

Nepal's green economy initiative and framework proposed

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Abstract

Some initiatives on green economy have taken place in Nepal, albeit mainly in the forms of dialogues and seminars on the subject. The National Planning Commission, with support of the Poverty Environment Initiative Programme, has organized a few discussion programmes on the subject in recent years. Different non-governmental organizations and the private sector have also organized dialogues on the subject. Among others, these dialogues and seminars have helped spur the debate on what a green economy means for Nepal, which are the sectors that could potentially contribute to a green economy and hence need to be promoted, and what roles different stakeholders should play in Nepal's pursuit of a green economy. Majority of the people living in Nepal are dependent on agriculture and forestry for their livelihoods. These sectors have not contributed much to greenhouse gas (GHG) emissions. The state of industrial development in the country has not been to the desired extent, and therefore, GHG emissions thereof are very minimal. That is not to say, however, that Nepal is free of environment-related problems. Environmental degradation has been ever increasing; urban population is constantly on the rise and environmental problems are rising commensurately; modern agriculture and unsustainable forestry management practices in many cases are adding to environmental woes; among others. Given that the world is increasingly resorting to a green economy path, Nepal needs to adopt green economy policies to be competitive in the world market. Hence, there is a need to have organized structures to steer the debate on green economy approaches that are applicable in the Nepalese context. Many sectors in Nepal, such as agriculture and forestry, are already green. Moreover, Nepal is yet to enter into the industrialization phase. Therefore, it is relatively easier for the country to take a greener approach to industrialization and development than for many other countries that need to revisit their traditional approach. Nepal can take the initiative of going green by focusing first on three major sectors: agriculture and forestry; infrastructure and energy; and tourism.

Key words: agriculture and forestry; infrastructure and energy; tourism

Introduction

Economic policies once heavily emphasized on the "exploitation" of natural resources, and technological innovations were persuaded for the same with sole purpose of profit making. Consumerist market demands instigated by mass aspiration for luxury and/or comfort supported the policies. In the society, natural resources were taken for granted, their limitations hardly realized. In contrary, those living simple life practicing green in every sense were subjected to abject poverty as their products were paid less value and natural capital unappreciated. For example, a *Jyapu* family of four in Bhaktapur, a heritage city in Nepal,

weaves straw-carpet *Sukul* out of paddy straw taking their whole day work; but the market puts a minimal price tag that hardly covers their half day wage, let alone their contribution in recycling of waste product and value addition to the straw is appreciated.

Lately, it has been realized that Earth's resources are limited: enough to fulfil their requirement but not their greed as MK Gandhi would say; that the human beings are just a part of the ecosystem, whose future is destined to collapse, if other components are not equally treated (UNWCED, 1987).

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More recently, the developed nations have seen that the economic growth, in its present form, is reaching its limit (BMZ, 2011). Global energy and resource consumption is soaring, while forests are shrinking, drinking water is becoming scarce, and ecosystems are vanishing along with their flora and fauna. The industrialized countries' consumption patterns are unsustainable, not least because the world's population is increasing and people in developing and emerging countries now also aspire to a more consumerist way of life.

Of the many pertaining issues, two mentioned here can highlight the urgency for economic paradigm shift: uncompromising climate change and rapid biodiversity loss.

The human caused global warming is an established fact now. In order to keep the increase in global temperature below 2°C, the international community as a whole must radically reduce its CO₂ emissions. It is estimated that unabated climate change could cost as much as 20% of global GDP by 2050 and cause widespread impoverishment (Stem, 2006). Furthermore, it is not only flora and fauna which are vanishing along with biodiversity: so are numerous opportunities to pursue a sustainable, pro-poor development pathway. There are over 120,000 protected areas on Earth provide humankind with ecosystem services valued up to US\$ 5.2 trillion per year, so their destruction or degradation would have massive economic costs. By contrast, the investments necessary to conserve these areas add up around US\$ 45 billion a year (TEEB, 2009).

The shifting of the world's economies onto paths that are consonant with the globe's resource base is an important objective (Ocampo, 2012), especially in these times in which the world is assessing the impact of the agenda such as sustainable development, millennium goal of development and the various other agreements on environment and climate change. In recent years, the concept of Green Economy has emerged that adheres to new economic growth paradigm that is friendly to the earth's ecosystems and can also contribute to poverty alleviation. Green Economy (GE) promises to serve as an engine for economic growth on a sustainable pathway with valuing the ecosystem services [but not hurting the poor who depend on them] and biodiversity issues while addressing the strategic uncertainties such as adverse climatic and other environmental changes and also the effectiveness of policy instruments (Bhandari, 2012).

The concept was a centre of policy discussion during the Rio+20 Conference that sought political commitments through institutionalization of sustainable development and green economy in various binding agreements. To achieve

the objective of sustainable development keeping the resource base less affected, it is important to consider both how individual economies can pursue more sustainable growth paths [that exploit the resources for quick return in the short terms?], and how more sustainable growth paths may be devised and delivered for their consideration. The transition to a green economy will not be easy, but it is hoped that this will create more opportunities than risks for the industrialized, emerging and developing countries alike. It also offers new horizons for humankind, for a green economy not only benefits the environment and the climate: it could also be a very effective tool to combat poverty and hunger. To achieve this, however, a functional framework must be put in place.

Framework on Green Economy

Governments around the globe are seeking ways to define and shape "green economy" into meaningful policies that advance inclusive economic growth while enhancing environmental protection and social progress. Some governments have already prepared frameworks of action, examples are: Cambodia (KOC, 2009), Ethiopia (FDRE, 2011), Japan (Jones & Yoo, 2011), South Africa (Montmasson-Clair, 2012), while some others are in the process of designing the framework and partnering with UNEP, examples are: Azerbaijan, Brazil, Peru, South Korea (Jones & Yoo, 2011). In some country like the USA, the States have prepared their own strategic paper for green economy, for example, Washington State (CTED, 2009). Policies should aim to be consistent with international trade rules, provide access to finance, promote technology transfer, strengthen capacity and reduce inequality. All stakeholders and beneficiaries including policy makers, business community that are intrinsic to this debate, need to be closely engaged in these important discussions.

Initiatives in Nepal

Some initiatives on green economy have taken place in Nepal, albeit mainly in the forms of dialogues and seminars on the subject. While some of these were national-level programmes focusing only on Nepal, others were regional/international-level programmes, which too, however, discussed the issues in the Nepalese context, although in varying degrees. Table 1 presents list of the initiatives in chronological order and provides some thoughts for initiatives to be undertaken in the future.

Though Nepal has been adopting green economy policies for a long time the term "green economy" has been coined very recently. Majority of the people living in Nepal are dependent on agriculture and forestry for their livelihoods. These sectors have not contributed much to GHG emissions. The state of industrial development in the country has not

Table 1. Initiatives on Green Economy taken in Nepal

Date	Initiative undertaken	Initiators	Remarks
National-level			
18 Nov 2010	Country Workshop on Environments of the Poor in the Context of Climate Change and the Green Economy	National Planning Commission (NPC), Government of Nepal, supported by the Poverty Environment Initiative (PEI) Programme	Major objective was to provide inputs to NPC in adopting poverty and climate responsive programmes in the next periodic plan. The green economy aspects were not discussed much.
25 Sep 2012	Green Economy Development Dialogue	NPC in collaboration with Himalayan Climate Initiative (HCI) and Confederation of Nepalese Industries (CNI) supported by PEI	Focus was on the green aspects of Nepalese agriculture and not much on manufacturing/industry. The discussions also could not enter into depths of the subject.
23 Nov 2012	Consultation Meeting	NPC/GoN, supported by PEI	Discussed on green economy framework, collected inputs on key ingredients of green economy to incorporate in the periodic development plans.
26 Mar 2014	Consultation on Green Economy Framework	National Planning Commission	A draft of framework on green economy was presented, reviewed and opinions were collected.
Regional/International level			
30 May-3 Jun 2011	Biotrade and Green Economy Week	UNEP, UNCTAD and GIZ	Focus was on the contribution of biotrade to green economy and how countries like Nepal having the niche in biotrade should seize the opportunity.
5-7 Sep 2011	International Conference on Green Economy and Sustainable Mountain Development	ICIMOD, supported by UNEP and IDRC	A focused programme on green economy and mountain systems that discussed several specific issues on how mountain countries should go ahead with greening their mountain systems, and non-mountain countries should support such endeavours.
3-5 May 2012	Regional Workshop on Environmental Mainstreaming for a Green Economy	Asian Centre for Environment Management and Sustainable Development	The major objective was to discuss and share experiences with other South Asian countries on environmental mainstreaming and green economy. Existing green economy activities were identified and calls were made to strengthen them as well as adopt other green economy policies, such as promoting the use of renewable energy.
25-29 Sep 2012	Asia Pacific Graduates' Youth Forum on Green Economy	Small Earth Nepal (SEN), Consortium for Capacity Building (CCB) at INSTAAR at the University of Colorado, Boulder and the Asia Pacific Mountain Network (APMN) of ICIMOD, with the support of the GoN, Swiss Agency for Development Cooperation (SDC), US Agency for International Development/Office of Foreign Disaster Assistance (USAID/OFDA), Small Earth Australia (SEA) and the Centre for Hydrology at the University of Saskatchewan	Major objective of the Forum was to build the capacity of young graduates dedicated to and engaged in sustainability issues, and to facilitate the sharing of their knowledge and information on green economy, environmental governance and climate adaptation. Accordingly, participants were given a broad overview of what a green economy entails and the important roles they should play for a safer and greener future.
23 Nov 2012	Brainstorming: What Green Economy Framework for Nepal?	SPMC/National Planning Commission	The objective was to discuss on green economy in professional perspective. Over 15 experts of various fields such as economics, agriculture, forestry, biodiversity, engineering, law, development, discussed on the issue.

been to the desired extent, and therefore, GHG emissions thereof are very minimal. That is not to say, however, that Nepal is free of environment-related problems. Environmental degradation has been ever increasing; urban population is constantly on the rise and environmental problems are rising commensurately; modern agriculture and unsustainable forestry management practices in many cases are adding to environmental woes; among others. Traditional modes of production and consumption have been increasingly ineffective to meet the growing needs let alone meet the rising aspirations. As a result, a significant number of people have begun to depend on the remittance income. Currently, the share of remittance in the national GDP is about 23% and is increasing rapidly, which in the long run will not be sustainable. Hence, there is need for the country to move to tertiary sectors to create more jobs for its youth. This need will keep on increasing, as emerging global environmental changes will continue to force us to adapt to impacts by maintaining ecosystem services, food security and livelihood support systems.

Initiatives on green economy in Nepal, whether in the form of dialogues, seminars and workshops, point out the need for Nepal to gradually adopt green economy policies in key economic sectors, and pursue green growth. Given that the world is increasingly resorting to green economy path, Nepal needs to adopt green economy policies to be competitive in the world market. The need is to have organized structures to steer the debate on Green Economy approaches that are applicable to Nepalese context.

Relevant Policy Landscape

Nepal is in the turning point in its history. Though the country is in political and governance dilemma, there is sufficient room to be buoyant that logical end of such non-economic factors is not that remote. The Interim Constitution has stated that Nepal will embark on the federal system of governance. It is believed that the new governance structure will consist of three tiers: local government at the lowest tier followed by state government at intermediate tier and central one at the apex. Such governance system is expected to ensure the political stability and good governance in the days to come. In the backdrop of such political transformation, the nation is dreaming of coming out of the current low income country to lower middle income country initially galloping towards middle income country within one decade by raising per capita income above US\$ 3,000. There are number of empirically tested macroeconomic channels that bread such quantum jump. Among them, the nature of the economy and resource endowment plus existing geo-socio-political reality of Nepal demands green economy or green growth channel to explore inclusive and sustainable development intervention ahead.

Despite peewee progress recorded in both economic and social fronts, Nepal is continuously confronting with the biggest challenges of overcoming the perpetuated poverty and deprivation, a precondition to ensure durable peace in the country as well. Though the population below poverty line is estimated to be about 25.16% (NPC, 2011), the poverty estimates based on deprivation indices shows that poverty in Nepal is as high as 65%. Based on 1.25 US dollar a day criteria, poverty is estimated to be in the neighbourhood of 55% (Oxford, 2010). Human Development Index of Nepal is at 0.541 - the lowest in South Asia (UNDP, 2014). The Nepal Living Standard Surveys (NLSS) of 2004 and 2011 also show that despite a steady reduction in the poverty level, the reduction has been highly disproportionate (CBS, 2006). The poverty in Nepal has gender, caste, spatial and social dimensions. An analysis on the access to physical and social infrastructure by quintile groups further indicates that the poor are highly deprived of such facilities. A more worrisome phenomenon is the rapid rise in income inequality measured in terms of gini-coefficient. It went from 34.2 in 1996 to 41.4 in 2004, the highest increment among the Asian countries in recent years (ADB, 2007). This means that more concerted efforts at identifying the major bottlenecks and better options must be explored for enhancing inclusive socio-economic development which has been the buzzword in the changed political context in Nepal. Various researches agree that such socio-economic distortions can be better managed by proper allocation of resources that guarantee the green growth and development. It can be argued that there must be some missing elements in Nepalese development thinking.

Though there are contesting schools of thoughts regarding the role of the planned government expenditure in general and the budget in particular, Government of Nepal (GoN) realizes that effective management of government expenditure is essential to ensure the promotion of green economic activities in the economy. Therefore, the GoN has introduced climate change budget code in the budget line to establish a public expenditure tracking system. It is a major step ahead that the poor economy like Nepal has taken to start such climate change and green economy sensitive public expenditure systems expecting to cater the overall development. It is suggested that managing public expenditure is essential in climate adaptation for a poor country like Nepal; and UNEP (2011) goes one step further advocating the green economy with public expenditure can be workable solution for the most climate change vulnerable economies like Nepal. They also suggest that sufficient green employment and green entrepreneurship can be developed given the underdeveloped socio-economic infrastructure and rampant poverty amidst weak private sector. It should also be noted that there is a growing body

of literature which suggests that unless proper sequencing, restructuring and reforms that are compatible to green economy strategy are in place, such green economy orientation could lead towards low level of equilibrium.

A systematic green economy assessment of; the alignment-misalignment between the local level priorities (including VDC and DDC, and all local and state tiers of governance in the coming days) and actual budget allocation from the centre; reforms introduced for transparency and accountability issues of ownership and sustainability etc. at the grass root level; could be of immense value from the policy standpoint at a time when Nepal is engaged in exploring suitable model of growth and development. Similarly, examination of processes adopted from the selection of the programmes to their implementation and issues of transparency and efficiency in resource use under the constituency development fund will also be equally important from the policy standpoint. All these development interventions need to be checked whether activities are going towards greener activities.

The institutional analysis of potential green economy channels and Macroeconometric analysis of the entire growth processes including alignment-misalignment between traditional factors of production and total factor productivity at disaggregated level may serve as a better policy supportive inputs. It demands a huge amount of time and resources that have remained as constraints so far in such analysis. The probable sources of green growth and reallocation of resources towards green activities that require less energy and generate productive employment for the relatively unskilled people of Nepal, need to be identified. It is important because Nepal will keep facing energy shortages for long time to come, while a large number of unskilled youths enter into the job market every year looking for a decent job. Even though there are not many empirical evidences to suggest the type of green activities which would help achieve twin objectives of low energy and high employment, a green economic framework based on potential areas and opportunities has been proposed here.

Sectoral Structure

Adapting green activities in key economic sectors may manifest several trade-offs. It might be directly related to the employment at first followed by revenue generation and low level of investment capacity in public goods and services. Available literature suggests that the employment growth may fall short relative to labour force growth giving rise to open unemployment at the initial phase of green orientation of resources. This may not be a major issue because in the absence of unemployment benefits and acute poverty, very few can afford to remain without employment; and even in

the absence of proper employment, one generally tries to find some work to eke out a living. An estimate of the quantitative dimension should be the first step in understanding the employment challenge. It is likely that the step might prove to be an opportunity to switch the local level activities towards green one with policy sequencing.

Besides such quantitative dimension of employment, perhaps more important is low productivity and earnings associated with a sizeable segment of the (under)employed population. An associated phenomenon is predominance of employment in the informal segments of the economy where productivity and earnings are low and working conditions are poor. This, in turn, is manifested in large numbers being employed and yet poor (working poor). And an important part of the employment challenge is to raise the productivity and earnings of workers through a change in the structure of employment towards sectors with higher productivity and raising productivity of workers in sectors characterized by low productivity. Again, this problem can be better addressed by orienting the activities towards green one making the economic activities more formal.

Such opportunities as well as the challenges for green orientation will be further interacting with gradual sectoral shifting of the economic activities. The experiences of the present day developed countries (example, UK, USA, France, Germany, etc.) as well as that of some of the late developers who have been successful in their development effort (example, Republic of Korea, Malaysia, Taiwan) show a common pattern of structural change in their economies. They experienced that the share of agriculture in both GDP and total employment declined and that of non-agricultural sectors increased during their boom days. Within non-agriculture, the share of manufacturing increased first and then the share of service sector rose at a later stage of development. Such a pattern of structural change enabled the labour force to move from agriculture (where labour productivity is usually lower than in industry and services) to sectors with higher productivity. Together with such moves, productivity in agriculture also increased, due both to decline in numbers remaining there and to the adoption of productivity enhancing technology and inputs.

The challenge before the present-day Nepal is to engender such a process of economic growth where not only output in non-agricultural sectors but also productivity and employment would grow. But Nepalese economy never exhibited such pattern. The country initially remained predominantly agriculture-based and suddenly jumped up to service sector as we can see the rise in the share of service sector in the GDP, which is above 51% these years. The

vacuum of industrialization is compensated by the unsustainable remittance. So, shifting to green economy needs some calculated moves in the policy area instead of blind replication of other successful stories from elsewhere. The point mentioned above about the need for a shift in the sector composition of output and employment should not be taken to imply that agriculture can be neglected in development efforts of a country. In fact, poverty in Nepal continues to remain a problem because a large number of the poor are engaged in agriculture, which is yet underdeveloped and mostly traditional. High growth in agriculture along with improvements in productivity and earnings (including real wage rates of workers) is a precondition for pro-poor and inclusive growth. It needs to be emphasized that most of the activities in Nepalese agriculture are green and thus sustainable.

Raising the productivity of workers thus emerges as a major issue in addressing the challenge of employment as we go for green economy. And that brings forth two major issues. First, if output growth is obtained only (or mostly) through productivity growth, employment growth would be low even when output grows at a high rate as the phenomenon dubbed as 'jobless growth' and has been observed widely in the development experience of the 1990s and the 2000s. Second, green economy might face the trade-off between growth of employment and labour productivity. These two points are inter-related and need to be addressed together. The analysis here takes the view that although there is a theoretical possibility of a trade-off between employment and productivity growth in green economy, in reality the situation may vary, depending upon the kind of green development strategy pursued and the pattern of resulting growth. One way of avoiding the trade-off between employment and productivity growth is to pursue a sectoral pattern of growth where those sectors that are more employment-intensive, can grow faster with green components defined earlier. Thus green growth and development strategy can generate green employment, green growth and sustainable development even if the structural pattern seems awkward. This can be seen as the opportunity to go green.

In sum, Nepal has comparative advantage in green economic activities; need to develop competitive advantage via proper technology and entrepreneur skill development. The missing industrialization phase of development can be re-gained with green entrepreneur, commerce and trade with green jobs.

Potential Sectors of Green Intervention

The nature of the sector for green interventions has been analyzed based on their employment potential, probable sources of growth and inter-linkages with other sectors. The majority of the participants in the consultation meeting held

to develop the framework were of the opinion that agriculture and forestry, Infrastructure and energy, and tourism should be given high and first priority for green intervention. The following sectors have been analyzed further for probable future scenarios with green intervention.

i. Agriculture and forestry

Agriculture accounts for one third of the gross domestic product (GDP) and two third of the total employment in Nepal. A large majority of the population is dependent on the agriculture and forestry sector for their livelihood. Therefore, this should be a priority sector in every development intervention, including in the transition to a green economy. Over the past several years, in the country's efforts to raise agriculture production to feed the masses, there have been major shifts in agriculture practices. Use of chemical fertilizers, and hybrid and modern seed varieties are preferred over organic farming. Hence, the sector has not been contributing to a green economy to the fullest. The challenge is getting higher agriculture productivity through the adoption of a green approach. Efforts such as enhanced research and development, including through participation of local stakeholders, on indigenous knowledge and technology (example, development of drought tolerant crop varieties) could be helpful in this regard.

In the forestry sector, Nepal has comparative advantage in the medicinal and aromatic plants (MAPs) and essential oils sector. This is already contributing to a green economy, but there is still much room for improvement. For example, as stakeholders have pointed out, harvesting of MAPs are not completely sustainable. Hence, this sector could contribute immensely to a Green Economy, if the attendant problems are addressed. Agriculture and forestry is a sector in which sufficient green jobs for relatively unskilled workers can be generated using less and clean energy.

ii. Infrastructure and energy

There are at least three reasons to consider infrastructure as a strategic point of entry for green economy and productive employment in Nepal. First, infrastructure is critical for investment and growth in other sectors of an economy. Lack of or degradation of infrastructure not only retards economic growth but also isolates and even discriminates against poorer communities located in remote areas. Second, infrastructure is a major sector of an economy. According to a World Bank study, infrastructure accounts for 3 to 8% of GDP, and 50% or more of domestic fixed capital formation consists of construction output. It also accounts for 20% of total investment and 40 to 60% of public investment expenditure. Third, there are viable technological options that are considered green, which can be adopted in this sector, yet without the need to compromise on efficiency and productivity.

Labour-based option in infrastructure is 10 to 30% less costly than the equipment-intensive option. The labour-based option also helps reduce foreign exchange requirements by 50 to 60%, and for the same amount of investment, this option creates 3 to 5 times more employment. Moreover, the labour-based option is much more environment-friendly, and hence contributes to a green economy. Although less documented than for the road sector, labour-based alternatives to conventional technologies also exist in other sub-sectors, such as irrigation (construction of canals, minor dams, etc.), drainage and sewerage systems, erosion control, soil and water conservation, land development, etc.

On the energy front, Nepal possesses enough hydroelectricity potential to not only meet its need, but also export the surplus to other neighbouring countries. However, due to a host of factors, this has not been realized so far. It has also not been able to harness renewable energy such as solar and wind power. Hence, Nepal's dependence on fossil fuel has been ever increasing. By promoting hydropower and renewable energy, and discouraging the use of fossil fuel through the right kind of policy mix, the energy sector can contribute to a green economy in Nepal.

iii. Tourism

Nepal has a natural advantage in the tourism sector. Its contribution to the country's GDP is 3.9% of the total GDP and generating over 504,000 employment (WTTC, 2014). It is a smokeless industry, and barring a few exceptions, it mostly consumes green inputs. Thus, green intervention in this sector is instantly viable. Linkages of the tourism sector with other sectors of the economy are potentially important. If linkages between the hotel and tourism sector with the country's agriculture sector and industries like beverages and tobacco can be strengthened, it would help in the broader distribution of the gains from growth in this sector. Appropriate policies for achieving this goal need to be formulated. Likewise, there should be potential for strengthening the linkages between the tourist-oriented enterprises and products of the manufacturing sector, such as garments, carpets, and other artisanal products (decorative as well as utilitarian).

Green intervention in the tourism sector is economically viable and technically feasible. Given that most of the activities in the Nepalese tourism sector are already green, it could be further promoted by branding it as green tourism. While discussing the framework and tools for assessing and understanding the Green Economy at the local level, it is suggested that one needs to keep in mind that such policy interventions will cause major structural changes in economies and labour markets. Hence, it is important to discuss the following questions:

- i. What does a shift to a green economy mean for jobs and skills?
- ii. In which sectors are jobs likely to be created and destroyed?
- iii. Does moving to a low-carbon economy necessarily mean lower productivity, lower wages, and slower economic and job growth?
- iv. Is the green economy the next wave of growth and innovation that will stimulate growth at the local and national levels, raising overall standard of living?
- v. What are the skills and technology needed to accommodate growth in the green economy?

To better answer these queries, scientific estimation of the size of the green economy and green jobs is a must. The size of the green economy and the greenness of the activities at the disaggregated firm-level would be instrumental for better policy sequencing. It will help to have a robust monitoring and evaluation of the interventions. Criteria for identifying green activities and methodologies for estimating the size of the green economy could vary. Hence, one must be very clear about the methodology and its economic interpretation.

GE Framework for Nepal: An Alternative Proposal

As mentioned above, the goal of the promoting green intervention is to lead Nepal's economy to middle income economy within one decade. Several steps required to drag the economy towards this end are explained below. A simple prototype of the green intervention and its final impact on Nepal's economy has also been proposed here (Fig. 1). For green intervention to take place, the macroeconomic indicators of the economy at aggregate and sectoral level must be analyzed first. On the one hand, around 400,000 new economically active people enter into the job market every year in Nepal. Majority of them are semiskilled. Keeping this fact in mind, the potential employment generation should be the first indicator. At the same time, the growth aspect of the sectors should be valued to have higher growth (some sectors have high potential and some have less). Even with works at war-footing pace to develop hydro-electricity, supplying sufficient energy to key economic sectors would take at least five years. At the same time, financial resources and will remain as a constraint. With these in mind, key sectors should be selected first from macro-economic point of view for green intervention.

There is a growing concern about global climate change and other irreversible environmental changes. Global community is committed to fostering the development of a green economy that is clean and energy efficient. Governments of many countries see investing in green economy as a way of helping their economies to recover. Therefore, after

assessing the economy from macro-economic point of view, cost benefit analysis of certain green economy indicators such as the potential of converting the sector into green by using: (i) inputs green, (ii) output green, (iii) both green at a broader level is needed. Such analyses help to identify the probable renewed growth on a more environmentally and socio-economically sustained ground.

capitalizing on the green wave of innovation, and new products and services. Based on the literature reviews, experts' perceptions and educated guess of the researchers, three sectors have been found with higher growth and job potential for semi-skilled people demanding relatively fewer energy. The financing capacity, resource generation capacity and potential green activities at least either from factor market or final goods and services market point of view, these sectors seems to possess higher potential for green intervention.

At the local level, states, territorial, and metropolitan areas see an opportunity to stimulate their economies by

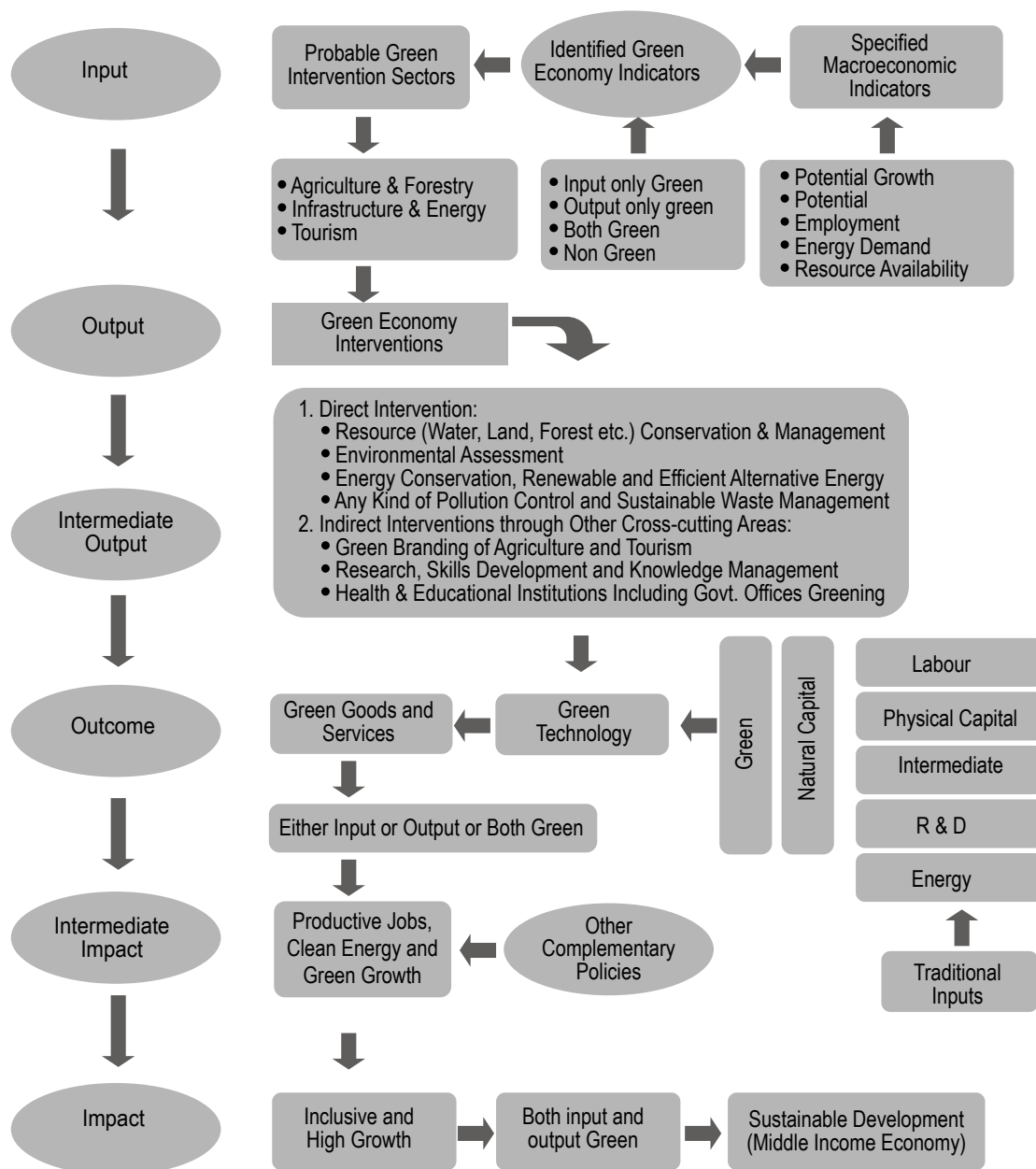


Fig. 1 A simplified proposed framework on green economy in Nepal

After identifying the sectors; following green interventions have been proposed in the selected sectors. Greening of other cross cutting areas such as health and school centres and branding or creating awareness also needs to be done. Major green interventions proposed are as follows:

1. Resource (water, land, forest, etc.) conservation and management
2. Environmental assessment
3. Energy conservation, renewable and efficient alternative energy
4. Any kind of pollution control and sustainable waste management
5. Other cross-cutting areas like:
 - i. Green branding of agriculture and tourism
 - ii. Research, awareness, training, skills development and knowledge management
 - iii. Educational institutions, government offices and health institutions greening

As forwarded by Eberts (2011), while discussing the 'Framework and Tools for Assessing and Understanding the Green Economy at the Local Level', such policy interventions will cause major structural changes in economies and labour markets. In this connection the following challenging questions will be raised in the economy:

- What does a shift to a green economy mean for jobs and skills?
- In which sectors are jobs likely to be created and/or destroyed?
- Does moving to a low-carbon economy necessarily mean lower productivity, lower wages, and slower economic and job growth?
- Or is the green economy the next wave of growth and innovation that will stimulate growth at the local and national levels, raising overall standard of living?
- What are the skills and technology needed to accommodate growth in the green economy?

To better answer these queries from policy view point, estimation of the size of the Green Economy and Green Jobs is must. The size of the green economy and the greenness of the activities at disagreed firm would be instrumental for better policy formulation. It will also help to build robust monitoring and evaluation of the interventions. Criteria for identifying green activities and methodologies may vary, therefore, a clarity in methodology and economic interpretation will be required.

Defining Green Product and Services

According to Eberts (2011), the U.S. Department of Commerce released a report in early 2010 that measures

the green economy. Their approach is to identify and assess green products and services based on the administration's energy conservation and environmental goals. This concept can be used in case of Nepal as well. They define green products and services as those whose predominant function serves one or both of the following goals:

- Conserve energy and other natural resources, which includes products or services that conserve energy to reduce fossil fuel use and promote water, raw material, land, and species and ecosystem conservation; or
- Reduce pollution, which includes products or services that provide clean energy or prevent, treat, reduce, control or measure environmental damage to air, water and soil. The remediation, abatement, removal, transportation, or storage of waste and contaminants also are considered to reduce pollution.

Before green intervention in selected sectors, it is necessary to know the current Green Economy status of the sectors in terms of Green Economy indicators. The GE definition suggests three specific green pillars called emission level, resource efficiency and the social inclusion status of the sectors. Based on the literature, consultation with the experts and understanding of the researchers, the expected status of the post intervention period on those sectors are indicatively expressed in Table 2.

Regarding the carbon emission status, the identified sector called agriculture and forestry is already low. It was one of the reasons why this sector has been chosen. After the green intervention, besides its complimentary support to other sector to be greener, managing the greenness of this sector is sufficient to lead the economy towards green in the course of time. Similar is the case for tourism sector too. Infrastructure and energy sector is assumed to have emitting the carbon at its medium level. The green intervention proposed above can lead this sector towards the low level of emission.

Based on the resource efficiency indicator, the agriculture and forestry sector allocates the resource at medium level and proposed intervention does not expect this sector to be more resource efficient. This sector is facing the low level equilibrium trap not because of the green economic activities problem. Besides, it is constraint to other heroic policy interventions like land leasing policies to global level trade regime. The researcher expects to maintain the resource efficiently in this level at least maintaining in its initial level even after in post intervention time frame. The energy and infrastructure is allocating available resources at its worst level that there is sufficient room to improve. Proposed green intervention as such is sufficient to drag this sector

Table 2. Examination of GE Pillars against selected sectors

GE Pillars	Sector	Current Status	Post Intervention Status
Carbon Emission	Agriculture & Forestry	Low	Low
	Energy & Infrastructure	Medium	Low
	Tourism	Low	Low
Resource Efficiency (Use, Productivity, Supplement/compliment)	Agriculture & Forestry	Medium	Medium
	Energy & Infrastructure	Low	Medium
	Tourism	Medium	High
Socially Inclusive (Job availability, Formal /informal, Women participation, marginalized & vulnerable group)	Agriculture & Forestry	High	High
	Energy & Infrastructure	Medium	High
	Tourism	Medium	High

Note: 1. Ranking based on literature review, perception of the experts, consultation, 2. Ranking in Nepalese context in relation to other macroeconomic sectors

to medium level of resource allocation efficiency. Opposite to these sectors, the resource allocation in tourism sector is already high that most of the activities are under private operation where individual profit is the driving force. Little bit, public policies to check the market failure and negative externalities will suffice this sector to allocate available resource at high level of efficiency.

The social inclusiveness pillar of green economy seems interesting in case of Nepal that agriculture and forestry sector is highly the livelihood source of the marginalized and endangered ethnic groups. So, researchers do believe that maintain the social inclusiveness aspect in this sector will suffice to lead the economy greener as per the definition given. Remaining two sectors are also relatively inclusive that the investment targeted and the job created in these sectors are relatively contributing the marginalized gender, ethnicity and cast groups in Nepal. And, there seems high scope obtaining such inclusiveness at high level. Therefore, Nepalese economy is relatively greener already. Making it more green is policy issue. If better policy crafted and robustly implemented, the dream of Green Economy with high growth initially followed by sustainable development is not that remote in Nepal.

Conclusion

Nepal should take initiative in the implementation of green economy, as well as in its integration to achieve the targets set out in the Millennium Development Goal (MDG) to ensure environmental sustainability. The country is heavily dependent on natural resources for economic development, but such resources have ecological limits, this compels Nepal to consider ways of decoupling the meeting of economic growth targets from increasing natural resources extraction. By principle, Green Economy results in improved wellbeing and social equity, while significantly reducing environmental

risks and ecological scarcities. However, research is necessary to find out the most appropriate ways.

Adapting green economic activities in majority of the sectors in the developing country like Nepal may manifest several trade-offs. It might be directly related to the employment at first followed by revenue generation and low level of investment capacity in public goods and services. Literature suggests that the employment growth may fall short relative to labour force growth giving rise to open unemployment at the initial phase of green orientation of resources. But in developing countries, this may not be a major issue because in the absence of unemployment benefits and acute poverty, very few can afford to remain without employment; and even in the absence of proper employment, one generally tries to find some work for the living.

Nevertheless, Nepal has some comparative advantages in green economic activities, what it needs is to develop competitive advantage via proper technology and entrepreneur skill development. The missing industrialization phase of development can be re-gained with green entrepreneur, commerce and trade with green jobs. The agriculture and forestry, infrastructure and energy and tourism sectors possess high employment potential, probable sources of growth and probable sector wise high inter linkages. These are the potential areas for first priority for green intervention. The final aim of the green intervention is leading the Nepalese economy to middle income economy within one decade.

While thinking of green intervention, the macroeconomic indicators of the economy at aggregate, at sectoral level and structural dynamics must be analyzed first. Every year, some 450,000 new economically active people enter to the job market in Nepal. Majority of them are semiskilled. Keeping this fact in mind, the potential employment generation

should be the first indicator. At the same time, the growth aspect of the sectors should be valued to have higher growth, some sectors have high potential and some have less. And, even if we start to work right from these days, we can supply sufficient energy basically hydro after five years. At the same time, financial resource availability should be considered that ours is the resource scarce country and will remain few years still.

The challenge for developing countries like Nepal is to foster economic growth, where not only output in non-agricultural sectors but also productivity and employment should grow. But Nepalese economy has yet exhibit such pattern. The country remained predominantly agriculture based for long period, as it was in isolation during industrial revolution; then took a jumping start in the service sector as manifested by the share of service sector which is above 51% these years. The vacuum of industrialization is compensated from unsustainable remittance. So, shifting to green economy seeks some smartly tricky policy games in Nepal instead of blind replication of any other successful stories that green may not sustainable.

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