2019-2020	2020-2021	2019-2020	2020-2021
303-1	(i)	X	X	✓	✓
	(ii)	✓	✓	✓	✓
	(iii)	✓	✓	✓	✓
	(iv)	✓	✓	✓	✓
303-2	(i)	✓	✓	✓	✓

Source: Authors' compilation

The above table indicates that Tata Power Ltd. reported all the required information in both the year under consideration whereas NTPC Ltd. failed to report one of the requirements.

Table 11: Comparison on Water-Specific Disclosure

GRI Standards	Reporting Requirements	NTPC Ltd.		Tata Power Ltd.	
		2019-2020	2020-2021	2019-2020	2020-2021
303-3	(i)	✓	✓	✓	✓
	(ii)	X	X	X	✓
	(iii)	X	X	X	✓
	(iv)	✓	✓	X	X
303-4	(i)	✓	✓	✓	✓
	(ii)	X	X	X	✓
	(iii)	X	X	X	X
	(iv)	✓	✓	X	X
303-5	(i)	✓	✓	✓	✓
	(ii)	X	X	X	X
	(iii)	X	X	X	X
	(iv)	✓	✓	X	X

Source: Authors' compilation

Lastly, Table 11 compares the reporting patterns of the requirements specified for water-related activities by the companies. Comparing the facts reported by NTPC Ltd. and Tata Power Ltd., it can be stated that NTPC Ltd. fulfilled a larger number of requirements as

compared to Tata Power Ltd. in both years. The reporting pattern of NTPC Ltd. in both years was similar. In contrast, Tata Power Ltd. fulfilled only 3 reporting requirements out of a total of 12 requirements in the year 2019–20. Although the compliance level increased in the next year, resulting in an improvement in reporting quality on water-related activities in 2020–21.

The Outcomes of the above Analysis have been Summarised as Given below:

Taking GRI 103 as a guide to reporting the management approach before selecting any material topic, it is clear that both NTPC Ltd. and TPL have reported the necessary requirements almost in an identical way. Out of a total of seven reporting requirements (including one optional requirement), they have complied with six of them. It indicates a high degree of seriousness on the part of the selected companies in complying with management approach requirements in the recent period.

Considering GRI 303 Part I, for illustrating management approach disclosure after pointing out water as a material topic, both TPLs disclosed all the pertinent requirements as demanded by the framework. But NTPC Ltd. failed to disclose one of the five reporting requirements related to the proper utilization of natural resources.

At the time of reporting water-specific information to the integrated report, NTPC Ltd. won the race. Following the GRI 303 standard, Part II, as an instructor for voluntarily portraying the topic-specific disclosure, TPL has communicated only 3 and 5 requirements in the years 2019–20 and 2020–21, respectively, out of the total 12 reporting requirements laid down in Part II. On the other hand, NTPC Ltd. disclosed 6 out of 12 reporting requirements in both years.

Conclusion

The analysis revealed that, as a public sector undertaking, NTPC Ltd. performed well in disclosing water-specific activities as compared to Tata Power Ltd. But TPL outperforms NTPC in regard to disclosure of water management activities.

Corporate citizens, especially those who are in the power generation sector, need to understand the ever-increasing importance of sustainable use of water as a resource not only to maintain their regular operations but also to contribute positively towards the realization of UNO’s Sustainable Development Goals (SDGs), more particularly SDG 6. Prima facie, the disclosure levels of both the selected companies (NTPC and TPL) are found to be almost identical. But an in-depth analysis revealed that Tata Power Ltd. reported the management-related facts more vigorously as compared to NTPC Ltd. On the other hand, NTPC was found to comply with almost all the requirements falling under water-specific disclosure when compared with TPL for the period under consideration.

In short, it can be said that the companies have voluntarily disclosed their water management practices by following GRI standards to a large extent. But there remains some scope for improvement. And with SEBI’s latest initiative to make the Business Responsibility and

Sustainability Report (BRSR) mandatory for all the listed Indian companies from 2022–2023, the situation is expected to improve a lot. But even during the voluntary regime, the selected power sector companies have shown a high degree of seriousness and integrity in disclosing relevant facts about the sustainable use of water as a resource, at least in the last two years of the voluntary regime loop.

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End Notes

GRI (Global Reporting Initiative), an independent, international organization which assist the business world to take responsibility for their impacts, by serving them with a global common medium to communicate those impacts towards the stakeholders (https://www.globalreporting.org/about-gri/).

SASB Standards acts as a guide to disclose the financially material sustainability information by companies to their stakeholders. It has 77 industry specific standards categorised into environmental, social, and governance issues that are pertinent for financial performance for each industry (https://www.sasb.org/about/).

The United Nations Sustainable Development Goals are a sustainable programme for all nations, affluent or poor, middle-income or developing, to take action in order to improve well-being through preserving the planet (https://www.un.org/sustainabledevelopment/).

Responsible Business Ranking published by the consultancy firm Futures cape. On the basis of some parameters the ranking has been assigned to the companies, such as, how much money businesses spend on CSR, how well they perform in terms of the responsibility matrix, how well they perform in terms of environmental, social, and governance (ESG) factors, and how well they integrate Sustainable Development Goals (SDGs) into their ethical business practices (https://www.futurescape.in/responsible-business-rankings/).

NTPC Ltd is a listed Indian power generating company indexed in Nifty50. Tata Power Ltd. is also a good representative of the Indian stock market as it is a part of the BSE 100 and the Nifty Mid-cap 100 (https://www.nseindia.com/, https://www.bseindia.com/).

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Customer's Satisfaction Towards Sustainable Banking Services of Public Sector Banks in India: A Study on SBI in the District of Hooghly, West Bengal

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ABSTRACT

The banking industry is one of the most important pillars in the Indian financial system for the sustainable progress and improvement of the Indian economy. The banking industry is a direct, customer-oriented service industry. After the induction of reforms in the financial sector of India in 1991, customer satisfaction with the banking products and services offered by the bankers in India has become the key factor for all types of banking business. Finally, customer service has turned into a differentiating factor for bankers' profitability, prospects, and sustainability. So, to survive and sustain in the globalized and competitive market, Indian public sector banks should have to satisfy their customers by offering newer and more innovative banking products and services as offered by the private sector and foreign banks to retain existing customers as well as attract prospective clients. The current research work attempts to analyze the satisfaction level of customers with sustainable financial services offered by the State Bank of India (SBI) in the Hooghly district of West Bengal. The study reveals that the customer's satisfaction level has an association with demographic aspects like gender, age, education, occupation, and annual income level.

Keywords: *Indian Financial System; Banking Industry; Indian Economy; Public Sector Banks; Customer Satisfaction*

Introduction

The Indian banking system plays a significant role in the sustainable economic improvement and growth of the country. It has been broadly classified into commercial banks (public sector banks, private sector banks, foreign banks, and regional rural banks), small finance banks, payments banks, and cooperative banks. The Reserve Bank of India regulates their functions. Before financial sector reforms, public-sector banks dominated the financial sector. The focus of the bankers then was to earn profit rather than the satisfaction level of customers with their services. As a result of financial sector reforms in 1991, public sector banks started to lose their shares in the banking market to private banks and foreign banks. The system has witnessed a paradigm shift in the focus of the banking sector towards customer satisfaction. Banking profitability and sustainability depend on how the banks are effectively mobilizing and utilizing funds and how they are satisfying the desires and wants of their customers. So, to stay alive and sustain themselves in the globalized and

competitive market, Indian public sector banks have started to induce newer and more innovative banking products and services, as induced by the private sector and foreign banks. The aim was to keep existing customers and attract prospective clients as well. The present study endeavors to analyze the satisfaction level of customers with sustainable banking services offered by the SBI in the district of Hooghly.

Problem Statement

Since the reforms in the financial sector in India in 1991, the public sector, private sector, and foreign banks have been serving bank customers in the Indian financial system simultaneously. Over time, public sector banks have started to face huge competition from the private sector and foreign banks, which has resulted in a reduction in clientele. Customer orientation should be the main focus of the public sector banks' efforts to stay alive in this aggressive world. Public-sector banks will have to induce newer and more innovative financial products and services for their customers now and then, as will private sector and foreign banks. It may help the public sector banks keep the subsist customers and incline prospective clients as well.

Literature Review

Numerous research studies have been done by many researchers and academicians on diverse perspectives of the customer satisfaction level with the various services provided by the Indian public sector banks over time. Some of those are highlighted below.

Saxena and Jindal (2019) analyzed the satisfaction level of customers with banking services in the district of Nainital. He revealed that the satisfaction level of customers is around 73.80% based on the analysis of the field-surveyed primary data.

Sugavaneswari and Rajan (2018) measured the satisfaction level of customers with various banking services and also analysed various types of services offered by the private sector as well as public sector banks in the Chennai district. They established that banks are able to opt for modern information technology to modify the technique of providing services to attract more customers and boost their level of satisfaction.

Mohan (2017) aimed to evaluate the worth of the services of the bank and their impression on the satisfaction level of customers. He also examined the connection between a customer’s loyalty and their satisfaction level. The study revealed that the improving people factor and modern banking services have prime importance in attracting banking customers.

Vanitha and Velmurugan (2015) attempted to identify the determinants of clients’ pleasure. dwelling area, sex, knowledge, quality, ability, skill, family proceeds, account occupying period, and sensation of service proficiency have been disclosed as the determinates of the satisfaction level of customers.

Rabb (2015) evaluated different aspects like the behavior of bank employees, available services of the bank, execution of the bank, infrastructure proficiency, credit related facilities, and additional significant services of the SBI in the Kanyakumari district that establish the satisfaction level of customers. The outcome of the study is that there is a noteworthy association between the various banking services offered by the SBI and the customer satisfaction variables. The study also found that there is a moderate level of satisfaction among the customers.

Research Gap

From the above literature reviews, it has been found that no such influential research work has been conducted on the satisfaction level of customers with the sustainable banking services of SBI in the district of Hooghly, West Bengal. The present study has tried to emphasize this untouched area.

Research Objective

The research objective of the present work is to overview and analyse the level of customer satisfaction with sustainable banking services offered by the public sector banks in India, especially the State Bank of India (SBI) in the district of Hooghly, West Bengal.

Methodology

1. Database: The study is analytical in nature. It is basically based on primary data that has been composed from ground-level investigations by interviewing respondents with the help of a controlled questionnaire. Some secondary data has also been used in the study. These are collected from various research-based articles, journals, and papers published by various academicians and researchers over time in India. The present study has been conducted on the SBI in the district of Hooghly, West Bengal. There are a total of 47 SBI branches in the Hooghly district. Randomly, 10 branches have been visited, and the questionnaires have been circulated among the banking customers of those branches of SBI. The convenient sampling technique has been applied to select and interview the customers with the structured, closed-ended questionnaire from February to July 2022. Finally, 250 banking customers have responded to the questionnaire.

2. Methods: The questionnaire has two parts: the first part consists of six demographic questions, and the second part consists of sixteen technical questions relating to banking services. The questions relating to banking services have been designed using a five-point Likert scale. The score, ranging from 5 to 1, has been assigned to the questions. It goes like this: ‘5’ for ‘highly satisfied’, ‘4’ for ‘satisfied’, ‘3’ for ‘neutral’, ‘2’ for ‘dissatisfied’, and '1’ for ‘highly dissatisfied'. So, the maximum score a customer would get is 80. The scores obtained by each bank customer have been divided by 80 and multiplied by 100 to form an index. It has been named the "Customer Satisfaction Index". On the basis of this index of satisfaction, surveyed respondents are grouped into three categories: customers with a high satisfaction level, customers with a moderate satisfaction level, and customers with a low

satisfaction level. To divide the three types of customer categories, quartiles have been applied. As a result, customers with a satisfaction index ranging from 61.26 and above are named high satisfaction level customers; those with an index value between 46.26 and 61.25 are named moderate satisfaction level customers; and those with an index value up to 46.25 are named low satisfaction level customers. Out of 250 surveyed customers, 120 (48%) have a high satisfaction level; 60 (24%) have a moderate satisfaction level, and the remaining 70 (28%) have a low satisfaction level. Frequency tables, percentages, and statistical tools like the chi-square test are applied for analysing primary data collected from the field survey to accomplish the objective of the study and draw a logical conclusion. The Cronbach's alpha test has been used to measure the inner uniformity of the questionnaire. The test result is 0.962. Usually, a reliability coefficient above 0.60 is considered sufficient for the reliability and consistency of the questionnaire in social science research. So, the measures taken in this research work based on the questionnaire are reliable and suitable. The data are processed and analysed with the aid of MS Excel and a statistical package (SPSS-20.0 version).

3. Hypothesis: Five flocks of inferences are formed to achieve the research objective. They are shown below:

1. H_o: The gender of customers and their level of satisfaction with the overall banking services offered by SBI have no relationship.
2. H_o: The age of customers and their level of satisfaction with the overall banking services offered by SBI have no association.
3. H_o: There is no connection between the education of customers and their level of satisfaction with the overall banking services offered by SBI.
4. H_o: There is no association between occupation and their level of satisfaction with the overall banking services offered by SBI.
5. H_o: The annual income level of customers and their level of satisfaction with the overall banking services offered by SBI have no relationship.

Results and Discussion

The data collected from the field survey through the questionnaire have been analyzed below:

Table 1: Determinants of Satisfaction Level of Customers towards Sustainable Banking Services Provided by SBI in Hooghly district, West Bengal

Variables		Customer Satisfaction Level					
		Low [70 (28%)]		Moderate [60 (24%)]		High [120 (48%)]	
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Sex	Male	70	100.00	30	50.00	70	58.33
	Female	0	0.00	30	50.00	50	41.67
	Total	**70**	**100.00**	**60**	**100.00**	**120**	**100.00**

Age	20 Yrs & Below	40	57.14	30	50.00	40	33.33
	21 Yrs-40 Yrs	10	14.29	30	50.00	60	50.00
	41 Yrs-60 Yrs	20	28.57	0	0.00	20	16.67
	61Yrs & Above	0	0.00	0	0.00	0	0.00
	Total	**70**	**100.00**	**60**	**100.00**	**120**	**100.00**
Education	Primary	0	0.00	0	0.00	0	0.00
	MP	10	14.29	0	0.00	0	0.00
	HS	10	14.29	10	16.67	10	8.33
	UG	20	28.57	50	83.33	60	50.00
	PG	30	42.86	0	0.00	30	25.00
	Others	0	0.00	0	0.00	20	16.67
	Total	**70**	**100.00**	**60**	**100.00**	**120**	**100.00**
Occupation	Employed	30	42.86	0	0.00	50	41.67
	Unemployed	40	57.14	60	100.00	70	58.33
	Total	**70**	**100.00**	**60**	**100.00**	**120**	**100.00**
Annual Income Level	Below Rs. 200000	40	57.14	60	100.00	80	66.67
	Rs. 200001-500000	20	28.57	0	0.00	10	8.33
	Rs. 500001-1000000	10	14.29	0	0.00	30	25.00
	Above Rs. 1000000	0	0.00	0	0.00	0	0.00
	Total	**70**	**100.00**	**60**	**100.00**	**120**	**100.00**
Satisfaction Level on the Overall Banking Services Offered by SBI	Highly Dissatisfied	50	71.43	0	0.00	10	8.33
	Dissatisfied	20	28.57	10	16.67	0	0.00
	Neutral	0	0.00	30	50.00	20	16.67
	Satisfied	0	0.00	20	33.33	80	66.67
	Highly Satisfied	0	0.00	0	0.00	10	8.33
	Total	**70**	**100.00**	**60**	**100.00**	**120**	**100.00**

Source: Field Survey

Review: From the above table 1, it is seen that out of low satisfaction level customers, male respondents are 100%, respondents in the age group of 20 years or below are 57.14%, 42.86% of respondents are post-graduates, 57.14% of respondents are unemployed, 57.14% of respondents have an annual income level below Rs. 200000, and 71.43% of respondents are extremely dissatisfied with the overall banking services provided by the SBI. This has also been found that out of moderate satisfaction level customers, female or male respondents are 50%, respondents in the age group of 20 years or below are 50%, graduate respondents are 83.33%, unemployed respondents are 100%, respondents having an annual income level below Rs. 200000 are 100%, and 50% of respondents are neutral with the overall banking services offered by the SBI. It has also been seen that out of high-satisfaction customers, male respondents are 58.33%, respondents in the age group of 20 years or below are 33.33%, graduate respondents are 50%, unemployed respondents are 58.33%, 66.67% of respondents have an annual income level below Rs. 200000, and 66.67% of respondents are pleased with the overall banking services offered by SBI.

1. Test of Chi-Square:

The chi-square test is used to check the assumption that two categorical variables are independent of each other or not associated with each other.

1.1. Hypthesis-1

H_o: The gender of customers and their level of satisfaction with the overall banking services offered by SBI have no relationship.

H_1: The gender of customers and their level of satisfaction with the overall banking services offered by SBI have a relationship.

Table 2: Cross Tabulation between Gender and Satisfaction Level on the Overall Banking Services Offered by SBI

			Satisfaction Level on the Overall Banking Services Offered by SBI					Total
			Highly Dissatisfied	Dissatisfied	Neutral	Satisfied	Highly Satisfied	
Gender	Male	Number	60	30	10	60	10	170
		% of Total	24.0%	12.0%	4.0%	24.0%	4.0%	68.0%
	Female	Number	0	0	40	40	0	80
		% of Total	0.0%	0.0%	16.0%	16.0%	0.0%	32.0%
Total		Number	60	30	50	100	10	250
		% of Total	24.0%	12.0%	20.0%	40.0%	4.0%	100.0%

Source: Field Survey

Table 3: Chi-Square Test

Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	102.941	4	0.000
Likelihood Ratio	128.792	4	0.000
Linear-by-Linear Association	27.708	1	0.000
No of Valid Cases	250		

Source: Field Survey

Explanation: The *P*-value of the above test is 0.000, which is significant at the 1% level of significance under the Pearson Chi-Square. So, the alternative hypothesis has been accepted, and the null hypothesis has been rejected. Finally, the concluding remark is that the gender of customers and their level of satisfaction with the overall banking services offered by SBI have a relationship.

1.2. Hypthesis-2

H_o: The age of customers and their level of satisfaction with the overall banking services offered by SBI have no association.

H_1: The age of customers and their level of satisfaction with the overall banking services offered by SBI have an association.

Table 4: Cross Tabulation between Age and Satisfaction Level on the Overall Banking Services Offered by SBI

			Satisfaction Level on the Overall Banking Services Offered by SBI					Total
			Highly Dissatisfied	Dissatisfied	Neutral	Satisfied	Highly Satisfied	
Age	20 Yrs & Below	Number	20	30	20	30	10	110
		% of Total	8.0%	12.0%	8.0%	12.0%	4.0%	44.0%
	21 Yrs-40Yrs	Number	20	0	30	50	0	100
		% of Total	8.0%	0.0%	12.0%	20.0%	0.0%	40.0%
	41Yrs-60Yrs	Number	20	0	0	20	0	40
		% of Total	8.0%	0.0%	0.0%	8.0%	0.0%	16.0%
Total		Number	60	30	50	100	10	250
		% of Total	24.0%	12.0%	20.0%	40.0%	4.0%	100.0%

Source: Field Survey

Table 5: Chi-Square Tests

Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	85.53	8	0.000
Likelihood Ratio	105.415	8	0.000
Linear-by-Linear Association	0.332	1	0.565
No of Valid Cases	250		

Source: Field Survey

Explanation: The *P*-value of the above test is 0.000, which is significant at the 1% level of significance under the Pearson Chi-Square. So, the alternative hypothesis has been accepted, and the null hypothesis has been rejected. Finally, the concluding remark is that the age of customers and their level of satisfaction on the overall banking services offered by SBI have an association.

1.3. Hypthesis-3

H_o: There is no connection between the education of customers and their level of satisfaction with the overall banking services offered by SBI.

H_1: There is a connection between the education of customers and their level of satisfaction with the overall banking services offered by SBI.

Table 6: Cross Tabulation between Education and Satisfaction Level on the Overall Banking Services Offered by SBI

			Satisfaction Level on the Overall Banking Services Offered by SBI					Total
			Highly Dissatisfied	Dissatisfied	Neutral	Satisfied	Highly Satisfied	
Education	MP	Number	10	0	0	0	0	10
		% of Total	4.0%	0.0%	0.0%	0.0%	0.0%	4.0%
	HS	Number	10	0	0	20	0	30
		% of Total	4.0%	0.0%	0.0%	8.0%	0.0%	12.0%
	UG	Number	10	30	40	40	10	130
		% of Total	4.0%	12.0%	16.0%	16.0%	4.0%	52.0%
	PG	Number	30	0	0	30	0	60
		% of Total	12.0%	0.0%	0.0%	12.0%	0.0%	24.0%
	Others	Number	0	0	10	10	0	20
		% of Total	0.0%	0.0%	4.0%	4.0%	0.0%	8.0%
Total		Number	60	30	50	100	10	250
		% of Total	24.0%	12.0%	20.0%	40.0%	4.0%	100.0%

Source: Compiled by Researcher

Table 7: Chi-Square Tests

Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	148.825	16	0.000
Likelihood Ratio	178.792	16	0.000
Linear-by-Linear Association	3.970	1	0.046
No of Valid Cases	250		

Source: Compiled by Researcher

Explanation: The *P*-value of the above test is 0.000, which is significant at the 1% level of significance under the Pearson Chi-Square. So, the alternative hypothesis has been accepted, and the null hypothesis has been rejected. Finally, the concluding remark is that the education of customers and their level of satisfaction with the overall banking services offered by SBI have a connection.

1.4. Hypthesis-4

H_o: There is no association between occupation and their level of satisfaction with the overall banking services offered by SBI.

H_1: There is an association between occupation and their level of satisfaction with the overall banking services offered by SBI.

Table 8: Cross Tabulation between Occupation and Satisfaction Level on the Overall Banking Services Offered by SBI

			Satisfaction Level on the Overall Banking Services Offered by SBI					Total
			Highly Dissatisfied	Dissatisfied	Neutral	Satisfied	Highly Satisfied	
Occupation	Employed	Number	30	0	10	30	10	80
		% of Total	12.0%	0.0%	4.0%	12.0%	4.0%	32.0%
	Unemployed	Number	30	30	40	70	0	170
		% of Total	12.0%	12.0%	16.0%	28.0%	0.0%	68.0%
Total		Number	60	30	50	100	10	250
		% of Total	24.0%	12.0%	20.0%	40.0%	4.0%	100.0%

Source: Field Survey

Table 9: Chi-Square Tests

Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	47.794	4	0.000
Likelihood Ratio	58.044	4	0.000
Linear-by-Linear Association	0.002	1	0.966
No of Valid Cases	250		

Source: Field Survey

Explanation: The *P*-value of the above test is 0.000, which is significant at the 1% level of significance under the Pearson Chi-Square. So, the alternative hypothesis has been accepted, and the null hypothesis has been rejected. Finally, the concluding remark is that the occupation of customers and their level of satisfaction with the overall banking services offered by SBI have an association.

Hypthesis-5

H_o: The annual income level of customers and their level of satisfaction with the overall banking services offered by SBI have no relationship.

H_1: The annual income level of customers and their level of satisfaction with the overall banking services offered by SBI have a relationship.

Table 10: Cross Tabulation between Annual Income Level and Satisfaction Level on the Overall Banking Services Offered by SBI

			Satisfaction Level on the Overall Banking Services Offered by SBI					
			Highly Dissatisfied	Dissatisfied	Neutral	Satisfied	Highly Satisfied	Total
Annual Income Level	Below Rs.200000	Number	30	30	40	70	10	180
		% of Total	12.0%	12.0%	16.0%	28.0%	4.0%	72.0%
	Rs.200001-500000	Number	20	0	0	10	0	30
		% of Total	8.0%	0.0%	0.0%	4.0%	0.0%	12.0%
	Rs.500001-1000000	Number	10	0	10	20	0	40
		% of Total	4.0%	0.0%	4.0%	8.0%	0.0%	16.0%
Total		Number	60	30	50	100	10	250
		% of Total	24.0%	12.0%	20.0%	40.0%	4.0%	100.0%

Source: Field Survey

Table 11: Chi-Square Tests

Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	50.694	8	0.000
Likelihood Ratio	60.311	8	0.000
Linear-by-Linear Association	1.221	1	0.269
No of Valid Cases	250		

Source: Field Survey

Explanation: The *P*-value of the above test is 0.000, which is significant at the 1% level of significance under the Pearson Chi-Square. So, the alternative hypothesis has been accepted, and the null hypothesis has been rejected. Finally, the concluding remark is that the annual income level of customers and their level of satisfaction with the overall banking services offered by SBI have a relationship.

Findings

From the above data analysis, some important findings have been established. These are expressed below.

1. The gender of customers and their level of satisfaction with the overall banking services offered by SBI have a relationship.
2. The age of customers and their level of satisfaction with the overall banking services offered by SBI have an association.
3. There is a connection between the education of customers and their level of satisfaction with the overall banking services offered by SBI.

4. There is an association between their occupation and their level of satisfaction with the overall banking services offered by SBI.
5. The annual income level of customers and their level of satisfaction with the overall banking services offered by SBI have a relationship.

Suggestions

From the above study, some suggestions can be given for improving customer satisfaction at a much higher level. These are as follows:

1. The banking staff should be more helpful to customers.
2. Customer relationship management should be given more importance.
3. The service quality should be improved to increase customer satisfaction levels.
4. Customers should be made aware of all kinds of banking services. It can be done effectively through proper and increased advertising by banks.
5. Banks should organise workshops to educate customers about the process of adopting modern technology in banking services.

Conclusion

In the present competitive market, clients' satisfaction is the key and most prioritised factor for any industry's long-term survival and sustainability. The banking industry is no exception. The public sector banks in India must adopt more modern technologies to change the way they provide services to their customers. It would enhance the customers' level of satisfaction. The present study reveals that the satisfaction level of customers with the sustainable bank services of SBI has an association with the customer's demographic aspects like gender, age, education, occupation, and annual income level. The public sector banks must make essential policy measures for enhancing clients' level of pleasure towards sustainable banking services at the cent percent level by introducing newer banking services as given by the private sector banks and foreign banks in India. The ideal working environment should be nurtured properly in the public sector banks so that they can effectively survive and sustain themselves in the current globalized and competitive financial market with higher and sustainable profitability in comparison to the private sector and foreign banks in India.

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Blue Economy: A Sustainable Development Paradigm

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ABSTRACT

The ocean's womb carries treasures of resources that sustain trillions of livelihoods. The ocean envelops nearly 71% of the earth's surface. The blue economy has huge potential for diversification, enhancing the economies of coastal countries. The study aims to identify the role of the blue economy in achieving sustainability in India's context. India has the seventh longest coastline in Asia, which measures about 8118 kilometres, and exclusive economic zones of 2.3 million km can be the catalyst for growth through the Blue economy. Blue economy aims to harness the ocean's resources for sustainable development to meet growing demand. The paper studies ocean resources like Fisheries and Aquaculture, Minerals, Hydrocarbons and renewable energy. The study found that ocean resources significantly contribute to the country's economy and have tremendous economic growth prospects.

Keywords: *Blue Economy; Ocean; Resources; Sustainability*

Introduction

The ocean is quintessentially a 'common pool of resources' (Ostrom *et al.,* 1994). The ocean's womb carries treasures of resources providing both renewable and non-renewable resources that support trillions of livelihoods. The ocean covers nearly 71% of the earth's surface and contains 97% of the earth's water. It is the source of 50% of the oxygen available and absorbs 25% of humankind's Carbon dioxide (CO2). It also absorbs 90% of heat emitted from greenhouse gases. Ocean resources are food, transportation, livelihood, and extractive resources like minerals, hydrocarbons- oil, gas, and other rare earth elements. Other resources include energy from wind, tidal, thermal and biomass. In recent past the pace of industrialization and exploitation of the ocean has evidenced growth worldwide. (McCauley *et al.,* 2015). The current scenario of vigorous resource exploitation and the increasing pollution rate has a detrimental effect on the dynamic ocean ecosystem. Efficient use of ocean resources can ensure social, environmental, and food security by enhancing the livelihood of coastal communities, reducing environmental degradation and alleviating poverty and hunger.

Blue Economy

Professor Gunter Pauli first propounded the idea of a "Blue economy" in his book "The Blue Economy: 10 Years, 100 Innovations and 100 Million Jobs", submitted to the 'club of Rome'

in 2009. It reflected the need for sustainable future growth and prosperity, along with the threats posed by global warming. The core objective behind this economic philosophy is the development of sustainable models for the marine ecosystem. The idea of the Blue economy took centre stage during the United Nations (UN) Conference held to discuss Sustainable Development, also known as the Rio+20 (Agarwala, 2022).

The United Nations' Sustainable Development Goals for the Ocean (SDG 14) are a universally ordained directive for the conservation and sustainability of resources in water bodies. Its motto is to conserve, protect, and sustainably use these resources for sustainable development. It recognizes the ocean's role in future economic, social and ecological development. It also focuses on small island states' progress and promotes small-scale fishermen. According to SDG 14, about 40% of the ocean is affected by human activity. The Blue economy is in line with the UN's SDG-14. Under Blue, the Economy Ocean is a 'developmental space' committed to preserving, conserving, restoring and sustaining activities like resource extraction, energy generation, bio-prospecting and marine transport (UNEP, 2012). It is essential to develop a balance between economic development and environmental development. The aim of the Blue economy is to harness marine resources for sustainable development to meet growing demand.

Blue Economy : Key Definitions

The Blue economy is a broader conception that identifies the ocean not just for economic development but also for environmental and social development. It comprises aspects of ocean governance, economic development, environmental conservation and protection. UNEP, 2012 stated the Blue economy is a means to tackle climate change by promoting low-carbon emissions, focusing on the energy-efficient shipping and marine renewable energy industries. It also focuses on sustainable marine tourism.

The Indian Ocean Rim Association (IORA) is a regional governance organization that strongly advocates for the Blue Economy's cooperation and governance to preserve the ocean's resources for future generations. According to IORA, "Blue Economy will contribute towards food security, poverty alleviation, the mitigation of and resilience to the impact of climate change, enhanced trade and investment, enhanced maritime connectivity, enhanced diversification, job creation and socio-economic growth".

According to the World Bank, "Blue economy aims for sustainable utilization of resources found in oceans for economic growth, improved livelihood, creation of jobs, and maintaining the health of ocean ecosystems."

The World Wildlife Fund defines the "Blue economy as a marine-based economy that works for social and commercial benefits for present and future generations by contributing to food security, poverty eradication, livelihood enhancement, income generation, providing employment opportunity, health, security, equity, and political stability; reinstates and upkeeps the diversity, productivity, resilience, and intrinsic value of marine ecosystems - the natural capital upon which its prosperity depends; is based on clean technologies,

renewable energies and circular material flows for economic and social stability in a time span while keeping within the limits of one planet."

Literature Review

Bax *et al.* (2021) highlighted the political and environmental complexity of adopting the Blue economy. The study conducted case studies in maritime countries like New Zealand and Myanmar to demonstrate obstacles and pathways in moving forward from the Business as Usual Model (BAU) to the Sustainable Development Goal (SDG). The study highlighted that the conflict resolution model transformed into a new form of social interaction and governance.

Lee, Noh and Khim (2020) studied the interdependence the Blue economy with United Nations' Sustainable Development Goals (UN SDG). The study demonstrated the complexity and diversity of the "Blue Economy" in connection to the UN's SDGs. The study highlighted the importance of the Blue Economy Strategy for safeguarding ocean resources. The study argued that the Blue economy is related with the UN's SDGs 14-17. The study showed that stakeholders of SDG could play crucial roles in the Blue economy SDG.

Cisneros-Montemayor *et al.* (2021) examined the extent to which worldwide ocean economies can achieve equitable and sustainable benefits. The study points out that establishing a Blue economy not just depends on the availability of resources but also on the social condition and governance capacity. The study used the fuzzy logic model to integrate equitable, viable, sustainable blue economy indicators. They found that factors such as national stability, infrastructure, and corruption affect the Blue economy implementation outcome. The study suggests that policymakers must engage researchers and stakeholders in promote-evidence-based strategy to achieve the goals of the Blue economy.

Soma *et al.* (2018) noted that the European Union has adopted a Blue growth policy to achieve sustainability and growth on the European seas. The article discusses the strategy of social innovation to achieve the goals of Blue development. The study suggests changing the behaviour of groups of actors within a network to find enhanced means of collaboration for the use and management of resources.

Silver *et al.* (2015), in their study, tracked the new terms' global environmental governance' and 'Blue economy. The study discussed the relationship between the ocean and humans in four crucial segments: the ocean as natural capital, the ocean as good business, the importance of the ocean for Small Island Development States and livelihood for small-scale fishing communities.

Kathijotes (2013) argued Blue Economy Model targets from scarcity to abundance of resources. He highlighted the importance of management decisions and investment for the well-being of the ocean. He pointed out in his study that the unsustainable use of resources can lead to the depletion of the marine environment.

National Studies

Agarwala (2022) highlighted the need for technological development in energy generation from the ocean. The study also pointed to the need for environmental impact assessment as associated technologies impact the biological elements of the environment. The study stressed the need for public-private partnerships as well as international participation to efficiently use the unexplored areas of marine renewable energy.

Ghoshal *et al.* (2019) studied the relevance of brackishwater aquaculture and its role in the blue economy. The study stated that brackishwater aquaculture has a role in increasing fish production and supporting the livelihood of the coastal community.

Modayil (2019) highlighted the growing importance of ocean resources with the depletion of territorial resources due to urbanization and the soaring population. The study pointed out the adverse effects of climate change on aquaculture and pressed the need for the ocean for resource extraction for survival and growth. The study stated that the Blue economy is an agent of change and economic growth.

Atmanand *et al. (*2018) stated that the Blue economy could catalyze the robust growth of the Indian economy. The study pointed to the requirement for technologies to protect the coast from cyclones and Tsunamis by innovating an early warning system. It also stated the need for technology for monitoring coastal ecosystems, like coral habitat monitoring.

Sarker *et al. (*2018) developed a conceptual framework for blue growth. The study stressed that to promote blue growth and achieve sustainable development goals (SDGs), a joint effort is required by all the stakeholders in the marine-based economy.

Research Gap

Blue economy is a new topic that started gaining momentum in the twenty-first century. There are many studies on the Blue economy at the international level in marine biology, marine technology, marine chemistry, geology, shipping, oceanography, etc. Also, many studies have been carried out at the national level. But there still appears to be some lacuna in understanding the scope and relevance of the Blue economy in India’s context.

Objective of the Study

- To highlight the role of the blue economy in achieving sustainability
- To understand the relevance of the blue economy for India

Methodology

The study adopts a qualitative research technique. Data is primarily from secondary sources, including various journals, books, newspapers, financial, and government reports. Besides various statistical reports available on the websites of the Ministry of earth science, Ministry of Shipping, Ministry of New and Renewable Energy, Ministry of Fisheries, Animal Husbandry and Dairying, Ministry of Petroleum and Natural Gas and Sagarmala.

Discussion

Blue Economy from India's Perspective

India is one of the mega biodiverse country, with the presence of a record 7.8% of the global species, which includes 45,500 recorded species of plants and 91,000 species of animals (MoEF, 2014). India's Marine ecosystem includes a wide range of mangroves, coral reefs, seagrasses, salt marshes, mud flats, estuaries, lagoons and unique coastal flora and fauna. India has the seventh longest coastline in Asia, which measures about 7516.6 kilometres, out of which 5423 km is in the peninsular region, and 2094 is in the Island region of Andaman and Nicobar Island and Lakshadweep Island. Nine states and four Union territories have coastlines and 1382 islands (EAC report: India's Blue Economy, 2020). The coastlines are distributed among nine states: West Bengal, Odisha, Andhra Pradesh, Tamil Nadu, Kerela, Karnataka, Gujarat, Maharashtra and Goa and four Union territories- Andaman and Nicobar Island (Bay of Bengal), Lakshadweep Island (Arabian Sea), Daman and Diu and Puducherry. Indian coastlines face the Bay of Bengal in the East, the Indian Ocean in the South and the Arabian Sea in the West. Three mega cities viz. Calcutta, Chennai, and Mumbai lie near these coastlines. Around 250 million people reside in towns and cities within 50 km of the coastline.

The coastline environment is vital in the Indian economy for connectivity, resources and biodiversity. It supports several economic activities like oil and gas extraction, establishing ports, hinterlands and harbours, functioning power plants, fishing, tourism, mining, etc.

Table 1: Length of Coasts and Fishing Villages of States and Union Territories

State	**Coastal Length (in Km)**	**Fishing Villages**
Gujarat	1600	260
Andhra Pradesh	974	555
Tamil Nadu	1070	608
Maharashtra	720	456
Kerala	590	220
Odisha	480	739
Karnataka	300	162
West Bengal	158	171
Goa	104	60
Union Territory	**Coastal Length (in Km)**	
Andaman and Nicobar Island	1912	169
Lakshadweep Island	132	10
Puducherry	45	39
Daman and Diu	27	12
Total	8118	3461

Source: Annual Report of Ministry of Fisheries, Animal Husbandry and Dairying, Period- 2021

The Indian government's vision of 'New India-2030', articulated in February 2019, recognized the Blue Economy as one of the core pillar to achieve the goal.

Ocean Resources

Fisheries and Aquaculture

Fisheries can be sub-categoried in two: Marine fisheries and inland fisheries. Fisheries have contributed Rs. 46,663 crore to the economy through exports in 2019-20. In the past decade, aquaculture production has evidenced tremendous growth. In 1950-51, fish production amounted to 0.75 MMT (million metric tonnes), and in 2019-20 it was 14.2 MMT. Out of 14.2 MMT production, Marine Fish production was 3.7 MMT, and inland fish production was 10.4 MMT (Annual Report of the Ministry of Fisheries, Animal Husbandry and Dairying, 2021). More than 14.5 million people depend on fishing activities. The national average annual consumption of fish and fish products is 7.85 kg/capita. In 2019-20 fish was consumed the most in Tripura, with 29.29 kg per capita/ year. Department of Fisheries, Government of India, had launched a flagship program called Pradhan Mantri Matsya Sampada Yojana (PMMSY) for diverse intervention in the fisheries value chain from production to consumption and everything in between. The PMMSY proposed an investment of Rs. 20,050 crores with Rs. 12,340 crores in beneficiary oriented activities and Rs. 7,710 crores towards infrastructure and regulatory framework (Annual Report of Ministry of Fisheries, Animal Husbandry and Dairying, 2021). There is fear of depletion of the natural reserve of major fish species with growing demand for consumption and increased capture due to technological advancements.

Minerals

The continental margins of India congregate an extensive variety of terrigenous, biogenous and homogenous mineral deposits (Gujar, Nath & Banerjee, 1988). Terrigenous heavy minerals like ilmenite, magnetite, monazite, zircon and rutile were reported from beaches of Indian coastal states. These minerals at beach placers are estimated to be about 630 million Tonn (MT) within a radius of 2 million km2 of the exclusive economic zone (EEZ) (Cronan, 1999). Biogenous sediments are reported from shallow offshore areas of Lacdive islands, the Gulf of Kutch, the outer shelf of Mumbai and the backwaters of Kerala. Chemogenous deposits like phosphorites are reported from the Southwestern and Western continental shelves (Gujar, Nath & Banerjee, 1988). Manganese crust is found in the Andaman Islands. Evidences have been found of reserve of Manganese, cobalt, and hydrothermal sulphides in the deep ocean in the Central Indian Ocean Basin (CIOB). The southern Indian Ocean contain a huge reserve of nickel and copper (Cronan, 1999). Also, marine gypsum is found in salt pans during the processing of common salt in the coastal region of Gujarat and Tamil Nadu. Ocean also contains huge rare earth minerals. These minerals are the crucial raw materials for manufacturing electronic chips crucial for Industries like electronics, automotive, etc.

Indian deep ocean exploration launched in October 2021 was India’s first human-crewed mission, ‘Samudrayan’ to explore at a depth of 1000 to 5500 meters to harness the resources like polymetallic manganese nodules, gas hydrates, hydrothermal sulphides and cobalt crusts.

Hydrocarbons

The sea beds are the major source of hydrocarbons. India has 26 sedimentary basins, spreading across a total area of 3.4 million square kilometres. Of the total sedimentary area, 49% of the total sedimentary area is located inland, 12% in shallow water with depths upto 400 meters and 39% in the deepwater area extending farther up to the Exclusive economic zone. There are 16 inland basins, seven located both inland and offshore and 3 completely offshore India hosts about 34 MMT of oil and 33 BCM of gas production (Directorate General of Hydrocarbons Annual report 2021). The current annual oil and natural gas consumption are about 1.3 billion barrels and 65 billion cubic meters, which is not met with the internal resources raising dependence on Imports.

Renewable Energy

Renewable energy includes energy from natural phenomena like sunlight, Onshore wind, Offshore wind, hydroelectric, tides, waves, etc. The generation of oceanic renewable energy has tremendous scope. India is working with countries like Canada, the UK, the USA, China, France, Japan and South Korea regarding the harnessing and commercialization of tidal energy. The commercialization of tidal energy has gained momentum in the past few years. The Technologies like tidal lagoons, tidal reefs, tidal fences and tidal barrages are used for tidal energy generation.

Services

India has a network of 12 major ports and 187 non-major ports. The Indian Maritime Industry plays a crucial role in the logistics sector. Approximately 95% of the country's trade by volume and 68% by value is moved through Maritime Transport (EAC report: India's Blue Economy, 2020). The Indian Maritime Sector comprises Ports, Shipping, Marine biotechnology, Shipbuilding and Ship repair and Inland Water Transport Systems. Other riparian industries, namely fishing, aquaculture, tourism, net manufacturing, and aquaculture technology, contribute to the country's economy. Other marine services include marine insurance.

Coastal tourism is seen as a vibrant segment of the Blue economy. Coastal tourism includes activities like cruise travel, boating, restaurants, scuba diving, bird watching, dolphin watching, swimming, sea angling and other activities. Tourism has certain potential as a source of income for the local community, but tourism on a large scale can have an adversative impact on the marine ecosystem.

Sagarmala Project

The current Indian government initiated the Sagarmala Project in 2015 to endorse 'port-led development' in India. It aims to modernize the ports, facilitate port-led industrial clusters and hinterlands, and boost infrastructure to facilitate transporting goods via ports. The project strives to harness the 8100 km long coastline of the country to explore its economic potential. Under this project, a certain geographical region has been identified as Coastal Economic Zones (CEZ), which has growth potential. The government aims to raise the living standard of the people of CEZ through the Sagarmala project. The government has

identified over 600 projects entitling a corpus investment of USD 120 billion (Rs 8 lakh crore). These projects will help in the reduction of logistic costs, proposed to save upto USD 6 billion annually and create 10 million new employment opportunities and increase port capacity by 800 Million Metric Tonne per Annum (MMTPA) (PTI, 2018)

Coastal Economic zones (CEZ) are targeted for development under the Sagarmala project with an allocation of funds up to USD 150 million for each location to develop the location economically by establishing industries and townships. The Sagarmala project also aims to enhance the livelihood of the coastal communities through skill development programmes, teaching modern fishing techniques and making them aware of the sustainable use of marine resources. Additionally, various initiatives are carried out under the Sagarmala project to generate renewable energy, like 31MW of solar power generation at ports, harnessing wave and tidal energy, etc. Other initiatives include oil spillage response facilities and wastewater and water treatment utilization in the harbour (PTI, 2018).

The Ministry of Earth Science (MoES) has undertaken the Deep Ocean Mission, which aims to harness deep-oceanic resources under the Umbrella scheme of the Blue economy. The government of India has sanctioned a budget of Rs. 4077 crores for the mission in November 2021(Ministry of Earth Science, Annual Report, 2022).

India has an umbrella scheme called O-SMART, which regulates the use of oceans and marine resources for sustainable development.

Recent Initiatives are Taken by the Ministry of Earth Science (MOES) under Ocean Services, Modelling, Application, Resources and Technology (O-SMART)

Ocean observation systems maintain a fleet of Agro floats, buoys, Tsunami buoys with bottom pressure recorders, equator current moorings, Acoustic Sropller Current Profiler (ADCP) moorings, eXpendable Bath Thermograph (XBT) transects, tide gauges, Wave Rider Buoys, and Automatic Weather Stations in collaboration with INCOIS and relevant academic and research institutes.

The Indian National Centre for Ocean Information Services (NCOIS) provides flagship service advisories on the Potential Fishing Zones (PFZ) each day of the year except during the fishing ban period and adverse sea-state conditions.

The Earth System Science Data Portal (ESSDP) was launched on July 27, 2021. The OMNI-RAMA Indian Ocean DATA Portal was launched on August 9, 2021. The ESSDP hosts metadata records for different programs implemented by MoES. ESSDP aims to serve the needs for data discovery of various users, including industries, research institutions, operational agencies, the academic community, strategic users, policymakers and the public.

Two pilot projects for an underwater mining system was successfully conducted in the central Indian ocean at 5270 m depth from March – April 2021.

Two gliders were deployed and recovered in the Bay of Bengal to monitor the deep ocean's physical and biogeochemical parameters to understand the temporal and spatial variability of the Oxygen Minimum Zone (OMZ).

A water quality buoy was deployed in July 2021 by the National Centre for Coastal Research (NCCR) in the coastal water off Puducherry with an aim to monitor the variation in the water quality and productivity of the coastal waters.

One new species of polychaete, two new species of deep-sea eels and six new species of decapod crustaceans were discovered by Resource Exploration and Inventorization Systems (REIS).

Six indigenous technologies were developed and transferred to M/s L&T for commercialization. Paten was granted the innovative technology titled 'Real Time Tsunami Monitoring System' in June 2021.

Environmental Protection

The Protected Marine Areas network has been identified and designated to protect marine resources in four legal categories: National Parks, Wildlife Sanctuary, Conservation Reserves and Community Reserves. India has created a network of 690 protected areas, including 102 national parks, 527 wildlife sanctuaries, 57 conservation reserves and four community reserves as of 2014. The Protected Areas are regions that fall either partially r entirely within the band area of 500m from the high tide line hosting the marine environment and are termed Marine Protected Areas. There are approximately 124 MPAs in India, consisting of 24 MPAs in peninsular India and 100 MPAs on the country's islands.

The ocean needs protection from harmful economic activities that adversely affect the marine ecosystem. Activities like overfishing, bottom trawling, seabed mining, offshore industries (oil and gas extraction), pollution from marine industries (shipping industry), urbanization of coasts, pollution from land sources, global warming, etc., are causing the grave deterioration of the ocean. According to the report by USEPA (United States Environmental Protection Agency, 2022), the Shipping industry emits 2-3% of global Green House Gases. Ships, while burning fuel, emit harmful pollutants like Black Carbon and tiny black particles. Pollution like Plastic debris, chemical runoff, and oil spillage in oceans is a serious concern. These have significant adverse effects on the marine ecosystem. The degradation of the coastal and marine ecosystems is the biggest threat. The problems like ocean acidification, Piling of debris and litter, and over-fishing have resulted in the depletion of biological fish stocks. Nations must adopt a strategy for the sustainable use of ocean resources.

For a long world has misused the ocean by extracting free resources and dumping their litter. Marine debris consists of tenacious, manufactured or processed solid material discarded or abandoned in the marine environment (UNEP, 2012). Land-based debris is a significant source of pollution which destroys the marine ecosystem. Marine litter and marine debris is a major pollutant in the marine environment. The International Coastal

Clean-up day is conducted in various parts of the world during the third week of September each year under the auspices of the United Nations Environment Programme (UNEP). Similar program is carried out by the South Asia Co-operative Environment Programme (SACEP) in the South Asian Region. Under the ongoing campaign, 'Swachh SagarAbhiyan' mass cleanliness and sensitization campaign was conducted in all coastal areas on 18 September 2021 by the Indian Coast Guard. The event was conducted to educate and motivate people to maintain cleanliness in coastal areas to protect the marine environment.

Table 2: Marine Debris and Litter Collected under the 'Swachhsagarabhiyan' Campaign

State	Debris and Litter Collected (September 2021)
Gujarat	8663
Andhra Pradesh	5050
Tamil Nadu	186
Maharashtra	4410
Kerala	2825
Odisha	575
Karnataka	1125
West Bengal	3060
Goa	964
Union Territory	
Andaman and Nicobar Island	3150
Lakshadweep Island	2050
Puducherry	4450
Daman and Diu	1500

Source: India coast guard report, Ministry of Defence

The major source of pollution is wastewater treatment plants, agricultural runoff, urban runoff.

Conclusion

Blue economy can be a possible solution for sustainable development. The paper attempted to show the current scenario of India's ocean resources. It could be seen that India's ocean resources, namely Fisheries and Aquaculture, Minerals, hydrocarbons, etc. has a huge contribution towards the economy. The Indian government is focussing on the ocean and trying to harness its resources through its flagship programs like Sagarmal, O-SMART and SAGAR. The Blue Economy aligns the Indian government's endeavour to accomplish its key goal of alleviating hunger and eliminating poverty with the sustainable utilization of marine resources.

Resource scarcity is a crucial concern for nations. As more and more countries are exploring and claiming marine resources and at times, these claims overlap. This highlights the need for strong diplomatic and governance initiatives. It is the need of high priority to establish a governance mechanism for the sustainable management of marine resources.

Ocean resources must be efficient and sustainable use for the growth of a nation. Territorial resources have been exploited vastly by nations for a long period of time. Ocean resources must not have the same fate as land resources. An action plan must be devised from the beginning for the sustainability of resources and the survival of humankind.

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Entrepreneurship as a Sustainable Prospect: A study on Students' Perceptual Variance

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ABSTRACT

Balancing is the ultimate necessity for achieving what is known as a sustainable environment. So, there is a need to equalise men and women for achieving balanced economic development by empowering women in a manner so that they can become financially independent and gain self-confidence to realize their self-worth. This study reflects the need for financial independence that each woman should seek for their individual empowerment by developing a positive perception of entrepreneurship as a viable career opportunity. The present study is based on reliability statistics (Cronbach's Alpha), descriptive statistics and inferential statistics (non-parametric test Mann Whitney U test). SPSS package has been conducted and the results show a positive perception of women towards entrepreneurship as a career and self-empowerment opportunity.

Keywords: *Entrepreneurship; Perception; Gender Equality; Women Empowerment; Education*

Introduction

'Sustainable Development' means balancing the needs of the present in such a way that it doesn't disbalance the future's needs. It is a systematic strategy for developing a quality environment for the future. So, it focuses on 17 goals, of which the 5th goal is Gender Equality and one of the ways of attaining the goal is by giving equal working space to women by empowering them to opt for entrepreneurship as a career prospect.

'Women Empowerment' is not a one-time event but rather a process of making women more aware of factors such as political views and economic productivity so that they become able to make independent decisions in matters that might affect them (Koko, 1992). Empowerment means becoming self-dependent, realizing self-worth, having the ability to make own choices and instiguating social change by giving one's own opinion based on knowledge, awareness, skill etc. Globally, there are 5 ways of empowering women, which are (Saeed, 2019):

1) Positioning women as leaders and giving them the decision-making roles.
2) Increasing more employment opportunities for women.

3) To focus and invest not only on women's entrepreneurial ideas, but also support them emotionally and financially.
4) Taking corrective measures for unpaid works.
5) Training women professionally and personally.

Now, empowering women by encouraging them to opt for entrepreneurship requires the development of a positive perception in their minds towards entrepreneurship as a viable career opportunity. In other words, it means to make them entrepreneur ready by dealing with financial as well as emotional barriers standing in their way of choosing entrepreneurship as a career prospect. Now, developing a positive perception regarding entrepreneurship depends on several factors, such as the long-term viability and stability of such a career opportunity, the required knowledge to opt for such a career prospect, and the government's support and infrastructure to promote entrepreneurship. So, investment are required on women education to give them the appropriate knowledge regarding entrepreneurship, to include training on entrepreneurship and entrepreneurship development studies in the curriculum, to build awareness among the women by organizing seminars, lectures, workshops, to instil a notion in the minds of women that entrepreneurship is a viable career option along with other available career options, to discourage the social belief regarding the choice of career opportunities as available, the government to take proper initiatives to encourage women to be entrepreneur-ready through free awareness programs, providing loans at a low-interest rate, encouraging women to start their venture, and making the rules and regulations related to business easily understandable and executable.

In South 24 parganas, West Bengal several government initiatives have been taken by the Department of Women Development and Social Welfare that work towards women's equity, development and empowerment. A few schemes are as follows –

Table 1: State Government Schemes for Women Empowerment

Government Schemes	Year	Purpose
Support to Training and Employment Programme for Women (STEP)	1986-87	To enable women to become self employed by developing skills and competencies towards entrepreneurship.
SABLA	2011	To improve health and nutrition status of socially backward women.
Kanyashree Prakalpa	2013	To protect adolescent girls by promoting education, social and financial inclusion.
RupashreePrakalpa	2018	To provide financial assistance to stressed families at the time of daughter's marriage.
Lakshmir Bhandar	2022	To provide financial support to urban and rural women.

Source: wbcdwdsw.gov.in/User/schemes

Therefore, it is necessary to encourage women, motivating them in a way so that they realize their equal needs in society and come forward to contribute towards the country's economic development. The need for society to come forward so that women are treated

equally in every sphere, Mokta (2014) This can somewhat help in tackling the problem of gender inequality by giving equal rights, attention, scope, opportunities, education, and skills to women so that they build a positive perception towards entrepreneurship as a viable self-employment opportunity.

Literature Review

Table 2: Brief Review of Literature

Sr. No.	Area of Work	Existing Literatures
1.	Role of Government in promoting gender equality.	Mokta (2014), Hills (2015)
2.	Needs to be fulfilled to bring women empowerment and thereby gender equality.	Kapur and Narayan (2020)
3.	Role of education in women empowerment and gender equality.	Bhat (2015)
4.	Legal provisions promoting women empowerment in India.	Yunus and Varma (2015)
5.	Gender inequality and its impact on a country's growth and poverty reduction.	Aina and Olayode (2012)

The need for society to come forward to ensure that women are treated equally in every sphere and the government's initiatives to empower women so that they realise their self-worth and come forward to contribute towards the society to enhance societal value, which could thereby help in achieving gender equality, Mokta (2014). A goal to achieve a 50 percent quota that will represent South African women in different executive organizational spheres by handling the drawbacks like dearth of education, detrimental domestic and cultural practices, unemployment rate, inequal employment opportunity for men and women, the limited pool of women who possess the required skills, the inconvenient access to finance etc., so that women on boards can use their powerful intuition to bring diversity in decision making, Hills (2015). The constitution of India does not discriminate between men and women, but society does in matters of education, employment, inheritance, politics etc. The focus is to be given to the education of women so that discrimination between men and women could be eliminated in every sphere to bring about gender equality. Bhat (2015). Several legal provisions in the Indian Penal Code and other special laws exist to protect women and give them equal rights in society so that they can form an integral part of it. But in spite of having several laws, rules, and regulations that promote women's growth, in reality, developing the equal status of women is a far cry (Yunus & Varma, 2015). Gender inequality is one of the major reasons for poor growth and poverty in Africa. The Nigerian gender gap is more complicated due to several cultural and traditional practices that make distinctions between men and women. Though women's participation has increased in different sectors, they fail to gain the same weight and value as men. A combination of good

corporate governance, reductions in poverty, and gender equality can pave the way towards achieving sustainable development. To eliminate the discriminatory practices, to promote the rights of women, and to take challenges to break the stereotypical mentalities so that the differentiation between the rights of men and women could be eliminated,whicht would ultimately pave a path towards gender equality in India, Kapur and Narayan (2020).

Objectives of the Study

Based on the extensive review of the existing literature, it is quite evident that there are many studies relating to women's empowerment and encouraging women's entrepreneurship that will lead towards gender equality, but the above review of the literature suggests that there is no study that focuses on the variance in perception with regards to certain factors that will determine female students' perception towards entrepreneurship as a viable career opportunity in Kolkata and South 24 Parganas within the state of West Bengal, India. So, considering the potential socio-economic and environmental significance associated with the study in the context of Kolkata and South 24 Parganas and the feasibility of data collection, a comprehensive study in this direction can serve to fulfil this research gap. This study attempts to fill the gap with the following objectives:

1. To understand the perceptual variance between male and female students with respect to entrepreneurship as a long-term career opportunity.
2. To understand the variance in perception between male and female students regarding the requisite knowledge base required to start a business.
3. To know the difference in perception between male and female students regarding government support and infrastructure for entrepreneurship development in India.

Methodology

Considering the potential area of study, the following research questions have been framed which are as follows-

1. Does perception about entrepreneurship as long-term career opportunity differ among male and female students?
2. Does there exist any perceptual variance regarding the requisite knowledge base required to start a business between the two independent groups?
3. Do male and female students have different opinions about infrastructure and support from the government?

Based on the above questions the following hypothesis have been framed-

H_{01}: There is no variance of perception regarding entrepreneurship as long-term career opportunity among male and female students.

H_{02}: There is no dissimilar perception among male and female students regarding the requisite knowledge base for starting a business.

H_{03}: There is no conflict of perception among the independent groups regarding government support and infrastructure.

In pursuance of the above hypotheses, the research objectives were observed to be both descriptive and empirical in nature and based on a quantitative data set. The data has been obtained through a primary survey conducted by the researcher. The data has been collected through a structured questionnaire and a convenience sampling procedure is used. The researcher used a focused group discussion method and a personalized interview method for collecting data from the sample. The parameters that are used for measuring perception regarding entrepreneurship as a viable career opportunity are as follows:

I. Entrepreneurship as a long-term career opportunity.
II. Government support and infrastructure for entrepreneurship development in the country.
III. Requisite knowledge base for starting a business.

These parameters are measured through 7-point Likert scale. Descriptive statistics have been used to present the distribution of different nominal and ordinal variables included in the data set in terms of percentage. Internal consistency among the three parameters measuring perception regarding "entrepreneur as a viable career opportunity" is being judged through Cronbach's Alpha. Finally, three hypotheses corresponding to three factors have been tested using the Mann Whitney U test and Coherent 1988 criteria to measure the Effect size. As an independent variable Gender is nominal in nature and individual factors, which are dependent variables, are on an ordinal scale.

Results and Discussion

Reliability Statistics

Cronbach's Alpha is the measure of the internal consistency and reliability of the questionnaire used for the primary survey.

Table 3: Reliability Statistics

Cronbach's Alpha	N of Items
0.625	4

Source: Computed by using SPSS 23

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It is observable from the above Table-3 that the Cronbach's Alpha comes to 0.625, as the value is above 0.6, hence the dataset is reliable and internal consistency among the individual measures is being ensured.

Descriptive Statistics

*Table 4: Long_term_career_opportunity * Gender Crosstab*

% within Gender				
		Gender		
		Male	**Female**	**Total**
Long_term_career_opportunity	Strongly agree	18.1%	7.6%	12.5%
	Agree	27.6%	13.4%	20.1%
	To some extent agree	13.3%	17.6%	15.6%
	Neutral	17.1%	25.2%	21.4%
	To some extent disagree	12.4%	14.3%	13.4%
	Disagree	7.6%	16.0%	12.1%
	Strongly disagree	3.8%	5.9%	4.9%
Total		**100.0%**	**100.0%**	**100.0%**

Source: Computed by using SPSS 23

It is observable from Table-4, that students (MALE) 3.8% Strongly disagree, 7.6% Disagree, 12.4% To some extent disagree, 17.1% Neutral, 13.3% To some extent agree, 27.6% Agree and 18.1% Strongly agree to the fact that government support and infrastructure is required for entrepreneurship whereas students (FEMALE) 5.9% Strongly disagree, 16% Disagree, 14.3% To some extent disagree, 25.2% Neutral, 17.6% To some extent agree, 13.4% Agree,7.6% Strongly agree to the fact that entrepreneurship is a long term career opportunity .

*Table 5: Knowledge_base * Gender Crosstab*

% within Gender				
		Gender		
		Male	**Female**	**Total**
Knowledge _base	Strongly agree	22.9%	5.0%	13.4%
	Agree	29.5%	19.3%	24.1%
	To some extent agree	18.1%	8.4%	12.9%
	Neutral	2.9%	5.9%	4.5%
	To some extent disagree	15.2%	18.5%	17.0%
	Disagree	9.5%	40.3%	25.9%
	Strongly disagree	1.9%	2.5%	2.2%
Total		**100.0%**	**100.0%**	**100.0%**

Source: Computed by using SPSS 23

It is observable from Table-5, that students (MALE) 1.9% Strongly disagree,9.5% Disagree, 15.2% To some extent disagree, 2.9% Neutral, 18.1% To some extent agree, 29.5% Agree

and 22.9% Strongly agree to the fact that requisite knowledge base is required for starting a business whereas students (FEMALE) 2.5% Strongly disagree, 40.3% Disagree, 18.5% To some extent disagree, 5.9% Neutral, 8.4% To some extent agree, 19.3% Agree, 5.0% Strongly agree to the fact that that requisite knowledge base is required for starting a business.

Table 6: Government_support * Gender Crosstab

% within Gender				
		Gender		
		Male	**Female**	**Total**
Government_support	Strongly Agree	17.1%	5.9%	11.2%
	Agree	20.0%	18.5%	19.2%
	To some extent agree	23.8%	33.6%	29.0%
	Neutral	17.1%	21.8%	19.6%
	To some extent disagree	9.5%	14.3%	12.1%
	Disagree	8.6%	5.0%	6.7%
	Strongly disagree	3.8%	0.8%	2.2%
Total		**100.0%**	**100.0%**	**100.0%**

Source: Computed by using SPSS 23

It is observable from Table-6, that students (MALE) 3.8% Strongly disagree, 8.6% Disagree, 9.5% To some extent disagree, 17.1% Neutral, 23.8% To some extent agree, 20% Agree and 17.1% Strongly agree to the fact that government support and infrastructure is required for entrepreneurship development in the country whereas students (FEMALE) 0.8% Strongly disagree, 5% Disagree, 14.3% To some extent disagree, 21.8% Neutral, 33.6% To some extent agree, 18.5% Agree, 5.9% Strongly agree to the fact that government support and infrastructure is required for entrepreneurship development in the country.

Inferential Statistics

This includes the following inferential statistical tools to validate the hypothesis.

H_{01}: There is no variance of perception regarding entrepreneurship as long-term career opportunity among male and female students.

- **Mann-Whitney U test for Hypotheses 1**

Table 7: Ranks

	Gender	**N**	**Mean Rank**	**Sum of Ranks**
Long_term_career_opportunity	Male	105	96.37	10119.00
	Female	119	126.73	15081.00
	Total	224		

Source: Computed by using SPSS 23.

It is observable from the above Table- 7 that students (Male) are having lower mean rank (96.37) in comparison to the students (Female) which is (126.73) regarding perception

towards entrepreneurship as long-term career opportunity. That means students (Female) have more positive perception compared to students (Male) regarding perception towards entrepreneurship as long-term career opportunity.

Table 8: Test Statistics[a]

	Long_term_career_opportunity
Mann-Whitney U	4554.000
Wilcoxon W	10119.000
Z	-3.549
Asymp. Sig. (2-tailed)	0.000

a. Grouping Variable: Gender

Source: Computed by using SPSS 23

- It is observable from the above Table-8 that null hypothesis is rejected at 5% level of significance ($p < 0.05$). Hence, perceptions towards entrepreneurship as a long-term career opportunity vary among Male and Female students. Since there exists a significant difference between Male and Female students Effect Size is calculated based on Cohen 1988 criteria ($r=\frac{z}{\sqrt{N}}$). According to Cohen 988 criteria 0.10 - < 0.30= small effect 0.30 - < 0.50 = medium effect ≥ 0.50= large effect. So based on Cohen 1988 criteria the Effect Size is 0.237128 in this case which signifies that there exists small effect between Male and Female students regarding perceptual variance towards entrepreneurship as a long-term career opportunity.

H_{02}: There is no dissimilar perception among male and female students regarding the requisite knowledge base for starting a business.

- **Mann-Whitney U test for Hypotheses 2**

Table 9: Ranks

	Gender	N	Mean Rank	Sum of Ranks
Knowledge_ base	Male	105	85.90	9020.00
	Female	119	135.97	16180.00
	Total	224		

Source: Computed by using SPSS 23.

It is observable from the above Table- 9 that students (Male) are having lower mean rank (85.90) in comparison to the students (Female) which is (135.97) regarding perception as to the requisite knowledge base required for starting a business. That means students (Female) have more positive perception compared to students (Male) regarding perception as to the requisite knowledge base required for starting a business.

Table 10: Test Statistics[a]

	Knowledge_base
Mann-Whitney U	3455.000
Wilcoxon W	9020.000
Z	-5.891
Asymp. Sig. (2-tailed)	0.000
a. Grouping Variable: Gender	

Source: Computed by using SPSS 23

- It is observable from the above Table-10 that null hypothesis is rejected at 5% level of significance ($p < 0.05$). Hence, perception towards the requisite knowledge base required to start a business vary among Male and Female students. Since there exists a significant difference between Male and Female students Effect Size is calculated based on Cohen 1988 criteria ($r = \frac{z}{\sqrt{N}}$**).** According to Cohen 988 criteria 0.10 - < 0.30= small effect 0.30 - < 0.50 = medium effect ≥ 0.50= large effect. So based on Cohen 1988 criteria the Effect Size is 0.393609 in this case which signifies that there exists medium effect between Male and Female students regarding perceptual variance towards the requisite knowledge base required to start a business.

H_{03}: There is no conflict of perception among the independent groups regarding government support and infrastructure.

- **Mann-Whitney U test for Hypotheses 3**

Table 11: Ranks

	Gender	N	Mean Rank	Sum of Ranks
Government_ support	Male	105	107.15	11251.00
	Female	119	117.22	13949.00
	Total	224		

Source: Computed by using SPSS 23

It is observable from the above Table 11 that male students have a lower mean rank (107.15) in comparison to female students, which is 117.22, regarding perceptions towards government support and infrastructure for entrepreneurship development in the country. That means female students have a more positive perception compared to male students regarding government support and infrastructure for entrepreneurship development in the country.

Table 12: Test Statistics[a]

	Government_support
Mann-Whitney U	5686.000
Wilcoxon W	11251.000
Z	-1.186
Asymp. Sig. (2-tailed)	0.236
a. Grouping Variable: Gender	

Source: Computed by using SPSS 23

- It is observable from the above Table-12 that the null hypothesis is accepted at 5 % level of significance with (*P*> 0.05). Hence Perception regarding government support and infrastructure for entrepreneurship development in the country does not vary among Male and Female students.

Findings

The analysis based upon the three hypotheses formulated to serve as the basis of empirical study reveals the following findings:

- **H_{01}: There is no variance of perception regarding entrepreneurship as long-term career opportunity among male and female students.**

The statistical outcome shows that perceptions regarding entrepreneurship as a long-term career opportunity vary between male and female students and female students tend to have a more positive perception of entrepreneurship as a long-term career opportunity. The reasons for such a result could be many, such as the bindings that females generally have in their personal as well as professional lives. Being an employee comes with several responsibilities towards the employer and organisation, comes with time boundaries, and comes with several limitations, whereas in the case of entrepreneurship, though there are limitations, it comes with the flexibility of setting the limitations as per one's own will and freedom, which is a big plus for women. As entrepreneurship i.e., self-employment opportunities, can give women the flexibility to manage work life as well as their personal life, which in case of employment is a matter of question.-

- **H_{02}: There is no dissimilar perception among male and female students regarding the requisite knowledge base for starting a business.**

The statistical outcome shows that perceptions regarding the requisite knowledge base for starting a business vary between male and female students and female tend to have a more positive perception regarding the requisite knowledge base for starting a business. Every new aspect requires proper knowledge, skills, ideas, training as it’s known that practice makes perfect, so is the case with entrepreneurship. Knowledge is the ultimatum for starting

a successful venture. An idea of the risk, the return, and the opportunities is necessary for any new venture, and this is only possible if a proper knowledge base is developed to be what is known as entrepreneur ready.

- **H_{03}: There is no conflict of perception among the independent groups regarding government support and infrastructure.**

The statistical outcome shows that the perception regarding government support and infrastructure for entrepreneurship development in the country does not vary among male and female students. The result shows a positive perception towards government support to encourage entrepreneurship and this perception is the same for both male and female students. The reason here is quite clear consideration was taken regarding the current scenario. The government is launching programs like *Atma-Nirbhar Bharat* to support entrepreneurship and encourage people to become self-dependent. Several schemes have been introduced to help the budding future generation start their own start-ups. So, government support and encouragement towards promoting Entrepreneurship are quite eminent and known to all.

Conclusion

Thus, female students show a more positive perception of choosing entrepreneurship as a self-employment opportunity. Females are valuing their skills and are looking forward to the intrinsic prospects of entrepreneurship. But in spite of positive statistical outcomes, in reality, the picture is totally different. Women, in spite of having a positive mindset towards entrepreneurship, are still, in reality, not ready to give shape to their positive mindset towards entrepreneurship. So empowering women by making women capable of becoming entrepreneurs is still a question, and here again, women are lagging behind men.

Limitations of the Study

Reasons could be many, like societal acceptance of women entrepreneurs, which is still a matter to be focused on, family acceptance and permission, lack of motivation, lack of funds, lack of proper knowledge of government schemes, lack of education, etc. So, conquering the actual barriers towards women entrepreneurship can help in taking the women empowerment concept to some other level and can also help in climbing another step towards gender equality i.e., achieving sustainable development by giving an access to an equal space a woman deserves to explore in every sphere.

Acknowledgment

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Urban Social Sustainability: The Notion and the Measurable Aspects

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ABSTRACT

Introduction: Urban social sustainability is about people's quality of life, now and in the future. It is enhanced by development, which provides the right infrastructure to support a strong social and cultural life, opportunities for people to get involved, and scope for the place and the community to evolve. The present descriptive paper, based on a theory-oriented explanatory study, tries to comprehend the notion of 'Urban Social Sustainability' and identify its quantifiable features. Methodology: With the help of the 'desk research' methodology, the present empirical theory-oriented descriptive study aims to present the perspective (abstraction and interpretation) of 'Urban Social Sustainability' and its measurable aspects. To get insight into the objectives, the 'desk research' methodology has been used in this study. The study essentially involves the collection and collation of related information from various resources. Several documents, ranging from scholarly literature to government reports and pertinent acts (state and/or central), have been reviewed. Result: There are influences from some external factors on the dynamic process of Urban Social Sustainability on regional and spatial scales, including service provision by local government and local economic, environmental, and political aspects at a broader scale. Conclusion: The present paper figures out the measurable aspects of Urban Social Sustainability and finds out the linkages between them. The "Common Accredited Indicators" are principally categorised into two groups: (a) indicators of equality in social infrastructure (basic amenities and social infrastructure) and (b) indicators of community sustainability.

***Keywords**: Sustainable Development; Urbanisation; Urban Social Sustainability; Social Infrastructure; Basic Amenities*

Introduction

In "An Essay on the Principle of Population", Malthus (1986), a renowned political economist, questioned whether there were enough natural resources to support the growing population since subsistence can only increase in an arithmetic progression, while a geometric progression of population growth is more likely. The fundamental principles of environmentalism were discussed by Malthus (1986). Until quite recently, human civilization was only interested in "efficient resource consumption" and not in "efficient resource allocation", which, in essence, disregarded the idea of resource exhaustion and instead caused resource shortages and pollution (Freeman, 1973). The limited availability of non-renewable natural resources is simply distressing for long-term economic progress.

Strong economic bases supported by infrastructural facilities, good governance, and a profound socio-cultural inheritance are essential for urban settlements to exist and to remain inhabited. Now one indispensable question arises: whether urban development is also "Socially Sustainable"? Does this urban development retain objectivity when it comes to concerns like access to jobs, housing, and fundamental requirements like health and education, as well as other social infrastructures like transportation inside the urban area? Do the features of the environment get proper consideration through this? Will the future generation get a well-brought-up, liveable society?

Methodology

The present descriptive paper, based on a theory-oriented explanatory study, tries to comprehend the notion of "Urban Social Sustainability" and identify its quantifiable features. The present paper also tries to identify the ‘Common Accredited Indicators’ for measuring urban social sustainability.

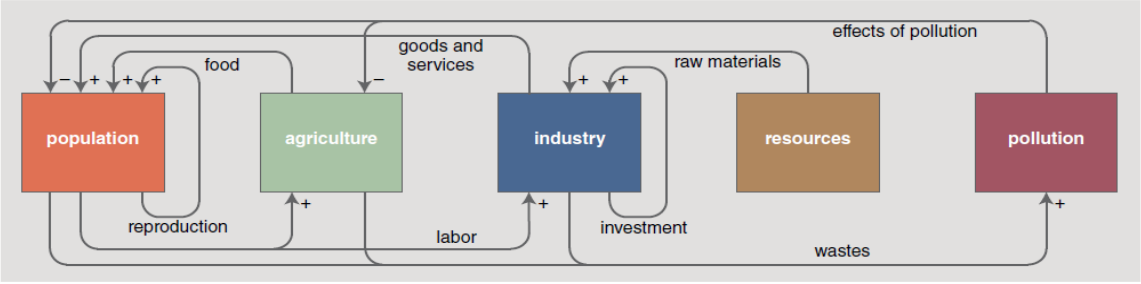
To get insight into the objectives, the ‘desk research’ methodology has been used in this study. The study is an empirical theory-oriented descriptive study with the aim of presenting the perspective (abstraction and interpretation) of ‘Urban Social Sustainability’ and its measurable aspects. This essentially involves the collection and collation of related information from various resources. Several documents, ranging from scholarly literature to government reports and pertinent acts (state and/or central) have been reviewed.

Results and Discussion

Notion of Sustainable Development

In 1972, Meadows *et al.*, with a team of researchers at the Massachusetts Institute of Technology, studied the relations among five fundamental key elements that influence the level of growth, which include: a) population; b) structural change in agricultural output; c) decrease in availability of non-renewable resources; d) industrial production; and e) pollution generation.

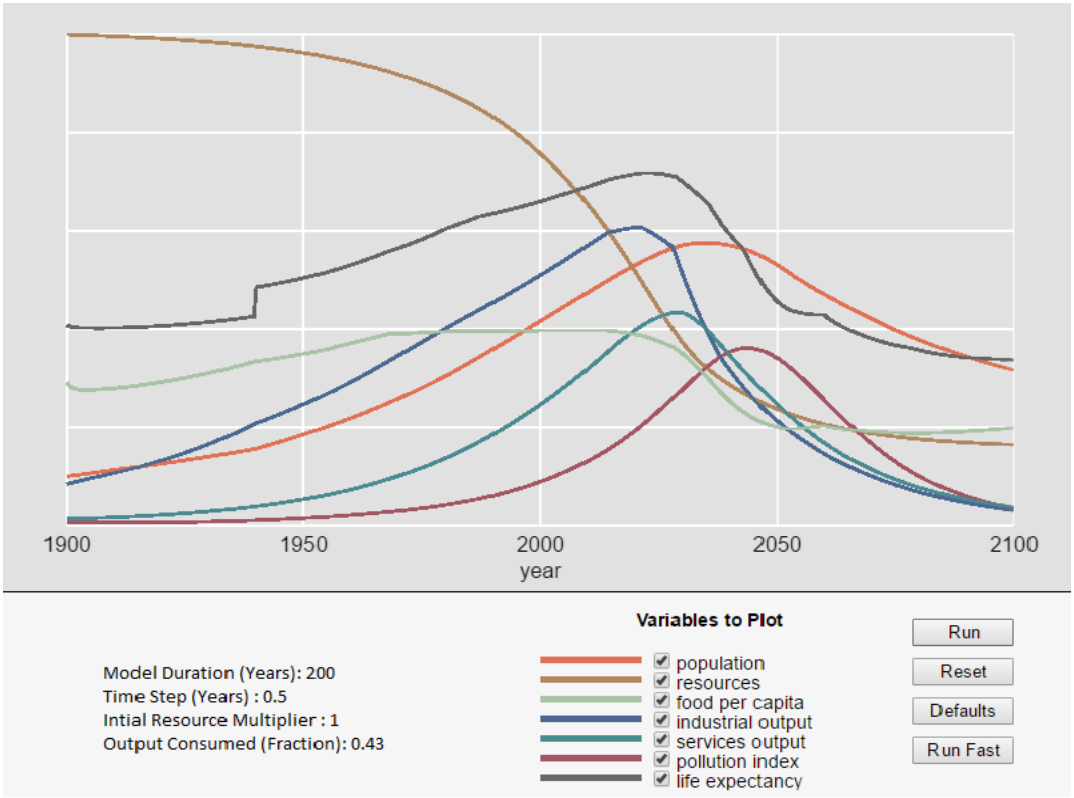
In "The Limits to Growth", the World3 model's five main parts are connected by feedback loops and other connections (Figure 1). As more people are born and more goods and services are generated by more equipment, the population and capital sectors create self-reinforcing feedback loops.



Source: Hayes (2012)

Figure 1: Five Major Aspects of the "World 3" Model's Major Trails

The World-3 Model's output aims to identify the status of important variables from 1900 to 2100. The benchmark scenario, as depicted in Figure 2, is based on the researchers' best estimate of the prime condition. Throughout the 20th century, the populace and additional economic activities (such as service output, industrial output, nutrition per capita, etc.) rose or at least stabilised; however, around the middle of the 21st century, they tended to collapse due to the rapid depletion of non-renewable resources. The situation will unquestionably get worse as pollution-related issues become more prevalent (Meadows *et al.*, 1972; Hayes, 2012). The World 3 model's underlying advice is that we ought to choose policies that will ensure population stabilisation, efficient use of limited resources, recycling, a minimal level of ecological instability, and maximum sustainability in order to prevent misfortune and provide for the highest level of its members' satisfaction (Goldsmith, 1972).



Source: Hayes (2012)

Figure 2: World 3 Model - A Probable State of Major Variables between 1900 and 2100

The report by the UN's "Global Commission on Environment and Development", led by Gro Harlem Brundtland, entitled "Our Common Future" proposed the most widely acclaimed and acknowledged definition of "sustainable development" as "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs …Thus, the goals of economic and social development must be defined in terms of sustainability in all countries - developed or developing, market-oriented or centrally planned*." (WCED, 1987).

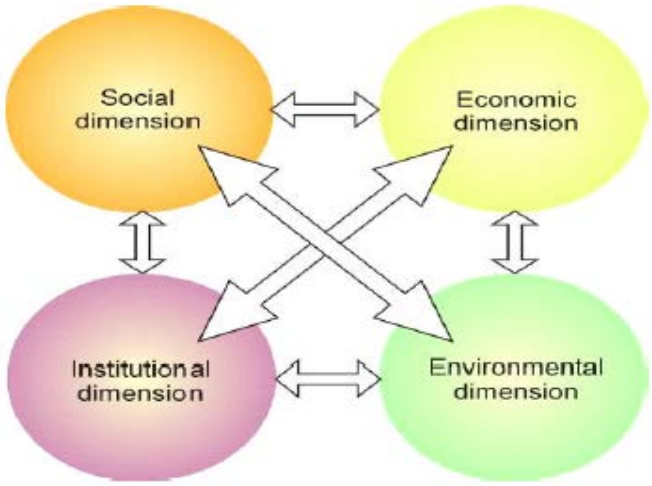
Urban Sustainability and Its Dimensions

The notion of "sustainable development" also calls for applying the idea of sustainability to the contemporary problem of revitalising, redeveloping, and reforming the accelerating process of urbanisation. According to Dempsey *et al.* (2011), the economic, social, and environmental aspects of development have become increasingly dependent on urban population growth and rapid urbanisation, making urban planning essential to achieving sustainability (Yung, Chan, & Xu, 2011).

The concept of "sustainable development," as it is described in Agenda 21, includes two main components: the environmental aspect, as well as the social and economic dimensions (i.e., resource management and conservation for development) (Hirano, 2003). As a result, the concept of "sustainable development" is founded on three main opinions: (a) economic sustainability; (b) social sustainability; and (c) environmental sustainability. Economic sustainability refers to the best case scenario wherein sustained economic progress will "trickle down" to the poor through effective resource allocation through the market, production processes, and consumption with little negative impact on the natural, social, and human resources. Social sustainability includes the ideas of equality, being empowered, mobility, involvement, collaboration, social and cultural identity, and stability in institutions. Environmental sustainability says that in order to reduce pollution, adequate waste management techniques must be utilised and that the important minimum threshold should not be surpassed when harvesting natural resources where they cannot be replenished (Basiago, 1998; Khan, 1995; Hirano, 2003).

This suggests further, at least conceptually, that the concept of "sustainable development" for a "sustainable urban society" calls for an integrative interrelationship between equality, the economy, and the environment. An improvement in local economic conditions may lead to more opportunities for capital accumulation, which might subsequently be used for additional savings and consumption geared towards eradicating poverty and achieving societal equality. This equality in society serves as inspiration for higher living standards, education, health, food access, and environmental awareness, all of which are crucial for developing the necessary level of collective intelligence for production-related inventions and innovations, among other things, to preserve productivity and safeguard the environment (Basiago, 1998). Only by effectively integrating the economic, social, and environmental aspects - also known as profit, people, and planet - can the path to sustainable development be found.

The "institutional component", whether it's a public institution, a private institution, or a joint venture between the two, can be imagined in addition to these three dimensions and is vital for urban social sustainability (Sengupta & Baranwal, 2012) (Figure 3). Other aspects of urban sustainability, including the political, legal, practical, ethical, and other elements, are also discussed by certain academics (Pawłowski, 2008).



Source: Sengupta & Baranwal (2012)

Figure 3: Urban Social Sustainability in its Different Aspects

Defining Urban Social Sustainability

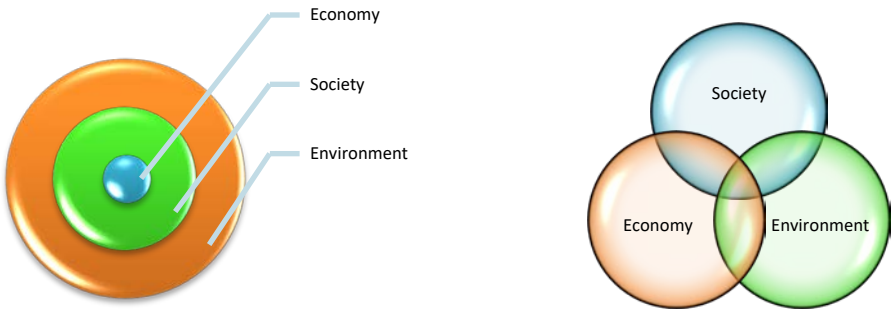
In the academic literature and among decision-makers, the environmental and economic components of the sustainability paradigm have received the most attention (Drakakis-Smith, 1995). There could be two causes for the unbalanced priority of the sustainability components. Firstly, the 1960s' burgeoning environmental movement and the international campaigns for "basic needs" of the 1970s collectively contributed to the development of the idea of sustainable development; Secondly, according to Colantonio (2008), in "Traditional and Emerging Prospects in Social Sustainability", evaluation of many social development's intangible and non-quantifiable features is fraught with measurement quandaries. Only since the 1990s have social factors in sustainability been taken into account (Colantonio, 2007).

A counterargument exists, and it is called the "Brown Agenda" trying to draw attention to the environmental and developmental issues faced by the developing nations. This is also an effort to theoretically discuss the various viewpoints on global "green" environmental problems and the problems particularly faced by urban areas. The 'Brown Agenda' makes brief note of the problems with access to clean water, proper sanitization, and drainage, due to the inappropriate management of dangerous solid waste and with air pollution, which includes unchecked emissions from companies, cars, and low-grade domestic fuels. This makes it clear why an urban focus is justified. According to the "Brown Agenda", linked economic growth and the building of "social capital" are the best ways to control the growing environmental degradation. It has been noted that the majority of severe environmental degradation typically occurs in regions with high poverty and weak social cohesion. Therefore, it is predicted that boosting social capital through development will surely produce an improved environment. (McKenzie, 2004; Agarwal & Narain, 1992; Geography, n.d).

"The Western Australian Council of Social Services" (WACOSS) proposed two social sustainability models that demonstrate the linkages between sustainability's social, economic, and environmental aspects. Three interacting spheres are present in the first

model, and according to some, the power of the environmental realm determines how well the "economic" and "social" elements function. Here, social issues are viewed as simply a mechanism for sustainability and are separated from discussions of actual issues (Ghahramanpouri, Lamit, & Sedaghatnia, 2013). According to this approach, the idea of sustainability has been de-socialized and the environmental components have been given normative weight (Maloutas, 2003; Davidson, 2009).

The second social sustainability model identifies the decisive role of social characteristics. This approach proposes three 'overlapping circles' that claim all three facets of sustainability have comparable outcomes (McKenzie, 2004; WACOSS, n.d.) (Figure 4). This concept re-socialized the idea of sustainable development by viewing sustainability in society as a goal as opposed to a tool (Maloutas, 2003).



Source: The Model of Social Sustainability, WACOSS (Western Australian Council of Social Services)

Figure 4: Two Models Illustrating How the Environmental, Social, and Economic Aspects of Sustainability Are Interconnected

Spangenberg and Omann (2006) put forward that the notion of sustainability is to be envisioned within an analytical space with four dimensions, where there are two separate axes, the economic and the environmental, whereas the ‘social dimension’ is divided into two additional axes of ‘soft infrastructures’, which are ‘the human’ (system, capital, domain) and ‘the societal’ aspects (capital stock, community capacity, community system analysis). Spangenberg and Omann (2006) also suggest that there are at least three different types of analytical methods to decide whether the axes of social sustainability are to be analysed separately or in conjunction (Spangenberg & Omann, 2006). The approaches are namely: (a) Functionality Analysis Approach: The functional analysis paradigm dominates discussions of social sustainability's definitions, dimensions, and measurement in studies of rural, urban, and community sustainability; (b) Capital Approach: This is a financial consideration based on the idea of social capital stocks. Spangenberg and Omann (2006) suggest that the notion ‘social capital stock’ is not helpful enough as a general criteria of social sustainability; the justification is that because it is grounded in economic theory, it is unable to distinguish qualitatively between the various difficulties that are used to explain the substance of social sustainability (Spangenberg & Omann, 2006); and (c) System Analysis Approach, this view suggests that if each domain is to sustain itself as a system of social sustainability, then each

domain must be able to reproduce itself (Bossel, 2000). For each of these reproductive processes, there are almost universally essential intrinsic social, economic, institutional, and environmental requirements of sustenance (Spangenberg & Omann, 2006).

This concept has received numerous definitions that have been utilised in relation to discussions on urban issues contextualised by different authors and academics, taking into account the elements and techniques of social sustainability (Ghahramanpouri, Lamit, & Sedaghatnia, 2013). According to McKenzie (2004), the combination of these diverse explanations of social sustainability collectively represents either the circumstances or the guiding principles and framework for measurement.

Ghahramanpouri, Lamit and Sedaghatnia (2013) have provided an organized array of definitions of social sustainability inside urban studies from both academic and policy perspectives, which are most cited in the literature. They group the various definitions into three major strata, (a) Definition of Conditions, (b) Definitions of Measurement Framework and (c) Attributes of Social Sustainability Definitions (Table 1).

Table 1: Definitions of Urban Social Sustainability

Definition of Conditions: these definitions focusing more on the 'conditions', typically explains the notion of "'social sustainability' either as a currently existing positive condition, or as a goal that remains to be achieved" (McKenzie, 2004).	
Author	Defining the Social Sustainability
Yuftachel and Hedgecock	"Continuing ability of a city to function as a long-term viable setting for human interaction, communication and cultural development." When defining social sustainability, they place emphasis on an urban perspective by stating that "urban social sustainability is about the long -term survival of a viable urban social unit." (Yiftachel & Hedgcock, 1993)
Polèse and Stren	Social sustainability of a city is defined as "...development (and/or growth) that is compatible with harmonious evolution of civil society, fostering an environment conducive to the compatible cohabitation of culturally and socially diverse groups... [and] encouraging social integration, with improvements in the quality of life for all segments of the population." Polèse & Stren (2020) put a focus on reducing the level of exclusion from the society by means of their definitions. They suggest that to achieve social sustainability such policy framing is required which shall reduce the level of social exclusion through employment generation, better and improved service delivery to the public, enhanced service accessibility, social cohesion and participation (Polèse & Stren, 2000).
Definition Of Measurement Framework: These definitions making use of the measurement frameworks try to suggest a number of social sustainability metrics. Dempsey *et al*. (2011) and McKenzie (2004) opine that "*though these indicators can be either positive (e.g., rate of literacy) or negative (e.g., the rate of homicide), the positive indicators are mostly used by scholars while defining social sustainability through the measurement framework*" (McKenzie, 2004; Bramley *et al*., 2009).	
Author	Social Sustainability Definition
Bramley, Dempsey, Power, Brown, Watkins	"'*Social equity' (access to services, facilities and opportunities) and 'sustainability of the community' are two recognizable, overarching concepts at the core of the notion of social sustainability within an area context… though these concepts may look upon as conceptually distinct but often strong relationships between them is observed)*" (Bramley *et al.*, 2009).

Andrea Colantonio	"*Traditional 'hard' social sustainability themes such as employment and poverty alleviation are increasingly being complemented or replaced by the emerging 'soft' and less measurable concepts such as 'happiness, social mixing and sense of place', i.e., there is a shift from almost statistics-based indicators to hybrid sets which mix qualitative and quantitative data*" (Colantonio, 2010)
Attributes of Social Sustainability Definitions: Partridge (2005) notes that "'*Future focus' and 'process' are the two most vital attributes in preciseness and usefulness of urban social sustainability discussions*" (Partridge, 2005). "*Future focus refers to the improvement of the society for current and future generations* (Castillo *et al*., 2007) *while the 'process', supported by policies and institutions ensure harmonious social relations, enhance social integration and improve living conditions for all groups within the society*'" (Holden, 2012). McKenzie (2004) considers the "'*future aspect' (time concern) in relation to considering 'equity' and 'transmitting awareness' for future generation and 'the process' through emphasizing 'a system of cultural relations, participation of citizens, a system for transmitting awareness' and 'maintaining that system of transmission'* ".	
Author	Social Sustainability Definition
Barron and Gauntlett	"Social sustainability occurs when formal and informal processes, systems, structures and relationships actively support the capacity of future generations to create healthy and liveable communities. Socially sustainable communities are equitable, diverse, connected and democratic and provide a good quality of life" (Barron & Gauntlett, 2002).
McKenzie	"Social sustainability is a life-enhancing condition within communities, and a process within communities that can achieve that condition" (McKenzie, 2004).

Source: Ghahramanpouri, Lamit & Sedaghatnia (2013)

In terms of the types of social sustainability themes, particularly in urban contexts, the definitions of social sustainability point to a "paradigm shift." The assessment process has changed as a result of this modification. (Neamţu, 2012). Colantonio (2010) asserts that indicators that are "almost statistics-based" are being replaced by hybrid sets that incorporate both qualitative and quantitative data. Also, the techniques of assessment are changing from being exclusively "quantitative procedures and metrics" to more "qualitative ones." (Neamţu, 2012). Table 2 depicts some of the important traditional and emerging themes as suggested by Colantonio (2011).

Table 2: Social Sustainability Themes

Traditional	Emerging
Basic needs – housing and environmental health	Changing demographics due to migration, ageing, and mobility
Education and skills	Social interaction and unity
Employment	Identity, sense of pride for place and culture
Equity	Access, involvement, and empowerment
Human rights and gender	Health and safety
Social justice	Social capital, health, contentment/happiness, and overall quality of life

Source: Colantonio (2011)

Moreover, as Dempsey *et al.* (2011) suggest, dimensions like (i) social interaction and social networks in the community; (ii) participation in collective groups and networks in the community; (iii) community stability; (iv) pride and sense of place; and safety and security are to be considered while measuring social sustainability within urban vicinity. And this

exemplifies again an alteration from "individual perception" towards the perception of ‘collectively / community’ (Bramley *et al.*, 2009; Neamţu, 2012).

Neamţu (2012) suggests that such paradigm shift of urban social sustainability is not being neglected by the government or the policy makers and researchers (Neamţu, 2012) as he mentions that some authors like Ormerod and Johns (2007) questions the capacity and willingness of governments to accomplish social goals (for instance, the use of the concept of ‘gross national happiness’ as the basis for policy making by the Kingdom of Bhutan which have, however, resulted in morally questionable outcomes) (Ormerod & Johns, 2007) and author like Layard (2007) who argues that many governments, without systematic explanation and/or efficient measuring methodology, are trying to achieve such objectives from a long period’ (Layard, 2007; Neamţu, 2012).

Being a ‘dynamic concept’, social sustainability adjusts "over time (from year to year or decade to decade) in a place". According to Dempsey *et al.* (2011), there are a variety of externalities that can affect the procedure on both local and spatial scales, such as improved service delivery at the local government level, which may promote social consistency (positive factors); economic, environmental, and political crises at the local level may have an impact on broader social activity (Bramley *et al.*, 2009).

Similarly, the notion of "Urban Social Sustainability" is a procedure in which a variety of issues control the quality of life and build up the community of an urban area. Taking into account all aspects of social sustainability, the concept of urban social sustainability can be defined in accordance with the definition of Woodcraft and Dixon (2013): *"Social sustainability [is] about people’s quality of life, now and in the future. Social sustainability describes the extent to which a neighborhood supports individual and collective well-being. It combines the design of the physical environment with a focus on how the people who live in and use a space relate to each other and function as a community. It is enhanced by development, which provides the right infrastructure to support a strong social and cultural life, opportunities for people to get involved, and scope for the place and the community to evolve."* (Woodcraft & Dixon, 2013; Bacon *et al.*, 2012).

Measuring Urban Social Sustainability

Measurable Dimensions and Themes

According to Dempsey *et al.* (2011), the various components that contribute to urban social sustainability and are entangled with different scales (such as Social consistency and national scale are related, activity and places on a local and spatial scale have connections with social interaction and local environmental quality), can be divided into two main categories of causal notions: Social Equity and Sustainability of Community. Table 3, on the basis of the opinion of Bramley *et al.* (2009), tries to summarize the measurable aspects / dimensions of these broad concepts and outline the suggested connections between them and the built environment in relation to urban social sustainability (Bramley *et al.*, 2009).

Table 3: Relationship between Measurable Aspects of "Urban Social Sustainability" and the Built Environment

<table>
<tr><th colspan="3">Two Broad underlying perceptions of the contributory factors of "Urban Social Sustainability"</th></tr>
<tr><td rowspan="4">Social Equity</td><td colspan="2">Social equality and social and environmental inclusion are linked in urban context. An equitable society is one in which people are not prevented from engaging economically, socially, or politically in society by "exclusionary" or discriminatory practices.</td></tr>
<tr><td>Theoretical Foundation:</td><td>This notion possesses a foundation in
justice in society,
distributive justice, often known as "fairness in the allocation of resources," and
condition for equality</td></tr>
<tr><td>Measurable Aspects / Dimensions:</td><td>"Accessibility is commonly cited as a fundamental measure of Social Equity. Aspects requires equitable access are education and training, decent housing, public services, (social) infrastructure, green space, culture and recreation."

Apart from these, 'local' services and facilities of an urban area which have impact on urban social sustainability;

Hospitals, Secondary Schools etc. are considered as more regional facilities as they generally cover larger catchment area.</td></tr>
<tr><td>Associations between built-environment attributes and dimensions:</td><td>Some of these elements have an obvious relationship with the built environment, either in relation to the supply of facilities and services or in terms of how to get to them. (as in, public transportation).

Others are connected in a more indirect way. For instance, the real structure's condition may impact one's ability to acquire quality housing, but it also depends on the level of service offered by the local authority or housing association in question.</td></tr>
<tr><td rowspan="2">Sustainability Of Community</td><td colspan="2">This is about the "ability of society itself, or its manifestation as local community, to sustain and reproduce itself at an acceptable level of functioning. Social interaction and the general stability of the society are essential for community sustainability".</td></tr>
<tr><td>Theoretical Foundation:</td><td>The terms "social capital" and "social cohesiveness" are used to describe this, which includes social networks, reciprocity standards, characteristics of social organisation, and the integration of subsequent social behaviour.</td></tr>
</table>

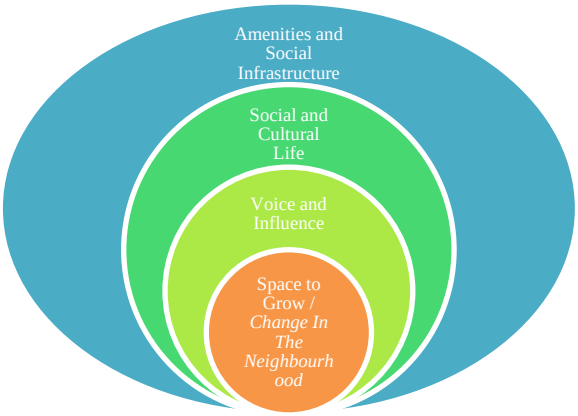
Two Broad underlying perceptions of the contributory factors of "Urban Social Sustainability"		
	Measurable Aspects / Dimensions:	At the neighbourhood five distinct, connected, and measurably important characteristics of a sustainable community can be identified ▪ *Social Networks and Interaction in the Community:* ▪ *Participation In Collective Groups And Community Networks*: ▪ *A stable community*: ▪ *Sense of pride for Place and culture*: ▪ *Security and Safety*:
	Associations between the dimensions and features of the built environment:	▪ At a neighbourhood scale, these dimensions are acceptable and meaningful notions since they relate to communal aspects of daily life. They have been linked to certain elements of the built environment, including: ▪ "*Social Interaction/Social Networks In The Community*: ▪ *Participation In Collective Groups and Networks In The Community*: ▪ *Community Stability*: ▪ *Pride/Sense of Place* ▪ *Safety and Security*"

Source: Bramley et al. (2009)

The Young Foundation has developed a framework containing four elements that are essential for urban social sustainability, i.e., to shape new urban communities that will eventually be prosperous and durable (Figure 5 & 6). The framework contains:

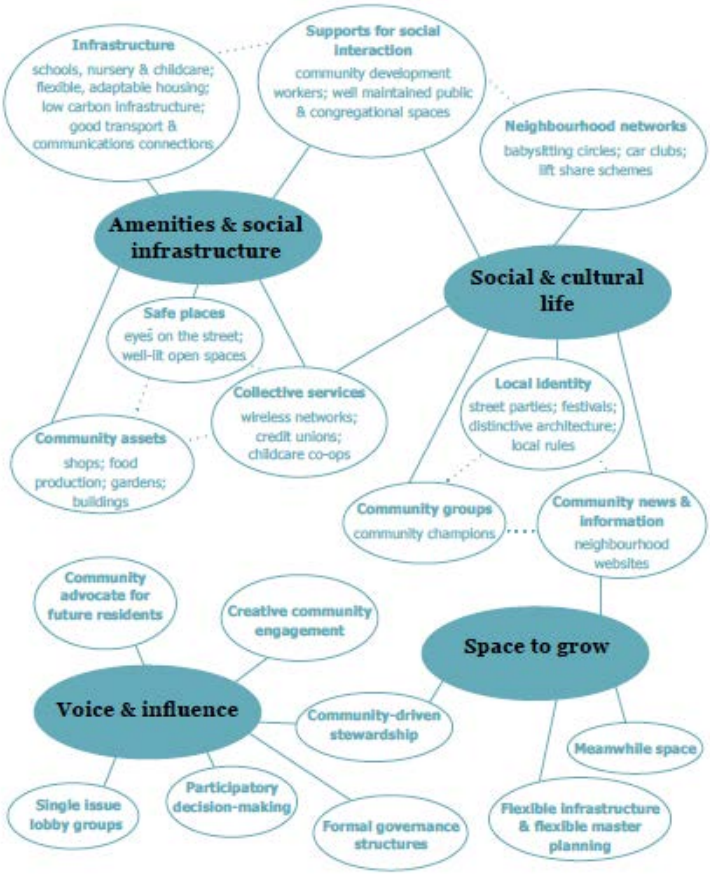
i. *"Amenities and Social Infrastructure*
ii. *Social and Cultural Life*
iii. *Voice and Influence*
iv. *Space to Grow / Change in the Neighbourhood*"

The opinions of Bramley *et al.* (2009) and the Young Foundation suggest, although independently, some common indicators of the quantifiable dimensions / aspects of the "Urban Social Sustainability". The common suggestive indicators are illustrated in Table 4. This framework, integrated with the public policy of governments, local institutions, other public agencies, and the private sector as well, shall help to understand the social needs and potential problems, which in turn shall suggest ways to improve the social supports and services to facilitate and empower society.



Source: Woodcraft, Hackett, & Caistor-Arendar (2011)

Figure 5 : Framework for Urban Socially Sustainability



Source: Woodcraft et al., (2012); Woodcraft & Dixon (2013)

Figure 6: Building Blocks for Urban Social Sustainability

Table 4: The Dimensions and Common Suggestive Indicators and Suggestive Measures of the Urban Social Sustainability (USS): Theoretical Approach

The Attributes	The Dimensions	Measurable Aspects	Common suggestive Indicators	Some Suggestive Measures
Social Equity	Amenities & social infrastructure	Availability and accessibility and of 'local' basic services	Provision of basic amenities (Health, Education), Adaptable Space, Local Integration, architecture of the Streets, Distinctive Character, Transport Link, Community Space,	Percentage households with piped water connections / electricity / sewerage network / toilet availability / sanitation / solid waste collections etc. Government expenditure per capita on core services Availability of Hospital, Schools, Transportation facilities, Firefighting service, Banks, Govt. Office etc.
Sustainability of Community	Social and Cultural life	Pride/Sense of Place; Safety and Security	Local Identity, Links with Wellbeing, neighbourhood, Local Facilities, Feeling of Safety	Availability of Cinema Theatre/ Auditorium/ Community halls / Stadium Religious tolerance / Tolerance for immigrants / Women treated with respect (1=low; 4=high) etc.
	Voice & Influence	Community Stability, Social Interaction, and Participation in Collective Groups	Willingness to act, Ability to influence	Liberty over choices in life / religions / trafficking in people and marriage to a child; demand for contraceptive met (percentage of women); Rights related to politics / Freedom to express oneself / Freedom of assembling / affiliation / Freedom of movement / Private rights to property (e.g., 0=low; 5=high)
	Space to Grow		Participation Social Enterprise Local Government	Per capita Revenue generation / capital expenditure; No. of Councillors per 1000 population; Voter participation rates by men / women; Voter turnout (%) etc.

***Source**: Bramley et al. (2009); Woodcraft, Hackett, & Caistor-Arendar (2011); Woodcraft & Dixon (2013); Miller, (2007)*

Panda, Chakraborty and Misra (2016) have also suggested the drivers or themes of 'Urban Social Sustainability' within the Indian context as well as the indicators that fall under each of these themes derived thereof by comparing and contrasting theoretical definitions, international standards, and Indian governmental/policy regulations (Panda, Chakraborty, & Misra, 2016). Table 5, in accordance with the opinion of Panda, Chakraborty and Misra (2016), depicts the common drivers or themes of 'Urban Social Sustainability' as identified by global and Indian initiatives, practices, etc.

Table 5: Common Themes of Urban Social Sustainability Framework as identified by Global and Indian initiatives: Practice

Dimensions	Themes	Themes identified by Global and Indian initiatives
Social dimension	Health	MDG, SPI, GUID, Global city indicator, CDB (ADB), IUSIL, FEEM SI, SSI Policy relevance with NSS
	Equity	MDG, SPI, CDB (ADB), SSI Policy relevance with NSS, Global city indicator, GUID, IUSIL
	Access to basic needs	SPI, GUID, Global city indicator, IUSIL, CDB (ADB), SSI Policy relevance with NSS
	Education	SPI, GUID, MDG, CDB (ADB), Global city indicator, IUSIL, SSI Policy relevance with NSS, FEEM SI
	Housing	SPI, CDB (ADB), Global city indicator, GUID, IUSIL, SSI Policy relevance with NSS
	Personal safety	SPI, CDB (ADB), GUID, IUSIL, Global city indicator, SSI Policy relevance with NSS
	Poverty	MDG, Global city indicator, CDB (ADB), IUSIL, FEEM SI, SSI Policy relevance with NSS
	Demography	CDB (ADB), IUSIL, FEEM SISSI Policy relevance with NSS
	Transport efficiency	GUID, CDB (ADB), IUSIL, Policy relevance with NSS
Institutional dimension	Local government	CDB (ADB), GUID, IUSIL, Global city indicator, SSI Policy relevance with NSS
	Governance and participation	GUID, IUSIL, CDB (ADB), Global city indicator, SSI Policy relevance with NSS

Source: Panda, Chakraborty & Misra (2016)

- SPI: Social Progress Index, The Social Progress Imperative (Stern, Wares, & Hellman, 2016);
- GUID: Global Urban Indicator Database (UN-Habitat, 2002);
- MDG: Millennium Development Goals (Millennium Project , 2006), (UN, 2006);
- CDB (ADB): Westfall & De Villa (2001)

- GCI: Global City Indicator (World Bank, 2011), (Bhada & Hoornweg, 2009));
- FEEM SI: FEEM Sustainability Index (Mattei, 2013);
- IUSIL: International Urban Sustainability Indicators List (Shen *et al*., 2011);
- Policy relevance with NSS (National Sustainable Strategy): (Town and Country Planning Organisation, 2011);
- SSI: Sustainable Society Index (Sustainable Society Foundation, 2017)

Conclusion

Consequently, by emphasising the social component of "Urban Social Sustainability", the relevant literature suggests some universal themes and indicators that are widely accredited by various global initiatives. The following Figure 7 illustrates the broad cataloguing of the attributes, dimensions, and universally accredited indicators (here termed as 'Common Accredited Indicators') in comparison with the "Common Suggestive Indicators" of "Urban Social Sustainability".

Urban Social Sustainability												
Attributes	Social Equity								Sustainability of Community			
Dimensions	Amenities & Social Infrastructure								Social & Cultural Life		Voice & Influence	Space To Grow
Common Suggestive Indicators	Provision of Basic Amenities, Modifiable space for street design and layout, transportation linkage, local integration, distinctive character, community space								Local Identity, Links With Neighbourhood, Wellbeing, Feeling Of Safety, Local Facilities		Willingness To Act, Ability to Influence	Participation, Social Enterprise, Local Government
Common Accredited Indicators	Health	Access to Basic	Housing	Education	Equity	Transport Efficiency	Demography	Poverty	Culture	Personal Safety	Governance And Participation	Local Government

Figure 7: Dimensions and Indicators of Urban Social Sustainability

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Adoption and Implementation of E-governance to Achieve Sustainable Development Goals in Education and Health in State Sectors in West Bengal

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ABSTRACT

With the nation-wide goals to achieve various sustainable development goals, it has become equally important for West Bengal to adopt and implement such sustainability development goals. This research investigates different aspects of e-governance in education and health in the state sectors in West Bengal to achieve the specific SDGs regarding education of high quality, that is, SDG-4 and health of good standard, that is, SDG-3. In the research, personal interviews were done to collect various views and perspectives of specific stakeholders who have adopted E-governance and implemented E-governance-based projects for both internal administration and external service delivery in multiple fields within the state sector of the government of West Bengal. The research analysed the responses on 14 parameters to conclude, on a least squares estimation basis, about the adoption principles and implementation strategies of those stakeholders and to conclude certain generalised adoption and implementation principles for the state sectors in West Bengal.

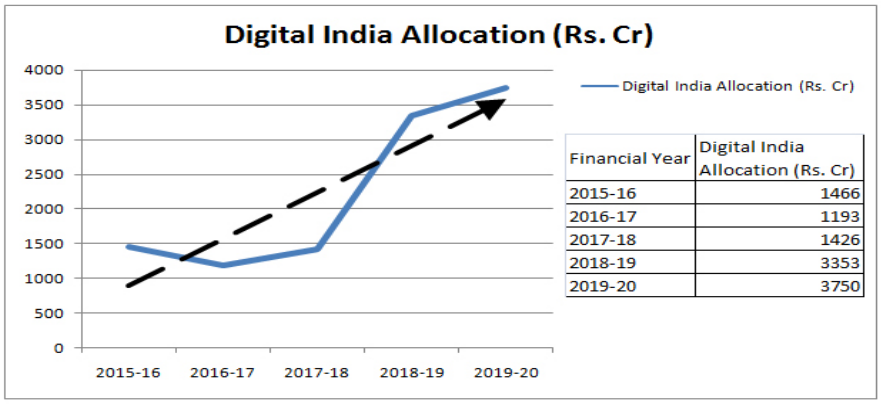
The research has studied to what degree a certain E-governance project has been accepted, new technologies related to that have been adopted, and, in terms of implementation, how far the technology-based service has been delivered to beneficiaries in multiple fields. Through a personal interview with government employees of two departments selected by convenience sampling, the researcher made an effort to assess how E-governance was welcomed by implementing agencies, departmental staff, stakeholders etc. in such different fields for the purpose of exercising administration. The outcomes depict that the maximum parameters measuring good governance and state sector employees' knowledge positively contribute towards sustainable development.

Keywords: *E-governance; Sustainable Development Goals; COVID-19*

Introduction

A general movement towards the use of Information Technology is being observed globally. E-governance is used as an effective mechanism to transform the way government delivers services. Interestingly, for a longer period of time in India, when it comes to globalization of technologies targeting superiority in innovation, as well as doubling the pace of upgrading

technology and tools of modern ICT (Information and Communication Technologies) the trend was more admissible in the private sector for a long time; but then, with the changing face of initiatives by the government of India, modernisations such as the designing of the National E-governance Plan NeGP 2006, Digital India 2015, the National Health Policy NHP 2017 and the National Education Policy NEP 2020, etc., there is a gradual shift in trend being observed also in the state sectors. At present, besides the private telecommunication industry, the state sectors in India are also seen as the largest investors in the Digital India campaign (NITI Aayog, 2022). The healthcare industry has been plummeting since 2015 at a Compound Annual Growth Rate of about 22% in India (KPMG, 2015), with nearly 50 lakh jobs since 2016 (Sarwal *et al*., 2021). India's online education market has grown at an almost 19% Compound Annual Growth Rate until 2021. (IBEF Report, 2021). Between 2015 and 2020, the Government of India has continuously raised budget allocations in information technology towards centrally sponsored schemes under the prestigious Digital India initiative, which describes the government's interest in the adoption and implementation of information technology-based digital services for all kinds of stakeholders.



Financial Year	Digital India Allocation (Rs. Cr)
2015-16	1466
2016-17	1193
2017-18	1426
2018-19	3353
2019-20	3750

Source: www.indiabudget.gov.in/ & www.meity.gov.in/integrated-finances

Figure 1: Year-wise Digital India Allocation between 2015 and 2020

Government-run or state-funded E-governance service deliveries actually started speaking on the opportunity of taking all stakeholders towards the government's modern administrative service deliveries, and as a result, regardless of the political inclination of the central government, stakeholders benefit from such technology driven deliveries that help in the exchange with the government. Adoption of e-government has increased in India, and at the same time, readiness for this adoption varies among states. There is a mighty increase in integrated services provided online by states in India, where West Bengal remains a leading state alongside Telangana, Andhra Pradesh, Gujarat, and Madhya Pradesh in the top five performing governments (UN E- Government Knowledgebase, 2020).

E-governance has many positive characteristics of its own, similar to what ideal and good governance should have. The success of the launch of E-governance depends on the successful delegation of those characteristics. The factors behind the potential success of E-governance have been analysed in the light of different characteristic factors of Governance

viz. Accountability, Transparency, Efficiency, Integrity etc, within the limited scopes of this Research paper and consequently, effort was made to establish how in India technological modernization can gain success fighting all odds like ignorance, lack of transparency, unreliability and irresponsibility. With an eye on the list of all the initiatives of the Government of India, analysis was made on the effects that those initiatives produced when implemented by the government of the State of West Bengal in different sectors.

India's recent years' economic agenda recognised the huge importance of ICT and E-governance for the twin objectives of economic restoration and comprehensive growth in achieving the Sustainable Development Goals in regard to Education and Health. In support, the government’s initiatives in flagship projects such as DBT (Direct Benefit Transfer), PM's Bima Yojana, PM Jan Arogya Yojana, as well as Digital Infrastructure for Knowledge Sharing (or DIKSHA) alongside the much-highlighted PM eVidya etc., all got noteworthy upliftment.

In March 2020, the Ministry of Health and Family Welfare under the Government of India released the newly formed Telemedicine Practice Guidelines. The guidelines allow all registered medical practitioners in India to make use of telemedicine tools to provide healthcare services in the country. Therefore, now it is possible to use telemedicine for medical treatment of the common people, all legally in the country, and thus march towards achieving universal standards of healthcare. Private hospitals in India are already using telemedicine technology for consultation purposes. For example, Medanta Hospital uses one all-inclusive telemedicine platform called 'Medanta eCLINIC' to provide virtual consultations. Also, Apollo Hospitals has successfully extended its e-consultation facility to treat patients who pursue medical care sitting at home. The Ministry of Health and Family Welfare has also started providing online medical sessions for non-COVID patients at AIIMS, New Delhi.

The worldwide pandemic-induced lockdown caused by COVID-19 has actually influenced the so-called education sector in a huge way. Therefore, to address the many challenges of spreading education, the Ministry of Human Resources Development (MHRD) has taken up many initiatives like remote or tele-learning systems for students, educators, and enduring learners at the same time in their quest for education. According to a UNICEF (2021) report on India, "school closures have obstructed 247 million children already registered in primary and secondary education and 28 million children registered in pre-schools and Anganwadi centers. This is in addition to the more than 6 million hapless children who had already dropped out of school for personal reasons before the Covid-19 crisis" (United Nations, 2020). In order to address this problem, the MHRD therefore initiated the Alternative Academic Calendar (AAC) in April 2020, designed by the National Council for Teacher Education (NCERT) for the benefit of primary and upper primary schools, as well as secondary and higher secondary schools. In those, teachers were given the privilege to teach using NISHTHA, DIKSHA, and ePathshala, which are national as well as state-level online platforms for education. Also, Massive Open Online Courses (MOOCs) were designed to encourage increasing numbers of study incumbents.

Literature Review

Sinha (2006) wrote in his book that in the last few years of the 20th century, there was a very fast growth of information and communication technologies with the discovery and spread of computing, which is user friendly and networking, which is robust. The use of electronics in government and business started only forty years ago in India. The advent of PC has brought a revolution to the work of both public and private offices.

Chaudhuri (2012) described that in India, E-governance and new technological adoption go side by side in a negotiation with no limit, and there is a conscious effort to hybridize technology with politics and people's culture. Since the establishment of the Ministry of Information Technology in 1999, and afterwards in 2002, E-governance was announced by the then Prime Minister of India to be one of the 15 most important enterprises of the nation. It was acknowledged that adoption and implementation of E-governance will bring efficiency, transparency, and liability to government-citizen interfacing and effective service delivery.

Shareef *et al.* (2011) pointed out correctly in their book that E-governance is something of highest interest to the common people of this nation, and therefore the most popular E-governance service is evidently the 'Government-to-Citizens' type.

Bwalya and Mutula (2014) acknowledged in their book that the use of information and Communication Technology is slowly taking centre-stage based on the drive by state sectors in developing countries to provide efficient and effective public service delivery that is responsive.

Muthuprasad *et al.* (2021) in their research paper have also discussed that since many educational establishments have stopped functioning during the COVID-19 pandemic, all over the world, thus endangering the academic planning of the government bodies, hence most of them now have shifted to online mode of providing education to keep with the academic activities. As a result, keeping pace with the change, most of the recipient end users (70%) opted to take the online classes in order to manage the curriculum during the lockdown period. As a result, the majority of the students, quickly adapting to the new environment, are now preferring to use their smart phones at home for tele-learning.

Sharma (2021) in her book has discussed that the number of TV channels for school education has massively increased from once 5 to now 12, thus transforming into 'one class, one channel' habitat, where now a dedicated channel for each of the grades is being served from 1 to 12. Some states like Chhattisgarh (Padhai Tuhar Duar portal), Kerala (KITE launched an education TV channel, Facebook page, and YouTube channel), Madhya Pradesh (mobile WhatsApp program called DigiLEP), and Maharashtra (The Learning from Home package over SMS and WhatsApp) also started initiatives locally.

Raman *et al*. (2021) in their report, acknowledged that online health care services and telemedicine have mixed outcomes, which are sometimes unexpected while other times useful due to varied human behaviour and diverse system responses. For example, telemedicine care was beneficial due to the continuity of care it could provide based on

technological advancements, which actually proved to be very effective in areas of lockdown during the COVID-19 pandemic period.

Narayanan (2021), in his book, has explained that a number of e-governance-based initiatives with the help of ICT were undertaken by Indian investigators to conduct research on the disease during the recent pandemic. Researchers from ISI Kolkata built a Deep Learning tool to screen COVID-19 virus. An AI-based-COVID detection application software was designed by DRDO's Centre for Artificial Intelligence & Robotics (CAIR) which they named ATMAN AI, and which uses chest X-rays (CXRs) that can classify the images into different types such as normal, COVID-19, pneumonia etc. The AarogyaSetu, a contact tracing app, was created by the government to create a database of people with the COVID-19 illness and with whom they came into contact. In just over a month after its release, 114 million users downloaded the app. In April 2020, the Health Ministry launched the platform called e-Sanjeevani, which made more than 3,00,000 consultations within just six months. On the parameter of the Universal Health Coverage (UHC) measuring index, which measures whether all people are receiving the health services as per need or not, whether quality is good, whether financial hardship is experienced in the process, etc., the index value of India has steadily increased from 27 (1990) to 42 (2010) to 47 (2019).

Objective of the Study

The research study has explored the perspectives of the different E-governance projects implemented in state sectors to identify, in the context of West Bengal, if the state is performing satisfactorily over time in regard to sustainable development in quality education and good health. Also, this paper analyses whether adoption and implementation of e-governance lead to the achievement of the required UN standardised sustainable development goals for quality of education and goodness of health for stakeholders.

Methodology

This study evaluates factors that affect the use of IT in the state government sector as well as the use of ICT to achieve specific goals such as the practice of online learning in the educational sector and telemedicine in the health sector, respectively, within the education and health sectors by the government. The research study has been carried out using both qualitative and quantitative methods with the help of primary and secondary data collected by the researcher. To validate such collected research data, the sampling survey method has been followed in this study. Primary data collection has been done by administering a comprehensive questionnaire to employees of the State Education Department and the Health & Family Welfare Department of the Government of West Bengal. Employees of both the School Education and Higher Education Departments in the education sector and those of the Department of Health and Family Welfare have been surveyed. The information was collected from different E-governance projects already running in the state sectors within a given time period. Only those projects that have been running for at least ten years have been taken as considerable projects that are running in the two departments. From among those projects, a group of projects are successful in terms of physical and financial status, and a

group of projects are not much of a success in terms of implementation due to lack of skills, lack of planning, irregular funding, irregular responses of citizen beneficiaries, etc. This study has carried out confirmatory factor analysis on the primary data collected in order to construe to what degree the respondents within a specific sample set approve any of the proposed objectives of the research study and also in what way the challenges for implementing an E-governance project can be overcome successfully, that is, by following proper planning, and thus subsequently how and what steps can be taken up for future projects by different State sectors in West Bengal towards successful E-governance project implementation. The research has reviewed the personal views of respondents implementing such projects and, as a result, made an effort to draw inferences on the availability of a proper planning algorithm behind strategizing and implementing such projects in terms of service delivery as well as funding for long-term running to call the projects successful ones.

In order to collect data from the respondents, personal interviews with a questionnaire have been conducted. This research has remained a cross-sectional research study, firstly considering the fact, that data is collected only from West Bengal, secondly, from selected departments of the state government, and thirdly, data is acquired only out of a specific time period, that is, between 2006 and 2016. Now, the logic of selecting a single state from the whole country rather than considering multiple states of India lies actually with the goal of eliminating the macro-environmental diversity that exists among states because of social, geographical, and cultural differences. Moreover, the collection of data from a fairly homogeneous environment is expected to further facilitate the control of probable effects cropping out from overpowering external variables. This research studies the contemporary situational impact that is caused as a result of different E-governance projects being implemented in the education sector. Again, the education department is selected by the researcher as a result of convenience sampling. 74 respondents, meaning those employees of the government department who are responsible for implementing smart education and administering necessary ICT tools for e-learning, have been selected from the teaching and administrative officials of the Education department. Another 73 sample populations of the Health and Family Welfare Department were selected who are responsible for the adoption of telemedicine technology to implement online health care, specially during the COVID-19 pandemic situation. Personal interviews with the officials through questionnaires and surveys of implemented e-governance projects at this level have been the primary source of data collected by the researcher from the mentioned departments.

There were 14 specific questions framed to measure parameters on planning, objectives, processing, strategizing, implementation, delivering, overall impacts, results, acceptability, effect on end users, scope of further development, evolution, impact on funding, and impact of future regulations. There are 7 hypotheses framed also on acceptance of e-governance, use of technology for service delivery, awareness of technology, difference in demand for technology, challenges, testing and development, and government funding.

Results and Discussion

Linear least squares regression was chosen for modelling and the output concluded that the model fit is good. Based upon rigorous statistical analysis of the 14 parameters, namely, X1 to X14 which are directly related to the 7 nos. Hypotheses, namely, H1 to H7 through least square regression of the two-sided distribution of obtained values, the following tabulated coefficient values were obtained –

Table 1: All 14 Parameters and their Values of Linear Equations

Parameters	Coeff. Least Sq. Estimation		Parameters	Coeff. Least Sq. Estimation
X1	0.271		X8	0.439
X2	0.148		X9	0.693
X3	0.731		X10	0.504
X4	0.874		X11	0.743
X5	0.918		X12	0.589
X6	0.796		X13	0.778
X7	0.836		X14	0.821

Source: Author's Estimation

The above table suggests the value of the linear equations made out of least square estimation and by that it was found that x1 = 0.271, x2 = 0.148, x3 = 0.731, x4 = 0.874, x5 = 0.918, x6 = 0.796, x7 = 0.836, x8 = 0.439, x9 = 0.693, x10 = 0.504, x11 = 0.743, x12 = 0.589, x13 = 0.778, and x14 = 0.821.

The required data filtration was done by performing normalization of the data. The data, which understandably is regarding the quality and preferences of life of a stakeholder of an implementing agency and is all about personal experiences and awareness, thus the data is not multi-variate normal and therefore the common test to examine univariate normalization, the Shapiro-Wilk test, has been performed on the dataset obtained against the 14 questions of the research survey. The univariate type of data considers only one variable at a time, and in a univariate analysis, several hypotheses are possible, and also tests of any partial subset of one or more predictor variables are possible with the considered complex Hypotheses in the research study.

The replies in the questionnaire are taken on a Likert scale in seven levels, that is, from the lowest level to the highest level. Here, from among the sample size, the set of respondents has been distributed into two separate groups on the basis of the order in which they have been surveyed serially. Those interviewees who have been interviewed as first, third, fifth, and such in the odd order have been grouped in the odd section. Similarly, those interviewees surveyed in even order of second, fourth, sixth, eighth, and so on serially have been grouped in the even section. The section consisting of the first, third, fifth, seventh, and so on respondents has been named the "odd answers' group" and the section consisting of the second, fourth, sixth, eighth, and so on respondents has been named the "even answers' group". These two sections of respondents, thus divided, have had their replies statistically

analysed to obtain distinct mean values and distinct standard deviation values. Those are then compared with one another, and the values of Cronbach's alpha and Pearson's Correlation are obtained. Considering, as per the thumb rule, that Cronbach's Alpha's max value is 1, in the research, a value above 0.7 reliability has been achieved. This apart, the Pearson value of 'r' credibly displayed that either there is a positive relation, such as when one variable increases, the other increases along with it, or else it depicts a negative relation, that is, when one variable increases, the other actually decreases, when it comes to the linear relationship between two research questions at any point in time. The two groups of replies collected from odd group answers (viz. the first, the third, the fifth, the seventh person and so on) and even group answers (viz. the second, the fourth, the sixth and so on) and the correlation between them have been calculated with the CORREL function of MS Excel, and the gotten Correlation coefficient is 0.836215. As per the Spearman-Brown reliability predictor, if the result of correlation is between 0.8 and 1.0, it designates higher internal consistency, and since the Spearman-Brown correlation value obtained is 0.9108, that indicates high consistency of the dataset. Apart from this, Guttman's reliability test, agreed to be another good way to test reliability, has been applied. The Guttman reliability, G-R coeff., is obtained as 0.888. Also, the weighted least squares method (WLSMV) for the confirmatory factor analysis (CFA) model of the ordinal dataset has been used by the researcher for data found to be non-normal and continuous. The odd and even replies of respondents are separately obtained to get the mean and standard deviation values. Then an unpaired t-test was carried out on the two samples for each of the questions to get the p-value. The p-value thus obtained for each of X1 to X14 is found to be less than the significance level. The Shapiro-Wilk W test value for each of X1 to X14 is approximately 0.8 and the p-value is never more than 0.001. So, all the null hypotheses have been safely rejected.

Secondary data related to several running E-governance projects in the state sector is obtained from various materials published, such as books, articles, and reports etc. by various academicians and internet surfing has been meted out regularly with the goal of getting current data. Those data are analysed in terms of funding, source of finance, political effect on the running of projects, the nature of adoption by the stakeholders at different levels of implementation, and the experience of such adoption in the long run.

As obtained from the statistical analysis of the data and responses, the least positive relationships can be observed in factors related to planning, objectives, and results. All these factors gave values less than 0.5 (a thumb rule says 0.5 or higher coefficients in least squares regression are always good). In real life too, when it comes to factors like planning and the objectives behind a project, there is always less clarity. Similarly, in regard to the result, there's always scope for debate. The respondent, while answering the questionnaire, quite humanly hesitated or faltered in marking those answers, and as a result, there remain marked differences in responses and wide variations in conceptualizing those factors. Even with a steady increase in funds, technology, basic infrastructure, and knowledge availability, there still remains a clear difference between demand and supply for running a project successfully

in both departments. For example, even though there are digital healthcare facilities run by the government in seven of the remotest districts of the state and even a floating healthcare system, it still fails to address the shortfall of one healthcare staff for five families. Similarly, although digital literacy under Bangla Siksha (Bengal's Education) has till date digitally transferred money for girl child's education for 68 lakh girls in West Bengal under its flagship initiative of Kanyashree Prakalpa, there are still high dropout rates of girls in the state at 49.9%.

Findings

The confirmation factor analysis process always assumes that the identified underlying factors of research are actually correlated to each other. It thus measures the degree of association existing between two hypotheses and thus across the related variables. Ideally, factor correlation must be <0.85 and that should be in the range between 0 and 1. By looking into the correlations between the factors, it can be concluded that, hypothesis related to the use of technology is found to be highly correlated with awareness of technology, and their Factor Correlation came out to be 0.642. And, hypothesis on awareness of technology is found to be strongly associated with the hypothesis on difference in demand for technology, where the factor correlation came out to be 0.731. On the other hand, government funding unfortunately has a negative association with awareness of technology as well as with differences in demand for technology. This concludes that awareness of technology makes use of technology popular in the state sector. Also, it is an accepted fact that not all divisions in a department have equal needs for technology, and accordingly, awareness of technology has been found to vary.

Findings of the research show that, though there are some limitations, information and Communication Technologies (ICTs) are helping in providing education of high quality and thus helping humans develop skills in order to make them suitable for the competitive global market, which serves smart education through e-Learning. The Education Department of West Bengal operates through different institutions such as, the Mass Education Extension and Library Services, School Education, Technical Education and Training, etc. West Bengal also envisions a plan to leverage EDUSAT to provide tele-education as a supplement to the schools. The State Wide Area Network (SWAN) has been built to provide state-wide intranet linkage that can leverage support in different administrative divisions in government departments. The State Data Centre (SDC) built to store and process all the data from all over the state and support the applications running to support services. In 2007-08, the state government started using the centrally sponsored ICT @Schools scheme and immediately applied computer education in 543 government-aided higher secondary schools with a budget of Rs. 0.4 billion. The yearly expense under the planned budget of the said department rose to Rs. 514.18 crore in 2017-18 from earlier Rs.108.7 crore of 2010-11(The Finance Minister, 2019, 2020, 2021). That was a 373% increase in budget for the Department of Education in the state of West Bengal. However, there is still a demand for higher funding, which is still unmet.

Similarly, it was found that in spite of the limitations in physical reachability, online health advice and telemedicine support actually proved a strong base of support to thousands of patients during the period of pandemic-related crisis, when lockdown and physical distancing had actually become a necessary regulation to avoid disaster. The State Government has augmented its planned Budget for the Health and Family Welfare Department to Rs. 5,530 crores in FY 2017-18 from earlier Rs. 899.3 crores, which was in FY 2010-11. That was more than 6 times increase. However, this still fell short of meeting the huge demand. However, to meet the gap, the government has given cover to more than 63 lakh families under the Rashtriya Swasthya Bima Yojona (RSBY). The number of hospitals empaneled under RSBY has also increased to 1,308 till 2017-18 (Open Budget India, 2018, 2019, 2020, 2021, 2022). This apart, the state government sponsored Swasthya Sathi scheme for more than 45 lakh families, which belong to different Self-Help Groups, ICDS Workers, ASHA Workers, Civic Volunteers Force, Civil defense Volunteers etc. apart from being selected contractual employees, cable TV operators etc. The Health department has developed the Stores Management Information System (SMIS) in order to digitalize the whole process of drug indenting, procurement, and related issues of medicines with the goal of eliminating the physical maintenance of ledgers and registers. There are 54 nos. of Mobile Medical Units functioning to provide curative services in remote and inaccessible areas of the state. Almost 20 lakh patients are annually benefited, from the hills area in Darjeeling to the forests of the Sunderban areas of the North 24 Parganas and even the now closed Tea gardens in the Dooars of Jalpaiguri, Alipurdaur and Darjeeling, as per reports on the portals of the respective departments.

Conclusion

The objective of this study being how the state is standing out in performance over a period of time in the context of sustainable development in quality education and good health, it was observed that awareness and knowledge base among the government officials who are delivering their duties in the said departments of health and education who are increasingly using ICT tools for delivering services. The adoption and implementation of E-governance in education and health have been accepted with much enthusiasm. But there are challenges, such as the availability of funds, which are often not proportionate to meet this enthusiasm and the increasing knowledge base of government officials.

It is, however, understood that in a developing country like India, where the literacy rate, as per the last done census, is 74.04% and 21.09% of the population is still living below the poverty level, when the Telecom Regulatory Authority confirms that almost 56% of the population uses the internet, it is surely an encouraging picture. But funding has always remained poor because the recent Rs. 3750 crore Digital India investment in the Indian IT industry, which already has a market valuation of more than USD 190 billion as estimated by the NASSCOM authority, depicts poor strategizing and a lack of planning to support and encourage the growth of revenues for the benefit of the Indian economy.

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Visualising Sustainable and Universal Access to Scholarly Information through the Prism of Open Access: A Selective Review

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ABSTRACT

Introduction: The existing model of research communication is tilted heavily in favor of a capitalist mindset wherein selective profit-making publishing establishments monopolize the lion's share of research publications and put a premium on access to the content of publicly funded research outcomes and thereby creating information starvation. As a viable alternative, the concept of Open Access has been doing the rounds. The present work is a selective review of existing literature on the research on Open Access and its different facets. **Methods:** The Library, Information Science and Technology Abstracts (LISTA) database was searched for the identification and selection of bibliographic details along with abstracts and keywords of relevant literature on OA practices. In the extracted literature, key concepts like "Open Access adoption", "Open Access publishing", "Open Access tools", and "Citation advantage of Open Access ", etc were singled out and a further Google Scholar search on these topics retrieved more related works. The literature thus selected was used to carry out the review. **Results:** The lack of a uniform OA adoption policy has resulted in variation in the adoption of OA across different disciplines, countries, institutions, publishers, and individual levels. Higher education and research institutes have welcomed OA and this is reflected in the adequate awareness of OA among academics and research scholars. At the country level, formulation and implementation of OA policy have not progressed much due to persistent misconceptions and misapprehensions about OA publishing. Article processing charges discourage the adoption of the open access publishing model among scholars. **Conclusion:** The review is expected to help understand the implications of OA not only in the ecosystem of universal access to scholarly information but also in the larger context of sustainable development goals 2030.

Keywords: *Open Access; Sustainable Development Goals; Open Access Tools; Gold Open Access; Green Open Access*

Introduction

Since the Second World War, there has been tremendous growth of research output in almost all the domains of human knowledge with special reference to science, technology,

engineering, and medicine (STEM). The tectonic shift from 'Little Science' to 'Big Science' (Fortin & Currie 2013) has been the cornerstone of development and is characterized by the involvement of groups of researchers under an institutional setup and supported by public funding. The benefits of research entail democratic dissemination of research output so that research results could be utilized for not only finding solutions to societal problems but also for furthering research as has been depicted in Ranganathan's 'Spiral of Scientific Method' (Satija & Chander, 2021).

But the existing model of research communication is tilted heavily in favor of a capitalist mindset wherein selective profit-making publishing establishments monopolize the lion's share of research publications and put a premium on the content whereby a selective elite, capable of paying an exorbitant price for the content, can enjoy the benefits of publicly funded research outcomes. This has undermined democratic dissemination and universal access to publicly funded research output and resulted in information starvation which is severely limiting further research initiatives across the globe.

Arguably, the Open Access Movement through the BBB declaration (Budapest in 2002, Berlin in 2003, and Bethesda in 2003) could be viewed as the earliest initiative to set the stage ready to challenge the capitalist mindset of research communication and put the Open Science Movement in proper perspective which resulted into surfacing of a number of concepts such as open access, open archiving, open data, open peer review, open evaluation, open source software, etc. Recognizing the power of these open standards in facilitating universal access to information for innovation and competition without barriers, UNESCO now advocates for Open Access (*Access to Information*, 2021), including free and affordable access to journals and books, and open archives for scientific information which is thought to directly contributes to the achievement of Goal 9 of Sustainable Development Goals (SDGs) (UNESCO, 2020).

The present work is a selective review of existing literature on the research on open access (henceforth OA) and its different facets. The review is expected to help understand the implications of OA not only in the ecosystem of universal access to scholarly information but also in the larger context of sustainable development goals for 2030.

Objectives of the Study

The objectives of the study are as follows:

- To understand the extent of adoption of OA across different disciplines, at country, institutional, publisher, and individual levels.
- To understand the new scholarly publishing business models and their sustainability based on the concept of OA.
- To find the efficacy of different OA tools and platforms in searching and finding OA resources.
- To try to know if there exists any citation advantage of OA resources over their traditional closed counterparts.

- To assess the role of Library and Information Science professionals in promoting OA within the institutional setup and beyond.
- To get an idea of the impact of OA on an overall free flow of information and thereby its role in supporting UNESCO's work on the promotion of universal access to information through Open Solutions.

Methodology

A two-tier exploratory search was made to find the relevant corpus of literature on OA for the review. In the first stage, a search was conducted in the Library, Information Science & Technology Abstracts (LISTA) database, hosted by EBSCO (Basic Search: EBSCOhost) for the identification and selection of bibliographic details along with abstract and keywords of relevant literature on OA practices. After an initial search, a number of filter options like peer-reviewed articles, articles published in English, academic journals, and the 2000- 2022 time span were applied to narrow down the search results to the most relevant literature. Duplicate entries along with editorial communication, letter to the editor, short communication, and book reviews were removed. Finally, 50 articles were found to be appropriate for the study. Abstracts and keywords of the selected articles were carefully studied for key concepts and in case of further clarification of the complexity of any research article, the full text was read in detail. In this way, key concepts like "Open Access adoption", "Open Access publishing", "Open Access tools", "Citation advantage of Open Access ", etc were singled out. In the second stage, for a comprehensive understanding of the contour of OA, a Google Scholar search was carried out on "Open Access adoption", "Open Access publishing", "Open Access tools", "Citation advantage of Open Access ", etc for further related works. The literature thus selected was used to carry out the review.

Literature Review

Adoption of Open Access

Adoption of OA at The University Level

OA presents itself in many hues such as OA journals, OA books, OA datasets, and OA repositories or archives. On the other hand, OA contents may present themselves as Gold OA, Green OA, Pale Green OA, and Grey OA (depending on the rights of the authors). Naturally, it is expected that there would be different patterns of adoption of OA. Hobert *et al.* (2021), while investigating the nature of adoption of OA in German research institutions, confirmed the growth of the OA share mirroring the international trend reported in related studies. Although subject-specific repositories were found to be the most prevalent type of OA, a steep increase in the percentages for both publication in full OA journals and OA via institutional repositories was also noticed. Is there any correlation between performance and effort Expectancy of faculty of a university and their adoption of OA scholarly publishing? This issue was investigated by NnennaOtubelu and Anunobi (2021) at five Nigerian state universities. Their findings showed that there is a high and positive relationship between performance expectancy and effort expectancy of lecturers and their adoption of open-access

scholarly publishing in state universities. They recommended that the management of the universities should reward the lecturers' performance through grants to enable them to engage more in open-access scholarly publishing together with the provision of more training and workshops on the use of open-access outlets to enhance the lecturers' capability to use such a system.

It is of paramount importance to understand the level of awareness, attitude towards, and acceptance together with the adoption of OA among the scholarly community at the university and research institute level covering both faculty and researchers.Towards this end, the research by Chewe *et al.* (2021) on scholars of the University of Zambia revealed that misapprehension about OA and the digital divide have been the major challenges to the adoption of OA. Although, neither was there any lack of awareness about OA among scholars nor were they hesitant about accessing OA contents. But a certain reservation for OA publishing was noticed. This could be due to doubt about the quality of integrating OA resources into libraries and managing OA funding (Whitt & Campbell, 2021). Sensitising the scholarly community at the university level may effectively increase the popularity of OA.

Gender and OA Adoption

The OA movement is touted to provide equitable access to scholarly content irrespective of gender, caste, financial and social status and to democratise research by providing equal opportunity. But, could there be any influence of gender inequality in adopting OA, especially in emerging countries? Or are female researchers underrepresented in OA journals? Vuong *et al.* (2021) investigated the extent of involvement of Vietnamese female researchers in OA publications in social science and humanities. They found that the number of women as first authors remained lower than men and contrary to Bayesian analysis, there was a negative association between Vietnamese female author participation and the likelihood to publish OA which might be due to the gender inequality induced by cultural and socio-economic factors. The mismatch in the trend was observed in hybrid journals where women are on par with men.

Geographical Distribution of OA Adoption

Beyond North America and major European countries, the growth and adoption of OA have been sporadic across the globe. The majority of small north European countries like Estonia do not have a national OA policy or financial support for OA publishing and there is a lack of awareness of OA among academics and researchers. Pendse (2021) in his article found that OA remains a robust complementary alternative to proprietary databases in Estonia. Estonian institutions have shown a keen initiative and interest in the development of OA sources. Dandawate and Dhanmjaya (2021) studied Open Access Initiatives in Western Asia. They found that even with support from international groups like EIFL and OpenAIRE, the region's open access market has not taken to the skies and lags behind that of more developed countries. Only Turkey and the United Arab Emirates (UAE) are exceptions among Western Asian states. Notably, Cyprus took the important initiative of instituting a national public OA policy.

Capturing the trend of use of OA books may consolidate the understanding of the difference in acceptance of OA books Vs their closed counterparts. While assessing the benefits of OA for scholarly books, Neylon et al (2021) showed higher geographic diversity of usage, higher numbers of downloads, and more citations for open access books across all strata. One very significant finding of their study was the confirmation of the positive role of open-access books in increased access and usage for traditionally underserved populations.

Institutional Repositories and social media as OA Dissemination Channels

Institutional repositories, especially open-access institutional repositories, can be potential hubs for democratic dissemination of carefully curated quality research contents of institutional research output to the associated faculty and research scholars. A thorough understanding of the factors that affect the implementation and effective use of the OA institutional repository would help to strategize properly. In this regard, Utulu and Ngwenyama (2021) did a multilevel analysis of factors affecting open-access institutional repository implementation in Nigerian universities and found that Institutional Repository implementation barriers evolved from global, organisational, and individual implementation levels in the research contexts. Side-by-side, the level of awareness of OA among academic staff and research scholars of a university would likely determine the acceptance, popularity, and effective use as well as satisfaction with the services of the institutional repository of that particular university. There could be different perceptions about OA and institutional repositories among scholars depending on the age of the users and the subject area they are interested in. All these issues were reflected in a study on the academic staff of a research-oriented Spanish university by Serrano-Vicente, Melero and Abadal (2016) where they found a consensus among academic staff on the need for OA as well as on making publications open access based on academic reward and professional recognition. But significant differences surfaced on the matter of the adoption of OA practices. Participation in OA practices was found to increase with the seniority of members of staff with tenure and positions of authority at the university. The services of institutional repositories were generally well accepted, although the intensity of engagement with repositories varied with the age and subject area of respondents.

Different social media platforms could act as supplementary diffusion channels for journal papers along with OA journal publications due to the speed of content delivery and a wide network of actual and potential target readers (Vílchez-Román & Vara-Horna, 2021). This may generate usage data at the article level and eventually would assist in judging the scholarship of an article. Vílchez-Román, Huamán-Delgado and Alhuay-Quispe (2021) while trying to prove that, Social dimension activates the usage and academic impact of Open Access publications in Andean countries applied Partial Least Squares – Structural Equation for modeling the information-seeking behavior, at the document level, found positive evidence for the path social → usage → citation, but a negative and nonsignificant association between the social dimension and citation.

OA and Institutional Ranking

Rankings of higher educational institutions and universities across the globe depend on a number of parameters and contribution to research is one such vital parameter which is mostly determined by the number of research publications in the form of journal articles in reputed and prestigious journals, conference papers, patents awarded to university faculty and researchers. In the case of a journal article, the number of citations accrued over time plays an important role not only in determining the worthiness of the article but may also come in handy in improving the overall score of a particular higher education institution on the global ranking list. OA gives an article global visibility, more readership and speedy dissemination over closed access articles and thereby helps to accrue more citations. Naturally, it is intriguing to know whether any relationship exists between open access presence and the ranking of universities onthe global stage. Ezema and Ugwuanyi (2021), While studying this relationship in the context of African universities, I found a highly significant positive but moderate correlation between open access presence and the ranking of African universities. They suggested that the science policy of African universities may be reviewed in line with open access initiatives to enhance the visibility and ranking of the university globally.

Open Access Publishing

As the OA practices gain a wider foothold among researchers and faculty due to their perceived benefits as opposed to the traditional restricted model of publication, dissemination, and access, it is a natural consequence that the traditional scholarly publishing industry would likely to venture into this uncharted territory either to remain relevant to the contemporary scholarly publishing business or to find out about new OA business models. But what are the main motivating factors that influence a journal's flipping to OA? Can bibliometric measures reflect the flipping of the journal? Do journal managers support the flipping process wholeheartedly or harbor certain reservations? In order to find answers to these questions, Bautista-Puig, López-Illescas and Moed (2021) interviewed a number of Spanish journal managers and found that the concept of OA is well known to them. An increase in the manuscript submission traffic, wider visibility, and internationalization are the most valued traits of OA and are playing decisive roles in convincing Spanish managers to switch to the OA publishing model. The managers also expressed their apprehension about the challenges in terms of the need for funding, lack of resources, capacity for technical support, and the creation of alliances. It may not be out of tune to pay special attention to the challenge of OA funding vis-a-vis the traditional scholarly publishing model which has flourished on hefty subscription costs and individual pay-per-view.

Also, there exists a complex equation between public policy for access to information, green open access, and copyright protection. Koutras (2020) examined the interplay between public policy and green OA through the prism of copyright protection and based on his study, proposed a theoretical framework that relies on the publishing model of open access and aims to develop a standard concerning stakeholders' interests through public policy.

On the other hand, public research funding for important projects expects the wider dissemination of funded research outcomes so that the extended research community along with common people can reap the benefits of research. Democratically this is only possible in OA publications, as the subscription-based access or pay-per-look access cost in traditional closed publications acts as the main barrier to the free flow of knowledge. Perianes Rodríguez and Olmeda-Gómez (2021) in their study, they tried to determine the access policies of the journals chosen by researchers benefiting from the European Research Council's funding to disseminate their findings. They found that the research proposed, reviewed, and funded by scientists delivered highly influential and visible results which while complying with OA publication recommendations and mandates, grantees preferred to publish their papers in non-gold OA journals.

Challenges of OA Publishing

Probably the most controversial issue regarding OA publishing is Article Processing Charges (APC) which authors are to pay to get their papers published in OA mode. Currently, there are no universally accepted standards to guide authors to source funds or negotiate the APC. Halevi and Walsh (2021) in their research found that the majority of research scholars, although supporting the concept of OA, expressed their concerns about too high APC, and in consequence, almost half of the respondents included anticipated APC costs in their grant applications. Only a handful of scholars would pay APCs using personal funds. Ironically, OA publishing, funded by article processing charges and implemented by most of the commercial for-profit large publishing bodies, is the preferred model with the highest OA output at present. Most of the time, APC is very high, yet due to the associated reputation of these publishing bodies among the research fraternity, this OA publishing model has been successful in terms of the number of OA publication (Jurchen, 2020). But this pay-to-publish OA model has the potential to further marginalise peripheral scholars and incentivize the development of sub-standard and predatory journals (Dudley, 2021). Bruns, Rimmert and Taubert (2020), while analysing the possible financial effects of Gold Open Access based on article processing charges, concluded that cost-sharing models would become an issue in the debate on how to shoulder a transformation toward Open Access.

Apart from article processing charges and subscription costs, there is another paywall i.e., the language paywall. English has almost become synonymous with the lingua franca of modern scholarly communication. Although there are other regional languages in which research papers are being published, their share remains minimal in comparison to the sheer volume of scholarly communication in the English language. This compels researchers from non-English speaking countries to either hire technical translation services to translate their manuscripts into English before submitting them to a reputed journal or run the risk of losing a wider global audience. There are two-fold consequences of this scenario- firstly, authors confront a hidden paywall in the name of translation services and secondly, global audiences would be deprived of an important piece of research work which may trigger repetition of the same research in different parts of the world. MoChridhe (2019), while nurturing the idea of linguistic equity as OA, suggested revisiting the 19th and 20th-century proposals for the use

of a constructed auxiliary language as an aid to global scholarship and feasible alternatives to traditional scholarly publishing with the help of contemporary developments in publishing technology and machine translation.

OA Publishing Models

Out of a number of OA publishing models, collaboration between research institutes and for-profit small or large publishers is the most common model. It would be intriguing to know if this collaboration has anything to do with the global visibility and academic influence of an OA journal. Asai (2021) examined the effects of the collaboration between research institutes and large and small for-profit publishers for the publication of 15 gold open access journals on the journals' internationality and academic influence and found evidence of improvement in the internationality and academic influence for most of the journals following the collaboration but this improvement was not dependent on the size of a publisher. But large publishers' acquisitions of small ones and collaboration with research institutes may strengthen the large publishers' presence in the open access journal market. This requires continuous monitoring.

Hollister, Bjork and Brower (2021) demonstrated a multi-institutional model for advancing open access journals when the open access journal Communications in Information Literacy (CIL) got migrated from Online Journals Systems (OJS) and a commercial web host to Portland State's Digital Commons (bepress) publishing platform, PDXScholar. This is an example of a viable, sustainable, and transformational publishing model where content migration from OJS to PDXScholar, post-migration actions to correct metadata, the introduction of functioning DOIs, and coordination with both free web and commercial indexers have been integrated under one roof.

The 'Austrian Transition to Open Access' (AT2OA), a collaborative project, to enable the large-scale transformation of publishing outputs from closed to open access (OA) in Austria, secured funding for a second four-year cycle from the Austrian Federal Ministry of Education, Science and Research to help establish a national OA monitoring data hub and transformative agreements with major publishers. This project materialised the launch of institutional OA publishing funds across the country and explored alternative publishing models together with the emergence of a nationwide network of OA experts.

The Issue of Publishing Lag

In both traditional print and contemporary electronic publishing, publishing lag is a burning issue in scholarly communication. Lin (2021) in his study tried to analyse the differences in the time of communication between articles published under the open access (OA) model and in the article in press (AIP) format based on the characteristics of publication lag and first-citation speed together with the exploration of the correlation of publication lag and first-citation lag to the journal evaluation indicators. He concluded that the OA mechanism can influence the lag of publication without forming a citation advantage. Moreover, the AIP mechanism affects citation speed but does not have any significant relation with publication

lag. So, it is clear from the analysis that OA and AIP mechanisms contribute to the efficiency of scholarly communication at different stages.

OA Publishing in Different Disciplines

At present, there are no uniform guidelines for OA publishing across all disciplines. But with the ever-increasing popularity of OA publications due to their global visibility, recognition and accelerated accumulation of citations, more and more universities, institutions and faculty members are seriously considering getting their papers published on OA platforms. This fact was proven by Torres and Manjarrez-Dominguez (2021) During a bibliometric analysis of open access (OA) and non-open access (non-OA) publications from the accounting departments of the University of Arkansas-Fayetteville, the University of Tennessee-Knoxville, and Auburn University wherein, a steady increase in the volume of published OA articles by professors of accounting was observed. Dhule (2021) studied the Directory of Open Access Journals (DOAJ), a database of fully open access peer-reviewed scholarly journals, to elicit the pattern of OA publications in law journals. He found that OA Law journals were published in 38 different languages and English was the most dominant language of publication. Double-blind peer-reviewed journals were in the majority. Demeter, Jele and Major (2021) analysed a cross-country and cross-disciplinary development of open access publishing from 2000 to 2019 covering seven world regions and nine scholarly fields. Their analysis revealed a significant increase in the overall share of OA journals over the last two decades but it also highlighted important differences across both the analysed world regions and disciplines. They noted a comparatively lower proportion of open access journals among the journals ranked in the Q1 quartile of Scopus database than in the general field except neuroscience. Barik and Jena (2021) applied Lotka's Inverse Square Law of Scientific Productivity to know whether the authors' productivity pattern of library and information science (LIS) open access journals adheres to Lotka's Law and to set a baseline for future studies on author productivity of LIS open access journals. They found the dominance of single authorship patterns in the LIS open access journals covered in this study. Selvam and Amudha (2020) did a bibliometric study on OA library and information science journals in the Directory of Open Access Journals. They identified 176 OA indexed journals and 53959 OA articles under Library and Information Science with differentiating elements like license Type, Journals published in different Languages, Country wise contribution, and Review systems.

Highlighting the other side of OA publishing, there are instances when early adopters of OA publishing like chemists lose the stream of publishing research in OA mode (Pagliaro, 2020). In order to instil a positive attitude towards OA publishing and encourage scholars belonging to different subject fields beyond chemical science to adopt OA, scholars need to be sensitised about enhanced citations, collaboration, job and funding opportunities.

OA Publishing in Different Countries

Footprints of traditional core countries with a very high rate of research publications and enviable journal portfolio are well documented and reflected in Journal Citation Report by Clarivate Analytics or Scopus database by Elsevier over the years, But what about the

visibility of contributions from the periphery or semi-periphery countries? Barik and Jena (2021) studied the Directory of Open Access Journals as of 31st March 2020 to find that the contribution of India to open access journals in the world stood at only 1.97%. Can OA papers improve the visibility of research in these countries? Which disciplines have contributed the majority of OA papers? What is the status of OA publishing policy at the government level in these countries? To find answers to these questions, Macan, Škorić and Petrak (2020) studied and analysed papers of Croatian authors published in 2017 from Web of Science Core Collection citation indexes with special emphasis on OA papers. They found the overall prevalence of OA papers (74.4%) over non-OA papers. Croatian journals were thickly populated with OA papers and humanities and social sciences contributed a lion's share to it. Most of the OA papers in humanities and social sciences were written in the Croatian language, although, the majority of papers including those in Croatian journals were written in English. This may be due to the desire to have a wider reader base. Besides, most of the Croatian journals were found to be non-commercial OA journals and receive government subsidies for being OA and for not demanding any article processing charge. So, OA might enhance the international visibility of journals from the periphery or semi-periphery countries.Tracking OA journal article use patterns may throw light on a host of issues such as demand for the type of resources (based on time of publication), languages in which articles are being published, diversity of users, etc. In one such study, Pölönen *et al*. (2021) analysed the aforementioned parameters based on use of open access articles on the Finnish Journal.fi platform to find that apart from students, researchers, and teachers, there are private citizens, journalists, civil servants, entrepreneurs and politicians who regularly access OA Finnish journals both in English and Finnish. Moreover, not only new publications but also there exists a large reader base of older materials, especially among students. They concluded that open access to publications in national languages is vital for the local relevance and outreach of research.

Longevity of OA Journals

Amid the proliferation of OA journals, a pertinent question may be raised about the longevity of such journals. Starting a new OA journal seems to be easier than maintaining the active and ethical publication status of that journal as most of the time OA journals do not have strong financial support for their upkeep. A weak financial backing may force an OA journal to disappear from the scholarly arena. Laakso, Matthias and Jahn (2021) studied this phenomenon and found 174 OA journals covering all major research disciplines that, through lack of comprehensive and open archives, vanished from the web between 2000 and 2019 and raised concern for the integrity of the scholarly record and highlighted the urgency to take collaborative action to ensure continued access and thereby prevent the loss of more scholarly knowledge.

Open Access Tools

The problem of searching and identifying OA articles accurately in the least possible time, especially when the request for articles comes from an interlibrary loan (ILL) arrangement, has led to the search for efficient OA search tools. With the advent of Information

Communication Technology (ICT), several internet browser extension tools have surfaced to help information seekers find OA versions of scholarly articles that are generally kept behind a paywall by for-profit entities.Open Access Button, Lazy Scholar, Kopernio, and Unpaywall are some of the most popular and frequently reviewed browser extensions. Are these tools user-friendly? Do they require a user to invest considerable time to get familiar with their mode of operation? To find answers to these questions, Azadbakht and Schultz (2020) conducted a usability study of the browser extension tools involving undergraduate students and faculty of a large research university in the USA. They noticed that both students and faculty preferred simple, clean design elements and straightforward functionality in browser extensions that enabled them to use the tools with limited instruction. Participants familiar with other browser extensions preferred tools like Open Access Button, whereas those with limited or no exposure to other extensions preferred tools that load automatically, such as Unpaywall. On the other hand, Determining the comparative efficacy of these tools could help us to select the best OA search tool/s according to situational requirements. Duffin (2020) compared six OA search tools such as OAIster, Open Access Button, OpenDOAR, JURN, Google scholar, and Google and found that both Google and Google scholar outperformed the rest but the very large number of retrieval led to some irrelevant documents. Schultz *et al.* (2019) while experimenting with the efficacy of OA finding tools against Google Scholar, noted the successful hits the tools registered and advocated their inclusion in searches for OA versions of scholarly contents.

Retail websites for books such as Amazon, usually deploy a recommender system to recommend the most relevant offerings after collecting data about their customers and at the expense of their privacy. This could be viewed as a kind of unethical practice. As an alternative, Snijder (2021) used a Text Mining algorithm to find the most important themes of an open access book or chapter as well as closely related books. The algorithm opened up many possibilities such as finding connected books across languages, using the algorithm for several use cases, not just recommender systems, creating benchmarks for publishers, or creating a collection of connected titles for libraries are other possibilities.

OA Citation

There is a long-standing debate on the citation advantage of OA articles versus closed-access articles. OA publishing, with different flavours, may influence citation advantages differently when compared with non-OA articles. Sotudeh, Arabzadeh and Mirzabeigi (2019) in their study compared the OA models' (Green-only OA, Article Processing Charge-only OA, and Green-Article Processing Charge OA) citation performances to non-open access (NOA) model's and investigated the relationship between the quantities of their papers. The outcome of their study established citation advantage over the NOA articles, despite their lower number and the mixed APC-Green, which gained the highest citation compared to the other access models. But the negative association between Green OA and APC-funded OA in terms of the greater number of Green OA articles than APC-funded OA articles signifies the popularity of Green OA articles over others. Basson, Blanckenberg and Prozesky (2021), in another study, conducted a bibliometric study to investigate whether OA articles published in Directory of

Open Access Journals (DOAJ) listed journals experience a citation advantage in comparison to subscription journal articles, specifically those of which no self-archived versions are available. They noticed that OA journal articles experienced a citation advantage in very few subject areas and, in most of these subject areas, the citation advantage was found on only a single measure of citation advantage, namely whether the article was cited at all. They concluded that access status accounts for little of the variability in the number of citations an article accumulates.

Comparative studies could be used to understand the most economic OA model with the best citation rate. To this end, Zhang and Watson (2017) compared the citation counts of articles published through gold and green models as reflected in the Web of Science database. They found that citation rates were comparable for green open access and non-open access articles, but citation rates for gold open access articles were lower. Although, among gold open access articles, citation rates were highest for open access journals with article processing charges. They concluded that green open access is the most economical approach to comply with open access policies and that it provides researchers with at least as much research impact as gold open access.

Role of Library and Information Professionals

Library and Information Science professionals, owing to their nature of work and responsibilities as custodians and disseminators of knowledge resources, especially at the university and research institute level, may bring significant differences in the mindset of the larger research community and sensitize as well as influence their decision towards adoption of OA practices in accessing, publishing, and disseminating research results. Now, for this to happen, it is required to assess the preparedness of LIS professionals and their mindset toward OA adoption. Borteye *et al*. (2021) undertook a study to examine the use of open access journals by librarians in Ghana to establish the familiarity, attitude, and benefits of open access journals among librarians in Ghana. It was established in the study that librarians in Ghana are aware of the benefits of OA journals but are not committed to publishing their works in OA journals. The more the librarians embrace OA by using OA resources and disseminating their research through OA mode, the more they will feel comfortable with OA ideas and in turn will promote OA culture among scholars.

The concept of OA has changed the role of academic librarians from gatekeepers of knowledge to gate openers. It would be interesting to know whether professionals in the librarianship profession have changed their attitude towards OA or not. Are they ready to accept OA as the new normal? Results of a survey on UAE librarians by Boufarss and Harviainen (2021) revealed that librarians are aware of OA and are reinventing their role as gate-openers along with supporting OA by managing OA infrastructure. Librarians are aware of OA and its pitfalls, such as predatory journals. Most librarians educate users on the use of OA resources and OA publishing as well as predatory publications and at the same time, they are harnessing and marketing OA resources alongside paywalled resources.

Discussion

As there is no uniform OA adoption policy, variations in the adoption of OA have been noticed across different disciplines, at the country, institutional, publisher, and individual levels. Chemical Sciences have been among the early adopters of OA. Although in the later period significant decrease in the OA mode of publishing has been noticed. Higher education and research institutes have shown a healthy trend in OA adoption. Adoption and implementation of OA policy at the university level would sensitise the stakeholders to participate in accessing as well as disseminating research works in OA mode (Narayan & Luca, 2017). At the country level, apart from North America and Europe, there has not been much progress in formulating and implementing OA policy at the government level. Yet the review finds adequate awareness about OA among academics and research scholars. Although, there persist some misconceptions and misapprehensions about OA publishing (Corbett, 2009; Morris & Thorn, 2009), with proper training and discussion, the misconceptions could be ironed out. At the author level, the gender inequality in terms of the lower representation of females as the first author needs to be addressed.

Article Processing Charges in open access publishing have been the bone of contention (Togia & Korobili, 2014; Mischo & Schlembach, 2011) and it undermines the very foundation of equitable access to information irrespective of cast, creed, geographical location, and financial capability. Open access institutional repositories, archives, and academic social networking platforms could be considered alternatives for disseminating research results, so that the dependency on for-profit publishers could be avoided (Beverungen, Böhm & Land, 2012).

Conclusion

The monopoly and severe restrictions exercised by a handful of for-profit industry players at different stages of academic and research publication as well as dissemination have been challenged by the Open Access movement. Several stakeholders at different points in time voiced their concern about the inaccessibility of reports of public-funded research in the form of journal articles and conference papers that are being published by for-profit industry behemoths and put behind a paywall. This arrangement has created an artificial class of elites who by virtue of their financial power are privileged to access the restricted contents and thereby disrupting the free flow of information to every nook and corner of the world and depriving human civilisation of the possibility of giving birth to new innovative ideas based on the outcome of completed and on-going research, be it in science, social science or the humanities. Open access and its sister concepts such as open data, open educational resources, and open peer review are being seriously considered as the solution to the problem with traditional scholarly publication and dissemination practices. Perhaps, government initiatives on a strong OA policy framework would, in the long run, prove to be strong support and a foundation for democratic decentralization of information for education, research, and development. UNESCO’s Sustainable Development Goals 2030 could give a fillip to the Open Access Movement and hopefully bring a new paradigm shift where equitable access to information would fuel future growth and prosperity.

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An Empirical Evaluation of Environmental, Social and Corporate Governance (ESG) Disclosures on the Select Public Sector Enterprises in India

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ABSTRACT

Environmental, Social and Corporate Governance (ESG) factors provide the quality management of the company, the culture of the company, the risk management of the company and other characteristics of the company. In the present study, the ESG adaptation of 87 Indian PSEs has been measured by developing the ESG Index. The aims of this study are to select of ESG factors, evaluate the current position of select PSEs on ESG reporting practices, highlight the position of sample PSEs on disclosure practices of ESG and explore the unit-specific determinants (if any) that may explain the variation in proactiveness among the sample units. The score/weightage assigned to ESG factors on the basis of their importance in the ESG disclosure practice of sample PSEs. Battelle Environmental Evaluation System (BEES) has been used for the distribution of total scores among all the indicators and their sub-indicators on the basis of their importance. In this study, each factor has some sub-factors, and the total score was allotted among the sub-factors under each factor on the basis of its anticipated importance according to the Battelle Environmental Evaluation System (BEES). To ascertain the quantitative and relative effect of different variable factors on the overall ESG score of different PSEs', multiple linear (OLS) regression analyses (Linear Enter model) have been made and subsequently tested through the SPSS statistical package. The study period was the financial year 2017-2018. In the present study, the highest score for overall ESG disclosure is 73.70% and the lowest score is 14.4%. In the present study the regression analysis showed that Net sales, Total expenses, Profit after tax, Current liabilities and provisions, Total assets, Amount spent on CSR activities during the year, Profit before taxation and Paid up equity capital (net of forfeited equity capital) have significant positive effect on the extent of percentage of Overall ESG disclosure score. The sample PSEs with higher Total expenses, Profit after tax, Current liabilities and provisions, Total assets, Amount spent on CSR activities during the year, Profit before taxation and paid up equity capital (net of forfeited equity capital) are more ESG proactive. ESG disclosure would not only demonstrate companies' committed approach towards the community and society at large, but also drive a company towards gaining competitive advantage in the long run. ESG disclosure performance of select PSEs' can be improved by Implementation of coherence legal structure has been implemented by Central Government and related By-laws have been framed by State Government for Environment related issues, Social accounting should be introduced in the enterprises and implement sound public governance system.

Keywords: *Environmental performance; Social Issues; Corporate Governance; Index; Indian Enterprises*

Introduction

At present, the number of companies reporting information relating to ESG performance has increased very significantly. Environmental, Social and Corporate Governance (ESG) factors provide the quality management of the company, the culture of the company, the risk management of the company and other characteristics of the company. For increasing the sustainable diligent advantage (i.e., business risk) and decreasing operational or reputational risks (i.e., financial risk). Companies are required to maintain definite relations with key non-financial partners like workers, consumers, society, and the government. ESG performance of a company may be objectively measured based on specific indicators, these are playing as evidence to assess the corporate governance of partners' relations with ESG disclosure (Boffo & Patalano, 2020). ESG factors include the risks and opportunities that businesses face based on ESG issues. It is worth mentioning that powerful governance systems, suitable executive control and top-class of clarity are among the factors likely to differentiate the act of corporate in long run (Maher & Anderson, 2000). Based on literature survey and normally accepted norms. This study focused on three major factors (Environmental, Social and Corporate Governance) and some important sub-factors. In the present research paper, to assess and analyze the degree of ESG execution of various companies the ESG Index has been developed for assigning weightage to various ESG issues.

Literature Review

Very few studies focused on the presentation of Environment, Social and Governance factors. In some studies, unit specific determinants have been purely theory driven, such as, those conducted by Greening of Industry Network, Ashford and Meima (1993); Welford and Gouldson (1993); Fiksel (1994). For framing the social factors, they evaluated three different research providers, which were Deloitte and Touche, KPMG and Pacific Sustainability Index (PSI) Scoring Sheet. They had added 20 social factors. Then General; Employee; Diversity, Opportunity and Human Rights; Customers and Communities; and Integrity and Ethics had been created for the distribution of 20 social factors. Energy, Water, Materials, Pollution and Waste Management and Others are the group's name of 'Environmental' disclosure factors. Chin, Jennifer and Taylor (2007) in their study of CTBL disclosure practice highlighted on the 60 disclosure items following the Global Reporting Initiative (GRI) Reporting Guidelines (2002). The 'social' indicators in the study of Chin, Jennifer and Taylor (2007) were primarily adapted from the 2002 GRI Guidelines. However, a few researches have awarded score to performance indicators on the basis of their merit of overall proactiveness (Rice, 1993; Russo & Fouts, 1997; Gupta & Goldar, 2003; Wu, Chan & Shen, 2004; Zhu & Sarkis, 2004; Zutshi, 2006). Global Environmental Management Initiative (1998) arguing in the same tune, put weightage of each performance level based on priority during the evaluation of environmental performance. In the study of Gupta and Goldar (2003), the scored allotted to different factors were differing significantly among the organiations' on the basis of their intrinsic characteristics. Wier *et al.* (2005) also used calculated environmental impact indices to create one environmental activity score for each family variety and product variety. Sahut and Descomps (2015) had concluded a non linear relationship between news based scores in ESG factors and the month wise returns of stock market in Switzerland, US and UK. Syed

(2017) in his study on Environment, Social and Governance (ESG) criteria and performance managers had conducted a questionnaire survey among 1400 managers who are involved in the investment process. To examine the association between several unit specific determinants (independent variables) and the extent of organisational proactiveness (dependent variable), diverse statistical analyses have been made by various researchers (Gates & Germain, 2010; Chin, Jennifer and Taylor, 2007.Kumar *et al.,* (2016) in their study on ESG indicators and risk –adjusted activities: a new numerical model had introduced ESG risk premium model which was a quantitative model for establishing the correlation between performance and volatility of stock return. Torre, Mango and Leo (2020) in their study showed that the performance of Eurostoxx 50 companies does not affected by their ESG commitments. In some studies the matched-pair statistical procedures have been used to test the difference between ESG performance scores of two country locations or two /more groups of sample firms. Some have relied on ANOVA, Z-testing and chi-square testing, while student's t-test has been used by some others. Bivariate statistical analyses have also been used by some researchers.

Gap Analysis

- Very few studies have been found which have attempted to assess the existing status of the corporate entities on incorporation of the ESG issues;
- No study in Indian perspective has been found where ESG issues have been evaluated quantitatively and ESG indicators have been identified;
- Though there are very few studies in global perspective, where proactiveness of corporate entities in disclosing ESG issues have been empirically assessed, whereas hardly any such study is found in case of Indian corporate sector;
- Even, not a single study is found where unit specific determinants have been attempted to explore that may explain the variation in proactiveness among the units.

Objectives of the Study

The important objectives of the present study are:

- To evaluate the proactiveness among the select PSEs about ESG factors.
- To select ESG factors and to examine the performance of select PSEs on ESG disclosure practices.
- To analyze empirically to which extent the select PSEs are proactive in disclosing ESG factors.
- To explore the unit-specific determinants (if any) that may explain the variation in proactiveness among the sample units.

Methodology

Sample Design

The present research work has surveyed 87 selected Central Public Sector Enterprises (CPSEs) i.e. selected 5 Maharatna CPSEs of India, comprising 5.7% of total 87 CPSEs; selected 14 Navratna CPSEs of India, comprising 16.1% of total 87 CPSEs; selected 50

Miniratna Category I CPSEs (of India, comprising 57.5% of total 87 CPSEs; and selected 18 Miniratna Category II CPSEs (as of India, comprising 20.7% of total 87 CPSEs.

Selection of indicators

ESG indicators include risks and opportunities that businesses face based on ESG issues. In the long run, powerful governance, proper executive domination and top clas of transparency are the factors that can comprehend corporate performance. Based on the literature survey and normally accepted norms, the study concentrated on three major factors which are Environmental, Social, Corporate Governance and some major sub-factors which are presented in the subsequent section.

Assignment of Score

This study considered ESG disclosure of the sample PSEs. The score/weightage had been allotted to all three indicators on the basis of their inherent significance in ESG disclosure performance for all the sample PSEs. The highest attainable allotted score/weight for every factor has been mentioned in Table 1.

Table 1: The System Relating to Indicator Wise assignment of Scoring/ Weight

Primary Indicator	Score/Importance
Environment	400
Social	300
Corporate Governance	300
Total	**1000**

In this study, every factor has some sub-factors. On the basis of inherent importance as per the Battelle Environmental Evaluation System (BEES), the maximum score was administered to every sub-factor of each major factor. As it was personalised, but it was not unavoidable (Wallace *et al.*, 1994). It can be stated here that some editing was made, as per the interaction with the educator, auditing personnel as well as corporate officials working in the field of finance, after creating the scorecard. On the basis of past empirical studies, it has been framed a weighted disclosure index with some alterations to measure the level of corporate ESG disclosure. The quantification for the level of disclosure was rated as follows:

- If a company did not disclose any item, then no score was assigned,
- The score was assigned based attributes like comprehensiveness, clarity, relevance, etc.; if a company disclosed any item then the score was assigned.

The weight is assigned to each of the factors or disclosure items on the basis of their relative importance in total disclosure practice. The present study has subdivided the maximum achievable score under each category (including sub-categories). The ESG disclosure score value for each of the indicators and sub-indicators has been shown in detail in Table 2.

Table 2: Scoring of ESG Disclosure Factors

ESG Indicators		**Score**
1	**Environmental Indicators**	**400**
1a	**Materials:**	**40**
1a(i)	The weight or volume of Materials used	20
1a(ii)	Percentage of recycled materials used as input	20
1b	**Energy:**	**30**
1b(i)	Consumption of Direct energy as the primary source	6
1b(ii)	Consumption of Indirect energy as the primary source	6
1b(iii)	Developments of Conservancy and efficiency improvements to save energy	6
1b(iv)	Proactiveness to provide energy-saving or renewable energy-based products and services, and decreases in energy requirements as a result of these proactiveness	6
1b(v)	Actions to decrease indirect energy use and reductions achieved	6
1c	**Water:**	**30**
1c(i)	Use of water through source	8
1c(ii)	Withdrawal of water significantly affects the Water sources	7
1c(iii)	Water recycled and reused in Percentage and total volume	15
1d	**Biodiversity:**	**20**
1d(i)	Area and volume of land occupied, leased, managed in, or surrounded to, reserved areas and areas of high biodiversity value outside reserved areas	4
1d(ii)	Details of important effects of activities, products, and services on biodiversity in secured areas and areas of increasing biodiversity value outside secured areas	4
1d(iii)	Protection or restoration of habitats	4
1d(iv)	Controlling effects on biodiversity by the policies, recent actions, and plans for future	4
1d(v)	Number of IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk	4
1e	**Emissions, Effluents, and Waste:**	**50**
1e(i)	The volume of direct and indirect greenhouse gas discharge	5
1e(ii)	Volume of discharge of Other relevant indirect greenhouse gas	5
1e(iii)	Initiatives to reduce and reductions achieved in greenhouse gas emissions	5
1e(iv)	Weight of ozone-depleting substances emissions	5
1e(v)	Important air discharge by type and weight of NOx, SOx, and other	5
1e(vi)	Quality and destination-wise total water discharge	5
1e(vii)	Different types and disposal methods wise weight of waste	5
1e(viiI)	Significant spills in total number and volume of	5
1e(ix)	The volume of transported, imported, exported, or treated waste deemed hazardous and the percentage of transported waste internationally shipped, on the basis of Basel Convention Annex I, II, III, and VIII	5
1e(x)	biodiversity value of water bodies and Related habitats are significantly affected by the reporting organization's discharges of water and runoff and the identity, size, protected status	5

1f	**Services and Products**	**50**
1f(i)	The extent of impact mitigation and Initiatives to reduce environmental effects of products and services	30
1f(ii)	Reclaimed by category of Percentage of products sold and the materials use for packaging	20
1g	**Compliance:**	**60**
1g(i)	For disobedience with environmental laws and regulations the noteable fines in monetary value and the total number of non-monetary sanctions	**60**
1h	**Transport**	**40**
1h(i)	Transporting products and other goods and materials and transporting members of the workforce used for the organization's operations have Significant environmental impacts	40
1i	**Overall:**	**30**
1i(i)	Types of total expenditures and investments for protecting the environment	30
1j	**Environmental Assessment by the Supplier**	**25**
1k	**Grievance Mechanisms of Environment**	25
2	**Social Indicators**	**300**
2a	**Labour Practices and Decent Work:**	**100**
2a(i)	Employment	15
2a(ii)	Relations between Labour and Management	15
2a(iii)	Health and Safety are related to the occupation	15
2a(iv)	Training and Education for Employees	15
2a(v)	Diversity and Equal Opportunity for women employees	10
2a(vi)	Women and Men employees are paid equal remuneration	10
2a(vii)	Labour Practices have been assessed by the Supplier	10
2a(viii)	Grievance Mechanisms for Labour Practices	10
2b	**Human Rights:**	**100**
2b(i)	Investment in protecting human rights	10
2b(ii)	Non-discrimination between different types of employees	10
2b(iii)	Collective Bargaining and Freedom of Association of labours'	10
2b(iv)	Appointment of Child Labour	10
2b(v)	Forced or Compulsory Labour to workers	10
2b(vi)	Security Practices are adopted for employees	10
2b(vii)	Indigenous Rights for workers	10
2b(viii)	Assessment of Human Rights	10
2b(ix)	Human Rights are Assessed by the Supplier	10
2b(x)	Grievance Mechanisms of Human Rights	10
2c	**Society:**	**60**
2c(i)	Local Communities	9
2c(ii)	Anti-corruption	9
2c(iii)	Public Policy	10
2c(iv)	Anti-competitive Behaviour	8
2c(v)	Compliance	8
2c(vi)	Assessment by the Supplier for Impacts on Society	8

2c(vii)	Impacts of Grievance Mechanisms on Society	8
2d	**Product Responsibility:**	**40**
2d(i)	Health and Safety of Customer	8
2d(ii)	Labeling on Product and Service	8
2d(iii)	Marketing Communications	8
2d(iv)	Customer Privacy	8
2d(v)	Compliance	8
3	**Corporate Governance Indicators:**	**300**
3a	**Board of Directors:**	**100**
3a(i)	Board size	10
3a(ii)	Percentage of outside directors	10
3a(iii)	Percentage of independent directors	10
3a(iv)	Presence of nominee directors	10
3a(v)	Presence of non-executive or promoter chairman	10
3a(vi)	Presence of promoter on board	10
3a(vii)	Total number of directorships held by independent directors	10
3a(viii)	Number of board meetings held	10
3a(ix)	Percentage of board meetings attended by independent directors	10
3a(x)	Percentage of independent directors who attended AGM	10
3b	**Ownership Structure and Investor Relations:**	**70**
3b(i)	Percentage of promoter ownership	19
3b(ii)	Percentage of foreign institutional ownership	19
3b(iii)	Percentage of domestic financial institution ownership	16
3b(iv)	Percentage of dispersed ownership	16
3c	**Audit Committee:**	**70**
3c(i)	Size of audit committee	19
3c(ii)	Percentage of independent directors	16
3c(iii)	Presence of executive directors in audit committee	15
3c(iv)	Number of meetings held	20
3d	**Auditor:**	**60**
3d(i)	Percentage of non-audit fees to total payment to auditors	15
3d(ii)	Top auditor in terms of audit fees	15
3d(iii)	Top auditor in terms of audit clients	15
3d(iv)	Change in auditor from last year	15
Grand Total		**1000**

The present study assessed the sum total of the ESG disclosure score of the sample units on the basis of ESG reporting in terms of the three primary indicators. The score has been assigned on the basis of attributes like extensiveness, clarity, relevance, etc. The following formula was applied to obtain ESG Disclosure Score (ESGDS).

$$ESGDS = \frac{ScoreObtained}{MaximumAchievableScore} x100$$

Data Analysis and Findings Relating to ESG Disclosure Score of Sample PSEs

The data from 87 samples were examined regarding reliability. Chronbach's Alpha is the instrument for measuring the reliability, had used in this study. Table 3 reveals that Cronbach's Alpha value is 0.924 (more than 0.700 is good). Therefore it can be concluded that in this study the data and results computed from these samples were reliable from the statistical point of view.

Table 3: Reliability of the Sample

Cronbach's Alpha	N of Items
0.924	4

Reveals of Environmental Factors by the Sample PSEs

The assessed score relating to the environmental disclosure of sample PSEs has mentioned in Table 4. The highest environmental disclosure score is 67%. From this study, it can be seen that not a single PSEs has scored more than 80%. The study also shows that the score of 91.95% of companies (i.e. 80 companies) is less than 40%.

Table 4: Disclosure Score of Environmental Factor of Sample PSEs

Score (%)	Sample PSEs	Sample PSEs (in %)
<40	80	91.95
40-60	05	5.75
60-80	02	2.30
>80	0	0
Total	**87**	**100.00**

Source: Annual Reports/Corporate Social Responsibility Reports/Sustainability Reports (2017-18) of Select PSEs. The results are calculated by the author.

Null Hypothesis (H_0): The Environmental Disclosure Score of PSEs do not vary among the different types of PSEs.

Alternative Hypothesis (H_1): The Environmental Disclosure Score of PSE varies among the different types of PSEs.

Null Hypothesis is not accepted when the P value less than 0.05.

Table 5 has sown the chi-square value. Here the Null hypothesis is not accepted (as P< 0.05). in the contrary the alternative hypothesis is accepted. The computed result of Chi-Square Test in the table 5 is shown that the relationship between disparity of the environmental disclosure score among the various types of PSEs.

Table 5: Assessment of Chi-Square of the Environmental Disclosure Score of Sample PSEs

	Value	df	Asymp.Sig. (2 sided)
Pearson Chi-Square	33.425	3	0.000

Source: Annual Reports/Corporate Social Responsibility Reports/Sustainability Reports (2017-18) of Select PSEs. The result is computed by SPSS software.

Reveals of Social Factors by the Sample PSEs

The assessed score relating to the social disclosure of sample PSEs has mentioned in Table 6. In this study the highest score of social disclosure factor is 85.67%. More than

80% Social Disclosure Score had attained by only one PSE. It can also state that less than 60% Social Disclosure Score has attained by the 91.95% of companies (i.e. 80 PSEs).

Table 6: Disclosure Score of Social Factor of Sample PSEs

Score (%)	Sample PSEs	Sample PSEs (in %)
<40	61	70.11
40-60	19	21.84
60-80	06	6.90
>80	01	1.15
Total	**87**	**100**

Source: Annual Reports, CSR Report, Sustainability Reports (2017-18) of Select PSEs. The results are calculated by the author.

Null Hypothesis (H_0): The Social Disclosure Score of PSEs do not vary among the different types of PSEs.

Alternative Hypothesis (H_1): The Social Disclosure Score of PSEs vary among the different types of PSEs.

Null Hypothesis is not accepted when the P value less than 0.05.

Table 7 has sown the chi-square value. Here the Null hypothesis is not accepted (as $P<$ 0.05). In the contrary the alternative hypothesis is accepted. The computed result of Chi-Square Test in the table 7 is shown that the relationship between disparity of the social disclosure score among the various types of PSEs.

Table 7: Assessment of Chi-Square of the Social Disclosure Score of Sample PSEs

	Value	df	Asymp.Sig. (2 sided)
Pearson Chi-Square	46.210	3	0.000

Source: Annual Reports/Corporate Social Responsibility Reports/Sustainability Reports (2017-18) of Select PSEs. The result is computed by SPSS software.

Reveals of Corporate Governance Factors by the Sample PSEs

The assessed score relating to the corporate governance disclosure of sample PSEs has mentioned in Table 8. The maximum score of corporate governance disclosure is high enough i.e. 82.33%. The study also reveals that 3.45% PSEs (i.e. 3 PSEs) have scored more than 80%. On the other hand, less than 60% have been scored by 59.77% of companies (i.e. 52 PSEs).

Table 8: Disclosure score of Corporate Governance Factor of Sample PSEs

Score (%)	Sample PSEs	Sample PSEs (in %)
<40	09	10.34
40-60	43	49.43
60-80	32	36.78
>80	03	3.45
Total	**87**	**100**

Source: Annual Reports, CSR Report, Sustainability Reports (2017-18) of Select PSEs. The Results are calculated by the author.

Null Hypothesis (H_0): The Corporate Governance Disclosure Score of PSEs do not vary among the different types of PSEs.

Alternative Hypothesis (H_1): The Corporate Governance Disclosure Score of PSE vary among the different types of PSEs.

Null Hypothesis is not accepted when the P value less than 0.05.

Table 9 has sown the chi-square value. Here the Null hypothesis is not accepted (as *P*< 0.05). In the contrary the alternative hypothesis is accepted. The computed result of Chi-Square Test in the table 9 is shown that the relationship between disparity of the corporate governance disclosure score among the various types of PSEs.

Table 9: Assessment of Chi-Square of the Corporate Governance Disclosure Score of Sample PSEs

	Value	df	Asymp.Sig. (2 sided)
Pearson Chi-Square	42.291	3	0.000

Source: Annual Reports/Corporate Social Responsibility Reports/Sustainability Reports (2017-18) of Select PSEs. The result is computed by SPSS software.

Reveals of Overall ESG Factors by the Sample PSEs

The calculate value of the overall disclosure score of the sample PSEs has mentioned in Table 10. 74% is the maximum score of overall ESG disclosure and the lowest value of overall ESG disclosure score is 11%. Not a single PSE of the 87 sample PSEs has attained more than 80% ESG disclosure score. From the following table 10 It can be concluded that the Less than 40% overall ESG disclosure score has scored by 80.46% PSEs (70 PSEs).

Table 10: Disclosure Score of Overall ESG Factor

Score (%)	Sample PSEs	Sample PSEs (in %)
<40	70	80.46
40-60	11	12.64
60-80	06	6.90
>80	0	0
Total	**87**	**100**

Source: Annual Reports, CSR Reports, Sustainability Reports (2017-18) of Select PSEs. The results are calculated by the author.

Null Hypothesis (H_0): The Overall Disclosure Score of PSEs do not vary among the different types of PSEs.

Alternative Hypothesis (H_1): The Overall Disclosure Score of PSE vary among the different types of PSEs.

Null Hypothesis is not accepted when the P value less than 0.05.

Table 11 has sown the chi-square value. Here the Null hypothesis is not accepted (as *P*< 0.05). In the contrary the alternative hypothesis is accepted. The computed result of Chi-Square Test in the table 11 is shown that the relationship between disparity of the overall disclosure score among the various types of PSEs.

Table 11: Assessment of Chi-Square of the Overall Disclosure Score of Sample PSEs

	Value	df	Asymp.Sig.(2 sided)
Pearson Chi-Square	49.236	3	0.000

Source: Annual Reports/Corporate Social Responsibility Reports/Sustainability Reports (2017-18) of Select PSEs. The result is computed by SPSS software

Data Analysis and Findings Relating to the Impact of Determinants of Overall ESG Performance Score Proactiveness on Sample PSEs Characteristics

This section made an attempt to identify some (16) determinants explaining the variations in the overall ESG performance score. Accordingly, firstly this section dealt with the selection of firm-specific determinants along with the formulation of hypothesis.

i) Total income

ii) Total sales

iii) Total capital

iv) Current assets

v) Last three years' Average net profit.

vi) Expenditure to be incurred for Corporate Social Responsibility

vii) No. of employees

viii) Size of the business

ix) Net sales

x) Total expenses

xi) Profit after tax

xii) Current liabilities and provisions

xiii) Total assets

xiv) Investment for CSR activities during the financial year

xv) Profit before taxation and

xvi) Paid-up equity capital (net of forfeited equity capital)

The correlation was undertaken among the 16 independent variables and the dependent variable. The data of 87 samples were tested in terms of reliability. Table 12 shows that the data and results found from this sample were statistically reliable because the value of Cronbach's Alpha is 0.838 (more than 0.700 is good).

Table 12: The reliability Test result of the Above-mentioned Sixteen Independent Variables of the Sample PSEs

Cronbach's Alpha	N of Items
0.838	16

Source: Annual Reports, CSR Reports, Sustainability Reports (2017-18) of Select PSEs. The Result is calculated by the SPSS software.

Formulation of Model

To ascertain the quantitative and relative effect of these factors, multiple linear (OLS) regression analyses (Linear Enter model) have been made and subsequently tested through SPSS statistical package. Accordingly, with the overall ESG performance score as the dependent variable and a linear relationship is assumed, the model for determination of relative role of each independent variable is framed as follows:

$$OESGPS_t = \alpha + \beta_1 TINCOME + \beta_2 SALES + \beta_3 NSALES + \beta_4 TEXPENSE + \beta_5 PAT + \beta_6 TCAPITAL + + \beta_7 CLPROV + \beta_8 TASSET + \beta_9 CASSET + \beta_{10} AVRNP + \beta_{11} CSR + \beta_{12} CSRINCUR + \beta_{13} EMP + \beta_{14} PBT + \beta_{15} SIZE + \beta_{16} PCAPITAL + u_t$$

where,

t = Index of unit (1, 2, ….., 87)

OESGPS = Overall ESG Performance Score

TINCOME = Total Income

SALES = Total Sales

NSALES = Net Sales

TEXPENSE = Total Expenses

PAT = Profit After Tax

TCAPITAL = Total Capital

CLPROV = Current Liabilities and Provisions

TASSET = Total Assets

CASSET = Current Assets

AVRNP = Average Net Profit (last three years)

CSR= Amount Spent on Corporate Social Responsibility Activities During the year

CSRINCUR= as per Companies Act 2013 the CSR Expenditure to be incurred

EMP= No. of Employees

PBT= Profit before Taxation

SIZE= Size of the enterprise

PCAPITAL= Paid up Equity Capital

α = Constant

β = Parameters

u = Error term

However, during running the model because of facing the problem of multicollinearity due to a high degree of VIF of total income (TINCOME), total sales (SALES), total capital (TCAPITAL), current assets (CASSETS), average net profit for the last three years (AVRNP), CSR expenditure to be incurred (CSRINCUR), no of employees (EMP) and size of the business (SIZE), it has been decided to avoid those eight variables in the final Model.

Accordingly, the final Model incorporated total eight explanatory variables viz

The modified equation for final Model is:

$$OESGPS_t = \alpha + \beta_3 NSALES + \beta_4 TEXPENSE + \beta_5 PAT + + \beta_7 CLPROV + \beta_8 TASSET +$$

$$\beta_{12}\,CSRINCUR + \beta_{14}\,PBT + \beta_{16}\,PCAPITAL + u_t$$

The results of the regression for final Model, obtained by using SPSS statistical package are reported in Table 13, Table 13A and Table 13B.

Table 13: Estimates from the OLS Regression Analysis of Overall Disclosure Performance Score on Sample PSEs Characteristics

Final Model

(Excluding total income, total sales, total capital, current assets, last three years' average net profit, expenditure for CSR to be incurred, no. of employees and size of the business):

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.728[a]	0.530	0.482	9.2501800064544450	1.505

Source: Annual Reports, CSR Reports, Sustainability Reports (2017-18) of Select PSEs. The Results are calculated by the SPSS software.

a. Predictors: (Constant), Paid up equity capital (net of forfeited equity capital), Profit before taxation, Sales, Amount spent on CSR activities during the year, Current liabilities & amp; provisions, Profit after tax, Total assets, Net sales, Total expenses

b. Dependent Variable: %of total

Table 13A: Calculation of One Way ANOVA[a] of Overall Performance Score on Sample PSEs Characteristics

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7538.259	8	942.282	11.012	.000[b]
	Residual	6674.135	78	85.566		
	Total	14212.394	86			

Source: Annual Reports, CSR Reports, Sustainability Reports (2017-18) of Select PSEs. The Results are calculated by the SPSS software

a. Dependent Variable: %of total

b. Predictors: (Constant), Paid up equity capital (net of forfeited equity capital), Profit before taxation, Sales, Amount spent on CSR activities during the year, Current liabilities & provisions, Profit after tax, Total assets, Net sales, Total expenses.

Table 13B: Coefficients[a] of Overall Performance Score on Sample PSEs Characteristics

Model		Coefficients in the form of Unstandardized		Coefficients in Standardized form	*t*	Sig.	Confidence Interval for B at 95.0%		Collinearity Statistics	
							Lower Bound	Upper Bound		
		B	Std. Error	Beta					Tolerance	VIF
1	(Constant)	26.702	1.272		20.986	0.000	24.169	29.235		
	SALES	0.000	0.000	-2.479	-3.423	0.001	0.000	0.000	0.011	87.111
	NSALES	0.000	0.000	1.230	2.978	0.004	0.000	0.000	0.035	28.324
	TEXPENSE	0.000	0.000	1.699	2.963	0.004	0.000	0.000	0.018	54.581

	PAT	0.000	0.000	0.641	5.096	0.000	0.000	0.001	0.381	2.626
	CLPROV	0.000	0.000	0.993	3.737	0.000	0.000	0.000	0.085	11.723
	TASSET	-0.0000344	0.000	-1.551	-5.405	0.000	0.000	0.000	0.073	13.676
	CSR	0.000	0.000	-0.087	-0.839	0.404	-0.001	0.001	0.566	1.768
	PCAPITAL	0.000	0.000	0.216	1.643	0.104	0.000	0.000	0.349	2.868

a. Dependent Variable: %of total

Source: Annual Reports, CSR Reports, Sustainability Reports (2017-18) of Select PSEs. The Results are calculated by the SPSS software.

Findings from the Linear Regression Test Results

From Table 13,13A and 13B the present study has constructed the following regression equation.

$OESGPS_t$ = 26.60767 + 0.00013 NSALES + 0.00016 TEXPENSE + 0.00024 PAT + 0.00011 CLPROV + 0.00003 TASSET + 0.00050 CSRINCUR + 00000001 PBT + 0.00018 PCAPITAL + 9.193967129214280

The overall significance of the regression models are indicated by their respective F-values. Since the values of F (9, 77) are not directly available from the Table 13B, values of F (9, 120) have been used instead of F (9, 77). Now, at the 0.01 significance level with 9 and 120 degrees of freedom, table value $F_{0.99}$ = 2.56. Since, observed value of F for final Model i.e. 10.126 > 2.56, therefore the values for final Model are found significant at 1% level.

Regression coefficients shown in the Table 13B revealed the relative contribution of the 8 independent variables to the explanatory power of the equation. The multiple correlation coefficient between the explanatory variables (NSALES, TEXPENSE, PAT, CLPROV, TASSET, CSRINCUR, PBT, PCAPITAL) and the dependent variable (OESGPS) taken together was 0.763. The overall explanatory power as indicated by adjusted R^2 of final Model is 0.489. Thus, the model explains about 48.9% of the variation in the extent of the ESG performance score by the selected company characteristics.

The Detail Measurements of Independent Variables are as Follows:

Table 14: Acceptance or Rejection of Different Hypotheses for the Regression Model

Sl. No.	Null Hypotheses	Alternative Hypotheses	Observed Value of |t|	Tabulated Value of |t| *	Decision
1	$H_0 3:\beta_3 = 0$	$H_1 3:\beta_3 \neq 0$	3.22274	2.38^{**}	Reject $H_0$3 and accept $H_1$3 at 1% level
2	$H_0 4:\beta_4 = 0$	$H_1 4:\beta_4 \neq 0$	2.85131	1.66^{***}	Accept $H_0$4 and reject $H_1$4 at 5% level
3	$H_0 5:\beta_5 = 0$	$H_1 5:\beta_5 \neq 0$	1.96202	1.66^{***}	Accept $H_0$4 and reject $H_1$4 at 5% level
4	$H_0 7:\beta_7 = 0$	$H_1 7:\beta_7 \neq 0$	3.32600	1.66^{***}	Accept $H_0$4 and reject $H_1$4 at 5% level

5	$H_O8:\beta_8 = 0$	$H_1 8:\beta_8 > 0$	5.02528	1.66^{***}	Accept $H_0 4$ and reject $H_1 4$ at 5% level
6	$H_0 12:\beta_{12} = 0$	$H_1 12:\beta_{12} > 0$	1.10864	1.66^{***}	Accept $H_0 4$ and reject $H_1 4$ at 5% level
7	$H_0 14:\beta_{14} = 0$	$H_1 14:\beta_{14} \neq 0$	1.39883	1.66^{***}	Accept $H_0 4$ and reject $H_1 4$ at 5% level
8	$H_0 16:\beta_{16} = 0$	$H_1 16:\beta_{16} > 0$	1.91102	1.66^{***}	Accept $H_0 4$ and reject $H_1 4$ at 5% level

Note: Since the values of* $|t|_{.01,\ 77}$ *and* $|t|_{.05,\ 77}$ *are not directly available from the Table 14, values of* $|t|_{.01,\ 80}$ *and* $|t|_{.05,\ 80}$ *have been used instead of* $|t|_{.01,\ 49}$ *and* $|t|_{.05,\ 49}$ *respectively.*

In this study the regression analysis showed that Net sales, Total expenses, Profit after tax, Current liabilities and provisions, Total assets, Amount spent on CSR activities during the year, Profit before taxation and Paid up equity capital (net of forfeited equity capital) have significant positive effect on the extent of percentage of Overall ESG disclosure score. The results of regression analysis also revealed that the remaining variables namely total income, total sales, total capital, current assets, the last three years' average net profit, CSR expenditure to be incurred, number of employees and size of the business have a statistically insignificant effect suggesting that these variables cannot significantly explain the variation in the extent of overall ESG performance score in of the sample. This may be due to the sampling error, or multicollinearity problem or due to the non-homogeneity of the nature of observations. If there would be larger sample size, such error could be minimized.

Discussion

The overall explanatory power as indicated by adjusted R^2 of final Model is 0.489. Thus, the model explains about 48.9% of the variation in the extent of the ESG performance score by the selected company characteristics. Of the eight significant explanatory variables, seven variables viz., Total expenses, Profit after tax, Current liabilities and provisions, Total assets, Amount spent on CSR activities during the year, Profit before taxation and Paid up equity capital (net of forfeited equity capital) have been found to be positive at 1% level of significance. This indicated that units with higher Total expenses, Profit after tax, Current liabilities and provisions, Total assets, Amount spent on CSR activities during the year, Profit before taxation and paid up equity capital (net of forfeited equity capital) are more ESG proactive. The other variable namely, Net Sales has also found to be significant at 5% level and have positive coefficient in all the models. This suggested that Net Sales has shown relatively better effect on overall ESG performance score. Whelan *et al.* (2020) have mentioned in their study that in case of 26% of studies disclosure alone found a positive correlation with financial performance compared to 53% for performance based ESG measures (e.g. assessing a firm's performance on issues such as greenhouse gas emission reductions). Aydogmus *et al.* (2022) have shown in their analysis by using correlation technique that, there is no correlation between ESG scores & Tobin's Q and ESG scores & ROA; however, ESG scores are highly correlated among themselves. There is also slight correlation between all ESG scores (particularly ENV) and Size indicating the bigger the company, the higher their ESG scores.

Conclusion

The present study has revealed the ESG disclosure performance of only 87 selected PSEs' in India. Large number of sample size may reveal better results. The present study has been restricted to performance of overall ESG disclosure proactiveness in the business practices. In the financial disclosure part of the sample PSEs' there were several other variables, which could have explained the disparity in the levels of overall ESG disclosure score. The study revealed that a few leading PSEs have developed innovative practices for Effective disclosures. ESG disclosures are not structured. But there is enough scope of improvement of corporate performance through ESG disclosure. ESG disclosure performance of select PSEs' can be improved by Implementation of coherence legal structure has been implemented by Central Government and related By- laws have been framed by State Government for Environment related issues, Social accounting should be introduced in the enterprises and implement sound public governance system which has a vital role in sustainable and all around development of society.

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ESG Reporting Enables Organisations to Move towards a Sustainable Future: A Case Study on Walmart Inc

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ABSTRACT

Corporations, whether public or private, rely on the society for a developed infrastructure such as roads, electricity, educated workforce, enforcement of law, among other things. Because of these factors the corporations must consider not only the interests of their shareholders but also those of their employees, consumers, suppliers, government and the general public. This necessitates the organisations to be aware of their responsibilities in terms of the business's environmental, social and governance aspects of the business. Walmart Inc strives for shared value by addressing social issues in a way that benefits both the company and its stakeholders. The organization's goal of becoming a regenerative company helps to renew people and the planet through their business. The environmental, social and governance reporting illustrates how they align their business activities with the social objectives in order to increase their ability to deliver more value.

***Keyword**: Environmental; Social; Governance; Progress; Sustainability*

Introduction

Previously, it was thought that the sole responsibility of a business was to perform its economic functions efficiently and provide goods and services to society in order to maximize profit and that it was preferable to delegate social functions to other institutions of society, such as the government. However, as the business environment changed, business leaders became concerned about community responses and environmental sustainability. They recognized that the government cannot and should not be solely responsible for promoting environmental and social well-being. The corporate sector also plays an important role in this area. With such a refined understanding, the organizations report on their environmental, social, and governance data, allowing them to take a step forward to a sustainable future (Fernando, 2020).

Walmart Inc's environmental, social, and governance reporting is being studied in order to shed light on how a "global giant" fulfils its societal responsibility. Walmart Inc serves more than 260 million customers per week worldwide through its vast network of supply chain spread across several countries. It is also the nation's largest employer. Walmart clearly has a significant impact on the US economy. The organization is continuously striving to go beyond the concept of "Business as usual", with the goal of expanding its ESG initiatives

beyond risk mitigation. It envisions a company that seeks out new opportunities, manages its climate actions, creates sustainable product supply chains, and fosters community cohesion. It prioritises ESG issues based on their importance to the company's mission, customers, and other stakeholders, as well as Walmart's ability to effect change on those issues.

Arvidsson and Dumay (2022) suggested that Swedish organisations must enhance their sustainability performance quality, which might result in a modest disclosure increase. The results also indicate that simply reporting will not suffice. The current business environment demands performance, and organisations should prioritise performance-driven ESG activities.

Nekhili, Boukadhaba and Nagati (2021) found that labour board representatives behave differently from employee shareholder board representatives by putting a greater emphasis on social performance and a lesser emphasis on environmental and corporate governance performance. The corporate ESG-financial performance relationship is moderated differently depending on how many employees are represented on the board of directors.

Xie *et al*. (2018) have looked into the connection between ESG practises and corporate financial performance. In their research, they found that ESG and CPF generally had a positive relationship, demonstrating that sustainability and an organization's financial performance are related.

Friede, Busch and Bassen, (2015) states that, to fully utilise value-enhancing ESG factors, one must have a thorough understanding of how to incorporate ESG criteria into investment processes. It is also suggested that the capital markets have not yet consistently demonstrated learning effects concerning the relationship between ESG and CFP.

Research Gap

Prior studies by esteemed research scholars yielded valuable results regarding ESG reporting and its contribution tosustainability. Their findings also revealed that efforts to improve sustainability improve financial performance and shareholder return. It is intended to look into Walmart's ESG reporting as a case study to show how a "global giant" aspires to be sustainable and sets and exceeds its own boundaries in order to advance in its endeavours. Previous research has not addressed such a case study.

Objective of the Study

The current study aims to examine the Walmart’s ESG reporting to assess the progress and current status of theirenvironmental consideration, social and governance aspects.

Methodology

The study’s goal is to investigate the conceptual framework of how ESG reporting enables organisations to move towards a more sustainable future usingacase study of Walmart. The secondary data, as provided by the Walmart Inc’s ESG reports and the annual report is used for the purpose of the study.

The study’s limitations include the fact that because the data is secondary in nature, it can only cover only those aspects which are depicted by the data provided by the organisation. As a result, theremay be other factors that the available datadid not reveal. Such observations are not taken into accountin this study. The paper makes no use of statistical techniques and is solely based on conceptual discovery and analysis.

Conceptual Framework

Walmart's ESG Report Analysis

Environmental Consideration

Companies have a moral, ethical, and social obligation to preserve the ecosystem's integrity and protect the environment. To ensure the health of the global environment, it is important to emphasise the need for clean air and water, fertile soil, biodiversity, and an overall cleaner world for people to live in (Fernando A.C,2020). According to a number of economists, progressive businesses can use environmental regulations to their advantage. Walmart Inc. also takes these environmental concerns very seriously and is working to put policies in place that protect the ecology and the environment. From an environmental standpoint, Walmart's aim is to achieve zero operational waste and natural resource regeneration. Among the initiatives aimed at achieving zero operational waste are:

- Percentage of waste diverted from landfill and incineration - 78% worldwide, 81% in the United States, 89% in Canada and 72% in Mexico. The target is to reach 90% by 2025.
- More than 7% of global private brand plastic packaging is made from post-consumer recycled content. The objective is to achieve 17% by 2025.
- 58% of private brand packaging worldwide is reportedly recyclable, reusable, or compostable in an industrial setting. The objective is to achieve 100% by 2025.
- Composting, animal feed, anaerobic digestion, and biochemical processing diverted 827 million operational food waste from the waste stream.

For the purpose of contributing to the regeneration of natural resources, Walmart performs the following activities:

- In fiscal years 2021 and 2022, Walmart and the Walmart Foundation will invest more than $14 million to help preserve irreplaceable landscapes.
- 99% of the seafood sold at Sam's Club and Walmart in the United States is sustainably sourced, both fresh and frozen.
- Products under private brands contain 90% palm oil. RSPO-certified environmentally friendly
- Other activities include supporting conservation and restoration, sourcing sustainable products, pushing for and funding enablers, and so forth.

In recent years, environmental performance has assumed critical importance. Because the reality of social responsibility and social accountability is having a significant impact on the organisation's image and consequently its future sustainability, Walmart Inc. has realised

the urgent need to reorient its perception and focus on sustainability. The organization's efforts to promote environmental sustainability are commendable.

Social Aspect

The pillars on which the social considerations of Walmart Inc are analysed in the given study are human capital management, product quality and safety, and supplier opportunities.Walmart envisions a stronger and more inclusive community in which suppliers can be assured of growth opportunities and the acceleration of supply chain sustainability. Equity and inclusion, well-being and growth are central to Walmart's human capital development strategy. It strives to be a retail gateway to upward mobility so as to accelerate the professional development of its associates. Associates are given the opportunity for good jobs and advancement. The key insights of its human capital consideration are highlighted hereunder:

(A) Equity and Inclusion

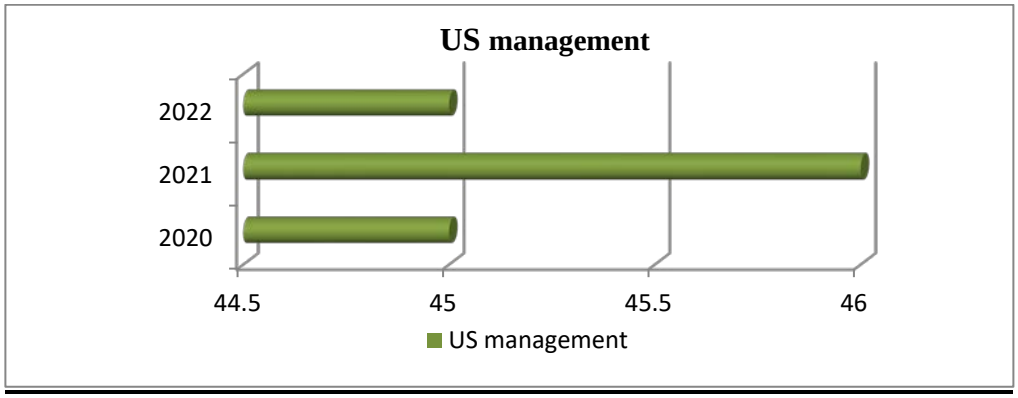
- **Representation of Women at Walmart**

  The representation of women at Walmart is analysed by their representation in US management, US total management promotions, US officers and US hourly promotions; for the last three financial years.

Table 1: Shows Representation of Women at Walmart for the Last Three Financial Years

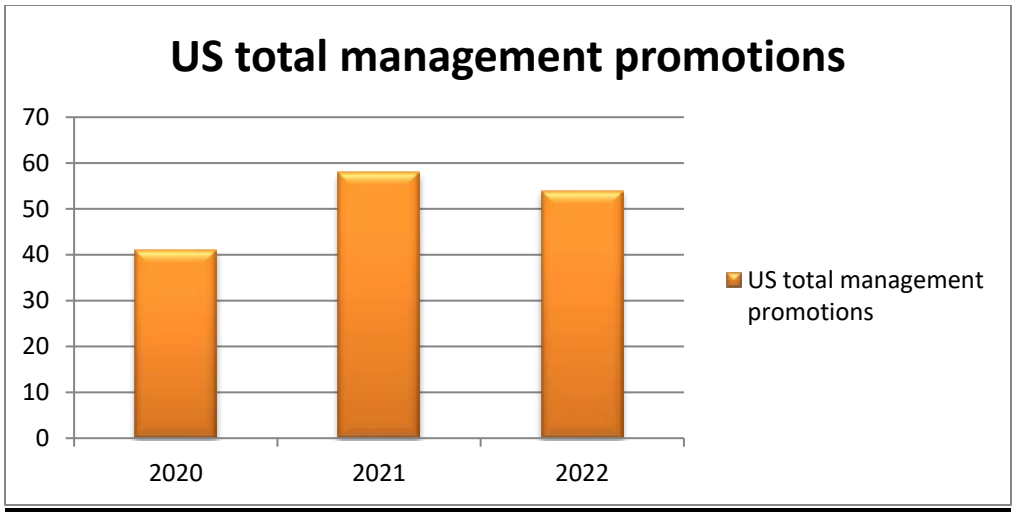
Year	US management (%)	US total management promotions (%)	US officers (%)	US hourly promotions (%)
2020	45	41	31	58
2021	46	58	46	33
2022	45	54	44	34

Source: https://www.walmart.com



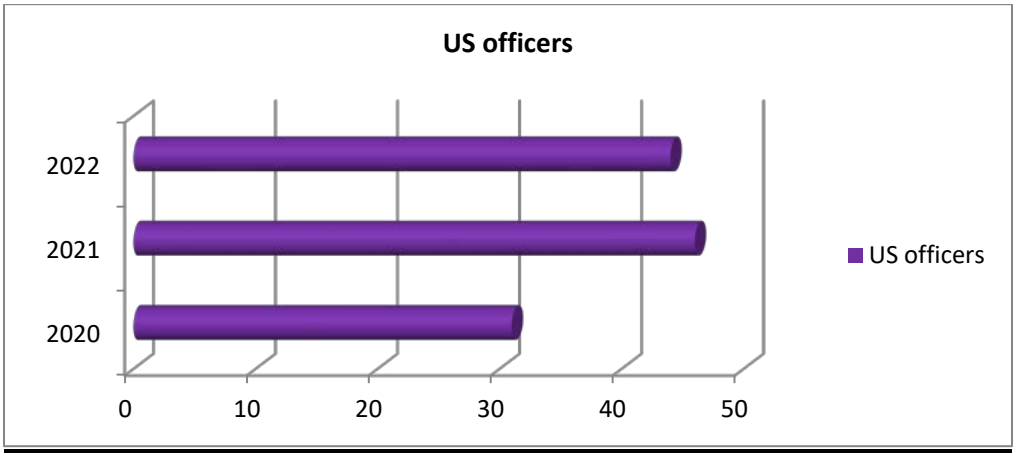
Source: https://www.walmart.com

Figure 1: Representation of Women at Walmart in US Management



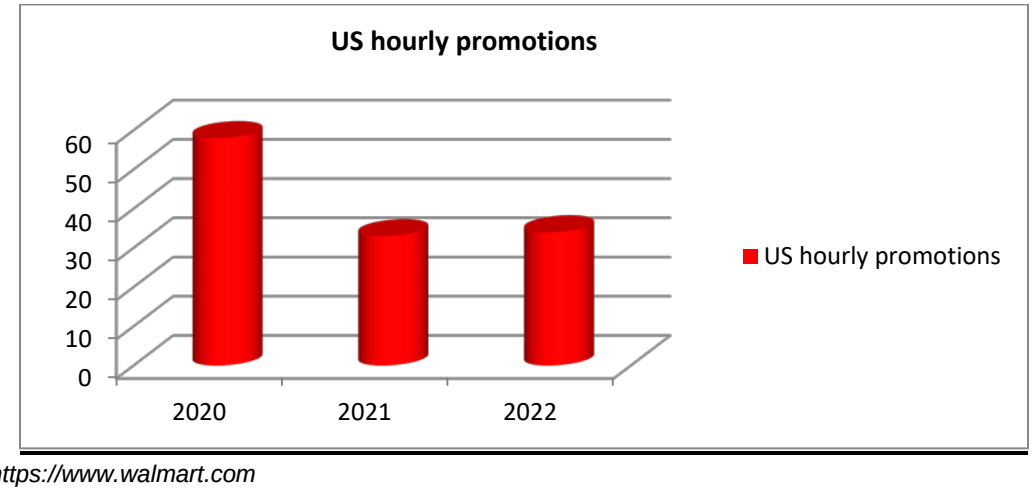
Source: https://www.walmart.com

Figure 2: Representation of women at Walmart in US total management promotions



Source: https://www.walmart.com

Figure 3: Representation of Women at Walmart in US Officers



Source: https://www.walmart.com

Figure 4: Representation of Women at Walmart in US Hourly Promotions

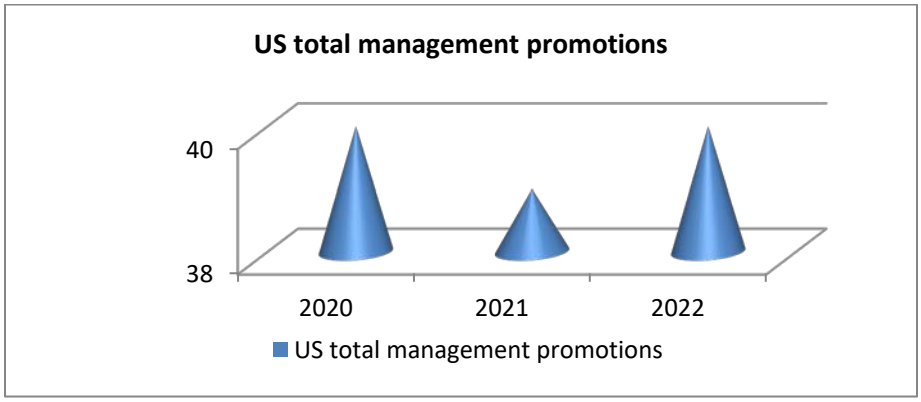
Representation of People of Colour at Walmart

Walmart reports that in FY2022, 56% of new hires in the United States were people of color. The representation of people of colour at Walmart for the last three financial years are:

Table 2: Shows the Representation of People of Colour at Walmart for the Last Three Financial Years

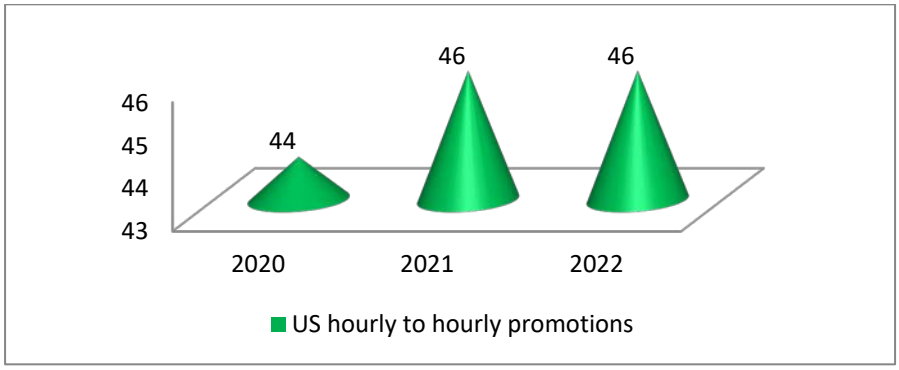
		021	2022
US total management promotions (%)		39	40
US hourly to hourly promotions (%)		46	46
US Management (%)		37	39
US officers (%)		25	27

Source: https://www.walmart.com



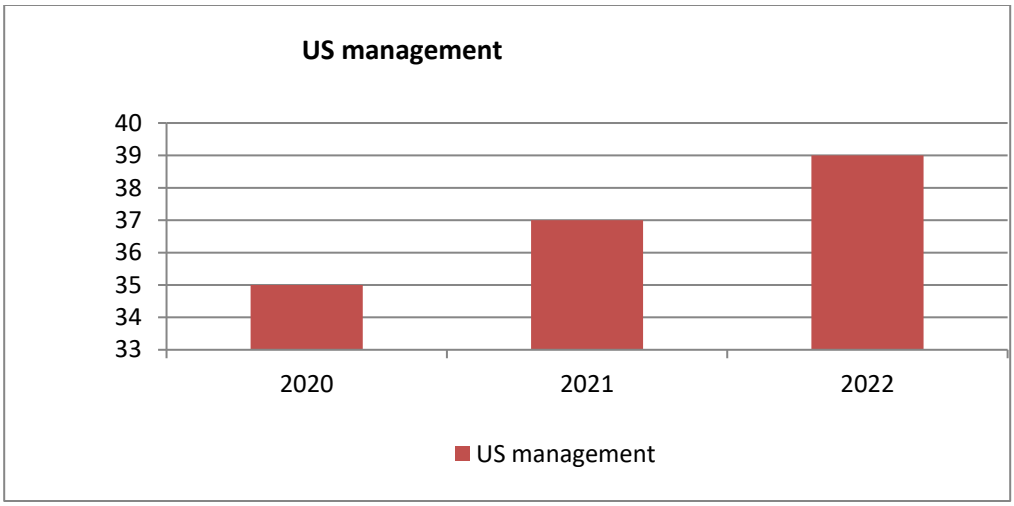
Source: https://www.walmart.com

Figure 5: Representation of People of Colour at Walmart in US Total Management Promotions



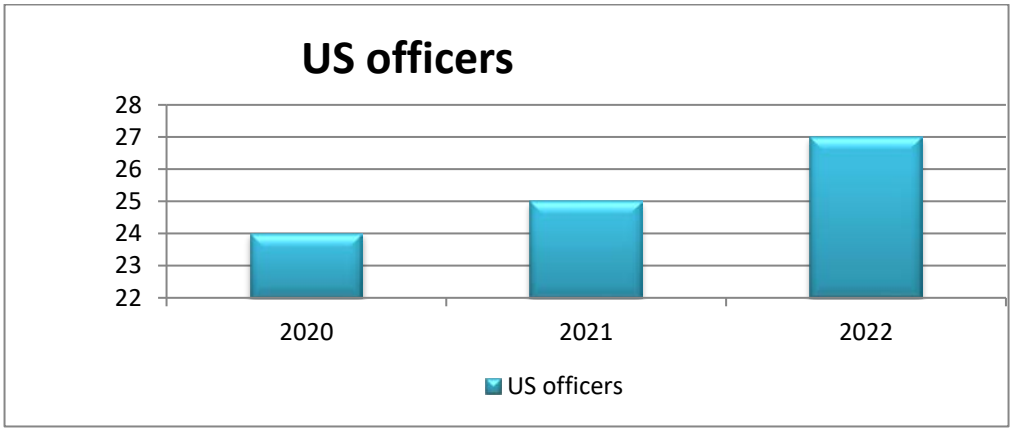
Source: https://www.walmart.com

Figure 6: Representation of People of Colour at Walmart in US Hourly to Hourly Promotion



Source: https://www.walmart.com

Figure 7: Representation of People of Colour at Walmart in US Management



Source: https://www.walmart.com

Figure 8: Representation of People of Colour at Walmart in US Officers

Well-Being of Associates

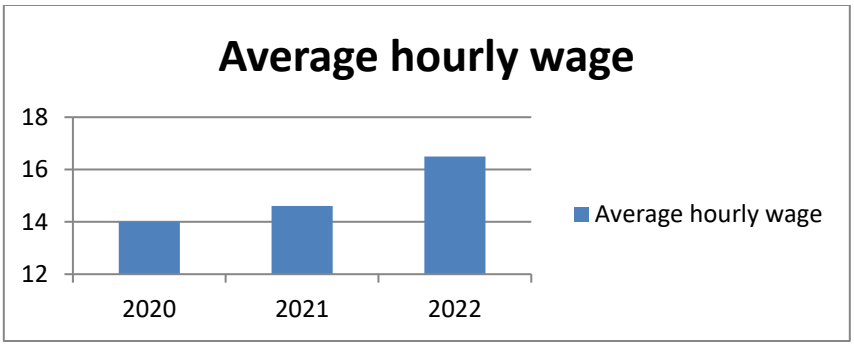
- **Financial Wellbeing**

  Though the wage rate varies by role and market, yet on an average the hourly wage rate in Walmart US stores for the last three financial years are :

Table 3: Represents Average Hourly Wage Rate in Walmart US Stores for the Last Three Financial Years

2020	>$14 per hour
2021	>$14.61 per hour
2022	>$16.50 per hour

Source: https://www.walmart.com



Source: https://www.walmart.com

Figure 9: Represents Average Hourly Wage Rate in Walmart US Stores for the Last Three Financial Years

It can be observed here that there is hike in the average hourly wage which portrays the organisation's efforts of providing high paying jobs to its associates.

- **Physical Wellbeing**
  - Walmart offers health coverage starting at around $29 per pay period for all full- and part-time associates who have worked an average of 30 hours per week over the past 12 months in 2020. This increased to $31.40 in 2022.
  - Enrolled associates have access to Walmart's Centers of Excellence programme, which offers high-quality care at low or no cost through partnerships.
  - Doctor on Demand provides associates enrolled in Walmart health plans with affordable, nationwide virtual access to health care providers.
  - Other benefits include paid time off, expanded parental leave, counselling sessions and many more.
- **Emotional Wellbeing**
  - All associates and their families, regardless of whether they are covered by a Walmart medical plan, can access Resources for Living for free counselling sessions and unlimited phone support.
  - Associates can take part in a stock purchase plan with a company match of upto $270 per plan year.

(B) GROWTH

Initiatives are taken for constructing a career ladder so that people can advance their careers at Walmart regardless of where they begin. Associates can begin working and learning as part of a team, receive role-specific Walmart Academy training, and access their "Live Better U" education programme. Associates can use their work experiences and knowledge, as well as those gained through our learning

programmes, to advance to roles with greater responsibility and higher pay. Walmart has a track record of achieving growth and advancement.

The above information portrayed: (A) Equity and Inclusion – under which focus has been given on the representation of people of colour at Walmart and Representation of women at Walmart;(B) Well-being of associates – under which financial well-being, physical well-being and emotional well-being have been studied; (C) Growth.

The organisation strives to give customers easy access to affordable food as well as other products and services. In addition to providing food access in thousands of communities around the world, it works to strengthen policies, standards and practices to sustain the safety and quality of their assortment. The product quality and safety are ensured in the following ways:

- Walmart maintains a global food safety compliance programme to assist Walmart associates and suppliers in meeting their safety expectations.
- The Global Food Safety Compliance team evaluates food safety risks, establishes standards, implements and trains associates on the necessary controls, and monitors the program's effectiveness.
- In FY2022, it has trained over 980,00054 associates worldwide on at least one food safety course.

Furthermore the organisation provides supplier opportunities for creating an atmosphere of sustainable development of its community of suppliers.

- Walmart is committed to making investments that support the creation of American jobs. As of the end of FY2022, they have increased US purchase by $12 billion as in effort to fulfill their commitment.
- Walmart's Vriddhi Supplier Development Program aims to train 50,000 Indian micro, small, and medium-sized suppliers to participate in global supply chains.
- Walmart's sourcing strategies promote equity and the inclusion of underrepresented and disadvantaged groups while also improving the product offering.

From the discussion above, it is evident that Walmart is constantly working to implement policies and practices that foster a sense of inclusion and equity among its communities. It thinks that simply focusing on maximizing shareholder returns will not lead to sustainable growth. The expansion of the community and its affiliates will create opportunities for the organization to have a sustainable future.

Governance Aspect

The largest retail organisation adheres to strict corporate governance standards in order to create trust as a competitive advantage. It seeks to establish policies and procedures governing its interactions with major stakeholders while wearing the badge of ethics and integrity. Good corporate governance, ethics and compliance, and digital citizenship are the foundationsof the organisation's governance.

The following is a summary of Walmart's governance approach:

- Preserving a majority independent board with a range of backgrounds, pertinent experiences, and expertise. The board of directors comprises 27% female, 18% identifies as racially or ethnically diverse, and also 7 out of 11 directors are independent. The term for independent directors is 12 years. Moreover 10 of the 11 directors are non-management.
- Effective oversight of strategy, risks, and opportunities by the board and management, including through board and management committees.
- Creating a diverse and talented stream of leaders.
- Creating compensation initiatives to assist the enterprise strategy while also aligning the leadership team with culture, strategy, and organisational structure.
- Consistently conversing with and receiving input from a wide range of stakeholders, such as shareholders, clients, employees, and suppliers.

Any company's ethical culture is dependent on each employee's personal moral compass and the social standards that the business and industry accept. So, strict adherence to corporate governance standards will help Walmart Inc. shape a better future.

Walmart Inc. Is Making Strides toward Sustainability

Sustainability has evolved over the past few years to become one of Walmart's guiding principles. For shared growth and development, it puts the planet and people first. Its quest for a sustainable future began in 2005 when it set out on a mission to protect acres of American natural habitat. It contributed significantly to disaster relief in the same year following hurricanes Katrina and Rita. Their ambitious "sustainable Walmart" plan included the use of renewable energy, zero waste production, and the sale of sustainable goods. Their 2007 investment in solar energy was another step in the direction of a sustainable future. In 2008, they even turned to wind energy as another renewable energy source. The creation of the global sustainability index gave their "sustainable Walmart" mission additional momentum. It started selling only concentrated liquid laundry detergents in their stores in order to protect forests and conserve water. In addition, the organisation worked together to cut greenhouse gas emissions and promote sustainable agriculture among the general public.

They updated their sustainability vision and created a new roadmap for their upcoming journey in 2016. By 2030, they wanted to completely stop emitting greenhouse gases. They also wanted to double the amount of locally grown produce that was sold in the US. Enhancing ingredient transparency was their goal in order to gain the trust and confidence of the consumer. Walmart worked together on a number of projects, including installing electric vehicle charging stations in 2018, enforcing strict reusable bag usage in 2019, and ensuring more sustainably sourced paper and seafood. With their consistent efforts to preserve, manage, and regenerate the environment, they actually developed into a

regenerative company. Additionally, they made a significant contribution by supporting and clinging to their community during the Covid-19 pandemic.

As a result, Walmart's progress towards sustainability is undoubtedly inspiring other organisations to put more effort into sustainable business practises. The organisation also engages in several notable ESG initiatives, such as eliminating single-use plastics, addressing climate change, and implementing a number of regenerative practises and initiatives. Walmart has made significant strides toward sustainability and will no doubt put forth a lot more effort in the future.

Conclusion

An organisation will be rudderless if it fails to manage the social aspects associated with the business organisation. Walmart Inc conducts business with the goal of providing maximum value to its shareholders by serving all of its stakeholders. It leaves no stone unturned in order to provide the most value to its stakeholders. The above study demonstrates how the organisation has been continuously improving its ESG considerations over the years. The strategic goal of making trust a competitive advantage drives the organisation to consider ways and means of achieving ESG leadership. A strong ESG programme can facilitate access to significant capital sources, strengthen corporate brands, and foster sustainable long-term growth that is advantageous to both businesses and investors. The Walmart case study illustrates how a company can work towards a sustainable future by putting in place practices and policies that encourage a sense of inclusion, equity, and opportunities for community growth.Further research on the company's proposed green financing framework, which is expected to take another step towards sustainability, is possible.

Acknowledgment

It will beacknowledged that this study was conducted using only secondary data from reports published on Walmart Inc.'s website, https://www.walmart.com, which was provided by Walmart Inc. While carrying out this work, no outside funding sources were used. If the study ever interferes with the interests of anyone or anything, it was not done intentionally. To the best of knowledge, also attempted to analyse the data provided on Walmart Inc.'s official website in order to demonstrate how the company is setting an example for how ESG reporting enables businesses to move towards a sustainable future.

The author is grateful to the joint editors of the book Prof. Bhaskar Bagchi Sir and Dr. Biswajit Paul, University of Gour Banga, Malda, West Bengal, for providing her this opportunity. Their constant support and cooperation have helped her to complete this study. The completion of the study could not have been possible without the expertise and guidance of the professors of the Department of Commerce, University of Calcutta, West Bengal, India.

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The Effects of Education on Poverty Reduction in India: Striving Towards Sustainable Development

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ABSTRACT

Education is crucial for the development of a nation. Education is a multidimensional process; it helps to enhance skills and human capabilities, promote human rights, reduce inequalities and crime, and enhance economic growth. The United Nations (UN) recognized the need to promote education and alleviate poverty. The UN set two significant Sustainable Development Goals (SDGs), i.e., SDG 1 and SDG 4, to reduce poverty at all levels and to ensure inclusive and equitable education, respectively. These SDGs were introduced in 2015; the world has already passed seven years. But, still, in developing countries (like India), a large portion of the population continues to live in poverty. In this context, it is important to investigate the effects of education on poverty reduction in India. Here, time series data on poverty reduction and education for India are gathered from various secondary sources such as articles, databases (mainly from the World Bank database), journals, websites, etc. relating to the time period from 1991 to 2020 to ascertain whether education has effects on the reduction of poverty or not. Here, the Johansen cointegration test, VECM, and Wald tests are applied to ascertain whether education has any long- and short-run effects on the reduction of poverty or not. This study found that education has long-term effects on poverty reduction in India.

Keywords: *Poverty; Education; Sustainable Development; VECM*

JEL Codes: *C32, I25, I32, Q01*

Introduction

Adopting the Millennium Development Goals (MDGs) was one of the UN's best efforts to address numerous issues. MDG 1 dealt with hunger and poverty. Even though the world made significant progress in achieving MDG 1, it was still unsatisfied. The UN then introduced the SDGs (a set of 17 distinct goals) in 2015. Among these 17 goals, one of the most important is SDG 1. SDG 1 emphasizes ending poverty at all levels. Though globally, the number of individuals who live below the international poverty line has decreased by more than 50%, a large portion of individuals continue to live in extreme poverty. In the case of India, it has witnessed unprecedented economic growth in the last few years and established itself as an emerging economy in the world. Even though the per capita income of India increased, a significant number of people still live in poverty. Poverty is the condition where a person cannot afford the necessities for a minimum standard of living because they do not have enough money. People in this circumstance are unable to meet

their basic necessities, such as having access to clean water, owning a home, eating well, receiving medical care, etc. Problems with poverty can be divided into two categories: personal and societal. At the individual level, people living in poverty don't have enough money to buy the things they need to live well. They have daily challenges obtaining food, clothing, shelter, medicines, and education. A person's physical and mental health might suffer from poverty. At a societal level, poverty hampers economic development and causes other issues, such as crime, unemployment, etc. (Krueger & Maleckova, 2003) whereas education means the knowledge that people learn and experience in their homes, schools, colleges, universities, and communities. The foundation for a person's and a society's progress is education. Education helps people develop their thought processes. It enables individuals to live the life they want by presenting a wide range of opportunities, like good employment. It basically gives people financial stability and self-confidence. Education promotes technological advancements and assists in community development. Education is essential for the proper growth of any country. Education boosts economic growth, eradicates poverty, and improves efficiency (Awan *et al*., 2011). Human capabilities can be enhanced through proper skills and knowledge. Education provides knowledge and skills that enable people to get high-salaried jobs. It indicates education helps to enhance a person's income. Good income helps them fulfill their needs (Janjua & Kamal, 2011). In this context, it is important to understand whether education has the potential to reduce poverty in India or not.

Literature Review

Bourne and Attzs (2005) made an attempt to find out the association between poverty and economic progress in the Caribbean. They found that economic growth is one of the key factors that influence a nation's ability to create and enhance employment, income, and access to resources. The outcome of this study demonstrated that a higher level of economic growth in a country attracts a higher amount of investment, enhances productivity, and increases expenditures on health and education. According to the study of Khan *et al*. (2008), poverty can be decreased by increasing human capital investment and enhancing the quality of human resources. They used the multivariate co-integration method in their study. They found that improvements in human resources have the capacity to reduce poverty. Kim and Lee (2014) investigated the relationship between non-formal education programs and poverty. Researchers found that one of the key elements influencing poverty is a low level of literacy and life skills. The results of this study demonstrated that education at the primary school level is insufficient to reduce poverty. Afzal *et al*. (2012) tried to investigate whether education and physical capital affect economic progress or not. This study concluded that education, physical capital, and economic growth are positively related to each other. That means education and physical capital positively affect economic progress. This outcome aligns with Adawo's (2011) study results. Janjua and Kamal (2011) examined how income and education contribute to reducing poverty. This study found that income growth is moderately helpful in reducing poverty. Education played a crucial role in eliminating poverty. According to the study of

Tilak (2007), secondary and higher education play an important role in human development and economic growth. This study found that secondary and higher education boost individual earnings and support economic growth. Chaudhary *et al.* (2009) investigated the association between higher education and economic growth from 1972–1973 to 2005–2006 in Pakistan. They found that a long-term association exists between real GDP, physical capital, the labor force, and education. Islam *et al*. (2007) assessed the linkages between educational and economic growth in Bangladesh. They applied a multivariate regression method in their study. It is concluded that economic growth and education have a long run association as well as bidirectional causation between the two variables. Brempong *et al*. (2006) investigated the impact of higher education on economic progress in Africa. In this study, they applied the Augmented Neoclassical Growth model for estimation. They found that higher education has a positive and significant impact on economic development in Africa. This result is consistent with the study by Hassan and Ahmed (2006). Hassan and Ahmed (2006) considered sub-Saharan African nations and used the Mankiw, Romer, and Weil-augmented Solow models in their study. They found that primary and secondary school enrollment ratios have a positive effect on economic growth.

Research Gap

A comprehensive review of the literature revealed that the majority of previous studies tried to identify the impact of education on poverty before the introduction of the SDGs. In the SDGs, two important goals, SDG 1 and SDG 4, are set to end poverty at all levels and enhance the quality of education, respectively. Though the world has already passed seven years since the introduction of the SDGs, in developing countries (like India), a large portion of the population continues to live in poverty. Since the government has been working to reduce poverty and improve education, it is crucial to understand how education affects poverty reduction in India.

Research Questions

Following are the research questions:

- Does education have any long-term effect on poverty reduction in India?
- Does education have any short-term effect on poverty reduction in India?

Methodology

Justification of Selecting Variables

Justification of selecting variables is discussed in Table 1.

Table 1: Description of Variables Used in This Study

Name of the Variables & its Representation	Description	Author/(s) used these variables in their studies
Household Final Consumption Expenditure (HFCE)	It consists of expenditure made by household on goods or services that are utilized for meeting needs or wants. It is used as a proxy variable for poverty.	Havinga, Kamanou and Vu, (2009) Bhalla, Bhasin and Virmani (2022)
Gross Enrolment Ratio (GER)	It indicates students who are enrolled in specific level of education, regardless of age. It is used as a proxy variable for education.	Owoeye, (2014); Dey and Mishra (2018).
Government Educational Expenditure (EDUEX)	Direct government expenditures on academic institutions as well as public subsidies provided to households for educational purposes are both included in the governmentexpenditure on education. It is also used as a proxy variable for education.	Sylwester (2000); Choudhary (2016); Chen *et al*. (2023)

Source: Researchers' own presentation

Data Source and Period of Study

The annual time series data relating to gross enrolment ratio (GER), government educational expenditure (EDUEX), and household final consumption expenditure (HFCE) covering the period from 1991 to 2020 are used in this study. Data are extracted from the World Bank database, i.e., World Development Indicators (WDI).

Model Specification

The following functional regression equation is constructed to examine the effects of education on poverty reduction in India by considering the aforementioned variables.

$$Y = b_0 + b_1X_1 + b_2X_2 + \ldots\ldots\ldots\ldots + b_nX_n + e$$

Where, Y= the dependent variable;

X_1 = independent variable 1

X_2 = independent variable 2

n= number of observations

$b0, b1, b2 ..... bn$ = Model parameters

ε = Random disturbance term

In the model, 'Natural Log of Household Final Consumption Expenditure' is considered the dependent variable, and 'Gross Enrolment Ratio' and 'Government Educational Expenditure (% on GDP)' are used as the independent variables to examine the effects of education on poverty reduction in India. The following general model is developed to meet the above-mentioned research objectives:

$$LN\_HFCE = b0 + b1\ EDN\_GER + b2\ EDU\_EX + \varepsilon$$

Where,

LN_HFCE = Natural Log of Household Final Consumption Expenditure

EDN_GER = Gross Enrolment Ratio

EDU_EX = Government Educational Expenditure (% GDP)

In this study, to examine the presence of unit roots in the data sets, the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) methods are first applied. Then lag length is selected using Akaike information criteria (AIC), Schwarz information criteria (SC), and Hannan-Quinn information criteria (HQ). Then, a cointegration test is run to estimate the long run effect of education on poverty reduction. Here, the Johansen methodology of cointegration is applied. Then, the Vector Error Correction Model (VECM) is also applied. In order to confirm whether education has any short-term effects on poverty reduction or not, the Wald test is used. Finally, to check the stability of the model, CUSUMQ is used.

Econometric Tools Used

Unit Root Tests

Time series modeling is not possible if the data series are non-stationary in nature (Farooq & Islam, 2021; Temiz Dinç & Akdoğan, 2019). Because of this, the unit root test is used to confirm whether the data series is stationary or not. Two popular unit root tests invented by Dickey, D. A., & Fuller, W. A. (1979) and Phillips, P. C., & Perron, P. (1988) are utilized in this study.

Lag Order Selection using VAR

A VAR model is used to determine the optimum lag length (Farooq & Islam, 2021; Temiz Dinç & Akdoğan, 2019). Here, the optimal lag length is determined using the AIC, SC, and HQ criteria. This lag selection is crucial because the cointegration test is very sensitive to the lag length of the VAR.

Estimated Long Run Coefficients

Long-term correlation between various time series is known as co-integration. To check this, in this study, the Johansen cointegration test is conducted to estimate the long run effects of education on poverty reduction (Paul and Sana, 2018; Temiz Dinç & Akdoğan, 2019).

Vector Error Correction Model (VECM)

If the cointegration test's outcomes confirm that there is cointegration between data sets, the VECM model is generally used. The long-term equilibrium relationship between the data sets and the existence or absence of error correction over time is examined using the VECM model (Asari *et al*., 2011; Temiz Dinç & Akdoğan, 2019).

Wald Test

The Wald test is carried out to determine the short-run relationship between data sets. If the Wald test probability value exceeds 0.05, it indicates a short-run relationship between the data sets (Farooq & Islam, 2021; Abid *et al*., 2016).

Stability Test

The Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ) is used to confirm the stability of the model. If plots of CUSUMSQ are inside the boundaries, there is no indication of any substantial structural instability (Burakov, D., 2017; Bahmani-Oskooee & Ng, 2002).

Results and Discussion

The results of the different analyses are discussed in this section.

Unit Root Test

For the purpose of examining the presence of unit roots in the data sets, the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) methods are applied. The results of the same are exhibited in the following tables: Table 2 and Table 3.

Table 2: Outcomes of Unit Root Test Using Augmented Dickey-Fuller (ADF) Method

Variables	At Level		At First Difference		Integrating Order
	Stat.	Probability.	Stat.	Probability.	
LN_HFCE	-1.4682	0.5313	-5.7541	0.0001	I (1)
EDN_GER	-0.4922	0.8790	-3.7591	0.0085	I (1)
EDU_EX	-1.9730	0.2963	-3.3176	0.0236	I (1)

Source: Researchers' own calculation

Table 3: Outcomes of Unit Root Test Using Phillips-Perron (PP) Method

Variables	At Level		At First Difference		Integrating Order
	Stat	Probability	Stat	Probability	
LN_HFCE	-2.7867	0.0726	-6.7740	0.0000	I (1)
EDN_GER	-0.5520	0.8665	-3.7223	0.0092	I (1)
EDU_EX	-1.9625	0.3007	-3.3006	0.0245	I (1)

Source: Researchers' own calculation

The existence of unit roots is checked by using the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test (Paul and Sana, 2018; Nazima, 2011). Table 2 and Table 3 show the presence of a unit root at level (at the 5% significance level), which denotes series that are non-stationar. The non-stationarity problem is resolved after taking the first difference, and in all cases, the p value is less than 0.05. Now, the Johansen cointegration method is applied to examine the long-run association between variables (Paul and Sana, 2018). Then, the appropriate lag length is decided using different lag length criteria selection methods. It was found that there would be two lags for all variables.

Table 4: Results of Lag Order Selection Criteria using VAR

Lag	Akaike Information Criteria (AIC)	Schwarz Information Criteria (SC)	Hannan- Quinn Information Criteria (HQ)
0	7.690576	7.834558	7.733389
1	-0.301584	0.274343	-0.130331
2	-0.982614*	0.025259*	-0.682921*
3	-0.836171	0.603647	-0.408038

Source: Researchers' own calculation

represents lag order selected by the criterion

According to the AIC, SC, and HQ information criteria, the optimum lag length should be 2 (Table 4).

Findings

Null Hypothesis H0 1: There is no integration between the variables.

Alternative Hypothesis: There is at least one cointegrating variable.

Model:

D(LN_HFCE) = C(1) (LN_HFCE(-1)+0.412878992245*EDU_EX(-1) - 0.106838544534*EDN_GER(-1) - 26.2393171272) + C(2)*D(LN_HFCE(-1)) + C(3)*D(LN_HFCE(-2))*

*+ C(4)*D(EDU_EX(-1)) + C(5)*D(EDU_EX(-2)) + C(6)*D(EDN_GER(-1)) + C(7)*D(EDN_GER(-2))+ C(8)*

This equation is used in the Error Correction Model. Here, the natural log of household final consumption expenditure (LN_HFCE) is used as the dependable variable. C (1) indicates the coefficient of the integrating equation.

Null Hypothesis H0 2: This null hypothesis states that there is no long term causality among HFCE, EDU_EX, and EDN_GER.

Alternative Hypothesis: There is long-term causality.

Table 5: Results of Johansen Test of Co-integration

HFCE = f (EDU_EX, EDN_GER)							
No. of Co-integration Equations	**Eigen value**	**Trace Stat.**	**0.05 Critical Value at 5%**	**Probability-Value****	**Maximum-Eigen Value**	**0.05 Critical Value at 5%**	**Probability- Value****
None *	0.585991	35.71341	29.79707	0.0093	23.81041	21.13162	0.0205
At most 1	0.316622	11.90300	15.49471	0.1616	10.27908	14.26460	0.1942

Source: Researchers' own calculation

At the 0.05 level of significance, the trace test and the Max-eigen value test indicate one co-integrating equation.

** represents rejection of the hypothesis at the 0.05 level*

***MacKinnon-Haug-Michelis (1999) p-values*

From table 5, it is observed that the Max. Eigen value and Trace test (the estimated test statistics) are higher than the critical value at the 5% significance level. This indicates that there is one cointegration equation. The null hypothesis is rejected because the probability is less than 0.05. It means cointegration exists between the variables.

Table 6: Outcomes of Vector Error Correction Estimates

Dependent Variable	Coefficient	Standard Error	t-Stat.	Probability Value
C(1)	-0.151419	0.046139	-3.281837	0.0039

Source: Researchers' own calculation

The above table shows that the co-efficient [C (1)] has a negative sign and is significant at the 1% significance level as the probability value is less than 0.01. This result indicates error correction over the long term. This also demonstrates the long-run effects of education on poverty reduction.

D(LN_HFCE) = C(1)(LN_HFCE(-1) + 0.412878992245*EDU_EX(-1) - 0.106838544534*EDN_GER(-1) - 26.2393171272) + C(2)*D(LN_HFCE(-1)) + C(3)*D(LN_HFCE(-2))*
*+ C(4)*D(EDU_EX(-1)) + C(5)*D(EDU_EX(-2)) + C(6)*D(EDN_GER(-1)) + C(7)*D(EDN_GER(-2))*
+ C(8)

Table 7: Estimation of Equation

	Coefficient	Standard Error	t-Stat.	Probability Value
C(1)	-0.151419	0.046139	-3.281837	0.0039
C(2)	-0.873580	0.281771	-3.100315	0.0059
C(3)	0.362277	0.192956	1.877507	0.0759
C(4)	0.005714	0.032000	0.178571	0.8602
C(5)	0.016829	0.031615	0.532323	0.6007
C(6)	-0.005292	0.005774	-0.916562	0.3709
C(7)	0.002036	0.007262	0.280433	0.7822
C(8)	0.179753	0.038908	4.619927	0.0002
R-squared	0.735950	Mean dependent var		0.121313
Adjusted R-squared	0.638669	S.D. dependent var		0.050366
S.E. of regression	0.030275	Akaike information criterion		-3.915762
Sum squared residual	0.017415	Schwarz information criterion		-3.531810
Log likelihood	60.86279	Hannan-Quinn information criterion		-3.801593
F-stat.	7.565166	Durbin-Watson statistics		2.324399
Probability (F-statistic)	0.000206			

Source: Researchers' own calculation

The above table shows that the probability value of the co-efficient [C (1)] is 0.0039, which is less than 0.05 and 0.01. This indicates the null hypothesis is rejected both at the 1% and 5% levels of significance. The coefficient [C (1)] has a negative sign in Table 7, which denotes long-term equilibrium. The adjusted R-squared is 0.638669, which indicates independent variables have a strong influence on the dependent variable. Over all models, it is significant because Prob. (F-statistic) is less than 0.05.

Table 8: Outcomes of Wald Test

Test Stat.	Value	Prob.
F-stat.	0.284621	0.8843
Chi-square	1.138485	0.8881

Source: Researchers' own calculation

To check whether EDU_EX and EDN_GER have any impact on LN_HFCE or not in the short run (SR), the Wald test is conducted (Abid *et al.,* 2016; Paul and Sana, 2018).

Null Hypothesis H0 3: This null hypothesis states that lag 1 & 2 of EDU_EX and EDN_GER cannot jointly affect LN_HFCE. The Chi square statistic's probability is less than 0.05. This indicates the null hypothesis is rejected. However, the null hypothesis is accepted here, since the probability of the Chi square statistic is greater than 0.05,

indicating that the lags 1 and 2 of the EDU_EX and EDN_GER do not jointly affect the LN_HFCE in the short run (table 8). So, in the short run, education doesn't have any immediate effect on poverty reduction.

Stability Tests

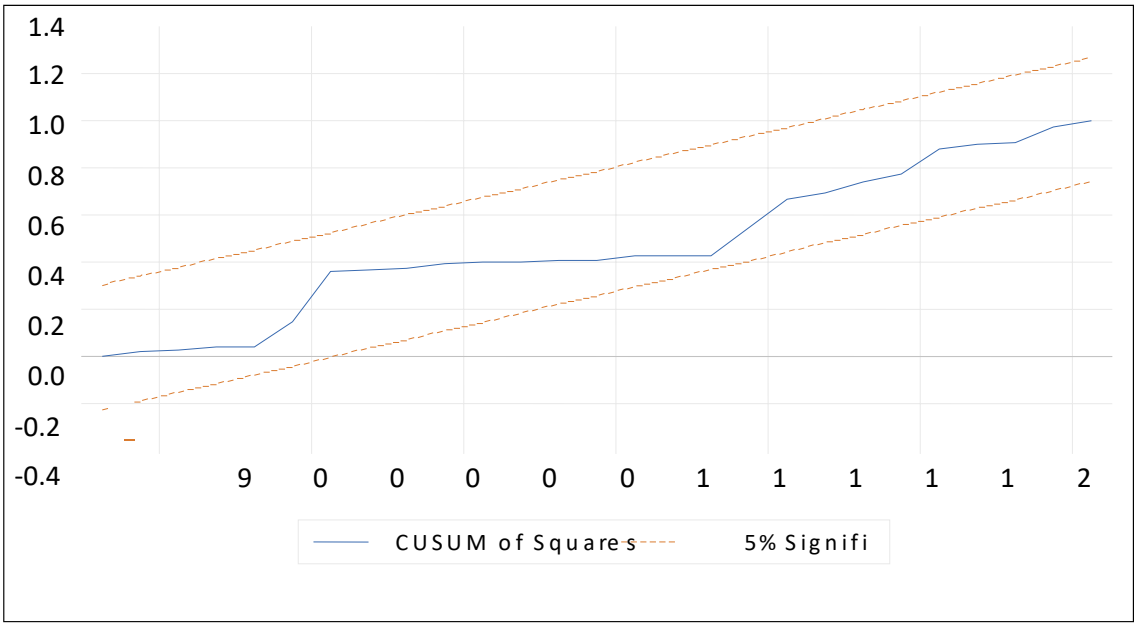

Figure 1: Plot of Cumulative Sum of Squares of Recursive Residuals

The above figure shows that plots of CUSUMSQ are inside the boundaries; this indicates a long-run relationship exists between the variables, and it also shows that the model is stable.

Conclusion

The key to economic development is investing in the educational sector. Education assists in the reduction of poverty and promotes socio-economic development. This study attempts to examine the effects of education on poverty reduction in India. With the help of the Johansen method, cointegration among series is investigated. The cointegration result demonstrated that there is a long-term association between education and poverty. This shows that education has a long-term, positive, and significant effect on reducing poverty. Therefore, poverty can be reduced by promoting education. The targets of SDG 1 (zero poverty) can be achieved by educating people (SDG 4). Enrollment in educational institutions rises if government spending on education rises. If enrollment in educational institutions rises, more students find employment after finishing their degrees, which contributes to rising household final consumption expenditure. In the long run, this higher household final consumption expenditure helps to raise living standards and reduce poverty, but there is no short-run effect. Government expenditure on education and the enrolment ratio won't have any immediate effect on reducing poverty, and it will take time to observe a noticeable result. It takes a few years after a student enrolls in school before they

are placed. Once they get a job, their income will rise, their expenses will rise, and poverty will gradually decline. These contribute to achieving SDG 1, i.e., eradicating poverty.

Limitations of the Study

This study did not take into account all of the factors like employment, economic growth, etc. The other pertinent factors could not be taken care of due to time constraints. To obtain more robust results, a number of other factors could have been considered. Further research can be done in this area.

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Poverty Eradication in India: A Study with Special Reference on SDG-1

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ABSTRACT

The term "poverty" means the state of being extremely poor or the state of being inferior in terms of quality. It is not about having enough money to meet the physiological needs of an individual but it is much more than what was understood. The World Bank describes poverty as hunger, lack of shelter, being uneducated and sick, not having a job or basic security, and being afraid for the future. On 25th September, 2015, 193 member countries assembled together at the UNs General Assembly to take an oath to transform the world into a better place to live and to ensure that development takes place in such a way that natural resources are sustained and passed on to future generations unimpaired by means of adopting Agenda 2030. The United Nations has listed a total of 17 Sustainable Development Goals (SDGs) and the first goal is to eradicate poverty in all its forms. This paper seeks to find out whether India is moving towards poverty eradication by providing basic needs to the people, proper health care facilities, proper education, job security, and growth, ensuring significant mobilisation of resources from different sectors and implementing those factors within 2030 as per UNs Agenda. In this paper, the study has been conducted in a descriptive manner and the data has been gathered from different secondary sources. The results also highlight how India is moving towards poverty eradication by following SDG 1.

Keywords: *Poverty; Sustainable Development Goals (SDGs); Millennium Development Goals (MDGs); SDGs Agenda 2030*

Introduction

"Extreme poverty anywhere is a threat to human security everywhere".

-Kofi Annan, Seventh Secretary General of the United Nations

Sustainable Development has become the "fuzz word" of both the academic and business worlds. The Sustainable Development Goals (SDGs) are a fitting framework that calls attention to the challenges to a sustainable future and organises individual and collective responses. The SDGs are a set of 17 goals that have been adopted by 193 member countries at the historical summit organised by the United Nations held in New York on September 25, 2015. The global community marked a paradigm shift in direction from the previous Millennium Development Goals (MDGs). India, home to one-sixth of all humanity, is cognizant of its role and responsibility in working towards a sustainable future for the planet and all of its life. It is usually described as development wherein needs of the current generation are met without compromising the ability of future generations to meet their own needs. The Sustainable Development Goals are a universal agenda that applies to all countries. At the conference held at the

headquarters of the United Nations, all the member countries took an oath to transform the mother earth into a better place to live by adopting Agenda 2030, where they decided to implement each and every goal (17 goals) in the best way possible so that sustainability and equitable growth can be achieved by minimizing the adverse impact of climate change.

There are 17 SDGs which are as follows (UNDP, 2023):

(1) No Poverty; (2) Zero Hunger; (3) Good Health and Well Being; (4) Quality Education; (5) Gender Equality; (6) Clean Water and Sanitation; (7) Affordable and Clean Energy; (8) Decent Work and Economic Growth; (9) Industry, Innovation and Infrastructure; (10) Reducing Inequality; (11) Sustainable Cities and Communities; (12) Responsible Consumption and Production; (13) Climate Change; (14) Life Below Water; (15) Life on Land; (16) Peace, Justice, and Strong Institutions; (17) Partnerships for the Goals.

UNs SDG 1 defines the ending of poverty in all its forms. For any developing country with a mammoth population, like India, poverty eradication is one of the difficult tasks that the government has faced throughout the years. The Government of India also introduced a task force, known as NITI Aayog (National Institution for Transforming India) (previously, The Planning Commission) whose tasks are to look after the objectives set by the UN's SDG and to utilise and implement those objectives into actions within the country in the fullest way possible so that the SDGs Agenda 2030 can be achieved within due course. According to the latest report of the World Bank (2023), every one in four people in India is living on less than $ 1.25 a day. It also shows that nearly 1.1 billion fewer people are living in extreme poverty than in 1990. Children, too, are victims of extreme global poverty. Poverty does not only signify money or income, it also talks about lack of access to resources, lack of physiological needs, education, unemployment, hunger, growth, ill health, clean drinking water, technological advancement and so on.

India is implementing a comprehensive development strategy to eradicate poverty. The main goal of India for SDG 1 is to reduce by at least half the proportion of men, women, and children of all ages living in poverty in all its dimensions by 2030. To reduce poverty, India is trying to maintain a high growth rate for job creation while also facing layoffs in various sectors of the economy. For achieving SDG 1, NITI Aayog has selected five national-level indicators to measure performance towards poverty eradication. The target is to reduce poverty by 2030, and in doing so, India adopts different poverty alleviation policies and programs that focus on the economic growth of the nation (Gera *et al*., 2018).

Literature Review

Many studies have been conducted worldwide over the years, but in India, the number of studies has been limited so far. Some of the important studies in this area are summarised below:

Griggs *et al.* (2013) mention how humans in the recent era have focused only on poverty alleviation without considering much about environmental degradation. Pradhan *et al.* (2017) found that the indicators are not independent of each other and show positive

and negative correlations, which they termed trade-offs and synergies, respectively. Das, Sharma and Babu (2018) pointed out that, with regards to "No Hunger", the performance of southern states is far better than their counterparts in the area of food security and nutrition. David (2018) identified challenges in India's implementation of SDGs, such as defining indicators, monitoring and ownership, measuring progress, and financing SDGs. Dhar (2018) focused on the economic empowerment of women and ending violence against women under the SDG framework. Roy and Pramanick (2019) conducted their research on the basis of "Clean Water and Sanitation" and took 28 parameters, which have been categorised into two categories of social and biophysical. The study also shows an interrelationship with hunger and poverty and concludes that a positive increase in sanitation indicators would improve water and sanitation related diseases. Choudhuri (2019) found a lacuna in linking the government's plan for clean energy and sanitation. Parvez and Agarwal (2019) studied the sustainability of Higher Education Institutes (HEI) in India. After considering the parameters and indicators of "STARS" and "UI Green Metric WUR" and found that around 50% parameters of the above benchmarks were not complied. The study also specifies the need for reporting specific rating parameters for HEI's in India.

There are some studies in India based on poverty alleviation, but related to SDG 1 and poverty alleviation, there are very few studies that focus on the need, current status, and progress towards achieving SDGs Agenda 2030 in India. This paper aims to bridge that gap.

Objectives of the Study

This paper seeks to dwell upon the following issues:

(a) To see whether social protection system throughout the country has been implemented properly to achieve SDGs Agenda 2030.
(b) To ensure significant mobilisation of resources for India as a developing economy.
(c) To implement different policies adopted by the Government of India and different poverty alleviation programmes to end poverty in all dimensions by 2030.

Methodology

This research paper is descriptive and exploratory in nature. It is based on the information and data that have been collected from secondary sources. It is an analytical study that is based on the information collected from newspaper articles, research journals, and governmental and non-governmental reports, such as the United Nations SDG Reports, India's SDX Index Reports, NITI Aayog, etc.

Results and Discussion

On 25th September, 2015, 193 member countries assembled together at the UNs General Assembly to take an oath to transform the world into a better place to live and to ensure that development takes place in such a way that natural resources are sustained and passed on to future generations unimpaired by means of adopting Agenda 2030. The Government of India, through different policy implementations, is trying to improve the socio-economic factors of the nation. Even in the health-care sector, India hit the worst during Covid 19 break-out in the second wave. Since then, the Indian Council of

Medical Research (ICMR) has been at the forefront of constantly evolving and trying to provide better solutions to every problem as the world is changing at a faster pace than ever before. They also join hands with Government's "Vision of Healthy India" for achieving the SDGs Agenda 2030 for Good Health and Well Being (SDG 3). The Indian Council of Medical Research also plans to re-align their research and development to become truly complementary with the national policies. For providing a social protection system throughout the country and to achieve the SDGs Agenda by 2030, the Government of India introduced different schemes, among which the Ayushman Bharat Yojana, also called Pradhan Mantri Jan Arogya Yojana (PMJAY).

This scheme has been introduced for economically weaker sections of society who are in great need of treatment. It started functioning from 23rd September, 2018, aims to cover a mammoth 50 crore Indian citizens under this scheme. As per the latest report, approximately 19,000 hospitals were covered under this scheme, more than 10 crore e-cards have been issued, and more than 45 lakh beneficiaries have benefited from this scheme across the country. The Ayushman Bharat Yojana, later renamed Pradhan Mantri Jan Arogya Yojana, aimed to provide health care services in both the secondary and tertiary sectors cashless, so that the underprivileged or economically weaker section of people could get the treatment without much difficulty. The coverage includes 3 days of pre-hospitalization and 15 days of post-hospitalization as well as all other related expenses. It covers a coverage of Rs 5 lakh for every family per year, thereby helping the weaker section of the population get their treatment (NPI, 2018).

It has been noticed that, due to not having proper equipment for treatment, people often died without even being diagnosed with the disease beforehand. At the national level, this scheme has been operative, similarly various state government as well as Union Territories have launched their own personalized scheme to provide better health care facilities to all. Besides health, education, unemployment, safe drinking, and sanitation also play dominant roles in any country's poverty eradication. As per the reports published by SDG India Index 3.0, 2020–21 report, approximately 28.7% of the population has at least one member of the family covered under Health Insurance or a health scheme (be it Governmental or Private those who can afford it) (NPI, 2018). Even with the introduction of Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY) and Pradhan Mantri Suraksha Bima Yojana (PMSBY) in 2015, the Ministry of Finance provides life insurance as well as accidental coverage to the poorer or economically weaker sections of the population. For PMSBY, this scheme is specially designed for people involved in working in high-risk sectors, namely, mechanics, laborers, truck drivers, etc. For PMJJBY, it is a one-year life insurance coverage scheme that is renewable from year to year, and the premium amount is very nominal so that people can afford it (National Informatics Centre, n.d.). Even so, it is very easy to get those schemes, as several governmental as well as scheduled banks, including an insurance company, namely the Life Insurance Corporation of India (LICI), also administer them.

Due to the outbreak of Covid 19, India as well as the rest of the world were in the turbulence stage, and hence the goal to achieve the No Poverty Agenda has shaken a little. For every nation to prosper, education as well as employment are keys to success. Sarva Shiksha Abhiyan (Education for All) was an initiative taken by the Government of

India way back in the 86th Amendments of the Constitution of India to provide free education to every corner of the country for children up to 14 years of age. Although there have been numerous discussions and criticisms of the role of the government in this pandemic era, they supplied free food to the poorest section of the population, which helped mitigate the risk for the poor. As per the latest article published by the UN in a daily newspaper, India's poor face low inflation risk, i.e., it creates low impact. The study used distribution per capita household income for benchmark and cost of living scenarios at three income levels: $ 1.9 a day (World Bank Standard for absolute poverty), $ 3.2 and $ 5.5. For vulnerability to poverty, the analysis also used a threshold of $ 13 a day (United Nations, n.d.).

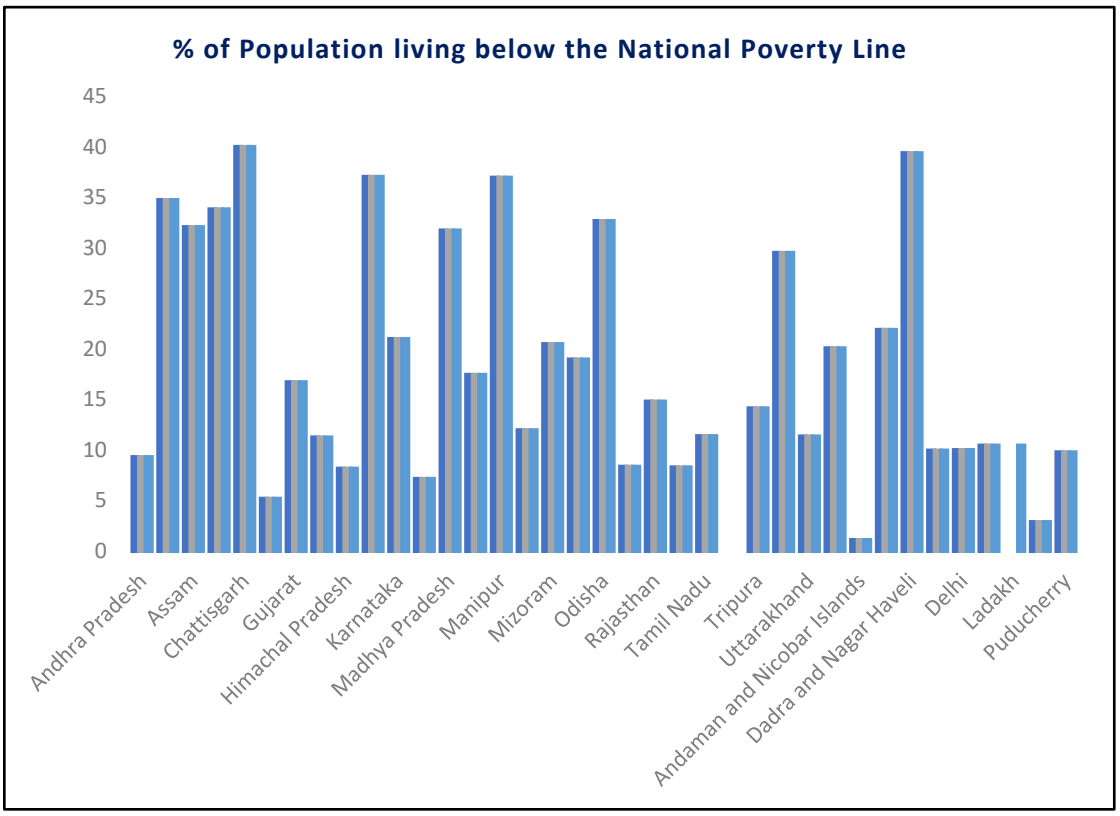
Table 1 shows a comparative analysis of the SDG India Index Baseline Report, 2018, SDG Index 2.0, 2019-20 and SDG Index 3.0, 2020-21, showing how much India has achieved state-wise as well as union territory-wise for goal attainment towards SDG 1 for poverty eradication in these years.

Table 1: Performance of States and UTs for Goal Attainment Towards SDG

Sr. No.	States/ UTs	Percentage of Population living below the National Poverty Line			Percentage of households of any usual member covered by a health scheme of health insurance			Persons provided employment as a percentage of persons who demanded employment under Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)			Proportion of population (out of total eligible population) receiving social protection benefits under Maternity Benefit (%) [Note: Lately the scheme has been renamed as Pradhan Mantri Matru Vandana Yojana (PMMVY)]			SDG 1 Index Score		
		2017-18	2019-20	2020-21	2017-18	2019-20	2020-21	2017-18	2019-20	2020-21	2017-18	2019-20	2020-21	2017-18	2019-20	2020-21
1.	Andhra Pradesh	9.2	9.2	9.2	74.60	74.60	74.60	87.77	91.28	83.81	17.40	17.40	96.40	67	69	81
2.	Arunachal Pradesh	34.67	34.67	34.67	58.30	58.30	58.30	85.56	93.39	95.44	20.50	20.50	92.76	52	34	54
3.	Assam	31.98	31.98	31.98	10.40	10.40	10.40	87.10	87.30	86.11	66.10	66.10	95.32	53	48	51
4.	Bihar	33.74	33.74	33.74	12.30	12.30	12.30	75.63	77.25	78.60	53.90	53.90	87.97	45	33	32
5.	Chattisgarh	39.93	39.93	39.93	68.50	68.50	68.50	77.25	79.91	77.09	66.20	66.20	94.98	50	49	49
6.	Goa	5.09	5.09	5.09	15.90	15.90	15.90	98.15	87.23	97.39	7.40	7.40	93.96	62	53	83
7.	Gujarat	16.63	16.63	16.63	23.10	23.10	23.10	80.92	82.99	83.63	8.90	8.90	92.83	48	47	66
8.	Haryana	11.16	11.16	11.16	12.20	12.20	12.20	80.16	79.04	79.12	13.50	13.50	97.24	50	47	69
9.	Himachal Pradesh	8.06	8.06	8.06	25.80	25.70	25.70	91.12	91.60	90.30	13.10	13.10	95.86	60	60	80
10.	Jharkhand	36.96	36.96	36.96	13.30	13.30	13.30	70.34	75.38	80.62	41.60	41.60	89.69	37	28	36
11.	Karnataka	20.91	20.91	20.91	28.10	28.10	28.10	84.26	85.53	86.34	19.90	19.90	92.35	52	49	68
12.	Kerala	7.05	7.05	7.05	47.70	47.70	47.70	87.98	89.33	88.85	20.40	20.40	97.75	66	64	83
13.	Madhya Pradesh	31.65	31.65	31.65	17.70	17.70	17.70	79.68	78.06	79.27	61.10	61.10	95.86	44	40	44
14.	Maharashtra	17.35	17.35	17.35	15.00	15.00	15.00	86.40	86.10	84.29	8.70	8.70	92.98	47	47	66
15.	Manipur	36.89	36.89	36.89	3.60	3.60	3.60	96.46	95.45	97.06	26.20	26.20	87.84	44	42	60
16.	Meghalaya	11.87	11.87	11.87	34.60	34.60	34.60	97.30	97.85	97.95	28.00	28.00	96.61	68	68	77
17.	Mizoram	20.40	20.40	20.40	45.40	45.80	45.80	99.94	99.92	99.92	47.50	47.50	93.45	71	67	80
18.	Nagaland	18.88	18.88	18.88	6.10	6.10	6.10	98.91	95.08	98.96	29.70	29.70	91.30	59	56	73
19.	Odisha	32.59	32.59	32.59	47.70	47.70	47.70	84.76	85.80	85.51	72.60	72.60	Null	59	47	41
20.	Punjab	8.26	8.26	8.26	21.20	21.20	21.20	81.63	76.12	77.66	19.10	19.10	96.46	56	48	69
21.	Rajasthan	14.71	14.71	14.71	18.70	18.70	18.70	85.07	83.16	84.24	56.10	56.10	98.15	59	56	63
22.	Sikkim	8.19	8.19	8.19	30.30	30.30	30.30	94.16	93.07	91.30	29.40	29.40	92.17	64	65	80
23.	Tamil Nadu	11.28	11.28	11.28	64.10	64.00	64.00	98.83	94.07	94.44	29.50	29.50	88.42	76	72	86
24.	Telengana	Null	Null	Null	66.40	66.40	66.40	77.06	84.40	81.38	12.20	12.20	Null	52	52	68
25.	Tripura	14.05	14.05	14.05	58.10	58.10	58.10	94.38	95.68	96.38	32.60	32.60	86.58	71	70	82
26.	Uttar Pradesh	29.43	29.43	29.43	6.10	6.10	6.10	84.30	84.23	82.15	48.70	48.70	93.48	48	40	44
27.	Uttarakhand	11.26	11.26	11.26	19.50	19.50	19.50	90.10	90.37	90.02	49.40	49.40	89.02	65	64	74
28.	West Bengal	19.98	19.98	19.98	33.40	33.40	33.40	87.63	88.37	87.59	28.70	28.70	71.57	57	52	59
29.	Andaman and Nicobar Islands	1.00	1.00	1.00	5.70	5.70	5.70	92.46	84.82	82.96	1.40	1.40	96.73	57	48	71
30.	Chandigarh	21.81	21.81	21.81	21.30	21.30	21.30	Null	Null	Null	13.70	13.70	96.22	39	48	75

31.	Dadra and Nagar Haveli	39.31	39.31	39.31	30.80	30.80	30.80	Null	Null	Null	2.60	2.60	94.94	21	33	65
32.	Daman and Diu	9.86	9.86	9.86	17.00	17.00	17.00	Null	Null	Null	19.30	19.30	90.21	58	58	
33.	Delhi	9.91	9.91	9.91	16.40	15.70	15.70	Null	Null	Null	7.90	7.90	96.50	30	54	81
34.	Jammu and Kashmir	10.35	10.35	10.35	4.20	4.20	4.20	88.79	87.52	84.32	54.00	54.00	96.69	61	58	69
35.	Ladakh	---	---	10.35	---	---	4.20	---	---	97.75	---	---	96.69	---	---	79
36.	Lakshadweep	2.77	2.77	2.77	3.40	2.90	2.90	56.13	91.20	91.85	17.50	17.50	26.41	43	56	61
37.	Puducherry	9.69	9.69	9.69	32.80	32.80	32.80	83.78	84.45	84.76	21.40	21.40	96.01	61	56	75
	India	21.92	21.92	21.92	28.70	28.70	28.70	84.75	85.26	84.44	36.40	36.40	91.38	54	50	60
	Target	10.95	10.95	10.96	100.00	100.00	100.00	100.00	100.00	98.95	100.00	100.00	100.00	100	100	100

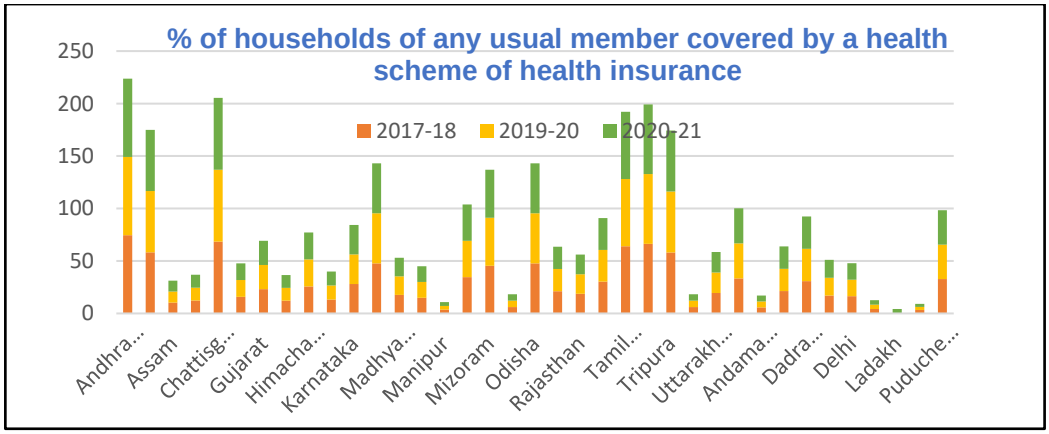
Compiled by the researcher, Source: NITI Aayog (2018, 2019, 2021)



Source: Presentation made by the researcher based on Table 1

Figure 1: Percentage of Population Living below the National Poverty Line of Indian States and Union Territories

According to the Tendulkar Committee's (Planning Commission, 2013) estimates for measuring the poverty rate, the poverty rate of India fell by 8.1 % between 1993–94 and 2004–05, further reducing it to 15.3% between 2004–05 and 2011–12. In 2011–12, it was noticed that only 21.92% of the population of India was below the poverty line, but the target was to achieve it within 10.96%. Although it has been noticed that, among the states, Goa is leading the race with only 5.09% of the population below the poverty line, followed by Kerala (7.05%), Himachal Pradesh (8.06%), Sikkim (8.19%), Punjab (8.26%), and Andhra Pradesh (9.2%). In terms of UTs, Andaman and Nicobar Islands are leading with only 1% of the population below the poverty line, followed by Lakshadweep (2.77%), Daman & Diu (9.86%), and Delhi (9.91%). Ladakh as a UT is the new entrant in 2020–21, with only 10.35% below the poverty line.

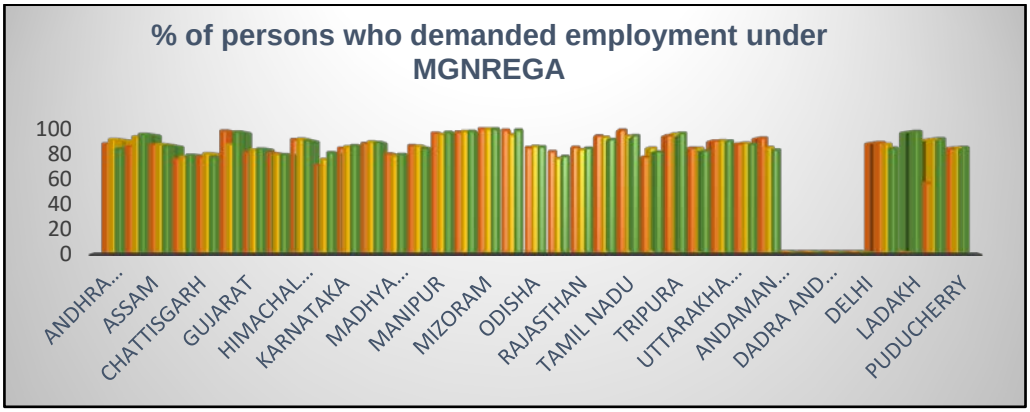


Source: Presentation made by the researcher based on Table 1

Figure 2: Percentage of Households of any Usual Member Covered by a Health Scheme of Health Insurance

According to Oxford Poverty and Human Development Initiatives (OPHI's) Global MPI Country Report on India 2020 based on the latest National Family Health Survey (NFHS) Report, it has been found that nearly 270 million people have been lifted out of Multi-Dimensional Poverty i.e., approx. 27.9% (NITI Aayog, 2020). The target of India is to reduce its population by half, and it is expected that within a few years, if India follows this strict approach, they can achieve the target by 2030.

One of the main tasks for poverty eradication is providing health care facilities to all citizens. As discussed earlier, Governments (both Central and States) work in tandem to provide basic health-care facilities to all irrespective of their needs, i.e., providing health insurance to all households in India, whether urban or rural, by implementing various schemes throughout the nation. As per the SDG India Index report 3.0, it is found that at least 28.7% of households in India cover at least one member of a family with a health scheme or health insurance. After all these efforts, India is still lagging behind in achieving the target of 100%. But still, there is hope that it will be achieved in the near future.

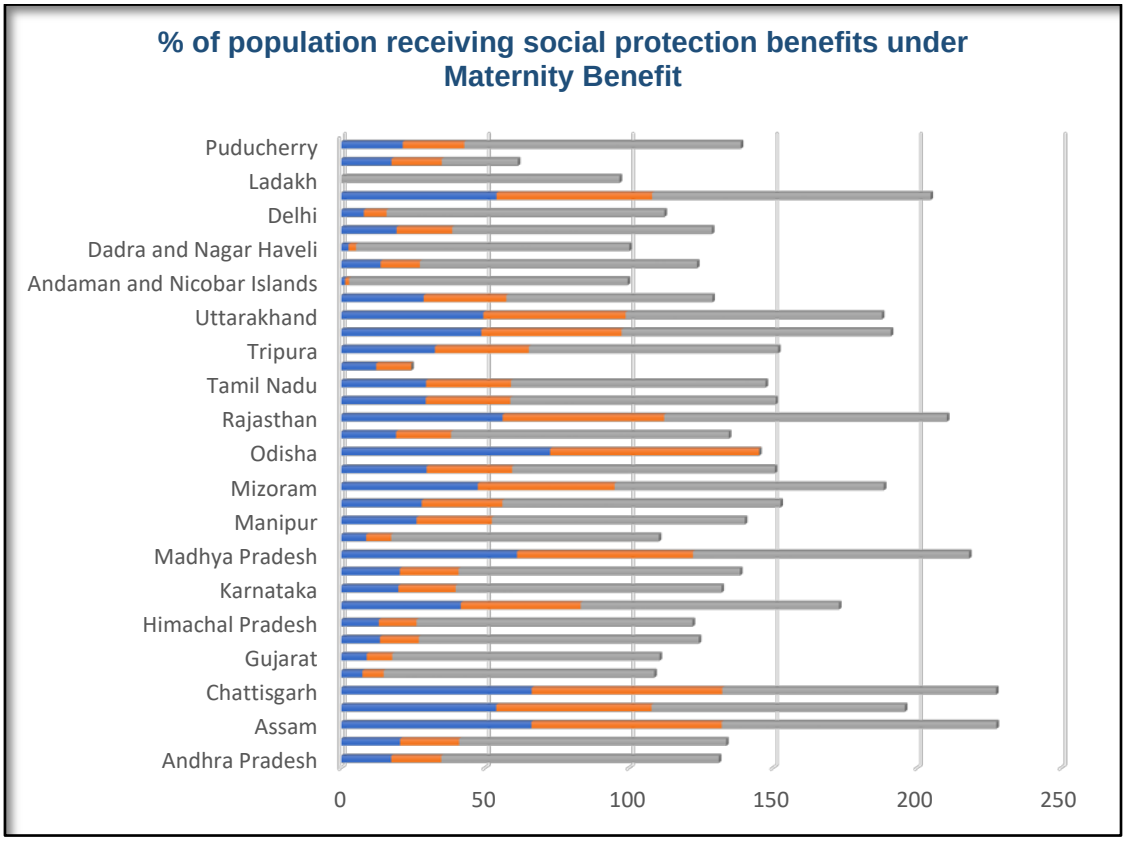


Source: Presentation made by the researcher based on Table 1

Figure 3: Percentage of persons who demanded employment under Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)

In terms of providing guaranteed employment opportunity, the Government of India introduced the National Rural Employment Guarantee Act (NREGA) in 2005; later, it was

renamed in 2009 as the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) for providing 100 days of guaranteed wage employment in every financial year to every rural household whose adult member volunteers to do unskilled work (Ministry of Rural Development, 2023). Based on the above table reports, it has been seen that more or less every state and union territory has performed significantly well to reach the desired goals. For three consecutive years, Mizoram (99.92%) outperformed every state and Ladakh, and the new entrants in UT also performed fairly well (97.75%) than others. Similarly, other poverty alleviation programs are also provided by the government to meet the needs of society and the people at large.

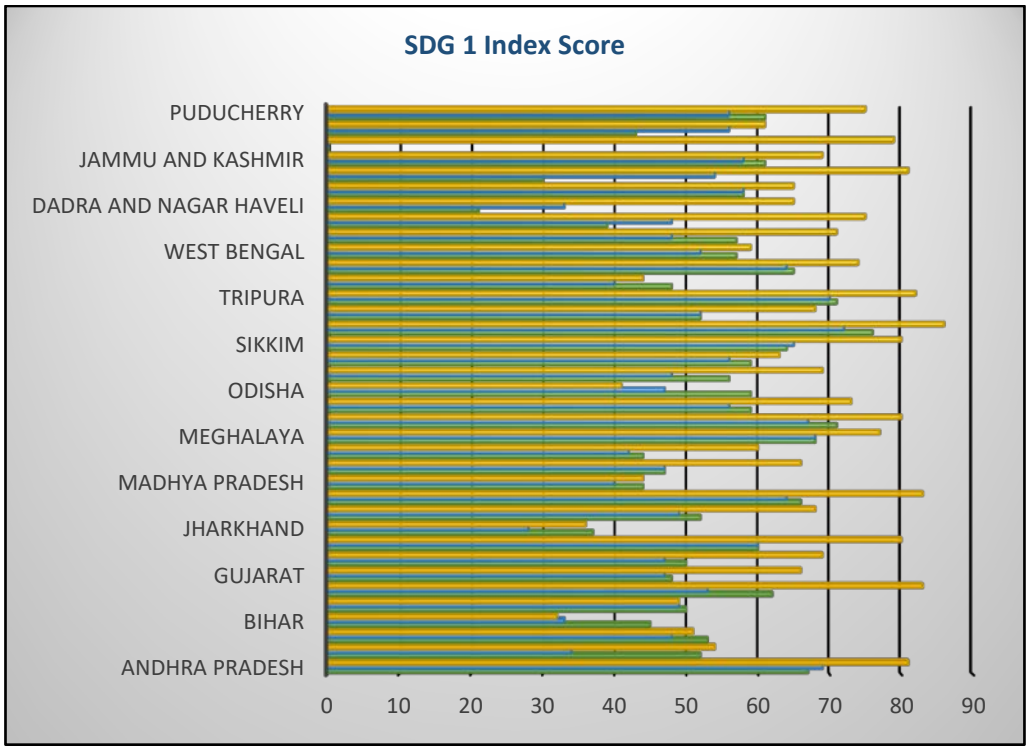


Source: Presentation made by the researcher based on Table 1

Figure 4: Percentage of population receiving social protection benefits under Maternity Benefit

In terms of providing social benefit, another important aspect of eradicating poverty as per SDG 1 is to provide maternity benefit across the nation. The Government of India launched a maternity benefit program in 2010 named Indira Gandhi Maternity Benefit Program. Matritva Sahyog Yojana was later, in 2017, renamed Pradhan Mantri Matru Vandana Yojana, implemented by the Ministry of Women and Child Development. The main focus of this scheme is to provide financial benefit in terms of conditional cash transfers for pregnant and lactating women of 19 years of age or older for the first live birth. The scheme also provides partial wage compensation to those women who suffer wage loss during childbirth. This has become a pilot project for the Government and it started implementing almost all the states and UTs across various districts as well. Initially, this scheme provides an amount of Rs 6,000 in two different installments for child care. The eligible beneficiaries receive this amount under the Janani Suraksha

Yojana for institutional delivery. In terms of the reports from the above table, India is performing well enough in 2020–21 as compared to 2018, 2019–20. In 2018 and 2019–20, India achieved only 36.40% of its objective of achieving the desired goal of 100%. But in 2020–21, India outperformed and achieved 91.38% towards the goal of 100%. Still, the target is yet to be achieved in full swing or coverage, and India is on the verge of achieving it in its full capacity. Among the states and UTs, Rajasthan and Andaman and Nicobar Islands had the highest coverage in India, with 98.15% and 96.73% of eligible beneficiaries receiving maternity benefits, respectively.



Source: Presentation made by the researcher based on Table 1

Figure 5: SDG 1 Index Score

The index score on the basis of SDG 1 No Poverty in different states of India has been measured on the basis of five national-level indicators that have been identified by the government of India, and out of these indicators, three out of seven SDG targets have been aimed at being fulfilled by 2030. The indicators have been selected based on the availability of data across the states and the UTs to ensure smooth comparability. This index score ranges between 32 and 86 for states and between 61 and 81 for UTs. The index score has been categorised under four heads: (a) Aspirants (having a score from 0 to 49); (b) Performer (having a score from 50-64); (c) Front Runner (having a score from 65 to 99) and (d) Achiever (Score of 100). Among the states, as per the 2020–21 report from the above table, Tamil Nadu is the Front Runner in the race with an 86 Index Score and in terms of UT, Delhi is the Front Runner bearing SDG 1 Index Score of 81. Overall, the SDG 1 Index Score value has also increased to 60 than that of 2019-20 (50) and 2018 (54), but still, it can be said that India is progressing towards poverty eradication slowly but steadily.

Conclusion

Poverty is a threat to humanity. Extreme poverty in India is declining. The extreme poverty rate fell before the pandemic. Although, a significant decline in poverty has been noticed in the urban sector rather than the rural.

India has achieved significant growth in the reduction of poverty in all its forms. One of the objectives of the UN as well as India is poverty eradication by 2030. There is still a long way to go to achieve the target, but it can be seen that India is progressing slowly but steadily. As a developing country with a huge population base, it is indeed a difficult task for the government to strictly adhere to the principles, rules, and nomenclatures to follow the protocol to achieve the goal, but out of all these restrictions, India is rapidly developing and slowing implementing various poverty alleviation programs to achieve the target.

Due to the outbreak of Covid 19 Pandemic, the whole system gets disrupted not only in the nation but also worldwide. But still, there is always hope that India will break the jinx and come out with a taste of success. By implementing various social protection schemes, employment opportunities, education, etc., it is noticed that India is trying to adopt the policies that the UN suggested, and core committees like NITI Aayog have been adhered to verify and to implement various goals of the SDGs. By no means can it be said that India has not tried to achieve the target, rather, they are prioritising these goals and strategically and systematically trying to implement them as much as possible. For a country like India, there will be barriers to effectively implementing the policies and functioning effectively. The title of this paper actually justifies the outcome that, India, the nation, is moving towards poverty eradication through the implementation of SDG 1.

Acknowledgement

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Studying the Economic Sustainability of Stock Markets Post Arab Spring Crunch: The Case of Select GCC Countries

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ABSTRACT

The goal of the current study is to inspect the economic viability of a few of the stock markets in Gulf Cooperation Council (GCC) nations after the Arab Spring crisis, taking into account volatility, volatility variability, long-term consequences, and regime-switching behaviour. Five stock market indices were considered, namely Bahrain All Share (BAX) (Bahrain), Muscat Securities Market (MSM 30) (Oman), Dubai Financial Market (DFM) (United Arab Emirates), Qatar stock market (QEAS) (Qatar), and Saudi Arabia stock market (TASI) (Saudi Arabia), from the week 3, December 2010, and continued up to the week 4, July 2022, with 606 sample observations. The Jarque-Bera test indicates the non-normality of the dataset. The breakpoint unit root test indicates the stationarity of the variables along with the breakpoint dates. The FIGARCH test studies the long-memory effects of the Arab Spring, where the ARCH term and the GARCH term are statistically noteworthy for all the select stock market indices, indicating the existence of volatility and variance in volatility. The $\alpha + \beta$ term has a value greater than 1, except TASI, which indicates the incidence of long-memory effects within DFM, BAX, MSM 30, and QEAS resulting from the Arab Spring. Therefore, it can be indicated that, although the Arab Spring concluded more than a few years ago, its historic impact in the form of a long-memory effect is still persisting within the economy and definitely distressing the policy-making of the concerned stakeholders. The Markov regime-switching model indicates the stock market indices shift from regime 1 to 2.

Keywords: *Economic Sustainability; Arab Spring; Breakpoint Unit Root; FIGARCH; MRS*

Introduction

The evolution of a nation's economy depends heavily on the stock market. They cater to augmenting economic expansion and aiding in the repair of monetary charges based on the supply and demand of investors. It also subsidizes hovering capital to appeal to cross-border investors and allows growth in business. They are considered the key indicators of political, economic, and security conditions prevailing across diverse nations (El-Chaarani & El-Abiad, 2019). The stock market is crucial in acting as the foundation of the economy. The Arab countries were suffering from the sub-prime meltdown, and before they could recover from it, another shock arrived from the Arab Spring crisis. The different Arab nations witnessed a

political crisis in 2010 in the form of a number of anti-government protests, disturbances, and armed uprisings that expanded across the Middle East. However, the escalation in these protests was found in 2011 during the spring, from which the term ‘Arab Spring’ was actually coined. Though there were differences in the objectives in different nations, the prime objective was to increase democracy and freedom within the nations.

The Gulf Cooperation Council (GCC), which is made up of oil-exporting nations including Kuwait, Bahrain, Oman, the UAE, Qatar, and Saudi Arabia, is a financial and radical alliance. The GCC nations are experiencing a poor return rate, a dearth of fluidity, and a surplus of unpredictability following the crisis of the Arab Spring. This can also be described as the aftermath of the crisis.

The crisis' repercussions may be seen in many stock markets in the Middle East and North Africa (Zaiane, 2018). According to certain research (Abdelbaki, 2013; Acemoglu, Hassan & Tahoun, 2018), the encounters in Syria, Lebanon, Yemen, Iraq, Libya, Tunisia, and Egypt that are geopolitical in nature have slackened the recovery of a few stock markets and the economic segment in the Middle Eastern economies (El-Chaarani & Ragab, 2018; El-Chaarani & El-Abiad, 2019). Nevertheless, Acemoglu, Hassan and Tahoun, (2018) acknowledged a link between the volume of demonstrations and the undervaluation of Egyptian stock markets.

Henceforth, the economic sustainability of the stock markets of the GCC nations post-Arab Spring crunch needs to be evaluated bearing in mind the performance of their capital markets in terms of volatility along with the long-memory effects of the anticipation of their directing power on the economic and political pronouncements in the Middle East province.

Literature Review

Existing studies on GCC republics demonstrating the post-Arab Spring scenario are hard to find. So, the authors also considered studies belonging to the Middle East and North African republics, where the impression of the Arab Spring was also evident.

The effect of the Arab Spring is examined by Korotayev and Khokhlova (2022) on the equilibrium volume of the MENA nations, where the stability volume of the domain was maintained during 2011-2012 and increased significantly between 2013-2016. Khondker, H. H. (2019) also analyses long-term prospects for democracy and growth in the MENA region while concentrating on the short-term relevance of the revolts sweeping through numerous MENA nations. They come to the conclusion that extreme results shouldn't be dismissed too quickly as failures since they can ultimately turn out to be patchy successes. According to Aras and Falk (2016), there are several paths for a final resolution in the MENA nations, which are in conflict with both regional and trans-regional efforts for a positive command. Moreover, Salam and E.A.A., (2015) argues that some of the region's most volatile issues have changed as a consequence of the Arab Spring.

After critically examining the past studies, it is noted that studies discussing the post-scenario of the Arab Spring are difficult to find. Moreover, the application of different econometric tools is also rare.

Objectives of the Study

The loopholes in the prevailing studies direct the authors to finalize the following objectives in this present study with the motive to study the economic sustainability of the stock markets of the GCC nations post-Arab Spring crisis:

- To study the existence of volatility in select stock market indices from Gulf Cooperation Council (GCC) nations post-Arab Spring crisis
- To examine the variability in the volatility of the select stock market indices from Gulf Cooperation Council (GCC) nations post-Arab Spring crisis
- To observe the long-memory effects of the Arab Spring on the select stock market indices from Gulf Cooperation Council (GCC) nations post-Arab Spring crisis
- To analyze the regime-switching manners of the select stock market indices from the period of the Arab Spring to the post-Arab Spring period.

Methodology

The closing results of a few chosen stock market indexes from Gulf Cooperation Council (GCC) nations are used as the basis for this study using weekly data. Initially, all six stock market indices from Gulf Cooperation Council (GCC) nations were selected as the samples for the study. But, after going through the data screening process, the sample size was finalized at five, including Bahrain All Share (BAX) (Bahrain), Muscat Securities Market (MSM 30) (Oman), Dubai Financial Market (DFM) (UAE), Qatar Stock Market (QEAS) (Qatar), and Saudi Arabia Stock Market (TASI) (Saudi Arabia). However, the Kuwait stock market index (BKM 50) was excluded due to the unavailability of data throughout the study phase. Apart from the stock market indices, a dummy variable is constructed to quantify Arab Spring. In order to get a flawless representation, the study period is considered from the 3rd week of December 2010 and continued up to the 4th week of July 2022, where the 3rd week of December 2010 to the 4th week of December 2013 is considered the Arab Spring period represented as ‘1’ in the dummy and the 1st week of January 2014 to 4th week of July 2022 is considered the post-Arab Spring period represented as ‘0’ in the dummy (El-Chaarani & El-Abiad 2019). During this time span, the first phase denotes a high state of unpredictability and the second phase denotes a low state of instability. The information for the various stock market indices is gathered from the investing.com database. All the data are transformed into equivalent natural logarithmic returns to eliminate the limitations associated with time-series data. 606 sample observations were finalized for the study.

The goals of the study are addressed by the authors applying the FIGARCH model propounded by Baillie, Bollerslev and Mikkelsen, (1996), although there are conventional

GARCH models. Moreover, the Markov regime-switching (MRS) model is also realistic for studing the regime-switching behavior of the variables. One aspect of the research has found that Markov regime-switching delivers greater dominance over the single-regime modelling unpredictability (Klaassen, 2002; Haas, Mittnik & Paolella, 2004; Marcucci, 2005). Also, they specify the existence of switching regimes in harmony with stylized economic actualities (Gray, 1996; Marcucci, 2005; Haas, Mittnik & Paolella, 2004). Moreover, descriptive statistics are used to analyse the dataset's features, and the breakpoint unit root test is applied to recognize the fundamental breakdowns along with the stationarity of the variables.

Breakpoint Unit Root Test

The Breakpoint Unit Root Test is a statistical measure for detecting structural breaks in time-series data and deciding if a unit root exists in each segment of the data.

A unit root refers to a statistical property of a time series where the series has a root or solution that is equal to one. This implies that the series is not stationary and has a stochastic trend. Unit root tests are commonly used in economics and finance to test for the presence of long-run dependencies in time series data.

It is based on the assumption that structural breaks may occur in the data and that the stationarity properties of the data may change before and after a break. The test is designed to detect the incidence of structural breaks and determine if a unit root exists in each segment of the data.

The test involves dividing the time series into two or more segments and then performing a unit root test on each segment separately. If the null hypothesis of a unit root is overruled in one or more segments, then it suggests that the series is stationary in those segments and that a structural break may have occurred.

Using Perron's (1989, 1997) predicted innovation outlier breakpoints, a thorough augmented Dickey-Fuller test was conducted. The models below employ an approach that depends on the correlation function and the innovation (i.e., noise) process and contains a variable for a steady change in the intercept of the trend function (Perron, 1997).

$$\Delta y_t = \mu + \theta DU_t + \beta_t + \phi D(T_b)_t + \alpha y_{t-1} + \sum_{i=1}^{k} z_i \Delta y_{t-i} + \varepsilon_t \ldots\ldots\ldots\ldots (1)$$

$$\Delta y_t = \mu + \theta DU_t + \beta_t + \omega DT_t + \phi D(T_b)_t + \alpha y_{t-1} + \sum_{i=1}^{k} z_i \Delta y_{t-i} + \varepsilon_t \ldots\ldots (2)$$

As per Perron (1989 & 1997), the breakpoint T_b can opt such that $t_{\hat{\alpha}}(T_{b,}k)$ is curtailed. The curtailed t-statistic is specified as:

$$t^*_{\hat{\alpha}} = \min_{T_{b\in(k+1,T)}} t_{\hat{\alpha}}(T_b, k). \ldots\ldots\ldots (3)$$

FIGARCH

Model

This model is a type of time-series model used to capture long-term dependencies and persistent volatility clustering in financial data.

The model permits the conditional variance of the data to vary over time and to be influenced by past shocks. It is a generalization of the ARCH and GARCH models, which assume that the conditional variance is a function of only the squared past shocks. The FIGARCH model relaxes this assumption by allowing for a more flexible specification of the relationship between the conditional variance and past shocks.

The FIGARCH model is characterized by a fractional differencing parameter d, which captures the long-term dependence in the series, and a parameter α, which governs the persistence of the conditional variance. The model also includes an autoregressive component, typically an AR (1) process, to capture the impact of past shocks on the conditional variance.

The FIGARCH model is commonly used in finance and economics to model volatility in asset returns, exchange rates, and other financial time series. It is particularly useful for capturing the long-memory properties of economic data, which can have important implications for risk management and asset pricing.

According to Baillie, Bollerslev, and Mikkelsen (1996), any shock can have a significant influence on how volatile a financial series is. Researchers have paid close attention to it since it emphasizes how volatile long-memory determination and grouping are. Studies of the volatility of high-frequency fiscal time series frequently take into account long-memory persistence (Baillie , Bollerslev & Mikkelsen 1996; Dacorogna *et al.,* 1993; Ding *et al.,* 1993; Granger & Ding, 1996). Therefore, there is still plenty of room to use the FIGARCH model to explore such endless shock.

The following is a representation of the GARCH (p, q) procedure's ARMA category illustration:

$$\varepsilon_t^2 = \alpha_0 + \sum_{i=1}^{q} \alpha_i \varepsilon_{t-i}^2 + \sum_{j=1}^{p} \beta_j \varepsilon_{t-j}^2 - \sum_{j=1}^{p} \beta_j v_{t-j} + v_t \text{ .....(4)}$$

Where, $v_t = \varepsilon_t^2 - h_t = (z_t^2 - 1) h_t$ and the z_t's are 0 correlated with E(z_t) = 0 and var (z_t) = 1. From (4), it can be witnessed that the GARCH (p, q) process can also be expressed as an ARMA (m, p) procedure in ε_t^2,

$$[1 - \alpha (L) - \beta (L)] \varepsilon_t^2 = \alpha_0 + [1 - \beta (L)] v_t \text{.....(5)}$$

Where, m = max{p, q} and $v_t = \varepsilon_t^2 - h_t$. The v_t method can be concluded as the “innovations” for the conditional variance, as it is a zero-mean martingale. So, an integrated GARCH (p, q) process can be inscribed as:

$$[1 - \alpha (L) - \beta (L)] (1 - L) \varepsilon_t^2 = \alpha_0 + [1 - \beta (L)]v_t \ldots\ldots\ldots (6)$$

By changing the initial difference operator, the fractionally integrated GARCH or FIGARCH group of models may be obtained by putting (1 − L) in (6) with the fractional differencing operator $(1 - L)^d$, where d is a fraction 0 < d < 1. As a result, the FIGARCH group of models may be purchased by taking into account:

$$[1 - \alpha (L) - \beta (L)] (1 - L)^d \varepsilon_t^2 = \alpha_0 + [1 - \beta (L)]v_t \ldots\ldots\ldots (7)$$

The supremacy of elaborating on and illustrating the historical dependencies of the financial market volatility over other forms of GARCH models is served by this (Davidson, 2004).

Markov Regime-Switching (MRS) Model

A Markov regime-switching model is a statistical model used to capture variations in the underlying structure of a time series over time. It assumes that the time series is governed by a set of latent states or regimes, each with its own set of parameters, and that the evolution amid states trails a Markov process.

In a MRS model, the parameters of the model, such as the mean and variance, are allowed to vary depending on the current state of the system. The transition between states is ruled by some set of likelihoods, which can be assessed from the data.

Markov regime-switching models are frequently used to model financial and economic time series that exhibit sudden shifts in behavior, such as stock market returns or interest rates. By allowing for changes in the underlying regime, these models can capture the dynamics of the data more accurately than customary linear models.

One popular example of a MRS model is the Hidden Markov Model (HMM), which is widely used in speech recognition, bioinformatics, and other fields. Another example is the Markov switching autoregression (MSAR), which is used to model time series data that exhibit both short-term and long-term persistence.

Hamilton and Susme (1994) developed the switching-regime ARCH, which was later generalised by Gray, based on the idea of financial structural shifts (1996). This type of model is also capable of identifying fundamental modifications in financial markets.

The first-order Markov chain with transition likelihood is which postulates the probability of moving from state *i* at time *t-1* to into state *j* at *t*.

$$P_r(S_t = j \mid S_{t-1} = i) = p_{ij} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (8)$$

The transition matrix is as follows allowing for two regimes:

$$P = \begin{bmatrix} p_{11} & p_{21} \\ p_{12} & p_{22} \end{bmatrix} = \begin{bmatrix} p & (1-q) \\ (1-p) & q \end{bmatrix} \ldots\ldots\ldots\ldots\ldots\ldots (9)$$

The unrestricted likelihood of presence in state $1(S_t) = 1$ is specified by:

$$\pi_1 = (1-p)/(2-p-q) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(10)$$

The MRS model in its common procedure can be inscribed as (Marcucci, 2005):

$$r_t \mid \zeta_{t-1} \sim \begin{Bmatrix} \int(\theta_t^{(1)}) & w.p.\ p_{1,t} \\ \int(\theta_t^{(2)}) & w.p.(1-p_{1,t}) \end{Bmatrix} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(11)$$

Where $\int.$ signifies one of the likely conditional disseminations which are anticipated that is normal (N), $\theta_t^{(1)}$ represents the vector of the restrictions in the *i*th regime featuring the dissemination, $p_{1,t} = P_r[S_t = 1 \mid \zeta_{t-1}]$is the ex-ante likelihood, ζ_{t-1}represents the data set at time t-1 that is the σ algebra prompted by the variables at the specified time phase that can be additionally separated into three measures as follows:

$$\theta_t^{(i)} = (u_t^{(i)}, h_t^{(i)}, v_t^{(i)}) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(12)$$

Where, $u_t^{(i)} \equiv E(r_t \mid \zeta_{t-1})$ is the conditional mean, $h_t^{(i)} \equiv \text{Var}(r_t \mid \zeta_{t-1})$ is the conditional variance and $v_t^{(i)}$ is the shape limitation of the conditional dissemination (Marcucci, 2005).

Henceforth, it can be specified that MRS comprises four essentials: the conditional mean, the conditional adjustment, the regime process, and the conditional dissemination (Marcucci, 2005). With or without drift, the conditional mean equation is expressed as follows:

$$r_t = u_t^{(i)} + \varepsilon_t = \delta^{(i)} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.....(13)$$

Where i=1,2, $\varepsilon_t = n_t\sqrt{h_t}$ and n_t is a zero mean, unit variance procedure. The chief purpose is unpredictability projecting (Marcucci, 2005).

The provisional adjustment ofr_t, specified the entire regime path

$$\tilde{S}_t = (S_t, S_{t-1}, ...), \text{is } h_t^{(i)} = [\varepsilon_t \mid \tilde{s}_t\ ,\ \zeta_{t-1}] \ldots\ldots\ldots\ldots\ldots.....(14)$$

For this conditional variance, the resulting GARCH (1,1) equation can be supposed as:

$$h_t^{(i)} = \alpha_0^{(i)} + \alpha_1^{(i)}\varepsilon_{t-1}^2 + \beta_1^{(i)}h_{t-1} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.....(15)$$

Where h_{t-1} is a state-independent average of historical provisional modification.

Some research works prove that the Markov regime-switching model can arrest mechanical breakdowns in monetary return sequence and worthily decrease valuation partiality caused by great persistence (Gray, 1996; Klaassen, 2002; Haas, Mittnik & Paolella, 2004; Teterin, Brooks & Enders, 2016).

Results and Discussion

Table 1: Descriptive Statistics

	DFM	BAX	TASI	MSM 30	QEAS	Arab Spring
Mean	0.001	0.004	0.001	-0.006	0.001	0.260
Median	0.001	0.004	0.002	-0.096	0.002	0
Maximum	0.126	0.047	0.137	0.123	0.124	1
Minimum	-0.191	-0.118	-0.162	-0.124	-0.118	0
Std. Dev.	0.03	0.013	0.025	0.017	0.023	0.439
Skewness	-0.758	-1.458	-0.819	-0.500	-0.280	1.090
Kurtosis	7.921	14.943	9.285	13.676	7.343	2.188
Jarque-Bera	669.77	3816.534	1065.281	2903.281	484.444	136.643
p-value	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*
Sum	0.709	0.297	0.620	-0.387	0.850	158
Sum Sq. Dev.	0.564	0.107	0.403	0.182	0.337	116.805
Observations	606	606	606	606	606	606

*denotes significance at 1% level

Source: Author's own computation using E-Views 12

Table 1 indicates descriptive statistics of the Dubai financial market (DFM), Bahrain All Share (BAX), Saudi Arabia stock market (TASI), Muscat securities market (MSM 30), and Qatar stock market (QEAS) along with the dummy variable, Arab Spring. The variables are non-normal at a 1 percent level, as confirmed by the Jarque-Bera test with 606 sample observations. DFM surges to 0.126 and makes a downturn to -0.191 with a mean of 0.001. BAX surges to 0.047 and declines to -0.118, with a mean of 0.004. Similarly, TASI and MSM 30 surged to 0.137 and 0.123, respectively, and took a downturn to -0.162 and -0.124, respectively. However, their mean values are 0.001 and -0.006, respectively. QEAS surged to 0.124 and made a downturn to -0.118 with a mean of 0.001. The dummy variable Arab Spring surged to the uppermost value of 1 and decreased to the bottommost value of 0 with a mean of 0.260.

Skewness refers to an asymmetry or distortion that deviates from a dataset's normal distribution or symmetrical bell curve. MSM 30 and QEAS indicate the data is properly symmetrical. DFM, TASI, and the Arab Spring are moderately skewed. BAX has highly skewed data (Joseph *et al.,* 2017).

Kurtosis indicates the normality of a dataset on the basis of its distribution by studying the tail of the bell-shaped normal curve.

Table 2: Breakpoint Unit Root Test

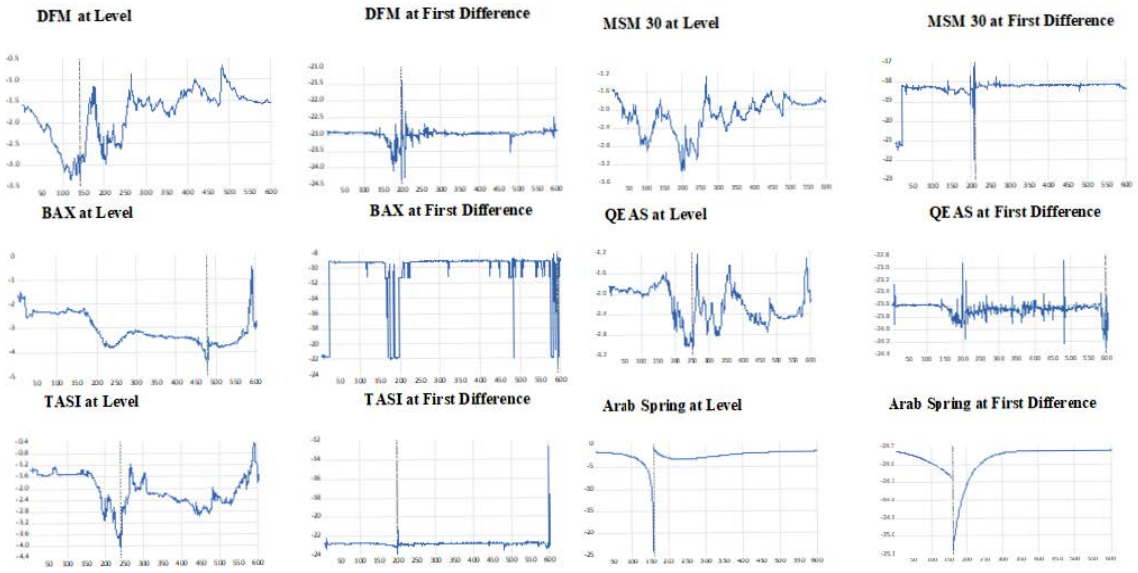
Trend & Intercept (Innovation Outlier Model)					
	Level		First Difference		
Variables	**t-statistics**	***p*-value**	**t-statistics**	***p*-value**	**Break Date**
DFM	-3.3993	0.8583	-24.38	0.01*	Aug 25, 2014
BAX	-4.4899	0.2412	-22.5071	0.01*	Feb 09, 2020
TASI	-4.0417	0.4935	-23.78	0.01*	Jul 12, 2015
MSM 30	-3.3658	0.8714	-22.0037	0.01*	Sep 28, 2014
QEAS	-3.0876	0.9491	-24.3013	0.01*	Oct 04, 2015
Arab Spring	-24.2576	0.00*	-25.0791	0.01*	Dec 15, 2013

*denotes significance at 1% level

Source: Author's own computation using E-Views 12

Table 2 provides the result of the breakpoint unit root test, where it is witnessed that the select stock market indices, namely DFM, BAX, TASI, MSM 30, and QEAS, are non-stationary at the level and stationary at the first difference, indicating the non-presence of a unit root at the first difference. However, the dummy variable Arab Spring is stationary at both level and first difference. The confidence interval for all the variables is 99 percent. The breakpoint dates of the stock market indices as well as Arab Spring are also noted in the above table, where it is seen that December 15, 2013, is the day when a change in the nature of the data in Arab Spring is noted. But for the stock market indices, the dates are different, indicating a change in the nature of the data on that particular date. Moreover, it needs to be mentioned that the stock market suffers from the shock of the Arab Spring until the break date.

The breakpoint graphs of the stock market indices as well as Arab Spring are represented below in Figure 1.



Source: Author's own computation using E-Views 12

Figure 1: Breakpoint Unit Root Test Graph

Table 3: Fractionally Integrated Generalized Autoregressive Conditional Heteroscedastic (FIGARCH) Model

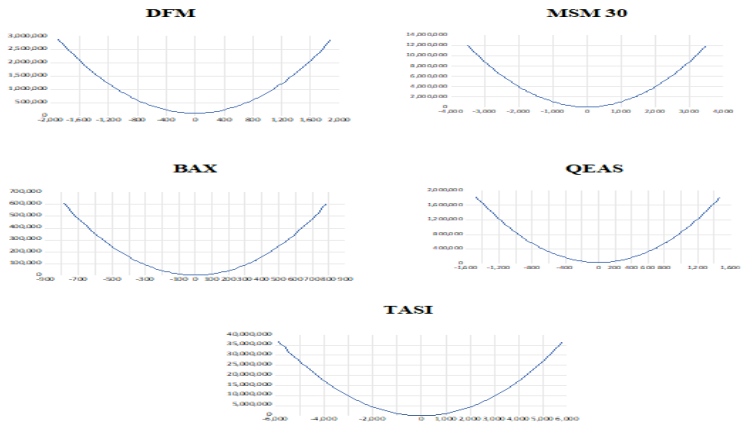
Dependent Variables	Constant (ω)	*p*-value	ARCH Effect (α)	*p*-value	GARCH Effect (β)	*p*-value	α + β
DFM	712.76	0.30	0.709	0.07***	0.3253	0.07***	1.0343
BAX	55.84	0.00*	0.4305	0.00*	0.9259	0.00*	1.3564
TASI	12578.9	0.2852	0.2173	0.07***	0.1418	0.08***	0.3591
MSM 30	201.82	0.881	0.8254	0.00*	0.6705	0.01*	1.4959
QEAS	-223.44	0.4506	0.6579	0.00*	0.4778	0.04**	1.1357

*denotes noteworthy at 1% level, ** denotes noteworthy at 5% level, *** denotes noteworthy at 10% level
Source: Author's own computation using E-Views 12

The above table provides the result of the FIGARCH test. This test allows us to capture the fractionally integrated volatility, i.e., the long-memory effect within the dependent variables, considering a slothful hyperbolic rate of decline for the effect of lagged squared originations.

It is observed that the constant values are significant for BAX only. However, α is statistically noteworthy for all the variables. DFM and TASI are noteworthy at the 10 percent level in the ARCH effect, and other stock market indices are noteworthy at the 1 percent level. This indicates the existence of volatility resulting from the shock of the Arab Spring crunch. Hence, the risk factor in these stock markets can be estimated. In the GARCH effect, DFM and TASI are noteworthy at a 10 percent level, QEAS is noteworthy at a 5 percent level, and others are noteworthy at a 1 percent level. This indicates the variability in the unpredictability, i.e., the unpredictability can upsurge if the crunch increases further or the volatility can shrink following a composed and unchanging condition within the market in the context of the shock arising out of the Arab Spring. The summation of α and β factors is greater than 1 for all the variables excluding TASI, indicating the incidence of long-memory influence within DFM, BAX, MSM 30, and QEAS resulting from the Arab Spring. Hence, it can be stated that though the Arab Spring ended several years ago, its momentous influence in the form of a long-memory influence is still persisting within the market and is certain to affect the decision-making of the interested stakeholders.

The select stock market indices are highly influenced due to the shock of Arab Spring which are depicted below in Figure 2.



Source: Author's own computation using E-Views 12

Figure 2: Impact Curve

Table 4: Markov Regime-Switching (MRS) Model

Indices	Regime	*c*	*p*-value	σ	LL
DFM	1	0.0147	0.02**	0.0305	1339.06
	2	-0.0010	0.6915		
BAX	1	0.0002	0.091***	0.0133	1824.98
	2	-0.0009	0.078***		
TASI	1	-0.0012	0.0613***	0.0258	1435.33
	2	-0.0013	0.00*		
MSM 30	1	0.0019	0.0683***	0.0173	1693.34
	2	-0.0157	0.08***		
QEAS	1	0.0029	0.00*	0.0236	1486.92
	2	-0.0003	0.00*		

*denotes noteworthy at 1% level, ** denotes noteworthy at 5% level, *** denotes noteworthy at 10% level
Source: Author's own computation using E-Views 12

This model permits the variation of a dependent variable due to an independent variable, resulting in a swing from one regime to another. The viability of this model is noted in the context of an exogenous shockwave. To capture the statistical significance of regime switching, the likelihood ratio test propounded by Hansen (1992) is realistic, where the transition probabilities are considered nuisance restrictions. The above table provides the results where it is comprehended that Regime 1 is the Arab Spring state (high volatility) and Regime 2 is the post-Arab Spring state (low volatility). The constant (c) values are greater in regime 1 than in regime 2, indicating that regime 1 is comparatively more unstable in nature with greater volatility. The p-values of all the stock market indices in regime 1 are significant, indicating that they shift from regime 1 to regime, i.e., from a high volatility condition to a low volatility condition. The p-values of all the stock market indices in regime 2 are also significant, except for DFM. The switching of the stock indices from one regime to another is supported by the estimated coefficients (σ). The maximum log-likelihood is represented by LL.

Table 5: Transition Probabilities

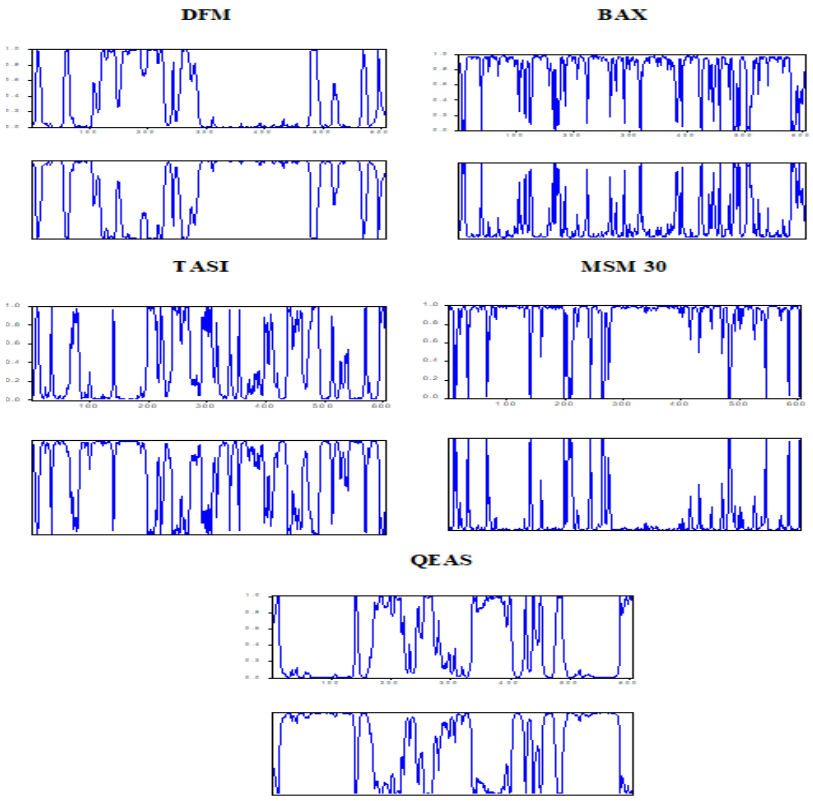
Indices	P_{11}	P_{21}
DFM	0.968658	0.031342
BAX	0.922701	0.077299
TASI	0.855945	0.144055
MSM 30	0.957352	0.042648
QEAS	0.947264	0.052736

Source: Author's own computation using E-Views 12

The above table delivers the values of the transition probability. P_{11} and P_{21} are the two matrices of the transition probabilities. The P_{11} values indicate the likelihood of the stock indices to stay in regime 1 when it is already in regime 1. The P_{21} values indicate the possibility of the stock indices coming back to regime 1 when it has already moved to regime

2. For all the stock indices, P_{11} provides a greater probability value than P_{21}. This is so because the influence of Arab Spring is greater in regime 1 than 2. When the stock indices move to a comparatively composed state i.e., regime 2, the effect is to negate out gradually.

The graphical representation of the smoothed regime probabilities is represented below:



Source: Author's own computation using E-Views 12

Figure 3: Smoothed Regime Probabilities

Conclusion

Despite knowing that it is challenging to compute with confidence the costs associated with the Arab Spring crisis, the econometric tools provide interesting results that enable the authors to conclude that during the study period, there remains volatility within the select stock markets of Gulf Cooperation Council (GCC) countries, along with variation in volatility resulting from the Arab Spring. However, the long-memory effect is very evident, and the stock markets move from a high-volatility condition to a low-volatility condition. Only the Saudi Arabian stock market (TASI) confirmed resilience in terms of the long-memory effect. It is due to the vast expenditures made by the government in terms of societal well-being. Hence, it can be stated that the stock markets are more reactive to bad news amidst political unpredictability from the Arab Spring, except for TASI. Finally, it can be stated that the select stock market indices from GCC countries have sustained the post-Arab Spring crunch, but the effect of the crisis can still be witnessed, though the magnitude of the effect has declined remarkably.

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Achieving Sustainable Development Through MGNREGA: A Study on West Bengal Covering the COVID - 19 Period

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ABSTRACT

Alleviation of poverty, achieving zero hunger, bringing gender equality, reducing inequalities, providing decent work, and achieving economic growth are just a few of the prioritized objectives of the Sustainable Development Goals. Consequently, inclusive social development and bringing equality among different genders are a few of the prioritized areas of the Sustainable Development Goals along with the development agenda of India. These objectives are the prerogatives of the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) of 2005 as well. Although this program started before the SDGs were announced, it promises to fulfill many of the SDGs. MGNREGA ensures 100 days of guaranteed wage employment for rural households at the government-decided wage rate without any discrimination against women or caste. Here, it has been examined for the state of West Bengal to check how much the MGNREGA Act has been able to uplift the state's marginalized communities, namely, Scheduled Castes (SCs), Scheduled Tribes (STs), and women, in the past 5 years from 2017 to 2022. In this study, an attempt has been made to show the trend in the number of person days or working days provided to the SCs, STs, and women for their upliftment through this scheme and whether the increase in total person days provided on the whole through the scheme is good enough that the person days of the SCs, STs, and women have increased proportionally.

Keywords: *SDGs; Inclusive Development; MGNREGA; Marginalised People; Regression Analysis*

Introduction

Achievement of the Sustainable Development Goals (SDGs) by means of inclusive development has been one of the prime goals of the Indian Government. Inclusiveness of all sections of people in the society along with the removal of gender disparity are in the line of priority of India's planning of developing the society, but the unbalanced form of growth, so far, has not allowed that to happen; the already developed segments of the society have progressed further, but the ones left behind could not move much. India is lagging behind in several social aspects. For the sake of bringing equality into society, achieving a balanced path of growth, or even moving towards the desired direction from all aspects, including indicators of health, education, social equality, etc., inclusiveness is the only way that can

not only include women and the marginalized sections in the mainstream of development but also take them towards development. Equality in society has to be prioritized in all aspects, be it achieving the goals of sustainable development, reducing unemployment, or distributing income. Growth along with equity have to be prioritized. But inclusiveness of all in society, especially the marginalized ones, is a huge challenge in a backward, developing nation like India. In India, it is a well-known fact that the majority of the people live in rural areas (at least 60%–65%), and they live in informal economic sectors. Bringing them into the mainstream of economic development is one of the biggest challenges that needs to be fulfilled. The problem or challenge that the nation faces is to distribute the advantages of growth among all sections of society; that is, the fruits of growth are accumulated by a few only. Hence, there is a dual economy in all parts of society and in all spheres of activity. Hence, it is necessary to prepare and implement a proper plan that can take care of the fact that balanced growth is necessary for all regions and for all segments of the population, with the intention to abolish casteism and gender discrimination. There action plans have to be committed as well as timely in order to bring about gender equality, unless it remains a dream. MGNREGA promises to address as well as fulfill both of these aspects by providing a minimum of 100 days of wage employment, at the government-decided wage rate, for public activities or public works to rural households. This act assures no gender or caste discrimination, thus ensuring the participation of women and people from all sections of society, including the marginalized ones. Hence, such an act can be considered a ‘never before’ opportunity for rural people of all categories of society. India has always suffered from wage discrimination against women due to several reasons, but NREGA ensures that it is abolished—a feature that could hardly be imagined in rural India. But one cannot deny the fact that despite no discrimination in wages, there is inequality in labor force participation among women; that is, in a few states, women have shown good progress as far as registration in NREGA is concerned, whereas in other states, there is a lack of participation by women in this program. This disparity in labor force participation is actually hampering the equality of standard of living between men and women, as well as between rural and urban areas—a feature that deserves to be abolished for the sake of the development of the economy. It is understandable that in a backward economy with such dualities in various forms, it is immensely problematic to empower women, but the planners in India have always emphasized that, and special attention was given to this aspect in the eighth five-year plan. It has been recognized that in a male-dominated society where women have been lagging behind in several aspects, including health, education, and employment, public funding has to be made in order to pull them out of the vicious cycle of backwardness. Otherwise, it would be impossible to uplift the women who are living in the lower range of inequality. One can highlight three important features that look to wipe away the existing gender inequality. Firstly, it ensures at least 33% female participation. Secondly, there is a guarantee of wage equality between men and women, and lastly, household members can allow their female members to participate in the program since the guarantee of employment is at the household level. Three basic features that were never thought of before but are immensely important to bring equality Even regarding the payment

of wages directly to the bank accounts, attention was given to discrimination, i.e., that the money should not go only to the account of the male member.

During the COVID period, it is an established fact that MGNREGA has acted as a life saver for all forms of labor forces, including the migrant ones. Around 10 million migrant workers were given employment opportunities under this act during the lockdown era. This act not only saved their lives, but they also managed to earn at least 30% of their income compared to the pre-lockdown period. Around 350 crore employment days, that is, person days of employment, were generated during this period of COVID, which was around 45% higher when compared to the person days of employment generated in the previous year of COVID. During the pandemic period, more than 52% of the employment under NREGA was for the female labor force, which is significantly good from the perspective of development. The government even extended the working days from 100 days to 150 or 200 days with increased wages for the migrant laborers. During the prolonged lockdown period because of the COVID, it has been proven and widely accepted that MGNREGA has acted as life-saving medicine for the rural poor (Lokhande & Gundimeda, 2021). This is one such scheme that not only curbed the migrant workforce's distress but also helped them not go back to their previously uncertain workplace. Hence, if properly used with innovation and good strategies, this scheme should be their forerunner in asset creation as well as infrastructure building in rural India.

Apart from all these under NREGA, the government of India has launched several exclusive schemes to remove the disparity between the rich and poor in India. Some of them include Janani Suraksha Yojana, Mission Antyodaya, Jan Dhan, Jan Suraksha, and Pradhan Mantri. Jeevan Jyoti Bima Yojana, Atal Pension Yojana, PAHAL The scheme has different perspectives. The Mission Antyodaya looks to pull out more than 1 crore households from below poverty level. The Jan Dhan was launched by the Prime Minister with the intention of financially including the backward people in the main stream by opening bank accounts, and it was a successful one as it opened around 60% of the rural people's accounts. The Atal Pension Yojana focuses on the unorganized sector. In this study, how women from the marginalized section of society have benefited from this act of NREGA has been shown. In a developing nation like India, the non-marketed activities of the women are not evaluated; these are not brought under the purview of national income accounting, a phenomenon against which feminists as well as social activists have always protested because they feel that men and women should be equally valued for their works in all spheres of life, be it at home, in the public sector, or in the private sector. They are even in favor of including child rearing as a prime source or form of labor employment, which would increase female labor force participation. Despite all these efforts, even today, women suffer from gender discrimination at work, even in the corporate world.

Here, the objective of the work is to vividly analyze whether marginalized communities and women are being uplifted through MGNREGA and how far MGNREGA has been successful in generating employment during the COVID-19 period in West Bengal. A study that is expected to cover up the achievement or failure of multiple SDGs is almost absent in the

literature, and an effort has been made to fill up that lacuna. If such an analysis can be done, it is expected to give an idea about at least five objectives of the Sustainable Development Goals (SDGs) which itself is expected to give answers to numerous questions on SDGs in West Bengal.

Literature Review

Mohanty (2012) have carefully questioned how the MGNREGA initiative was upheld and its effects on the lives of tribal people, that is, how much the program has been able to provide in the tribal areas of the Sundergarh district of Odisha. After careful analysis, this study revealed that the impact of MGNREGA on rural lives is close to negligible. The careless implementation of the program and the callous way in which it has been carried out have ruined its spirit. Religious, cultural, and caste bias in the case of job distribution, along with faulty leadership, have stood as major obstacles in this program.

Ranaware *et al.* (2015) surveyed 4800 users over 100 villages in 20 districts in Maharashtra to verify their existence under the MGNREGA scheme and to understand how the targeted areas under the scheme perceived the initiations along with the problems and advantages they faced under its implementation. The survey found that most of the work provided was agriculture-related. Most users were found to have benefited from the scheme and gave positive feedback. Overall, this paper finds the scheme to be a success with some room for improvement.

Sukhtankar (2017) in his paper, he presented some takeaways after analyzing the past 10 years' data regarding the implementation of the MGNREGA scheme in all the Indian states. The first states that it has not been implemented equally well in all states, and its impact in each state depends on how well it was implemented individually. Secondly, the poorest states, which need the scheme the most, are the most unable to put it into effect. Third, the increase in rural private sector wages has led to an increase in the opportunity cost of attending school for older children. Fourthly, the scheme's impacts on productivity remain a topic of debate to this day.

Ranjan and Ahmedabad (2015) examined the performance and effectiveness of the MGNREGA in order to improve the living conditions of backward sections of Indian society by providing employment. The study has analyzed secondary data, bringing to light many deliberate as well as nondeliberate effects of the act. The main positive effect was the increase in agricultural productivity due to large water harvesting and land development works undertaken under MGNREGA. A subsequent con was the rise in the cost of production along with soaring food prices because of the increase in wages, which had an effect on social welfare in MGNREGA.

Mafruza and Rao (2016) have canvassed the standing of women, their part, and their performance under MGNREGA in India, particularly in the State of West Bengal. The paper dealt with giving equal rights to women on frontiers, like the priority of their participation in the one-third ratio of total workers, and making sure that they receive a consistent wage rate under MGNREGA. It can be seen that after the implementation of MGNREGA in West

Bengal, there has been an increase of 4.75% in women's person days (the number of people working per day times the number of days worked) and a decrease of 7.77% in men's worker participation from FY2012 to FY2017. The study has shown that the implementation of MGNREGA has been a success in the studied districts of West Bengal in the above time span. Socially and economically marginalized women in these rural districts have empowered themselves under the MGNREGA.

Kumar (2016) examined the impact of MGNREGA on rural women in Coimbatore, Tamil Nadu. The block selection was based on the highest employment status among women workers in the program. Most respondents during the interview said that neither their income had improved nor was it sufficient after their enrollment in the scheme. The study found that the implemented scheme did not improve the expected level of socio-economic conditions for rural women.

Paul (2016) has given us an exhaustive study on the advantages, applicability, and challenges faced by MGNREGA in its effectuation in rural areas of India as well as West Bengal in recent years. The study is based on detailed arguments and the incorporation of various qualitative and quantitative elements based on secondary data related to MGNREGA activities in rural India. This study has been based on secondary data collected from different books, research papers, reports, journals, newspapers, and online databases. The study reveals that MGNREGA has a positive impact on rural employment generation and development.

Breitkreuz *et al*. (2017) provided us with an emic perspective on how the MGNREGA scheme has brought about change in areas; it aims to create a difference. Two-thirds of India’s population inhabits rural areas. 30% of Indians live below the poverty line. SCs (22%) and STs (11%) account for 80% of the rural poor. Further, women are overrepresented in rural poverty, holding an unreasonable number of marginal agricultural jobs with low wages in rural India. They used a qualitative research design in three study areas (Kerala, Tamil Nadu, and Odisha) with 60–85% poverty rates. Major findings included that the number of days worked per householder was 54, significantly more than in 2006–07 but almost half the promised 100 per year. The average percentage of MGNREGA funds spent on wages was only 67.5%. The lack of awareness of MGNREGA decreased the likelihood of participation among the poorest households. There is also evidence that some MGNREGA spots were reserved for the middle class, thereby lessening positive impacts for the poorest. Although in national-level analysis, MGNREGA is used by the poorest, in one state it was being used by community members who were relatively well off. Findings suggest that the MGNREGA program was known to end users in all three regions, but wages varied between genders and were uneven in some regions.

Vasanthi (2017) has provided us insights with an original research paper based on the MGNREGA scheme, which talks about the empowerment of women in rural areas of selected blocks in Tiruchirapalli district, Tamil Nadu. Her paper consists of descriptive research based on both primary and secondary data. Primary data was collected with the help of a specifically designed structured questionnaire and personal interview schedule for

rural women under MGNREGA, with special reference to villages in Tiruchirapalli such as Azghyamanavalam, Thiruvasi, and Kovathakudi. Through the study, the author has been able to conclude that MGNREGA is an effective device for poverty alleviation and improving the socio-economic conditions of rural women in particular. It was observed that women, after the implementation of MGNREGA, have gained a stronghold and the opportunity to start saving their daily income in banks. It was also found that the recognition of rural women in the above areas increased, which led to their active participation in society as a whole and helped them overcome their societal problems.

Michael (2018) in his paper, he strives to study the progress, consistency, and performance of MGNREGA in the Bangalore district of Karnataka. The objective of this paper is to examine the employment situation in those mentioned districts after the MGNREGA scheme was implemented there. It also provides some insightful remedies after analyzing the obstacles that arose. Findings reveal elite groups among workers who try to capture the majority of job cards. There was a delay in the payment of wages and difficulty in the implementation of the scheme where the market wage rate was high.

Kumar (2019) in her study of the correlation between MGNREGA and women's empowerment, she has shown that originally MGNREGA was not envisioned as a women’s empowerment program, yet it has brought about the economic and social empowerment of women. By providing an insured income to its registered workers, it has brought about change among the previously unemployed inhabitants of rural areas in the country. Boosted livelihood protection in the form of the generation of stipulated wage employment by enhancing village infrastructure was the main focus of the scheme. Gender-neutral measures such as increased participation of women in MGNREGA's implementation of better working conditions, safety facilities, wages, phased work plans, and hasty complaints addressed invigorated women to demand more work under this scheme.

Narayanan, Oldiges and Saha (2020) have combined administrative data per month with data from the district levels on migration and poverty to test whether the additional person days in public works generated by MGNREGA have been distributed among districts homogeneously or not. Findings suggest that poorer districts were found to have extended the program to more households. Secondly, this seems to not hold for districts with a higher proportion of out-migrants. Thirdly, in these districts, unmet demand for work is higher than in other areas. Also, the number of person days generated per rural household suggests that expansion is far from enough, given the large number of households pushed into economic distress in specific districts. What these hurdles need is continued funding and attention to fulfill their promises of credibility, especially in districts that need it the most.

Chahal and Kumar (2020) have used secondary data to check the effectiveness of MGNREGA in Haryana, and the authors have found that the scheme has not only been significant in increasing food productivity and generating food security but also immensely impactful in generating employment.

Patwardhan and Tasciotti (2022) have used NSS level data for the period of 2004–05 to 2009–10 and have shown the effectiveness of MGNREGA in repayment of a household's outstanding credit. The authors have found positive and significant results in this study, and they concluded that MGNREGA is an effective scheme for minimizing the outstanding credit amount of households.

Singh, Modi and Maurya (2022) have shown the effectiveness of the MGNREGA scheme on the social upliftment of the tribal people living in the districts of Annupur and Dindori in Madhya Pradesh. The authors, by means of various econometric tests on a sample size of 200 households, have concluded that the scheme has been effective in improving the socio-economic conditions of the tribal people in these areas and that it needs even more coverage.

Narayan (2022) has raised the important question of whether MGNREGA has been the most effective employer or not. The author has observed that since its inception, MGNREGA has been immensely helpful for the social improvement of the marginalized section, but since 2014, there has been a sharp reduction in its coverage, which has had a significant impact on its beneficiaries and on society. Hence, by praising its effectiveness, the author concluded that MGNREGA needs more budget allocation and coverage for the sake of social improvement in the backward section.

Few Facts and Figures

Although at present NREGA works effectively in around 700 districts nationwide after 22 years of implementation, initially it was implemented in 200 backward districts during its inception in February 2006. Then it was extended to 130 more rural as well as backward districts in its second phase in 2007, and then in the third phase, the remaining districts of rural India were brought under its functioning. It is a guaranteed scheme that legally provides 100 days of wage employment to the rural as well as unskilled labor force who are willing to take part in public or government-related activities. The wage rate has kept on changing over the years, and state-wise, this has varied as well. This act has always looked to diminish the rural-urban wage gap, or even the men-women or rich-poor wage gap, by not only ensuring guaranteed female participation but also by ensuring an increase in the purchasing power of the rural population, which has, over the years, helped in the growth of the rural economy by multiplier effect. Apart from these, NREGA has been immensely influential in pulling people out of the poverty line and thus contributing to the reduction of overall poverty in the nation, especially the poverty among the rural, backward, and marginalized communities, which has been massively reduced, which has been a move towards sustainable development. Unlike other initiatives, NREGA is a huge initiative in all aspects. Since its inception, it has generated more than 30 billion person-ddays of wage employment, which, as of January 2020, had cost around 6,000 crore rupees. One can easily understand that during the lockdown period, these figures have increased at an increasing rate. Despite these impressive figures, expenditure on NREGA has never exceeded even 1% of the GDP. There are several works that are permitted under the scheme of MGNREGA. There is scope for conservation of water, and there is opportunity

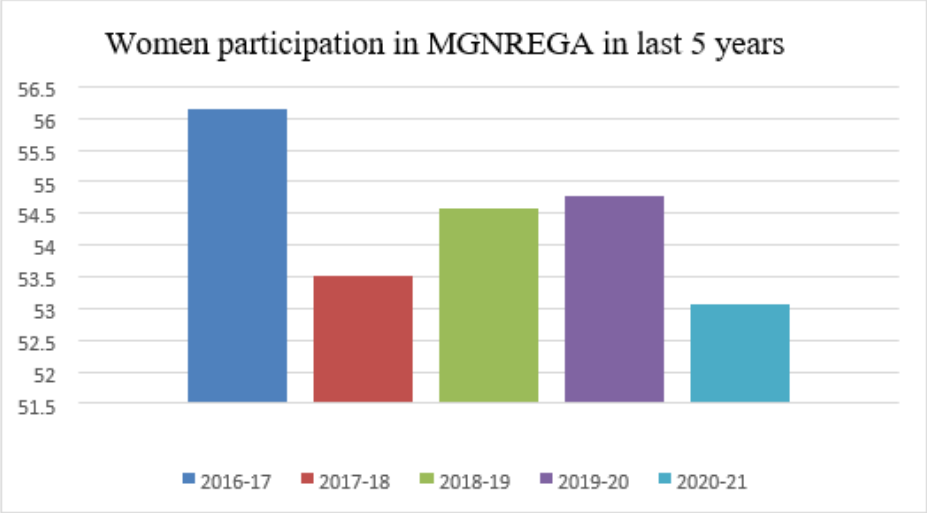
for plantation as well as afforestation that would help against drought. There are chances to work for protection against floods, the development of land and irrigation facilities, and improving rural connectivity. For the people in marginalized and backward segments of society, there are several other scopes, including horticulture.

Here, secondary data have been accumulated from different sources, including various books, research papers, and journals, and a descriptive analysis related to SCs, STs, and women's employment generation through MGNREGA is developed.

Table 1: Coverage of MGNREGA in Employment Creation in West Bengal

Total No. of Districts	23
Total No. of Blocks	342
Total No. of GPs	3,341

But it is a sad phenomenon that employment under the scheme of MGNREGA has been falling over the years, and it went down to a five-year low figure of around 53% in 2020–21. Sources from the Ministry of Rural Development reveal that these figures were over 56% in 2016–17, and then the gradual fall started.



Source: MGNREGA Website

Figure 1: Last 5 Years Women Participation in MGNREGA in West Bengal

Data from the ministry about the scheme reveals that Scheduled Caste people accounted for 25% of the total employment share in the first year of its inception. Then these figures went on increasing and reached their peak of 31% in 2010–11. Since then, it has remained constant or gone down. In 2016–17, this figure was 23%, but in 2020, it went down to 21%. For the STs, these figures started at 36% in 2006 but kept on decreasing to as low as 16% in 2013–14. But since then, it has gone up slightly. The year 2009 witnessed the highest joint participation from these two marginalized communities (SCs and STs) since the implementation of the scheme, which was as high as 55%.

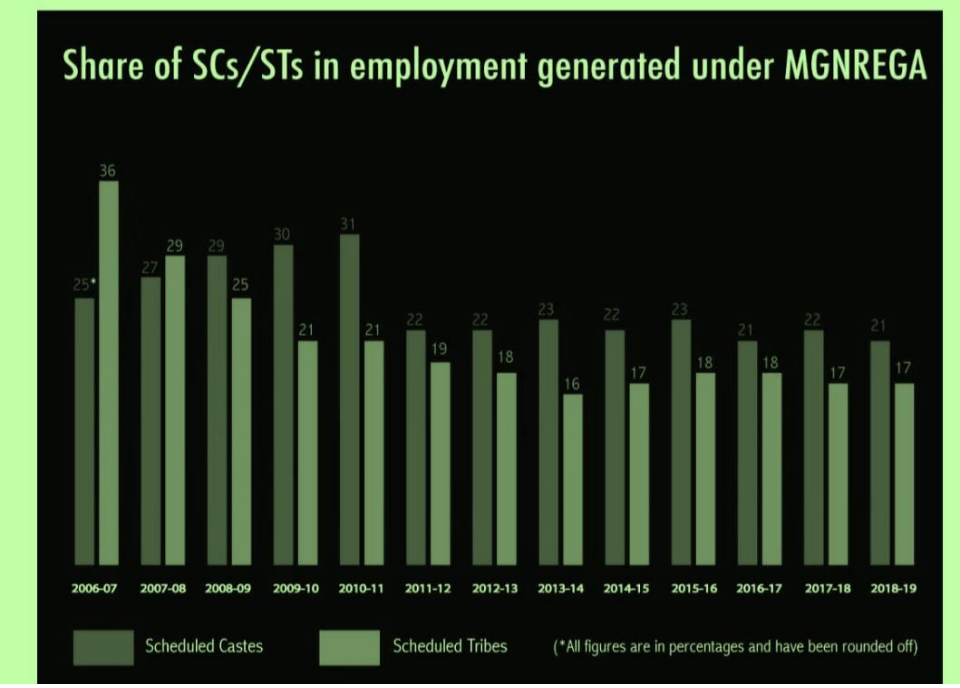
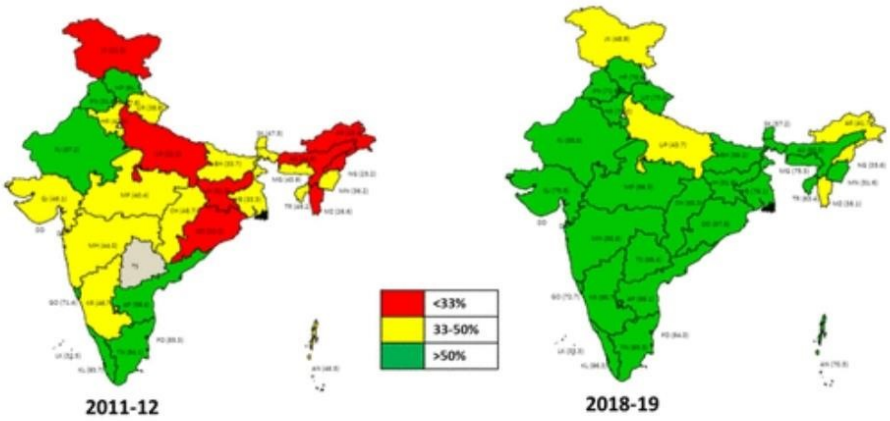


Figure 2: Year Wise Scs, Sts Employment Generation Through MGNREGA in West Bengal (Tewari, 2019)

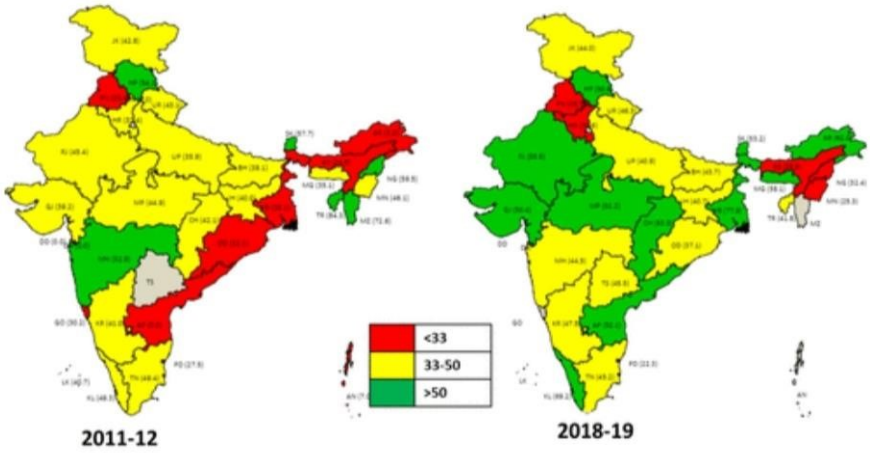
So, if the COVID era for now is excluded, it is quite clear that though women's participation in India has increased slowly till 2019, the participation of SC and ST has fluctuated over time, but overall it has followed a declining trend.

Women's, SC, and ST participation in MGNREGA varies within states. Though several states have satisfactory results for women's participation, that does not mean the SC and ST participation in those states is also satisfactory. Let us see the state-wise performance of women, SC and ST participation in MGNREGA.



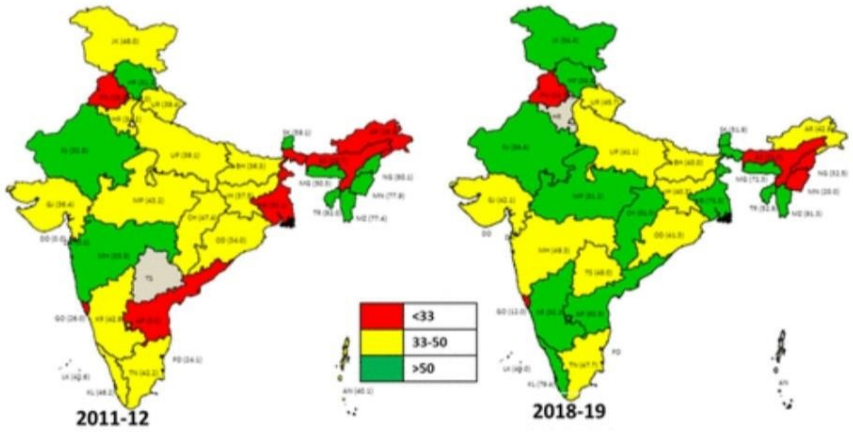
Source: https://www.theindiaforum.in/article/continuing-relevance-mgnrega

Figure 3: SC Participation in MGNREGA in all over India



Source: https://www.theindiaforum.in/article/continuing-relevance-mgnrega

Figure 4: ST Participation in MGNREGA in all over India



Source: https://www.theindiaforum.in/article/continuing-relevance-mgnrega

Figure 5: Women Participation in MGNREGA in India

Here, the state-wise picture of employment generation for women, SC, and ST can be compared between 2011–12 and 2018–19. Though the employment generation of women has increased all over India over the years, in the case of SC and ST, the picture is not so impressive. But one thing can be easily concluded: West Bengal has massively improved its situation in generating SC, ST, and women's employment through MGNREGA.

Methodology

This study focuses on inclusive development and women's empowerment through MGNREGA. It analyzes the implementation process in the state of West Bengal, the

inclusive development of the socially and economically backward classes, and the economic empowerment of women.

To meet the objectives, secondary data has been collected from the official website of MGNREGA, the Government of India. The following tools were used during the analysis:

- To analyze the trend of person days generated by SC, ST and women, with the help line diagrams.
- To check if there is a relation between total person days and SC person days, ST person days and women person days, simple linear regression model has been used.

Data Analysis on SC, ST and Women Participation in MGNREGA

Inclusive development and women's empowerment were two of the main objectives of MGNREGA. In a society that is mainly dominated by the upper classes, it is very difficult for the marginalized sections to develop their socio-economic status. The same goes for women; in a male-dominated patriarchal society, it is very difficult for a woman to earn and be financially independent, as it is very difficult to believe that women's decision to avail employment under the MGNREGA would get precedence over the decision of male family members. But since the inception of MGNREGA, there has been a change in the socio – economic status of marginalized people and women, especially in rural areas. There are various factors that encourage the participation of SC, ST, and women under this scheme, such as 100 days of guaranteed employment, limited work hours, availability of work locally, a substantial increase in the wage rate, the nature of work etc.

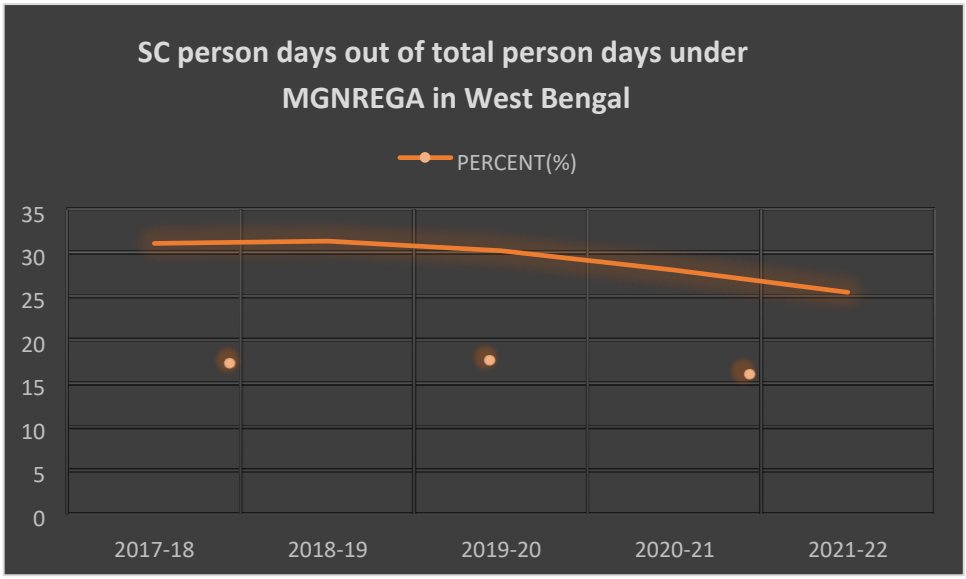
Table 2: MGNREGA in West Bengal at a Glance in the Last Five Years

INDICATORS	2017-18	2018-19	2019-20	2020-21	2021-22
Person days Generated so far (in Lakhs)	3125.55	3382.53	2723.05	4140.17	3405.96
SC person days as of total person days (%)	31.12	31.36	30.28	28.02	25.51
ST person days as of total person days (%)	8.46	8.4	9.66	8.39	7.96
Women person days as of total person days (%)	47.59	48.12	47.86	45.2	46.6
Average wage rate per day per person (in Rs.)	170.66	174.5	178.62	193.29	201.13

Source:https://mnregaweb2.nic.in/netnrega/homestciti.aspx?state_code=32&state_name=WEST%20BENGAL

From the above table, it can be seen that the person days generated have been showing an increasing trend and were highest during the pandemic years, i.e., 2020–21. The SC and ST person days out of total person days have shown a decreasing trend, with the former being reduced to 25.51% in FY 2021-2022 from 31.12% in FY 2017-18, and the latter being reduced to 7.96% in FY 2021-2022 from 8.46% in FY 2017-18. The number of women's days also shows a declining trend, but the decline is not very large. The average wage rate

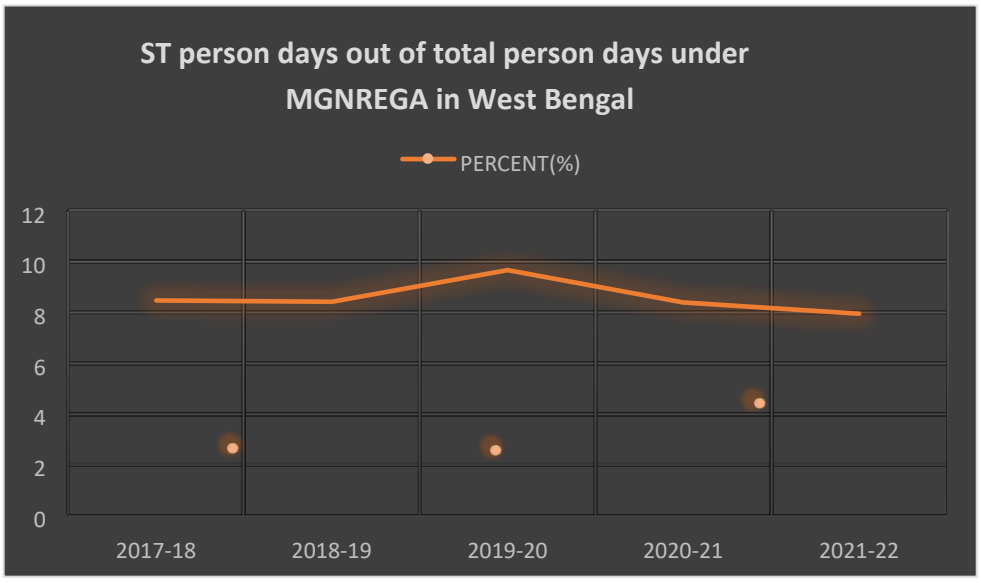
per day per person is also rising; it reached Rs. 201.13 in FY 2021-2022 from Rs. 170.66 in FY 2017-18.



Source:https://mnregaweb2.nic.in/netnrega/homestciti.aspx?state_code=32&state_name=WEST%20BENGAL

Figure 6: SC Person Days Generated Through MGNREGA In Last 5 Years (The Author's Calculation)

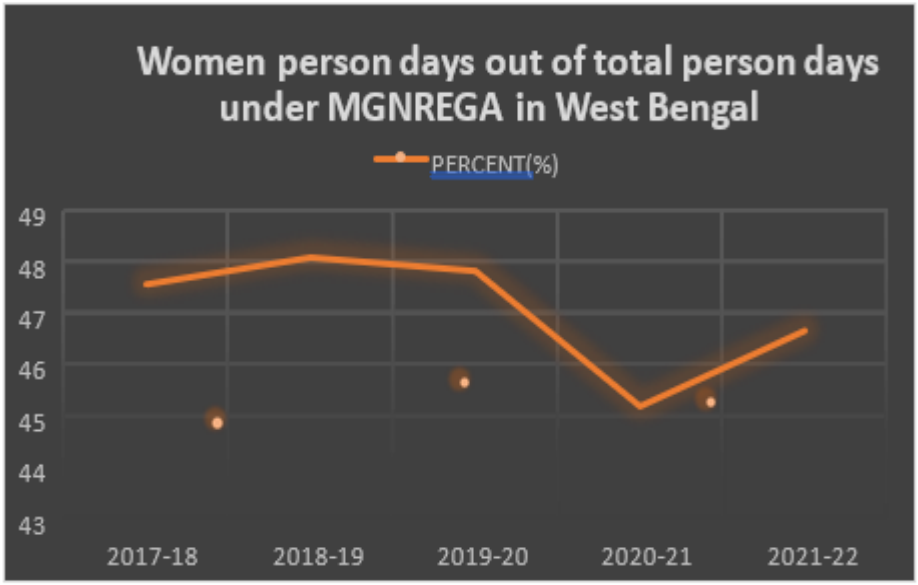
The above figure shows that the person days generated by SC under MGNREGA shows a declining trend.



Source:https://mnregaweb2.nic.in/netnrega/homestciti.aspx?state_code=32&state_name=WEST%20BENGAL

Figure 7: ST Person Days Generated Through MGNREGA In Last 5 Years (The Author's Calculation)

In the above figure it is shown that the person days generated by ST under MGNREGA initially shows an increasing trend i.e., till 2019-20. After that it starts declining.



Source:https://mnregaweb2.nic.in/netnrega/homestciti.aspx?state_code=32&state_name=WEST%20BENGAL

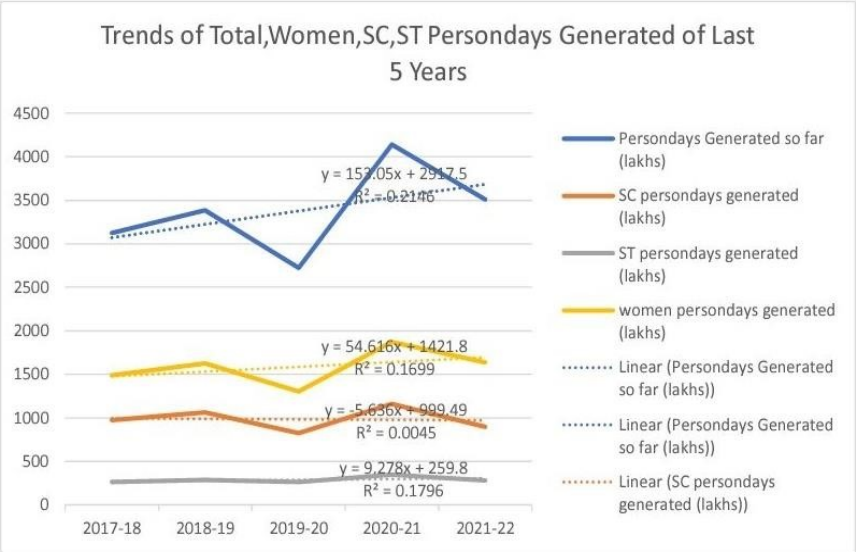
Figure 8: Women Person Days Generated Through MGNREGA In Last 5 Years (The Author's Calculation)

In the above figure it can be observed that the person days generated by women under MGNREGA initially shows an increasing trend (till 2018-19), after that it starts declining and there is a sharp decline in the pandemic years (2020-21). After that it again starts increasing.

Table 3: Data Analysis of Person Days Generated Through MGNREGA in West Bengal

Year	Persondays generated so far (lacs)	SC persondays generated (lakhs)	ST persondays generated (lakhs)	women persondays generated (lakhs)
2017-18	3125.55	972.68	264.43	1487.45
2018-19	3382.53	1060.77	284.14	1627.68
2019-20	2723.05	824.54	263.05	1303.26
2020-21	4140.17	1160.07	347.36	1871.36
2021-22	3511.98	894.85	279.21	1638.69

Source:https://mnregaweb2.nic.in/netnrega/homestciti.aspx?state_code=32&state_name=WEST%20BENGAL



Source: Author's Calculation

Figure 9: Trends of Total, Women, SC, ST Person-Days Generated in Last 5 Years

The Regression Equations Are as Follows:

(1) (SC person days) (y)= a+b(x) (total person days)

(2) (ST person days) (y)= a+b(x) (total person days)

(3) (Women person days) (y)= a+b(x) (total person days)

Here, SC person days generated in lakhs are regressed on total person days generated per year to show how much the total person days provided affect the SC person days and how much the SCs are benefited by the increase in the total person days.

Checking whether the total person days generated are enough to explain the person days generated for the SC category The p-value is 0.0124 = 1.24%, which is less than 5% and hence significant. The positive sign of the coefficient shows that with the increase in total person days generated, person days generated for the SC category increase as well. R-squared is 0.6878, i.e., 68.78% of the variation in SC person days can be explained by the total person days provided. A coefficient of 0.21 shows that for every one-person day increase in total, 0.21 SC person days have increased.

Again, ST person days generated in lakhs are regressed on total person days generated per year to show how much the total person days provided affect the ST person days and how much the STs benefit from the increase in the total person days.

To check whether the total number of person days provided is enough to explain the number of person days provided for the ST category, the P-value is considered. A value of 0.0283, or 2.83%, which is less than 5%, is significant enough. The positive value of the co-efficient shows that with the increase in total person days generated, person days

generated for the ST category increase as well. R-squared is 0.8411, i.e., 84.11% of the variation in ST person days can be explained by the total person days provided. A coefficient of 0.06 shows that for every one-person day increase in total, 0.06 ST person days have increased.

Women's person days generated in lakhs are regressed on total person days generated per year to show how much the total person days provided affect the women's person days and how much the women are benefited by the increase in the total person days.

On checking whether total person days provided are enough to explain the person days provided for women, the P-value is 0.007, i.e., 0.07%, which is less than 1% and is very significant. The positive value of the co-efficient shows that with the increase in total person days generated, person days generated for women increase as well. R-squared is 0.9863, i.e., 98.63% of the variation in women's person days can be explained by the total person days provided. A coefficient of 0.39 shows that for every one-person day increase in total, 0.39-woman person days have increased.

Conclusion

The study evaluates the concept of inclusive development and women's empowerment in West Bengal through MGNREGA by analyzing time series data for the period 2017–2022. After a thorough study of the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) 2005, although West Bengal has a population of over 10 crore people with a skewed sex ratio, gender disparity, extensive poverty, and unemployment to begin with, the MGNREGA initiative has succeeded in improving many socio-economic areas that previously had not been thought of, of improving. Hence, the process towards achieving multiple SDGs through one program has been initiated, and it is very feasible to do so. The initiative has also been subject to difficulties and failures which have mainly arisen through political reasons and misuse of power. Unlike earlier studies, this study attempted to check the condition of marginalized communities in society and that of women. Three of the marginalized classes of society - SC, ST and womenfolk have been the faces of MGNREGA since its inception in 2006. There are various factors that encourage the participation of SC, ST and women under this scheme.

According to collected data over the past 5 years from 2017 to 2022, the percentage of working person days provided to women of the total ranged from around 45 to 48%, which is a significantly large chunk showing that women were targeted and their condition improved by implementation of the Act even though their involvement peaked at 48.12% (FY 2018–19) but decreased slightly thereafter. The involvement of SCs in terms of their person-day percentage varied from 25 to over 31%, which could have been much better and is comparatively low as compared to the former. STs have had it the toughest, with the lowest inclusion range of 7–10%.But one thing has to be remembered: within the female workforce, there are SCs and STs included as well. So, from the data of women, one can conclude that conditions for SCs and STs have improved as well, but from their sole data, it may not generate a bright picture for the last five years. But one should remember that

during the prolonged pandemic of COVID-19, when millions of people were becoming unemployed, coming back to their home states, and searching for employment opportunities, this very program (MGNREGA) provided employment to the millions and helped them to sustain themselves during challenging periods.

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The Impact of Corporate Social Responsibility on Net Profit: An Empirical Study on Central Public Sector Enterprises in India

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ABSTRACT

Research scholars throughout the world have given immense importance to the topic of Corporate Social Responsibility as it could help firms increase their financial benefits. The present study sheds light on the quantitative evidence of the relationship between CSR and the financial performance of Central Public Sector Enterprises in India and tries to examine the impact of CSR on the net profit of CPSEs. The sample size of the study is 73. Secondary data have been collected from the annual reports of 73 CPSEs individually as well as from the Prowess Database, moneycontrol.com, and finance.yahoo.com for the period of 2010–11 to 2017–18. Net profit has been considered a dependent variable, and CSR has been considered an independent variable. Panel regression has been conducted to analyse the data. Panel regression analysis shows that CSR can affect net profit positively.

Keywords: *Corporate Social Responsibility; CSR; Net Profit; CPSE; Panel Regression Analysis*

Introduction

The relationship between CSR and the financial performance of firms is not a new issue in research. It gained importance as well as controversy before the century (Preston & O'Bannon, 1997) when the name corporate social responsibility was not developed and was known as social responsibility or social performance. Corporate social responsibility may be considered as doing extra beneficial activities for society that go beyond complying with the law (William & Siegel, 2001).

Normally, firms want to be good corporate citizens and try to spend money on various social activities. But the behaviour of firms towards society may depend on the resources available to them (Prseston & O'Bannon, 1997). Firms should adopt the mechanisms of globalization and change people's attitudes towards society. Firms should be aware of long-term sustainable business development rather than making a short-term profit and take initiatives to fulfil their responsibility towards society and nature rather than fulfilling self-interest only (Barauskaite & Streimikiene, 2021). If firms make themselves socially responsible by doing CSR activities, then these firms will have a better social image and reputation and thereby can create more profits (Barauskaite & Streimikiene, 2021). But when firms do not spend money on CSR activities, their sales and profits fall (James, 2013).

Now, after realising the importance of CSR, the Indian government has made it mandatory to spend money on CSR activities as per the Companies Act, 2013 (Vskill.in, 2020). It is mentioned in Sec. 135 of the Companies Act, 2013 that if those companies have a net worth of Rs. 500 crore or more, a turnover of Rs. 1,000 crore or more, or a net profit of Rs. 5 crore or more, then these companies need to spend at least 2% of the average net profit of their last three immediately preceding years (Ministry of Corporate Affairs. Date: 01.04.2014). The Ministry of Heavy Industries and Public Enterprises, Government of India, also issued some guidelines and states that CPSEs need to spend huge amounts of money on CSR activities; as a result, CPSEs are losing this opportunity for monetary gain.

CSR perks up clarity, corporate control, and responsibility to stakeholders, as well as facilitating state-making procedures. CPSEs enjoy lots of profits by spending CSR in the vein of perked-up financial performance, lesser operational costs, augmented sales, and better utilization of renewable sources (Abilasha & Tyagi, 2021). CPSEs have also spent money on CSR activities out of compulsion; it is necessary to know how CPSEs would be impacted by spending the necessary amount on CSR activities. For this reason, it is also necessary to know whether the financial performance of CPSEs is improving or not. Various research results illustrate that CSR spending influences financial performance, but there is a lack of consistent evidence regarding the relationship between CSR and financial performance. The present study would help the managers as well as stakeholders of these companies get the answer to whether, after making CSR expenditures, there is any monetary benefit these companies are getting or not. So, in the present study, an attempt was made to determine the influence of CSR on the financial performance of CPSEs.

Literature Review

Raza *et al*. (2012) studied the association between CSR and financial performance using content analysis for the period 1972–2012. When they studied 45 research papers that considered ROA, ROE, and ROS as the financial performance indicators, they found that out of 45 studies, 25 showed a positive result, 9 reflected a neutral relationship between these two concepts, and one study gave a mixed result, but no study gave a negative relationship between CSR and financial performance. Again, when they studied 25 research papers that were considered stock market returns as a financial performance indicator, they pointed out that out of 25 studies, 7 showed a positive relationship, 8 showed a negative relationship, 7 gave a neutral relationship, and 3 had a mixed relationship between CSR and financial performance. So, the behavior of CSR towards financial performance is changing. There is inconclusive evidence regarding the association between CSR and the financial performance of firms. This has caused confusion among researchers about the above-mentioned critical issues for several decades. Sometimes researchers find a positive relationship between CSR and financial performance; sometimes there is a negative relationship between CSR and financial performance; and sometimes CSR and financial performance have a neutral or no relationship. Again, some scholars found a mixed relationship between CSR and various financial performance indicators.

Positive Relationship between CSR and Financial Performance

This school of thought believes that CSR is a crucial element to help firms increase profitability (Maqbool & Zameer, 2018), and CSR could be an action strategy for firms to improve their financial performance (Bhunia, 2012). Spending money on CSR may not give many positive benefits to firms to enhance their financial health in the short run, but it can provide an extraordinary fiscal benefit to firms in the long run (Lin, Yang & Lios, 2009). Lin, Yang and Lios (2009) studied 1000 firms in Taiwan, where they saw that these companies considered research and development expenditure as one of their business strategies to make them sustainably developed, and they pointed out that CSR affects financial performance positively. Later on, many scholars (Devie *et al*., 2019; Choi, Kwak & Choe, 2010; Foote, Gaffney & Evans, 2010; Arso, Arabact & Ciftcioglu, 2012; Uadiale & Fagbemi, 2012; Asatryan & Brezinova, 2014; Basuony, Elseidi & Mohamed, 2014; Malik & Nadeem, 2014; Khan *et al*., 2016) found a positive relationship between CSR and financial performance empirically. CSR may help in product differentiation and thereby help firms charge higher prices for goods and services to earn more profit, as the same strategy has been adopted by Ben & Jerry Company (William & Siegel, 2001). Albuquerque, Koskinen and Zhang (2019) in their paper, supported the industry equilibrium model (where firms can do CSR activities), where it is anticipated that CSR could be beneficial for firms in reducing systemic risk and thereby enhancing the value of a firm. Firms could fulfil the implicit claims of employees and customers, who are major stakeholders, to improve the reputation of firms, which ultimately leads to better financial performance (Preston & O'Bannon, 1997).

Negative Relationship between CSR and Financial Performance

CSR could be an economically disadvantageous tool for firms, as some scholars believe that firms need to spend money to establish themselves as socially responsible entities, which may lead to extra costs for these companies compared to firms that don't want to establish themselves as socially responsible entities (Lin, Yang & Lios, 2009). These scholars actually support the trade-off hypothesis which states that socially responsible firms need to bear the financial cost (Preston & O'Bannon, 1997). The neo-classical economic school of thought and utility theory believes that CSR does have a negative relationship with financial performance (Devie *et al*., 2019). According to Friedman (1970) and Aupperle, Carrol & Hatfield (1985), socially responsible firms may use the capital and other resources for charity, environmental protection, community development, etc. that the firm should not be supposed to spend (Preston & O'O'Bannon, 1997), as that would have a negative effect on the financial performance of these socially responsible firms (Preston & O'Bannon, 1997). Later on, some scholars [Hirigoyen & Poulain-Rehm (2015), Pan *et al*. (2014), Elouidani & Zoubir (2015), Selcuk & Kiymaz (2017), Senyigit & Shuaible (2017), Babalola (2012), Anlesinya *et al*. (2014)] found a negative relationship between CSR and financial performance empirically.

No Relationship between CSR and Financial Performance

Sometimes CSR does not play any role in enhancing the financial performance of firms, i.e., CSR has no relationship or a neutral relationship with financial performance, as empirically proved by some scholars: Hashim, Ahmed and Huai (2019), Han, Yu and Kim (2019), Iqbal *et al*. (2012), Dianita (2011), Aras, Aybars and Kutlu (2010), Nelling and Webb (2009), and Mehar and Rahat (2007).

Mixed Relationship

Sometimes CSR has a mixed relationship with various financial indicators, i.e., CSR has a positive relationship with some financial performance indicators. Again, this has a negative relationship with other financial performance indicators. Some scholars found a mixed kind of relationship between these two, like Okafor, Adeleye and Adusei (2021); Sung Kim and Oh (2019); Manokaran *et al*., (2018); Kamatra and Kartikaningdyah (2015); Kiran, Kakahel and Saheen (2015); Simionescu and Gherghina (2014) and Enughulu and Dabor (2018).

Objectives of the Study and Hypothesis

The main objective of the present study is to see the impact of CSR expenditure on the financial performance of CPSEs in India.

To fulfil the objective of the study, the following hypotheses have been formulated:

H0: There is no impact of CSR on the NP of CPSEs in India.

H1: There is an impact of CSR on the NP of CPSEs in India.

Methodology

To see the impact of CSR on the net profit of CPSEs in India, data from 73 CPSEs was collected. The population size of our study was 255 CPSEs. After using Yamane's formula, the required sample size became 155 CPSEs. But out of 155 CPSEs, only 83 have been doing CSR expenditures. But due to the unavailability of data, our sample size became 73. The period of the study is eight years, starting from 2010–11 to 2017–18. The secondary data have been collected from 73 CPSEs in India individually, as well as the Prowess Database, moneycontrol.com, and finance.yahoo.com databases. In the present study, the financial performance indicator NP has been considered a dependent variable to determine the impact of CSR on the financial performance indicators. CSR has been taken as an independent variable to see the influence of CSR on financial performance indicators, i.e., the NP of CPSEs. Eleven control variables have been taken into account here, namely, CEE (Capital Employed Efficiency which indicates firm's ability to create value after utilising capital), CR (Cost Ratio means firms' responsibility towards customers, calculated as operating costs /operating profits), CSRTC (CSR to Creditors means firms' responsibility towards creditors, calculated as total assets/total liabilities), DPS (Dividend per Share), EPS (Earnings per share), ICR (Interest Coverage Ratio which shows firms' responsibility in making payments to investors), SAL (Salary of employees means firms' responsibility towards employees), SALES, TAX (it indicates the responsibility of firms' in fulfilling

Government requirement , VA (Value Added). A panel regression analysis has been done to see the effect of CSR on the net profit of CPSEs.

Results And Discussion

To see the impact of CSR on the financial performance indicator, panel regression has been conducted. NP has been taken as the financial performance indicator in this study. In this study, NP has been considered the dependent variable, while CSR expenditure has been taken as the independent variable to examine the influence of CSR on financial performance. Rest of the variables i.e., DPS, EPS, ICR, TAX, SALES, CR, VA, CEE, SAL, and CSRTC as control variables in each case of regression equation.

The study began with the formulation of two regression models, i.e., a fixed effect model and a random effect model, to describe the association between CSR expenditure and the financial performance indicator, i.e., net profit.

The regression model that has been used in this analysis is:

$NP= \beta_0 + \beta_1(CSR_{it}) + \beta_2(CEE_{it}) + \beta_3(CR_{it}) + \beta_4(CSRTC_{it}) + \beta_5(DPS_{it}) +\beta_6(EPS_{it}) + \beta_7(ICR_{it})+ \beta_8(ROE_{it})+ \beta_9(ROA_{it}) +\beta_{10}(SAL_{it})+\beta_{11}(SALES_{it})+ \beta_{12}(TAX_{it})+ \beta_{13}(VA_{it}) + \varepsilon_{it}$

β_0 = Intercept coefficient;

β_1 = Slope coefficient of independent variable CSR;

β_2 = Slope coefficient of independent variables CEE;

β_3 = Slope coefficient of independent variable CR;

β_4 = Slope coefficient of independent variables CSRTC;

β_5 = Slope coefficient of independent variables DPS;

β_6 = Slope coefficient of independent variables EPS;

β_7= Slope coefficient of independent variables ICR;

β_8= Slope coefficient of independent variables ROE;

β_9= Slope coefficient of independent variables ROA;

β_{10} = Slope coefficient of independent variables SAL;

β_{11}= Slope coefficient of independent variables SALES;

β_{12}= Slope coefficient of independent variables TAX;

β_{13} =Slope coefficient of independent variables VA;

ε_{it}= Residual errors of i in year t.

In this model, NP has been selected as a dependent variable, CSR has been considered an independent variable, and the rest of the eleven variables have been taken as control variables. Two-panel regression models, that is, the fixed-effects model and the random-

effects model, have been employed, and the results of both models have been presented in the table.

Table 1: Panel Regressions Test Results

	Fixed Effects		**Random Effects**	
Variable	Coefficient	t-statistic	Coefficient	t-statistic
Intercept	784.47	6.22 (0.00)	154.90	1.75 (0.07)
CSR	6.54	3.93 (0.00)	16.36	12.32 (0.00)
CEE	-3.22	-0.42 (0.67)	-4.89	-0.67 (0.49)
CR	0.23	0.28 (0.77)	-0.11	-0.15 (0.87)
CSRTC	-0.01	-0.02 (0.97)	-0.02	-0.06 (0.94)
DPS	-0.02	-0.50 (0.61)	0.001	0.05 (0.95)
EPS	0.00001	0.01 (0.98)	0.00001	0.03 (0.97)
ICR	0.01	1.10 (0.26)	0.02	1.98 (0.04)
ROE	0.29	0.51 (0.60)	0.43	0.81 (0.41)
ROA	2.02	0.84 (0.39)	-1.48	-0.77 (0.44)
SAL	-0.33	-8.10 (0.00)	-0.23	-8.07 (0.00)
SALES	0.005	3.35 (0.00)	0.007	7.12 (0.00)
TAX	0.89	10.24 (0.00)	0.91	13.70 (0.00)
VA	0.03	3.57 (0.00)	0.06	7.85 (0.00)
Panel Regression	577		577	
R^2	0.82		0.73	
Adjusted R^2	0.79		0.72	
F-statistic (prob.)	28.01 (0.00)		118.97 (0.00)	

Source: Author's estimation

Again, the Hausman specification test was applied to determine which panel model (fixed effects model or random effects model) should be utilised here among the two-panel

regression models. Here, the null hypothesis (H_0) says that the "random effects model is suitable" and the alternative hypothesis (H_1) "random effects model is not suitable". The Hausman specification test results have shown below the table:

Table 2: Hausman Specification Test Results

Test Summary	Chi-Sq. Statistic	d.f.	Prob.
Cross-section random	128.40	13	0.00

Source: Author's estimation

From the above table, it can be seen that the null hypothesis has been rejected here because the probability value is less than 0.05, and the alternative hypothesis has been accepted here. It indicates that the fixed effects model is more suitable here. So, the fixed effect model will describe the panel data regression in the present research work.

Panel regression analysis based on the fixed-effects model in Table 1 depicts that NP has a positive relationship with CSR, CR, ICR, ROE, ROA, SALES, TAX, and VA but NP has a negative relationship with CEE, CSRTC, DPS, and SAL.

NP is positively (strongly) related to CSR, and they have a statistically significant relationship. NP will be increased by 6.54 units due to a one-unit increase in CSR, i.e., higher CSR expenditure means higher NP. It says that if CPSEs do more CSR spending for various CSR activities, then these companies' net profit will also be higher (Kiran, Kakahel & Saheen, 2015). Here it can be noticed that the *p*-value (0.00) of the t statistic is less than 0.05, which indicates that NP can be affected by CSR and is statistically proven. So, spending money on CSR activities is very important for CPSEs to generate more net profit.

NP has a negative and statistically insignificant relationship with CEE. NP will be decreased by 3.22 units due to a one-unit increase in CEE. As the *p*-value (0.67) of the t statistic is not less than 0.05, CEE is not a crucial element to discuss the relationship between CSR and NP.

NP is positively related to CR, but their relationship is not statistically significant. If CR is increased by one unit, then NP will be increased by 0.23 units. It says that if CPSEs spend more money for their customers, then the NP of these companies will decrease. Here it can be seen that CR is not an important control variable to describe the relationship between CSRE and NP because the probability value (0.77) of the t statistic is not less than 0.05.

NP is negatively related to CSRTC, and their relationship is not statistically significant. NP will be decreased by 0.01 units due to a one-unit increase in CSRTC. It indicates that if CPSEs pay the due obligations of their creditors on time, then these companies' net profit will be reduced. Here, the probability value (0.97) of the t statistic is not less than 0.05, so CSRTC is not an important control variable to discuss the relationship between CSR and NP of CPSEs in India.

Again, NP has a negative and statistically insignificant relationship with DPS. NP will be decreased by 0.02 units due to a one-unit increase in DPS. It indicates that if CPSEs need

to pay more dividends to their equity shareholders, then these companies' net profit will be lower. DPS is not a crucial element to show the impact of CSR on net profit because the p-value (0.61) of the t statistic is greater than 0.05.

NP is positively and meagrely related to EPS, and they have a statistically insignificant relationship. NP will be increased by 0.00001 units due to a one-unit increase in EPS. It says that if CPSEs can earn more earnings for their equity shareholders, then these companies' net profit will also be higher. Here it can be stated that EPS is not a crucial element to show the relationship between CSR and NP because the probability value (0.98) of the t statistic is not less than 0.05.

Again, NP has a positive relationship with ICR, but it is statistically insignificant. NP will be increased by 0.01 units due to a one-unit increase in ICR. It shows that CPSEs can earn more net profit by using more debt capital. ICR is not an important control variable because the p-value (0.26) of the t statistic is not less than 0.05 to describe the effect of CSR on net profit.

NP is positively related to ROE, but they do not have a statistically significant relationship. NP will be increased by 0.29 units due to a one-unit increase in ROE. It says that if CPSEs can earn more return from their equity, then these companies' net profit will also be high. But ROE is not an important control variable to show the relationship between CSR and NP of CPSEs in India because the p-value (0.60) of the t statistic is not less than 0.05.

Again, NP has a positive but statistically insignificant relationship with ROA. NP will be increased by 2.02 units due to a one-unit increase in ROA. It indicates that CPSEs can have a higher rate of return from their assets, so the net profit of these companies will also be high. But ROA cannot be considered an important control variable to describe the association between CSR and NP of CPSEs in India because the p-value (0.39) of the t statistic is not less than 0.05.

But NP has a negative as well as statistically significant relationship with SAL. NP will be decreased by 0.0002 units due to a one-unit increase in SAL. It indicates that if CPSEs need to pay more salary to their employees, then the net profit of these companies will be less, and SAL is an important control variable to describe the effect of CSR on the NP of CPSEs in India because the probability value (0.00) of the t statistic is less than 0.05.

NP has a very weak positive relationship with sales, and their relationship is statistically significant. NP will be increased by 0.005 units due to a one-unit increase in sales. It shows that if CPSEs sales are increased, then obviously these companies' net profit will also be improved, and sales is a crucial element to discuss the effect of CSR on the net profit of CPSEs in India because the p-value (0.00) of the t statistic is less than 0.05.

Again, NP has a positive relationship with tax, and their relationship is statistically significant. NP will be increased by 0.89 units due to a one-unit increase in tax. It indicates that if CPSEs need to pay more tax, then obviously these companies' net profit will also be higher. But tax is a crucial element to show the impact of CSR on net profit, as the probability value (0.00) of the t statistic is less than 0.05.

Again, NP and VA are both positively related to each other, and they have a statistically significant relationship. NP will be increased by 0.03 units due to a one unit increase in VA. It says that if CPSEs can add more value to their businesses, then these companies' net profit will improve, and VA is a crucial element to show the relationship between CSR and NP of CPSEs in India because the probability value (0.00) of the t statistic is less than 0.05.

R2 is the coefficient of determination that shows the variation in the dependent variable due to the change in the independent variable. As it can be seen that the R2 value is 0.82, it indicates that independent variables are responsible for describing 82% of the dependent variable. Here, the regression model is highly fitted to describe CSR (the dependent variable) with the help of financial performance indicators (the independent variable). The value of adjusted R2 is 0.79, which indicates that the model is moderately (highly) good to discuss the impact of financial performance indicators on CSR. It can be said that the regression model is perfectly fitted as the p value of the F-statistic (28.01) is less than 0.05 (0.00).

Conclusion

A detailed analysis has been done to determine whether the net profit of CPSEs has been impacted by CSR or not. Panel data regression has been conducted to get the result. Panel regression analysis divulges that CSR affects NP positively and that their relationship is statistically significant. It shows that the net profit of CPSEs will increase at a high level if they spend more money on CSR activities. So, it can be stated that CSR has a positive and significant relationship with financial performance indicators, i.e., NP, and CSR can impact the financial performance health of CPSEs in India.

Despite the financial gain, CPSEs have been trying to be social entities to develop and enrich society, people, and the planet through various CSR activities, i.e., they have been trying to enhance the sustainability development goals in society. CPSEs have been helping many students and building up new schools. Many people, including women, have been getting medical facilities, vocational and job training, computer training, etc. CPSEs have been trying to plant trees and protect the environment. The study could have been enhanced by considering additional dependent variables.

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Modernism of Rural Development in India-Sustainability towards the Digital Transformation

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ABSTRACT

Digital conversance has become important to India's economic growth and the civilizing of economic and social impartiality among the diverse demographic landscape. To bridge the vantage the Indian government has launched the 'Digital India' program. One of the key purposes of the program is to improve the digital infrastructure in rural India. To promote the digitalization process in rural development, e-panchayats are a way to promote all the services that are needed by the local residents. Automation of gram panchayat functions is an e-panchayat initiative for the rural division, providing an extensive software solution. E-governance systems aim to bring out the local voices and share social, cultural, and economic exercises, stories, and dissents.

Keywords: *Sustainability; NPP; NAD; LGD; GIS*

Introduction

Digital technologies are keys to making rural communities more smart, attractive, and sustainable, as well as decreasing puzzles in services related to remoteness and progressing access. Digital transformation is a continuous process throughout India. It is increasing the pressure on villages and their citizens, businesses, and public bodies to barter a new thing. Panchayats need to become smart players in their own digital transformation. In villages, managing authorities need to ensure that several conditions are in place throughout their territory to support their digital transformation. In rural regions, technological progress can mitigate some of the challenges caused by structural changes, including shrinking local economies, demographic changes, and a shortage of skilled labour and entrepreneurs (OECD, n.d.). The COVID-19 pandemic has highlighted the importance of clasping technology for economic spring and well-being. Confinement measures during the emergency fomented the use of teleworking, remote learning, and e-services, which are particularly important for rural territories given their long distances and interchange times. India is one of the greatest and fastest-growing countries for digital transformation. Modernism refers to a global movement in society and culture. In the twenty-first century, there will be a huge change in infrastructure development; rural local bodies will become more advanced as they shift towards digitalization. The modern world mainly focuses on its infrastructure development, which depends on digital equipment. In order to strengthen the rural social fabric, digitalization involves using advanced digital technologies. Technology can lead to better services for the rural population and economic strength, ultimately providing them with more opportunities to lead connected lives.

Literature Review

Verma (2015) revealed that agricultural and allied activities are still major vocations. India cannot emerge as a developed economy without rural upliftment. He also explained how information and communication technology has become a key factor in rural transformation in modern times.

As per Kumaiyon and Padalia (2017), the e-governance of PRI can play an expanded role in the implementation of development and planning programs. They shed light on how the digitization process met the needs of citizens in rural areas.

Bhatt (2020) observed that the digital revolution has created numerous opportunities in India. He highlighted several policies launched by the GOI to increase the internet self-efficacy level of people in rural areas. This article also discusses digital village schemes and their impact on villages.

As per Sahu, Prajapati and Upadhyay (2020), rural areas in India struggle to maintain social services like employment, education, and other services. The urban community had more advantages compared to the rural community. They found that digital possibilities can not only shape change but may even generate a future leapfrog effect for rural communities.

Objectives

The main objectives are:

1) To review the role of technology in the employment scheme.
2) To review the role technology can play in promoting livelihood in villages.
3) To analyze the role of e-panchayat in rural development.

Methodology

A systematic review was conducted to address the research objectives mentioned above. As the nature of the present study was largely exploratory, data were collected from secondary sources. Different reports of the government and bodies of the UN, journal articles, and views of the experts were incorporated in the study.

Results and Discussion

E-Panchayat Systems:

Under the Mission Mode Project Various programs being employed which have been discussed below:

Priasoft – Priasoft is centralized accounting software aimed at the maintenance of accounts by all three elevations of the panchayat, viz., block, district, and village panchayat. PRIASOFT is highly user-friendly and soft to use. The main advantages of this system are:

1) It is accounting software that is simple and user-friendly.
2) It is transparent.
3) This software has a strong authentication mechanism.
4) It is open-access software where all transactions are tracked in the proper format.

National Panchayat Portal (NPP) – Under the e-panchayat mission mode project (MMP), NPP is one of the applications developed as part of the panchayat enterprise suite (PES). It is designed to be a versatile front end for local self-government that supports seamless access to the services provided by the local body. The main features of NPP are:

1) Facilitates easy management of content.
2) Facilitates communication among PRIs, state PR and MoPR through content transfer.
3) Allows organization of content for easy and simple access.

National Asset Directory (NAD) – The National Asset Directory is a portal that is controlled by urban local bodies, rural local bodies, and concern departments, where each asset code has to be maintained. The main purpose of this system is the effective utilization of the assets.

Local Government Directory (LGD) – The Local Government Directory is an information desk that facilitates every state government to update and maintain the name of every panchayat or local body and also the record of conversion from rural to urban areas, etc. LGD provides the information in the public domain.

Social Audit and Meeting Management (SAMM) – At the panchayat level, Social Audit and Meeting Management is a tool to facilitate the social audit process and the management of meetings to enable transparency and accountability.

Geographic Information System (GIS) – Geographic Information System is a digital mechanism which visualize the geographic content. It is systems that create, manage analyzed maps and all types of data. It improves the mapping system in remote area.

Success of Digitization

The broadband connectivity system in the Indian government had taken the initiative, through the Digital India program, to connect all the panchayats. The center has laid out a design to ensure that modern panchayats use digital services for various activities. According to the central government's data, 238,000 gram panchayats have already adopted e-gram swaraj for the purpose of the accounting system. 219000-gram panchayats have taken steps to carry out payments via the public finance management system (PFMS), and 181000-gram panchayats have made online payments.

Pradhan Mantri Adarsh Gram Yojana (PMAGY) – The central government of India has taken various initiatives for the development of the scheduled caste population. The Pradhan Mantri Adarsh Gram Yojana was one of the programs for the development of the SC population. This program was launched in the year 2009-10. It was one of the successive projects as per village concern.

Mahatma Gandhi National Rural Employment Gurantee Act (MGNREGA) – MGNREGA was previously known as the National Rural Employment Guarantee Act or NREGA. It is a social security scheme that targets the rural population for employment purposes. This scheme in remote areas provides at least 100 days of wage employment to every rural household in each fiscal year.

Swachh Bharat Mission Grameen (SBMG) – Swachh Bharat Mission is a campaign taken by the central government of India to improve the system of solid waste management. It is an universal program for all rural or urban area to clean the locality as much as can. It is not only a policy it makes more renewable energy for future aspect.

Jal Jeevan Mission (JJM) – In rural area JJM aims to serve drinking water supply in adequate quantity of prescribed quality on regular and long term basis at affordable service delivery charges leading to elevation in living standards of rural communities.

Gram Panchayat Management System (GPMS) – in e-governance GPMS is a part which initiatives of the panchayats and rural development department of the West Bengal Government. Accounting system of the panchayats makes account helping comfortable, transparent and easy to the users. It is not only a accounting software it also used by the citizens for the purpose of emission of birth and death certificates, emission of trade certificates, assessment of tax etc. Software is regular used in all gram panchayats of West Bengal. Accounting of an organization is a most critical and also a controversial subject, but after the implementation of GPMS, accounting in gram panchayats even more consistent, at the websites monthly statement of accounts also been made available.

Conclusion

In its broadest sense, sustainability refers to the ability to continuously maintain or change a process over time. In this era, digitalization is the process of overcoming the hurdle of insufficient data or communication. The implementation of ICT in the area of government is considered to have a metamorphosis impact on the existing structure of the state, the other systems, and the operation of local government in general. The integration of information technology into governance has vouched for improved connectivity, better customer inclination, and swifter transactions.

After the digitalization process in the governance system, various e-services have been functioning within panchayat systems, such as the following:

1. Emission of birth and death certificates
2. Emission of trade licenses
3. Receipts of funds/progress reports
4. Various data on BPL (Below Poverty Line)
5. Various house-related services
6. E-tendering
7. Various reports related to public works, etc.

Rural development is experiencing a rapid cultural transformation of socio-economics with improved information technology-enabled surface connectivity communication services, and community-centric infrastructure.

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Indian Pharmaceutical Industry and Environmental Sustainability: An Exposition

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Abstract

The Indian Pharmaceutical Industry (IPI) is considered one of the core industries of India, contributing around 2 percent to India's GDP and around 8 percent to the country's total merchandise exports. IPI has successfully proven itself as one of the major players globally, particularly after the outbreak of the Novel Corona virus. However, the pharmaceutical industry needs a proper understanding of chemical processes that will be helpful in balancing coexistence with natural resources and competitiveness. The objective of this research is to investigate sustainability awareness in the Indian pharmaceutical industry by looking into social well-being as well as economic and environmental aspects and the achievement of sustainability goals. Their awareness and related activities need to be scrutinized by integrating them into the planned, strategic, and effective functions of a pharmaceutical organization. The objective of the paper is to highlight the issue of environmental sustainability at pharmaceutical companies. In this research, an analytical approach based on a qualitative study is adopted. The article also presents a case study of an Indian pharmaceutical company in this context for a better understanding of the subject matter. It is found that, as the industry responds to compression from social and environmental concerns, it needs to align profitability with greener actions. So not only imposition by government but a spontaneous practice of CSR can pave the way towards environmental sustainability.

Keywords: *Indian Pharmaceutical Industry; Environmental Sustainability; Welfare; Corporate Social Responsibility*

Introduction

One of India's main industries is thought to be the Indian Pharmaceutical Industry (IPI). According to production volume, it is in third place globally, while according to production value, it comes in fifteenth. According to the Department of Pharmaceuticals' report for 2019, this industry made up about 2% of India's GDP and about 8% of all of its exports of goods. The Indian pharmaceutical sector also draws new domestic and foreign businesses to set up operations here due to its low production costs. Additionally, IPI has effectively established itself as one of the key participants on the international stage, notably during the Novel Corona virus outbreak. Thus, undoubtedly, it can be said that IPI can be regarded as the backbone of the Indian economy.

The process of evolution of the Indian pharmaceutical industry adopted a sustainable process of production, considering environmental aspects and economic and social welfare. The pharmaceutical industry needs a proper understanding of chemical processes that will be helpful in balancing coexistence with natural resources and

competitiveness. In this respect, the E-factor metrics are used to evaluate sustainable practices (Chaturvedi *et al.*, 2017). According to Narayana, Pati and Padhi (2019), the main objectives of Indian pharma companies are to achieve low-cost, high-quality production to compete in the international market. So, the environmental damage that is caused by them is not a major concern for the companies. Moreover, proper treatment of industrial waste and the adoption of reverse logistics require huge investments, which are difficult for small companies to make.

Alshemari *et al.* (2020) noted that the creation of a circular pharmaceutical supply chain can minimize pharmaceutical waste and maximize the value of medicines. It enables sustainability within the supply chain. Mathew and Unnikrishnan (2012) noted that India, like many other countries, does not have any standard medication disposal protocols. Also, a policy shift from pollution control to pollution prevention is very much recommended. Schneider, Wilson and Rosenbeck (2010) opined that sustainability should be measured through the triple bottom line, and pharmaceutical companies should ensure that they follow the sustainability line during the production process. According to Veleva, Cue Jr. and Todorova (2018), the Indian pharma supply chain should obtain green chemistry mechanisms that design the chemical process and product in such a manner that can reduce or eliminate the generation of hazardous substances. Sreenivasan and Reddy (2019) investigated the performances of different Indian pharmaceutical companies and discussed the importance of CSR in social and environmental development. Gupta (2019) has used a qualitative approach in determining the sustainability, ESG and CSR reports of various Indian pharmaceutical companies and concluded that CSR has a positive role in achieving sustainable development goals.

In recent times, the role and importance of IPI in the Indian economy have been understood. The sector is also a major contributor to environmental pollution in India. The objective of this research is to investigate sustainability awareness in the Indian pharmaceutical industry by looking into social well-being as well as economic and environmental aspects and the achievement of sustainability goals. Despite innovations and economic attainments, it is a fact that sustainability aspects in the Indian pharmaceutical industry are still in their infancy. Thus, looking at sustainability broadly, its awareness and related activities need to be scrutinized by integrating them at the planned, strategic, and effective levels of a pharmaceutical organization. The objective of the paper is to highlight the issue of environmental sustainability at pharmaceutical companies.

Methodology

Since IPI is an important factor for the development of an economy, the Government is quite concerned about its progress, problems, and prospects. However, at the same time, the issue of environmental degradation by these pharma companies cannot be ignored, especially in recent times. The general approach of these companies to maintaining environmental sustainability has been discussed here. In this research, an analytical approach based on a qualitative study is adopted. The article also presents a case study of an Indian pharmaceutical company in this context for a better understanding of the subject matter. The case study methodology contains the use of cases to create

theoretical constructs, propositions from case based (within and across) empirical indications (Eisenhardt, 1989).

Case Study

In this section, a case study will be presented that depicts the need for investment in order to reduce industrial waste and associated difficulties. A case study on the performance of GlaxoSmithKline Pharmaceuticals Ltd. can be mentioned in this context. An Indian pharmaceutical company is trying to maintain environmental sustainability. The company was established in India in 1920. They publish the Sustainability Accounting Standard Board (SASB) index to show how the companies reports align with the Biotechnology and Pharmaceutical industry guidelines. GSK places emphasis on nature-based solutions that can offset the harmful impacts of industrial waste. In 2021, they reduced 7 percent of the waste from the sites and recovered 43 percent of these materials through reuse and recycling. This year, they have launched 40 million recycle-ready toothpaste tubes in 20 markets. The company has joined the public-private Lowering Emissions by Accelerating Forest Finance (LEAF) program. Under this program, importance is given to the protection of forests from deforestation. The company has aimed to achieve net zero emissions across its full value chain by 2030. The target is also set to use 100 percent renewable electricity. In 2020–21, they reduced their scope 1 and 2 carbon emissions by 15 percent compared to the previous year. The emissions are being reduced through investment in on-site generation of renewable energy and reducing the number of sites. Another target of the company is to achieve a net positive impact on nature by 2030 by reducing adverse environmental impacts on water, materials, and biodiversity. This can only be achieved by protecting and restoring nature through huge investments.

The company sets water targets through good water stewardship. It aims to reduce water usage by 20 percent by 2030. It also wants to achieve a zero-impact active pharmaceutical ingredient level for all manufacturers and key suppliers in the next ten years. In view of industrial waste and their harmful effects, the company sets the target of zero operational wastes, which also includes one-time use plastics and a 25 percent environmental impact reduction. This impact has been created by products and packaging. They mostly use recycled plastics and encourage the recycling of plastic components. Their aim is to repurpose the waste for beneficial use. They try to avoid the harmful environmental impacts that arise from landfills and try to use the materials in circulation for the production of new products. Another aim in this regard is a 10 percent waste reduction in the supply chain. This case study can be compared with the case study of Sun Pharmaceutical Industries Limited. Sun Pharma targets reducing water usage by 10 percent and co-processing hazardous waste by 2025. They have set a target of a 35 percent reduction in Scope 1 and Scope 2 emissions by 2030. The company aims to reduce Green House Gas emissions by de-carbonizing through an annual tree planting program in each of its operating locations. Sun Pharmaceutical has planted 4,899 trees and saplings within its manufacturing locations in India. The comprehensive EHS (Environmental Health and Safety) governance structure of Sun Pharmaceutical ensures effective implementation of it.

Discussion

The case study of a particular pharmaceutical company and its comparison with another company reveal the fact that more and more investment in corporate social responsibility results in a movement towards the goal of environmental sustainability. In this respect, the aim to reduce carbon footprint and water usage is an improvement towards sustainable development. Thus, pharmaceutical companies should invest more in CSR. They have to balance financial gains with the environmental and social costs associated with their activities. This is their responsibility for the greater good. The companies have to accept the challenges of economic consequences related to instant investments and long-term returns with sustainability drives in the Indian pharmaceutical industry. This will definitely be a forward step towards the circular economy. To achieve net positive biodiversity, the company tries to improve habitats, protect species, and improve soil and water quality. Certainly, a huge investment should be made in this regard.

An organization-based case study design permits an in-depth analysis in different contexts and allows researchers to better understand the occurrence of outcomes (Miles & Huberman, 1994). The tentative clarifications found in a within-case analysis can be verified across different cases, enhancing the consistency and validity of the conclusions (Yin, 2009). The case study approach is better than the survey or exploratory approach in situations where there is a need to maintain a holistic perspective and analysis of the real-life actions in the study (Yin, 2009). The case study approach is helpful for theory development (Dubois & Gadde, 2002).

Goal of Environmental Sustainability: Role of Corporate Social Responsibility

It is evident from various studies that carbon dioxide emissions are 50 percent greater in pharmaceutical industries than in automotive industries globally (Belkhir & Elmeligi, 2019). The Indian pharmaceutical industry is no exception in this regard. The total environmental scenario due to IPI and allied activities is rather scary. As we have already mentioned, India is a low-cost production hub for medicine production, but at the same time, it compromises with environmental damage. Except for some large companies, most of the companies still follow ineffective methods in the treatment of industrial waste; they are also not concerned about the fact of chemical emissions. It is observed that the areas that are in close proximity to the manufacturing units are more directly and adversely affected, which results in the contamination of the water source and food source. Naturally, this is a matter of serious concern. In this context, the well-known disaster of Patancheru Bollaram Zone, Hyderabad, where all the collected specimens have shown evidence of contamination with antimicrobials, can be mentioned. The production of both the APIs and the finished dose creates drug resistance. Another serious concern is the process of disposing of medicines. Though IPI is not directly responsible for it, it should be mentioned that this medicine disposal is equally harmful for the environment. There is no proper guideline for the disposal of drugs in India. Discharging antibiotics into the environment can create the natural development of antibiotic resistant pathogens, which are harder to treat.

Thus, it is observed from the discussion that a drug can create pollution in its entire life cycle, starting from its production and ending with its disposal. The Supreme Court of India ordered a zero liquid waste policy in 2016. But the majority of IPIs rely on the treatment

and disposal of waste water instead of source reduction. For environmental sustainability, adoption of green chemistry metrics becomes necessary, which can create a green supply chain for a better future. Here we should also mention the Triple Bottom Line, which integrates three dimensions of sustainability, namely, the environmental, social, and economic dimensions of sustainability. The economic dimension of sustainability places emphasis on external impacts on financial health, economic performance, and potential financial benefits. The social dimension of sustainability measures the well-being of people and communities, workplace health and safety, etc. The environmental dimension of sustainability measures the impacts of processes, products, and services on the environment, biodiversity, and human health.

It is interesting to note that a conflict of interest exists between large pharmaceutical industries (who are the contributors to a large supply chain) and individual communities (who are adversely affected in many ways). So, a balancing of power is required, which can be ensured by firms adopting corporate social responsibility. CSR is expected to be helpful in accelerating the rate of both social and economic development. CSR includes corporate responsibility, corporate accountability, corporate ethics, responsible entrepreneurship, etc. It is basically the responsibility of an organization to maintain transparency and ethical behavior that is consistent with the sustainable development and welfare of society.

In India, under the CSR concept, pharmaceutical companies take responsibility for the impacts of their activities on different stakeholders, along with profitability and growth. The big business houses earn enormous profits from society, and it is their responsibility to return a part of this profit to society. It is expected that companies should not be driven only by profit motives; they should share their benefits with society as well. Also, when a company expands, it aims to build a trustworthy relationship with consumers as well as with the community. Thus, opting for corporate social responsibility becomes evident. Initially, CSR was associated with charity and donations to overcome different social issues. But nowadays, IPI plays an important role through CSR, which facilitates extensive social changes. CSR has become an extended part of corporate strategies. It focuses on the improvement of health and education in underserved communities. The pharmaceutical industry has expertise, a financial advantage, manpower, etc. These facilities are used to secure social development. As an integral part of social development, a huge emphasis is given to environmental sustainability. CSR is no longer a voluntary act by the company; it is now mandatory in India under the Indian Companies Act 2013. It is expected that Corporate Social Responsibility will act as a positive measure of sustainable development. In the past, these two concepts moved separately. CSR was explained as the social responsibility of the business, and sustainable development was explained as the effects of business on the environment. But presently, it is understood that due to CSR, the goal of sustainable development can be achieved.

Conclusion

The corporation now places a high value on sustainability, and it must report on it in order for the public to be aware of it. The government has this industry on its radar for sustainability. Despite the fact that the law was implemented nine years ago, many small and medium-sized pharmaceutical businesses still put profit before the dreadful

consequences of their activities on the environment. Industry must balance profits with greener initiatives as a response to pressure from social and environmental issues. So, not only imposition by government but a spontaneous practice of CSR can pave the way towards environmental sustainability.

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Advertisement As a Tool to Empower ‘The Women’: A Study in the Selected Areas of Kolkata

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ABSTRACT

Deaths by dowry, gender inequality, child abuse, female infanticide, trafficking, sexual harassments, insecurity in workplace, the violence of killing the fetus, if it is detected as feminine gender and the constant violence inflicted on women make them a highlighted character in the society. With the passage of time, the violence against women increased highly. Social issues usually tend to create advertisement a vital role to play. Previously, advertising depicted a traditional picture of women who are simply a homemaker but in recent times the theme and concept of advertising is changed. Quite a few brands have been quick to plug in a ‘women empowering theme’ into their brand communication. In this era, advertising in through different forms play a significant role in order to protect and promote the status of women thereby getting them empowered. This paper will specially highlight the role of advertising in empowering women. A total of 300 respondents consisting of women have been selected from the area of Tallygunge, Behala, Joka, New Alipore, Thakurpukur and Sarsuna, (50 respondents from each area) of Kolkata and South 24 Pargana. Regression Model is used to show the impact of advertisement on woman empowerment. Regression result shows that Women with high age groups are less interested about advertisement. Working and educated women are much more interested to follow advertisement on woman theme. Independent women are more prone towards advertisement message.

Keywords: *Advertising; Empowering Women; Social Media*

Introduction

The empowerment of women has emerged as an important issue in recent years. Pandit Jawaharlal Nehru once remarked, "When women move forward, the family moves, the village moves, and the nation moves." Empowering women is a "must’ in India, where the main role of a woman is confined to the house as a homemaker.

According to the National Family Health Survey, 2020–21, India’s sex ratio in 2022 will be 1020 females per 1000 males. So, women's society needs a huge push up by means of empowerment. Advertising is a communication channel through which news and other important messages are publicized and reach a number of audiences with the help of newspapers, radio, television, the internet etc. Nowadays, these are necessary for spreading awareness and decreasing gender discrimination. Advertising promotes ideas in different forms and helps increase women’s self-expression and decision-making abilities.

Women's empowerment refers to the creation of an environment for women where they can make decisions on their own for their personal and social benefits. The term "empowerment of women" refers to the process of strengthening the hands of women who have been

suffering from various disabilities, humiliation, inequalities, and gender discrimination. Recent studies on women's empowerment give a straight view of women in their society.

‘Women's empowerment involves the building up of a society and a political environment where women can breathe without the fear of oppression, exploitation, apprehension, discrimination, and the general feeling of persecution that goes with being a woman in a traditionally male-dominated structure’ (Rani, 2021). ‘Being a traditional society, women have been given a secondary status, which is reflected in the economic, social, and political spheres." However, women's equality and empowerment have always remained a priority area and have been taken with the utmost care by stakeholders’ (Singh & Singh, 2020). ‘Empowerment is a multi-dimensional and dynamic social process that helps people gain control over their own lives. Empowering girls and women are the key to economic growth, political stability, and social transformation’ (Tembhre, 2018). ‘Across the globe, gender disparities still exist with regard to equitable access to resources, participation in the decision-making process, and gender- and sexual-based violence. This is particularly true in fragile and conflict-affected settings, where women and girls are affected by both fragility and conflict in unique ways. While women have been acknowledged as key actors in peace processes and post-conflict reconstruction, evidence on the effectiveness of gender-specific and gender-transformative interventions to improve women’s empowerment in fragile and conflict-affected states remains understudied’ (Lwamba *et al.*, 2022). ‘Empowerment is viewed as a means of creating a social environment in which one can make his or her own decisions and make choices either individually or collectively for social transformation’ (Kushwah, 2020; Sharma & Singh, 2020). ‘Women’s ideas of empowerment must differ according to their culture, economic, and social controls, as well as donor-driven definitions. Both similar and distinct positive effects of participating in empowerment activities are felt, highlighting the importance of incorporating women's priorities when planning empowerment projects’(Völker & Doneys 2021).

Objectives of the Study

The main objectives are to highlight the impact of advertising on empowering women in the age group and to shed light on the changing outlook of society towards women.

Methodology

The present study is empirical and explanatory in nature. The study is based on both primary and secondary data. The primary data have been obtained by administering a structured questionnaire, and the secondary data have been sourced from the relevant books, e-journals, newspapers, and websites. For administering the questionnaire, the respondents have been selected through judgmental sampling. A total of 300 respondents consisting of women have been selected from the areas of Tallygunge, Behala, Joka, New Alipore, Thakurpukur, and Sarsuna (50 respondents from each area) of Kolkata and South 24 Pargana. The selection of these localities is made on the basis of judgmental sampling. The age range of the respondents in the selected sample ranges from 15 years to more than 45 years, which has been taken to get a clear view of the impact of feminism in the minds of the women in different age groups. The questionnaire has been distributed through personal contact and e-mail. After the collection of the responses from 300 filled-out questionnaires, the analysis has been done. A regression model is used to show the impact of advertisements on women's empowerment.

Different form of Advertisement

The medium of advertisement includes two forms: traditional or conventional media and modern or new media. Traditional media is a one-way communication process and includes news channels, TV, radio, banners, newspapers, magazines, etc. New media is a two-way communication process that includes digitally driven tools like Facebook, Twitter, blogs, WhatsApp etc.

Advertisement is not only the promotion of goods and services; it also promotes an idea or a concept. Previously, advertisements depicted a traditional picture of women who are simply homemakers, but in recent times, the theme and concept of advertisements have changed. Quite a few brands have been quick to plug in a 'women-empowering theme' into their brand communication. In 2014, quite a few leading Bollywood actors and actresses leveraged the 'respect for women' theme on social media to gain massive support from their followers. A few examples of such female advertising are as follows:

- Tata Tea 'Jaago Re' Campaign
- Vivel by ITC 'AbSamjhautaNahi'
- Scooty pep+ 'why should boys have all the fun?
- Dove 'Real Beauty' Campaign
- Titan Raga 'Women of Today'
- Nirma Ambulance
- Havell's Coffee Maker 'She is not a Kitchen Appliance'
- Stayfree 'Army'
- Stayfree's 'women for change' campaign
- Vatika Hair Oil
- Prestige Pressure Cooker 'Jo biwi se kaarepyaarwoh prestige kokaisekareinkaar'
- Pro- Ease Go Long 'SirfEkShart, Ke Koi ShartNahi'
- Airtel Boss
- Vogue Empower 'Start with the Boys'
- Nestle supported 'Nanhi Kali' for the girl child
- Mahindra Rise 'LadkiHaath Se NikalJaayegi' with Project Nanhi Kali
- Nihar Naturals 'Akai Aiksho Woman'
- Reliance Fresh 'JeeLeZara'
- Ariel Matic campaign 'Is laundry only a woman's job
- Brooke Bond Red Level (shatter the stereotype concept-pink is for girl, blue is for boys)
- Tanishq celebrates the concept of the remarriage of a mother
- PC Chandra Jewellers in calcutta takes a provocation stance on women's day, stating 'let's uncelebrate women's day and celebrate women everyday instead
- Joy cosmetics- focus on inner beauty and not with body size or type.

Results and Discussion

Table 1: Occupational Status of Respondent

Occupation	Percentage
Housewife	35.08772
Service	56.14035
Others	8.77193

Source: *Researchers' Own Calculation*

Table 1 shows the occupational status of the respondent, and they can see that more or less 35% are housewives, 56% are service women, and 9% belong to other categories like students.

Table 2: Time to Follow Advertisement

Time to follow advertisement	Percentage
Always	1.754386
Often	35.08772
Sometimes	63.15789

Source: Researchers' Own Calculation

From Table 2, it can be said that approximately 2% of the total respondents always follow advertisements. 63% follow sometimes and 35% of respondents said that they often follow advertisements.

Table 3: Impact of Advertisement on Woman Theme

Impact	Percentage
Always	7.017544
Often	22.807022
Sometimes	63.15789
Not at all	7.017544

Source: Researchers' own calculation

Table number 3 shows the impact of advertising on women's themes in society. As they told earlier in the data methodology portion of the paper that the study is based on an opinion survey, about 63% of the respondents thought that advertisements on women's themes were effective sometimes. 22% opined that the impact of advertisements is very often felt in society. Interestingly, 7% of participants said that advertisements are ineffective, and another 7% thought that advertisements are always effective in society.

Table 4: Age Wise Following Advertisement

AGE	Follow Advertisement on woman theme (figures are in %)				Follow advertisement (figures are in %)	
	Always	sometimes	Often	not at all	Sometimes	Often
15-25		20	80		20	80
25-35	9.52	19.04	57.14	9.52	38.09	61.90
35-45	20	18	50	12	50	50
45 and above		11.05	39.47	49.03	47.61	42.85

Source: Researchers' own calculation

In the age group 15–25, 20% of respondents sometimes follow normal advertisements and advertisements on women's themes, and 80% often follow the same. Though 38% women follow normal advertisement in the age group 25-35, only 19% follow advertisement on woman theme. This low percentage is due to work pressure and family pressure. About 57% to 62% of women in this group often follow advertisements. About 49% of women never follow advertisements at an age above 45. From Table 4, it can be seen that as age increases, interest in advertisements on women's themes decreases. But age does not affect the preference of normal advertisements. Indian women are very prone towards their families. They prefer those things that the family members like. This common story of Indian women is reflected in the above table. 'Women in the age group 51 and above are most empowered, followed by women in the age group of 36–50 years. Women in the age group 20–35 years are least empowered as compared to other groups. (Menon & Sharma, 2020).

Table 5: Educational Qualification Wise Following Advertisement

Education	Follow Advertisement on woman theme (figures are in %)				Follow advertisement (figures are in %)	
	Always	sometimes	often	not at all	Sometimes	Often
undergraduate		30	20	50	30	70
graduate	10	40	40	10	40	60
masters	7.41	58.52	34.07		33.33	66.66

Source: Researchers' own calculation

In table 5, 30% of undergraduate women sometimes follow normal advertisements and advertisements on women's themes, 20% often follow them, and 50% never follow advertisements on women's themes. Among the graduates, 10% always follow, and 40% sometimes follow advertisements on a woman's theme. As the level of education increases, that is, at the master's degree level, approximately 58% of women sometimes follow and 34% often follow advertisements on a woman's theme. That is, level of education and preferences of advertisements on women's themes are proportionally related to each other.

Table 6: Family Type Wise Following Advertisement

Family type	Follow Advertisement on woman theme (Figures are in %)				Follow advertisement (Figures are in %)	
	Always	sometimes	often	not at all	Sometimes	often
joint	1.33	16.66	54.17	27.84	25	75
nuclear	10.06	28.88	61.06		45.45	54.54

The respondent belongs to a nuclear family, which is more exposed to the effects of advertisement on women than a joint family. 10% of women in nuclear families always follow it, 28.88% sometimes follow it, and 61.06% often follow advertisements on women's themes. In cases of joint families, only 16.66% of women sometimes follow, and 54.17% often advertise on a woman's theme. Approximately 28% never follow advertisements on a woman's theme.

Table 7: Occupation Wise Following Advertisement

occupation type	Follow Advertisement on woman theme (figures are in %)				Follow advertisement (figures are in %)	
	Always	sometimes	often	not at all	sometimes	Often
Housewife	5	25	45	25	50	50
Service	6.25	31.88	61.87		28.13	71.87
Others		20	80		20	80

Source: Researchers' own calculation

Table 7 indicated that working women are more interested in following advertisements on women's themes and normal advertisements than housewives. The reason may be that working women are more up-to-date about technology and follow advertisements. 'Working women are highly empowered concerning work, home, and freedom of choice or movement, and their total empowerment is better than that of women who are not working.'(Menon & Sharma, 2020).

Table 8: Regression Result 1

Dependent Variable Y				
Variable	Coefficient	Std. Error	t-Statistic	Probability
X1	-0.097586	0.055802	-1.748785	0.0862
X2	0.076203	0.059655	1.277387	0.0071
X3	-0.230548	0.088867	-2.594319	0.0123
X4	0.235529	0.096822	-2.432592	0.0185
a	2.381764	0.290307	8.204280	0.0000
R-squared	0.306335	F-statistic	5.741025	0.000664

Source: Researchers' own calculation

Table number 8 summarizes the regression result 1, where the preference of advertisement on woman theme like a dummy variable is regressed on age, educational qualification, family background and occupational status. The entire coefficients are statistically significant at 1% level. The coefficients of age and family background are negative. This implies that preference of advertisement on woman theme is negatively affected by these variables. Women with high age groups are less interested about advertisement. This result support table 4. Family background has negative impact. The women belonging to joint family have less time to follow advertisement on woman theme as they have common television or other means of media. In case of occupational status, the coefficient is positive and significant. Working women are much more interested to follow advertisement on woman theme. Educational qualification has positive impact on advertisement on woman theme. Educated people are more sensitive towards advertisement on woman theme.

Table 9: Multicolinearity Test of Regression 1

Variable	Coefficient Variance	Centered VIF
X1	0.003114	1.855539
X2	0.003559	1.123923
X3	0.007897	1.085355
X4	0.009375	1.952088
A	0.084278	NA

Source: Researchers' own calculation

*VIF – Variance Inflation Factor
a= constant
Y= Preference about the advertisement on woman theme.
X1= age
X2= educational qualification
X3= family background (nuclear or joint)
X4= occupational status

Table 9 depicts the result of the multicollinearity test. They saw that the values of the variance inflation factor (VIF) are less than 10. So, multicollinearity is absent for the quadratic regression model.

Table 10: Regression Result 2

Dependent Variable Y				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Probability**
X1	0.169029	0.111114	1.521229	0.0341
X2	-0.248172	0.121451	2.043396	0.0460
X3	-0.078337	0.118118	-0.663209	0.0101
a	0.706019	0.345852	2.041391	0.0462
R-squared	0.151585	F-statistic	3.156474	0.032176

Source: Researchers' own calculation

Table 11: Multicolinearity Test of Regression 2

Variable	**Coefficient Variance**	**Centered VIF**
X1	0.012346	1.124757
X2	0.014750	1.667982
X3	0.013952	1.577705
a	0.119614	NA

Source: Researchers' own calculation

*VIF – Variance Inflation Factor

a= constant

Y= Preference on advertisement on woman theme

X1= marital status

X2= family type (orthodox and unorthodox)

X3= dependence on family

Table number 8 summarizes the regression result 2, where the preference of advertisements on women's themes, like a dummy variable, is regressed on marital status, family type, and dependence on family. The coefficient of marital status is significant and positive. The reason may be that married women become more concerned about their rights, privileges, etc. Orthodox families want to stick with traditional values and beliefs. They are less concerned about women's rights and education. That's why advertisements on women's themes have

less impact on them. More dependency on family has a negative effect on women's thinking about advertising. Independent women are more prone to ad messages.

The values of VIF are also less than 10 suggested by table number 11. So here too the multicollinearity is absent for the regression model.

A study by Omika Bhalla Saluja, Singh and Kumar 2023 ‘identified Patriarchy structure, psychological factors, low income/wages, low financial literacy, low financial stability and ethnicity as six prominent barriers and Government and Corporate programs policies, microfinance, formal saving accounts and services, cash and asset transfer, self help groups and digital inclusion as six leading interventions to summarize the literature and highlight its gaps’.

The paper by Seema Singh and Antara Singh (2020) have covered ‘about affirmative legislation, plans and programs initiated by the Government, NGOs and Corporate sectors through their corporate social responsibility over a very large spectrums starting from the Indian constitution to development in recent years’.

Suggestions and Recommendations

- Primary Educational System needs to be explored and extended more especially at grass root level.
- More efforts are needed to make ‘women’ awake in terms of raising their voices against any antisocial activities.
- Proper motivation, inspiration and support are also required for women development.
- Advertisement through social media plays an influential role in the human mind, so it should act with more responsibility before informing and publishing any news.
- The coverage area of advertisement needs to be extended further even among the women in grass root levels.
- Unbiased gender society and empowering women should be supported and further explored through the massive usage of social network.
- Implementation of strong social security on the internet to avoid cyber bullying is desirable.
- Advertisement covers broader view of crimes against women. Necessary provisions are required in conducting a social audit on factors responsible for increasing crimes, particularly against women and children. Investigation procedures need to be encouraged further.
- Various mass media campaigns should be organized at the grassroots level through their understandable medium like traditional form of communication which includes puppetry, story- telling, folk arts, folk music and other vernacular mediums.
- Government should implement sufficient measures for women to look after their safety and security.

Government is seen to implement many more schemes to safeguard the honour and respect of Indian women through ‘BetiBachao, BetiPadhao’ scheme, ‘Nanhi Kali’, UJJAWALA, SWADHARGreh, NARI SHAKTI PURASKAR and many more. The most important role of advertising is to educate all the needy women through suitable channel.

Conclusion

Advertisement as a medium of media education is a medium to inform about the changing outlook of society and promote several government initiatives to reduce the vulnerability of women towards poverty, inequalities, and being marginalized in society. But no medium can be successful in attaining women's empowerment unless women understand their inherent capability, because empowerment of women does not only mean strengthening their hands financially but also making them mentally capable of understanding their inherent quality to fight for their identity.

History has proven that ‘if you educate a man, you educate an individual, but if you educate a woman, you educate a nation’.

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