Ups and Downs in Global Green Politics and India's Part in It

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V. Basil Hans

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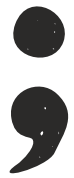

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Preface

The 21st century has witnessed an unprecedented global discourse on environmental sustainability and green politics. From the corridors of power in developed nations to the grassroots movements in emerging economies, the urgency of climate action has shaped policies, economies, and international relations. However, the journey toward a greener world has been far from linear—marked by breakthroughs, setbacks, and geopolitical struggles.

This book, Ups and Downs in Global Green Politics and India's Part in It, delves into the shifting landscape of environmental politics worldwide, examining the factors that have influenced global commitments, the role of major international agreements, and the impact of economic and political changes on sustainability efforts. While many nations have led the charge toward carbon neutrality, others have hesitated or backtracked due to economic and political pressures.

A significant part of this discourse is India's evolving stance in global green politics. As a rapidly developing economy with a growing energy demand, India faces the dual challenge of sustaining economic progress while fulfilling its environmental responsibilities. This book explores India's policies, achievements, and challenges in balancing these priorities. From its leadership in the International Solar Alliance to the debates surrounding its coal dependency, India's environmental journey offers valuable insights into the complexities of green politics in the Global South.

By analyzing the historical and contemporary trends of environmental politics, this book aims to provide readers with a nuanced understanding of where the world stands today in its fight against climate change and what the future might hold. It is intended for policymakers, academics, students, and anyone keen to understand the intricate interplay between politics, economy, and environmental sustainability.

I hope this book encourages reflection and meaningful discussions on the way forward in creating a greener, more sustainable world.

V. Basil Hans

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Chapter 1

Introduction to Green Politics

1. Defining Green Politics

One key aspect of understanding contemporary Green politics is realizing that Green societies are not simply advanced industrial societies that have become environmentally enlightened. Rather, Green politics represents a radical break with the entire worldview and practices of industrial societies. This break is essentially spiritual, philosophical and political. Ecological problems reflect deeper psychological and philosophical problems, most notably an alienation from nature. The cause of environmental problems is thus an entire system of values and attitudes (Nurmardiansyah, 2015). Green politics is based on the recognition that the environmental crisis is not simply a technical problem of pollution control, preservation of wilderness or alternative energy technology. Rather, it is a symptom of a general social and political malaise—the takeover of cultural and political life by centralized bureaucracies and corporations, the domination of the primary process of production by a drive for economic profit, and the substitution of material values for spiritual and ethical values.

The term “Green politics” implies a connection to ecology. In the broadest sense, green principle is to be understood as a commitment to the environment. This environmental principle is part of a broader ideology, “biocentrism,” that places human relationship with the natural world at the center. This ideology is contrasted with anthropocentrism, which considered nature to exist simply as a resource for human exploitation or washing. Biocentrism is based upon the belief in the intrinsic value of all life, not just human life. Early human societies tend to have a reverence for nature. The environment was a conscious aspect of the religious and mythical perspective that provided the context for all life activity. In such a world local ecosystems and species of plant and animal were held to have inherent value, aside from any possible use to human beings. In contrast, industrial societies tend to have a utilitarian and materialistic view of the natural world,

as pre-existing for and ultimately subordinate to the progress of biologically evolved humanity. It is this attitude that has released the present ecological devastation.

2. Historical Development of Green Politics

Green politics, also known as ecopolitics, emerged as a political movement advocating for environmental sustainability, social justice, grassroots democracy, and nonviolence. Its development can be traced through different historical phases:

1. Early Environmental Concerns (19th – Early 20th Century)

- The Industrial Revolution led to pollution, deforestation, and resource exploitation, prompting early environmental activism.
- Thinkers like Henry David Thoreau (*Walden*, 1854) and John Muir (Sierra Club, 1892) emphasized conservation and nature preservation.
- The first national parks (e.g., Yellowstone, 1872) were established, highlighting growing environmental awareness.

2. Post-War Environmental Awareness (1940s – 1960s)

- The aftermath of World War II and rapid industrialization led to rising pollution and ecological damage.
- Rachel Carson's *Silent Spring* (1962) exposed the dangers of pesticides, influencing the modern environmental movement.
- The 1960s counterculture movement promoted ecological awareness, linking it to peace and anti-nuclear activism.

3. Birth of Green Political Movements (1970s – 1980s)

- The first Earth Day (1970) symbolized mainstream environmental activism.
- The Club of Rome's report *Limits to Growth* (1972) warned about resource depletion.
- Green parties emerged:
    - United Tasmania Group (1972, Australia) – The first Green political party.
    - Die Grünen (1980, Germany) – Became the prototype for Green parties worldwide.

- New Zealand Values Party (1972) – Advocated for sustainability-based policies.

4. Institutionalization of Green Politics (1990s – Early 2000s)

- The Rio Earth Summit (1992) led to global agreements like Agenda 21 and the UN Framework Convention on Climate Change (UNFCCC).
- Green parties gained political influence in Europe, forming coalitions in Germany, France, and the Netherlands.
- Climate change became a central issue, leading to the Kyoto Protocol (1997).

5. Contemporary Green Politics (2000s – Present)

- Climate activism intensified with figures like Greta Thunberg and movements such as Fridays for Future.
- The Paris Agreement (2015) reaffirmed international climate commitments.
- Green parties gained more electoral success, particularly in European Parliament elections (2019).
- Corporate sustainability, renewable energy policies, and climate justice became mainstream political issues.

Green politics has evolved from conservation efforts to a global political movement advocating for systemic change. It continues to shape policies on climate action, sustainability, and social equity in the 21st century.

In the early 1980s a new kind of political movement emerged and it became a permanent feature of the democratic landscape in most industrialised countries since then. By now there seem to be few countries where a Green Party or a Green movement does not exist (Rudig, 2019). Already in 1990 more than 90 Green parties and organisations existed worldwide, and many more have been founded since then. The tacit assumption that without a preserved natural state there is no human life either has manifested itself in various forms in all cultures in different historical epochs. But Green parties are the first to have succeeded in expressing this philosophy in a political programme, thus filling a gap that has opened up between the needs of industrial society on the one hand and the rapidly expanding environmental problems on the other.

On the other hand, however, this political innovation coincided with an unprecedented economic crisis that had massive implications for the majority of Green parties throughout their formative years. As a consequence, green party politics were more heavily focused on the national level than it would have been the case under more

tranquil economic circumstances. Nevertheless, already by the mid-1990s environmental politics had to an extent stabilised within many political systems. Pollutants had often reached their peak, and public awareness as well as stringent national and international regulation had brought about a certain 'normalisation' of environmental policies – which also affected the political fortunes of green parties. Hence, one could observe a transformation within green parties along two parallel lines.

3. Key Principles and Values of Green Politics

Although organized Green politics has now existed for over 30 years in some countries, there has been no systematic study of the key principles and values underlying it. The political values and principles common to Green parties and movements, and the ways in which these may differ between countries, have been relatively neglected. Some have argued that "Green politics" is little more than a collection of vague attitudes and sentiments, amounting to a mystical reverence for nature and epitomized in the modern use of green as a political color (K. Alper & J. Salazar, 2002). Green politics is instead viewed as an ideology, distinguishing between individual Green attitudes, the wider Green movement, and the specifically political version of Green politics. This political version is defined as embracing certain tenets unifying Green parties and political movements; for example, the explicit rejection of economic growth as a priority goal, and the advocacy of decentralized, participatory democracy.

The study demonstrates the viability of a systematic approach to the core values and distinctiveness of green politics, drawing upon the beliefs and conjectures of participants in an international conference on Green and eco-socialist political thought. The analysis identifies basic values and orienting principles overwhelming shared by Green parties and movements but does not preclude significant variation attributable to differing contextual features. There is an essential reference to the first green principle, a commitment to the environment, rooted in addressing the corrosive consequences of industrial capitalism and the imperative of sustainable social practices in a social life-world that human beings both make and find (Nurmardiansyah, 2015).

4. Green Political Parties and Movements

The green movement as a society-wide phenomenon began in the late 1970s. However, even as the green movement has gained more popular acceptance, it has generally been the case that the environmental concern of the great majority of the people involved in it has been relatively shallow. The green movement of the late 1970s acquired a variety of party forms, of which there are three main types. The Danish People's Movement

against (nuclear) EU, the Irish Green Alliance, the Norwegian Ecology party, and Ökologisch-Demokratische Partei der Schweiz were plausibly defined as radical green parties.

Green political parties emerged in most west European countries in the wake of the upturn of the green social movements of the late 1970s as well as those in North America, Australia, New Zealand, and the New states of Aotearoa. In adapting to operating as political parties, the original parties had authoritarian structures, simple power elite, and charismatic leadership models being the most common types (Rudig, 2019). The transformation of some green parties from green advocacy groups into professionalized electoral machines and professionalization processes should be understood in terms of enduring organizational features of green parties. Roughly speaking, 1989 was the breakout year of green parties in West European politics. Subsequently, green parties have been more stable features of West European party systems than is generally assumed.

5. Green Policies and Initiatives

Green policies and initiatives are gaining more and more attention in both developed and developing countries. This is an introduction to the field of Green politics. Green politics is a political ideology based on the aspiration to protect the natural environment. Governments, international organizations, and civil society are starting to acknowledge the seriousness of environmental issues and related concerns. While some people believe that the efforts to tackle these problems are inadequate, others argue that technology and development will ultimately solve most environmental problems.

Green policies can be regarded as the basis of Green parties and form the main differences between Green politics and other ideologies. Green parties represent the idea of green policies by trying to give a solution to problems such as air pollution, global warming, soil erosion, and water pollution. Basic policies of Green parties suggest the prohibition of industrialized countries to export toxic products. It is recommended to make use of public transportation vehicles by developing, and it is suggested that intensive agriculture against the destruction of the rainforests be halted. Various energy sources such as nuclear power plants and fossil fuel are not regarded as a correct way to satisfy the energy needs of a country according to the green policy view. Instead, the use of a decreased amount of energy and the supply from natural resources like sun and wind are encouraged. It is proposed that everyone in the world has the right to profit from basic resources and there must be a government to control the production of technology. In this way, natural resources cannot be consumable without considering the needs of the next generation (Unfried, 2005).

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Chapter 2

Rise of Environmental Consciousness

1. Introduction

From an ecological perspective, human activities are inseparable from the natural environment. The rise of a deep level of environmental consciousness has acquired different consequences for people and the earth. The most visible changes are the reduction of green vegetation and the loss of numerous animals and specialized ecosystems that provide benefits to people. Neglect of those environmental issues will cause humans to be excluded from the circle of nature, resulting in the associated chain of problems.

Millennium because the population growth, resource consumption increased, leading to air, soil and water environmental pollution become more serious. Plastic waste contamination the sea increase, and global temperature up, polar sea ice melt, stormy, forest fire and hurricane continue. Humans and global climate have been changing because of industrial structures, fossil energy and deforestation since the 18th century. Developed countries have further developed in the energy, economy, manufacturing and building area after the Industrial Revolution (Zhong & Shi, 2020). Agricultural landscape areas has been reduced and other areas has been turned into wastelands. Prior to 1800, the amount of carbon dioxide in the air was 280 ppm. However, the increase of greenhouse gas concentration has become the primary environmental factor that threatens the earth since the growth of energy in the past 100 years. People's activities are causing the earth's livable environmental problems. There are still various methods and technologies that can use or mitigate the environmental backlash effects. Refraining and reformation the value of consumption, actively reducing waste, rationally using the resources and alternating the pollution sources have become the immediate needs that everyone on earth should actively contemplate and undertake.

2. Historical Context

The significance of environmental consciousness has surged in recent decades. There are myriad propensities and estimations to elucidate modern enthusiasm and care for the globe, all set in a comprehensive, rhetorical, and narratological construction that suggests the beginnings of the asian environmental movement. In the most common narrative, a well-meaning person with intellectual pretensions and a western education makes a trip or two to western nations. In the first world, the splendors invariably include a museum or two and mean streets famously frequented by artists and poets. In subsequent questioning, there will be other individuals; some simply interested in follow-up information and others bullish, eager conspirators who seek also to make a name for themselves. Responses to such suggestive questioning can come in the form of vociferous denunciations of pollution, well-worn jeremiads about global warming, disputes over the causes of the ozone hole, or all of these at once. This caring group of individuals will then, with various degrees of novelty and vision, be said to have come together to form the asian environmental movement (Bell Maclean, 2015).

For the most part, in this representation, the asian environmental movement springs semi-fully formed from the body of worries of air travelers. Prior to the arrival of these understandably impatient people in the asian archipelago, environmental concern was practically nonexistent. Yet to so depict the birth of this care and activism is to fall back upon a broader narrative that necessitates a more demanding rhetoric. Contextualization of contemporary environmental concern renders an exploration of the history of ecological thought and early environmental movements. Tugged and tossed by myriad social, political, economic, and philosophical currents, the notion of what constitutes the environment, or indeed any natural object, is, to say the least, ambiguously defined. Set in this sprawling matrix of proto-environmental awareness and concern, are sown the seeds of those beliefs, ambitions, and policies that shape and bind the physical and conceptual direction of society for centuries. Skin, stone, and plant are molded and cast according to the mercurial dictates of these ideological dollops. Viewing contemporary environmental thought and action through this crucible of time can yield valuable insights and perspectives, providing the contemporary analyst with an arsenal of precedents and practices that guide, encourage, and edify in the complex world of environmental concern.

2.1. Early Environmental Movements

One might recollect that environmental consciousness is quite the hip phenomenon that exploded on the cultural scene in the prosperous West precisely fifty years ago. A predominantly middle-class, counter-cultural blend of holistic beliefs, pseudoscience, or anti-science attitudes and involved but rarely resolved struggles over specific environmental issues. On this narrative, the current Western environmental movement

emerged already mature and almost full-grown peace in point of time, Edenic innocence in point of origin, from the ashes of the Sixties' revolt against pollution, greed and good old bad old war. What appeared to be a sudden consciousness was however inchoate and troubled. The tones of Apollo's lyre were scarcely out, and between inspiration and hecatomb transcendence featured the gulf of unreflective action, bad faith and inarticulate agendas. Recent interest in the older history of organised conservation, ecology and environmental lobbying is a growing trend in the structuration of historical attention. Emerging from the margins of environmental history or the history of science, the first monographs and articles have begun to reconstruct a neglected past dominated by a short list of romantic and aesthetic reactions to dramatic landscapes and dark satanic mills, and a much longer litany of highly practical interventions in the management and preservation of natural resources (Bell Maclean, 2015).

2.2. Key Events and Milestones

For almost a century, the vast, free-flowing Snake River slashed through its canyon. When it reached Hells Canyon's entrance, it was cascading over a miniature version of Niagara Falls. Yet by the mid-1960's, nature had to come second to business for river valleys of the Northern Rivers. Land, lush with virgin pine, fir, and larch, brought prospecting industrial giants; (P. Hays, 1986). The 1970's brought renewed commitment from the federal government to preserve the nation's environmental heritage. However, unlike other deep-seated pockets of wilderness in the United States, the valleys of the North Fork drainage survived their first threat. Yet the river did not escape the federal hydroelectric venture of 1955. Soon the falls themselves were submerged under four hundred seventy feet of placid reservoir.

A renaissance of the American environmental consciousness began in the late 1960's, culminating in the authorization of Earth Week 1970. Yet in this renewed commitment to nature, the land held in the public trust was absent. The zeal to preserve America's heritage only existed where man had ignored and forgotten it. Where resources lay just below the surface, nature had to bow to business. This section will recount the battles, the failures, and the legal victories of land and water advocates, northern Idaho descendents of the nineteenth-century preservationist movement. In light of the mid-action for the Snake, the decisions made and not made may illustrate broader interpretations of administrative and political practices.

3. Factors Contributing to the Rise

Scientific discoveries have tightly paralleled the burgeoning interest in environmental concerns over the past century. The linkage between heavy dirty smog and asthma in the

1950s and the climbing cap of the ozone hole investigated in the 1970s provide the 'proof' of the environmental disturbance. These pivotal events render visible signals of environmental perturbations. As a consequence, the general public gets involved growingly in the arising environmental politics. The ever broadening access to new technologies fosters the spreading of news, warnings and solutions to environmental problems worldwide. This spiral feedback of science, information, and involvement lays the ground for the diffusion of environmental consciousness.

Although physical signals are at the basis of any environmental awareness, the arising concern is also driven by the cultural and human context. The demographic explosion together with the industrial development and pollution is at the basis of the environmental problems. A society more and more stratified between poor and affluence, between North and South, neglected the consequences due to the collective impact on nature (Pol et al., 2024). Although the signal from affected ecosystems needs more time for becoming evident, small populations in remote locations mimic the Canary in the mine. Newspapers and images of devastated lands of native population energize a reflection on the environment's fate. The synergy between physical evidence and cultural drive propels the developing of new attitudes, rules, and conventions still currently opening the path towards the rising environmental consciousness. Last but not least, the growing pressure on natural resources solicit a determined effort for sustainability and the restoration of best practices of conservation and environmental respect over the traditional knowledge and experience. The Eastern philosophies and holistic view of the Western holistic view, do represent a valid drive and endorsement for a new lifestyle based on a return to nature and the respect attitude towards it. To this aim consistency among different cultures often still pursuing conflicting paradigms, is seen as a prerequisite for fertilizing the cognitive approach to the alarming Popperian problems. With this in mind, the interplay among the various factors propelling the environmental movements and the roles of the different states in such a contest is here surveyed.

3.1. Scientific Discoveries

The essential data from the recent advances in ecological and atmospheric sciences necessary for understanding the implications of human actions on the earth are reaching the public today. Researchers have begun to uncover the intimate relationship between industrial practices and environmental degradation. Many controversies have been engendered as a result of these seminal studies, the voluminous research in the interim years, and awareness of the consequences of unchecked exploitation. Tools to facilitate knowledge of the complex and often unfamiliar aspects of the environment as well as new remains of transportation of pollutants into the atmosphere were also developed. This new knowledge has been communicated to the public utilizing a burgeoning variety

of media, and the often-complex data have usually been synthesized into a readily digestible form. Increased recognition of the planet's fragility, burgeoning populations in areas of limited natural resources, and the ubiquity of pollutants all combine to emphasize the urgent need for change. Such knowledge has empowered individuals, the environmental, and ecological movements, and numerous interested community action groups have formed. This resultant increase in general environmental consciousness has been directed towards the achievement of a wide array of proposed solutions and prompted strong reactions from various industrial lobbies. The synthesis and dissemination of this information has often required the application of Information Technology and Communication methods by the scientific community.

3.2. Industrialization and Pollution

Many argue that ecologically conscious events such as Earth Day could only have developed in countries where industrialization had proceeded far enough to permit large numbers of people to lead lives apart from ongoing contact with the natural world. In other words, urban consumers who were no longer much a part of their natural environments would be the ones best able to support ecological organizations. There are, however, reasons to think otherwise about the relationship between industrialization and the rise of environmentalism, particularly on the issue of pollution. Industrialization, with its rapid urban growth and often chaotic expansion, can also bring environmental problems that are no longer avoidable even by those residents who might wish to ignore their surroundings. The nineteenth century, when many modern conservationist movements got their start, saw the explosive growth of industry and cities in the western world. This rapid industrial growth caused the smog, waste disposal, and pesticide problems many urban centers still endure. A century later, such problems are even more rampant and often more dangerous. Thus, from the earliest days of industrialization, environmental problems alongside public concern over those problems grew rapidly. The term "pollution" once had a nonpejorative use in English, coining to describe the refining of raw materials into more valuable goods. By the 1860s, however, pollution increasingly took on its modern meaning. Throughout the western world and indeed in every advanced industrialized, health of the environment began to be openly questioned, becoming so by the last decades of the nineteenth century. Here public health problems associated with concentrated urban industrial growth far outweighed those of earlier invention. And indeed it was this realization, more and more prevalent, that took a toll on the environment would mean a concomitant toll on human health that galvanized the most lasting environmentalist sympathy. The growth of conservation movements in the United States, for instance, was spurred not merely by public sentiment, but by the observable direct damage pollution was inflicting on America's landscape and thus its people. Similarly, in Europe, the first major forays into environmental legislation came from abatement of the industrial practices causing health threats to consumers of water

and the most visibly affected communities. Industrially generated pollution was thus the principal progenitor of the rise of environmental consciousness and its practice in urban centers of the rapidly industrializing nations. These health concerns were the main driving force behind modern attempts at environmental regulations. In the United States, such regulations were galvanized by the wild fires caused by corporate brush burning at oil refineries following an ecological disaster, while in the Soviet Union, it was the highly publicized mercury poisoning of bread in Sverdlovsk. In many ways, media-induced epiphanies over widespread ecological damage originating from corporate activity prompted the Earth Day events of later years, for without this widespread realization of current pollution problems, it would have been impossible to mobilize the support for the types of environmental legislation needed for immediate abatement. On a more mundane level, activism surrounding environmental problems centered around the production process was often, at least in the beginning of the 1970s, quite pragmatic. Pollution, it was bitterly noted, killed or drove away more people than can be said of stumps. Polluted lands and axed mountains can be relatively small parts of the natural ecosystem, but evolved pollution can kill thousands or force them from their homes. In the light of such facts, it was realized that since industrialization in any form was already a vast reality, the only manageable solution would be to ensure that it evolved to at least minimal standards of sustainable practice. Thus, the first environmental restrictions were largely concerned with the manufacturing process, and there was a broad impetus for industry to go green. Purification goods and clean technology filters became all the rage and many modern anti-pollution techniques were piloted in gratitude strategic choices had a profound effect not only on national industrial practices, but on the evolution of industry in general as further expansions in that sphere elsewhere were required. Earth Day activities the most immediate were and have continued to be attempts by concerned grassroots organizations to forestall the development of endangered areas in the wake of early “clean up” legislation.

4. Impact on Policy and Legislation

Since the first Earth Day more than four decades ago, there has been a significant rise of environmental consciousness globally. This awareness increased even more in the late 1990s and the early years of the new millennium. Likely, it has continually grown in the years that have passed since, as many people around the world have become fully conscious of the life-threatening world environment issues. In such a way, the shocking ecological trends that surfaced in the 1990s worked to raise consciousness on a broad scale (Brian Winchester, 2009).

The rapid loss of biodiversity, forest cover, and fresh water in many states was now an acute crisis. The gradual global warning of Earth’s climate and the thinning of its

protective ozone layers showed where the world was headed in the coming centuries. All of these were and continue to be matters of utmost global concern. In response, a formidable array of laws and treaties over environmental management and conservation as well as environmental protection and pollution control have been enacted at global and national levels. There has also appeared a motley yet increasingly influential multitude of environmental lobbies, NGOs and members of global civil society keen to advocate policies and exhaust legal measures in defense of the life-support system.

5. Future Prospects and Challenges

The development of environmental consciousness has made great strides in recent years. Among both public discourse worldwide and international policy-making venues, the issue of environmental protection has taken on increasing importance, indicating the beginning of an irreversible global trend. Thanks to the multiplying efforts to raise public awareness and growing mobilization for concerted action, a wide array of measures supporting global and local environmental gains are underway. Meanwhile, the development of environmental ethics has started to challenge existing modes of production, consumption, and design, providing grounds for rethinking and reshaping human's relationship with the rest of the Earth.

New generations of young individuals have been brought up in a more environmentally concerned and ethically pragmatic way, converging on a global cultural shift toward a more ecological morality. Casual actions, as long as they remain inauthentic and uncommitted, may collaborate with an ultimately market-oriented mainstreaming of environmental commitments (André P. et al., 2022). Technological innovation has represented the engine for the enlargement of environmental horizons for thousands of green jobs reshaping the late capitalist economies. Thanks to a more refined epistemic (eco)system, environmental issues have gotten more and more under control, unlocking the spellbound gates of a disciplined (eco)consciousness. Hedging human health against a changing climate may represent the strong front on which environmental referees can decarbonize the global industry, steering way clear of any ecological fouls. Various tailor-made, military-inspired modifications of the Earth’s complexion, dubbed geoengineering, have entered the contemporary imagination, benchmarking a paradigmatic shift from the down to Earth collateral household care of runaway side-effects. Measures to curb over-exploitative practices and safeguard harvests for future generations have been prompted worldwide, hailing the successful efforts of environmental diplomats aspiring to envision Ross’ ever-renewing angels in the harmonious society of nations. Yet, the ecological optimism fuelling this bright ideology still appears as only partly warranted; its embrace deeply marked by contingent and parochial circumstances and imageries. On the other side, the past century saw

widespread outbreaks of environmental damage; more alarmingly, the rate of this narrenspiel seems to have accelerated, morphing environmental policy into an empire of talking shops and ethical governance into a metapsychosis parody.

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Chapter 3

Major International Agreements and Their Impact

Here are some major international environmental agreements and their impacts:

1. Paris Agreement (2015)

- **Goal**: Limit global warming to well below 2°C, preferably 1.5°C, above pre-industrial levels.
- **Impact**:
    - Countries set their own emission reduction targets (Nationally Determined Contributions, NDCs).
    - Increased global commitment to renewable energy and climate adaptation.
    - However, some countries struggle to meet their targets.

2. Kyoto Protocol (1997)

- **Goal**: Legally binding targets for developed countries to reduce greenhouse gas (GHG) emissions.
- **Impact**:
    - Led to the creation of carbon markets.
    - Paved the way for future climate agreements.
    - Criticized for not including major emitters like the U.S. and China.

3. Montreal Protocol (1987)

- **Goal**: Phase out ozone-depleting substances (ODS), such as CFCs.
- **Impact**:
    - Successfully reduced ODS emissions.
    - The ozone layer is recovering and is expected to heal by 2060.
    - Considered one of the most successful environmental agreements.

4. Convention on Biological Diversity (CBD) (1992)

- **Goal**: Protect biodiversity, promote sustainable use of natural resources.
- **Impact**:
    - Led to national biodiversity action plans.
    - Helped in the conservation of ecosystems and species.
    - Some targets, like the Aichi Biodiversity Targets, have not been fully met.

5. Ramsar Convention (1971)

- **Goal**: Conservation and sustainable use of wetlands.
- **Impact**:
    - Over 2,400 wetlands designated as Ramsar sites.
    - Improved water management and ecosystem protection.
    - Enforcement and funding remain challenges.

6. Stockholm Convention (2001)

- **Goal**: Reduce and eliminate persistent organic pollutants (POPs).
- **Impact**:
    - Phased out hazardous chemicals like DDT and PCBs.
    - Reduced environmental and health risks.
    - Implementation challenges in developing countries.

7. Basel Convention (1989)

- **Goal**: Control transboundary movements of hazardous waste.

- **Impact**:
    - Reduced illegal dumping of toxic waste.
    - Encouraged recycling and proper waste management.
    - Some countries still struggle with enforcement.

8. UN Convention to Combat Desertification (UNCCD) (1994)

- **Goal**: Prevent land degradation and desertification.
- **Impact**:
    - Supported sustainable land use in arid regions.
    - Launched initiatives like the Great Green Wall in Africa.
    - Limited success due to financial constraints.

Overall Impact of These Agreements

- **Successes**: Improved global awareness, policy changes, and some measurable environmental improvements.
- **Challenges**: Enforcement, lack of funding, political resistance, and slow implementation.

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Chapter 4

Political and Economic Challenges in Green Transitions

1. Introduction

As the threat of climate change looms and planetary boundaries approach irreversible tipping points, transitioning to greener modes of production, consumption, and living has become one of the greatest challenges of our time. Despite widespread environmental policy reforms in response to such challenges, some candidates of green transition find political and economic changes necessary to sustain green reforms hard to implement. For example, the perceived distributional impacts of combating climate change and environmental degradation have been important elements in igniting opposition and undermining some of the most promising initiatives to reduce greenhouse gas emissions (V Hernandez Serrano & Zaveri, 2020). Furthermore, the gap between political commitments to addressing environmental challenges, on the one hand, and a lack of policy coherence in this direction, on the other, has fuelled the belief among some that societies are unable to self-regulate effectively, not least to address climate change, which is one of the most daunting policy dilemmas in the whole history of representative democracy. This essay investigates the challenges green transitions face within such a complex environment by simultaneously reflecting on empirical findings and theoretical developments in both political economy and ecological economics. Various economic frameworks suggested in the discourse of environmental policy diffusion are utilized to systematically develop a political economy perspective on green transitions. For the first time, these economic frameworks are then complementarily embedded within selected political theories to generate a multi-disciplinary framework capable of unveiling the interplay between ex-ante political actions and ex-post economic outcomes in fostering green transitions. The open research agenda arising from this framework seeks to extend the existing literature on the difficulties of successful green transitions.

2. Theoretical Framework

Current societal debates on green transitions to sustainability mirror the scientific and public discourse on the subject. The respective disciplinary discussions, it might even be said, revolve independently of each other; economy concerning employment and value adding, ecology concerning resource consumption, pollution, and biodiversity, and political science concerning public goods, accountability, and legitimacy. At the same time, the environmental crisis poses a very concrete challenge to sustainability: access to energy that does not conflict with future generations' access to life-sustaining ecosystem processes. The focus, then, is not on global climate change, but on the economic and political implications of phasing out fossil energy carriers, which account for the predominant burden of direct resource damage. However, the point of departure for the discussion is not the state of knowledge of economic or technical and natural sciences, but of political science and theory on governance of environmental issues and public goods (Köhler et al., 2019). The interplay of environment and governance has been analyzed in a great many theoretical models that differ in their determinants and expectations.

Green transitions are characterized by a necessary change of goals and means of modern society's economic production and consumption, emphasis on sustainable development refers to a large spatial and temporal reach. Trends, behavior, and institutional behavior that significantly increase the risk of adverse securitization are the key concerns of politics and governance in the transition context, non-sustainability, or unsustainability denotes the heuristic counter-factual hypothesis that a continuation of trends, behavior, and institutions will increase environmental threats. Lack of sustainability can be identified and acted upon by the means of three theoretical perspectives as well as by their respective differentiations, these descriptors address the lack of sustainability as concerning environment, consumption, and pathways of preference formation, as market failure, as biased institutions and as opposition bias. The combination of these descriptors leaves various aspects of lack of sustainability aside or obscured, recent research has tried to broaden in two respects the analytical perspectives on the lack of sustainability. Issues that have not been fully addressed in conventional models are considered and established concepts are refined in order to better match real-world observations.

2.1. Green Transitions and Sustainability

Environmental awareness and economic structures promoting sustainable development currently undergo a dynamic period, constructing strategies to mitigate impacts of human activity on natural environment. The common goal of this approach rises in reducing environmental footprints and slowing deleterious ecological changes—commonly addressed as green transitions. This concept is intimately related to sustainability, an overriding principle for shaping global development in the past decades.

Sustainability targets long-term development trajectories that meet present societal needs, without compromising future generations. The conference "Our Common Future," held in 1987, states the most commonly cited definition of sustainability, thereby pointing to the need for regarding the balance of environmental, social, and economic goals shaped by an integrated dimension. In response to the over-exploitation of resources, this concept has sparked a movement supporting the equality and interactivity of the three dimensions mentioned above (Ryszawska, 2016). Thereby trails of assessing green transitions have to be broadened and encompass multi-color analyses to address diverse goals.

Without doubt, current patterns of production and consumption are not sustainable. Nevertheless, ongoing attempts to promote lifestyles, technologies, and routines in congruence with sustainability objectives are challenging. Policies and strategies attempting to diversify energy production, restrict emissions, or reduce electricity and heat consumptions are frequently met with reluctance or battles. A widely accepted agreement on the environment and the strategy of social and economic development is instead still outpaced by economic interests and exploitation traditions. Thus, environmental issues are still subordinated to economic and social considerations, which perpetuates numerous problems and limits the ability to find solutions. Agendas and protocols on an international scale stand in defiance; therefore, the scientific community is searching for new arguments that are accentuated by a wide consensus and should intensify the step of pursuing solutions in agreement with ethically grounded common-known truths.

3. Political Challenges

The complexities of a transition to a green economy, as well as issues in the path towards 2030 (and beyond), are discussed in the national and international settings. The issues addressed are observed after pointed feedback from key stakeholders of the Steering Committee and more than 300 participants of two conferences which took place in Berlin

and Paris during 2010. Afterwards, additional consultations with business, trade unions, and think tanks fed into this discussion.

The section is structured along four priorities for action in the period ahead: - political challenges, - economic ones, - emerging (new) issues arising in the public debate, and - those particularly relevant for science (including research and capacity-building needs).

Although the transition to a green economy is first and foremost an economic and social challenge, the role of political circumstances is emphasized in this section. This is due, in part, to the recent financial and economic crises which fuel political uncertainties and increase the complexity of the political decisions required to drive the green transition. It is also due to advice which suggests that getting an ambitious green growth strategy is as much a political task as an economic one. The first aim is to discuss the political challenges in the transition to a green economy. It is suggested that moving toward sustainable development implies bringing the environment onto the political agenda in a unified manner; this demand enables advocacy for a very broad perspective on society and the economy, as well as a multidimensional vision of the global challenges ahead. Of particular concern are the disparate views on growth, prosperity, fairness, and governance which are at the core of the political strife around the role of the markets and the state.

3.1. Policy Implementation

This subsection examines policy implementation in the context of governmental and political economy challenges to green transitions . Policy implementation is the process of translating policy goals into actual outcomes. This process entails a number of stages, including program design, public procurement, training programs and outreach, monitoring and evaluation, and the development of improved policy through learning and experimentation. At each of these stages, government agencies must utilize a variety of tools including formal regulations, capacity-building efforts to develop technical staff competencies, prepared statements, and contracts for service providers. Government officials from the ministerial department must also engage with a multitude of outside stakeholders, including the parliament, businesses, and NGOs. As a result, policy implementation often requires coordination of activities across multiple agencies and tiers of government. This process of coordination and negotiation can be a significant source of delay and opportunities for influence or outright violations and corruption. Policy implementation failures can occur due to lack of resources, administrative capacity bottlenecks, poor coordination between state and non-state actors, perverse incentives generated by the policy, lack of political commitment of crucial actors, and failure to generate broad public support.

Transparency is important in all of these areas. Effective monitoring and evaluation require data on policy outcomes to be shared with the policy analysis community. Fair and impartial implementation requires the process to be transparent to all stakeholders. Indicators for compliance with green transition reforms include monitoring disclosure compliance rate, crime scene and procurement control, and insurance, among others. Analyzing each of these challenges, it is possible to identify a related set of strategies for growing stakeholders looking to influence green transition reforms. Political commitment induces actors to make the necessary resources available to carry on the conditions precedent to successful implementation, and there are a number of tools for leveraging political commitment including public and high-profile documentation calls, authority reporting, and social marking.

4. Economic Challenges

The economic challenges in shifting to environmentally- and socially-compatible development paths are considerable (Kemp-Benedict, 2014). Many appear as financial obstacles, but there are also technical issues involved. This broad set of issues cannot be thoroughly investigated within the scope of this work. Rather, the following will provide an initial survey, including critiques of standard approaches, the identification of difficulties, and an exploration of some of the components of a more constructive approach. Most obviously, environmentally- and socially-sound technologies may simply cost more than their unsustainable alternatives. This is fundamentally an obstacle on the demand side, regardless of any other market dynamics that might be involved. For this reason, mechanisms such as combinational "package policies," which sport "an unconditional mix of economic, fiscal, regulatory, and social promotional policy measures" can sometimes make the difference. In any case, the issue of demand-side economic obstacles is addressed below in a more systemic context. While much of the consideration here is given to true externalities where it can be unequivocally demonstrated that market mechanisms and more specifically tendencies toward competitive equilibria are misdesigned, the environmental economic literature's exclusive focus on externalities and public goods is found to be far too narrow. This restriction results from the general adoption of standard functional forms and the Kähler-Manne condition. However, the "classical" industrial organization approach that these models are founded on are simply not valid. This critique will begin with market power issues and the broader concerns arising from entitlement-based approaches to the environment. Significant discussion will also be reserved for the problem that environmental policy often conflicts with the precepts of other economic policy. For example, rigid monetarist approaches to inflation must conflict with environmental policy's requirements for encouraging competition and recycling. Attention will also be

given to ensuring that public financing decisions do not inadvertently support a brown environmental agenda. While desperately necessary changes are delayed, the fact is that even the current system can only be addressed at a global level, where economic disparities and the question of access to necessary markets are exacerbated. The discussion of economic obstacles must then be followed by a consideration of financial system matters. Beyond broad-based taxation for funding the ecologically sustainable projects themselves there remains the issue of how, in a sustainable world, other types of projects are likely to be funded. The task of somehow enabling an economic (market) system parallel to a set of stabilisation goals involving exogenously-set conservation targets would seem to be exhausting enough. But this question is further complicated by the fact that there remains an important role in the post-Kyoto climate change regime for a trading mechanism between public and private entities.

4.1. Investment and Financing

In the context of ongoing climate change, social benefits are anticipated when green transitions take place which can often materialize in the long term. Despite this anticipation of social benefits, green transitions often require a huge, upfront investment with benefits that only materialize slowly over time. These features of green transitions make them particularly vulnerable to market failures and hard to finance because of the mismatch between the scale of the required investment and the quantity of available liquid savings for investment. Long-term assets, like housing, transportation, infrastructure, agriculture, industry, and energy, are at the heart of green transition. The promotion of investment in sustainable assets would come naturally to overcoming financing needs of the green transition. However, such investment are hampered by existing liquid savings that are overwhelmingly used for speculation rather than sustainable investment. In a nutshell, the capital stock will have to be largely renewed within a generation while a flood of easy money is channelled into existing long-term assets, keeping their prices constantly inflating. As a result, the required green investment receives little attention since it is comparatively riskier and has a lower anticipation of short-term profits (Murau et al., 2022). General investment needs are agreed to be substantial across various sectors (green assets), including renewable energy, green buildings, public transport, agriculture, water, forestry & fishery, recycling, R&D, training, and education, among others. In this respect, a fundamental contribution should come from sector-specific finance that can help finance (at the right cost and tenor) not just the marginal but also the vast majority of sustainable initiatives that are becoming economically feasible. In this way, the unsatisfied demand for investment in sustainable development should finally see a financial facilitation that currently is not in place. This general framework suggests that intervention in financial models and mechanisms of funding of investments are crucial aspects for the successful promotion of green transition since they can both unlock and direct the private sector

into the desired green paths (Pietri, 2022). There is growing recognition of the importance public finance should have to leverage broader investments. Current policy focuses on establishing carbon prices and fostering the right market for green investments in renewable energies. Although essentially right, these measures might overlook that the cost-effective solutions are not necessarily aligned with the decarbonization and sustainable development goals. On the other hand, they run the risk of overly focusing on particular green economic activities, sometimes leading to crowding out effects, the adoption of consensus or non-spillover innovative technologies, or the usual financings of 'green-washing' investment strategies. Instead, interventions in financial plans should leverage public finance to help create and direct the finance-demand markets for broader green transitions, effectively channeling the finance into sustainable initiatives that are economically feasible and require funding.

5. Case Studies

This section presents case studies to provide real-world examples of the political and economic challenges in the transition to a green economy. The selected case studies cover a range of geographical contexts including England, Germany, Japan, the United States, and the European Union. Similarly, they explore a mix of both successful and failed initiatives, looking at both national level policies as well as to regional and city-level approaches. The purpose of the case studies is to delve into the political and economic dimensions of green transitions faced in different contexts. This empirical groundwork aims to provide a deeper understanding of what factors play a role in both driving, and inhibiting progress towards a green economy. By focusing on empirics over theory alone, it is hoped that lessons emerge for overcoming political and economic barriers that can in turn contribute to future and better-theory building.

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Chapter 5

The Role of Major Global Powers

The Role of Major Global Powers in Green Politics

1. Introduction

The number of states and non-actor entities focusing attention on global green issues was increased because of the recognition that environmental problems have the capacity to negatively affect global, regional, and domestic politics. Indeed, when one considers security and transborder issues, both civil and military sources of environmental problems are seen as the most important. Rapid changes in the environment are also posing problems in terms of production, international trade, consumption, demographic movements and migration.

How current major global powers respond to these and other environmental challenges, and how they try to transform these into political tools, are important questions. The relations of the states in general and particularly global actors with the environment and the tools of these relations are questions to be discussed in relation to the escape capacity of global and regional environmental problems that cannot be solved by unilateral environmental schemes. There is no doubt that extra-regional environmental problems, particularly the problem of climate change, and the possible results of the rise of the sea level, should be resolved with the cooperation of states, and especially of the scientific, diplomatic, and technological resources of the global actors. Evaluation of the profound environmental policies, which are likely to be more intensely involved in global politics in the coming years, can be started by illuminating the significance of the environmental problems in the international relations area.

The fact that environmental problems are global is generally accepted, even though the scale, the intensity, and the appearances of these problems may differ from one region to another (Hafezi et al., 2024). The irreversible consequences of the environmental pollution, damage to the range of living conditions as a result of industrialisation, urbanisation, and, malfunctioning technology, and the rapid degradation of renewable

and non-renewable natural resources, including soil, water, air, forests, and biotas, give rise to concerns that push the environment to the top of the public agenda in a growing number of countries. The increasing rise of disputes and tensions in water sources over water, soil, pasture, and minerals resources are likely to shift territorial and boundaries Free of charge because of the intensity of the disputes. Squabbles have rendered interest in approaching an issue of international politics and security concerning conflict and cooperation. The environmental dimension of the international relations area includes three more specific areas, concerning: (1) the effect of state-environment relations on foreign policy structure and behaviour; (2) the impacts of more general international relations on global and regional environmental policy, and (3) how the arena of environmentalism could contribute to the change in existing paradigms in the international relations. There are a number of atoms typical of the Third World political geography, which affect the international relations and the approaches to global environmental issues. Political considerations and practices such as competition, friendship, and conflict, are not entirely reducible to the result of material processes and human behaviour for satisfaction of universal needs or edicts but are also conditioned by the specific histories of certain territories and the social property relations that sustain them (Sussman, 2013).

2. Historical Background of Green Politics

Emerging in the latter part of the twentieth century, environmental politics has become a core component of global governance. Transecting North-South divides, green politics encompasses a broad range of actors—from right-wing conservatives to radical activists—in arguing that the environment should be protected for the sake of humanity. The sweep of green politics worldwide, however, has occasionally masked the exact role that different global powers play in these processes. Addressing the lacunae in existing research regarding the theoretical conceptualization and empirical analysis of Major Powers' role in green politics, this article is the first to explicitly engage in these issues (Posocco & R. McNeill, 2023).

Saving the environment is an old concern. Already in the late 19th century people worried about the health effects of breathing air filled with new artificial particles and in the 1960s population control became a widespread demand all over the world. Based on that, one could say that environmental politics is almost as old as regular partisan politics. However, the apolitical rise of the environmental movement in the late 1960s complicated the democratization process. While the post-war industrial boom was pushing already developed nation-states further into prosperity and claiming that industrial products were the key to wellbeing, grassroots movements were rising all around the globe demanding the contrary. Industrialization also demanded urbanization,

meaning people going into big cities to work in factories, leaving smaller towns and rural areas. Then, mobility was rising, and car production had its highest growth rate ever. This was the perfect storm for the environmental problems to arise. Prior bills worldwide did not take much into consideration the pollution caused by the ambitious industrialization targets, thinking that it was an unavoidable side effect of the future development. Meanwhile, the environmental movements were growing, causing all sorts of havoc around the globe. Police would fight back by brutally attacking protestors, causing potential harm to reporters and passers-by, normal people, who would sympathize with the movement right after seeing senseless violence performed by the state against passive-agressive "proterrors." That garnered mass support all around the globe, eventually becoming too costly to keep ignoring the environmental demands. Preceded by the American from the early 1970s, nation-states coerced by protests were creating what would become the first environmental agencies. In the beginning, those environmental agencies did not have much power, but still, international norms were being written regarding the environment. Initially it was not taken very seriously, such as simple agreements towards reducing pollution in big cities. But international attention was ultimately given, and treaties with more concrete actions names came to flourish.

Given the many advantages of grassroots movements, there was a broad perception of success that turned environmentalism into a very popular policy. Silence followed, but not the policy itself: it became clear that principles of the movement were taking place; goals were being reached. On the other hand, maintaining the current economic growth was just too costly (if not impossible) to be preserved. Environmental regulations harmed a lot of industries (energy transformation being hit the hardest). At this point in time, environmental parties had the majority in most regular political positions, causing them to take a position that was the contrary of their former principles: capitalism and environment should never even touch each other. Nontheless, despite the business-friendly environment policies, much of what the movement fought for had already become deeply rooted in most nation-states' legal systems. Keynesian constructions were made regarding nature and energy to ensure a surplus of resources to turn essential if economic disasters were to happen. This way, one of the main principles of the movement was guaranteed by the state. The basic endurance of nature was also protected; conservation programs were initiated to the hopes of creating a vast emergency fund of nature to be used in times of despair. These programs made the two remaining major companies of the "energy pollutants" to seize fire. It was then proposed a radical innovation straight out of the utopian books of Heinlein: the production of atomic energy by fusion. Praise was immediate and worldwide, and an underdeveloped nation not yet roped in the conservation projects began to gain the international respect and admiration. This ultimately culminated in the creation of an award program called the "Nobel Prize of Environmental Protection," with the specific purpose of awarding

the one that most contributed to the world for the wellbeing of the environment. Two prizes were given after WWIII: one for the former helped for the mitigation of the USSR's desertification, and one for the later helped slowing down terraforming undertaken by the Americans in Africa. In the endless efforts to keep that nation-state from gaining too much power and challenging the international status quo, the Americans proceeded to help that nation-state as much as they could with technology, advisers, and a lot of money. The result was an overall boost in welfare and GDP growth for that nation-state, which had suddenly become a self-sufficient environmentally friendly industrial powerhouse.

3. The Emergence of Major Global Powers in Green Politics

Recent research has shown that, as green politics have become more established at the global level, previously reticent nation-states have been forced to bring their national environmental policy into line with internationally defined green issues, simultaneously embracing environmentalism. This has led to a more active environmental diplomacy by the new global environmental powers as well as by other smaller, less influential countries, setting a global environmental agenda that is dictating a new global environmental governance. The alignment of global and national environmental policy is being elaborated through diplomacy, through strands of discourse linking sustainable development to trade, aid, debt and other forms of capital flow, and through strategies of North–South cooperation, largely articulated and initiated at the international level through international organizations (Posocco & R. McNeill, 2023). This paper secondly explores the various ways in which the five permanent members of the UN Security Council are integrating green issues into their own national agendas, the range and nature of the conflicts and/or congruences that may arise in the process, and the larger implications this has for the interfacing of the global and the national in the governance of the environment. Special emphasis is placed on the cases of the USA and France to illustrate the strategic and integrated way in which global environmental matters are being promoted at the international level. The main unpredicted outcome of this activity, however, is the rapidity with which global diplomatic initiatives are locked into global norms. Thus, global initiatives on green issues have taken on an autonomous logic, shaping both the space in which individual states must act, and the range of polices that can be pursued.

4. Case Studies of Major Global Powers' Green Policies and Initiatives

The United States entered “green politics” under Barack Obama, when the U.S. administration started to address climate change. In anticipation of the Paris climate summit 2015, China announced a number of nation-wide initiatives: a commitment to peak CO2 emissions no later than 2030; an increase of energy from non-fossil sources to about 20% by 2030; a commitment to build up 4.5 million km of forest; a commitment to establish a South-South Climate Cooperation Fund and a China-Britain-Green Investment Fund; and an announcement to set up a national cap-and-trade system. Brazil legislated important conservation measures, e.g. in 2005 introduced the Legal Land reserve and complementary deforestation levels and in 2010 the National Policy on Climate Change. Over the past few years, India has taken some significant steps to address climate change. The 2015 Paris agreement sets in place a tectonic shift in global climate policy architecture and is likely to spur governments to deepen their efforts. However, countries must boost their efforts if they are to limit global temperature rise to 3.6°F (2°C) above pre-industrial levels. At the same time, cleaning up air pollution is, and will remain, a global imperative (Schmitz, 2016).

Russia is fully engaged in green practices, as testified by its initiatives on organic agriculture, protection of the environment in Baikal region, Pacific region and Sochi National Park, reservation within the territory of the Russian Federation of specially protected natural territories, and protection of red data species, as well as initiatives on energy saving that Russia pursues in the G-8 and U.S.-Russia Bilateral Presidential Commission. The “activated” green politics praxis of major global powers is putting into question this spatio-temporary scenario, i.e. it has influenced its former habits. Each of the case studies so provides insight into the mode of “activation” of this panel of major global powers ship in the field of green initiatives. Green agendas are hereby examined and success and failure of these countries to effectively use this mode of insertion into international system are placed under the microscope.

At the centre of the analysis of green politics is a contention that it is instituted by a certain state or group of states. According to this view, environmental concerns and constraints may move states into forging collective policies imperative to the preservation of the biosphere. Such policies would seek to resolve or ameliorate conflicts brought about by environmental problems, such as: habitat degradation, deforestation, desertification, and depletion of ozone, and in a manner consistent with the maintenance of Capitalocentric Material Reproduction (CMR) founding the current world order. Employment of a bio-political framework would enable an elucidation of the structural parameters and imperatives of international governance required to maintain the species being and create parameters of a new, resilient mode of global community.

5. Challenges and Opportunities for Major Global Powers in Promoting Green Politics

Green politics have been gaining prominence across the globe due to environmental hazards. There are ample reasons for people to be engulfed in the storm of green politics with the continuing serious environmental issues, urge for a healthy life, and well-being of future generations. In this background, it has become the responsibility of major global powers to take initiatives for the greening of their domestic as well as foreign policies. It is the ultimate hope that global powers, considering the increasing need for the sustenance of global commons and strategic national interests, will head toward the broad spectrum of green politics.

Major global powers that have competitive advantages in green politics due to their economic prosperity, well-built infrastructures, and institutional capabilities can perhaps prove to be the game changers. Taking into account both traditional as well as modern security issues, they have the potential for the greening of their security policies. Since the green movement is not just confined to domestic politics, much can be done for the greening of foreign policy. Global conscience toward sustainability is not confined to domestic matters, but it is expanding through the greater sphere of global interdependence and common interests. Cooperation on salient global issues can further strengthen global harmony, which in turn would make a happier and peaceful world. Disputes on territorial issues and the settlement of global commons can be made the cornerstones for the joining of hands. Promoting the green components at the peace table discussions is a pressing concern that global powers should take into account. Environmental refugees are also a common outcome of unresolved conflicts on territorial disputes. So to keep things on the green side, global conflicts on borders and territories must be resolved amicably.

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Part II: India’s Role in Global Green Politics

Chapter 6

India’s Environmental History and Policy Evolution

More than most varieties of history, environmental history is an interdisciplinary project. Many scholars in the field trained as geographers or historical ecologists. In addition to the customary published and archival texts of the standard historian, environmental historians routinely use the findings culled from bio-archives (such asFirst is the study of material environmental history, the human involvement with forests and frogs, with coal and cholera. This entails study of the evolution of both human impact on the rest of nature and nature‘s influence upon human affairs, each of which is always in flux and always affecting the other. This form of environmental history puts human history in a fuller context, that of earth and life on earth, and recognizes that human events are part of a larger story in which humans are not the only actors. In practice, most of the historical work in this vein concerns the last 200 years, when industrialization among other forces greatly enhanced the human power to alter environments (Natarajan,2024.).

India's environmental policy evolution started before independence with a focus on conservation and resource management, gradually progressing to more comprehensive legislation like the Wildlife Protection Act of 1972, followed by the landmark Environment (Protection) Act of 1986, which empowered the government to tackle pollution and protect the environment across various sectors; this marked a significant shift towards a proactive approach to environmental protection in the country.

Indian Supreme Court has underlined the need of sustainable development and the preservation of natural resources in a number of its judgements. Due to these choices, laws like the National Forest Policy in 1988 and the National Environment Policy in 2006 were created. India has also taken steps to promote global environmental cooperation. The United Nations Framework Convention on Climate Change

(UNFCCC) and the Paris Agreement are two of the international agreements and protocols that the country has ratified. India's willingness to solve global environmental concerns and support sustainable development is seen in these agreements. Despite these successes, India still has several challenges in putting its environmental laws and policies into practice and enforcing them. Effective environmental governance is nevertheless hampered by weak enforcement measures, a lack of public knowledge, and the need for better agency collaboration. The nation also faces particular challenges as a result of its substantial population, rising urbanization, and industrial growth. In order to address these challenges, India must concentrate on bolstering its institutional structures, raising public engagement levels, and encouraging sustainable practises. Effective implementation and enforcement of environmental laws and regulations at all levels is crucial. To handle new environmental issues, it is also vital to continuously monitor, assess, and revise current legislation (Meena & Maikhuri, 2023).

Key points in the evolution of India's environmental policy:

- **Pre-Independence Era (before 1947):**

Early laws like the Shore Nuisance Act (Bombay and Kolaba), Elephant Preservation Act, Fisheries Act, and Smoke Nuisance Acts in different regions focused on specific conservation issues.

- **Post-Independence Era:**
    - **Focus on Wildlife Protection:** The Wildlife Protection Act, 1972 was a crucial milestone, establishing legal protections for endangered species and wildlife habitats.
    - **Pollution Control:** The Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981 were enacted to address water and air pollution concerns.
- **The Environment (Protection) Act, 1986:**

Considered the most significant environmental legislation, providing a broad framework for environmental protection, including the power to regulate industries, control pollution, and establish environmental authorities.

- **Further Developments:**
    - **National Forest Policy, 1988:** Focused on sustainable forest management and tribal rights

- **Coastal Regulation Zone (CRZ) Notifications:** Regulating activities along the coastline to protect coastal ecosystems
- **Forest Rights Act, 2006:** Recognizing the rights of forest dwelling communities
- **National Green Tribunal Act, 2010:** Established a specialized tribunal to address environmental disputes efficiently

Key factors influencing the evolution of India's environmental policy:

- **Growing environmental awareness:**

Public movements and increased concern about environmental degradation played a crucial role in pushing for stricter regulations.

- **Economic development:**

Balancing economic growth with environmental protection became a major policy challenge.

- **International agreements:**

India's commitment to international environmental treaties like the Convention on Biological Diversity influenced domestic policy.

Here's a brief overview of India's environmental history and policy evolution:

1. Pre-Colonial and Traditional Environmental Practices

- Indigenous communities followed sustainable practices like sacred groves, water harvesting (stepwells, tanks), and biodiversity conservation.
- Ancient texts (e.g., Arthashastra, Vedas) mention environmental ethics and sustainable resource use.

2. Colonial Era (1757–1947)

- British rule prioritized resource extraction (deforestation for railways, commercial agriculture).
- The Indian Forest Act of 1865 and 1927 centralized forest control, restricting traditional forest access.

3. Post-Independence (1947–1970s): Industrialization and Environmental Concerns

- Rapid industrialization led to deforestation, pollution, and degradation.
- The National Forest Policy of 1952 emphasized commercial forestry over conservation.
- Major environmental disasters, like the Bhopal Gas Tragedy (1984), raised awareness.

4. The Rise of Environmental Policy (1970s–1990s)

- **1972:** India participated in the Stockholm Conference; later established the National Committee for Environmental Planning and Coordination (NCEPC).
- **1974:** Water (Prevention and Control of Pollution) Act was passed.
- **1980:** Forest Conservation Act restricted deforestation.
- **1986:** Environment Protection Act (EPA) strengthened regulations post-Bhopal disaster.

5. 21st Century: Sustainable Development and Climate Action

- **2002:** Biological Diversity Act recognized traditional knowledge and conservation.
- **2006:** National Environment Policy introduced.
- **2010:** National Green Tribunal (NGT) was set up to handle environmental cases.
- **2015:** India adopted the Paris Agreement, committing to reducing carbon emissions.
- **2022:** India set a Net Zero target for 2070.

6. Key Challenges and Future Directions

- Air and water pollution, deforestation, and climate change remain concerns.
- Policies are shifting towards renewable energy, circular economy, and stricter environmental regulations.

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Chapter 7

India’s Commitments in Global Climate Agreements

In response, India pledged to achieve net-zero emissions by 2070 at the 26th Conference of the Parties (COP 26) in 2021. India's 4th Biennial Update Report (BUR-4) highlighted a 7.93% reduction in GHG emissions in 2020 compared to 2019. This demonstrates India's commitment to a sustainable, climate-resilient future. India has taken on a significant role as a mediator in global climate negotiations. This position allows India to bridge the gap between developed and developing nations, ensuring that all voices are heard in the fight against climate change.

India as a Mediator in Climate Negotiations

India has taken on a significant role as a mediator in global climate negotiations. This position allows India to bridge the gap between developed and developing nations, ensuring that all voices are heard in the fight against climate change.

Bridging Gaps Between Developed and Developing Nations

- India advocates for the needs of developing countries, emphasizing equity in climate action.
- It promotes the idea that developed nations should take greater responsibility for their historical emissions.
- India’s nonalignment policy enhances its credibility, allowing it to act as a neutral party in discussions.

Facilitating Consensus on Key Issues

- India has been instrumental in pushing for agreements that reflect the interests of both sides.

- It encourages dialogue on critical topics such as climate finance and technology transfer.
- By advocating for a fair distribution of responsibilities, India helps to foster cooperation among nations.

Role in Multilateral Climate Agreements

- India has actively participated in major climate agreements, including the Paris Agreement.
- At COP28, India emphasized the need for developed nations to fulfill their financial commitments, such as the pledge to provide $100 billion annually to developing countries.
- The country has called for a total of $5.9 trillion in climate finance by 2030 to implement its Nationally Determined Contributions (NDCs).

India's role as a mediator is crucial in ensuring that climate negotiations remain inclusive and equitable, promoting a sustainable future for all nations.

Domestic Climate Policies and Their Global Impact

India's Intended Nationally Determined Contributions

India has set its Intended Nationally Determined Contributions (INDCs) to reduce emissions intensity by 33-35% by 2030 compared to 2005 levels. This commitment reflects India's dedication to balancing development and environmental sustainability.

Impact of Domestic Policies on Global Climate Goals

India's domestic climate policies have significant implications for global climate goals. For instance:

- Emission Reductions: India's climate policies have already saved 440 million tonnes of CO_2 from 2015 to 2020, and are projected to save 3,950 million tonnes of CO_2 from 2020 to 2030.
- Renewable Energy Expansion: The push for renewable energy sources contributes to global efforts to combat climate change.
- Sustainable Development: Policies aimed at sustainable development help in achieving broader international climate objectives.

Challenges in Policy Implementation

Despite these efforts, India faces several challenges in implementing its climate policies:

1. Technological Barriers: Many necessary technologies are still under development or not commercially viable.
2. Financial Constraints: Access to affordable financing for climate projects remains a significant hurdle.
3. Land Availability: Limited land resources complicate the expansion of renewable energy projects.

India's approach to climate policy must consider both domestic needs and international responsibilities, ensuring that development does not come at the cost of environmental degradation.

Future Directions for India in Climate Negotiations

Enhancing Global Leadership Role

India is poised to strengthen its position as a leader in global climate negotiations. By advocating for the needs of developing nations, India can play a crucial role in shaping international climate policies. This includes pushing for equitable climate finance, as seen in its demands at COP29, where India and other developing countries called for fair financial commitments.

Strengthening Climate Resilience

To combat the impacts of climate change, India must focus on building resilience. This involves investing in climate-resilient infrastructure and enhancing disaster preparedness. By doing so, India can protect its vulnerable populations and ecosystems from climate-related disasters.

Innovative Policy Approaches

India should explore innovative policy solutions to address climate challenges. This could include:

- Promoting renewable energy technologies.
- Encouraging sustainable agricultural practices.
- Implementing carbon pricing mechanisms.

India's future in climate negotiations will depend on its ability to balance development needs with environmental responsibilities.

In summary, India's future directions in climate negotiations will revolve around enhancing its leadership role, strengthening resilience, and adopting innovative policies to ensure a sustainable future for all.

India's Role in Climate Adaptation and Resilience

Investments in Climate-Resilient Infrastructure

India is making significant investments in climate-resilient infrastructure to combat the effects of climate change. This includes:

- Building flood defenses in vulnerable areas.
- Upgrading water supply systems to handle extreme weather.
- Enhancing transportation networks to withstand climate impacts.

These efforts are crucial for protecting communities and ensuring sustainable development.

National Adaptation Fund for Climate Change

The National Adaptation Fund for Climate Change (NAFCC) plays a vital role in supporting projects that enhance resilience. Key initiatives include:

- Funding for agricultural adaptation projects.
- Support for research on climate impacts.
- Community training programs to improve local resilience.

Community-Based Adaptation Strategies

India emphasizes community involvement in adaptation strategies. Some approaches include:

1. Promoting climate-smart agriculture through local innovations.
2. Engaging communities in disaster preparedness training.
3. Encouraging local water management practices to enhance resilience.

Investing in community-based strategies is essential for building resilience against climate change impacts.

Highlight

India is advancing climate-smart agriculture through the National Innovations in Climate Resilient Agriculture (NICRA) and Pradhan Mantri Krishi Sinchai Yojana (PMKSY).

The Economic Implications of India's Climate Strategies

Balancing Economic Growth with Emission Reductions

India faces a significant challenge in balancing its economic growth with the need to reduce emissions. The country aims to achieve sustainable development while addressing climate change. This requires careful planning and investment in clean technologies. Here are some key points to consider:

- Investment Needs: India needs to invest approximately $250 billion annually until 2047 to transition to a low-carbon economy.
- Sectoral Impact: Key industries such as manufacturing and agriculture must adapt to new regulations and technologies.
- Job Creation: Transitioning to green technologies can create new job opportunities, especially in renewable energy sectors.

Impact on Key Industries

The shift towards a low-carbon economy will have varying effects on different sectors:

1. Energy Sector: A move towards renewable energy sources like solar and wind will require substantial investment and innovation.
2. Manufacturing: Industries will need to adopt cleaner technologies to meet emission standards, which may involve higher initial costs.
3. Agriculture: Sustainable practices will be essential to ensure food security while reducing environmental impact.

Opportunities in Green Technology

India's commitment to climate strategies opens up numerous opportunities in green technology:

- Renewable Energy: Expanding solar and wind energy projects can lead to energy independence and job creation.
- Green Hydrogen: Developing hydrogen as a clean fuel source can position India as a leader in this emerging market.

- Sustainable Agriculture: Innovations in farming practices can enhance productivity while minimizing environmental harm.

The transition to a low-carbon economy is not just a challenge but also an opportunity for India to lead in sustainable development.

In conclusion, while India faces challenges in its climate strategies, it also has the potential to drive economic growth through innovation and sustainable practices. The path forward will require collaboration between the government, industries, and communities to ensure a balanced approach to development and environmental stewardship.

India's approach to climate change has significant effects on its economy. By investing in green technologies and sustainable practices, the country can create new jobs and boost economic growth. However, these strategies also require careful planning to ensure they benefit everyone.

India plays a significant role in global environmental negotiations, balancing its developmental priorities with international climate commitments. Here are some key aspects of India's role:

1. Leadership in Climate Justice and Equity

- Advocates for **Common but Differentiated Responsibilities (CBDR)**, emphasizing that developed countries should take greater responsibility due to their historical emissions.
- Highlights the need for financial and technological support from developed nations for developing countries.

2. Participation in Major Agreements

- **Paris Agreement (2015)**: India committed to reducing its emissions intensity and increasing renewable energy capacity.
- **Glasgow COP26 (2021)**: Announced the "Panchamrit" strategy, including a **net-zero target by 2070**.
- **Montreal Protocol (1987)**: Supports the phase-down of hydrofluorocarbons (HFCs) under the Kigali Amendment.

3. Advocacy for Sustainable Development

- Launched **International Solar Alliance (ISA)** with France to promote solar energy globally.

- Initiated the **Coalition for Disaster Resilient Infrastructure (CDRI)** to strengthen infrastructure resilience.
- Promotes **Lifestyle for Environment (LiFE)** movement, advocating for sustainable consumer habits.

4. Challenges and Criticism

- Balances economic growth with emission reduction, as coal remains a major energy source.
- Faces pressure to accelerate its transition to green energy.
- Advocates against carbon border taxes that may hurt developing economies.

5. Role in COP28 (2023) and Beyond

- Stressed the need for **climate finance** and **technology transfer**.
- Advocated for a **phase-down of fossil fuels**, rather than a phase-out, considering energy security concerns.
- Pushed for a **Loss and Damage Fund** for vulnerable countries.

India remains a crucial voice in climate diplomacy, championing the interests of the Global South while progressing towards its own sustainability goals. Let me know if you want details on specific summits or policies!

Conclusion

In summary, India's role in global climate talks is crucial and complex. As a developing nation, India faces the challenge of balancing its economic growth with the need to address climate change. The country has made significant commitments to renewable energy and climate finance, advocating for fairness in how responsibilities are shared among nations. However, India also has to navigate its own development needs and energy requirements, which sometimes leads to a cautious approach in negotiations. Moving forward, India's ability to mediate between developed and developing countries could be key in achieving global climate goals, ensuring that all voices are heard and that progress is made in a fair manner (sleepyclasses.com, n.d.).

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Chapter 8

Renewable Energy and Sustainability Initiatives

Introduction

The transition towards sustainable energy sources has emerged as a crucial imperative in the face of mounting environmental concerns and the need to reduce our reliance on finite fossil fuels. Renewable energy technologies, such as solar and wind power, hold immense potential to address these challenges and pave the way for a more sustainable future.

The Benefits of Renewable Energy

Renewable energy sources offer a myriad of benefits that extend beyond just environmental protection. Renewable energy is seen as a necessary step toward sustainable energy development, diminution of the use of fossil fuels and mitigation of climate change (Masson et al., 2014). Furthermore, the implementation of renewable energy will require a new paradigm of decentralized energy production and small production systems, which can have profound implications for the energy sector. (Masson et al., 2014)

The Potential of Renewable Energy

The potential for renewable energy resources is enormous because they can, in principle, exponentially exceed the world's energy demand. Electric energy security is essential, yet the high cost and limited sources of fossil fuels, in addition to the need to reduce greenhouse gasses emission, have made renewable resources attractive in world energy-based economies. (Ellabban et al., 2014) As such, renewable energy technologies will

have a significant share in the future global energy portfolio, much of which is now concentrating on advancing their pool of renewable energy resources. (Hernandez et al., 2020) (Ellabban et al., 2014)

Recent analysis has shown that when the complete life-cycle of renewable energy is considered, they are not yet CO2 sinks. However, their greenhouses gas emission rate per unit of energy produced is much less than for energy sources based on fossil fuels and slightly less than for nuclear power. Additionally, the analysis uncovered best practices in wind and solar design and deployment that can better inform climate change mitigation efforts in the electricity sector. (Masson et al., 2014)

Literature Review

The existing literature on renewable energy and sustainability initiatives is extensive and diverse,

providing valuable insights into the current status, future prospects, and enabling technologies. A systematic literature review conducted by one study identified a range of drivers and barriers that could help understand the diverging paths of renewable energy deployment across different countries. (Şener et al., 2017) The review revealed that unlike conventional sources, the use of renewable energy sources has multiple benefits, including increased energy security, sustainable economic growth, and pollution reduction, particularly in terms of greenhouse gas emissions. (Şener et al., 2017)

However, the review also highlighted the considerable difference in the share of renewable energy sources in national energy portfolios, suggesting that there are significant barriers to their widespread adoption.

The major barriers to renewable energy identified in the literature include economic, policy and legal, and technical factors.

Methodology

To gain a comprehensive understanding of the current state of renewable energy and sustainability initiatives, this research paper will employ a multi-faceted approach. First, it will provide an overview of the benefits and potential of renewable energy resources, highlighting their role in addressing environmental concerns and enhancing energy security.

Next, the paper will delve into a detailed literature review, examining the findings of previous studies on the key drivers and barriers to the deployment of renewable energy technologies. This analysis will shed light on the complex interplay of social, economic, technological, and regulatory factors that have shaped the diverging paths of renewable energy adoption globally.

Finally, the paper will identify and discuss emerging trends and best practices in the field of renewable energy and sustainability, offering insights and recommendations for policymakers, industry stakeholders, and the research community.

Results

The literature review suggests that the transition towards renewable energy is hindered by a range of barriers, including economic, policy, and technical factors (Kabel & Bassim, 2020). Economically, the high upfront costs and capital-intensive nature of renewable energy projects, coupled with the relatively low prices of fossil fuels, have deterred widespread adoption.

Furthermore, the lack of effective policy and regulatory frameworks, as well as the absence of clear financial incentives, have posed significant obstacles to the large-scale deployment of renewable energy technologies. (Kabel & Bassim, 2020; Şener et al., 2017)

However, the analysis also revealed that social and cultural factors can play a crucial role in shaping the success of renewable energy initiatives.

Implications and Future Directions

The findings of this research paper have several important implications for the future of renewable energy and sustainability.

First, the identification of key barriers underscores the need for a comprehensive and coordinated policy approach that addresses the economic, regulatory, and technical challenges. This could involve the implementation of targeted subsidies, tax incentives, and streamlined permitting processes to lower the barriers to entry and incentivize investment in renewable energy projects.

Second, the importance of social and cultural factors highlights the need for community engagement and awareness-raising campaigns to foster public acceptance and support for renewable energy initiatives.

Finally, the paper suggests that future research should explore the potential synergies between renewable energy and other sustainable practices, such as energy efficiency, smart grid technologies, and the circular economy, to develop more holistic and integrated approaches to sustainability.

Discussion

The research chapter provides a comprehensive analysis of the current state of renewable energy and sustainability initiatives, drawing insights from a diverse body of literature. The findings suggest that while renewable energy technologies hold immense promise in addressing environmental concerns and enhancing energy security, their widespread adoption is hindered by a range of barriers.

The literature review highlights the complex interplay of economic, policy, technical, and social factors that have shaped the diverging paths of renewable energy deployment across different countries.

Conclusion

In conclusion, this chapter has shed light on the multifaceted challenges and opportunities surrounding the transition to renewable energy and sustainable development. By identifying the key barriers and examining emerging trends and best practices, the chapter provides a nuanced understanding of the current landscape and offers strategic recommendations for policymakers, industry stakeholders, and the research community to accelerate the deployment of renewable energy technologies and foster a more sustainable future.

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Chapter 9

Challenges to India's Green Transition

1. Introduction

There is an ever growing need to address the concerns posed by rapid economic growth to the environment. Since India embarked on its economic liberalization journey during the early 1990s there has been extraordinary growth in terms of both GDP and GDP per capita. This growth has culminated in surging levels of consumption, pressure on natural resources and both environmental and social concerns. India's changing socio-political environment make it unique; never before has a country following a democratic system of governance experienced such high growth levels. There are many challenges and barriers that India faces in terms of transitioning to a green economy (H. et al., 2019). They range from the national, regional and city level through to the sector level and even down to individual entrepreneur and consumer levels. Challenges include policy, technological, financial and socio-economic facets, which include but are not limited to:

1. Existing Business Models and Practices: Although environmental problems are becoming more apparent, the prosperous city and life styles fueled by rapid economic growth have largely been a cause of natural resource depletion. The majority of businesses continue to prioritize profits over sustainability. This can be seen in the constant conflict between biodiversity concerns and large-scale infrastructural development projects. Social concern is often seen as solely a by-product of environmental concern and marginalized in comparison to economic gain. For many businesses trying to 'green wash' is simply not worth the cost compared to making profit from existing non-environmental friendly practices. Concerns about environmental protection have only begun to resonate in the wider community in the past decade. Environmental protection has remained the most neglected part of the city's development despite the recognition of the problems. The main issues have been around deforestation, the badly managed air pollution and waste controls and an increase in the number of untreated effluents being piped into the environment. At the same time there

are international concerns that India could become a waste dumping ground for those involved in perpetrating environmentally and socially unsustainable practices.

The above listed downsides have contributed significantly to the challenges and barriers for businesses seeking modern and effective environmentally and socially responsible practices and transitioning to a green economy. By breaking down the main challenges that businesses, and - by extension - the empowered stakeholders are facing, it is hoped that a need for top-down action, and re-assimilation of the concerns, demands and desires of all stakeholders back in to formal policy and incentive building processes. In this sense the very nature of such practices and the potential impact of conflict that they might lead to should be of political interest, particularly in a current situation where the Government is actively encouraging a more 'competitive approach to politics'.

2. Policy and Regulatory Challenges

India as a result of its growth will need 2.4 trillion dollars invested in power generation, eco-space and transportation. Institutional investors will be of utmost importance for raising funds in these sectors. It was proposed that revision of trust deeds to allow for consideration of ESG factors as investment criterions be considered in India, as well as developing ESG friendly indexing practices and internal engagement expertise within institutional investors (Saravade, 2018). As the world's fourth largest greenhouse gas (GHG) emitter, it will be important that investors in India consider climate change risks and opportunities. In addition to it being a concern on its own, carbon restriction policy will have implications on virtually all sectors, leading to increased climate risks such as changing monsoon patterns and increased frequency and intensity of flooding and cyclones.

The Indian equity market is somewhat protected from climate risk; despite it being a large agricultural economy, food production will not readily affect companies' credit worthiness. Rather, two main risks rank higher on Indian policy maker's agendas –the country's high vulnerability to climate related repercussions and the potential for significant impact on the country's GDP growth. With drought among one of the extreme climate risks, food security and effective groundwater management are already difficult enough without the added stress of climate change. Nearly 80% of agriculture in India is rain fed; traditional safety nets are dysfunctional or inadequate leading to political responses to food price hikes which decelerate economic growth.

2.1. Inconsistent Policies and Regulations

Policies and regulations to promote sustainable practices and technology differ considerably across India's states with some states being far more engaged with green

activities than others. Such variation often stems from different histories, local political agendas, resource endowments, and the federal political constitution with states having an extensive list of separate heads of powers. It is not uncommon for different states to have policies that not only vary but potentially conflict with each other (Jörgensen, 2012). This may lead to confusion and complicate any implementation of these policies. Without an alignment of policies, programs, and incentives across national, state, and local scales, the uptake of green technologies and practices by households, industry and policy makers in general will be much less effective (Saravade, 2018). It is likely that investors will shy away to invest in green technologies knowing that their investment may soon be rendered obsolete or unsupported due to changing policies and regulations.

Of perhaps greater long-term concern is the erosion of public confidence. India has an extremely poor record of effectively implementing environmental protections, primarily due to a lack of coordination amongst (and within) different levels of government. Without a clear articulation and implementation of a coherent governance structure to support green technology adoption in India, the large potential for investing in economically viable green technology may never be realized. The following examples of contradictory policy demonstrate the challenges associated with implementing green initiatives in an environment of inconsistent policy/regulations. This is then followed by a section of other regulating barriers that have further stalled progress in various green or environmental projects. However, it is argued that regardless of any particular case may have broader implications for current climate policy goals.

2.2. Lack of Enforcement Mechanisms

India's geopolitical and geoeconomic context is critical as it provides the backdrop for considering the success and failures of the current 'green transition.' The growth is often heralded as the backdrop for considering the success and failures of the current 'green transition.' India has faced many pressures that have drawn attention to its environmental and climate record, including its growing dependence on imported fuels, political concerns around energy security, and an expanding mercantilist resource acquisition strategy. The continued global price shocks faced by India and the ever-increasing innovation, in the transfer costs of renewable energy sources and improvements in energy efficiency technologies, are an increasing concern.

Continued pressure to curb environmental damage from the growth of industry demands the creation and repeated enforcement of policy levers that have been difficult to translate into effective measures. As elsewhere, the legal and regulatory infrastructure are in place, but the ability actively to monitor, police, and prosecute non-compliance is largely lacking. It is here that the main limitation on green growth appears to lie. It is not uncommon for environments to go unmonitored for years, and non-compliance with rules is usual in many of the most heavily monitored sectors. Industries are frequently

successful in demonstrating technical compliance, and tend to report and manipulate data in relation to their impacts. More widely, with the bureaucracy seeing as overly interventionist, trends in the business of politics suggest a reduced commitment to enforcement, highlighted by the election of a more business friendly government at the national level. The central failure of the green transition therefore appears to be a lack of effective enforcement. Efforts to control interrogation and resources use will be seriously undermined if the implementation gap cannot be closed (Kattumuri & Lovo, 2018). Strengthening enforcement: Theoretical perspectives The central difficulty in implementing environmental policies is the poor capacity on the part of regulatory bodies to monitor compliance, but enforcement is a complex multifaceted process itself. Given the overwhelming importance of compliance monitoring, and the relatively clearer understandings of the procedural challenges faced by monitoring agencies, this sub-judice examines the 'darker' side enforcement measures required of could monitor bodies to ensure compliance.

3. Technological and Infrastructural Challenges

The first and possibly the most critical obstacle for the green transition in India is connected with the impediments in the available technological and infrastructural systems. Despite rapid growth, the main networks for energy, transport and real estate are largely obsolete. This aging infrastructure is not characterized at present nor can possibly be in the near future by dynamics and flexibility required to manage the shift to renewable sources or to enhance energy efficiency, such as modern energy and transport management systems or smart residential and commercial buildings. For example, in relation to the power system, all aspects of modernization remain insufficient and at risk of the whole strategy of the transition to a green economy (Rehman & Hussain, 2017). This includes failure to attract substantial investments to upgrade and improve networks, interconnections and, more generally, the viable energy systems, which are prerequisites to future low-carbon energy security and sustainability. The second, and not at all secondary, aspect of the technological and infrastructural constraint is the lack of access to efficient innovation systems and lack of possibility to adapt them to the context of many regions of the country and in particular the rural and semi-urban areas. The use of clean technologies required for a successful transition to the green economic model is not widespread and faces various technical and institutional obstacles, especially in relation to the producers and residential users located outside the big urban agglomerations.

3.1. Aging Energy Infrastructure

India's transition to a greener energy landscape is encumbered by several constraints. A critical issue, rarely addressed in policy deliberations, is the country's aging energy infrastructure. Much power generation, transmission, and distribution in the existing setup have been around since independence. While fossil fuel hails from modern plants, the systems housing them are mostly the same as they were half a century ago. Thus, obsolete infrastructure acting as critical bottleneck in fostering green energy. Limitations to increasing share of renewables include technical constraints of intermittency and unpredictability. It is thus essential to maximise renewable energy capacity when available. However, this is constrained since much of the existing grid infrastructure is unable to receive energy spikes from the likes of solar power (Rehman & Hussain, 2017). Rather, it must be absorbed back into the grid or it would cause a frequency rise and lead to an inadvertent islanding or blackout. A modern grid backbone, termed the green energy corridor, was announced in 2010 with a hoped completion per that year 12th plan term. While significant steps have been made to actualise this, the progress was considerably less than hoped. Moreover, partially due to such grid imitations, it is estimated that 1.35 GW of Indian solar power potential was wasted in 2013.

The inefficiencies in transmission and distributing energy in India are staggering. Management of the Central Electricity Authority in 2009 estimated these losses at 28.25%; this is to say that less than three-quarters of energy went from A to B in a country where at the time annual energy consumption was only projected to increase (by 6.5% assuming 9% GDP growth; though actual figures have far exceeded both). The broader energy sector in India is considered one of the least secure globally, scoring poorly on both energy supply and access reliability. Much of the distribution lines date back to the 1960s-70s, with 15-20 years as a general standard lifespan. A large level of them will require replacement beginning well before their lifespan is up. The assessment is that power distribution grids in 230 of 644 districts, causing nearly 29% of total losses, will require modernisation by 2017-18. Random user data from forum websites indicate that this is not necessarily an unrealistic timescale as has been missed. However, mathematical modelling projects that the Indian economy would see at least 7% more points of GDP growth by 2030 if these targets were reached. On a global scale, India is one of the greatest beneficiaries of grid modernisation in terms of human lives. With much recent talk about squalor in India, this is an issue which has the potential to impact a very large number of disenfranchised. Given India is also an emerging market society, the demand for energy shall more than double by 2020. The planned modernisation, which includes 11 associated missions, would increase the capability to produce power by 51.1 GWs and add 83,874 circuit km of transmission lines. However, these costs on the order of 800 million USD and involve well over 2,000 giga-joules of raw materials. This necessarily dampens speed. Moreover, conceptual work finds that using existing

infrastructure, a net profit could be made starting with projects worth just under a combined 200 million USD; much of the same work India is engaged to undertake. Guidances to successes have also been taken from the work.

3.2. Limited Access to Clean Technologies

A major impediment to a transition is the limited access to clean technologies (Suzuki, 2010). Rural communities, who are mostly outside the ambit of technological advancement, particularly the renewable energy solutions, cannot make use of the advancements concentrated in the urban centers. There exists a tremendous gap in making use of modern day utilities for regular chores between rural and urban residents. Even if there is a willingness to invest, the initial cost for the setup is high, which acts as a major deterrent.

It is important to develop a local innovation grounds along with a regime facilitating technology transfer for local application. Customized and locally trained package should be developed for deployment of technologies in remote areas, attracting the involvement of the private sector with acceptable options in the market for non-urban people. The private sector may produce and sell such technologies, generating a monetary return and completely different model of business which is not very common in the usual profit-driven market. The government should be well aware that it is essential to put in place a proper regime for technology transfer that keeps in mind all the barriers to deployment of technologies. The government has the capacity to operate such a regime. Collaboration between public and private agencies would be more prolific and fruitful. Much of the focus needs to move towards the technology return as this alone can address the other social and economic barriers. The developed model is a promising driver for encouraging the transfer of sustainable technology by providing a business return model. This usually lack of research is a financial return from investment or wider business opportunities in developing countries. The latest is a US$100 billion annually by 2020 from both public and private sources. However the developed models show that instead of investment in that much money, the technology, and business opportunities are created which can easily cover such costs to help implement the commitment.

4. Financial Challenges

India, the world's third largest energy consumer, aims to boost the share of renewables in its power mix from 20 percent in 2018 to 40 percent by 2030 so it can meet its Paris Agreement climate commitments. This would involve an additional 523 Gigawatts (GW) of renewable power capacity installed over the period which would require an investment of $80bn-100bn per year until 2040. For wind and solar schemes that are to

be competitive with existing coal capacity at the time of investment, that may require prices 40 percent higher than existing renewable schemes have achieved, and more than double the 2019 renewables share (Burke et al., 2019). This daunting mix of financial risks seems to have deterred private sector involvement in renewables. Indeed, state and central government agencies accounted for 91 percent of total renewable capacity installed in 2018. Commercial banks have been reluctant to lend to large renewable energy projects due to the high investment risk involved and the requirement for large working capital (Rehman & Hussain, 2017). Public sector banks have likely been deterred by the long tenor of renewable projects. More generally, there has been a significant shortfall of finance for Indian renewable power since 2011. Importantly, the shortfall worsens, and becomes policy-intractable, as renewable ambitions grow and projects begin to compete with each other for a dwindling pool of international capital. Development finance institutions, however, struggle to address such constraints at scale - and with respect to domestic projects, largely provide a surfeit of mega-schemes that, practically, governments are unable to 'absorb'. Combined with the difficulties faced in dealing with government departments on such projects, the result is stiance to new initiatives. Also, with a comparatively low risk appetite, new ventures in innovative industries are in doubly short supply since, unlike Western markets, there are no well-trodden paths that have proved successful. For the Indian economy and the environment, this impasse is distinctly unwelcome. Given the scale of the transformation and both international and domestic pressure, the ambition of $100bn/year in renewable investment by 2030 risks falling seriously short if left to public funds alone. Indeed, if achieved, such a goal holds the potential to overhaul not only electricity networks, but place a significant burden on the balance sheets of the handful of financial institutions capable of supporting it. While it could mean rapid growth for such institutions, it would equally increase their exposure to the sector. The environmental and financial implications of such over-exposure in the context of projects that involve unreliability are highly concerning. For renewable developers, Indian or otherwise, the current state of the industry is far from welcoming.

4.1. High Initial Investment Costs

A significant barrier to adopting green technologies in India is the high initial investment costs (Burke et al., 2019). The considerable upfront expenses associated with renewable energy projects, particularly solar and wind power, are often prohibitive for both businesses and consumers. This financial hurdle is more acute for small and medium enterprises (SMEs). In India, SMEs represent a large proportion of industrial activity, but these enterprises often lack the capital required to invest in green production. Consequently, the financial burden of adopting renewable energy can prevent the development of broader sustainability transitions within this sector. In this context, new and innovative solutions for financing green investments are needed. Renewable energy

projects require substantial investments in fixed assets, including the installation of generation and distribution facilities. Developing these requires funding beyond the capacity of many firms, particularly SMEs. Public-private partnerships between businesses, financial institutions, and governments can help share these costs (Rehman & Hussain, 2017). Such partnerships can provide both the necessary long-term loans and strategic investments to support the development of sustainable infrastructures.

Creation and maintenance of solar parks, for example, have been financially supported through government funding assistance schemes. Additionally, collaborative efforts to establish sustainable supply chains can reduce the costs of necessary inputs, improving the economic feasibility of green investments. Supporting regulatory frameworks, including policies of subsidies, feed-in tariffs, and tax breaks, are also crucial for supporting investments in renewable energy. Different firms have particular financial structures and vulnerabilities, necessitating flexible implementation of these strategies. As Indian firms often do not have access to sufficient credit, developing specialized financing solutions for green investment can be valuable. Facilitating credit relationships between large enterprises and smaller suppliers can help ensure that sustainability gains among major firms translate across their production links. Furthermore, various examples of successful models for funding industrial sustainability transitions are provided. Each addresses the challenges of high upfront costs, suggesting pathways for other firms and governments seeking to guide such investments.

4.2. Limited Access to Green Financing

Besides those challenges that impede the diffusion of green and climate-friendly technologies and lifestyle changes amongst the growing middle class, another major aspect why India's transition is not necessarily green is being overlooked. This text specifically addresses this other side of the coin, employing an innovation system perspective. Despite increasing concerns about the growth momentum of India, and particularly the growth potential of its industrial sector, both – industrial policy and innovation policies – are mostly tackled as separate, unlinked phenomena. Innovation issues are hardly mentioned in the debate on industrial development, and the promotion of industries is not very evident in the debate on innovation promotion.

Unlike this traditional and neoclassical perspective, an evolutionary economic research perspective takes an interactive view of policy-induced industrial and innovation development. It points to the need for comprehensive innovation and industrial policy mixes. From this point of view, the provincial innovation system approach is introduced as a means to investigate and open up policy leeway for a green transition of industries and industrial sectors embedded in an Indian province. Taking this approach to the union level entails investigating the interplay of different state and union policies within the overall system of governance in the country. The latter is indeed found to be a stumbling

block for green transition, particularly because decision making processes are influenced by the established industrial structure and path dependencies from previous industrial development, which is not necessarily green. This leads to a scenario where tickets to a green transition are hardly written.

5. Socio-Economic Challenges

In the narrative on green transitions, little attention has been paid to the social aspects of a new or refashioned economy. While maps of carbon emissions, rising or receding temperatures and sea levels, of biomass and deforestation, or urban sprawl and environmental degradation have all become a mainstay of analyses of anthropogenic climate change, a different set of maps may be used to depict the demographic pattern of jobs and activity in the fossil fuel economy. How such a landscape is being altered may be linked to what is at the same time a social one. Despite those altered landscapes, lives and livelihoods of exploitation or conflict over the division of resources or environmental conditions among classes, castes, genders, or regions can also be mapped. Meanwhile, different ways, including collective ones, are being proposed to address these challenges (S. Henry et al., 2020).

India is therefore poised at the threshold of a complex interplay between a developmental imperative, whose template was laid down in an era that predated the knowledge of climate change, and a landscape of socio-economic dislocations that is contemporaneous with an awareness of a new and unwelcome geophysical trajectory. As Indian and global policy makers grapple with the course and directions of an inevitable transition, it may be useful to circle back and place the upcoming sets of negotiations and conflicts more squarely within this landscape of contradiction and predicament.

Since the turn of the century, periods of buoyancy and retreat in global commodity prices, demand, and production have been grist to a mill of political claims and counterclaims concerning the nature and levels of employment in non-agricultural employment in India. Given the setting of a burgeoning labour force and a concomitant process of informalisation, the shedding of jobs and relevant facets of workers' income must form a significant site for the play of interests and action in an environmental governmental regime. It is to these concerns, albeit in a sharper and new frame, that this reflection seeks to draw attention, as a complicating, if not opaque, background of the shift to a lower carbon emissions trajectory of economy.

5.1. Impact on Livelihoods in Fossil Fuel Industries

India faces significant challenges as it embarks upon transitioning to a "green" or climate-resilient economy, in line with global and national commitments. One of the

most critical is the likely disruption to people's livelihoods – mainly in the "brown" sectors that are likely to contract, such as coal mining, coal-fired power plants, and aluminum (Strachan et al., 2023). At present, over 90% of India's energy generation is based on coal, and expansion continues today, albeit possibly peaking this decade. Despite this, India's National Electricity Plan presciently estimated that solar energy, perhaps the best renewable resource in the country, would outcompete new coal plants by 2026. In this context, a smooth and just transition is critically important.

Like previous major structural shifts, it is likely that a "just transition" can lead to widespread economic payoff, but without proactive and persistent effort, potentially extreme economic costs will fall unevenly on some of India's most vulnerable citizens (Mijin Cha, 2017). It can also cause deep psychological and community harm as traditional ways of living and the landscapes and communities that support them are uprooted. At the same time, India may leapfrog some entire sectors, such as centralized power generation, reducing time to adjust, and enormously increasing the stakes of business-as-usual decisions, yet limiting the effectiveness of green stimulus and financial support. As the difficulties facing one of India's by far most coal-dependent states, Jharkhand, illustrate, this is most acute for currently coal-dependent states with the least economic diversity. Other states, including Maharashtra and Tamil Nadu, implementing the most aggressive expansion plans also face heightened risk, but it is mostly the poorest/Jharkhand who have the least policy capacity to adapt. They do however have time to prepare, emphasize the importance of expansive stakeholder engagement over the coming years, towards the development and implementation of effective local transition strategies. These initial steps focused on understanding the impact of a green transition on regions reliant on "brown" industries to construct programs to prepare the most vulnerable regions for the economic disruptions to come and to build a consensus around these programs. The initial results demonstrate the varying levels of vulnerability despite the similar exceptional reliance on coal in energy production and the early signaling of risks by changing coal plant economics.

5.2. Unequal Distribution of Benefits

Discussions on sustainability transitions, including the green transition to a low carbon economy, often view the distribution of benefits, burdens, and risks as critically shaping the outcomes of the transformation. Despite suggestions of potential win-win outcomes, ensuring a fair distribution of benefits to all socio-economic groups is no less important than imposing a fair distribution of the burdens of change. There are concerns that the green transition may lead to a reinforcement of existing socio-economic inequalities or the creation of new ones. The current patterns of industrial location, environmental pollution, energy access and job distribution in the green sector are unequally distributed, meaning that the existing social gradients of advantage and disadvantage between the

various population groups may get worse under the green transition scenario in the absence of any equity policies (Mohammed, 2011).

Empirical analyses drawing on the experience of the European countries show that an overemphasised green growth policy approach may widen regional disparities. In the context of the pro-growth bias, rich areas are likely to expand their market activities and technological development by attracting green investments and leave poorer regions behind. As the rural and less urbanized territories are already lagging behind the average development, they are likely to remain at the lower edge or even worsen in terms of sustainability. Therefore, an equity sustainability approach is needed to ensure that resources and opportunities generated by the transition are made available to all equitably, so that less privileged social groups and territories also benefit from and are part of the process. This means that green policies need to ensure resources and opportunities are distributed more justly. In more practical terms, it involves the design and implementation of specific policies and targeted interventions ensuring that disadvantaged people and areas receive a fair share of benefits arising from the green transition. These policies may aim to close the distributional gaps by assisting the less favoured population groups and territories in order to enhance their pro-activeness and capacity to exploit the opportunities. Such targeting policies require to match the local needs and priorities with the provision of appropriate resources and services. Another important aspect is the realization and activation of local potentials and the setting-up of functioning relational systems and supportive institutions in order to facilitate knowledge exchange, peer learning and the increase in social and political capital. Furthermore, ensuring their spatial and social inclusiveness, arrangements must guarantee that a rich set of values and cultures characterizing the territorial diversity is respected and encouraged.

6. Conclusion

With populations rising and climate impacts becoming worse every year, governments have realised a need to transition towards a low-carbon world. As one of the most polluted cities in India, New Delhi's Chief Minister attempted to take some strong actions in order to curb the air pollution. It is quite appreciated that New Delhi has strictly implemented the odd-even vehicle formula during air pollution season since 2016. Under this formula, vehicles drive on the basis of the last digit of their license plate: those with odd digits are only allowed to drive on odd dates and vice versa for those with even digits. According to the statement, such action was proved to be the world's greatest coordination exercise. However, this odd-even formula has been brought into the spotlight due to the potential chances of rising air pollution levels again in New Delhi. The transportation formula or scheme leads to an uneven relief to vehicle users. On the

other hand, the government has taken a courageous decision for the reduction of sulphur content of petrol and diesel which is also appreciated by observing social and political actors. Similarly, the process engaged in the continuous monitoring of air quality levels was shown to put New Delhi on the front foot. But it comes out of surprise the role of the central government in this regard. There is no mention of central government's fast and depth consideration towards the air pollution primitive of New Delhi.

To ease the smog from the air, acting by the New Delhi air quality control management has the mightiest coordination challenges. As an aftermath, some grand decisions were taken like the banning of construction work, closing schools, considering the running of trains on horns and the water sprinkles by helicopters. Nevertheless, this action does not mark an effective step because these types of actions are taken every year even though they cause various dilemmas. Amid multiple protests, odd-even trial run has been started in New Delhi. It is the second odd-even formula to road rationing trial run since the first experiment conducted in 2016 hence this makes the government's action unimpeachable. Another concern was shown towards sharing and shortage of data and information of preventive actions. Apart from that, Delhi's pollution problem is presumably accepted as "Delhi Pollution Problem" only, even though air pollution is entirely spread in the northern Indian states. In hindsight of the previous actions taken to overcome air pollution, there is no ambitious highest strategic developmental plan for the long run. It is found that in many cases, the actions are taken only for the sake of records or actions are shown only without any effective implementation. Some detrimental issues have emerged from the ongoing practices to curb the rising air pollution. In order to explore and understand the complexities of air pollution in New Delhi, this piece of work tries to put into practice the Sustainable Transition framework which aids in the systematic analysis of green transition in the highly polluted region of New Delhi from the air pollution perspective but also centers the government's potential actions.

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Chapter 10

Green Movements and Activism in India

Introduction

India, with its vast and diverse landscape, has long been a hub of environmental activism and green movements. The country's rich natural resources, combined with a growing population and rapid industrialization, have led to numerous challenges in sustainable development. In recent years, there has been a marked shift in the attitudes and behaviors of both consumers and businesses towards environmental responsibility and green initiatives.

Green Entrepreneurship and Innovation

The growing awareness of climate change and sustainable development has catalyzed the emergence of green entrepreneurship in India (Haldar, 2019). Consumers are increasingly opting for eco-friendly products, driving businesses to innovate and redesign their offerings with a green perspective. (Haldar, 2019) Many companies have recognized the potential of green marketing as a means to build customer trust and gain a competitive edge. (Garg, 2015) In fact, both public and private sector firms in India are actively embracing environmentalism as a market opportunity, rather than just a compliance measure. (Garg, 2015)

Grassroots Activism and Community Efforts

Alongside the corporate initiatives, India has witnessed a groundswell of grassroots environmental activism and community-driven green movements. Individuals and local organizations have been at the forefront of campaigns to protect forests, conserve biodiversity, and promote sustainable practices. These movements have empowered communities to take ownership of their natural resources and hold the government and corporations accountable for environmental degradation. (Haldar, 2019; Garg, 2015)

Challenges and the Way Forward

Despite the growing momentum, the green movement in India faces significant challenges. The sheer scale of the country's population and the pressure for economic development often clash with environmental concerns. Moreover, the adoption of green marketing and sustainable practices by the business community remains inconsistent and limited. (Haldar, 2019) To address these challenges, a multi-stakeholder approach is necessary, involving the government, businesses, and civil society. Comprehensive policy frameworks, innovative financing mechanisms, and increased public awareness can help to further strengthen the green movement in India and ensure a sustainable future for the nation.

Green movements and environmental activism in India have played a crucial role in addressing ecological concerns, advocating for sustainable practices, and influencing policy changes. Here are some key movements and initiatives:

1. Chipko Movement (1973)

- One of India's earliest environmental movements.
- Originated in Uttarakhand (then part of Uttar Pradesh).
- Led by *Sunderlal Bahuguna*, *Gaura Devi*, and others.
- Villagers, mainly women, hugged trees to prevent deforestation by loggers.
- Led to a ban on commercial logging in the region.

2. Silent Valley Movement (1973-1983)

- Aimed to stop the construction of a hydroelectric project in Kerala’s Silent Valley, a biodiversity-rich rainforest.
- Led by environmentalists and NGOs.
- Resulted in the declaration of *Silent Valley National Park* in 1985.

3. Narmada Bachao Andolan (NBA) (1985 - Present)

- Opposed the construction of large dams on the *Narmada River* (Sardar Sarovar Dam).
- Led by *Medha Patkar* and supported by activists like *Arundhati Roy*.
- Focused on displacement of tribal communities and environmental destruction.
- Though some dam projects continued, the movement raised awareness about rehabilitation and sustainable development.

4. Save Western Ghats Movement (1980s - Present)

- Aimed to protect the fragile ecosystem of the Western Ghats.
- Advocated against deforestation, mining, and unregulated tourism.
- Contributed to the recognition of Western Ghats as a UNESCO World Heritage site.

5. Appiko Movement (1983)

- Inspired by the Chipko Movement.
- Started in Karnataka's Uttara Kannada region.
- Villagers hugged trees to protest against deforestation by commercial industries.

6. Tehri Dam Protest (1990s-2000s)

- Led by *Sunderlal Bahuguna* to oppose the Tehri Dam on the Bhagirathi River in Uttarakhand.
- Highlighted risks of submergence, displacement, and seismic vulnerability.
- The dam was eventually built, but the movement sparked debates on large-scale hydro projects.

7. Coastal Regulation Zone (CRZ) Activism

- Focused on protecting India's coastal ecology from real estate, tourism, and industrial projects.
- Led by organizations like *National Fishworkers Forum (NFF)*.
- Opposed the dilution of CRZ norms that allow unrestricted development along coastlines.

8. Environmental Laws and Policy Reforms

- **Right to Environment as a Fundamental Right:** The Supreme Court of India has interpreted *Article 21 (Right to Life)* to include the right to a clean and healthy environment.
- **Public Interest Litigations (PILs):** Many environmental issues have been addressed through PILs filed in the Supreme Court and High Courts.
- **Green Tribunal (NGT):** Established in 2010 to handle environmental disputes efficiently.

9. Contemporary Movements

- **Aarey Forest Protest (Mumbai, 2019-2020):** Protest against cutting trees for a metro car shed.
- **Save Dehing Patkai (Assam, 2020):** Opposed coal mining in a biodiversity-rich rainforest.
- **Extinction Rebellion India:** A part of the global climate action movement focusing on policy changes to address climate change.

India has a rich history of environmental activism, combining grassroots efforts with legal and policy interventions. Despite challenges, these movements have played a vital role in shaping sustainable development policies.

Results and Discussion

Results

1. Policy Changes and Legal Impact

- **Forest Conservation Act (1980):** Enacted to regulate deforestation and promote sustainable forest management, influenced by movements like *Chipko* and *Appiko*.
- **Environment Protection Act (1986):** Strengthened environmental governance, partly due to activism following the *Bhopal Gas Tragedy (1984)*.
- **National Green Tribunal (NGT) (2010):** A specialized court to address environmental issues quickly, influenced by sustained legal activism.
- **Ban on Single-Use Plastic (2022):** A result of years of activism against plastic pollution.

2. Protection of Biodiversity and Ecosystems

- **Silent Valley National Park (1985):** The hydroelectric project was halted, saving a unique tropical rainforest.
- **Western Ghats Recognition (2012):** Declared a UNESCO World Heritage site after activism emphasized its ecological importance.
- **Reduction in Large Dams:** Protests like *Narmada Bachao Andolan* led to increased scrutiny of displacement and environmental damage due to large dam projects.

3. Increased Public Awareness and Participation

- **Rise of Youth-Led Climate Movements:** Organizations like *Fridays for Future India* and *Extinction Rebellion India* engage youth in climate activism.
- **Community Involvement in Conservation:** Movements like *Chipko* and *Appiko* empowered local communities to take charge of their forests.

Discussion

1. Successes and Strengths

Legal and Policy Influence: Many environmental laws and policies have been shaped by activism.
Global Recognition: Indian environmental activism has gained global attention, contributing to sustainable development goals (SDGs).

2. Challenges and Limitations

Development vs. Environment Conflict: Many movements face opposition from industries and governments prioritizing economic growth.
Slow Policy Implementation: Even after legal victories, enforcement remains weak (e.g., delays in rehabilitation of dam-displaced communities).
Suppression of Activism: Some environmental activists have faced legal action and intimidation, impacting large-scale movements.
Climate Change and Urbanization: New environmental challenges, such as urban pollution and climate change, require evolving strategies.

India's green movements have significantly influenced conservation policies, legal frameworks, and public awareness. However, ongoing challenges require adaptive strategies, stronger law enforcement, and sustainable development models to balance ecological protection with economic growth.

Conclusion

India's environmental movements and activism have played a crucial role in shaping the country's conservation policies, legal frameworks, and public awareness. From grassroots movements like *Chipko* and *Silent Valley* to large-scale protests such as *Narmada Bachao Andolan*, these efforts have successfully protected forests, rivers, and biodiversity while influencing government policies.

However, challenges such as conflicts between development and environmental protection, weak enforcement of laws, and the suppression of activism continue to hinder progress. While movements have led to legal victories, ensuring their effective implementation remains a pressing concern.

Moving forward, a balanced approach is necessary—one that integrates environmental sustainability with economic growth. Strengthening public participation, enhancing legal enforcement, and promoting sustainable alternatives will be key to addressing emerging environmental challenges such as climate change, pollution, and rapid urbanization.

India's green movements have set a strong foundation for ecological conservation, but continued activism, policy reforms, and community involvement are essential for building a sustainable future.

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Part III: The Road Ahead

Chapter 11

Global Trends and Future of Green Politics

1. Introduction

In the face of mounting environmental challenges, the rise of green politics has emerged as a significant global trend, shaping the political landscape and offering a transformative vision for a sustainable future. This paper aims to explore the key aspects of this phenomenon, including the underlying economic theories, the evolving political discourse, and the potential implications for policymaking and global cooperation.

2 Theoretical Frameworks in Green Politics

The concept of "green growth" has gained traction as a means of reconciling environmental concerns with economic development. This approach emphasizes the potential for economic activities to be conducted in a more sustainable manner, leveraging technological advancements and policy interventions to reduce the environmental impact while maintaining economic growth. (Jacobs, 1992) The political economy of green growth, however, is complex, as it challenges the traditional trade-offs between economic and environmental priorities. (Jacobs, 2012)

Scholars have explored the theoretical foundations of green politics, examining the role of market-based mechanisms, state intervention, and the potential for a "green capitalism" (Jacobs, 2012). The transition to a green economy also poses significant challenges, such as the need for radical technological change, the management of global environmental risks, and the distribution of the costs and benefits of sustainability efforts. (Söderholm, 2020)

3. Current Research Trends

1. Gaps and Future Directions

The growing importance of green politics has inspired a rich body of research, however, several gaps and future research directions remain. (Choucri, 1993) (Söderholm, 2020) (Jacobs, 1992)

* Integrating global environmental risks: The diffuse and global nature of environmental challenges requires a deeper understanding of how political and economic systems can effectively address these risks (Söderholm, 2020).

* Fostering radical technological change: Researchers must explore how to catalyze the development and adoption of transformative sustainable technologies, moving beyond incremental improvements.

* Addressing distributional concerns: The transition to a green economy will have uneven impacts on various social and economic groups, necessitating research on equitable policy approaches.

4. Global Trends in Green Politics

1. **Rise of Green Political Parties**
    - Green parties have gained influence in Europe (e.g., Germany's *Alliance 90/The Greens*, France's *Europe Ecology – The Greens*).
    - In some countries, green parties participate in coalition governments, influencing environmental policies.
2. **Climate Action and Policy Commitments**
    - The *Paris Agreement (2015)* set global goals to limit temperature rise to below 2°C.
    - Countries are adopting *Net Zero* targets (e.g., EU by 2050, China by 2060, India by 2070).
    - Carbon pricing and emission trading systems are being implemented in multiple regions.
3. **Youth-Led Climate Activism**
    - Movements like *Fridays for Future* (led by Greta Thunberg) have pressured governments for stronger climate action.

- Grassroots campaigns against deforestation, fossil fuels, and industrial pollution are growing globally.

4. **Corporate Sustainability and Green Finance**
    - ESG (Environmental, Social, Governance) investing is influencing corporate decision-making.
    - Green bonds and sustainable finance initiatives are promoting eco-friendly infrastructure.
    - Companies are pledging carbon neutrality and adopting circular economy models.
5. **Legal and Judicial Activism**
    - Courts in several countries are holding governments accountable for failing to act on climate change (e.g., Netherlands' *Urgenda Case*).
    - Indigenous and community-led lawsuits are challenging environmental destruction.
6. **Technology and Innovation in Sustainability**
    - Growth of renewable energy (solar, wind, hydrogen) is reducing dependence on fossil fuels.
    - AI and big data are being used for climate forecasting and environmental monitoring.
    - Innovations in sustainable agriculture, green buildings, and waste management are gaining traction.

5. Future of Green Politics

1. **Stronger Climate Legislation and Policy Integration**
    - More countries will enforce stringent environmental laws, integrating sustainability into all policies (energy, transport, industry).
    - Climate justice and green taxation will become central to policymaking.
2. **Decentralized and Community-Led Environmental Governance**
    - Local governments and grassroots organizations will play a bigger role in environmental conservation.

- Cities will implement their own green policies (e.g., low-emission zones, urban greening projects).

3. **Geopolitics of Climate Change**
   - Green policies will influence global trade and diplomacy (e.g., EU's *Carbon Border Adjustment Mechanism*).
   - Developing nations will demand climate finance and technology transfers from wealthier nations.
4. **Pushback from Industries and Political Opposition**
   - Fossil fuel lobbies and industries dependent on resource extraction may resist green policies.
   - Green movements may face political backlash in certain regions where economic growth is prioritized over sustainability.
5. **Public Awareness and Behavioral Change**
   - Green politics will increasingly focus on consumer choices (e.g., plant-based diets, sustainable fashion).
   - Education systems may integrate environmental literacy into curricula.
6. **Intersection of Green Politics with Social Justice**
   - Climate policies will need to address inequalities (e.g., impact on marginalized communities, fair transition for workers in fossil fuel industries).
   - Indigenous and rural communities will demand greater representation in environmental decision-making.

Conclusion

Green politics is rapidly evolving from a niche movement to a mainstream force shaping global policies. As climate change intensifies, governments, corporations, and individuals will need to prioritize sustainability. While challenges remain, the future of green politics depends on strong policy commitments, international cooperation, technological innovation, and active civic engagement.

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Chapter 12

India’s Roadmap for a Sustainable Future

1. Introduction

This chapter offers suggestions for India's roadmap for a sustainable future and is intended to serve as a think piece. The idea behind sustainable development is to use the earth’s resources in such a manner that they provide a good standard of living for all, both now and in the future, by ensuring environmental health, economic prosperity, and social equity. India’s current environmental and economic problems are only too evident. Air pollution has made several Indian cities among the world’s most polluted. Abysmally low per capita availability of potable water and long distances between home and workplace characterize urban India. A historical lack of investment in safe working conditions continues to plague the country. A single political party has such little legitimacy at the local level that almost every top civil and police service position is filled using officers transferred from other states, an unenviable example of constitutional disrespect and administrative disarray. The relationship between environmental degradation and India’s economic development is also well established.

The detailed proposals for a sustainable India or for any sustainable country remain to be developed. This essay suggests some basic directions. The successful rollout of initiatives in any one sector will, of course, depend on actions in related sectors. The point about sustainability is that it is a multi-stakeholder and multi-sectoral concern. For example, vehicles will certainly need to be made more energy efficient, especially in a country that imports virtually all its oil. But just as critical will be urban planning to minimize the distances people travel. Administrative measures against polluting and noisy vehicles will be important. And the public must be mobilized and convinced to start using public transport. The endeavors in interconnected sectors need to be operationalized together to achieve coherence.

2. Current Environmental Challenges in India

India faces severe environmental challenges. 600,000 deaths occur in India annually due to outdoor and indoor air pollution. Cities in India are among the top ten in the world for the highest rate of urban air pollution. Elevated concentrations of PM2.5 cause diseases in humans that reduce their life expectancy by seven years. Millions of people in India do not have clean drinking water; 70% of surface water is contaminated, and depletion of groundwater resources is happening at an unsustainable rate. The government itself admitted that about 44,000 MW of thermal power plants had violated environmental norms, requiring an investment of approximately to upgrade their pollution control technology. It is estimated that about 50% of the country's geographical area was under forests at the dawn of the 19th century, which has come down to about 21.54% of the total geographical area at present. India concentrates about 7-8% of the recorded species of the world, including wildlife, which is estimated at over 40,000 species of flora and fauna. India is known for taking the world lead in the field of agriculture and has about 1,700 units for exotic crop development, out of 167 countries engaged in bio-resources management and research.

This stresses that 170 million hectares of grasslands and cultivated areas are in a devastating condition due to unplanned industries and urbanization. The continuous chain of eco-friendly human inventions adapted by communities over time was disrupted by colonial policies and industries, where we acquired high-end technology in the short term without paying adequate attention to our available wisdom. Besides, ecosystems that do not get weight in GDP need rethinking; otherwise, their cumulative societal impact can lead to poverty, malnutrition, slow development, food insecurity, conflicts, and multi-billion losses in economic value. While seeking growth, a typical city with a growing educational urban population will turn into juggernauts of consumption and exploitation, inviting floods, landslides, deforestation, decreases in productivity, economic recessions, squandering of disease-related expenses, and loss of women and children, and will become non-competitive in the global economy. Human-centered GDP growth in India has helped to lift humans above survival level; but it has reduced resilience, adaptability, and coping mechanisms of society to coming natural crises and climate impacts, with un-employability for which nobody in society is taking any responsibility. My generation, the present younger generation, has to take responsibility for many actions, developments, emergency escapes, and forgiveness for crop failures, food security, increasing and hidden imbalances on Earth, involving poor people in collateral debts, new governance of natural resources, legal and development interventions, etc. For example, an aluminum smelter working for releases fluorine into the atmosphere and eventually settles down with water vapor during rain. Contaminated vegetation is consumed by cattle, and milk and meat in the value chain eventually get consumed by malnourished children, which affects and contaminates the unborn children

in terms of health; their health and memory of childhood are already encroached. From the above discussion, it is evident that climate change is only a part of the environmental challenge, indicating that the 'do nothing' option is a costlier one.

3. Private Sector Contributions

In India, companies are under pressure to not only be profitable but to mind their social, environmental, and ethical responsibilities. Internally, companies work on sustainability issues by checking their environmental impact, their effects on their suppliers, and considering their own company culture. Industry and government partnerships have also been set up to address environmental problems. In the corporate world in India, the main threats can be discussed in terms of financial and time-related issues. These aspects include the cost of running sustainable operations, which are higher. A more subtle and worrying aspect is the long-term profitability of heeding environmental and social responsibilities. This is due to the tax breaks for CSR-related activities, which specify that companies operating in India need to give away 2% of their net profits every year to social development.

The Ministry of Environment and Forest has been actively working on corporate initiatives towards the environment. Corporate social responsibility (CSR) initiatives in the environmental field are designed to get the community and employees involved in environmental conservation. Selected projects are showcased in India and at international platforms along with a best practice report. Companies have shown their interest in applying for the Green Awards and also in becoming members of FICCI and using it as a platform for green business. The government should enable industry and the private sector to be active participants, assist in forming R&D markets, arm industry and the private sector in being the conduits of the necessary technologies, as well as ensure property rights and human rights are adhered to. Innovation and technology for environmentally sound processes and products are key components in sustainable development and will rely heavily on the capabilities of the private sector. The new vision set by the Indian government in the National Manufacturing Policy is expected to bring in technology and innovation as the key driver of growth.

4. Role of Education and Awareness

Education and awareness can play an instrumental role in fostering sustainability. It is, therefore, essential to integrate environmental education at all levels of school education to instill our future generations with the right values and understanding. This will help approach sustainability as a part of our culture. The importance of outreach programs in

enhancing a proactive, knowledge-based approach towards environmental issues cannot be overstated. A wide range of activities, such as eco-clubs for students, organizational workshops, heritage walks, nature trails, science exhibitions related to environmental themes, debates, quizzes, essays, surveys, etc., can help promote interest and engage the community through an environmental lens. Various media campaigns, TV and radio programs, electronic documentaries, exhibitions, and festivals have been organized to augment the efforts in this direction.

There have been a number of educational and awareness programs to shed light on the critical problems while also providing an outlet for local activists and other citizens. In an effective campaign, a multimedia initiative followed by a door-to-door social communication drive was launched in selected coastal villages to educate them about the reasons leading to, and consequences of, fish aggregate destruction. Such programs have attempted to provide awareness and build up the knowledge of the local inhabitants regarding the ecological and social importance of protecting fish aggregation sites from indiscriminate fishing. The dissemination of this knowledge is a very powerful tool for empowering local communities and non-governmental organizations to influence the appropriate management and policymakers.

A concern, however, is whether a majority of the population has an in-depth understanding of the nuances of sustainability, apart from the very broad definitions. To be truly effective, the principles of, and inherent notions about, sustainability should be understood by the people across the country. It is important that sensitivity and commitment to environmental education are translated into real action at all levels. There is a significant divide related to awareness and consciousness about environmental and resource issues between different cross-sections of the population. Moreover, limited resources and a lack of funds are the bane of large-scale outreach. The future lies in its youth and its local communities. Our children need to be trained well and imbued with a holistic ethos, and this can only be carried out by disseminating the message of value-based education adequately and efficiently to schools. To achieve this, educational systems will have to empower people with a value-based education that sparks spirituality and begins early in life. The full potential of our education system must be put to use for nurturing citizens with environmental values. Religious and spirituality-centered methods operating through educational institutions, NGOs, and others should be fostered to accelerate these efforts. Educational institutions are special agents in the nation-building process. They can provide a leadership role in enhancing environmental governance, and thus sustainability. Educational institutions can also undertake involved research and motivate the many facets of the green technologies revolution. These efforts seek to minimize trade-offs in the new paradigm for education.

5. Conclusion and Future Prospects

In the face of multiple social and environmental challenges, India has been working on a roadmap for sustainability for over a century. This roadmap is now being implemented as part of the Agenda. The federal government has started the process of integrating and mainstreaming SDGs into national policies. However, solitary legislation or policies will not help in achieving the ambitious targets of the Agenda. The great progress that India has made in the field of sustainable development should not take our attention from the fact that this is a long journey ahead, and so much intense work is required in order to materialize the Agenda in all spheres. Multi-actor partnerships and national ownership, as well as support, will remain crucial. An unprecedented level of resources in terms of technology, finance, and data management has to be generated. Innovation has to be accelerated to address the new challenges, like combating the threat of wildfires.

To turn the global ecosystem into a dynamic transformational one, it is necessary to go through continuous self-assessment of the pathway of SDGs in accordance with dynamic environmental conditions. Sustainable development cannot be conferred on the onlookers from above. It necessitates dynamic and collective efforts of all the segments, including government, market, and civil society actors working together to steer through complex and interconnected conflicts to endeavor for inclusive, sustainable futures. In this context, the Agenda provides a rare opportunity to remake economies, contribute intensively to justice, and create business opportunities that can help lift millions of people out of poverty. The Agenda, at its utmost, is utilizing climate action as a driving force for a sustainable future and the common good of all humans and living beings. When we look to the future, India has to commit more than a decade to ensure a sustainable, livable, and resilient planet for the next generations. This long-term vision, guided by the principle of equity, encompasses the essence of sustainability: creating lasting prosperity through social development, investment in technological and social innovations, resource efficiency, inclusivity, environmental care, and global collaborative leadership.

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Chapter 13

Conclusion: A Shared Responsibility for the Future

1. Introduction

In an increasingly interconnected and fragile world, the future holds both great challenges and immense potential (Calder & Clugston, 2005). As we confront pressing environmental issues, it is imperative that we recognize our shared responsibility as members of the human family and the Earth community. (Calder & Clugston, 2005) The threat of climate change, in particular, demands urgent and coordinated action, as it profoundly shapes the world our children and grandchildren will inherit. (Feulner, 2015)

2. The Emergence of Global Green Politics

Global green governance has emerged as a reactive, fragmented, and ad hoc response to the complex environmental challenges facing the world today. This patchwork approach, while well-intentioned, lacks the coherence and tools necessary to implement a comprehensive, systemic solution. As the world becomes increasingly globalized and interconnected, a more principled, rule-of-law framework is necessary to guide the transition towards a sustainable, equitable, and green global future.

3. The Challenge of Shared Responsibility

The concept of shared responsibility is a central tenet of global green politics

. It acknowledges that the health of our planet and the wellbeing of our species are inextricably linked, transcending national boundaries and requiring collective action. However, this shared responsibility is often undermined by political and economic

interests, as well as entrenched power structures that prioritize short-term gains over long-term sustainability.

4. Towards a Sustainable Future

In order to effectively address the challenges of global green politics, a paradigm shift is necessary. This shift must be rooted in the recognition that "in the midst of a magnificent diversity of cultures and life forms we are one human family and one Earth community with a common destiny" (Calder & Clugston, 2005). By embracing a shared sense of responsibility and a commitment to universal human rights, economic justice, and a culture of peace, we can chart a course towards a sustainable global society that respects the delicate balance of the natural world.

5. Conclusion

As we confront the complex and interconnected environmental challenges of our time

, we must heed the moral and scientific imperative to act. Through a shared commitment to a sustainable future, we can harness the power of global cooperation and collective action to build a more just, equitable, and environmentally-conscious world for generations to come. (Calder & Clugston, 2005) (Feulner, 2015)

The case for a world environment organization is a compelling one, as it can provide the necessary governance structure to protect the global environmental commons (Biermann, 2000). By doing so, we can safeguard universal human rights and the welfare of nature, ensuring a brighter future for all. (Calder & Clugston, 2005)

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