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INTERGRATING GREEN GROWTH IN NEPAL

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Forward

In Nepal, the pursuit of green growth is pivotal to achieve a sustainable and prosperous future. The country's unique landscape, rich biodiversity, and reliance on natural resources underscore the significance of adopting eco-friendly practices. Green growth isn't merely an aspiration; it's an essential thing for Nepal's economic resilience and environmental preservation. Balancing economic progress with environmental consideration is crucial, especially in a nation where industries can intersect with delicate ecosystems and communities closely tied to nature.

It is my great pride and optimism to prepare and publish this report titled on **Integrating Green Growth in Nepal**, on behalf of the president of FNCCI, on green growth, a culmination of our collective dedication to sustainability and progress. It gives me immense pleasure to witness the success of our commitment to environmental leadership reflected in this document. This report stands as our commitment to foster growth and contribute to the national economy, while safeguarding the environment and this earth.

This report has insights, strategies, and plans that will guide our nation and our industry's journey toward a more sustainable future. It reflects our belief that economic prosperity and environmental responsibility are not different goals but harmonious things upon which we must stand. Our collective efforts for this report are a proof to our commitment to leaving a positive legacy for generations to come.

I extend my deepest gratitude to the dedicated individuals, experts, and organizations whose invaluable contributions have shaped this report. I would also like to thank ILO for supporting us for preparing and publishing this report. It is evidence that demonstrates the power of collaboration and collective actions. I hope this document serves as a catalyst for transformative change, inspiring us all to embrace sustainability as a guiding principle in our daily efforts and activities, and as an industry, to shape our direction towards a more sustainable and prosperous future.

Chandra Prasad Dhakal
President

01/18/2024

नेपाल उद्योग वाणिज्य महासंघ
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Message

The Government of Nepal is committed to meeting Sustainable Development Goals (SDGs) and its Nationally Determined Contribution (NDC), particularly amid rapid urbanization, emphasizing the need for increased resource productivity in urban areas to sustain economic growth. Industry is one of the major revenue sources for the economic development of the nation and can be the highest contributor through it's efforts in meeting these targets and commitments.

It brings me immense pleasure to introduce this report on green growth. This is an effort of FNCCI Commodity Council to include environmental and social aspects in the development and economic growth. We have prepared this important document with the support of the ILO under the project titled "RBSA Skill Project."

The FNCCI's report on green growth serves as a guiding compass for Nepal's industries, emphasizing the linkages between economic growth and environmental sustainability. The message in this report extends an invitation to all stakeholders, urging them to integrate sustainable approaches into their operations. It underscores the significance of collaborative efforts, encouraging businesses, policymakers, and communities to unite in embracing green growth as a fundamental principle. It advocates for a future where Nepal's economic progress is synonymous with environmental preservation. In summary, this report emphasizes on various things we can do to shift towards green transition.

My heartfelt thanks go to Mr. Gokarnaraj Awasthi, the Director-General of FNCCI, for his exemplary leadership. I would also like to convey my sincere gratitude to the International Labour Organization (ILO) and its dedicated team, especially Mr. Saurav Ram Joshi, National Project Coordinator at ILO, whose invaluable contributions played a crucial role in the success of this endeavor. Special appreciation is extended to Dr. Bijay Thapa, the project consultant, whose tireless efforts and support were instrumental in preparing this report. I also acknowledge and express my gratitude to Mr. Bidur Chandra Lamichhaney, the Deputy Director of FNCCI and Project Coordinator, for his significant contributions. Additionally, I am grateful to Mr. Brajesh Verma, the project Admin Finance officer, and Mr. Sushant Basyal, the project officer, for their substantial contributions. I extend my thanks to our commodity members and leadership for their continuous support in this endeavor.

Last but not least, the successful completion of this report is a testament to the hard work, cooperation, and dedication of all involved. It is my hope that this report will serve as a guiding resource, inspiring us to incorporate sustainability into our business strategies and paving the way for a more prosperous and environmentally conscious future.

Mr. Hem Raj Dhakal
Chairperson Commodity Council and Vice President, FNCCI

01/18/2024

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ACRONYMS AND ABBREVIATIONS

ADB: Asian Development Bank

CCS: Carbon capture and storage

CPS: Country Partnership Strategy

ESG: Environment, Social and Governance

e-waste: Electrical waste

FNCCI: Federation of Nepalese Chamber of Commerce and Industry

GDP: Gross Domestic Production

GHG: Greenhouse Gases

GLOF: Glacier Lake Outburst Flood

HDI: Human Development Index

ILO: International Labour Organization

M&E: Monitoring and Evaluation

MOLESS: Ministry of Labour, Employment, and Social Security

MOFE: Ministry of Forest and Environment

MOICS: Ministry of Industry, Commerce, and Supplies

MOEST: Ministry of Education, Science, and Technology

NAP: National Adaptation Plan

NDC: Nationally Determined Contributions

NGO: Non-Governmental Organization

NPR: Nepalese Rupees

R&D: Research and Development

TVET: Technical and Vocation Education and Training

UNEP: United Nations Environmental Program

USD: US Dollars

WBG: World Bank Group

EXECUTIVE SUMMARY

Green growth, a concept originating in the late 20th and early 21st centuries, focuses on fostering economic development while ensuring the continued provision of natural resources and environmental services. It aims to enhance human well-being, reduce environmental risks, and promote sustainable practices. This approach involves building resilience, efficient management of natural assets, and sustainable infrastructure, ultimately steering society toward a harmonious relationship with nature. Green growth promotes economic restructuring and innovation in growth models to achieve prosperity, environmental sustainability, and social equity, aligning with the goal of limiting global temperature rise.

Nepal, a landlocked country in South Asia, shares borders with India and China and has a growing population, reaching 29.16 million in 2021. Despite relatively high access to water and electricity, the quality of this access is a concern, and sanitation facilities are accessible to just over 61% of the population. The population's concentration in urban and limited areas is straining natural resources and infrastructure, making the country vulnerable to environmental degradation and disasters. Nepal's GDP is estimated at around $41.34 billion in 2023, with services contributing significantly due to remittances and tourism income. The industrial sector is on the rise, despite challenges like limited infrastructure and technology. Agriculture, while important, faces productivity issues due to factors like scarce arable land, low labour efficiency, and climate change. The country ranks 143 out of 191 countries on the Human Development Index, with persisting issues of income inequality, gender disparities, and modest per capita income. Vulnerability to natural disasters, including climate change, earthquakes, and floods, is substantial, with Nepal experiencing a wide range of hazards. The 2015 earthquake was particularly devastating, causing substantial loss to the country's economy and growth. Political instability and budgetary inconsistencies have further impeded development efforts in Nepal. Though there are policies and strategies on the environment and sustainable development, very less efforts are seen on adopting green growth. Nepal has experienced significant economic growth but still grapples with poverty, inequality, and various environmental and socioeconomic challenges. Despite limited utilization of forest resources (1.5% of GDP), high imports have widened the trade deficit. Rapid population growth and development contribute to health risks associated with issues like unsafe water, air pollution, and biomass use, impacting public welfare and economic development. Environmental challenges, including traffic congestion, poor storm drainage, and inadequate waste management, increase vulnerability to floods and reduce resilience. These environmental issues have substantial economic costs and have contributed to a reduction in GDP. High unemployment rates, with many Nepalese seeking jobs abroad, exacerbate these challenges. Despite its relatively low contribution to greenhouse gas emissions, Nepal has an opportunity to pursue climate-resilient, low-carbon growth, tapping into its vast hydropower and renewable energy potential. The country's significant dependence on imported fuel, including petroleum and coal, has resulted in trade deficits and increased greenhouse gas emissions. There's an assumption that introducing green growth and green economy concepts will add costs to the operation, but studies have shown that investments in environmentally sustainable practices can yield substantial returns. Notably, green investments in land, water, and energy can offer returns of up to three times per year, while investing in energy efficiency can save twice the cost of required investments in new energy supply. These findings challenge the notion that a "grow first, clean up later" approach is more attractive, particularly given Nepal's developmental context.

Nepal faces challenges in implementing its commitments to global agreements and policies, with a strong focus on economic growth that often neglects social and environmental considerations, exacerbating poverty-related pressures. Green growth emphasizes the need to develop the economy while preserving or enhancing environmental and social assets. It involves principles such as maximizing resource efficiency, minimizing waste and pollution, and building resilience across livelihoods and economic sectors. To effectively implement these principles, Nepal should shift from a top-down to a bottom-up approach, consider the concerns of marginalized communities, adopt cross-sectoral strategies, and promote synergies while reducing trade-offs between social, economic, and environmental development.

This report has identified the processes and interventions required to adopt the green growth in Nepal. The process of mainstreaming green growth into Nepal's national development planning involves a two-fold

approach. Firstly, it requires evaluating and selecting economically, socially, and environmentally sustainable approaches through upstream diagnostics. Secondly, it involves establishing the necessary policy priorities and institutions to support the chosen approach. Developing a green growth roadmap is vital, integrating a long-term strategic vision with a phased set of activities. The challenge lies in preventing fragmented approaches and ensuring alignment with broader development planning. Priority pillars and programs need alignment with existing policies and legal documents for effective implementation. To enable the transition to green growth, conditions such as macroeconomic stability, human development, and capacity building, devolution, governance, sustainable financing, a favorable business environment, a framework for resource-dependent industries, a sustainable trade regime, and the creation of green jobs are essential components of the strategy.

The green growth strategy for Nepal encompasses various thematic areas and strategies to guide the nation's transition towards a sustainable and environmentally responsible future. These key thematic areas and associated strategies are:

Promoting Sustainable Infrastructure: The focus here is on developing, upgrading, and expanding infrastructure across sectors while mitigating adverse effects on social, economic, and environmental processes. Strategies include enhancing sustainable mobility, improving water and sanitation services, increasing the share of renewable energy, promoting energy-efficient buildings, and developing agricultural infrastructures.

Building Resilience: This theme emphasizes making the economy and livelihoods less susceptible to climate change and external shocks. Strategies involve exploring and mobilizing resources for building resilience, implementing disaster risk reduction measures, and providing access and support to vulnerable communities.

Sustainable Natural Resource Management: This area aims to optimize the role of natural resources in driving economic growth and well-being. Strategies encompass implementing and complying with existing legal documents, promoting entrepreneurship in natural resources management, and endorsing standards and certification for natural resource products.

Promoting Resource Efficiency: This section focuses on maximizing resource utilization while reducing costs and environmental impacts. Strategies include increasing energy efficiency, facilitating energy audits and certifications, enhancing water use efficiency, implementing the 3Rs (Reduce, Reuse, Recycle), and promoting resource-efficient and cleaner production technologies.

Social Inclusion and Sustainable Livelihoods: Ensuring that all segments of society benefit from the transition is vital. Strategies involve accelerating the creation of green jobs, promoting green technology development and innovations, strengthening protection for consumers and employees, and mainstreaming green growth and green economy in education and training.

These thematic areas and strategies collectively shape Nepal's approach to green growth, encompassing environmental, social, and economic considerations for a more sustainable and equitable future.

In the industrial sector, this report has identified activities that need to be carried out to adopt green growth. The plan includes enhancing energy performance and efficiency, decreasing energy usage across sectors, and diversifying domestic energy sources. Moreover, it has focused on promoting sustainable and organic farming practices, along with afforestation and sustainable forestry. The report suggests a gradual reduction of environmentally harmful sectors while fostering green industries to generate employment and increase incomes. It emphasizes energy efficiency, the development of a smart grid, and modernizing irrigation systems for climate resilience. Additionally, the report encourages e-mobility, improved waste management, and air quality, with a strong emphasis on eco-friendly consumption and procurement. Furthermore, it underscores the management of natural resources, including land and water, and promotes social inclusivity across sectors, ensuring equitable access to opportunities and services as part of the green transition. The identified implementing agencies include Ministry of Industry, Commerce and Supplies (MOICS), Ministry of Forest and Environment, Ministry of Labour, Employment and Social Security, Ministry of Education, Science and Technology, Local bodies and other stakeholders who can contribute to the green transition.

SECTION 1
INTRODUCTION

1.1 Definitions

Green growth

Green growth is an economic and environmental concept that started in the late 20th and early 21st centuries. OECD (2011) defines green growth as "fostering economic growth and development, while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies".[1] UNEP has defined green economy as "one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities"[2]. African Development Bank has defined Green growth as "the promotion and maximization of opportunities from economic growth through building resilience, managing natural assets efficiently and sustainably, including enhancing agricultural productivity, and promoting sustainable infrastructure."[3]

Green economy

"A green economy is defined as low carbon, resource efficient and socially inclusive. In a green economy, growth in employment and income are driven by public and private investment into such economic activities, infrastructure and assets that allow reduced carbon emissions and pollution, enhanced energy and resource efficiency, and prevention of the loss of biodiversity and ecosystem services."[4] The green economy specifically focuses on economic activities and sectors that are directly related to the environment, sustainability, and low-carbon practices. It's about creating and maintaining jobs and businesses that have a positive impact on the environment.

Circular economy

The circular economy is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible. In this way, the life cycle of products is extended. [5] A circular economy is an economic system designed to minimize waste and make the most of resources by promoting the continual use, recycling, and regeneration of products, materials, and resources. In a circular economy, the traditional "take-make-dispose" linear model of production and consumption is transformed into a more sustainable and restorative approach.

Green jobs

Green jobs are decent jobs that contribute to preserve or restore the environment, be they in traditional sectors such as manufacturing and construction, or in new, emerging green sectors such as renewable energy and energy efficiency.[6] At the corporate level, green employment involves creating environmentally beneficial products and services, such as eco-friendly buildings and clean transportation. Nonetheless, these environmentally friendly

1 OECD (2011), Towards Green Growth, https://read.oecd-ilibrary.org/environment/towards-green-growth_9789264111318-en#page3

2 UNEP (2011), Green Industrial Policy: Concept, Policies, Country experiences, https://www.unep.org/resources/report/green-industrial-policy-concept-policies-country-experiences

3 African Development Bank (2013), African Development Report 2012: Towards Green Growth in Africa.

4 UNEP (2023), https://www.unep.org/regions/asia-and-pacific/regional-initiatives/supporting-resource-efficiency/green-economy, retrived on October 20, 2023

5 EU (2023). https://www.europarl.europa.eu/news/en/headlines/economy/20151201STO05603/circular-economy-definition-importance-and-benefits#:~:text=The%20circular%20economy%20is%20a,products%20as%20long%20as%20possible. , retrieved on October 20, 2023.

6 ILO (2023), https://www.ilo.org/global/topics/green-jobs/news/WCMS_220248/lang--en/index.htm, retrieved on October 19,2023.

outcomes may not always result from green manufacturing methods and technologies. Thus, green jobs can also be identified by their role in advancing eco-conscious processes, like reducing water usage or enhancing recycling systems. Nevertheless, positions classified based on their production methods do not guarantee the creation of environmentally beneficial products or services.

Just transition

To address urgent environmental issues such as climate change, pollution, and the decline of biodiversity, countries and companies must shift towards more environmentally friendly, robust, and carbon-neutral economies and communities. This will have negative impacts of job losses. Just transition seeks to ensure that the shift to a green economy benefits everyone, addressing the social and economic impacts on workers and communities through measures like job retraining, income support, and community revitalization. It has been defined as: "A set of principles, processes and practices that aim to ensure that no people, workers, places, sectors, countries or regions are left behind in the transition from a high-carbon to a low carbon economy." [7]

A Just Transition entails optimizing the social and economic advantages of climate action while minimizing and prudently addressing associated difficulties. This involves engaging in effective social dialogues among all affected groups and upholding fundamental labour principles and rights. Ensuring a just transition is crucial for all nations, regardless of their development stage. It is also pertinent to every economic sector, extending beyond just energy supply, and it applies to both urban and rural regions.

1.2 Introduction

Rio summit (1992) played a pivotal role in shaping the industry's approach to environmental responsibility. Rio declaration and Agenda 21 called for the sustainable development practices in the industries. This has been instrumental in development and growth of environmental initiatives, corporate social responsibility, adopting sustainable practices like reduction of pollution and conservation of resources. This summit also explored possibilities of replacement of fossil fuels with alternative sources of energy.

Green growth aims at orienting future generations to a green living culture, forming a civilized and modern society in harmony with nature and the environment. Green growth contributes to promoting economic restructuring associated with growth model innovation, in order to achieve economic prosperity, environmental sustainability, and social justice; towards a green, carbon-neutral economy and contribute to the goal of limiting global temperature rise. Green growth is further explained as:

- Enhancing productivity by creating incentives for greater efficiency in the use of natural resources, reducing waste and energy consumption, unlocking opportunities for innovation and value creation, and allocating resources to the highest value use.
- Boosting investor confidence through greater predictability in how governments deal with major environmental issues.
- Opening up new markets by stimulating demand for green goods, services and technologies.
- Contributing to fiscal consolidation by mobilizing revenues through green taxes and through the elimination of environmentally harmful subsidies. These measures can also help to generate or free up resources for anti-poverty programmes in such areas as water supply and sanitation, or other pro-poor investments.
- Reducing risks of negative shocks to growth due to resource bottlenecks, as well as damaging and potentially irreversible environmental impacts.

Promoting green growth involves stimulating investment and fostering innovation, with the aim of sustaining economic expansion and creating fresh economic prospects. This approach is designed to be practical and

7 IPCC (2022), Climate change 2022 Mitigation of Climate Change

adaptable, allowing for concrete advancements in both the economic and environmental aspects, all while considering the social implications of transitioning economies toward a greener growth trajectory.

The green growth agenda for Nepal will likely have to be emphasized on sustaining rapid growth and poverty alleviation by avoiding environmental damage that can have negative impact on future. This could be achieved through integrating Environment, Social and Governance aspects on industries by shifting towards decarbonization, abating pollution, reducing the usage of energy and water, creating green jobs etc. The development processes need to be adapted to manage these requirements.

1.3 Country profile of Nepal

Nepal is a landlocked country in South Asia, bordering with India and China. It has a population of 26.49 million in 2011 which has increased to 29.16 million in 2021[8]. Although more than 91% of the population has access to water and about 90% has access to electricity[9], the quality of this access is questionable. Slightly more than 61% of Nepalis have access to improved sanitation facilities[10]. The increasing population in urban and limited areas has increased significant pressure on existing natural resources and available infrastructures, which makes the people highly vulnerable to environmental degradation and catastrophe.

The GDP of Nepal is estimated to be US $ 41.34 billion in 2023[11]. The share of GDP is 61.76% and 14.29% from service and industries, respectively. The share of GDP on service is high mostly due to the inflow of remittances as well as income from the tourism sector. Industry and manufacturing contribution has started to increase despite lack of investment due to limited access to basic infrastructures and other reasons. The agricultural sector contributes 23.95% of the GDP. However, limited availability of arable land, low labour productivity, the lack of advanced technology, difficult topography, and changing climate are the main drivers behind decreased agricultural productivity[12].

Nepal ranked 143 out of 191 countries in the Human Development Index, and is only above Pakisthan and Afganisthan among members of the South Asian Association for Regional Cooperation (SAARC)[13]. While Nepal has made progress in terms of increased life expectancy at birth and enhancements in the quality of education, its per capita income remains relatively modest. Notably, inequality remains a significant concern, with evident disparities in income among various castes and ethnic groups. Moreover, gender disparities in life expectancy, education, and income persist as significant challenges throughout Nepal.

Nepal's susceptibility to disasters is largely due to its delicate geology and rugged terrain. Nepal is ranked 20th for disaster risk, with the country ranking 4th, 11th, and 30th in terms of vulnerability to climate change, earthquakes, and floods, respectively[14] . It regularly contends with a wide array of natural hazards, including floods, landslides, earthquakes, fires, extreme cold, hailstorms, windstorms, lightning strikes, sudden heavy rain, droughts, glacier lake outburst floods (GLOFs), avalanches, and epidemics. The precarious, steep slopes and the fragile geological composition of this youthful mountain range, coupled with heavy monsoon rains, create a significant array of geological and hydro-meteorological disasters throughout the nation. The diverse geological features, combined with intense rainy season precipitation, lead to events like landslides, debris flows, and floods. Nepal's location within the collision zone of the Indian and Eurasian tectonic plates makes the country highly prone to earthquakes. The earthquake that hit Nepal in early 2015 highlights this vulnerability and its severe consequences for the country's development. The 7.6 magnitude earthquake impacted all dimensions of life in Nepal. Approximately 9,000 casualties were reported and more than 20,000 people were injured.

8 CBS (2021)
9 WDI (2021), https://databank.worldbank.org/source/world-development-indicators
10 UNICEF (2019), Drinking Water, Sanitation and Hygiene (WASH) Multiple Indicator Cluster Surveys
11 IMF (2023), https://www.imf.org/external/datamapper/profile/NPL, retrieved on 11th October, 2023
12 GGGI (2018), ▪ Green Growth Potential Assessment Nepal Country Report
13 UNDP (2022), Human Development Report 2021/22
14 ADRC (2019), Nepal: A brief country profile on Disaster Risk Reduction and Management

Earthquake has caused the loss of USD 5 billion from 1990-2019). Gorkha Earthquake dropped 1.5% of GDP growth. 80% of the Terai region got inundated due to monsoon rains causing US $ 584 million losses [15]. This shows how much effects disasters and other external factors can impact on the country. There are other factors like political instability, inconsistencies in yearly budget plans that has further hindered the development of the nation.

1.4 The Rationale for Transitioning to Green Growth

Green growth provides a practical approach for achieving not just economic growth but a responsible growth with due consideration to environment and social aspects. The focus of green growth is to ensure that the natural assets can deliver their full economic potential on a sustainable basis. Green growth is all about including the provisions of clean air and water, and the resilient biodiversity needed to support food production and human health. It takes into account that natural resources are not infinitely renewable and due consideration has to be taken into account. This is very much relatable to Nepal, as well.

The economic growth rate in Nepal has been impressive over the last decade, however poverty and inequality remains an concern[5]. Though, the utilization and exploitation of forest resource seems significantly low (1.5% of GDP), the import has been significantly high, thereby increasing the trade deficit and reducing the foreign reserve in the county. However, increasing population and development has increased the burden linked with environmental diseases linked often to unsafe water, air pollution or use of biomass poses a threat to health, welfare and economic development. Traffic congestion imposes increasing costs while poor storm drainage and inadequate solid waste management increase vulnerability to floods and reduce resilience. The cost associated with the environmental consequences has significantly played a role in reduction of GDP. Unemployment rate, over 19% with 2.7% being the average unemployment rate of the world, is another problem in Nepal[16]. A lot of people go abroad in search of jobs. Though a small country, Nepal ranks 11th in terms of brining remittances from overseas migrants and is about USD $8.51 billions. This has contributed a lot to the economic development but each year more than 1,200 dead bodies of migrant workers arrive in Nepal[17]. One of the major objective of fifteen five year plan (2019-2023) was to create employment opportunities within the country, the country has not been able to do that. Though a lot of people depend on agriculture for their livings, there has been issues of land degradation and low agricultural productivity in absence of access to the technologies, infrastructure, energy and finance, reduced postharvest losses, value chain addition and competitive marketing.

Nepal's vulnerability to disasters and extreme climate events is well documented but it urges on improving resilience and disaster risk management. Nepal contributes less than 0.03% of greenhouse gas emissions, its emissions per unit of GDP is also significantly low. But there are opportunities to work on climate resilient, lower carbon emission growth pathways like some of the developing countries like Bhutan are working. Nepal has huge potential of hydropower and other renewable energy resources. It has a potential of 83 GW physically with more than than 42 GW is estimated to be economically feasible. Yet, imports more than 2.6 million liters annually of petroleum products from India [18]. Nepal also imports coal or similar products equivalent to be US $ 273 million [19]. Though the import of coal is decreasing and growth rate of import of petroleum products is decreasing, the dependency on imported fuel is still high, considering the low-quality electricity supply. The import has increased the trade deficit and increasing the emission of GHG.

15 UNDRR (2019), Disaster Risk Reduction in Nepal, Status Report 2019

16 ILO (2023), https://www.ilo.org/kathmandu/areasofwork/employment-promotion/lang--en/index.htm, retrieved on 11th October, 2023

17 ORF (2023), https://www.orfonline.org/expert-speak/massive-outflow-of-youth-from-nepal/#:~:text=Of%20those%20going%20to%20overseas,is%20a%20record%20in%20itself., retrieved on 11th October, 2023

18 NOC (2023), https://noc.org.np/import, retrieved on 10th October, 2023

19 Trend Economy (2023), https://trendeconomy.com/data/h2/Nepal/2701, retrieved on 11th October, 2023.

There are assumptions that current economy is operating well and introducing concepts of green growth and green economy will add cost to the operation. As the developed countries have done over the years, grow first and clean up later approach seems to be more attractive to the developing countries. The reason of this assumption is inadequate knowledge.

Figure 1 Interlinkages for Green growth

Often ecosystem goods and services are provided for free, hence the cost associated is not accounted for when planning for development activities. The cost associated with the impact on degradation of environment (health, degradation, and climate change) has higher costs, which cannot be accounted easily. The impact on soil fertility, productivity etc are also not considered much, as of now. However, there have been a lot of studies, which prove these assumptions wrong. Green investments in land, water and energy could bring the returns up to 3 times per year was the finding of a study conducted by McKinsey and Company[20]. World Bank estimated that investing a dollar on energy efficiency saves two dollars of required investments in new energy supply[21]. ILO-UNEP jointly published a report which suggests, productivity levels in 2030 will be lowered by 7.2% in business-as-usual scenario by 2050[22]. Climate change will be responsible for 2% decline in cereal yields globally whereas demand will increase by 14% per decade[23]. These studies suggest that it may be more economical to reduce or prevent pollution at an early stage than to incur the higher costs of repairing the losses. This is even more relevant for Nepal, where most of the developmental works are to be executed in few years.

20 McKinsey and Company (2011), Resource Revolution: Meeting the world's energy, materials, food and water needs

21 World Bank (2012), Inclusive Green Growth The pathway to sustainable development

22 ILO-UNEP (2012), Working towards Sustainable Development

23 CGIAR (2011), Achieving Food Security in a changing climate

SECTION 2
APPROACHING GREEN GROWTH

Though Nepal has signed treaties and has made commitments on global scale and has policies, acts, regulations and standards in place, but the implementation is very poor. Current practices are more focused on economic growth with less consideration to the social and environmental externalities that contributes or creates more pressure to poverty. Green growth recognizes the need to grow and develop the economy but maintaining, increasing or restoring environmental and social assets. Green growth is a more holistic approach that integrates economic, social and environmental perspectives for improving human welfare. The key principles are, but not limited to:

- Maximizing natural resources use efficiency.
- Minimizing waste and pollution
- Building resilience of livelihoods and economic sectors

For the effective implementation of the key principles, Nepal needs to shift from top-down approach to bottom-up approach, listening to the concerns of people on the bottom of the pyramid (BOPs), sectoral to cross-sectoral approaches and shift from project centric to harnessing synergies and reduce trade-offs between social, economic, and environmental development. The focal areas for inclusive green growth includes:

Efficient use of natural resources	Minimizing pollution	Resilient livelihoods and economic sectors
▪ Minimizing foodprints ▪ Water ▪ Minerals	▪ Reduction of usage of raw materials ▪ Energy efficiency ▪ Reducing the pollution	▪ Strengthen disaster risk management and adaptive capacities to physical, socio-economic and environmental shocks ▪ Inclusiveness of green growth

Figure 2 Focal areas for inclusive green growth

Typically following steps needs to be followed for proper implementation and application of green growth within a country[24].

i. Employ well designed planning and co-ordination processes.

The establishment of sustainable green growth initiatives heavily relies on well-defined planning procedures, guided by top government officials with clear authority and goals. These processes prioritize deliberate involvement of stakeholders, effective institutional governance, and trustworthy analysis. The plans should be in line with national goals and should not change with leadership changes. The plans should also have clear economic, environmental and social objectives with outcome-based mandates. The formation of committees inclusive of top-government officials, industries, academic institutions and other stakeholders (civil societies, NGOs etc.) will help in co-ordination and implementation processes of the plans. FNCCI's formation of Green growth advisory consisting of representatives of relevant ministries, institutions, academia and industries.

ii. Establish clear visions, targets and baselines.

Governments experience the highest levels of success when they articulate their green growth goals as a 'vision' for an envisioned future state, following an ambitious and extended path of transformative change. Typically, this vision includes specific, short- and medium-term objectives concerning economic expansion,

24 GGGI (2014), Green Growth in Practice, Lessons from Country Experiences

poverty alleviation, job creation, emission reduction, industrial development, and the preservation of natural resources. Often, these future narratives are compared to 'business-as-usual' scenarios, providing a baseline for illustrating the contrast. This vision, targets and baselines are drafted with engagement of high-level political leadership and supported through consensus processes across various stakeholders. The vision could be more inclined based on the baseline and priority of the nation.

iii. Undertake robust analysis and balanced communication of the benefits of green growth

The pursuit of a green growth trajectory can yield a wide spectrum of advantages spanning economic, environmental, and social realms. Successful governments in this pursuit prioritize harnessing the interconnections among these three dimensions while effectively addressing trade-offs. They aim to facilitate transformative change, particularly by separating economic growth from the depletion of natural resources and enhancing climate resilience. To build a compelling case for green growth, governments must conduct trustworthy analyses of the primary benefits and communicate these advantages comprehensively, robustly, and in a balanced manner.

iv. Prioritize measures and technologies and construct credible pathways towards formulated targets

In the process of selecting technologies and policies to achieve desired outcomes in green growth, it's crucial to conduct a thorough evaluation of options through inclusive consultation. Valuable insights from successful approaches include the need for a combination of top-down and bottom-up analyses encompassing a wide range of sectors, economy-wide objectives, and their effects on diverse groups, including those in poverty. Utilizing alternative pathways allows for an exploration of the magnitude and pace of change needed in various sectors while highlighting choices and uncertainties. An iterative approach to analyzing options, identifying priorities, and crafting both short and long-term green growth strategies, with stakeholder input, is essential. Making clear assumptions, relying on reliable data, and actively involving stakeholders are critical in choosing priorities and pathways for green growth. The selection of analytical tools and methods should be deliberate, tailored to the local context, and should not dictate the analytical direction. Combining outputs from various types of analyses enhances result consistency and addresses the limitations of individual tools.

v. Design portfolios of policies to address near-term development and longer-term green growth transformation goals and respond to specific market failures and political economy challenges

Governments committed to green growth acknowledge the necessity of implementing extensive and unified policy reforms and advancements to facilitate transformative change throughout the entire economy. These policies should encompass both broad, economy-wide measures and specific, sector-focused initiatives. They are essential for promoting structural and behavioral shifts among consumers and producers and for attracting private investments towards sustainable practices. These policies should effectively address market failures, tackle political challenges, establish robust governance and enforcement systems, and be seamlessly integrated with existing policy frameworks.

vi. Design public finance instruments to overcome barriers to mobilizing private investment into green growth sectors

The transition to green growth hinges on the significant mobilization of capital. Successful financing strategies for green growth establish the market conditions that encourage primarily private sector investments and address obstacles such as investment risks, inadequate returns on some green technologies, competing subsidies, capacity limitations, information gaps, and regulatory barriers. Effective green growth financing strategies play three key roles in mobilizing private green investments: Firstly, they create a conducive environment for long-

term green investments. Secondly, they allocate public budgets and investments, often through dedicated funds or financial intermediaries, to promote green growth. Thirdly, they employ tailored financial instruments to mitigate risks and enhance investment returns, thus stimulating private sector green investment.

vii. Strengthen public-private collaboration

Achieving green growth successfully demands participation from all sectors of society to develop new skills, foster innovation, promote sustainable resource management, and envision new pathways for economic development and community interactions. A vital instrument in realizing green growth objectives is the collaboration between robust government efforts and the private sector. Such partnerships are essential for mobilizing resources, leveraging expertise, and demonstrating innovative leadership required to attain green growth goals.

viii. Strengthen collaboration among regional, sub-national and national levels

In addition to national green growth programs, a growing number of subnational governments are initiating their own green growth initiatives, and in some instances, are taking the lead or spurring national efforts. The successful execution of both national and subnational green growth endeavors relies on close collaboration to ensure that their activities complement and support each other.

ix. Build and maintain green growth monitoring and evaluation systems

Efficient monitoring and evaluation (M&E) systems play a crucial role in facilitating learning, informed decision-making, and management improvements. They also enhance government accountability, foster public trust, and encourage stakeholder involvement. It's essential to establish and sustain these systems for assessing, monitoring, and communicating progress and outcomes in the context of green growth initiatives.

SECTION 3
INTEGRATING GREEN GROWTH IN NEPAL

1.1 Review of legal documents of Nepal

Constitution of Nepal

The constitution of Nepal recognizes right to clean environment. It also outlines principles of sustainable development and environmental conservation. It emphasizes the protection and improvement of the environment, sustainable use of resources and promotion of clean and renewable energy. It also emphasizes the protection of biodiversity and natural heritage. Although not extensively detailed in the Constitution, Nepal has expressed concerns about climate change and its impact on the environment. Nepal is a signatory to international agreements related to climate change and works on climate resilience and mitigation strategies.

Fifteenth Periodic Plan of Nepal (FY 2019/20-2023/24)

The fifteenth five-year plan has set the vision of sustainable, employment-oriented and high return industrial development for economic prosperity for industrial development with limited focus on environment and social aspects. Whereas on environment and climate change sector, the visions are to create a clean, green and healthy environment and climate resilient society. Though both sectors have strong working strategies and policies, but it is not reflected in industry sector. The inclusion of green growth is not elaborated.

Climate Risk Country Profile

The study estimates that global warming will result in the loss of between 36% to 64% of ice mass in Asia's high mountain glaciers by the end of the 21st century(WBG & ADB, 2021).ADB agreed a Country Partnership Strategy (CPS) with the GoN for 2020–2024, CPS states that ADB assistance will focus on disaster and climate change risk management by building institutional capacities (including knowledge base and management systems), ensuring resilience of infrastructure against the risks, and applying risk-screening tools in designing projects. The World Bank agreed a CPF with the GoN covering the period 2019–2023. Climate change is addressed in the third focus area of the CPF (WBG & ADB, 2021).

National Adaptation Plan

The Conference of the Parties of the United Nations Framework Convention on Climate Changeat CoP16 decided to formulate and implement National Adaptation Plans (NAP).The Government of Nepal has recognized climate change adaptation as critical to protecting vulnerable communities, ecosystems, and climate-sensitive sectors from the effects of climate change. So, the Government of Nepal started the NAP formulation process and on October 2021, the Council of Ministers Of The Government Of Nepal approved National Adaptation Plan (2021-2050). It has adaptation programs in eight thematic and four cross-cutting sectors. These includes agriculture and food security, forests, biodiversity and watershed conservation, Water resources and energy, rural and urban settlements, industry, transport and physical infrastructure, tourism, natural and cultural heritage, health, drinking water and sanitation and disaster risk reduction and management as themes and gender equality and social inclusion, livelihoods, and governance as cross-cutting issues.

Second Nationally Determined Contribution (NDC)

NDC has emphasized expanding clean energy generation to 15,000 MW by 2030 and 15% of total energy demand to be supplied from clean energy sources. It also plans to adopt low emission technologies in brick and cement industries and formulate guidelines and establish mechanisms to monitor emissions from large industries, reduce waste generation and adopt and implement waste to energy projects in at least 100 municipalities. This also aims to reduce GHG emissions.

Nepal's Long-term strategy for Net-zero emissions

Nepal has planned to achieve net zero emissions by 2045. The strategy has 6 sectoral strategies to meet the target, which includes: Energy, Industrial process and product use, agriculture, forestry and other land use, for forestry and other and land use, waste and energy trade. The strategy has plans for carbon capture and storage, through other interventions except through forest sector only.

Environmental Protection Act, 2019

This study has mandated the environmental study report prior to initiation of proposal depending upon the scale. Further, the Act explicitly authorizes the Government of Nepal to set standards to reduce and regulate emission, hazardous waste, Pollution emitted by vehicles, equipment, industries, hotels, restaurants and other institutions or activities. The Act regulates the manufacturing and distribution of harmful substances. The Act also addresses the concern of climate change and control of greenhouse gases and other gasses.

Environmental Protection Regulation, 2020

The law has been formulated to protect the fundamental right of each citizen to live in a clean and healthy environment, provide the victim with compensation by the polluter for any damage resulting from environmental pollution or degradation, maintain a proper balance between environment and development, mitigate adverse environmental impacts on environment and biodiversity and face the challenges posed by climate change at province level. This further elaborates the steps to carry out the environmental study reports.

Solid waste management Act, 2011

The act has been formulated to make the management of the solid waste in a systematic and effective way by reducing at its source, re-use, processing, or discharge and for maintaining a clean and healthy environment through the reduction of adverse effects that may be caused to the public health and environment by amending and consolidating the laws relating to the Management of solid waste like most essential services laws.

1.2 Interventions required in integrating green growth in Nepal

1.2.1 Mainstreaming green growth into national development planning processes

To attain development goals such as enhancing agricultural productivity and expanding energy access, green growth principles advocate a two-fold approach. First, through upstream diagnostics, it is crucial to assess and determine which approaches are not only economically feasible but also socially and environmentally sustainable. Second, once the most viable approach is identified, the establishment of requisite policy and institutional priorities becomes paramount. This entails the creation and implementation of supportive policies and the development of necessary institutions to effectively realize the chosen approach, ensuring that development objectives are met while considering economic, social, and environmental factors.

1.2.2 Developing a green growth road map

Incorporating green growth principles into a nation's development planning can be achieved through the creation of a strategic roadmap. This approach complements mainstreaming green growth and requires a more advanced discussion on green growth. The roadmap allows for the integration of a long-term strategic vision with a phased set of activities. However, a key challenge lies in avoiding fragmented approaches or overlapping priorities, ensuring that the roadmap ultimately contributes to and informs the broader context of overall development planning.

1.2.3 Identifying Priority Pillars and Programs

This has to be in line with existing policies and legal documents of Nepal. Various pillars has been considered when preparing the strategies for NDC, Long-term strategy for net-zero emissions and other legal documents. If the documents are linked to each other, it's easier to implement and plan the programs accordingly.

1.2.4 Enabling environment for transition

For the transition to green growth, there are many factors that has to be considered. The following conditions has been identified as key enabling conditions for the rapid transition:

Maintaining macroeconomic stability for green growth

Maintaining stability in the broader economy is a crucial element for creating a healthy environment for both private and public sector investments. These efforts will bolster the economy's ability to withstand external economic disruptions. The government will assess and consider utilizing fiscal tools like taxes, guarantees, and spending strategies, such as "green procurement," to support the development of a sustainable, environmentally friendly economy. Emphasis will be placed on directing public funds and fostering collaborations between the public and private sectors to advance renewable energy resources and create an efficient transportation network, covering road, rail, air, and water systems.

Human development and capacity building:

The government will have to allocate resources to bolster the health and education sectors, aiming to strengthen the human workforce needed to promote sustainable growth. Within the public health sphere, the primary goals will be to enhance access to clean drinking water, housing, sanitation, and food security. Simultaneously, investments in education will concentrate on skill enrichment, fostering innovation, research, and development across all sectors, thereby facilitating the creation of new technologies and harnessing existing green innovations. The integration of green economy principles, initiatives, and endeavors necessitates the development of expertise at all administrative levels to facilitate this transition.

This includes focusing on green skills, work-based learning and just transition.

Devolution:

As counties assume a more significant role in governance, it becomes imperative to prioritize the green economy within County Integrated Development Plans and budgeting procedures. Effective inter-governmental coordination is of utmost importance to establish synergies in this endeavor.

Governance and sustainable structural transformation:

Emphasizing good governance and the execution of structural reforms, guided by the principles enshrined in the Constitution of Nepal, should be a top priority. These structural reforms will center on enhancing the administration of public resources and eliminating corruption. The government needs to encourage diversification and transformation to ensure optimal resource utilization.

Sustainable financing:

Expanding financial inclusion is anticipated to strengthen economic resilience and facilitate the transition to a Green Economy. The government will investigate a broader range of policies and financial tools to promote the green economy, including options like green bonds and eco-taxes. Efforts will also be made to build local capacity, enabling access to both national and international sources of funding.

Cost of doing business:

Government will have to work to create a competitive business environment by eliminating obstacles and streamlining administrative requirements and regulations that pertain to business operations. This includes aspects like business taxation, registration processes, utility expenses, legal proceedings, environmental clearances, and the safeguarding of intellectual property rights.

Framework for industries relying on natural resources:

A robust governance framework will have to be put in place to improve the sustainable extraction of natural and

public resources, ensuring transparency and accountability in the distribution and utilization of benefits. The adoption of cleaner technologies in resource extraction processes will be a key focus. The government will also work to encourage adherence to and bolster the enforcement of environmental laws and regulations.

Sustainable trade regime

Worldwide, there is a growing popularity of environmental and social standards in business to safeguard the environment and public health. These standards encompass various aspects, including technical specifications and eco-labeling for different products. A major policy focus is on establishing the necessary infrastructure and enhancing the skills of the workforce to tap into sustainable trade prospects at the national, regional, and global levels.

To address these concerns, the government will engage in collaborations with the private sector to explore market opportunities linked to the shift towards a green economy.

Green jobs

According to the International Labour Organization (ILO), approximately 400,000 people enter the job market each year[25]. To support green growth and make a positive contribution to the economy, it's essential to increase the number of quality job opportunities. This can be achieved by introducing innovative measures aimed at enhancing workplace safety, expanding social protection and healthcare initiatives, and fostering social dialogue.

To realize these objectives, the strategy will employ a range of social policy instruments and make focused investments in green enterprises.

1.2.5 Thematic areas and strategies

This section defines the scope of each thematic area identified based on the similar documents of other countries and outlines objectives and a set of strategies to guide Nepal's journey to a green growth. The strategy focuses on several key thematic areas, which include:

i. Promoting sustainable infrastructure.

The focus on infrastructure is pivotal in underpinning a robust and sustainable economic environment. The government is actively involved in various projects aimed at developing, upgrading, and expanding infrastructure across sectors like energy, transportation, agriculture, water and sanitation, housing, and waste management. While these initiatives, there are equal chances of economic development and environmental challenges. Thus, the objective of this thematic area is to promote sustainable infrastructure with a keen eye on mitigating adverse effects on social, economic, and environmental processes essential for human well-being, biodiversity, and the preservation of natural resources. This approach also emphasizes the careful balance between natural and built infrastructure for both large and small-scale developments.

The following activities can be carried out in this theme to speed up the transition.

- Enhancing sustainable mobility by promoting public transport, reducing vehicular emissions by promoting e-mobility (EVs and Hydrogen vehicles).
- Enhancing water and sanitation services by constructing infrastructures, promoting environmentally friendly technologies like ecosan toilets, biological systems to treat water and wastewater.
- Increasing the share of renewable energy (Current sources of energy are 66.3% from biomass, 17.8% from

25 ILO (2023), https://www.ilo.org/kathmandu/areasofwork/employment-promotion/lang--en/index.htm#:~:text=Over%20400%2C000%20young%20people%20are,the%20employment%20challenge%20in%20Nepal., retrieved on 11th October, 2023

petroleum products and LPGs, 9.3% from coal, 6.6% from hydropower and renewables[26])

- Promoting energy efficient buildings
- Developing and enhancing agricultural infrastructures by introducing efficient technologies for irrigation, reducing post-harvesting losses etc.
- Explore and mobilize financial resources (Capital and other green financing opportunities) for green investments

ii. Building resilience

Ensuring that the economy and people's livelihoods are less susceptible to the risks and challenges posed by climate change and evolving growth dynamics is of utmost importance. In recent times, Nepal has experienced adverse effects from external shocks, including disasters. Incorporating resilience into the growth strategy is not a novel idea; it involves intensifying efforts and programs in this direction. These efforts will align with the ongoing work conducted under the National Climate Change Action Plan, National Adaptation Plan, and Climate Change policy, with a specific focus on enhancing resilience to climate change. The following activities can be carried out in this theme to speed up the transition.

- Explore and mobilize resources (green financing, green bonds, grants and funds) for building resilience.
- Disaster risk reduction measures to be implemented (Early warning systems, Nature based solutions etc.).
- Provide access and promote vulnerable communities.

iii. Sustainable natural resource management.

This thematic area places its focus on the intricate relationship between the economy and the environment, with the goal of optimizing the role of natural resources in driving economic growth, industrialization, and the well-being of communities. It encompasses a wide range of sectors including agriculture, forestry, water, fisheries, wildlife, land use, and mining. Key challenges in this theme include population growth, the risk of excessive resource extraction, wildlife poaching (which has notably decreased), urbanization, changing consumption patterns, climate change, and chemical usage. The sustainable utilization of these resources holds the potential to create new opportunities like green employment, bolster food security, and enhance livelihoods. Furthermore, this area aims to fortify natural resource governance, ensuring equitable and transparent distribution of benefits, advancing natural capital accounting, endorsing standards and certification for natural resource products, and promoting sustainable land and other natural resource management practices. The following activities can be carried out in this theme to speed up the transition.

- Effective Implementation and compliance of existing legal documents
- Promoting entrepreneurship in natural resources management by developing a natural resources accounting system, incentivizing conservation, reduction in emissions and carbon captures etc.
- Promoting natural resources management and sustainable utilization of natural resources.

iv. Promoting resource efficiency.

Promoting resource efficiency is a critical component of this strategy, aiming to discover methods to maximize resource utilization while reducing costs and environmental impacts. Boosting resource productivity across all sectors involves achieving higher output with fewer resource inputs over time. The shift toward a Green Economy also involves backing green and eco-friendly technologies, as well as research and innovation initiatives. Investing in efficiency can result in more resources available for the transition to a Green Economy, reduced harmful emissions, and less waste production. Resource efficiency is applicable at various economic

26 WECS (2022), Nepal Energy Synopsis Report

levels, including production supply chains, and specific opportunities and activities concerning resource efficiency are outlined in the relevant sector strategies. The following activities can be carried out in this theme to speed up the transition.

- Increasing energy efficiency through transmission and distribution lines reinforcement, efficient transformers, awareness and promotion of energy efficient technologies.
- Promote and facilitate energy audits, equipment testing and certifications.
- Enhance water use efficiency by introducing water efficient technologies, reducing the non-revenue water, reducing the water footprints and developing water sustainability plans for water resources.
- Implementation of 3Rs, promotion of resource efficient and cleaner production technologies and processes, developing markets for secondary raw materials and recycled products and extending producer responsibility for the generated waste, especially for special wastes (hazardous, e-waste etc.)

v. Social inclusion and sustainable livelihoods.

This thematic area underscores the importance of ensuring that all segments of society have the opportunity to participate in and benefit from the transition to a green economy on an equitable basis. It acknowledges the vital role of an informed, educated, well-trained, and healthy population in driving this transition. Such a population is prepared to adopt sustainable livelihoods through education, the development of green skills, behavioral changes, and enterprise development, ultimately leading to the creation of green jobs. The following activities can be carried out in this theme to speed up the transition.

- Accelerate creation of green jobs by establishing measures to support green businesses, conducting training in TVET etc.
- Promotion of green technology development and innovations (Promotion of green procurement incentives, supporting green ideas through incubation and innovation centres, incorporating ESG and environment management plans in businesses, establishing ties with research and academic institutions etc.)
- Incorporate Environmental safeguard and occupational health by strengthening protection to consumers and employees.
- Mainstreaming green growth and green economy in education and training and creating awareness among stakeholders.

1.3 Integrating Green growth in Industries and Businesses

1.3.1 Drivers for integrating green growth

The drivers for integrating green-growth in Industries and Businesses are:

1.3.1.1 Regulatory and compliance drivers (Legal requirements like IEE/EIA)

Regulatory and compliance drivers for green growth are instrumental in promoting sustainability and environmental responsibility across various industries. Governments worldwide are increasingly enacting stringent regulations and standards to address climate change, reduce carbon emissions, and protect natural resources. These measures encompass a wide range of areas, from emissions limits and energy efficiency requirements to waste management and sustainable sourcing practices. Compliance with these regulations not only helps organizations avoid legal penalties and reputational damage but also fosters innovation and investment in eco-friendly technologies, ultimately driving the transition towards a more sustainable and green economy.

1.3.1.2 Economic drivers (Customers, Investors, Stakeholders)

Economic drivers for green growth, influenced by customers, investors, and stakeholders, are increasingly shaping corporate strategies and policies. Customers are demanding environmentally responsible products and services, creating a market for sustainable offerings. Investors are recognizing the financial advantages of eco-conscious investments, with green companies often demonstrating resilience and growth potential. Additionally, stakeholders, including communities and non-governmental organizations, are exerting pressure on businesses to adopt sustainable practices, pushing them to reduce their environmental footprint, which in turn can enhance reputation and long-term viability. The pursuit of green growth not only meets market expectations but also secures a competitive advantage, fostering innovation and driving profitability while contributing to a more sustainable global economy.

1.3.1.3 Social drivers (CSR, voluntary actions, community drivers)

Social drivers for green growth, encompassing Corporate Social Responsibility (CSR), voluntary actions, and community-driven initiatives, play a pivotal role in advancing sustainability. Companies are increasingly recognizing the importance of CSR in building trust and goodwill with their customers and communities. Voluntary actions, such as setting ambitious sustainability goals, reflect a commitment to environmental responsibility and can attract a conscientious customer base. Community drivers, including local grassroots movements and socially responsible consumer choices, are pushing businesses to align their practices with community values and environmental concerns, fostering a sense of collective responsibility. Embracing these social drivers not only demonstrates a commitment to a greener future but also fosters positive relationships, brand loyalty, and a more inclusive and environmentally conscious society.

1.3.2 Requirements

Knowledge

Green growth knowledge requires a deep understanding of sustainable development principles, environmental science, and economics, with an emphasis on the interplay between economic growth and environmental protection. It involves familiarity with clean and eco-friendly technologies, circular economy concepts, renewable energy sources, resource-efficient practices, and waste reduction strategies. Proficiency in interpreting and complying with environmental regulations and standards is essential, as is the ability to assess and monitor sustainability performance and report transparently. Additionally, staying updated on emerging green technologies and fostering collaborations among industries, governments, and civil society is crucial for effectively promoting and achieving green growth. To enhance the knowledge required for green growth, individuals can pursue a multidisciplinary approach by seeking educational opportunities in sustainable development, environmental science, and economics. This may include formal education, online courses, workshops, and self-study. Staying informed about the latest research and trends in clean technologies, renewable energy, and circular economy practices through industry publications, academic journals, and professional networks is essential. Engaging in hands-on projects and internships in green industries, participating in sustainability-related conferences and events, and collaborating with experts and organizations dedicated to environmental sustainability can further expand one's knowledge. Continuous learning and adapting to evolving green technologies and regulations are vital for staying at the forefront of green growth knowledge.

Technology and skills

To support green growth, individuals and industries need to harness a range of technologies and skills. This includes expertise in renewable energy systems, energy-efficient building design, clean transportation technologies, waste management and recycling processes, sustainable agriculture practices, and eco-friendly manufacturing. Additionally, digital skills for data analysis and technology integration, along with environmental management and policy knowledge, are crucial. Enhancing these skills and technologies can be achieved

through formal education, specialized training programs, workshops, and certifications. Collaboration with experts and organizations in the green sector, participation in research and development projects, and staying updated on industry trends and innovations are keyways to continually improve and integrate these skills and technologies for sustainable growth. Focusing on capacity building in the field of green jobs can be beneficial in enhancing skills that are required for industries.

Financial requirements

Access to private funds, public support, and investments/grants is vital for green growth. To enhance access, businesses and organizations should develop compelling business cases that highlight the financial and environmental benefits of their green projects, engage in networking and outreach efforts to connect with potential investors and public entities, actively seek out available grants and incentives, collaborate with experts and industry-specific organizations, stay informed about emerging funding opportunities, and provide clear evidence of the positive impact and return on investment of their green initiatives. Additionally exploring sustainability funds, carbon financing, carbon trading/offsetting can be explored to fulfill the financial requirements gap.

1.3.3 Possible interventions in Industries and Businesses

1.3.3.1 Energy sources, savings, and energy efficiency

To enhance energy performance and efficiency, decrease energy usage across various sectors including production, transportation, commerce, and industry, and ensure the nation's energy security, there is a need to simultaneously develop various energy sources within the country. This involves efficiently harnessing and economically utilizing domestic energy resources while transitioning away from heavy reliance on fossil fuels. The goal is to encourage the efficient utilization of energy resources and increase the share of renewable and new energy sources in the country's energy production and consumption. Transitioning to renewable energy sources, like solar, wind, and hydropower, is a key component of green growth in various industries, as it reduces reliance on fossil fuels and lowers carbon emissions. "Energy saved is energy generated". Implementing energy efficient technologies will save energy which can be used for other purposes. Investment on on-site renewable energy generation and energy storage solutions are other necessities in this field.

Examples: Solar energy adoption in industries replaces fossil fuels. This also helps in reduction of energy cost, which can be redirected into other areas of the economy. Similarly, energy efficient lighting transition to energy efficient led lights reduced energy consumption and electricity costs. Similarly, when we are adopting these technologies, these technologies have created plenty of jobs globally too.

1.3.3.2 Water management

Implementing efficient water usage and wastewater treatment can help industries reduce their water footprint and protect water resources. Water management enables the efficient and sustainable use of water resources. By reducing wastage, improving water quality, and preserving ecosystems, effective water management simultaneously promotes environmental stewardship and economic vitality. It bolsters industries such as agriculture and manufacturing by enhancing resource efficiency, reducing operational costs, and fostering innovation in water-saving technologies. Moreover, responsible water management contributes to increased resilience against climate change impacts, ensuring that communities and businesses can thrive in the face of water-related challenges. Ultimately, it underpins a more sustainable and ecologically responsible economy, driving the transition towards green growth.

Examples: using water efficient technologies in agriculture like drip irrigation or repairing the leakages saves a lot of water and expenses associated with water tariffs, pumping costs etc. Another example could be implementing green infrastructures for flood control like rainwater harvesting and recharging the groundwater

that minimized the damage by preventing flood and increase water availability.

1.3.3.3 Waste Management and circular economy

Innovative waste reduction and recycling solutions can minimize landfill waste and promote a more sustainable approach to waste management. Shifting from a linear "take-make-waste" model to a circular economy involves recycling, reusing, and reducing waste, which can reduce resource depletion and environmental damage. Waste management and the circular economy are fundamental to green growth as they reduce resource depletion, environmental damage, and the overall carbon footprint. Efficient waste management practices, including recycling, composting, and responsible disposal, minimize landfill waste and pollution. In a circular economy, products and materials are designed to be reused, remanufactured, or recycled, thus reducing the need for virgin resources and lowering production emissions. By implementing these principles, businesses not only cut costs and enhance resource efficiency but also foster innovation and create new job opportunities in recycling and sustainable product design. Together, waste management and the circular economy contribute to a more sustainable and environmentally responsible economic model, driving the transition towards green growth.

Examples: recycling and waste to energy projects divert a significant portion of waste from landfills by reducing pollution and at the same time saving money through recycling for the raw materials and energy generation. Another example could be circular economy in electronics. The electronics industry is increasingly adopting circular economy principles by designing products that are easily repairable, upgradable, and recyclable. This not only reduces electronic waste but also fosters a secondary market for refurbished and remanufactured electronics, stimulating economic growth in the electronics repair and recycling sectors. The development of sustainable supply chains for electronics components also promotes green growth by reducing resource consumption and waste in the manufacturing process.

1.3.3.4 Sustainable sourcing

Implementing sustainability measures throughout the supply chain can reduce the environmental impact of products and services. Sustainable sourcing, which involves responsibly procuring raw materials and products while considering their environmental and social impacts, is instrumental in promoting green growth. It encourages industries to reduce their ecological footprint by favoring suppliers that adhere to sustainable and eco-friendly practices. Sustainable sourcing minimizes the negative effects of resource extraction, deforestation, and habitat destruction, thereby conserving biodiversity and protecting natural ecosystems. By choosing materials and products with lower environmental and social costs, businesses can enhance their reputation, reduce operational risks, meet regulatory requirements, and cater to consumers' increasing demand for environmentally responsible products and services. Ultimately, sustainable sourcing fosters a more sustainable, resilient, and environmentally friendly economy, supporting the transition towards green growth.

Examples: For raw materials being agricultural products, advancing modern agriculture, promoting sustainable, organic, and clean farming practices, while also enhancing the quality, value, and competitiveness of agricultural production has to be done. This will be achieved through the application of efficient processes and technologies to make economical use of resources like seeds, feed, and agricultural materials in various sectors including livestock, crops, forestry, and aquaculture, alongside the. Furthermore, the strategy aims to expedite afforestation, reforestation, and sustainable forestry economic development projects. Similarly, sourcing organic produce or locally grown foods reduces the use of synthetic pesticides and lowers transportation-related emissions. Supporting fair trade and sustainable agriculture initiatives also ensures that farmers receive fair compensation and can invest in environmentally friendly farming practices, thereby enhancing food security and promoting economic development within the agriculture sector.

1.3.3.5 Cleaner technologies and innovation

Advancements in green technologies, such as carbon capture and storage, can help industries reduce their environmental impact. Cleaner technologies and innovation play a pivotal role in green growth by offering more efficient, environmentally friendly alternatives to traditional practices. These advancements reduce resource consumption, emissions, and pollution, leading to a more sustainable and ecologically responsible economy. They foster the development of clean energy sources, such as renewable power and electric vehicles, which not only decrease the carbon footprint but also create jobs and economic opportunities. Additionally, innovation can lead to breakthroughs in waste reduction, sustainable agriculture, and circular economy solutions, promoting resource conservation and minimizing environmental impact. The adoption and integration of cleaner technologies and innovative approaches not only drive economic growth but also contribute to a healthier, more sustainable planet, making them central to the concept of green growth.

Encouraging eco-friendly and sustainable consumption and procurement will involve implementing initiatives such as energy labeling, eco-labels, and green labels. This also includes advancing green public procurement and persistently using economic instruments to regulate consumption patterns effectively. Over time, the objective is to cultivate a green culture and way of life, gradually creating an environment conducive to such practices.

Examples: Adopting electric vehicles reduces greenhouse gas emissions and air pollution and reducing the usage of fossil fuel which is imported in our country. Another example could be carbon capture and storage (CCS). CCS captures carbon dioxide emissions from these sources and stores them underground, preventing them from entering the atmosphere. The development and deployment of CCS technologies not only mitigate climate change impacts but also create job opportunities in the carbon capture, transport, and storage sectors.

1.3.3.6 Low-carbon economy and emissions

Low-carbon economies and emissions reduction efforts are pivotal to green growth as they address one of the most pressing global challenges—climate change. Transitioning to a low-carbon economy involves reducing greenhouse gas emissions, primarily carbon dioxide, by adopting cleaner energy sources, improving energy efficiency, and implementing sustainable practices. This shift not only mitigates the adverse impacts of climate change but also opens up new opportunities for green innovation, job creation, and sustainable economic development. By curbing emissions, countries and industries can minimize their environmental footprint, enhance energy security, and reduce health risks associated with pollution, while simultaneously fostering the growth of clean energy sectors. This dual benefit of reducing environmental harm and driving economic growth is fundamental to the concept of green growth, creating a more sustainable and resilient global economy.

Examples: Renewable energy transition helps in shifting from fossil fuels to renewable energy sources. This move reduces carbon emissions, lowers the environmental impact of energy production, and creates jobs in the renewable energy industry. The development, installation, and maintenance of renewable energy infrastructure contribute to economic growth while simultaneously promoting environmental sustainability.

1.3.3.7 Education and advocacy

Raising awareness and educating people about sustainable practices and the benefit of green growth is essential for driving change at all levels of society. Education and advocacy are instrumental in promoting green growth by raising awareness, fostering a deeper understanding of environmental issues, and mobilizing individuals, communities, and businesses towards sustainable practices. Through education, people gain the knowledge and skills necessary to make informed decisions that reduce their ecological footprint and support environmentally responsible initiatives. Advocacy campaigns and movements, on the other hand, create a collective voice that pushes for policy changes and encourages businesses to adopt green practices. By engaging in advocacy efforts, individuals and organizations can influence governments and industries to implement eco-friendly policies, invest in renewable technologies, and reduce their environmental impact.

Ultimately, education and advocacy work together to drive a cultural shift towards sustainability, making green growth a shared goal and ensuring a more sustainable and environmentally conscious future.

Examples: Educational programs and initiatives that raise environmental awareness and promote sustainability can lead to more informed and responsible consumer choices. As people become more conscious of the environmental impact of their decisions, there is a growing demand for eco-friendly products and services, stimulating the development of green markets and industries. Additionally, environmental education fosters a skilled workforce capable of driving innovation and advancements in sustainable technologies, contributing to economic growth in green sectors. Advocacy efforts by non-profit organizations, communities, and individuals can influence governments and industries to adopt more eco-friendly policies and practices. Pressure from advocacy groups can lead to regulations, incentives, and investments in green technologies, such as renewable energy and energy efficiency, driving economic growth while mitigating environmental harm. Moreover, advocacy campaigns can promote the adoption of sustainable practices, such as reducing waste and conserving resources, further supporting the concept of green growth.

1.3.3.8 Green jobs, just transition and work based learning

Green jobs, a just transition, and work-based learning collectively promote green growth by aligning economic development with environmental sustainability and equitable opportunities. Green jobs in sectors such as renewable energy, sustainable agriculture, and conservation drive economic growth while reducing environmental impact. A just transition ensures that workers from declining industries can access these green job opportunities, supporting an inclusive shift towards a greener economy. Work-based learning programs equip individuals with the skills and knowledge needed for green jobs, enhancing workforce preparedness. The combination of these elements not only fosters job creation and a more sustainable economy but also empowers a diverse workforce to participate in and benefit from the transition to a greener, more environmentally responsible future.

Examples: Work-based learning initiatives in sustainable agriculture offer hands-on experience for individuals interested in eco-friendly farming practices and conservation. transition principles can be applied by providing training and employment opportunities to workers transitioning from conventional agriculture sectors. As workers learn about organic farming, regenerative agriculture, or habitat restoration through work-based learning, they not only acquire valuable skills but also contribute to more sustainable land management and conservation efforts. This approach fosters green growth by expanding the workforce in environmentally responsible agriculture while ensuring a fair and inclusive transition for workers from less sustainable agricultural practices.

1.3.3.9 Partnership and collaboration

Partnership and collaboration are instrumental in green growth by fostering a collective approach to tackling complex environmental challenges. In a world where environmental issues transcend borders, industries, and sectors, collaboration between governments, businesses, non-profits, and communities is essential to sharing knowledge, expertise, and resources. These partnerships can accelerate the development and adoption of sustainable technologies, promote policy innovation, and pool investments for eco-friendly projects. Furthermore, by engaging diverse stakeholders and facilitating the exchange of ideas and solutions, collaboration drives consensus on environmental goals and promotes their effective implementation, leading to a more coordinated and impactful effort in achieving a greener, more sustainable economy.

Examples: Collaboration among companies, research institutions, and government agencies can drive innovation in green technologies. By pooling resources and expertise, these consortia can accelerate the development and adoption of environmentally friendly technologies, such as clean energy solutions or sustainable manufacturing processes. For example, joint research initiatives in the clean energy sector have led to breakthroughs in renewable energy technologies, which not only reduce carbon emissions but also stimulate economic growth by creating jobs and fostering innovation.

1.4 Implementing Agencies and tasks

- Ministry of Industry, Commerce, and Supplies (MOICS)

- Develop strategy and action plans for green growth.
- Develop guidelines and integrating the thematic contents.
- Develop mechanism to monitor, evaluate, and report on the implementation of strategy and action plan on green growth.
- Mobilize resources and coordinate with domestic and international funding agencies, climate finances.
- Capacity building and promotion of green growth, green public procurement, circular economy.
- The development of policies to facilitate an energy transition towards greener, cleaner, and more sustainable sources, including increasing the share of renewable energy while reducing dependence on imported and fossil fuels.
- The formulation of mechanisms and policies to encourage investment in the energy efficiency sector across various economic segments. This includes exploring financial instruments and incentive systems while improving access to finance for energy efficiency projects.
- The creation of a list and guidelines for implementing the best available technical solutions and environmental management practices for industries, considering national conditions and technological development levels.
- The development and refinement of institutions and policies for eco-friendly and sustainable industrial clusters, along with the application of the circular economy model in the construction, operation, and management of these clusters.
- The coordination and implementation of the National Program on Economical and Efficient Use of Energy in industries.
- To develop and implement programs and projects on the protection and restoration of ecosystems and biodiversity in agriculture, forestry, fishery, and fisheries, recovery, and increase of carbon accumulation in natural reservoirs (agricultural and forestry land and forests), survey, inventory and monitor developments. (Jointly with Ministry of Agriculture)

- Ministry of Forest and Environment (MOFE)

- To establish a carbon market in coordination with the Ministry of Finance.
- The establishment and execution of a national measurement, reporting, and verification system to monitor greenhouse gas emission reduction initiatives at the national level.
- The regulation of sources of environmental pollution, the prevention of environmental incidents, and the management of transboundary environmental concerns.
- The development and implementation of programs and projects that focus on environmental protection, especially concerning the utilization of natural resources and the preservation of natural ecosystems and biodiversity, aligning with their respective roles, responsibilities, and competencies.

- Ministry of Labor, Employment, and Social Security (MOLESS)

- Organizing training programs to cultivate a skilled workforce in green economic sectors, aligning with the necessary competencies.

- Developing and implementing policies that promote the creation of green jobs, fostering employment opportunities in sustainable sectors.

- Formulating and executing social security and assistance policies that provide support to vulnerable groups and those affected during the transition towards a green economy.

- Ministry of Education, Science and Technology (MoEST)

- To develop and implement training programs and integrate green growth content into educational activities.

- To make a national list of clean technologies and low carbon emissions in manufacturing industries.

- Local bodies

- Manage and treatment of waste according to the assigned functions, tasks.

- Maintain and improve the quality and hygiene of the environment.

- To develop a database system for monitoring, forecasting, and early warning of impacts of climate change and air pollution on health

- FNCCI through Green Growth Advisory service

- Promoting Environmentally Friendly Business Practices for Economic Growth: The Advisory Service shall actively advocate and support businesses in adopting environmentally sustainable practices while concurrently fostering economic growth.

- Capacity building and information dissemination: The Advisory Service shall ensure that awareness campaigns are organized at the provincial level, focusing on employment-oriented skill development, green jobs, and just transitions, with a particular emphasis on the industrial corridor.

- Policy Reforms for Green Economy Promotion: The Advisory Service shall engage in policy reform initiatives aimed at promoting the green economy and assisting in development of strategies and action plans. This includes providing recommendations on regulations, incentives, and targets to promote sustainability.

- Advocacy on importance of green growth and national and local level and regulatory guidance to ensure the implementation of green growth by establishing metrics and indicators to track progress.

- Support on collaboration and cooperation with different entities to exchange knowledge, technologies and best practices related to green growth and engaging various stakeholders (industrial representatives, government agencies, environmental organizations, academic institutions, NGOs/INGOs etc.).

- Other stakeholders

- Supporting technically and financially in preparing and implementing the strategies and action plan of green growth.

1.5 Implementing plans

1.5.1 Short-term strategies (1-3 years)

Advocacy

- Advocacy and support government on achieving the targets and commitments by participation in preparation of national plans, NDCs etc.
- Advocate for introduction of green procurement in public procurement systems that encourage greener production.

Green awareness campaigns

- Plan and implement short-term awareness campaigns to educate commodity associations members and industries about the benefits of green practices and the importance of green growth.

Workshops and Training sessions

- Organize short-term workshops and training sessions to provide practical insights and guidance on implementing green technologies and practices.

Best practices documentations

- Compile and distribute a short-term document showcasing best practices in sustainable industrial processes within the association's network.

Initiate Green award

- Establish short-term green awards to recognize and reward companies within the industry that demonstrate outstanding commitment to environmentally friendly practices.

Employee training

- Provide training programs for employees to raise awareness about sustainable practices and the importance of green initiatives.
- Promote green jobs, green skills and just transition.
- Implement education and certification programs to build a skilled workforce proficient in green technologies and practices.

1.5.2 Mid-term strategies (3-5 years)

Establish standards and metric systems.

- Develop and implement standards, plans and metric systems to guide and monitor progress on tracking the progress towards green growth specific to the industry and providing a framework for companies to follow in their green initiatives.

Capacity building of industries on renewable energy integration and circular economy

- Invest in and transition to renewable energy sources, such as solar, wind, and biomass, to power industrial processes through private fund and advocate for provisions of public funds.
- Transition towards a circular economy model, focusing on minimizing waste and maximizing the reuse and

recycling of materials.

Collaboration with Government bodies

- Engage in advocacy for policies that support and incentivize green growth within the industry, green certifications and promotion of green products and services.

Research and Development funding

- Allocate funds for research and development projects focused on green technologies and sustainable practices within the industry.

Green supply chain initiatives

- Work with industry members to implement initiatives that encourage sustainability throughout the supply chain, from sourcing to production.

1.5.3 Long term strategies (5-10 years)

Long-term policy advocacy

- Advocate for long-term policy changes at the national and international levels that support and enforce sustainable practices within the industry.

Enhance Collaborations

- Establish collaborations with international industry associations, fostering knowledge exchange and joint efforts towards global sustainability goals.
- Implement community engagement programs that ensure the industry's activities positively contribute to the well-being of local communities.
- Work on establishing collaborations with financial institutions to create green financing schemes that incentivize and support sustainable initiatives within the industry.

Establish innovation hub for green technologies.

- Develop or support innovation hub or research center focused on green technologies, acting as a resource for industry members to access cutting-edge sustainable solutions.

Continuous improvement framework

- Develop a framework for continuous improvement, encouraging industry members to regularly assess and enhance their sustainability efforts.

SECTION 4
CONCLUSIONS AND NEXT STEPS

Nepal stands at a pivotal juncture in its journey towards green growth, a concept that aligns economic prosperity with environmental sustainability and social equity. While the country faces numerous challenges, including environmental degradation, economic disparities, and vulnerability to natural disasters, the adoption of green growth principles presents a transformative opportunity. This report has outlined the crucial processes and interventions required to make green growth a reality in Nepal. It emphasizes the importance of evaluating and selecting sustainable approaches, aligning policies and institutions, and developing a comprehensive green growth roadmap. The challenge lies in ensuring coherence and synergy with broader development planning while addressing macroeconomic stability, human development, and capacity building. The thematic areas and strategies identified offer a comprehensive framework for Nepal's green growth journey. From sustainable infrastructure development to building resilience, sustainable resource management, promoting resource efficiency, and fostering social inclusion, these areas encompass the full spectrum of environmental, social, and economic considerations. As Nepal advances on this path, it must engage diverse stakeholders, including government bodies, industries, academic institutions, civil societies, and NGOs. Collaboration and alignment among regional, sub-national, and national levels are crucial for success. The transition to green growth is not without its challenges, but it presents a unique opportunity to redefine the future of Nepal, safeguard its natural resources, and enhance the well-being of its people. With the right strategies, commitment, and collaboration, Nepal can pave the way for a more sustainable and equitable future.

The following could be the next steps in effective implementation of the green growth principles.

1. Capacity building and awareness on green growth, green jobs and just transition.

2. Establish a national steering committee with stakeholders from all the actors involved.

3. Developing policies, strategies, and action plans on green growth.

4. Communication, education and awareness by continuing to propagate, educate and raise awareness of the whole society about the role and meaning of green growth, dissemination of good practices and practical actions on green lifestyle and consumption and focusing on education on soft skills and improving the capacity to identify energy labels, eco-labels and green labels for goods and products; strengthen the dissemination of information on low-emissions, environment-friendly products and services.

5. Development of human resources on green jobs and employment opportunities.

6. Mobilizing the financial resources through policies, directives for green growth by focusing on incentives, development of capital and carbon market, green insurance etc. and encouraging the participation of private sectors for investments on green transformation.

7. Promotion of technology and innovation by encouraging R&D and promoting the ideators, innovators by establishing incubation centers.

8. Integration and cooperation in R&D and fund sourcing and mobilization.

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