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Assessments of Environmental Sustainability and Its Financial Impact on Indian Economy

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Abstract: *Environmental sustainability has gained significant attention in the global economic discourse, particularly in developing economies like India that continues its rapid industrialization and urbanization, the need to integrate sustainability practices into its economic policies has become more pronounced. This research aims to explore the economic implications of sustainability practices in India, concentrating on their impact on several sectors such as agriculture, manufacturing, energy, and infrastructure. This study investigates the financial costs and benefits of sustainability measures through quantitative analysis, examining the potential contributions of investments in environmental protection to GDP growth, job creation, and long-term economic stability. It examines the correlation between sustainable development goals (SDGs) and economic performance, emphasizing areas where environmental, social, and economic objectives intersect. The study evaluates the impact of sustainable practices, including renewable energy adoption, waste management, green technologies, and eco-friendly agriculture, contributing to cost reduction, efficiency enhancements, and long-term economic development. The study demonstrates that India's shift to sustainable practices produces long-term economic advantages that surpass early investment expenditures. These encompass sustainable employment, international market competitiveness, reduced resource depletion, and enhanced productivity. The study highlights the significance of technical innovations, governmental regulations, and corporate funding in promoting sustainable development. It asserts that India might develop a more robust economy by amalgamating economic advancement with environmental and social considerations.*

Keywords: *Sustainable development, Environment, Indian economy, Economic policies*

INTRODUCTION

Economic growth is crucial, particularly for developing nations facing challenges such as poverty, unemployment, and infrastructural deficiencies. The condition of the natural environment is crucial for the economy, as it serves as a public benefit, providing sustenance for humans, animals, and other species inhabiting the globe. Considering this, it has influence of environmental sustainability and economic growth on the Indian economy (Villanthenkodath, 2022).

Human actions, including deforestation, overfishing, and industrialization, have profoundly affected environmental sustainability and the well-being of future generations (Halla, 2020). These activities have resulted in the depletion of fossil resources, pollution of air, water, and soil, and present health hazards (Fisher, 2021). Climate change is an important global concern for rapid action to reduce greenhouse gas emissions and shift toward renewable energy sources.

India is considering to achieving the Sustainable Development Goals (SDGs) in line with Mahatma Gandhi's global vision. Approved by members of the United Nations (UN), the Sustainable Development Goals (SDGs) fit the "2030 Agenda for Sustainable Development" and help to advance peace and wealth. According to the goals action plan, every country should cooperate globally to guarantee the required actions for a sustainable future for the earth and the people. To build a sustainable and liveable planet for the next generations, it emphasizes strongly an integrated strategy to eradicate poverty and hunger, improve the quality of health, education, water, and sanitation, lower inequalities (both class and gender), and handle the problem of climate change (Sahoo, 2023). The nation is striving to create a new age of cooperation among all development partners and synchronize local policies,

initiatives, and operations with international agreements (Kaswan, 2019). The country supports the suggestion to customize implementation strategies according to the distinct requirements and national policies of each country and has effectively aligned its domestic plans, programs, and activities with the goals of international agreements (Akpodiogaga-a, 2010).

The Sustainable Development Goals are a worldwide program focused on eliminating poverty, protecting the environment, and guaranteeing prosperity and peace for all citizens (Bahadorestani, 2020). Nation is committed to achieving the 17 Sustainable Development Goals & 169 associated targets within the designated timeframe (Cernev, 2020). A national implementation strategy for the SDGs will be developed, considering the current development context and experiences while adhering to the ideal of "leaving no one behind."

India's developmental measures targeting the Sustainable Development Goals (SDGs) are consistent with its objectives to eliminate poverty, substantial disparities, and widespread underdevelopment in many parts of the country (Biswas, 2022). The SDGs provide a valuable policy framework to address developmental shortcomings that have hindered India's advancement in recent decades. An equitable, prosperous, and sustainable world corresponds with India's interests, and the global realization of the SDGs would alleviate emerging impediments to India's development while cultivating an international environment conducive to its rise in global stature (Colvin, 2020; Das, 2020).

Sustainable Development and Economic Growth in India

India's pledge to reach net-zero emissions by 2070 is an important part of its economic growth plan in addition to being a climate goal. The country aims to reduce its GDP's emission intensity by 45% and switch 50% of its electricity generation from fossil fuels by 2030. India has implemented a number of financial tools, such as tax breaks, subsidies, green bonds, renewable energy certificates, and feed-in tariffs, to promote investment and sustainable energy sources (Reddy, 2023).

With solar power making up 15 GW (81% of the new renewable capacity) and wind energy almost tripling to 3.3 GW, India has achieved significant strides in the field of renewable energy. As of February 2023, India had issued more than $21 billion worth of green bonds. Economic development will be aided by the nation's energy composition becoming more diverse, the use of renewable fuels increasing, and the expansion of the installed base through innovation and technology solutions. Economic diversification is necessary for sustainable development since the various resources found in Indian states may make a purely renewable energy-based approach impracticable. Jobs and innovation may be boosted by programs like supporting renewable energy, improving industry energy efficiency, encouraging green manufacturing, diversifying agriculture, supporting green fuels like hydrogen, and backing electric cars (Hussain, 2023).

Sectoral interventions, such as those in manufacturing, tourism, infrastructure, and agriculture, have the potential to enhance GDP, provide opportunities regarding jobs, and promote green innovation. The extensions of production innovation and process innovation in the sectoral intervention are environmental sustainability and resource efficiency. It also includes several product life cycles, the supply chain, and end-of-life issues for GDP (Kapoor, 2021). To make the switch to renewable energy go more smoothly, we need a full subnational governance system that makes sure regional projects are in line with national goals, makes it easier to divide up resources, and makes sure policies are carried out on time. Economic growth may be further aided by efficient finance tools, including grants, subsidies, concessional loans, and carbon pricing. The institutionalization of capacities to handle climate change via resilience, innovation, and informed decision-making is another crucial element in fostering sustainable development and economic progress.

Before water can be used for drinking, agriculture, recreation, or industrial purposes, it is crucial to evaluate its physical, chemical, and biological characteristics (Dessie et al., 2024). Climate change marked by global warming and seasonal droughts both globally and particularly in Iraq, has led to significant alterations in water quality parameters due to reduced water levels and discharge rates exceeding design capacities (Bayatavrkeshi et al., 2023).

While it is widely acknowledged that human activities drive climate change, predicting the extent and likelihood of its impacts on water quality remains complex. This complexity arises from the broad spectrum of natural variations in hydrology, chemistry, and ecology, compounded by significant uncertainties (Al– Delewy et al., 2006). Climate change is a major factor influencing policies for the Environment Agency and the water industry. Understanding its potential effects on water quality is essential for policymakers to provide informed guidance on impact management (Yang et al., 2020; Ahmed et al., 2020).

LITERATURE REVIEW

Sajeev, et al. (2020) employed the environmental Kuznets curve (EKC) theory to scrutinize India's GDP and CO2 emissions from 1980 to 2012. The study examined trade openness, foreign direct investment, energy costs, legal systems, and industrialization to determine if the Environmental Kuznets Curve is linear, quadratic, or polynomial. Integration with structural discontinuities is possible with autoregressive distributed lag (ARDL) bounds testing. Trade openness, GDP, industrial development, carbon emissions, and foreign direct investment figures are gathered from crude oil prices, the US Energy Information Agency, the Fraser Institute's Economic Freedom Index, the World Development Indicators online database, and other sources. An inverted U-shaped Environmental Kuznets Curve (EKC) is found for the short term but not the long term. FDI-adjusted models imply that trade liberalization reduces carbon emissions. Fuel cost increases reduce carbon emissions across models. Given India's current economic policies of globalization, privatization, and liberalization, the research recommends ecologically friendly regulatory frameworks. Economic freedom, evaluated by "size of government," is unique to the EKC model and helps establish if nations with smaller governments pollute more. The study examines how NABARD-funded watershed initiatives might change rural communities and boost economic growth. The study reveals that we don't comprehend integrated watershed restoration programs' long-term benefits and drawbacks. They need more robust research to create climate-resilient rural development strategies.

Jha, et al. (2019) determined that green funding is essential for sustainable economic development and ecological advantages. This facilitates augmented financial contributions from many sectors, encompassing governmental, commercial, and non-profit entities. The UN Environment is channeling financial resources to attain the 2030 Sustainable Development Goals, underscoring the significance of green financing. India requires a comprehensive green finance strategy to promote sustainable economic development, necessitating around $4.5 trillion in funding for green infrastructure by 2040. The participation of banks and organizations from both the public and private sectors is crucial for green financing. This study analyses the green finance initiatives of Indian banks, governmental bodies, and corporations, pinpointing challenges and suggesting solutions to address them.

Kumar et al. (2024) discovered that, despite the high interest rates on their loan advances, contemporary lending organizations such as SHGs have a robust recovery rate. Moreover, they incur reduced transaction costs relative to conventional lending institutions. This requires credit cooperatives and commercial banks to analyse the structures of new-generation lending institutions, especially their interest rate arrangements and loan recovery strategies. Previous internal research has unequivocally demonstrated the improved recovery performance and reduced transaction costs of SHGs. Reports indicate that these societies have positively impacted the social and economic status of their members. Furthermore, the RFIs in Maharashtra experience a high prevalence of NPAs or delinquencies. Consequently, it is imperative to implement more rigorous and coordinated measures for debt collection from chronic and significant defaulters. In essence, it is essential to rejuvenate the rural credit delivery system by tackling the dual issues of high transaction costs and poor payback performance. Implementing further fiscal legislation that enforces severe penalties for intentional defaults, especially by big agricultural producers, can accomplish this. The rural loan delivery system must prioritize efforts that improve operational efficiency, recovery performance, sustainability, viability, small farmer inclusion, and fair sectoral growth.

Ananthi, (2023) concentrated on analysing the methods by which Indian enterprises implement ecological development and establish connections among their characteristics. The first step involves conducting quantitative research on business sustainability to determine the study's objective. This research uses scientometric analysis to

study the historical contribution of corporate sustainability. Furthermore, we conduct a bibliometric study to assess the research gaps identified in previous investigations. A study of corporate sustainability performance and firm-level correlation mapping are used in this paper to show how corporate sustainability, performance, and firm production are linked. Extensive empirical research establishes a theoretical basis for corporate sustainability culture. This work uses linear and non-linear least squares techniques to explore the generalization of the model about corporate heterogeneity. The proposed approach seeks to measure the impact of company attributes such as governance, social responsibility, and tax evasion on business success. They analyse many intermediary variables to empirically predict the correlation among corporate factors. This study significantly contributes to the examination of business sustainability.

METHODOLOGY

Environmental sustainability is the ability to conserve natural resources to enhance the well-being of current and future generations through ecological equilibrium in the planet's natural environment. In this Study, We discussed that how environmental sustainability and its financial impact on the Indian economy. We used the process to find the results using qualitative approach. For this, we collected the data from Government library and published papers and we have prepared formal interview through which data have been collected. For the data collection, we have two methods as explained below:

Secondary Data collection: This research is mainly dependent over secondary sources of the research; hence, we have collected data from the Published papers, Government libraries, Published financial statements etc.

Primary Data Collection: As this research is minorly dependent over primary source of data Therefore, We prepared the some interview questions that have been asked from Investment Bankers, Economist and Ecologists etc.

ANALYSIS AND DISCUSSION

In this Result section, we are following pattern of methodology, we discuss and analyse the environmental sustainability and its impact on Indian economy:-

4.1 Analysis of Govt. Data

Climate Resilience and Sustainability

India has implemented numerous laws and initiatives to promote environmental sustainability and address climate change. Solar powers, sustainable agriculture, water resources, and the Himalayan ecology were among the subjects addressed by the National Action Plan on Climate Change (NAPCC) introduced in 2008. By ratifying the Paris Agreement and submitting its Nationally Determined Contributions (NDCs) through the Ministry of Information and Broadcasting, the government pledged to achieve global climate objectives. France established the International Solar Alliance (ISA) in 2015 to encourage and promote the global adoption of solar energy. The Rewa Ultra Mega Solar Park in Madhya Pradesh is one of the largest solar power installations in the world, demonstrating India's ability to attract foreign investment and increase solar energy production. The program has been expedited by ISA's financial support for solar technology, which has improved the affordability and competitiveness of solar energy in India and established new standards for solar prices.

The Pradhan Mantri Ujjwala Yojana (PMUY) aims to reduce indoor air pollution and deforestation caused by conventional fuels by providing rural populations with clean cooking fuel through LPG connections. This campaign has especially impacted women, who frequently face the adverse effects of indoor air pollution.

The FAME initiative advocates for sustainable transportation by facilitating the adoption of electric cars via manufacturer incentives, subsidies, and enhancements to infrastructure. This project has significantly contributed to the adoption of sustainable transportation alternatives nationwide, aiding India in meeting its objectives for reducing air pollution and greenhouse gas emissions from the transportation sector. The Green India Mission and CAMPA are two Indian projects focused on afforestation and reforestation, designed to mitigate climate change by enhancing carbon sinks, biodiversity, and forest cover. Efforts are being made nationally and globally to improve

climate resilience, reduce emissions, and advance sustainable development (Share, 2024).

Job Creation and Sustainable Growth

The hydropower industry is the largest employer in India, with over 453,000 jobs generated and 20% of global employment. In 2023, it is anticipated that the country will have 1.02 million renewable energy-related occupations. India ranks fifth globally in terms of cumulative capacity and new installations, with the solar photovoltaic sector employing approximately 318,600 individuals. In 2023, the operational module manufacturing capacity of the nation reached 46 gigawatts, and it is anticipated that this figure will increase to 58 gigawatts by 2024. India became the world's second-largest manufacturer of photovoltaic cells in 2024, as its capacity for production increased from 26 gigawatts in 2023 to 32 gigawatts. IRENA reported 238,000 positions available in grid-connected solar PV in 2023, representing an 18% increase from 2022. In 2023, India had 2.8 gigawatts of installed wind power capacity, which placed it fourth globally with a combined installed wind power capacity of 44.7 gigawatts. Approximately 52,200 individuals were employed in the wind industry in India, with 35% of them specializing in construction and installation and 40% in operations and maintenance (Kumar, 2024).

Government Approaches towards Environmental Sustainability

- **Renewable Energy Capacity**

India's total power-generating capacity attained 452.69 GW, with renewable energy comprising a substantial portion of the energy mix. By October 2024, the nation had a renewable energy producing capacity of 203.18 GW, or 46.3% of the total installed capacity (Sadhu, 2015). In 2023, India's renewable energy sector generated over 1.02 million jobs, indicating a significant shift in the country's energy infrastructure toward cleaner, non-fossil fuel sources. India's attempts to utilize its copious sunlight are supported by 92.12 GW of solar energy. The nation's inland and coastal wind corridors produce the second-highest amount of wind energy (47.72 GW). India's rivers and water resources provide a reliable and sustainable energy source via hydroelectric power, with large hydro projects generating 46.93 GW and smaller hydropower providing 5.07 GW. Bio-power, which includes biogas and biomass energy, adds 11.32 GW to India's clean energy capacity and renewable energy portfolio (Alnabooee, 2023).

In 2023, India's contribution to the global renewable energy workforce increased significantly from 13.7 million in 2022 to 16.2 million. Hydroelectric power has become the largest employer in the sector, creating approximately 453,000 employments, accounting for 20% of the global total. The solar photovoltaic (PV) sector employs about 318,600 persons in both on-grid and off-grid activities. By the end of 2023, India's solar photovoltaic capacity had risen by 9.7 GW, reaching a total of 72.7 GW. The wind industry employed over 52,200 persons, with 35% engaged in construction and installation and 40% in operations and maintenance. Several renewable energy subsectors, including solid biomass, liquid biofuels, and biogas, propelled job growth (Nautiyal, 2011).

- **Eco-Friendly Agriculture**

The government must implement strong measures for sustainable farming in the forthcoming budget. Enhancing financial support for sustainable agriculture is essential. Enhancing resource allocation to initiatives such as the Paramparagat Krishi Vikas Yojana (PKVY) and the Pradhan Mantri Krishi Sinchai Yojana (PMKSY) will facilitate a greater number of farmers in adopting sustainable practices. Increased financing can improve access to essential supplies and technology, alleviating the financial strain on farmers.

Enhancing extension services is essential for instructing farmers on sustainable practices. Investing in training programs and utilizing digital platforms, like mobile applications and online portals, may enhance outreach and accessibility. Enhancing access to credit is crucial; broadening the Kisan Credit Card (KCC) program to incorporate allowances for sustainable inputs helps mitigate financial limitations.

Facilitating Farmer Producer Organizations (FPOs) is an essential measure. Enhancing FPOs can assist small farmers in consolidating their output, accessing superior markets, and investing in shared resources. The government's goal of establishing 10,000 FPOs by 2024 requires corresponding financial and technical assistance. These groups can significantly contribute to the expansion of sustainable practices and the augmentation of farmers' negotiating

strength.

The economic influence of sustainable agriculture is substantial, especially for small and marginal farmers, who represent 86% of India's agricultural sector. By implementing sustainable techniques, these farmers may decrease costs associated with chemical fertilizers and pesticides. The use of integrated pest control has demonstrated a reduction in pesticide usage by as much as 50%, resulting in significant cost savings. Moreover, conservation agricultural approaches can save labor and fuel expenses owing to less tillage.

Sustainable agriculture also provides access to high-end markets. There is an increasing domestic and global demand for organic and sustainably produced food. By 2025, projections indicate that the organic food industry in India will reach INR 75,000 crore, with a compound annual growth rate (CAGR) of 20%. Agricultural producers might demand elevated pricing for their crops, thus augmenting their revenue levels. This is especially advantageous for smallholders, who may attain improved returns on their constrained production.

Furthermore, sustainable agriculture enhances enduring soil fertility and water preservation, mitigating the likelihood of crop failure resulting from environmental deterioration. This consistency is essential for farmers' economic resilience, particularly during climate change-related weather uncertainty (Sharma, 2024).

- **Carbon Emission Reduction**

India is leading a number of global efforts to improve resilience and slow down climate change. One World, One Sun, One Grid (OSOWOG), Infrastructure for Resilient Island States (IRIS), Coalition for Disaster Resilient Infrastructure (CDRI), and Leadership Group for Industry Transition (LeadIT) the International Solar Alliance (ISA). India met the majority of the original NDC's goals ahead of time. India lowered the emission intensity of its GDP by 33% from 2005 levels in 2019 and reached a cumulative installed capacity of 40% electrical power from non-fossil fuel-based energy sources in 2021. Nine and eleven years before the 2030 goal year, respectively, these accomplishments took place. Furthermore, as of May 31, 2024, 45.4% of the installed energy production capacity comes from non-fossil sources, a considerable gain from 32% in April 2014. By 2030, trees and forest cover in India are expected to make an extra carbon sink of 2.5 to 3.0 billion tonnes. India created a 1.97 billion-ton CO_2 equivalent carbon sink between 2005 and 2019.

India's GDP rose at a Compound Annual Growth Rate (CAGR) of roughly 7% between 2005 and 2019; emissions rose at a CAGR of roughly 4%. Stated another way, our GDP is rising more quickly than emissions. This suggests that India has effectively separated its economic growth from greenhouse gas emissions, thereby reducing the emission intensity of its GDP. Development plans now include climate resilience and adaptation, as seen by India's overall adaptation-relevant spending rising from 3.7% of GDP in 2015–16 to 5.60% of GDP in 2021–2022 (Sajeev, 2020).

According to the poll, the country has undertaken a number of measures to improve the business climate and raise more funds. In January and February 2023, the government sold ₹16,000 crore in sovereign green bonds to generate funds for public sector projects aiming at reducing the carbon intensity of the economy. Between October and December 2023, ₹20,000 crore were then generated via sovereign green bonds. The Framework for Acceptance of Green Deposits for Regulated Entities (RBI) has now been implemented by the Reserve Bank of India to help further stimulate and build a green finance ecosystem in the country. Furthermore, under its Priority Sector Lending (PSL) policies, the Reserve Bank of India (RBI) supports renewable energy (Udemba, 2021).

- **Waste Management**

Nearly one-third of Indians live in cities which generates a growing and alarming amount of municipal solid waste that degrades the environmental sustainability hence they can generate huge loss in Indian economic system as well. For the management of the wastes to recover from the unnecessary losses the projections show that India will generate in excess of 600 million tons of municipal solid waste (MSW), up over 150 million tons from 2016 numbers by 2025. For Indian municipalities; the large increase of garbage presents a serious sustainability problem. Apart from the environmental and health problems related to careless disposal, uncontrolled manufacturing and

disposal of municipal solid waste has a significant financial impact. Municipal solid trash primarily consists of recyclable materials such as plastic, aluminum, and paper. Regrettably, people frequently burn these items without recycling them or discarding them in landfills, leading to environmental contamination and significant financial costs.

Responding to this challenge, Indian cities are running several initiatives to improve their waste management systems that can support in environmental sustainability and hence the economic growth. For this, the common goals have been considered that includes improving recycling rates, developing innovative composting techniques, and extending the running lifetime of landfills. These steps are intrinsically important, but they also are necessary conditions for more complete solutions like waste-to-energy plants or landfills that can be deactivated upon capacity.

- **Financial Impact of Environmental Sustainability**

The urban population of India is expanding quickly, resulting in a substantial rise in municipal solid garbage. By 2025, the nation is anticipated to produce in excess of 600 million tonnes of municipal solid trash, an increase of more than 150 million tonnes compared to 2016. This has prompted sustainability worries for Indian towns, as the unregulated production and disposal of trash have considerable economic ramifications. Most municipal solid waste is recyclable, like plastic, metal, and paper. Instead of recycling these materials, we often discard them in landfills or burn them, causing environmental harm and significant financial costs (Chaffee, 2017).

Indian municipalities are instituting initiatives to enhance waste management systems, including increasing recycling rates, improving composting techniques, and extending landfill operational lifespans (Sarkar, 2016). Nonetheless, these methods are inadequate for more extensive solutions, such as waste-to-energy plants or landfills that may be decommissioned upon reaching capacity (Sharma, 2021).

Sustainability and sustainable development are dynamic ideas, with sustainability advocating for human advancement while preserving natural resources (Spuerk, 2017). Businesses are gradually incorporating sustainability reports into their financial statements, but it's important not to use them for green-washing. Businesses must prosper if their products and services continually fulfill client expectations over time (Stjepcevic, 2017; Sun, 2016).

Business sustainability reporting is essential for elucidating how a firm guarantees the sustainability of the global economy for future generations, Behal, V., & Gupta, M., (2022); Kumar, A., & Sanjana, S. (2025). By encouraging openness, honesty, and legislative conformity, the governance pillar ensures that the goals of a firm are complementary with social interests. Adopting sustainable business practices could increase the sustainability of a company and benefit the surroundings and society. Persistent success depends on companies and stakeholders developing trust (Tempels, 2017).

4.2 Analysis of Formal Interviews

In this section, we discussed about the prepared the formal interview questions that have been asked from Investment Bankers, Economist and Ecologists etc. who have given their valuable opinion towards environmental sustainability and its financial impact on Indian economy as discussed below:

Environmental Sustainability

Environmental sustainability is about to balancing our nature based requirements with those of the surroundings. It means making careful judgments that will protect our natural resources so they may always flourish and support life on Earth far into the future.

Needs of Environmental sustainability

Well, we need to environmental sustainability to preserve the Natural resources, reduction climate changes and try to ensure ecological balance for future generations. It demands renewable energy adoption, waste reduction, sustainable agriculture, biodiversity conservation, and responsible consumption. Achieving sustainability fosters economic growth, improves public health, and enhances resilience against environmental challenges while ensuring long-term planetary well-being.

Impact of Environmental Sustainability on Economic System

Environmental sustainability definitely influences the economic system via fostering green job creation, reducing cost through renewable electricity, and promoting green useful resource use. It reduces weather risks, enhances agricultural productivity, and attracts foreign investments in clean technologies. Sustainable practices make sure lengthy-time period financial resilience and inclusive increase while retaining ecological balance.

Opinion regarding to enhance the environmental sustainability for improving Indian finance system

Enhancing environmental sustainability in India can improve its financial system by means of promoting renewable power investments, incentivizing green technology, and adopting sustainable agricultural practices. Efficient waste control and carbon credit score markets can appeal to worldwide investment. Integrating inexperienced regulations into monetary making plans fosters resilience, reduces costs, and stimulates job introduction, riding sustainable financial increase.

CONCLUSION

This research emphasizes the connection between environmental sustainability and the Indian economy, highlighting the need to maintain natural resources for human survival and economic stability. India has put in place a number of policies, plans, and targets aimed at both promoting sustainable development and mitigating climate change. The National Action Plan on Climate Change (NAPCC) highlights Himalayan ecology, sustainable agriculture, water resources, and solar energy. By signing the Paris Agreement and turning in its Nationally Determined Contributions (NDCs), India has taken consideration for world climate goals. The International Solar Alliance (ISA) promotes the cost-effectiveness of solar energy and access to funding. The Pradhan Mantri Ujjwala Yojana provides clean LPG fuel to rural populations, enhancing health results and fostering environmental preservation. The FAME project advocates for sustainable transportation and electric vehicles. We project that India's renewable energy sector will generate 1.02 million jobs in 2023, predominantly within the hydropower industry. In 2024, India's total power-generating capacity reached 452.69 GW, with renewable energy accounting for 46.3% of the total installed capacity. The government must establish robust initiatives for sustainable agriculture, including enhanced financial assistance, extension services, and improved access to funding. The formation of Farmer Producer Organizations (FPOs) might assist small farmers in concentrating their output and improving market access. Sustainable agriculture offers substantial economic advantages, particularly for small and marginal farmers, by reducing costs related to chemical fertilizers and pesticides and enhancing access to high-value markets. India is leading global efforts to reduce carbon emissions and manage municipal solid waste, projected to exceed 600 million tons by 2025.

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