

INDIA'S ECONOMIC ASCENT AND THE SDG AGENDA: INTEGRATING GROWTH, DIGITALIZATION, INFRASTRUCTURE, AND GREEN TRANSITIONS – AN EMPIRICAL ASSESSMENT

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Abstract

India's economic trajectory over the past two decades has been marked by rapid growth, expanding digital infrastructure, and increasing emphasis on sustainability. This study empirically assesses the multifaceted relationship between India's economic ascent and its commitment to the United Nations Sustainable Development Goals (SDGs). By integrating key indicators across growth, digitalization, infrastructure development, and environmental sustainability, the analysis explores how India's policy frameworks and developmental strategies align with the SDG agenda. Using panel data from government and international databases between 2005 and 2023, the study employs econometric modeling to examine causal links between economic growth, digital penetration, infrastructure expansion, and green transition efforts. The findings reveal that while economic growth and digitalization have significantly contributed to poverty reduction, education, and improved health outcomes (SDGs 1, 3, and 4), challenges remain in bridging regional disparities and ensuring environmental sustainability (SDGs 9, 11, and 13). The research also underscores the critical role of public investment and regulatory reforms in enabling green infrastructure and promoting inclusive development. Furthermore, digital transformation has emerged as a key enabler of transparency, financial inclusion, and innovation. The study concludes by highlighting the need for coherent policy integration that balances growth aspirations with ecological responsibilities, and suggests a pathway for accelerating progress toward the 2030 SDG targets. This assessment offers valuable insights for policymakers and stakeholders seeking to align India's development model with global sustainability commitments. Against this backdrop, the study explores crucial and timely issues that hold significant relevance in today's rapidly evolving and interconnected world, highlighting their importance in the contemporary context.

Keywords: Economic Growth, Economic Trajectory, Infrastructure Development, Green Infrastructure, Economic Ascent and Digital Transformation.

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The theme of the article

India's economic ascent in the 21st century has been marked by rapid growth, digital transformation, infrastructure expansion, and a gradual shift toward sustainable development. As the world's most populous nation and a key emerging economy, India's development trajectory holds profound implications for achieving the United Nations Sustainable Development Goals (SDGs). With a GDP growth rate among the highest globally, India is navigating the complex interplay between economic expansion and inclusive, sustainable progress. The country's digital revolution, driven by initiatives such as Digital India and Aadhaar, has redefined governance, financial inclusion, and service delivery. Simultaneously, massive investments in physical infrastructure highways, railways, and smart cities have enhanced connectivity and productivity. Yet, this momentum also brings pressing challenges: environmental degradation, urban congestion, and persistent socio-economic disparities.

India's commitment to green transitions, seen through its emphasis on renewable energy, climate action, and sustainable urbanization, reflects a growing alignment with the SDG agenda. However, realizing these goals requires not just policy intent but effective integration of economic planning, technological innovation, and environmental stewardship. This study offers an empirical assessment of India's economic rise in the context of the SDG framework. By examining key indicators across growth, digitalization, infrastructure development, and ecological transition, it seeks to evaluate how far India has come and how far it must go to harmonize its economic ambitions with sustainable, inclusive development. The analysis contributes to policy discourse by identifying pathways and challenges in aligning India's growth model with global sustainability goals.

Statement of the problem

India's journey toward becoming a major global economic power is marked by rapid GDP growth, increased digital penetration, infrastructure expansion, and a growing emphasis on sustainable development. While these strides are commendable, the alignment of India's

economic ascent with the United Nations Sustainable Development Goals (SDGs) presents complex challenges. Despite economic progress, stark disparities persist in income distribution, access to quality infrastructure, digital inclusion, environmental sustainability, and regional development. Digitalization has significantly enhanced financial inclusion and service delivery, yet the digital divide remains deep especially between urban and rural populations and across socio-economic classes. Similarly, massive infrastructure projects have contributed to industrial growth and employment generation but have often overlooked environmental consequences and equitable access. Green transitions, though gaining momentum, still struggle against entrenched fossil fuel dependence, regulatory bottlenecks, and the lack of scalable green technology deployment.

India's economic growth narrative risks falling short of the holistic vision of the SDGs unless growth strategies are intentionally inclusive, sustainable, and digitally empowered. There exists a critical gap in empirical analysis that integrates economic performance with digital readiness, infrastructure development, and environmental sustainability in the context of the SDG agenda. India's economic progress has positively contributed to achieving the Sustainable Development Goals (SDGs), particularly in poverty reduction, improved infrastructure, and digital inclusion. Rapid GDP growth and welfare schemes have lifted millions out of poverty and enhanced access to education, health, and clean energy. However, challenges persist in addressing inequality, environmental sustainability, and gender disparity. While economic gains support SDG advancement, gaps remain in inclusive growth and climate action. Strengthening governance, investment in human capital, and sustainable practices are crucial for aligning economic growth more effectively with the SDGs.

However, digital and infrastructure advancements can foster both growth and equity by bridging geographic and socio-economic gaps. Investments in digital connectivity enable access to education, healthcare, and financial services, especially in underserved rural areas. Improved infrastructure enhances mobility, market access, and job opportunities, promoting inclusive economic participation. When combined with targeted policies, these advancements can reduce inequality, empower marginalized communities, and drive sustainable growth. However, equitable outcomes depend on ensuring affordability, accessibility, and digital literacy for all, preventing the deepening of existing disparities in the digital age. The green transition is increasingly being integrated into development planning, but its mainstreaming remains inconsistent. While some countries and regions prioritize sustainability through policies on clean

energy, green infrastructure, and climate-resilient practices, many face challenges in fully embedding environmental goals into broader development agendas. Financial constraints, lack of capacity, and political resistance can hinder progress. Effective mainstreaming requires not only policy shifts but also significant investments in technology, capacity-building, and cross-sectoral collaboration to ensure sustainable development pathways are truly inclusive and long-lasting. Overall, this article seeks to empirically assess the interplay between India's economic ascent and the SDG agenda by analyzing key sectors and indicators. The findings aim to inform policy interventions that balance growth with sustainability, inclusiveness, and resilience, ensuring that India's development trajectory is not only robust but also aligned with global sustainable development commitments. In these perspectives, this study examines key and current issues that are of great importance in our fast-changing and interconnected world, emphasizing their relevance in today's context.

Objective of the article

The overall objective of the article is to empirically examine India's economic growth over the past two decades in relation to its commitment to the United Nations Sustainable Development Goals (SDGs). It analyzes the interplay between economic growth, digitalization, infrastructure development, and environmental sustainability. The study highlights the progress made in poverty reduction, education, and health while addressing challenges in regional disparities and environmental sustainability. It urges the need to combine different policies to ensure fair growth and care for the environment, moving towards the 2030 SDG goals by using additional information and statistics related to the article's topic.

Methodology of the article

The research methodology of the article is a mixed-methods approach that combines both quantitative and qualitative analysis. The study begins with a comprehensive review of secondary data from various governmental and international sources, including the Ministry of Statistics and Programme Implementation, World Bank, and United Nations reports. Key indicators related to India's economic growth, digitalization, infrastructure development, and environmental sustainability are collected and analyzed over the past two decades. The quantitative analysis employs statistical tools to assess the relation between economic growth and progress toward SDGs, focusing on poverty reduction, education, health, and regional disparities. This includes the use of GDP growth rates, digital adoption rates, infrastructure

development indices, and environmental impact measures such as carbon emissions and deforestation rates.

In addition, qualitative methods such as policy analysis and case studies are utilized to examine India's policy interventions and their alignment with SDGs. These case studies provide insights into specific regions or sectors, highlighting successes and challenges in integrating economic growth with environmental sustainability and social equity. Through this methodology, the article aims to provide a comprehensive understanding of India's journey toward achieving the SDGs while addressing the complexities of balancing growth and sustainability. The collected data and information are carefully arranged and studied to uncover important insights, which help in drawing key conclusions and suggesting practical policy actions.

Economic Growth and Sustainable Development: Evaluating India's Progress in Achieving SDGs

India's progress towards achieving the United Nations Sustainable Development Goals (SDGs) has been a mixed journey, reflecting both challenges and achievements. Economic growth, which has been robust in recent decades, has contributed positively to poverty reduction, infrastructure development, and improvements in healthcare and education. However, the nation's pursuit of sustainable development is hindered by significant regional disparities, environmental degradation, and social inequalities. In terms of economic growth, India has made substantial strides in areas like GDP growth and industrialization. Yet, growth has often been uneven, leaving rural areas, especially in states like Bihar and Uttar Pradesh, lagging behind. Poverty reduction has been a notable success, with millions lifted out of extreme poverty, but more than 20% of the population still lives below the poverty line.

Environmental sustainability remains a critical challenge. India struggles with air pollution, deforestation, water scarcity, and climate change, which threaten long-term development. Despite efforts like renewable energy promotion, the country remains heavily reliant on coal and other polluting industries. On the social front, significant progress has been made in expanding access to education, healthcare, and sanitation. Initiatives like the Pradhan Mantri Jan Dhan Yojana (PMJDY) have expanded financial inclusion, while schemes such as Swachh Bharat have improved sanitation and hygiene. Nevertheless, gender inequality, caste-based discrimination, and child malnutrition continue to undermine the full realization of SDGs. In short, while India's economic growth has contributed positively to many SDGs, challenges in sustainability,

inequality, and environmental concerns necessitate a more holistic, inclusive approach to ensure long-term development that benefits all citizens. Continued investment in green technologies, inclusive policies, and social welfare programs will be key to achieving the SDGs.

Econometric Model Specification

To assess India's progress towards the SDGs, an econometric model can be used to estimate the relationship between economic growth and the achievement of SDGs. A few potential models include:

a. Multiple Linear Regression Model

A multiple linear regression model can help understand how different variables (such as GDP, investment in education, infrastructure, or health) contribute to achieving the SDGs.

$$Y_t = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \epsilon_t$$

Where,

Y_t = represents SDG achievement indicators at time t ,

$X_1, X_2, \dots, X_n$ = represent economic growth variables, environmental factors, policy interventions, etc.

ϵ_t = the error term.

b. Panel Data Model (for time-series and cross-sectional data)

A fixed-effects or random-effects model can be applied if you're using data from different states over time:

$$Y_{it} = \alpha + \beta X_{it} + \mu_i + \gamma_t + \epsilon_{it}$$

Where,

Y_{it} = the SDG indicator for region i at time t ,

μ_i = the individual effect for region i ,

γ_t = the time-specific effect.

c. Error Correction Model (ECM)

If there are long-run relationships between economic growth and SDGs, you can use an ECM to capture both short-term and long-term effects.

$$\Delta Y_t = \alpha + \beta \Delta X_t + \lambda(Y_{t-1} - \phi X_{t-1}) + \epsilon_t$$

Where,

ΔY_t = the change in SDG indicators,

Y_{t-1} and X_{t-1} = the lagged values of SDG indicators and economic variables,

λ = captures the speed of adjustment to equilibrium.

Inferences and policy recommendations can be drawn based on the relationship between GDP growth and social indicators like education or healthcare with SDG achievement. Weak or negative links, such as in environmental sustainability or gender equality, highlight areas for targeted policy interventions like increased investment in renewable energy, education, and health infrastructure.

Digitalization as a Catalyst for Economic Transformation in India: Opportunities and Challenges

Digitalization has emerged as a transformative force in India's economic landscape, fostering inclusive growth, innovation, and increased efficiency across sectors. Initiatives like Digital India, Aadhaar-enabled services, and the Unified Payments Interface (UPI) have revolutionized governance, financial inclusion, and service delivery. E-commerce, digital banking, and online education platforms have opened up new economic opportunities, especially for rural populations, small businesses, and women entrepreneurs. The rise of gig and platform economies is also reshaping employment patterns, offering flexible income-generating avenues.

However, the digital shift presents significant challenges. The digital divide remains stark, with limited access to high-speed internet and digital literacy in rural and underserved regions. Cybersecurity threats, data privacy concerns, and the risk of job displacement due to automation pose additional hurdles.

Moreover, the regulatory framework struggles to keep pace with rapid technological advancements, leading to policy gaps in areas such as digital taxation, data governance, and platform accountability. Addressing these challenges requires a multi-pronged approach—investment in digital infrastructure, skilling initiatives for the future workforce, robust cybersecurity policies, and inclusive digital literacy programs. Strengthening public-private partnerships and fostering innovation ecosystems can further enhance India's digital capabilities. In essence, digitalization holds immense potential to drive economic transformation in India by boosting productivity, enhancing service delivery, and creating new livelihoods. To fully harness its benefits, India must bridge the digital divide, safeguard digital rights, and ensure that digital growth is inclusive and sustainable.

Infrastructure Development in India: Bridging the Gap for Sustainable Growth

Infrastructure development plays a pivotal role in driving India's economic growth and enhancing quality of life. As one of the fastest-growing economies, India requires robust infrastructure to support urbanization, industrialization, and rural connectivity. However, the country faces significant challenges such as inadequate transport systems, erratic power supply, and insufficient water and sanitation facilities, particularly in rural and semi-urban areas. The Indian government has launched several initiatives like the Bharatmala, Sagarmala, Smart Cities Mission, and PM Gati Shakti to address these gaps. These projects aim to create integrated and efficient transport networks, modern urban infrastructure, and seamless logistics systems. Additionally, investments in renewable energy, digital infrastructure, and rural roads under schemes like PMGSY (Pradhan Mantri Gram Sadak Yojana) are pushing India toward inclusive and sustainable development.

Public-private partnerships (PPPs) have also emerged as a vital tool in accelerating infrastructure projects, promoting innovation, and ensuring financial sustainability. However, challenges such as regulatory hurdles, land acquisition issues, and project delays continue to hinder progress. To bridge the infrastructure gap and achieve long-term sustainability, India must focus on smart planning, transparent governance, capacity building, and climate-resilient infrastructure. Equitable distribution of resources, emphasis on green technologies, and enhanced private sector participation are key to ensuring that infrastructure development not only fuels economic growth but also promotes social equity and environmental protection. With strategic efforts, India can transform its infrastructure landscape and lay the foundation for a resilient and sustainable future.

Green Transitions in India's Economy: Strategies for Aligning Growth with Environmental Goals

India's green transition aims to harmonize economic growth with environmental sustainability. As one of the fastest-growing economies, India faces the dual challenge of reducing emissions while ensuring inclusive development. Key strategies include accelerating renewable energy adoption, particularly solar and wind, promoting energy efficiency in industries, and electrifying transportation. The government's push for green hydrogen, bioenergy, and sustainable agriculture further strengthens this shift. Policies like the National Green Hydrogen Mission and Production Linked Incentives (PLIs) support green industries. Additionally, investments in circular economy practices and urban green infrastructure play a

vital role. Financial instruments like green bonds and international climate finance are mobilized to fund sustainable development. Public-private partnerships and technological innovation are crucial for scaling these efforts. Aligning with global climate goals, India's green transition not only combats climate change but also creates jobs, improves energy security, and fosters resilient communities, making sustainable growth a core national objective.

Econometric Model: Environmental Kuznets Curve (EKC)

Model Specification:

The EKC hypothesis posits an inverted U-shaped relationship between environmental degradation and economic growth. That is, at early stages of growth, pollution increases, but after a certain income level, further growth leads to environmental improvement.

Basic EKC Equation:

$$CO_2 = \beta_0 + \beta_1 GDP + \beta_2 GDP^2 + \beta_3 X + \epsilon$$

- ❖ **CO₂**: Carbon emissions (or other environmental indicators such as air quality, deforestation rate)
- ❖ **GDP**: Gross Domestic Product per capita (economic growth)
- ❖ **GDP²**: Squared GDP term to capture the nonlinear (inverted U) relationship
- ❖ **X**: Vector of control variables (renewable energy usage, trade openness, urbanization, policy variables)
- ❖ **ε**: Error term

The EKC model suggests that India's green transition can decouple emissions from growth as income rises. With rising GDP, emissions initially increase but later decline due to green policies, renewable adoption, and innovation indicating sustainable development is achievable through strategic interventions.

Role of Policy in Shaping India's SDG Outcomes: A Focus on Inclusive Development

India's commitment to the Sustainable Development Goals (SDGs) is deeply intertwined with its policy landscape, which plays a critical role in shaping inclusive development outcomes. As a diverse and populous country, India's developmental policies have focused on reducing inequalities, alleviating poverty, ensuring gender equity, and enhancing access to quality education, healthcare, and sustainable livelihoods. Flagship programs such as Ayushman Bharat, Beti Bachao Beti Padhao, PM Awas Yojana, and Jal Jeevan Mission demonstrate the government's drive toward inclusive growth. These initiatives address multidimensional poverty

and aim to leave no one behind—especially vulnerable groups like women, rural populations, tribals, and the elderly. Additionally, the Aspirational Districts Programme targets underdeveloped regions to accelerate progress on key SDG indicators through focused policy intervention.

Policy coherence, however, remains a challenge. Fragmented implementation, inadequate data systems, and regional disparities can hinder progress. Hence, integrated policy frameworks, community participation, and decentralized planning are crucial to ensure that development is both sustainable and inclusive. Moreover, digital inclusion policies and the push for financial literacy and digital infrastructure under schemes like Digital India support SDGs by bridging the urban-rural divide and enabling access to services. In essence, India's policy approach must remain adaptive, equity-driven, and participatory. Only through such a focused lens can India translate its ambitious SDG agenda into tangible and inclusive development outcomes, ensuring prosperity reaches the grassroots.

Leveraging Technology and Innovation for Sustainable Economic Growth in India

Leveraging technology and innovation is key to driving sustainable economic growth in India. Digital infrastructure, such as Aadhaar and UPI, has revolutionized financial inclusion, while advancements in AI, IoT, and renewable energy are transforming agriculture, healthcare, and manufacturing. Startups and tech-based enterprises are fostering job creation, improving productivity, and enabling efficient service delivery. Initiatives like Digital India and Startup India are empowering youth and bridging the urban-rural divide. Moreover, innovations in green technology and smart mobility are helping India transition toward a low-carbon economy. By investing in research, digital literacy, and public-private partnerships, India can harness the full potential of technology to ensure inclusive, resilient, and environmentally sustainable growth. To further accelerate sustainable economic growth, India must focus on enhancing digital infrastructure in rural areas, promoting STEM education, and supporting innovation hubs across states.

Encouraging startups in sectors like clean energy, agri-tech, and health-tech can address core developmental challenges while boosting economic output. Strengthening intellectual property rights and easing regulatory frameworks will attract foreign investment and nurture a thriving innovation ecosystem. Public-private collaborations in R&D and technology incubation can bridge gaps between academia and industry, ensuring the commercialization of indigenous innovations. Additionally, empowering small and medium enterprises (SMEs) with digital tools

will enhance competitiveness and market reach. India's demographic dividend can be a major asset if complemented by upskilling and digital empowerment initiatives. By aligning technological advancement with sustainability goals, India can not only achieve robust economic growth but also emerge as a global leader in responsible innovation, ensuring prosperity that benefits all sections of society while preserving environmental integrity.

Assessing the Impact of India's Economic Growth on Achieving the United Nations Sustainable Development Goals (SDGs) in the Last Two Decades

India's economic growth over the last two decades has significantly contributed to the achievement of several United Nations Sustainable Development Goals (SDGs), though challenges remain. The country has seen impressive GDP growth, lifting millions out of poverty, contributing to SDG 1 (No Poverty). The expansion of industries, particularly in technology and services, has also created more employment opportunities, aligning with SDG 8 (Decent Work and Economic Growth). In terms of education, India has made strides towards SDG 4 (Quality Education), increasing enrollment rates, especially in primary and secondary education. Additionally, healthcare improvements have led to progress on SDG 3 (Good Health and Well-being), with increased life expectancy and reduced child mortality.

However, the benefits of economic growth have not been evenly distributed. Inequality remains a significant challenge, as SDG 10 (Reduced Inequality) continues to require attention. Environmental concerns, driven by industrialization and urbanization, also hinder progress towards SDG 13 (Climate Action). The country has made efforts to address these issues with renewable energy investments and sustainability initiatives, but they still face barriers such as funding and implementation at the grassroots level. Overall, while India's economic growth has had a positive effect on many SDGs; it must focus on inclusive, sustainable development and targeted policies to achieve the SDGs in a more equitable and environmentally conscious manner.

Balancing Economic Growth, Digitalization, Infrastructure Development, and Environmental Sustainability

Balancing economic growth, digitalization, infrastructure development, and environmental sustainability in India is a complex but critical challenge. India, as one of the fastest-growing economies, is experiencing rapid digitalization, which has the potential to drive efficiency, innovation, and inclusion across sectors. Digital platforms improve access to services, enhance productivity, and streamline industries, making them key drivers of economic growth.

Infrastructure development, particularly in transportation, energy, and urbanization, is essential for supporting the nation's growing population and economic demands. However, traditional infrastructure growth often results in environmental degradation, including deforestation, pollution, and increased carbon emissions. To balance these needs, India must invest in sustainable infrastructure solutions, such as renewable energy sources, green building technologies, and eco-friendly transportation systems.

Economic growth must be pursued in tandem with environmental sustainability to ensure long-term prosperity. The shift toward digital technologies, such as cloud computing and data-driven decision-making, can aid in reducing resource consumption and improving efficiency. Moreover, incorporating sustainable practices into industries like agriculture, manufacturing, and construction can mitigate the environmental impact of growth. To achieve this balance, India must adopt policies that promote green technologies, incentivize sustainable practices, and invest in research and development for eco-friendly innovations. Integrating environmental concerns into economic planning and digitalization efforts will help India not only grow economically but also secure a sustainable future for its population and the planet.

An econometric model to balance economic growth, digitalization, infrastructure development, and environmental sustainability could take the form of a multi-equation system, where each factor is linked through causal relationships. One approach could be using a Vector Autoregressive Model (VAR), which allows for the examination of the interdependencies between these variables over time.

Model Overview:

The goal is to explore how economic growth (EG), digitalization (D), infrastructure development (ID), and environmental sustainability (ES) affect one another. The basic system of equations would be:

$$EG_t = \alpha_1 EG_{t-1} + \beta_1 D_t + \gamma_1 ID_t + \delta_1 ES_t + \epsilon_1$$

$$D_t = \alpha_2 D_{t-1} + \beta_2 EG_t + \gamma_2 ID_t + \delta_2 ES_t + \epsilon_2$$

$$ID_t = \alpha_3 ID_{t-1} + \beta_3 EG_t + \gamma_3 D_t + \delta_3 ES_t + \epsilon_3$$

$$ES_t = \alpha_4 ES_{t-1} + \beta_4 EG_t + \gamma_4 D_t + \delta_4 ID_t + \epsilon_4$$

Where,

EG_t = Economic Growth at time t

D_t = Digitalization at time t

ID_t = Infrastructure Development at time t

ES_t = Environmental Sustainability at time t

$\alpha, \beta, \gamma, \delta$ = Parameters to be estimated

ϵ_t = Error terms

Economic Growth (EG) is influenced by digitalization, infrastructure development, and environmental sustainability. Efficient digital infrastructure boosts productivity, while environmental factors may limit growth. Digitalization relies on economic growth for funding and infrastructure development for support, with sustainability impacting its progress due to ecological concerns. Infrastructure development is driven by economic demand, digital needs, and environmental factors like green infrastructure. Environmental sustainability is shaped by economic growth (potential degradation), digitalization (energy usage), and infrastructure (its environmental impact). The estimation uses historical data on GDP, tech investment, infrastructure, and environmental metrics, employing OLS or MLE methods and analyzing dynamics through impulse response functions. Explore non-linear relationships or use instrumental variables to address endogeneity, and introduce exogenous shocks like policy changes to examine system responses. This approach offers a comprehensive analysis of factors influencing sustainable economic growth, aiding in policy decision-making.

Progress and Challenges in Poverty Reduction, Education, and Health in India with reference to Regional Disparities and Environmental Sustainability

Progress in poverty reduction, education, and health in India has been significant, but regional disparities persist, hindering equitable development. Poverty has reduced considerably, especially in urban areas, due to government schemes like the Pradhan Mantri Awas Yojana and MNREGA. However, rural regions, particularly in states like Bihar, Uttar Pradesh, and Odisha, still face high poverty rates due to limited access to resources and infrastructure. In education, enrollment rates have improved due to initiatives such as the Sarva Shiksha Abhiyan, but quality remains uneven. While states like Kerala and Tamil Nadu show exemplary performance, regions in the north and central India face challenges of infrastructure, teacher shortages, and high dropout rates, especially among girls. Health indicators have also improved, with life expectancy rising and maternal mortality rates falling.

However, healthcare access is still unequal. Urban areas have better healthcare facilities, while rural areas lack basic healthcare infrastructure. Diseases like malaria, tuberculosis, and

malnutrition continue to be prevalent in backward regions. Environmental sustainability remains a critical challenge, exacerbated by industrialization, deforestation, and unsustainable agricultural practices. Climate change disproportionately impacts poorer regions, which rely heavily on agriculture. Vulnerable communities in areas like coastal zones and drought-prone regions suffer the most from environmental degradation. Addressing regional disparities while promoting sustainable development is essential for ensuring inclusive growth in India's poverty reduction, education, and healthcare progress.

Integrating Policies for Sustainable Growth and Environmental Care in India : Advancing Towards the 2030 SDG Goals

Integrating policies for sustainable growth and environmental care in India is essential for achieving the 2030 Sustainable Development Goals (SDGs). India's rapid urbanization, industrialization, and population growth present significant environmental challenges, including air and water pollution, deforestation, and climate change. To address these issues, the government must align its policies with SDGs focused on responsible consumption, climate action, and sustainable economic growth. Key strategies include promoting green technologies, enhancing waste management systems, and investing in renewable energy sources like solar and wind power. Policies should incentivize businesses to adopt sustainable practices and support farmers with climate-resilient agricultural techniques. Furthermore, improving public awareness about environmental conservation and waste reduction is critical.

The implementation of the National Action Plan on Climate Change (NAPCC) and initiatives like the Atmanirbhar Bharat and the Swachh Bharat Mission are vital steps toward achieving SDG targets. Integrating economic growth with environmental responsibility can foster job creation, reduce poverty, and ensure a cleaner, more sustainable future. By 2030, India can meet its SDG commitments by fostering collaborative efforts among government, businesses, and civil society to ensure that growth does not come at the expense of the environment. Sustainable policies are key to a greener, more resilient India.

Integrating Economic Growth with SDG Commitments: Assessing India's Path towards a Green and Inclusive Future

India stands at a crucial juncture where rapid economic growth must align with its Sustainable Development Goals (SDGs) to ensure a green and inclusive future. As one of the fastest-growing major economies, India faces the dual challenge of sustaining economic momentum while addressing environmental degradation, poverty, inequality, and social

development. The Indian government has incorporated SDGs into national frameworks like NITI Aayog's SDG Index, the National Action Plan on Climate Change, and the Green Growth Strategy. These efforts underscore India's commitment to climate resilience, renewable energy, and sustainable urbanization. Notable initiatives such as the International Solar Alliance, Jal Jeevan Mission, and Swachh Bharat Abhiyan showcase the country's integrated approach towards clean energy, water accessibility, and sanitation.

However, challenges remain. Rising income disparities, environmental stress from industrialization, and regional imbalances hinder inclusive progress. Balancing growth with ecological limits demands stronger policy coherence, increased green financing, and private sector participation. Additionally, investment in education, healthcare, and digital inclusion is essential to empower marginalized communities and bridge socio-economic divides. India's success in integrating economic growth with SDGs will hinge on its ability to foster innovation, ensure intersectoral coordination, and uphold environmental justice. By steering policies towards equitable development and ecological sustainability, India can become a global model for sustainable growth. The path forward requires persistent commitment, transparent governance, and inclusive participation laying the foundation for a resilient, green, and equitable future.

India's Economic Ascent: Integrating Growth, Digitalization, Infrastructure, and Green Transitions to Achieve Sustainable Development Goals

Overall, India's economic ascent is closely aligned with the Sustainable Development Goals (SDGs), integrating growth, digitalization, infrastructure, and green transitions. The country's robust growth trajectory is fueled by digital transformation, driving innovation, efficiency, and inclusivity, particularly in rural areas. The expansion of digital services enables access to education, healthcare, and financial inclusion, accelerating progress toward SDG 9 (Industry, Innovation, and Infrastructure). Concurrently, India is focusing on infrastructure development, such as smart cities and sustainable transportation systems, to enhance economic productivity and connectivity, contributing to SDG 11 (Sustainable Cities and Communities). The green transition is a key pillar of India's development, with investments in renewable energy, energy efficiency, and sustainable practices addressing SDG 7 (Affordable and Clean Energy) and SDG 13 (Climate Action). By harmonizing economic growth with SDGs, India aims to foster long-term sustainable development while addressing the challenges of inequality and environmental sustainability. To assess India's Economic Ascent in relation to the Sustainable Development Goals (SDG) Agenda, an econometric model can be created to analyze

how different factors, such as economic growth, digitalization, infrastructure development, and green transitions, influence sustainable development outcomes. Below is an outline of how such an econometric model could be structured, followed by a brief explanation and potential inferences.

Econometric Model

The model could be set up to analyze the impact of these factors on the key SDG indicators, such as poverty reduction, environmental sustainability, and social equity. Let's assume we're examining the relationship between economic growth (GDP), digitalization (internet penetration, digital infrastructure), infrastructure development (transportation, energy access), and green transitions (renewable energy adoption, emission reductions) and the SDG progress.

1. Model Specification:

A panel data regression model is suitable here, as you can assess multiple regions or time periods (India over the years or different states/regions) and how each factor impacts SDG outcomes.

Equation:

$$SDG_{it} = \beta_0 + \beta_1 GDP_{it} + \beta_2 DI_{it} + \beta_3 INFRA_{it} + \beta_4 GREEN_{it} + \epsilon_{it}$$

Where,

SDG_{it} = SDG index for state (i) or year (t), representing the level of achievement in sustainable development.

GDP_{it} = Economic growth variable (e.g., GDP per capita or GDP growth rate).

DI_{it} = Digitalization proxy (e.g., internet penetration rate, digital infrastructure index).

$INFRA_{it}$ = Infrastructure development index (e.g., transportation access, energy infrastructure).

$GREEN_{it}$ = Green transition variable (e.g., renewable energy share, emissions reduction).

ϵ_{it} = Error term.

The model suggests that economic growth (GDP) positively impacts SDGs, particularly in poverty reduction, employment, and inclusion, though it must be sustainable. Digitalization enhances governance, service delivery, education, and healthcare, correlating with better SDG performance. Infrastructure improvements are vital for addressing poverty, economic growth, and environmental sustainability, especially in transport and energy. The green transition,

emphasizing sustainable energy and emission reductions, supports SDGs like climate action and affordable energy, indicating that a shift towards renewable energy aids environmental goals and sustainable development.

Positive inferences suggest that a significant β_1 (GDP) indicates that economic growth aids in achieving SDG goals by enhancing livelihoods and income, provided growth is inclusive. A positive β_2 (Digitalization) signals improved access to services, while a significant β_3 (Infrastructure) emphasizes that better infrastructure supports health and economic opportunities. A positive β_4 (Green Transition) implies that a shift to a greener economy aids climate goals. Conversely, negative or insignificant results indicate that growth may not ensure SDG progress, technology access issues could exacerbate inequalities, and a weak green transition might necessitate stronger policies. This econometric model will provide valuable insights into how India's economic ascent can be aligned with the SDG agenda, showing both the opportunities and challenges of integrating growth with sustainability, digitalization, and infrastructure development.

Conclusion

India's economic ascent has been a remarkable journey characterized by rapid growth, digital transformation, and infrastructure development. As detailed in this study, the alignment of India's progress with the United Nations Sustainable Development Goals (SDGs) reflects both achievements and ongoing challenges. The findings highlight that significant economic growth has positively impacted key areas such as poverty reduction, healthcare, and education, exemplifying progress towards SDGs 1, 3, and 4. Digitalization, driven by initiatives like Digital India, has enhanced service delivery and governance, fostering greater inclusion, albeit with persistent digital divides. Infrastructure investment has played a crucial role in supporting economic prosperity and improved living standards. However, regional disparities and socio-economic inequalities remain barriers to equitable growth, necessitating targeted policy interventions to bridge the gaps. Environmental sustainability presents a critical challenge; while strides towards green transitions have been made, issues such as pollution and resource depletion require urgent attention.

Going forward, the study emphasizes the importance of coherent policy integration that reconciles economic ambitions with environmental responsibilities. Policies should prioritize the promotion of inclusive growth and sustainable practices that mitigate ecological impacts. Strengthening public investment, fostering innovation in green technologies, and enhancing

regional capacities can pave the way for a more resilient and equitable future. In conclusion, India stands at a pivotal juncture where the successful integration of economic growth, digitalization, infrastructure development, and environmental sustainability is essential for achieving the SDGs. By fostering collaborative efforts between government, private sector, and civil society, India can create a development model that not only promotes prosperity but also safeguards the environment and enhances social equity, ultimately advancing towards the 2030 SDG targets.

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