

Progress and challenges in achieving sustainable development goals in India: A comprehensive review

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Abstract: The Sustainable Development Goals (SDGs), adopted via the United Nations (UN) in 2015, provide a global blueprint for tackling key social, environmental, and economic challenges. As a country with a diverse and significant population, India's progress towards these goals presents unique opportunities and challenges. This review article critically analyses India's progress in attaining the Sustainable Development Goals, investigates the challenges faced, and proposes potential ways to accelerate advancements towards sustainable development. The article utilizes a wide array of secondary data to thoroughly evaluate the present condition of SDG implementation in India. The analysis focuses on government policies, creative interventions, and successful case studies. It provides recommendations for future action, contributing to a more detailed knowledge of India's efforts and the wider global discussion on sustainable development.

Keywords: Clean water and sanitation, Climate action, Economic growth, Food security, Gender equality, Healthcare infrastructure, Infrastructure development, Marine ecosystems, Multi stakeholder, Collobaration, Peace and justice, Poverty alleviation, Quality education, Renewable energy, Sustainable development goals, Terristrail Ecosystems.

1. Introduction

1.1. Concept and Significance

The Sustainable Development Goals (SDGs) were overwhelmingly ratified by all United Nations member countries in September 2015. These goals aim to tackle significant global social, economic as well as ecological concerns by the year 2030 [1]. The 17 objectives and supporting 169 targets establish an extensive framework for sustainable development, to guarantee that no one is marginalized or disregarded. The objectives emphasized in this declaration prioritize the eradication of poverty, improvement of health and education, advancement of gender equality, conservation of the environment, and creation of resilient and inclusive societies [2].

1.2. India's Commitment to Achieve SDGs

India, home to around 1.3 billion people and an exceptionally diverse socio-cultural environment is essential to the global pursuit of the SDGs. As the world's largest democracy and among the signatories of the United Nations SDG agreement documents additionally the fastest-growing economies, India's progress or setbacks significantly affect global metrics. However, its large and diverse population, coupled with a range of economic and social disparities, also presents considerable challenges [3].

1.3. Purpose & Rationale

This review seeks to analyze India's advancement towards the Sustainable Development Goals (SDGs), assessing the distinctive obstacles it encounters, and investigating methods to expedite its path towards sustainable development. India's dedication to SDSs or Sustainable Development Goals is demonstrated by its incorporation of the goals into its national development agenda, as stated in its initial Voluntary National Review submitted to the UN High-Level Political Forum on Sustainable Development in 2017 [4]. However, an analysis of the actual circumstances reveals an intricate and

multifaceted depiction. This study seeks to enhance comprehension of this context and facilitate the evolution of future tactics, regulations, and interventions.

1.4. Methodology

The methodology employed in this comprehensive review involved a thorough examination of the secondary data sources, aimed at providing a complete picture of India's advancements made toward the SDGs. Data sources used include government documents such as the Voluntary National Review Report on the Implementation of Sustainable Development Goals 2017 and 2020 submitted by the government of India to the United Nations [4] along with other national policies and programs. Data also includes findings from independent surveys and field studies conducted by non-governmental organizations, research institutions, and other bodies. Information was collated from a wide array of academic literature, including peer-reviewed articles, reports, conference papers, and case studies. The review also took into account reports by international organizations like the United Nations, World Bank, and World Health Organization. The criteria for selecting relevant research were a clear focus on one or more of the SDGs, a major impact, coverage of a substantial geographic region within India, and conduction or publication between 2015 and 2023. The duration of the study ensured that the research was directly applicable to the era of implementing the Sustainable Development Goals (SDGs).

The data collected from these various sources were then critically analyzed, with a focus on identifying key achievements, challenges, and strategies for each of the 17 SDGs in the Indian context. A meta-analysis of key indicators related to the SDGs was conducted, which helped to map out the country's progress and compare it against the intended targets. This comprehensive review and meta-analysis methodology was designed to provide a holistic view of India's development toward the SDGs and identify the factors that could potentially accelerate or impede this progress.

2. Progress in Achieving SDGs in India

India has made significant progress in accomplishing several Sustainable Development Goals (SDGs). This section will focus on several significant areas of advancement.

SDG 1 - No Poverty: According to the World Bank, in 2019, In India extreme poverty went down from 271 million in 2011 to 73 million in 2021. These critical reductions have been achieved through various poverty alleviation programs started by the government, one such program being the “Pradhan Mantri Jan Dhan Yojana (PMJDY)” which aimed to provide a national mission for financial inclusion.

SDG 2 - Zero Hunger: In India, much progress has been achieved towards food and nutrition security, although several challenges had to be faced. The Voluntary National Review Report 2020 noted that food grain production increased significantly from 50 million tonnes in the agricultural year 1950-51 to over 292 million tonnes during 2019-20. “The National Food Security Act (NFSA)” of 2013 introduced a restructured Public Distribution System. Food grains are supplied through as long as 540,000-plus nationwide network of Fair Price Shops. The share of beneficiaries as per the National Food Security Act rose to 97.6 in 2018-19 from 95.2% in 2015-16.

SDG 3 - Good Health and Well-Being: The World Health Organization [5] further agrees that considerable improvements have been effective in enhancing the infrastructure for healthcare and thereby improving health output. The National Health Mission, among many other healthcare measures, has been greatly useful in making this progress possible. “The Pradhan Mantri Jan Aarogya Yojana (PMJAY),” however provides health insurance up to 100 million at-risk families and provides coverage for up to INR 500,000 (around USD 6,666.7) annually for each family hospitalization in secondary and third-level healthcare facilities. “The Pradhan Mantri Jan Aushadhi Pariyojana” is a program that provides high-quality medication at reasonable prices. India's doctor-population ratio is 1:1456, which is less than the WHO norm of 1:1000. India has so far achieved a reduction of 6.15 percent in MMR, decreasing it from 130 within the period 2014-16 to 122 in the period 2015-17. This marks that India stands well on its track to reach below 70 “Maternal Mortality Ratio (MMR) by 2030”. The Infant Mortality Rate declined from 37 in 2015 to 32 in 2018. In continuation, the Under-5 Mortality Rate has also been lately declining 43 in 2015 compared to 37 in 2017, as stated in the Voluntary National Review Report of 2020.

SDG 4 - Quality Education: The Indian Constitution has ensured that every citizen of the nation has been provided (up until the age of 14 years), free schooling as required through the Right of Children to Free and Compulsory Education Act which was passed in 2009.

It is imperative that there be proper implementation of Children's Right to Free and Compulsory Education. The adoption of the Education Act in 2009 has seen an increase in the enrolment rates of primary schools, as stated by UNESCO in 2021. The various initiatives that the government has shown its devotion to the education cause include "Samagra Shiksha Abhiyan (SSA)." The percentage of qualified educators grew from 75.49% to 77.85% for the primary institutions and from 78.52% to 83.69% for secondary institutions. "Skill India" and "Pradhan Mantri Kaushal Vikas Yojana (PMKVY)" are both meant for skill training among the youth so that they are equipped with industry-relevant skills and increase their livelihood opportunities. By the end of 2020, 8.7 million applicants had been trained under the PMKVY or Pradhan Mantri Kaushal Vikas Yojana Program. Report on Voluntary National Review, 2020.

SDG 5 - Gender Equality: MGNREGA or The Mahatma Gandhi National Rural Employment Guarantee Act prescribes a minimum of 33 percent women's participation to foster gender equity. The actual participation rates recorded during 2018-19 and 2019-20 were 54.59 percent and 54.67 percent, respectively. "Deen Dayal Antyodaya Yojana" - National Livelihoods Mission-Rural aims to create institutions of the poor that are self-sustainable, empower and organize the women, increase their skills, provide them with access to loans, marketing opportunities, and various livelihoods while consolidating them into "Self-help group (SHGs)." About financial inclusion, out of the total population of 380 million people, an impressive 54 percent of the Jan Dhan bank accounts were held by women, the Pradhan Mantri said. The number of percentage women who were able to receive bank services increased from 43 percent in the year 2014 to 77 percent in 2017. The percentage of women's representation in the national legislature lower house in 2014 read at 11.4 percent and to 14.4 percent in the year 2019. This information was obtained from the 2020 Voluntary National Review publication report.

SDG 6 - Clean Water and Sanitation: The Indian government has established a new ministry called the Ministry of Jal Shakti which aims to unify and oversee water resources and management. The goal of this initiative is to provide good water governance and address the challenges associated with water management. Furthermore, the country is taking robust measures to optimize its water resources while ensuring universal access to water. The recently launched Jal Shakti Abhiyan aims to improve water conservation and rainfall management. The country aims to establish a water-secure future through activities such as harvesting, renovating traditional and other water bodies, reusing water and recharging infrastructure, developing watersheds, and implementing intense afforestation with the active involvement of the community. India has been

executing a focused and time-limited plan since 2014 to revolutionize the condition about the sanitation situation in the nation. The Swachh Bharat Mission (SBM), also known as the Clean India Campaign, has effectively accomplished its goal of eliminating open defecation in India. This was achieved by installing more than 109 million toilets in households and communities since October 2, 2014. These toilets have been built in 603,175 villages spanning 706 districts around the country. The percentage of rural residences that were equipped with individual household toilets increased from 38.7% in 2014-15 to 100% in 2019. Report for the Voluntary National Review in 2020.

SDG 7 - Affordable and Clean Energy: As per the International Energy Agency, 2022, tremendous advancements in the enhancement of electricity accessibility went from nearly 80% of households that was in 2015 to today's nearly 100%. The Pradhan Mantri Sahaj Bijli Har Ghar Yojana, called Saubhagya, which was initiated in September 2017, has effectively electrified almost all residences across the 603,175 villages in the country. More than 80 million of the most impoverished households have gained clean heating fuel is accessible since its launch in 2015. The share of households using clean cooking fuel increased from 63.11% during 2015-16 to 96.22% during 2018-19. Founded in 2015, Pradhan Mantri Ujjwala Yojana marked a vital leap towards lessening dependency utilizing biomass for culinary purposes and thus, bettering the welfare of women by letting them unleash their empowerment through asset control. Thus, in September of 2019, the program accomplished the objective with success

of facilitating access to LPG for eighty million households. for cooking purposes. The 2020 Voluntary National Review Report.

SDG 8 – Decent Work and Economic Growth: The growth in real “Gross Domestic Product (GDP)” for the year 2019–20 is 5.0 percent, in contrast to the development rate of 6.8 percent as recorded during 2018–19. Further, the growth in “Per Capita Income (PCI)” is at 4.3 percent for the year 2019–20, as compared to the previous year's 5.6 percent. Accordingly, India would want to emerge as an ecosystem valued at USD 5 trillion by 2025, characterized by an inclusive and sustainable growth trajectory from the presently estimated 2018–19, in current terms, GDP of USD 2.72 trillion. One of the significant strategies under economic prosperity has been entrepreneurship. In fact, it has the third largest ecosystem of entrepreneurship globally. There has also been an upsurge in recent years, in entrepreneurial pursuits whereas the cumulative annual growth rate of the number of new entities in the formal sector was 3.8 percent. During 2006–2014, it climbed by 12.2 percent from 2014 to 2018. Skill India, initiated in 2015, focuses on short-duration vocational education and aspires to create at least 400 million skilled people by 2022. The National Skill Development Mission has provided training to more than 10 million students, while the PMKVY has trained an additional 8.7 million. Voluntary National Review Report 2020

SDG 9 – Industry, Innovation, and Infrastructure: The time and cost burden on enterprises has been alleviated by the simplification of government processes in Central Ministries. The State Level Business Reforms Action Plan implemented more than seven thousand reforms to streamline business regulations in the States. The proportion of GDP allocated to research and development (R&D) for Intellectual Property Products has risen from 3.52 percent in 2015–16 to 3.91 percent in 2017–18. India has initiated the Startup India program to identify, foster, supporting and expediting the expansion of innovative enterprises. As of the end of 2019, a total of 26,804 businesses were officially acknowledged under the Startup India initiative, spanning throughout 551 districts. Additionally, a significant amount of INR 31.23 billion (equivalent to USD 416.4 million) was pledged to support 47 Alternative Investment Funds. Currently, India boasts the third-largest startup ecosystem globally, with about 50,000 firms in 2018, out of which 9,300 are technology-driven startups. In 2018, the rate of expansion inside the startup ecosystem has risen to 15 percent annually, although the expansion of accelerators and incubators has reached 11 percent. The proportion of female entrepreneurs increased significantly, reaching 14 percent, compared to 10 percent and 11 percent within the last two years (2018–19 and 2019–20). The report for the Voluntary National Review in 2020.

SDG 10 – Reduced Inequalities: India is dedicated to achieving social, economic, and political equality through legislation and targeted multi-sectoral interventions. The Mahatma Gandhi National Rural Employment Guarantee Scheme is instrumental in securing income for rural households, ensuring at least 100 days of work annually. A national initiative aims to double farmers' income by 2022, reflecting a commitment to enhancing agricultural prosperity. To improve job prospects for marginalized communities, various measures have been enacted. In the fiscal year 2018–19, 22 percent of Pradhan Mantri MUDRA Yojana credit accounts were held by SC/ST entrepreneurs, who secured 12 percent of the total loan amount, INR 410 billion (USD 5.5 billion). OBC entrepreneurs accounted for 26 percent of all accounts and obtained 19 percent of the total loan amount, INR 606 billion (USD 8 billion). Women held 62 percent of loan accounts and accessed 41 percent of the total loans, amounting to INR 1330 billion (USD 17.7 billion). The National Social Assistance Program (NSAP) provides pensions to the elderly, widowed, or disabled. Additionally, 67 million rural women have participated in 6.1 million self-help groups focused on entrepreneurship. The Pradhan Mantri Jan Dhan Yojana (PMJDY) has facilitated financial inclusion by extending banking services to previously excluded individuals. Approximately 382.5 million bank accounts have been opened since the beginning, with over 50% of them being owned by women. The report for the Voluntary National Review in 2020.

SDG 11 – Sustainable Cities and Communities: In 2011, the urban habitats of India were home to approximately 377 million individuals, which accounted for approximately 31% of the total population. It is anticipated that the urban population of India will increase to approximately 606 million by 2030. This imposes further strain on the existing overwhelmed urban infrastructure, including housing, transit services, access to clean water, and sewage treatment. India has implemented a comprehensive

“Smart Cities Mission (SCM)” that is designed to enhance 100 cities throughout the nation with a particular emphasis. City enhancement (retrofitting), city renewal (redevelopment), and city expansion (greenfield development) are the primary components of area-based development in the Smart Cities Mission. Additionally, there is a pan-city project that applies Smart Solutions to broader areas of the city. India has initiated adoption of the “Pradhan Mantri Awas Yojana (PMAY)” specifically targeting urban households. The National Policy on Disaster Management (2009) establishes a comprehensive and proactive strategy for enhancing disaster resilience. In 2017, India introduced the Energy “Conservation Building Code (ECBC)” intending to decrease energy usage and encourage environmentally friendly development. The ECBC 2017 establishes guidelines for architects, designers, and constructors to incorporate renewable energy sources into building design by incorporating passive design principles. The report for the Voluntary National Review in 2020.

SDG 12 – Responsible Consumption and Productions: India has established goals to increase in the intensity of GDP's emissions by 20 to 25 percent from its 2005 levels by 2020 and by 33 to 35 percent by 2030. India has reaffirmed its commitment to Sustainable Development Goal 12 by endorsing the 10-Year Framework of Programmes on Sustainable Consumption and Production (10YFP), a global initiative aimed at accelerating the transition to sustainable production and consuming. The country actively engages in several 10YFP program areas, including consumer information, sustainable lifestyles and education, sustainable agricultural systems, sustainable tourism, and sustainable buildings and construction. India is seeing substantial progress in sustainable development practices, as highlighted by the US Green Buildings Council, which ranked it third globally for Leadership in Energy and Environmental Design (LEED) as of December 31, 2018. The nation boasts over 899 LEED-certified projects covering more than 24.81 million gross square meters. In 2019, tourism contributed 6.8 percent to India's GDP and supported 8.1 percent of the workforce. The sector is projected to grow its direct GDP contribution by an annual rate of 7.1 percent over the next decade. However, India faces significant waste management challenges, with 377 million people in 7,935 urban areas generating 62 million metric tons of solid refuse from municipal sources annually. As of August 2017, ninety-one percent of municipal solid waste was collected, with 23 percent undergoing treatment. Noteworthy advancements include trash segregation, with 74.82 percent of municipality districts achieving complete Segregation of sources in Indian cities by January 2020. Report for the Voluntary National Review in 2020.

SDG 13 - Climate Action: India is currently in the process of track to exceed its Nationally Determined Contribution (NDC) targets set under the Paris Agreement before the 2030 deadline, demonstrating its strong commitment to addressing climate change [6]. The country is making significant strides in sustainable energy transformation. As of March 31, 2020, India's installed renewable energy capacity reached 132 GW, including 34.62 GW from solar, 37.69 GW from wind, 10 GW from biomass, 4.68 GW from small hydro, and 45.7 GW from large hydropower. This represents a 75% increase since 2014 and moves India closer to its 2030 goal of 450 GW of renewable energy generation. India's progress in renewable energy and its near-zero Energy and emissions per capita consumption have earned it a commendable position within the Climate Change Performance Index 2020, reflecting its dedication to the ambitious targets for renewable energy and the objective of limiting the phenomenon of global warming to well below 2 degrees Celsius. Report of the Voluntary National Review for the year 2020.

SDG 14 – Life below Water: India is the world's second-largest producer of seafood and the 16th-largest maritime nation. Its contribution to the total global fish supply is 6.3 percent, which is inclusive of both the riverine and marine sources. The contribution of the marine industry alone is 1.1 percent of the Gross Domestic Product and 6.58 percent to the agricultural GDP. India has been continuously monitoring the possible pollution as there is a possibility of oil spills, transportation through sea routes, disposal and wastes, and air emissions owing to shipping activities. Critical studies relating to the coastline. Additionally, the marine ecosystem of peninsular India has identified 106 sites of high biodiversity value for conservation. The sites identified so far have now been designated Significant Marine and Coastal Biodiversity Areas, and management for conservation is in place. The government is also implementing various activities that ensure sustainability of fishing, such as the establishment of

an advisory regarding potential fishing zones program, modernization and upgrading of fisheries facilities, and banning mechanized fishing in certain areas. Report for Voluntary National Review, 2020.

SDG 15 – Life on Land: India has taken the lead in managing terrestrial ecosystems sustainably a top priority, focusing on protecting, restoring, and enhancing these vital environments. A key commitment aims to rectify 26 million hectares (Mha) of land that has been damaged. To achieve this, the Government has employed three main strategies: afforestation through both artificial and natural regeneration and the defense and oversight of existing forests. These efforts aim to conserve and develop forested areas, ensuring their resilience and sustainability for future generations. India's wetlands cover 4.63% of the entire geographical area and exhibit a variety of ecological and meteorological conditions, additionally different terrain. India possesses a strong and effective framework of laws for safeguarding and preserving wetlands. Examples of legislation related to “environmental protection include the Forest Act of 1972,” “the Forest (Conservation) Act of 1980,” “the Wildlife (Protection) Act of 1972,” “the Water (Prevention and Control of Pollution) Act of 1974,” “the Water (Prevention and Control of Pollution) Cess Act of 1977,” and “the overarching provisions of the Environment (Protection) Act of 1986.” Report for the Voluntary National Review in 2020.

SDG – 16 Peace Justice and Strong Institutions: Many types of laws, policies, plans, and programs are in place at the federal level to support people’s practice of their rights as well as their access to them. India has a strong legislative aspect wherein violence affects all strata of society. The rate of overall crime per one hundred thousand fell for the years 2017 and 2018 from 388.6 to 383.5. Meanwhile, there was a 1.3% rise in the number of cases registered. Crime per 100,000 people decreased 34% in 2015–2018. The crime rates of homicide and culpable homicide decreased by 3% from 2016 to 2018. Under the concept of 'Sabka Saath, Sabka Vikas, Sabka Vishwas'—which means "together with everyone, growth for everyone, and everyone's trust"—India has always tried to overcome the segmentation of society and people's exclusion from different socio-economic groups. Several initiatives also saw the introduction of other groups subject to vulnerable situations. Since the United Kingdom is a functional parliamentary democracy, the federal government (the Union) has full responsibility to the legislature. Some of the Indian institution features are the judiciary, which is fairly independent and impartial, ranging from the local to the federal levels; the chief auditor Moreover, the auditor general of the nation, that is the CAG.; a quasi-judicial body known as Lokpal and Lokayuktas both at the federal and local levels. In the 2020 Voluntary National Review Report,

SDG – 17 Partnerships for the Goals: In recent years, the Indian Government and several State streamlined processes to enhance predictability, equity, and automation. The implementation of GST (Goods and Services Tax) reform sought to streamline the complex system of indirect taxation. It has taken the place of all indirect taxes imposed by the federal and state governments on goods and services. An active startup community has developed. The third-biggest startup ecosystem worldwide is located in India. A total of USD 12 billion was invested in startups in 2019, and this amount is anticipated to rise. From January to December 2019, India had USD 456.79 billion of inflows of foreign direct investment (FDI) equity, demonstrating the effectiveness of the government's efforts to reduce corporate regulations and promote ease of doing business. India received USD 49 billion in foreign direct investment (FDI) in 2019, placing it in the top 10 beneficiaries, up 16 percent from the previous year. The Public Finance Management System (PFMS), which is driven by technology, has enhanced the system by increasing accountability, responsiveness, and openness. The Government Integrated Financial Administration System (GIFMIS) enhances fiscal reporting methodology to ensure efficient fiscal administration. India has extended more than 300 Lines of Credit (LoC) totaling USD 30.66 billion to 64 countries so far. In addition to concessional financing to its African partners, a grant assistance fund of USD 600 million was established including USD 100 million for the India-Africa Development Fund, USD 10 million for the India-Africa Health Fund, and financial arrangements for 50,000 scholarships for training African students. (Voluntary National Review Report 2020) Although there has been a lot of improvement made in these areas, challenges also remain.

Table 1.
Progress in achieving SDGs in India (all 17 SDGs).

SDG	Progress and achievements
1	Significant reduction in extreme poverty from 271 million in 2011 to 73 million in 2021 [7].
2	A rise in agricultural production and government programs like the National Food Security Act [8] have improved food security.
3	Enhanced access to healthcare services, along with better healthcare infrastructure and results [5].
4	Higher primary and secondary enrolment rates, a focus on high-quality instruction, and the development of skills [9].
5	Advances in women's emancipation, heightened representation in politics and governance, and programs such as Beti Bachao and Beti Padhao [10].
6	A major increase in the availability of clean water and sanitary amenities, with an emphasis on the Swachh Bharat Mission (Government of India, 2021).
7	Approximately all homes have access to electricity, with a focus on renewable energy sources and increased availability of electricity [11].
8	Initiatives to support entrepreneurship, create jobs, and achieve equitable and sustainable economic growth (Government of India, 2021).
9	Advancements in infrastructure development, including transportation, communication, and digital connectivity [10].
10	Reduction in inequalities, focus on social protection measures, and affirmative action policies [8].
11	Sustainable urban development, with initiatives like Smart Cities Mission and improved infrastructure [10].
12	Initiatives to foster entrepreneurship, generate employment, and attain sustainable and equitable economic growth [8].
13	Dedication to combating climate change, surpassing carbon emission reduction goals, and supporting renewable energy sources [6].
14	Protection of coastal ecosystems, preservation and sustainable use of marine resources [10].
15	Actions to preserve and repair ecosystems, such as biodiversity conservation and afforestation [8].
16	Focus on promoting peace, justice, and strong institutions, including initiatives for transparency and accountable governance [8].
17	Emphasis on partnerships, including public-private collaborations and international cooperation [10].

3. Challenges and Bottlenecks

India faces multiple difficulties and bottlenecks in achieving the SDGs. This section will discuss some of the key issues hindering progress.

3.1. Socioeconomic Disparities

India's vast population and diverse socioeconomic landscape present significant disparities across regions, communities, and social groups. These disparities contribute to unequal access to resources, opportunities, and services, exacerbating the challenges of poverty eradication (SDG 1), quality education (SDG 4), and reducing inequalities (SDG 10) [4].

3.2. Institutional and Policy Challenges

Inadequate institutional capacity and policy implementation gaps pose significant challenges. Weak governance structures, administrative inefficiencies, and corruption hinder the effective implementation of SDG-related policies and programs [3].

3.3. Environmental Degradation and Climate Change

India faces environmental challenges, including contamination of the air and water, deforestation, and destruction of the land. These issues impact several SDGs, such as clean water and sanitation (SDG 6), affordable and clean energy (SDG 7), sustainable cities and communities (SDG 11), and climate action (SDG 13). Climate change further exacerbates these challenges, posing dangers to water resources, farming, and vulnerable communities [4].

3.4. Population Growth and Urbanization

Urbanization and population increase at a rapid pace exert pressure on resources, infrastructure, and service delivery. The demand for housing, healthcare, and basic amenities in urban areas strains the

capacity to provide sustainable cities and communities (SDG 11) and decent work and economic growth (SDG 8) [12].

3.5. Data and Monitoring

Timely and accurate data collection and monitoring are crucial for effective policymaking and tracking progress toward the SDGs. India faces challenges in data collection, data quality, and monitoring mechanisms, which can impact the formulation of evidence-based policies and targeted interventions [4].

3.6. Lack of Effective Multistakeholder Collaboration

To achieve desired results in any SDG multi-stakeholder collaboration needs to be identified and established. There is a lack of such effective collaboration at all levels in India. For example, corporations and governments both work for employment generation but their efforts are not focused together resulting in which desired results not being achieved

In order to overcome these obstacles, thorough policy reforms, capacity building, and multi-stakeholder collaborations at various levels.

4. Policy Interventions and Innovations

India has adopted multiple policy interventions and creative techniques to expedite progress in the direction of reaching the Sustainable Development Goals (SDGs). This section showcases notable initiatives and their consequential effects.

4.1. Swachh Bharat Mission (Clean India Campaign) - SDG 6 and 11

The Swachh Bharat Mission, launched in 2014, aims to achieve universal sanitation coverage and improve cleanliness in both rural and urban areas. The campaign has led to the construction of millions of toilets, increased access to safe sanitation facilities, and a significant reduction in open defecation practices [10]. This initiative contributes to SDG 6 (clean water and sanitation) and SDG 11 (sustainable cities and communities).

4.2. Pradhan Mantri Ujjwala Yojana (PMUY) - SDG 7

The PMUY, launched in 2016, aims to provide clean cooking fuel to women living below the poverty line. It promotes the use of liquefied petroleum gas (LPG) as a cleaner and healthier alternative to traditional cooking fuels like wood and biomass. The program has provided millions of households with access to LPG connections, reducing indoor air pollution and improving the health and well-being of women [13]. This initiative contributes to SDG 7 (affordable and clean energy).

4.3. Beti Bachao, Beti Padhao (Save the Girl Child, Educate the Girl Child) - SDG 5 & 4:

The Beti Bachao, Beti Padhao campaign, launched in 2015, aims to address gender-based discrimination and promote the education and empowerment of girls. It focuses on preventing gender-biased sex-selective practices, improving access to education for girls, and enhancing their social and economic status. The initiative has contributed to increased awareness, improved enrollment rates of girls in schools, and a positive change in societal attitudes towards the girl child [14]. This initiative contributes to SDG 5 (gender equality) and SDG 4 (quality education).

4.4. Digital India Initiative - SDG 9 and 16:

India is to become a knowledge economy and society enabled by technology through the introduction of the Digital India program in 2015. It focuses on providing digital infrastructure, expanding internet connectivity, and promoting e-governance and digital services. The initiative has led to increased access to digital services, improved government-citizen interaction, and enhanced transparency and efficiency in service delivery [8]. This initiative contributes to SDG 9 (industry, innovation, and infrastructure) and SDG 16 (peace, justice, and strong institutions). These policy interventions and innovative approaches demonstrate India's commitment to achieving the SDGs. They

address critical development areas, promote inclusivity, and leverage technology and governance reforms.

5. Lessons from Successful Case Studies

Examining successful case studies from different regions of India provides valuable insights into strategies and approaches that have effectively contributed to the achievement of specific SDGs. Here are some key lessons learned:

5.1. Case Study: Kerala's Achievements in Health and Education (SDGs 3 and 4)

Kerala, a state in southern India, has achieved remarkable progress in health and education indicators. Key lessons from Kerala's success include:

- Strong public health infrastructure and primary healthcare systems that prioritize preventive measures [15].
- Emphasis on social determinants of health, such as education, clean water, and sanitation, leading to improved health outcomes [16].
- High investment in education, particularly in primary education, promotes high literacy rates and educational attainment [17].

5.2. Case Study: Self-Help Groups in Andhra Pradesh (SDGs 1 and 5)

Andhra Pradesh's success in poverty reduction and women's empowerment through self-help groups (SHGs) offers valuable lessons:

- Promoting women's participation and leadership through SHGs, providing access to credit, training, and income-generating activities [18].
- Linking SHGs to government programs and schemes, enabling access to social protection measures and livelihood opportunities [18].
- Strengthening community-based institutions for collective decision-making and resource management [19].

5.3. Case Study: E-Governance Initiatives in Karnataka (SDG 16)

Karnataka's successful implementation of e-governance initiatives demonstrates the importance of leveraging technology for transparency and efficient service delivery:

- Digitization of government services, simplifying processes and reducing corruption [20].
- Citizen-centric approaches, ensuring accessibility and responsiveness of government services [20].
- Integration of technology with existing governance systems, fostering collaboration and information-sharing among different departments [20].

Similar initiatives are not limited to Karnataka only but are followed by other states also. This case study highlights the significance of community participation, innovative approaches, and effective governance models in achieving the SDGs. They emphasize the importance of tailored interventions and contextualized strategies for specific regions and sectors.

5.4. Case Study: Bhungroo System in Gujarat (SDG 2)

The Bhungroo system, implemented in Gujarat, addresses water scarcity and promotes sustainable agriculture. Key lessons include:

- Utilizing innovative technology to harvest and recharge rainwater, providing irrigation for crops during dry spells [21].
- Empowering smallholder farmers by training them on water management techniques and promoting climate-resilient agriculture practices [22].
- Integrating the Bhungroo system with rural development programs, such as the Mahatma Gandhi National Rural Employment Guarantee Scheme, to enhance livelihoods and food security [22].

5.5. Case Study: Waste Management in Indore & Model Followed throughout India (SDG 12)

Indore's success in waste management showcases effective approaches towards sustainable consumption and production. Indore pioneered the model of the ideal waste management system later followed throughout India. Lessons include:

- Implementing a comprehensive waste management system that includes source segregation, recycling, composting, and landfill management [23].
- Active involvement of citizens through awareness campaigns, community participation, and citizen-led initiatives, fostering a sense of responsibility towards waste management [23].
- Collaboration between municipal corporations, non-governmental organizations, and private entities to establish waste management infrastructure and promote waste-to-energy projects [23].

This case study highlights the importance of innovation, community engagement, and multi-stakeholder collaboration in achieving the SDGs. They demonstrate the effectiveness of localized solutions that address specific challenges and leverage local resources and expertise.

5.6. Case Study: Jan Dhan Yojana in India (SDG 1)

The Jan Dhan Yojana, a financial inclusion program, has made significant progress in reducing financial exclusion and poverty. Key lessons include:

- Opening bank accounts for the unbanked population, providing access to formal financial services and social security schemes [24].
- Promoting financial literacy and awareness to empower individuals in making informed financial decisions [25].
- Integrating the program with other social welfare schemes, such as direct benefit transfers, to enhance the reach and effectiveness of social protection measures [24].

5.7. Case Study: Sabarmati Riverfront Development in Ahmedabad (SDG 11)

The Sabarmati Riverfront Development project in Ahmedabad demonstrates successful urban revitalization and sustainable development. Lessons include:

- Transforming the riverfront into a vibrant public space with parks, gardens, promenades, and cultural attractions, enhancing the quality of life for residents [26].
- Emphasizing sustainability by incorporating water conservation measures, wastewater treatment plants, and renewable energy sources [26].
- Fostering public-private partnerships and community engagement to ensure inclusivity and participation in the planning and development process [27].

5.8. Case Study: Rashtriya Swasthya Bima Yojana (RSBY) (SDG 3)

The Rashtriya Swasthya Bima Yojana, a government health insurance scheme, has contributed to improved healthcare access and financial protection. Lessons include:

- Providing health insurance coverage for vulnerable populations, reducing out-of-pocket expenses and ensuring affordable healthcare [28].
- Emphasizing partnerships with public and private healthcare providers to expand the network and ensure quality healthcare services [28].
- Leveraging technology for efficient implementation, such as smart cards for beneficiaries and digital platforms for claim processing [28].

This case study demonstrates the significance of targeted interventions, inclusive approaches, and policy integration in achieving specific SDGs. They highlight the potential for replicating successful models in other regions or sectors to accelerate progress.

5.9. Case Study: NCW Women Helpline (SDG 5)

To help women register grievances and offer psychological assistance, the National Commission for Women (NCW) has taken the initiative to start the NCW Women Helpline. It is a 24-hour nationwide

helpline and provides a Digital Complaint Registration System for women affected by violence or in distress. It facilitates psychological counseling or referral to appropriate organizations such as the District Legal Service, Police, and Hospitals Authorities, or one-stop crisis centers. It also provides information about appropriate government organizations, support services, etc.

- Major women issues handled by this helpline successfully are cyber-crime against women, domestic violence, acid attacks, sexual assault, harassment of women at the workplace, molestation, etc. (NCW Annual Report 2022-23)
- During the period from 1st April 2022 to 31st March 2023 155242 calls were received by this helpline. (NCW Annual Report 2022-23)

This case study shows how women in distress or suffering from any violence or crime can be helped by registering their complaints throughout India. Complainants are provided immediate help from police, hospitals, and one-stop crisis centers. It supports SDG 5 for Gender equality.

5.10. Case Study: Unified Payment Interface- UPI (SDG 9)

Since its introduction in April 2016, the Unified Payment Interface (UPI) has had a profound influence on India's digital payment ecosystem.

5.10.1. Revolutionizing Digital Payments

UPI is an instantaneous digital payment system that enables consumers and organizations to promptly money transfer from a single bank account to another. India is the global leader in real-time payment transactions, having processed 48.6 billion transactions in 2021. (World Economic Forum, June 26, 2023)

- **Economic Impact:** Research estimates that UPI has saved the Indian economy approximately \$67 billion since its launch. This substantial cost-saving effect highlights the efficiency and convenience of UPI for users and businesses alike.
- **Digital Transformation:** India's robust digital public infrastructure, including UPI, has played a pivotal role in enabling the country's digital transformation. It provides citizen-centric and transparent governance services, such as the Digi Locker (an online repository of citizens' documents).
- **Response to COVID-19:** During the pandemic, UPI facilitated the country's response. Apps like Aarogya Setu and CoWin helped track and contain the spread of COVID-19 and facilitated vaccination efforts.
- **Steady Growth:** UPI transactions have witnessed consistent growth. Within five years, transactions increased from 92 crores in 2017-18 to 8,375 crores in 2022-23, displaying a Compound Annual Growth Rate (CAGR) of around 147% (Data Quest 27 Feb 2024)
- **Current Usage:** Over 300 million UPI users in India transact through applications like Google Pay, PhonePe, and Paytm. Monthly transaction volumes have surpassed 10 billion, representing year-on-year growth of over 60%. (India First Bank 17 February 2024)

This study clearly shows how the invention of the UPI system in India changed the payment landscape in India. Due to its easy interface, promptness, reliability, and no additional cost all sections of society and industry have adopted this system in a big way. Now common people find their day-to-day life very hard without the UPI system. It contributes to SDG 9 Industry innovation and infrastructure.

6. Future Outlook and Recommendations

The future outlook for achieving the SDGs in India requires sustained efforts and a comprehensive approach. Based on the analysis of progress, challenges, and successful case studies, the following recommendations can contribute to accelerating progress toward sustainable development:

6.1. Strengthening Policy Integration

Enhance policy coherence and integration across sectors to address the interlinkages among the SDGs. This includes aligning national and state-level policies with the SDGs and integrating them into

sectoral plans and programs. Stakeholder efforts in India are not formally mapped to SDGs and therefore it is an urgent requirement to code all social, environmental, and economic activities by stakeholders linking with 17 SDGs by the United Nations.

6.2. Promoting Multi-Stakeholder Collaboration:

Foster partnerships and collaboration among governments, civil society organizations, private sector entities, and communities to harness collective efforts and resources. Encourage multi-stakeholder platforms for dialogue, knowledge-sharing, and collaborative decision-making. National Institution of Transforming India (NITI Ayog) must have adequate powers to promote multi-stakeholder collaborations with central, state, and local level effectively implementing partners.

6.3. Leveraging Technology and Innovation:

Embrace technological advancements to drive sustainable development. Promote digital solutions, data analytics, and artificial intelligence to enhance monitoring, evaluation, and targeted interventions. Support innovation and entrepreneurship for sustainable solutions. Technological innovations are making possible effective monitoring, and evaluation in a very easy manner and within stipulated cost and time frame in all wakes of life and therefore participating agencies need to be updated with the latest technological advancement in their respective domain.

6.4. Strengthening Institutional Capacity:

Enhance institutional capacity at various levels to ensure effective implementation, monitoring, and evaluation of SDG-related policies and programs. Invest in capacity building, training, and knowledge transfer to empower government agencies, local authorities, and other stakeholders. A separate autonomous body may be an effective solution for policymaking to implement, review and monitor SDGs efforts by implementing partners.

6.5. Mainstreaming Climate Action:

Incorporate climate change mitigation and adaptation measures into policies and programs across several sectors. To effectively tackle climate concerns, it is crucial to give priority to the development of renewable energy sources, energy efficiency measures, sustainable agricultural practices, and resilient infrastructure.

6.6. Empowering Marginalized Groups:

Prioritize the needs and rights of marginalized and vulnerable groups, including women, children, indigenous communities, and persons with disabilities. Ensure their meaningful participation, access to resources, and protection from discrimination.

6.7. Enhancing Data Collection and Monitoring:

Strengthen data collection systems, enhance the quality of the data, and enhance monitoring mechanisms to track progress towards the SDGs. Invest in data infrastructure, technology-enabled data collection methods, and enhancing capabilities for data examination and interpretation. For data collection, there must be a robust but uniform system for all SDGs mapped social, environmental, financial, and acts by participating partners.

6.8. Mobilizing Financial Resources:

Mobilize domestic and international financial resources to support SDG implementation. Promote innovative financing mechanisms, public-private partnerships, and social impact investment to bridge funding gaps. It is crucial to approach the SDGs holistically, acknowledging the interconnected nature of the goals and targets. This requires an inclusive and participatory approach, where the voices and perspectives of all parties involved are considered. India may expedite its progress towards sustainable development and make a significant contribution to the worldwide endeavours aimed at reaching the SDGs, or Sustainable Development Goals by implementing these proposals.

7. Conclusion

In conclusion, India's journey in the direction of accomplishing the Sustainable Development Goals (SDGs) is marked by both progress and challenges. While notable strides have been made in areas such as poverty reduction, health, education, and clean energy, significant gaps remain in achieving other goals such as gender equality, decent work, and sustainable cities. India encounters a variety of complex problems in achieving the Sustainable Development Goals (SDGs). Progress is hindered by socioeconomic inequities, institutional and policy obstacles, environmental deterioration, population expansion, and data restrictions. Nevertheless, India has showcased its dedication to the Sustainable Development Goals (SDGs) by implementing policy reforms, employing creative strategies, and achieving notable success in several case studies.

Drawing upon the lessons learned from successful case studies across various sectors and regions, India can chart a path toward accelerated progress. Strengthening policy integration, promoting multi-stakeholder collaboration, leveraging technology and innovation, and mainstreaming climate action are vital strategies. Additionally, empowering marginalized groups, enhancing data collection and monitoring, and mobilizing financial resources are key considerations. Sustained efforts and collective action are essential to ensure sustainable development for all in India. Comprehensive policies, adequate investments, and inclusive approaches are critical in addressing the unique challenges faced by the country. By embracing these recommendations and building upon the progress achieved, India can contribute significantly to the global discourse on achieving the SDGs and promoting sustainable development worldwide.

This comprehensive review paper provides valuable insights into India's progress, challenges, and potential strategies towards the SDGs. It serves as a valuable reference for policymakers, researchers, and practitioners working towards sustainable development, offering a nuanced understanding of the current state of SDG implementation and avenues for overcoming barriers. This study makes a valuable contribution to global efforts in meeting the Sustainable Development Goals (SDGs) and promoting sustainable growth for the advantage of current and future generations by specifically addressing the distinct circumstances of India.

Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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