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ASSESSMENT OF GREEN GROWTH, ITS INTERVENTIONS AND SUSTAINABLE DEVELOPMENT IN KARNATAKA

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ABSTRACT

Introduction – *Green growth entails promoting economic growth and development while ensuring that natural assets continue to provide the resources and environmental services that we rely on for our well-being.*

Aim of the study – *To discuss the green economy, green growth and development in India.*

Research methodology – *The data have been collected through secondary sources.Field visits, extensive government-stakeholder consultation, and a comprehensive policy landscape analysis of sector-specific interventions in Karnataka validate the analytical insights produced.*

Data analysis – *The data have been analysed on green growth and its effect and developmentThe energy supply and demand have been examined using the TERI-MARKAL (MARKet Allocation MARKAL) energy system model.*

Conclusion - *Two arrangements of models are considered to comprehend the connections between advancement results and green mediations. An energy framework model was utilized to analyze the supply and demand for energy. TERI-MARKAL (MARKet Allocation MARKAL) is a truncation for "MARKet Allocation MARKAL."*

Keywords *– green growth, economy, intervention, capital, sustainable development etc.*

1. INTRODUCTION

1.1 Introduction

The current global economic growth trajectory is unsustainable from an environmental standpoint. Current production and consumption patterns degrade and deplete many of the world's environmental resources. As a result, new approaches to promoting inclusive and environmentally sustainable economic development – a green economy – are required. Such approaches can be found in the work towards a green economy (GE).

The term "green economy" was coined by a group of leading environmental economists in a

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ground-breaking 1989 report for the Government of the United Kingdom titled Blueprint for a Green Economy. The report was commissioned to advise the UK Government on whether there was a consensus definition of "Sustainable development," as well as the implications of sustainable development for measuring economic progress and evaluating projects and policies. The green economy is defined as an economy that aims to reduce environmental risks and ecological scarcity, as well as to achieve long-term development without negatively impacting the environment. According to the 2011 United Nations Environment Programme (UNEP) Green Economy Report, "that in order to be green, an economy must be both efficient and fair. Fairness entails recognising global and national equity dimensions, particularly in ensuring a just transition to a low-carbon, resource-efficient, and socially inclusive economy." In addition, "a green economy is one that improves human well-being and social equity while significantly reducing environmental risks and ecological scarcity." A green economy, in its most basic form, is one that is low carbon, resource efficient, and socially inclusive."

1.2 Green economy

A "green economy" gives the impression of an economy that is environmentally conscious, conscious of the need to conserve natural resources, conscious of the need to reduce pollution and emissions that harm the environment during the manufacturing process, and produces products and services whose existence and consumption do not harm the environment.

The underlying ideas of David Pearce et albook.'s "Blue Print for a Green Economy" introduced the term green economy to the academic world. The main key argument developed was that the current price system results in an allocation of resources in the economy that is anti-environmental. Environmental assets and services are treated as inputs for production, and they are overvalued in some core sectors while undervalued or not valued in others, resulting in inefficient use of natural resources and environmental degradation. Similarly, the costs of pollution are generally borne by the public rather than the polluters. As a result, the price system correction faced by the agents in the economy would result in more favourable environmental outcomes.

Adding another dimension, a green economy can be defined as one in which producers incorporate environmental benefits (social costs) into their production decisions.

The factors involved in a green economy are both future growth and existing stocks of natural capital that are subject to transformation in the environmental system.

1.2.1 Why Green growth

The economic system requires a transformation toward environmental sustainability and increased resource efficiency, as well as increased and smarter use of green technologies and innovations. Working toward a green economy helps to alleviate poverty in the four dimensions identified by Sida. It increases poor people's access to a clean and safe environment, thereby increasing their opportunities and choices; It promotes human security by preventing or resolving conflicts over access to land, food, water, and other natural resources; it promotes increased power and voice among the poor by, for example, strengthening their rights to a safe and clean environment, functioning ecosystems, food, and health; it promotes resources, including improved quality and

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quantity of natural resources, and it reduces pollution or degradation.

1.3 Green growth

Green growth is a term used to describe an environmentally sustainable path of economic growth. It is based on the understanding that as long as economic growth is the primary goal, economic growth must be decoupled from resource use and negative environmental impacts.

Green growth entails promoting economic growth and development while ensuring that natural assets continue to provide the resources and environmental services that we rely on for our well-being.

Green growth is not a substitute for long-term development. Rather, it offers a practical and adaptable approach to achieving concrete, measurable progress across its economic and environmental pillars, while taking into account the social consequences of greening economies' growth dynamics. The goal of green growth strategies is to ensure that natural resources can deliver their full economic potential on a long-term basis. This potential includes the provision of critical life support services such as clean air and water, as well as the resilient biodiversity required for food production and human health. Natural resources are not infinitely substitutable, and green growth policies recognise this.

1.4 Sustainable Development

The green economy approach to sustainable development advocates a differentiated view of the concept that takes into account the various circumstances in which industrialised, emerging, and developing countries find themselves. Given the low level of economic development in developing countries, the concept of a "Right to Development" draws attention to developing countries' lack of options for reducing their vulnerable economies, material and energy intensity.

Any green economy knowledge sharing platform would eventually include a number of core structural components in order to achieve its goals and objectives. As a result, the five core structural components of a green economy are as follows:

- A mechanism for promoting connections, networks, discussions, and collaborations that aid in implementation.
- A demand-driven brokering mechanism that connects "knowledge seekers" with "knowledge providers" to support capacity development.
- A sophisticated online data platform and toolbox that incorporates a structured menu of policy options as well as how-to guidelines, case studies, and principles.
- Expert focal points or hubs for gaining access to and integrating expert analysis and policy analysis.
- A financing mechanism to assist developing countries in developing and implementing green economy policies.

2. REVIEW OF LITERATURE

Lucret,ia Dogaru (2020) - Economic activities are increasingly being carried out in modern conditions, which is frequently associated with a negative effect on the environment. They have now progressed to the point where they can be considered a genuine factor in climate formation and modelling. This trend has

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resulted in a plethora of initiatives and strategies aimed at the development of a green economy. As a result, in recent years, special public policy measures for the green economy and green growth have been developed and implemented. The analysis of the major challenges in economic and environmental development, as well as public policies for a green economy, is a genuine concern. Green economy and green growth are increasingly being represented as global trends for sustainable development. The purpose of this article is to present and analyse the issue of green economy and green growth, which is a new global and European operating strategy. In this regard, we will investigate the purpose of the concurrent operation of these three green ideas. Due to the complementary and simultaneous nature of these concepts, we believe that coexistence of the three green ideas (green economy, green growth, and sustainable development) is reasonable.

SeyedMeysamKhoshnava, et al (2019) - Global economic trends have revealed an increase in social inequalities and environmental degradation in the grey economy. To achieve the Sustainable Development Goals, new economic practises and policies must be developed (SDGs). A green economy (GE) works in tandem with the implementation of sustainable development (SD), which has the potential to revitalise the grey economy, human well-being, and social equity while significantly reducing environmental risks and ecological scarcity. The goal of this research is to create a hybrid methodological and mathematical approach for prioritising the most effective variables from a set of classified GE and SDGs criteria (23 criteria) in order to implement SD. The Decision-making trial and evaluation laboratory (DEMATEL) technique was used in this study to consider interconnections among numerous criteria in order to collect the most effective variables (12 criteria) based on the three pillars (3Ps) of SD. Similarly, the analytic network process (ANP) technique ranked these effective variables based on three indicators by taking into account their network relationships. Finally, integration was used to finalise and prioritise the most effective variables based on the ANP technique's weight. This study will highlight the green economy as the most effective variable among the GE and SDGs criteria for SD implementation, with a focus on exclusive environmental issues and sustainable growth.

Lucien Georgeson and Mark Andrew Maslin (2017) - The green economy has emerged as an important policy framework for sustainable development in both developed and developing countries over the last decade. It offers an appealing framework for achieving more resource-efficient, lower-carbon, less-harmful-to-the-environment, and more socially inclusive societies. There are tensions between competing green economy discourses, and a variety of definitions exist, all of which have significant flaws. This is complicated further by the disparities in the underlying concepts of the ‘weak,' ‘transformational,' and ‘strong' green economies. Several key definitions centre on the aspirational "transformational green economy." Economic and environmental measurement are required to enable and track this 'transformation.' Current approaches are still in development, lack available data, or exhibit inconsistencies with proposed definitions, and thus may not support effective decision-making or economic transformation efforts. This review identifies these current shortcomings and makes four broad recommendations for improving measurement for green economy transformations, including more affordable, faster, and widely available data, as well as broader frameworks for measuring economy–society–environment interactions. To better track the

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'transformational green economy,' we believe that proper measurement of the green economy must move beyond GDP as the primary measure of progress. Given the emerging Sustainable Development Goals and post-COP 21 frameworks, this will allow the green economy to regain national and international relevance.

Olivia Bina (2013) -The United Nations Conference on Sustainable Development (or Rio+20) was conceived at a time when global economic health was a major concern. In this context, the 'green economy' was chosen as one of the conference's two central themes, building on a growing body of literature on the green economy and growth. This study investigates the relationship and effect of the double crisis and the rise of 'greening' as a solution. The aim is to understand what defines and distinguishes the proposals contained in twenty-four sources on the green economy (including policy documents by international agencies and think tanks, and research papers), and what is the meaning and implication of the rising greening agenda for sustainable development as it enters the 21st century. Three categories of discourse that can illuminate the meaning and implications of greening are identified through a systematic qualitative analysis of textual material: 'almost business as usual,' 'greening,' and 'all change.'

Shreekar Acharya and A.H. Sequeira (2012) - In recent years, the concept of green economy has become a focal point of policy debates. This paper discusses the issues, challenges, and critics of the UNEP's green economy policies. It also sheds light on the areas of green economy promotion as a measure of sustainable development and the relationship between economic growth and the environment. In this paper, UNEP provides an insight into the Rio 20 Conference in relation to the aforementioned themes.

3. RESEARCH METHODOLOGY

3.1 Sources of data collection

The data used in this study is based on secondary information which is collected through internet, magazines, research papers, journals, books etc.

3.2 Approach

The examination utilizes evidence based analytical strategies for creating strategy decisions and green growth opportunities. The analytical experiences delivered are approved from field visits, broad government-partner interview and a comprehensive strategy scene examination of sector-wise intercessions in Karnataka.

3.3 Data analysis

The energy supply and demand has been analysed through an energy framework model TERI-MARKAL (MARKet Allocation MARKAL). The investigation has additionally seen field-based examinations for explicit challenges looked by the state governments in Karnataka.

4. DATA ANALYSIS AND RESULT

4.1 Effect of Green Growth and its Interventions

The goal of this integrated techno-economic analysis is to comprehend the effect of green growth interventions in the energy sector on future energy demand, emissions, energy access, energy security, and development indicators. An integrated modelling framework

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combining a bottom-up energy systems model (TERI-MARKAL) and a top-down simulation-based dynamic, recursive computable general equilibrium model was used to understand these inter-linkages. This integrated modelling framework was used to conduct scenario analysis for the green growth interventions listed below.

- Energy efficiency and conservation measures in energy demand sectors (agriculture, transport, industry sector, commercial building, and residential sector)
- Enhancement of modern energy access
- Promotion of clean energy supply through renewables and cleaner fossil-fuel–based energy generation technology, and
- Resource (soil and water) conservation in the agriculture sector.

Four scenarios were considered to understand the implications of these green growth interventions on energy and development indicators, with the type and range of interventions varying. These are the scenarios (a) Reference (REF), (b) Policy (POL), (c) Ambitious-1 (AMB-1) and (d) Ambitious-2 (AMB-2) (AMB-2). The REF Scenario corresponds to a business-as-usual scenario. The POL Scenario assumes that existing policies are effectively implemented. The Ambitious Scenarios include measures that go beyond what is considered in the POL Scenario, such as implementation action.

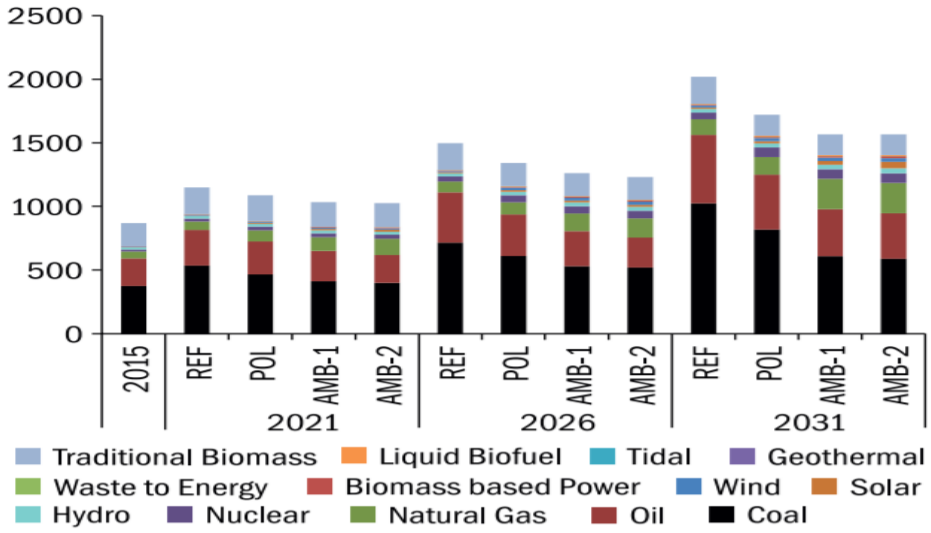

Figure 1: Primary energy supply - Scenario-wise

Figure 1 depicts the primary energy supply by fuel across the four scenarios. Primary energy supply more than doubles under the REF scenario, from 869 Mtoe in 2015 to 2,017 Mtoe in 2031. Coal is expected to remain the mainstay of the Indian energy system, albeit with a significant decrease in its share over the projection period. Primary energy supply from coal falls to 818 Mtoe in the POL scenario by 2031, and 609 Mtoe and 590 Mtoe in the AMB-1 and AMB-2 scenarios, respectively. In the POL and Ambitious scenarios, the share of renewables in the primary energy supply mix rises by 2031. Traditional biomass's share of primary energy supply falls from 20% in 2015 to around 10% in 2031 (across scenarios),

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owing to increased access to clean energy (such as improved cookstoves) and improved quality in rural areas. In the long run (by 2031), natural gas will also play an important role in India's energy mix, particularly under the ambitious scenarios.

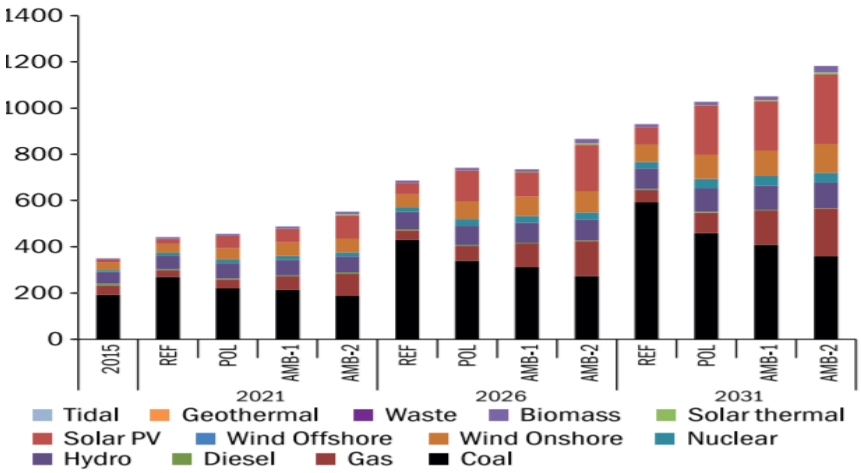

Figure 2: Power generation capacity (GW) - Scenario-wise

Figure 2 depicts the capacity mix of power generation across the four scenarios. Although coal-fired installed capacity is expected to decline significantly by 2031, it remains the single largest source of electricity generation. Amongst renewables, solar based installed capacity increases substantially by 2031, from 12 GW in 2015 to 215 GW under POL scenario, and 220 and 310 GW under AMB-1 and AMB-2 scenarios, respectively. Overall, the share of non-fossil power generation sources increases from about 32% in 2015, to about 46% under POL scenario, and 47% and 52% under AMB-1 and AMB2 scenarios, respectively.

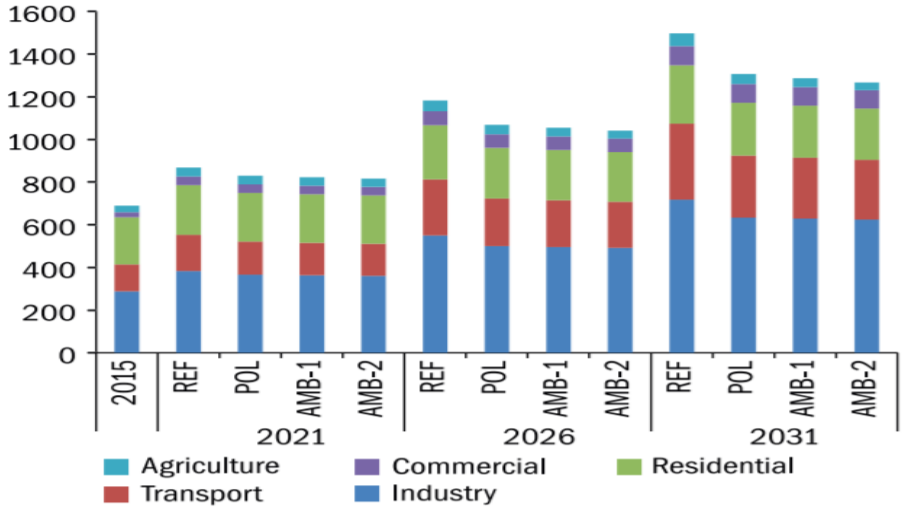

Figure 3:Final energy demand under the four scenarios

The three major energy-consuming sectors, namely industry, residential, and transportation, continue to dominate final energy demand, accounting for roughly 90% of total demand over the modelling horizon under the REF scenario. Energy demand in the transportation

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sector has nearly tripled, rising from 125 Mtoe in 2015 to around 360 Mtoe in 2013. (Under the REF scenario). The final energy demand is reduced in the POL and AMB scenarios due to demand side management measures in various end use sectors.

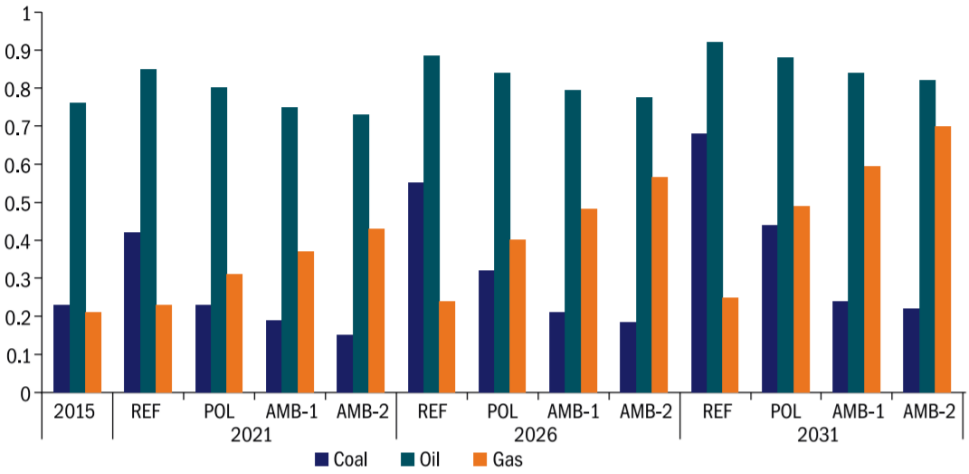

Figure 4: Import dependency

Figure 4 shows that under the REF scenario, coal import dependence increases significantly between 2021 and 2031. However, with an aggressive push on solar and other renewables, coal's import dependency drops significantly from 55 percent in the REF scenario to 19 percent in the AMB-2 scenario in 2031. Oil import dependency remains significant over the modelling horizon, though it decreases marginally under the Ambitious scenarios compared to the POL scenario. It is also worth noting that the increasing share of gas in India's energy mix, combined with serious constraints on domestic gas availability, leads to a significant increase in natural gas import dependency under the POL and AMB scenarios. This has direct implications for the country's energy security, as well as the current account deficit.

4.2 Green Growth and Sustainable Development

As shown in Tables 1 and 2, green growth and development policies have a positive effect by lifting more people out of poverty, thereby influencing key education and health indicators. Increased use of renewable energy (RE), sustainable agriculture practises, improved natural resource management, and structural changes in the industry and infrastructure sectors are among the green growth interventions. The income generated by these measures and new investments is distributed, particularly among rural households, reducing inequality. Additionally, over the modelling horizon, a number of additional skilled and unskilled jobs are created in RE, energy efficiency, and resource efficiency related sectors, particularly under the POL and Ambitious scenarios. In the ambitious scenarios of 2031, a complementary increase in both skilled and unskilled job creation generates incremental income, reduces income inequality across and within rural and urban household classes, and reduces poverty levels by 2031.

Table 1: Effect of green growth on health and education - Scenario-wise

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Indicator	Units	Baseline	Policy Scenario		Ambitious-1 Scenario		Ambitious-2 Scenario	
		2007	2021	2031	2021	2031	2021	2031
Literacy rate (adult male)	Percentage of people ages 15 and above	75.19	76.33	80.29	80.70	86.85	83.13	89.55
Literacy rate (adult female)	Percentage of people ages 15 and above	50.82	55.91	61.50	57.43	64.90	64.90	67.23
Literacy rate (total)	Percentage of people ages 15 and above	62.75	66.41	70.66	71.82	78.17	78.17	82.39
Infant mortality rate (IMR)	Under 5 years (per 1,000 live births)	72.10	34.11	13.41	32.97	12.96	12.96	9.10

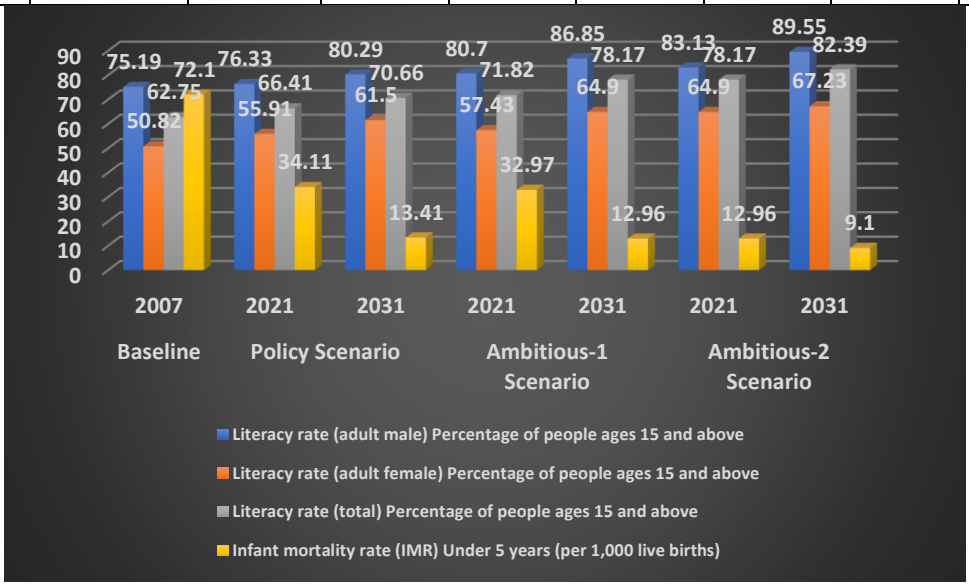

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Figure 5: Effect of green growth on health and education - Scenario-wise

Table 2: Effect of green growth on jobs and poverty - Scenario-wise

Indicator	Units	Policy Scenario		Ambitious-1 Scenario		Ambitious-2 Scenario	
		2021	2031	2021	2031	2021	2031
Poverty	Millions of persons BPL	9.30	8.37	8.09	7.28	7.36	7.06
Number of additional skilled job creation	In lakhs	61	70	63	74	68	79
Number of additional unskilled job creation	In lakhs	24	29	26	31	29	38

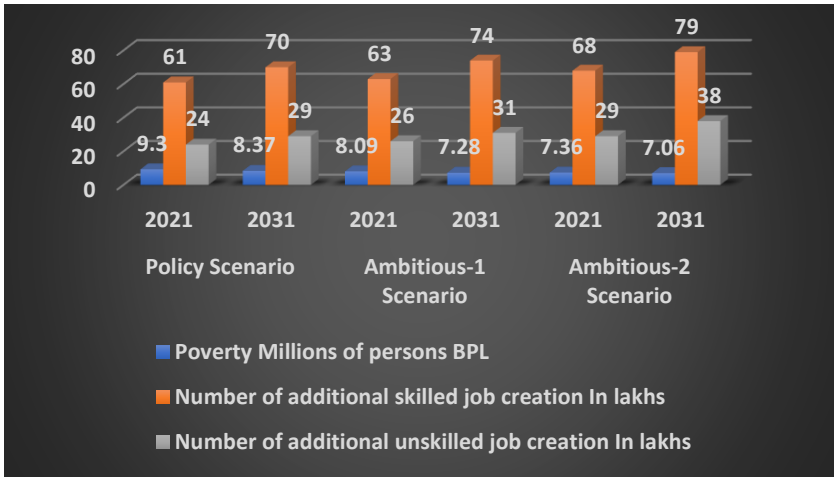

Figure 6: Effect of green growth on jobs and poverty - Scenario-wise

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5. CONCLUSION

The Initiative on Green Growth and Development in India project aims to generate evidence that will allow the Indian economy to transition to an inclusive green growth paradigm of development. The evaluation intends to bring together rigorous studies conducted at the national and state levels (Karnataka). The Energy and Resources Institute's collaborative research project, which is supported by the Global Green Growth Institute, employs an integrated systems modelling framework that has robustly identified opportunities for green growth in terms of efficient use of natural resources, adoption of new technologies, minimization of environmental impacts, and risk reduction. To inform interventions and policy recommendations, a rich mix of quantitative analysis and stakeholder engagement was used. The project benefited greatly from a highly effective project management architecture that included a national steering committee that was supported by the project management committee. Two sets of models are considered in order to understand the links between development outcomes and green interventions. An energy system model was used to examine the supply and demand for energy. TERI-MARKAL (MARKet Allocation MARKAL) is an abbreviation for "MARKet Allocation MARKAL."

REFERENCES

1. Lucret,ia Dogaru (2020). Green Economy and Green Growth—Opportunities for Sustainable Development. Proceedings 2020, 63, 70; doi:10.3390/proceedings2020063070
2. SeyedMeysamKhoshnava, et al (2019). Aligning the Criteria of Green Economy (GE) and Sustainable Development Goals (SDGs) to Implement Sustainable Development. Sustainability 2019, 11, 4615; doi:10.3390/su11174615 www.mdpi.com/journal/sustainability
3. Georgeson, Lucien & Maslin, Mark &Poessinouw, Martyn. (2017). The global green economy: a review of concepts, definitions, measurement methodologies and their interactions. Geo: Geography and Environment. 4. e00036. 10.1002/geo2.36.
4. Olivia Bina (2013). The green economy and sustainable development: an uneasy balance?. Environment and Planning C: Government and Policy 2013, volume 31, pages 1023–1047
5. Acharya, Shreekar&Sequeira, A.H.. (2012). A Model of Green Economy for Developing Countries. SSRN Electronic Journal. 10.2139/ssrn.2192369. Kahle, L.R.; Gurel-Atay, E. Communicating Sustainability for the Green Economy, 1st ed.; Sharpe, M.E., Ed.; Routledge: New York, NY, USA, 2014; pp. 22–24.
6. Kahle, L.R.; Gurel-Atay, E. Communicating Sustainability for the Green Economy, 1st ed.; Sharpe, M.E., Ed.; Routledge: New York, NY, USA, 2014; pp. 22–24.
7. Loiseau, E.; Saikku, L.; Antikainen, R.; Droste, N.; Hansjürgens, B.; Pitkänen, K.; Leskinen, P.; Kuikman, P.; Thomsen, M. Green Economy and Related Concepts: An Overview. J. Clean. Prod. 2016, 139, 361–363.
8. Bailey I and Caprotti F 2014 The green economy: functional domains and theoretical directions of enquiry *Environment and Planning A* **46** 1797– 1813
9. Barbier E B 2011 The policy challenges for green economy and sustainable economic development *Natural Resources Forum* **35** 233– 245

ISSN: 2320-3714
Volume: 3 Issue:3
September 2021
Impact Factor: 11.9
Subject Economics

10. Vazquez-Brust, Diego & Plaza-Úbeda, José. (2021). Green Growth Policy, De-Growth, and Sustainability: The Alternative Solution for Achieving the Balance between Both the Natural and the Economic System. Sustainability. 13. 4610. 10.3390/su13094610.

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