

“Think Ecology, Do Ecology and Save Ecology” – Is it a Better Pathway to the Long-lasting Green Economy instead of the Mythical Efforts as Green Growth or Sustainable Development, or Not...?

Rabin Das

Assistant Professor of Geography, Bajkul Milani Mahavidyalaya

Abstract: *It is twenty four years since the Rio conference which debated on ‘Our Common future’ and the passage of the Agenda 21 which summarizes the core thinking of the global community on the question of sustainability of human settlements. The World Commission on Environment and Development (Brundtland Commission) defines sustainable development as meeting the needs of the present generation without compromising the needs of future generations. It stresses intergenerational equity. The World Summit on Sustainable Development, 1992, 2002, 2012, 2013, 2014 and 2015 held in Rio de Janeiro (Brz.), Johannesburg (SA), Rio de Janeiro (Brz.), London (UK), London (UK) and New York (USA), mentions the three components of sustainable development – economic development, social development and environmentally sustainable development, as interdependent and mutually reinforcing pillars. But, doing or maintaining the Sustainable Development is at the zenith of the public debate and global agenda. Recently, to date, different environmental issues have not been effectively addressed in degrading world analyses and greenway policy formulations. All of nation’s most of the ecological and environmental systems are badly polluted and degraded. The pollution adversely affects the environment, threatens public health and reduces the flow and regeneration of resource available for human use. Hence, is sustainable development really this easy, we merely have to stick with the status quo? This is unfortunate that there are some unanswered questions on ‘Sustainable Development’! So, there is a big asking on the typical subject as “Nature + Development: The Pathway to Sustainable Development.”-A Myth or Reality? Under this backdrop, this article reveals that there is an urgent need to ‘free’ the discourse on sustainability from ideas and knowledge that has been germinated in the Western world whose developmental contexts are entirely distinct from the developing world. Slogan for both present and future world should be – “Think, Plan and Act Locally, Support Nationally and Realize Globally”. There should be needed to take the ‘4R’ policy on Reduce, Reuse, Recycle and Recover of resources. This paper wants to say, what we need is a culture of “do ecology”, i.e., meeting the needs of the current and future generations without ecological harm. What we need is a culture of “save ecology”, i.e., protecting, preserving and conserving the nature, natural resources, the living and non-living correlation, the man-nature inter-relationship and green ward activities without ecological deterioration. What we need is a culture of “think ecology”, i.e., making the eco-centric idea for the social, cultural, economic, political, administrative and also spiritual development without undermining the base of local, regional, national and global ecology.*

Keywords: intergenerational equity, the World Summit on Sustainable Development, environmental issues, ‘4R’ policy, do ecology, save ecology and think ecology.

1. Focus Questions on Green Economy and Green Growth

- Is a “green economy” possible?
- What economic theories provide insight into the relationship between the economy and the environment?
- Is protecting the environment bad for the economy?
- What policies can promote a transition to a green economy?

2. The Green Economy: An Introduction

Economic and environmental objectives are often presented as conflicting goals. A common theme in political debates in recent years is that certain environmental regulations result in unacceptable job losses. Thus the choice is presented as being between improved environmental quality on one hand and a robust economy on the other. But is the choice this simple? Can’t we have both sufficient environmental quality and plentiful, good jobs? In this chapter we explore the relationship between protecting the environment and economic growth. We’ll consider the research on the topic to determine if there is necessarily a tradeoff between the

environment and the economy. While protecting the environment clearly involves some costs, including job losses in some sectors, economists focus on whether the benefits justify these costs. Environmental regulations may also create jobs in some sectors— for example, environmental restrictions on coal plants may lead to expansion of wind power production. Thus it may be possible that at least some environmental regulations actually lead to net job gains. Some recent policy proposals suggest that a well-designed response to current environmental and energy challenges can actually be the engine for future economic growth. Companies and countries that make the investments necessary to create a low-environmental-impact society may gain a competitive advantage over those that continue to pursue business as usual. In addition, excessive rates of natural capital degradation can reduce economic productivity, measured in traditional terms as a reduction in GDP, or in broader terms using the measures. Thus maintaining natural capital may be a critical factor to ensure future economic growth.

3. Setting the stage for a green economy transition

1) From crisis to opportunity: The last two years have seen the idea of a “green economy” float out of its specialist moorings in environmental economics and into the mainstream of policy discourse. It is found increasingly in the words of heads of state and finance ministers, in the text of G20 communiqués, and discussed in the context of sustainable development and poverty eradication.

This recent traction for a green economy concept has no doubt been aided by widespread disillusionment with the prevailing economic paradigm, a sense of fatigue emanating from the many concurrent crises and market failures experienced during the very first decade of the new millennium, including especially the financial and economic crisis of 2008. But at the same time, there is increasing evidence of a way forward, a new economic paradigm – one in which material wealth is not delivered perforce at the expense of growing environmental risks, ecological scarcities and social disparities.

Mounting evidence also suggests that transitioning to a green economy has sound economic and social justification. There is a strong case emerging for a redoubling of efforts by both governments as well as the private sector to engage in such an economic transformation. For governments, this would include leveling the playing field for greener products by phasing out antiquated subsidies, reforming policies and providing new incentives, strengthening market infrastructure and market-based mechanisms, redirecting public investment, and greening public procurement. For the private sector, this would involve understanding and sizing the true opportunity represented by green economy transitions across a number of key sectors, and responding to policy reforms and price signals through higher levels of financing and investment.

2) An era of capital misallocation: Several concurrent crises have unfolded during the last decade: climate, biodiversity, fuel, food, water, and more recently, in the global financial system. Accelerating carbon emissions indicate a mounting threat of climate change, with potentially disastrous human consequences. The fuel price shock of 2007-2008 and the related skyrocketing food and commodity prices, reflect both structural weaknesses and unresolved risks. Forecasts by the International Energy Agency (IEA) and others of rising fossil fuel demand and energy prices suggest an ongoing dependence as the world economy struggles to recover and grow (IEA 2010).

Currently, there is no international consensus on the problem of global food security or on possible solutions for how to nourish a population of 9 billion by 2050. See Box 1 for further information on the population challenge. Freshwater scarcity is already a global problem, and forecasts suggest a growing gap by 2030 between annual freshwater demand and renewable supply (McKinsey and Company 2009). The outlook for improved sanitation still looks bleak for over 1.1 billion people and 844 million people still lack access to clean drinking water (World Health Organization and UNICEF 2010). Collectively, these crises are severely

impacting the possibility of sustaining prosperity worldwide and achieving the Millennium Development Goals (MDGs) for reducing extreme poverty. They are also compounding persistent social problems, such as job losses, socio-economic insecurity, disease and social instability.

The causes of these crises vary, but at a fundamental level they all share a common feature: the gross misallocation of capital. During the last two decades, much capital was poured into property, fossil fuels and structured financial assets with embedded derivatives. However, relatively little in comparison was invested in renewable energy, energy efficiency, public transportation, sustainable agriculture, ecosystem and biodiversity protection, and land and water conservation.

Most economic development and growth strategies encouraged rapid accumulation of physical, financial and human capital, but at the expense of excessive depletion and degradation of natural capital, which includes the endowment of natural resources and ecosystems. By depleting the world’s stock of natural wealth – often irreversibly – this pattern of development and growth have had detrimental impacts on the wellbeing of current generations and presents tremendous risks and challenges for the future. The recent multiple crises are symptomatic of this pattern.

Existing policies and market incentives have contributed to this problem of capital misallocation because they allow businesses to run up significant, largely unaccounted for, and unchecked social and environmental externalities. To reverse such misallocation requires better public policies, including pricing and regulatory measures, to change the perverse incentives that drive this capital misallocation and ignore social and environmental externalities. At the same time, appropriate regulations, policies and public investments that foster changes in the pattern of private investment are increasingly being adopted around the world, especially in developing countries (UNEP 2010).

Towards a Green Economy, aims to debunk several myths and misconceptions about greening the global economy, and provides timely and practical guidance to policy makers on what reforms they need to unlock the productive and employment potential of a green economy.

Perhaps the most prevalent myth is that there is an inescapable trade-off between environmental sustainability and economic progress. There is now substantial evidence that the greening of economies neither inhibits wealth creation nor employment opportunities. To the contrary, many green sectors provide significant opportunities for investment, growth and jobs. For this to occur, however, new enabling conditions are required to promote such investments in the transition to a green economy, which in turn calls for urgent action by policy makers.

A second myth is that a green economy is a luxury only wealthy countries can afford, or worse, a ruse to restrain development and perpetuate poverty in developing countries. Contrary to this perception, numerous examples of greening transitions can be found in the developing world, which

should be replicated elsewhere. Towards a Green Economy brings some of these examples to light and highlights their scope for wider application.

UNEP's work on green economy raised the visibility of this concept in 2008, particularly through a call for a Global Green New Deal (GGND). The GGND recommended a package of public investments and complementary policy and pricing reforms aimed at kick-starting a transition to a green economy, while reinvigorating economies and jobs and addressing persistent poverty (Barbier 2010a). Designed as a timely and appropriate policy response to the economic crisis, the GGND proposal was an early output from the United Nations' Green Economy Initiative. This initiative, coordinated by UNEP, was one of the nine Joint Crisis Initiatives undertaken by the Secretary-General of the UN and his Chief Executives Board in response to the 2008 economic and financial crisis.

2) Towards a Green Economy – the main output of the Green Economy Initiative – demonstrates that the greening of economies need not be a drag on growth. On the contrary, the greening of economies has the potential to be a new engine of growth, a net generator of decent jobs and a vital strategy to eliminate persistent poverty. The report also seeks to motivate policy makers to create the enabling conditions for increased investments in a transition to a green economy in three ways.

- First, the report makes an economic case for shifting both public and private investment to transform key sectors that are critical to greening the global economy. It illustrates through examples how added employment through green jobs offsets job losses in a transition to a green economy.
- Second, it shows how a green economy can reduce persistent poverty across a range of important sectors – agriculture, forestry, freshwater, fisheries and energy. Sustainable forestry and ecologically friendly farming methods help conserve soil fertility and water resources. This is especially critical for subsistence farming, upon which almost 1.3 billion people depend for their livelihoods (UNEP et al. 2008).
- Third, it provides guidance on policies to achieve this shift by reducing or eliminating environmentally harmful or perverse subsidies, addressing market failures created by externalities or imperfect information, creating market based incentives, implementing appropriate regulatory frameworks, initiating green public procurement and by stimulating investment.

3) Concept of Green economy:

The green economy is defined as an economy that aims at reducing environmental risks and ecological scarcities, and that aims for sustainable development without degrading the environment. It is closely related with ecological economics, but has a more politically applied focus. The 2011 UNEP Green Economy Report argues "that to be green, an economy must not only be efficient, but also fair. Fairness implies recognising global and country level equity dimensions, particularly in assuring a just transition to an economy that is low-carbon, resource efficient, and socially inclusive."

A feature distinguishing it from prior economic regimes is the direct valuation of natural capital and ecological services as having economic value (*see The Economics of Ecosystems and Biodiversity and Bank of Natural Capital*) and a full cost accounting regime in which costs externalized onto society via ecosystems are reliably traced back to, and accounted for as liabilities of, the entity that does the harm or neglects an asset.

Green Sticker and ecolabel practices have emerged as consumer facing measurements of friendliness to the environment and sustainable development. Many industries are starting to adopt these standards as a viable way to promote their greening practices in a globalizing economy.

4. Definition of Green Economy

Karl Burkart defines a green economy as based on six main sectors:

- Renewable energy
- Green buildings
- Sustainable transport
- Water management
- Waste management
- Land management

The International Chamber of Commerce (ICC) representing global business defines green economy as "an economy in which economic growth and environmental responsibility work together in a mutually reinforcing fashion while supporting progress on social development".

In 2012, the ICC published the Green Economy Roadmap, containing contributions from experts from around the globe brought together in a two-year consultation process. The Roadmap represents a comprehensive and multidisciplinary effort to clarify and frame the concept of "green economy". It highlights the essential role of business in bringing solutions to common global challenges. It sets out the following 10 conditions which relate to business/intra-industry and collaborative action for a transition towards a green economy:

- Open and competitive markets
- Metrics, accounting, and reporting
- Finance and investment
- Awareness
- Life cycle approach
- Resource efficiency and decoupling
- Employment
- Education and skills
- Governance and partnership
- Integrated policy and decision-making

5. The Dynamic Concept of Green Economy Thinking from Sustainable Development

The concept of *sustainable development* emerged under the name of *ecodevelopment* in the 1970s. It resulted from the effort to find a third alternative path to those that put developmentalists on the one side and advocates of zero growth on the other. For the latter, called "zeroists" or

(pejoratively) “neo-Malthusians”, environmental limits would lead to catastrophes if economic growth was not stopped.

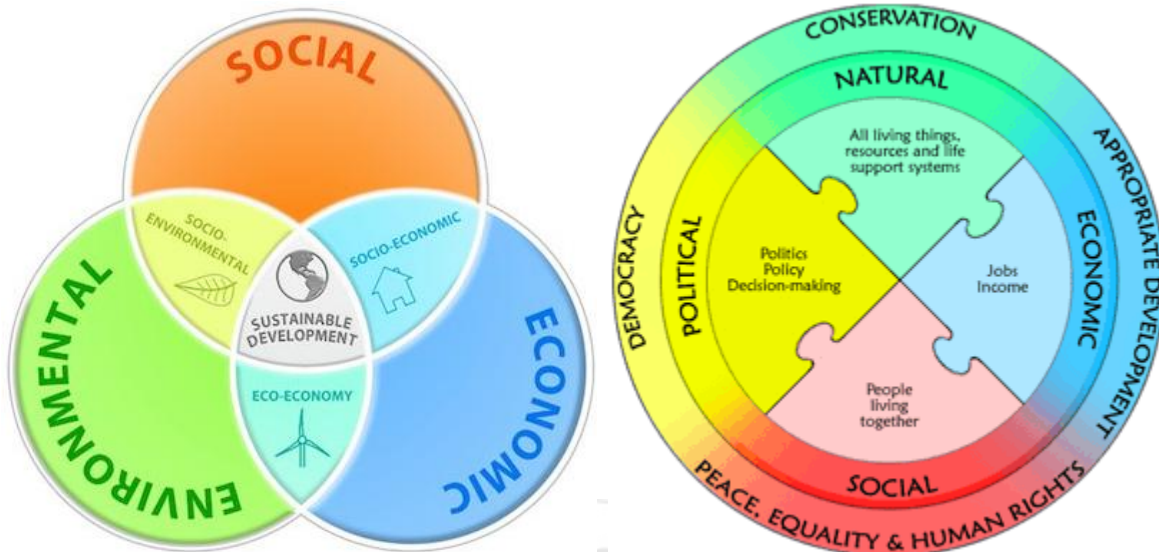


Figure 1 & 2: Conceptual Dimensions and Parameters of Sustainable Development

The controversy that put developmentalists against “zeroists” began with the publication of the report prepared by the Meadows couple, from MIT, under the auspices of the Club of Rome, on environmental limits to economic growth (Meadows et al., 1972), whose conclusion was that economic growth needed to be stopped to prevent the depletion of natural resources and pollution from causing a sharp drop in living standards. The first United Nations Conference on Environment held in Stockholm in 1972 was the stage of this polarization that tended to generate deadlocks. This conclusion came at a time of strong global economic growth driven by the recovery from the post-war chaos (“The Glorious Thirty”) and the rise of some emerging nations such as the “Asian Tigers” and of Brazil as the country of the “economic miracle”. In turn, the vast majority of countries remained poor, with problems to start a process of sustained economic growth.

Until then the great controversy about economic development put on the one side those who saw the scenario of global inequality as a problem of historical stages in the process of economic growth, i.e., each country would be able, at a given time, to start a trajectory of sustained economic growth, which was seen as a necessary and sufficient condition for social development. The difficulties that many countries faced in order to meet the conditions necessary to take off towards the process of sustained economic growth resulted primarily from *endogenous factors* (Rostow, 1960). On the other side were those who saw both international inequality and national inequality (concentrated income distribution in poor countries) as a result of some form of perverse articulation between rich and poor countries for the benefit of the first and of a minority, small elite, in the latter. In other words, inequality stemmed primarily from *exogenous factors* related to the form of unfavorable inclusion of poor countries in the international division of labor.

Initially, all currents rejected the conclusions of the Club of Rome report. To mainstream economists firstly because

there were theoretical reasons to reject the idea that natural resources could represent an absolute limit to economic growth; and secondly because of the socioeconomic and political consequences of zero growth for both poor and rich countries. To the representatives of the second current there were no theoretical reasons to justify defending the lack of environmental limits to economic growth. The problem was also in the socio-economic implications of this idea, but related to the perpetuation of exclusion in favor of central capitalist countries.

The first UN reactions following the Stockholm Conference, with the support of eco-developmentalists, were not only to defend the need for economic growth in poor countries, but also to consider poverty itself as one of the root causes of environmental problems in those countries. According to the Cocoyok Declaration (1974), the population boom would be the result of the lack of all types of resources, which in turn would lead this population to overuse the land, water and other natural resources. The responsibility of industrialized countries to the problems of underdevelopment would lie in over-consumption. They would have to reduce their consumption levels and disproportionate participation in the pollution of the biosphere. The positions taken in Cocoyok were consolidated in the Dag-Hammarskjöld Report (1975), which goes further to pinpoint the responsibilities of industrialized countries resulting from the legacy of colonialism. The colonial system would have concentrated the land suitable for agriculture in the hands of a social minority and European settlers. Consequently, large masses of the original population were expelled and marginalized, and forced to use less suitable land.

The conciliatory proposition of eco-developmentalists is based on a normative concept of what development can and should be: it is possible to maintain efficient (sustainable) economic growth in the long term alongside improved social conditions (by distributing income) while respecting the environment. However, efficient economic growth is seen as a necessary but not sufficient condition for improving

human welfare: the desired income distribution (the primary indicator of social inclusion) does not automatically result from economic growth, which can be socially exclusionary; specific public policies designed to prevent growth from benefiting only a minority are necessary; likewise, the ecological balance can be adversely affected by economic growth and limit it in the long run without the help of ecologically prudent policies that encourage the increase of eco-efficiency and reduce the risk of potentially important environmental losses.

In the case of poor countries, this set of policies would provide an opportunity for them to start a process of sustained economic growth, distributing income and avoiding repeating the trajectory of environmental impacts of developed countries. More than an opportunity, these policies would be the very condition for a development based chiefly on the endogenous forces of those countries ("self reliance").

Because of their assumptions and propositions, eco-developmentalists have taken a unique position in relation to other currents under debate: they share with all of them the rejection of the zero growth idea, but differentiate themselves from each of them: in relation to the mainstream for its concern about potentially important environmental losses and poverty and income concentration; in relation to Marxism and structuralism, because they assumed that the situation of poor countries resulted from essentially endogenous factors, although they also pointed to the need for developed countries to show solidarity in the struggle to overcome international inequality - either by increasing foreign aid or by correcting business and financial mechanisms that are unfavorable to developing countries (see Sachs, 1981, 1986).

At the beginning of the following decade, UNEP organized the Nairobi Conference in 1982, when the decision was made to create a World Commission on Environment and Development under the leadership of the Prime Minister of Norway, Gro Harlem Brundtland. The results of the effort were made public in 1987, in a document entitled *Our Common Future*, also known as the Brundtland Report (1991). Similarly to eco-developmentalists, the authors of the report considered that the environmental risk of economic growth should be taken seriously, a concern that was expressed in the motto defining what should be understood as sustainable development: "the development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Sustainable development can be achieved through a set of policies capable of simultaneously guaranteeing the increase in national income and access to basic social rights (economic security, access to health and education) and reducing the impact of increased production and consumption on the environment. Thereafter, the term "sustainable development" has replaced almost completely the term "eco-development", while expressing the same normative concept.

The second UN Conference on the environment took place in Rio de Janeiro, Brazil, the same year in which an update of the first Club of Rome report was published ratifying the

key conclusions of the original document. Interestingly, twenty years after the first conference, it had become clearer that technical progress - the magic wand of optimistic developmentalists - had been much more efficient in addressing the issue of the environment as (a) a provider of raw materials than in confronting the issue of the environment as (b) a provider of ecosystem services: (a) the prices of raw materials had fallen, *thanks to technical progress* in the exploitation of natural resources, in the replacement of expensive inputs for cheaper ones, and in the (ecological) efficiency of their use; (b) however, pollution and the degradation of ecosystems had increased *despite technical progress*.

This second fact (b) is reflected in the updated report of the Club of Rome, whose main highlight is the destruction of ecosystems and its implications in the carrying capacity of the planet, to the extent that ecosystems as a whole provide the main ecosystem service, i.e., the ability to absorb and recycle the waste generated by human activities. The risk of depletion of non-renewable raw materials, especially oil, pales before this. In any event, the conclusion of the analysis remains the same: economic growth needs to be stopped.

Another important fact to note in the socioeconomic context of that time was the realization - taking Brazil was an iconic case - that economic growth by itself could be highly exclusionary. High income concentrations could persist despite years of strong economic growth, because of structural problems that could only be solved through more active State intervention. These facts have contributed to strengthen the position of advocates of the concept of sustainable development: there is a risk of important environmental losses, and economic growth can be socially exclusionary; the solution is a set of public policies that remove structural obstacles to the dynamic redistribution of income and address environmental problems with caution and ecological efficiency (technical progress).

The emergence of the global warming issues in the 1990s, however, ultimately brought the debate to a new level in relation to two key aspects: (a) the assessment of environmental risk; (b) the "trade-off" between economic growth and the environment. Regarding the first aspect, the notion of prudence gives way to the most appropriate and accurate concept of Precaution, raised to the condition of principle - formally adopted at the Rio 92 Conference. Prudence applies to situations of risk in which the distribution of probabilities is known. Precaution applies when there is uncertainty. In the first case, safety procedures can be defined with probable margins of precision, thus enabling maintaining a given course of action. In the second case there is only one safety procedure: stopping or reducing the course of action in order to buy time for the acquisition of new knowledge that reduces or eliminates uncertainty (Hourcade, 1997).

In the case of global warming and its confrontation based on the Precautionary Principle (as proposed by the Kyoto Protocol), the issue of ecosystem uncertainty highlights the second aspect, since the rapid reduction of emissions is costly. Although eco-developmentalists have not denied the existence of some sort of "trade-off" between economic growth and the environment, the assumption was that this

trade-off would be negligible provided that the set of proposed policies was adopted. Policies that supposedly addressed the risk of environmental losses in a proper way, based on prudence. Actually this “trade-off” has become the main reason for results to have fallen short of what was expected in the successive conferences on the environment after Rio-92.

The difficulties in implementing the Kyoto Protocol have reinforced the position - based on the work of William Nordhaus – of the advocates of smooth, low cost induction of change in the energy matrix (decarbonization) through moderate fees on fossil fuels, which minimizes or ignores the uncertainty about the possibility of potentially catastrophic, irreversible losses.

The explicit concern about intergenerational distribution (and justice) leads him also to adopt a very low, close to zero discount rate. However, he explicitly rejects the idea of zero growth as the ultimate solution to the environmental problem. Similarly to eco-developmentalists, he proposes a set of environmental policies capable of taking the environmental risk into account, but with low “trade-off” between economic growth and the environment. In contrast, however, he structures these policies based on a framework of macroeconomic scenarios where the environmental costs of inaction are estimated.

In the recent report of the United Nations Environment Program on Green Economy (UNEP, 2011), the fundamental eco-developmental premise is explicitly stated, but similar to the Stern Review it is included in a stricter macro-economic analytical framework. Two key aspects of this analytical scheme deserve to be highlighted: firstly, environmental risks can be estimated, therefore enabling the simulation of scenarios showing the cost-benefit of adopting a particular set of policies; secondly, the problems stem primarily from the inefficient allocation of production factors; this inefficiency, in turn, results from market failures related to ecosystem services, as well as from wrong incentives arising from existing public policies. Also worth noting is the explicit adoption of the “unorthodox” premise that capital and natural resources are not perfect substitutes;

ecosystem services in particular would be very limitedly replaced by capital.

Policy proposals are a mix of command and control policies and with policies based on economic instruments. In relation to the first, an aggressive environmental regulation is also recommended to anticipate future scarcity. As for the second, beyond the pricing of ecosystem services, it will be necessary to virtually reverse the signals of an economic incentive structure which, in key-sectors such as energy and transport favor the use of fossil fuels and individual transport. Developing countries have specificities - such as large portions of the population still living on forestry activities and small subsistence agriculture - that need to be addressed through specific policies. Supposedly, the “greening” of these activities would be capable of simultaneously increasing the supply of jobs and labor productivity and therefore of income. There is no “trade-off” between economic growth and the environment. The issue of environmental limits raised by the Club of Rome would be nothing but a “myth”.

There is a great expectation towards the role of technology: “green” technologies which are “triple winner”: **environmentally friendly, socially appropriate and economically efficient**. Another UN report (DESA, 2011), whose title precisely expresses this expectation, indicates the policies required to stimulate technological change, especially so that emerging countries may be able to “leapfrog” directly into these new triple-winner technologies. The technological revolution of the green economy would be different for three reasons: (a) the short period of time within which it should occur given the pressure on ecosystems; (b) because of that and the limitations of market mechanisms, governments will have to play a much more active role in the production and dissemination of technology; (c) the need for international cooperation, since the main environmental problems are global in nature.

6. Evolution of World’s Green Economy Thinking

Table 1: The Five-Stage Evolution of World’s Green Economy Thinking

Stages	Name of the Stages	Periods	Basic Criteria/ Goals
Stage-I	Environmental protection	1970s–1980s	• End-of-pipe pollution control • Nascent awareness of environmental protection • The original Environmental Protection Law enacted
Stage-II	Sustainable development	1990s	Goal to alleviate negative impacts of economic growth • Clean production and end-of-pipe control • Agenda 21 released as first sustainable development plan
Stage-III	Harmony between man and nature	2000–2006	• Harmony between man and nature • Circular economy • Resource efficiency and environmental concerns appear in the official development rhetoric
Stage-IV	Scientific development strategy	2003–2012	Environmental sustainability as a central piece of development thinking • Balanced and people-oriented economic development • Various green sectoral policies
Stage-V	Ecological civilization	2007–present	Investment and stimulus package for the renewable energy sector • Green jobs • Quality of economic growth over speed • Ecological civilization

7. Pathways to a Green Economy

If the desirability of moving to a green economy is clear to most people, the means of doing so is still a work in progress for many. This section looks at the theory of greening, the practice and the enabling conditions required for making

such a transition. However, before embarking on this analysis, the section frames the dimensions of the challenge.

7.1 How far is the world from a green economy?

Over the last quarter of a century, the world economy has quadrupled, benefiting hundreds of millions of people (IMF 2006). However, 60 per cent of the world's major ecosystem goods and services that underpin livelihoods have been degraded or used unsustainably (Millennium Ecosystem Assessment 2005). This is because the economic growth of recent decades has been accomplished mainly through drawing down natural resources, without allowing stocks to regenerate, and through allowing widespread ecosystem degradation and loss.

For the first time in history, more than half of the world population lives in urban areas. Cities now account for 75 per cent of energy consumption (UN Habitat 2009) and of carbon emissions (Clinton Foundation 2010).¹ Rising and related problems of congestion, pollution and poorly provisioned services affect the productivity and health of all, but fall particularly hard on the urban poor. With approximately 50 per cent of the global population now living in emerging economies (World Bank 2010) that are rapidly urbanising and developing, the need for green city planning, infrastructure and transportation is paramount.

The transition to a green economy will vary considerably among nations, as it depends on the specifics of each country's natural and human capital and on its relative level of development. As demonstrated graphically, there are many opportunities for all countries in such a transition. Some countries have attained high levels of human development, but often at the expense of their natural resource base, the quality of their environment, and high greenhouse gas (GHG) emissions. The challenge for these countries is to reduce their per capita ecological footprint without impairing their quality of life.

Other countries still maintain relatively low per capita ecological footprints, but need to deliver improved levels of services and material well-being to their citizens. Their challenge is to do this without drastically increasing their ecological footprint. As the diagram illustrates, one of these two challenges affects almost every nation, and globally, the economy is still very far from being green.

7.2 Enabling conditions for a green economy

To make the transition to a green economy, specific enabling conditions will be required. These enabling conditions consist of national regulations, policies, subsidies and incentives, as well as international market and legal infrastructure, trade and technical assistance. Currently, enabling conditions are heavily weighted towards, and encourage, the prevailing brown economy, which depends excessively on fossil fuels, resource depletion and environmental degradation.

At the national level, any strategy to green economies should consider the impact of environmental policies within the broader context of policies to address innovation and economic performance (Porter and Van der Linde 1995). In this view, government policy plays a critical role within economies to encourage innovation and growth. Such intervention is important as a means for fostering innovation and for choosing the direction of change (Stoneman ed. 1995; Foray ed. 2009).

Thus, moving towards a green development path is almost certainly a means for attaining welfare improvements across a society, but it is also often a means for attaining future growth improvement. This is because a shift away from basic production modes of development based on extraction and consumption and towards more complex modes of development can be a good long-term strategy for growth. There are several reasons why this shift might be good for long-term competitiveness as well as for social welfare.

- First, employing strong environmental policies can drive inefficiencies out of the economy by removing those firms and industries that only exist because of implicit subsidies in under-priced resources. The free use of air, water and ecosystems is not a value-less good for any actor in an economy and amounts to subsidizing negative net worth activities. Introducing effective regulation and market-based mechanisms to contain pollution and limit the accumulation of environmental liabilities drives the economy in a more efficient direction.
- Second, resource pricing is important not just for the pricing of natural capital and services, but also for pricing of all the other inputs within an economy. An economy allocates its efforts and expenditures according to relative prices, and under-priced resources result in unbalanced economies. Policy makers should be targeting the future they wish their economies to achieve, and this will usually require higher relative prices on resources. An economy that wishes to develop around knowledge, R&D, human capital and innovation should not be providing free natural resources.
- Third, employing resource pricing drives investments into R&D and innovation. It does so because avoiding costly resources can be accomplished by researching and finding new production methods. This will include investment in all of the factors (human capital and knowledge) and all of the activities (R&D and innovation) listed above. Moving towards more efficient resource pricing is about turning the economy's emphasis towards different foundations of development.
- Fourth, these investments may then generate innovation rents. Policies that reflect scarcities that are prevalent in the local economy can also reflect scarcities prevalent more widely. For this reason, a solution to a problem of resource scarcity identified locally (via R&D investments) may have applicability and hence more global marketability. The first solution to a widely experienced problem can be patented, licensed and marketed widely.
- Fifth, aggressive environmental regulation may anticipate future widely-experienced scarcities and provide a template for other jurisdictions to follow. Such policy leadership can be the first step in the process of innovation, investment, regulation and resource pricing described above (Network of Heads of European Environment Protection Agencies 2005).

In sum, the benefits from a strong policy framework to address market failures and ecological scarcities will flow down the environment pathway that comes from altering the direction of an economy. Policies and market-based mechanisms that enhance perceived resource prices creates incentives to shift the economy onto a completely different foundation – one based more on investments in innovation

and its inputs of human capital, knowledge, and research and development.

7.2 How to measure progress towards a green economy

It is difficult, if not impossible; to manage what is not measured. Notwithstanding the complexity of an overall transition to a green economy, appropriate indicators at both a macroeconomic level and a sectoral level will be essential to informing and guiding the transition.

To complicate matters, conventional economic indicators, such as GDP, provide a distorted lens for economic performance, particularly because such measures fail to reflect the extent to which production and consumption activities may be drawing down natural capital. By either depleting natural resources or degrading the ability of ecosystems to deliver economic benefits, in terms of provisioning, regulating or cultural services, economic activity is often based on the depreciation of natural capital.

Ideally, changes in stocks of natural capital would be evaluated in monetary terms and incorporated into national accounts. This is being pursued in the ongoing development of the System of Environmental and Economic Accounting (SEEA) by the UN Statistical Division, and the World Bank's adjusted net national savings methods (World Bank 2006). The wider use of such measures would provide a better indication of the real level and viability of growth in income and employment. Green Accounting or Inclusive Wealth Accounting are available frameworks that are expected to be adopted by a few nations initially and pave the way for measuring the transition to a green economy at the macroeconomic level.

7.3 Criticisms against Green Economy

A number of organizations and individuals have criticized aspects of the 'Green Economy', particularly the mainstream conceptions of it based on using price mechanisms to protect nature, arguing that this will extend corporate control into new areas from forestry to water. The research organization ETC Group argues that the corporate emphasis on bio-economy "will spur even greater convergence of corporate power and unleash the most massive resource grab in more than 500 years." Venezuelan professor Eduardo Lander says that the UNEP's report, *Towards a Green Economy*, while well-intentioned "ignores the fact that the capacity of existing political systems to establish regulations and restrictions to the free operation of the markets – even when a large majority of the population calls for them – is seriously limited by the political and financial power of the corporations." Ulrich Hoffmann, in a paper for UNCTAD also says that the focus on Green Economy and "green growth" in particular, "based on an evolutionary (and often reductionist) approach will not be sufficient to cope with the complexities of climate change" and "may rather give much false hope and excuses to do nothing really fundamental that can bring about a U-turn of global greenhouse gas emissions. Clive Spash, an ecological economist, has criticised the use of economic growth to address environmental losses, and argued that the Green Economy, as advocated by the UN, is not a new approach at

all and is actually a diversion from the real drivers of environmental crisis. He has also criticized the UN's project on the economics of ecosystems and biodiversity (TEEB), and the basis for valuing ecosystems services in monetary terms.

7.4 Ecological economics: sustainable scale and the law of entropy

From the standpoint of *ecological economics*, the environment represents an absolute limit to the expansion of the economy, which is one of its subsystems. However, if by definition a subsystem cannot be larger than the system that contains it, its size in relation to the whole does not have the system as its maximum limit, but rather its carrying capacity, which is defined by thresholds of ecosystem resilience. This is one of the fundamental premises of ecological economics that has its origin in the work of Kenneth E. Boulding. To illustrate this idea, Boulding (1966) uses the analogy of the "cowboy economy" and the "spaceship economy". In the first, the economic subsystem - the cowboy in the Great Plains – does not have enough critical mass to cause some important irreversible ecosystem impact; in the latter, the size of the economic subsystem - the spaceship crew - is large enough to endanger its own survival if the resources available are not handled carefully. It is not possible to replace essential ecosystem services with capital. Natural resources (natural capital) are complementary to capital and/or labor. The current size of the economic subsystem and its rapid expansion bring the planet ("Spaceship Earth") closer to the second.

With regard to population growth, the idea of limits of "Spaceship Earth" is generally accepted by all, including neoclassical environmental economists. The difficulty lies in the idea that economic growth, increasing production and per capita income are also limited by the size of Spaceship Earth.

This limitation is due to the law of entropy, according to which no productive matter and energy change activity (first law of thermodynamics) is possible without an irreversible entropic degradation process that generates waste (second law of thermodynamics); it is possible to reduce the amount of waste by increasing eco-efficiency, but beyond a certain point there are insurmountable entropic limits. This is another fundamental premise of Ecological Economics which has its origin especially in the work of N. Georgescu-Roegen (1971).

Based on these two assumptions, Herman Daly (1996), the pioneer responsible for incorporating these ideas into a theoretical body that founded ecological economics, concludes that the total waste inevitably generated by the extraction, processing and consumption of natural resources in a given period of time (which he calls "throughput") cannot exceed the carrying capacity of the Earth and that, therefore, zero growth is the only way to prevent that from happening.

The thermodynamic destabilizing effects of human activities result from two sources. The first source of imbalance is the expansion of human occupation of the space. Rich estuarine ecosystems give way to cities and ports; huge natural spaces

are radically transformed by agriculture, forestry and animal husbandry. The second is the introduction of materials and energy from sources exogenous to the system. The minerals found in the Earth's crust at concentration levels (mines) that economically justify their exploitation are inert, i.e., they either do not interact or interact only marginally with biological activities in the ecosphere. The mining, processing and consumption of these materials result in the production of waste that will be dispersed in the ecosphere, forcing ecosystems to adapt in order to absorb them. Depending on the amount, this waste represents a source of pollution that can affect or even destroy the ability of ecosystems to provide services.

These activities have impacts similar to those of volcanoes, with the difference, however, of being selective: the volcanoes spew especially relatively high entropy materials such as silica, which are abundant in nature, so that their assimilation by ecosystems is easier (besides the fact that ecosystems have co-evolved with volcanic activities for hundreds of millions of years); human mineral extraction practices, on the contrary, are focused on low-entropy materials concentrated in certain places by telluric forces for million years, thus hindering their assimilation by ecosystems. Added to these materials are those produced artificially, an already huge number of new substances whose impacts on ecosystems and directly on humans are not well known, such as POPs (Persistent Organic Pollutants), hormone-mimicking molecules, etc. In the long term, therefore, the sustainability of the economic system is not possible without the stabilization of waste (and heat) production levels according to the carrying capacity of the planet. This is the biggest limiting factor: the environment as a producer of ecosystem services and not as a producer of non-renewable raw materials. Services that cannot be replaced by capital and that the market is incapable of adequately taking into account.

Once the existence of a carrying capacity that cannot be exceeded is recognized, the next issue is its size. To what

extent human pressure on ecosystems can be absorbed by these without a catastrophic rupture? Great efforts have been made in this regard. According to Rockstrom et al. (2009a, 2009b), for example, the current scale of human activities would have already exceeded the limits of ecosystem services of biodiversity, nitrogen cycle and climate regulation. However, although these efforts are required, it must be recognized that these ecosystem services result from complex ecosystems that have, *inter alia*, the property of resilience, i.e., the ability to rebalance without rupturing (or phase shift, to use a more precise thermodynamics language), whose *threshold* cannot be fully known. It is a radical uncertainty that science is unable to solve.

From these assumptions, the central question for ecological economics is how to get the economy to operate while accepting the existence of these limits. Two action plans need to be considered: (a) one relates to specific policies for each type of environmental problem to be addressed; (b) the other to the stabilization of global waste production at sustainable levels - zero growth. Conventional environmental economics, as we saw earlier, only takes into account the first action plan, in that it ignores the existence of environmental limits to growth, based on the possibility of unlimited replacement of scarce resources with abundant resources and/or capital. In the case of environmental goods traded in the markets (material and energy inputs), it is assumed that the growing shortage of a particular good raises its price, thus leading to the introduction of innovations that enable saving it and, at the limit, replacing it with other, more abundant resources, whose stocks the economic agents are supposed to know, along with quality differences, the future course of technological progress, and demand itself. In fact, as pointed out by Daly (1996), the prices reflect the availability of each resource regardless of the total stock of resources, thus preventing them from being used to signal an optimal extraction process from the standpoint of sustainability.

Table 2: Environmental cum Ecological Economics

📖 Concepts 📖				
📄 Green accounting	📄 Green economy	📄 Green trading	📄 Eco commerce	📄 Green job
📄 Environmental enterprise	📄 Fiscal environmentalism	📄 Environmental finance	📄 Renewable energy	
📖 Policies 📖				
♣ Sustainable tourism	♣ Ecotax	♣ Environmental tariff	♣ Net metering	♣ Environmental pricing reform
♣ Pigovian tax				
📖 Dynamics 📖				
🕒 Renewable energy commercialization	🕒 Marginal abatement cost	🕒 Green paradox	🕒 Green politics	🕒 Pollution haven hypothesis
📖 Carbon related 📖				
📄 Low-carbon economy	📄 Carbon neutral fuel	📄 Carbon neutrality	📄 Carbon pricing	📄 Emissions trading
📄 Carbon credit	📄 Carbon offset	📄 Carbon emission trading	📄 Carbon emission trading	📄 Personal carbon trading
📄 Carbon tax	📄 Carbon finance	📄 Feed-in tariff	📄 Carbon diet	📄 Food miles
📄 2000-watt society	📄 Carbon footprint			

In the case of the ecological economics this process needs to be reversed, starting by determining the sustainable scale of use of natural resources. Thus, what used to be process adjustment variables (amount of ecosystem goods and

services to be used) are now being treated as physical parameters of ecological sustainability, to which the (now) nonphysical variables of technology and preferences should adjust. Because of the technology, the latter begin to be

limited by the scale. Determining a *sustainable scale*, in turn, involves other values besides the individual pursuit of maximizing gain or well-being, such as solidarity between and within generations. These values have to be affirmed in the context of scientific controversies and uncertainties in

complex cases such as those of global environmental problems. In such cases, the scale deemed sustainable can only be determined through collective decision-making processes, from perspective of application of the *Precautionary Principle*.



Figure 3: Purpose, mission, Vision and Strategy for Green Economy and Green Future

Thus, without a collective intervention to define the scale that society deems sustainable, the improvement of environmental quality induced by environmental degradation (the Environmental Kuznets Curve) tends to be limited to the degradation that affects the level of well-being of the very agents making the decision (such as that caused by the emission of sulfurous gases, particulates, disposal of domestic sewage, etc.), leaving aside that whose effects involve more dispersed and long-term costs as is the case, for example, of the degradation caused by the emission of carbon dioxide responsible for the greenhouse effect (Arrow et al. 1995).

Once the sustainable *scale* has been determined, the issue of distribution of the right of access - which has become restricted - to a particular ecosystem good or service follows suit. This issue does not exist in the conventional analytical scheme, since there are no environmental limits. The basic distribution criterion should be one that society considers fair. Once the distribution of the right of access based on a fairness criterion accepted by all has been defined, the *allocation* of available resources between investments in pollution control and investments in pollution payment should be made based on market criteria.

In the case of global warming, the policies proposed by the Kyoto Protocol followed this analytical framework. A sustainable scale of use regarding the capacity to absorb greenhouse gases was defined³³ based on ecological criteria;

then the *distribution* of the use of this capacity among signatory countries was established based on criteria considered fair (emission reduction based on the contribution of each country); and finally the *allocation* of investments was left to the carbon market, with the addition of the ingenious Clean Development Mechanism.

Regarding the second action plan - stabilization of the level of heat and waste emissions in developed countries, which implies stopping economic growth (zero growth) - the problem is how to do it without generating a socioeconomic crisis (to be discussed in a coming section). In the case of developing countries, economic growth is essential to eliminate poverty and inequality. For those, policies like the ones advocated by UNEP (2011) and by eco-developmentalists in general are the ones that should be implemented. Politically and operationally, as seen in a previous section, it is possible to develop a set of policies that lead to institutional, organizational and technological innovations capable of putting these countries on a path of sustainable growth until they achieve levels of material comfort similar to those of developed countries.

Green Thinking and Building equitable, inclusive, green societies:

Clearly we need to break with 'business as usual'. Green economies are an important means to achieve what sustainable development ultimately aims at: the wellbeing of people while respecting the environment. Green economies

alone are not enough. The complex and multifaceted challenges and risks of today and the future call for a response which addresses the social, economic and environmental issues facing the world today in an integrated and comprehensive manner, with new indicators to guide us. It calls for building green societies. Green societies must be fair, equitable and inclusive societies.

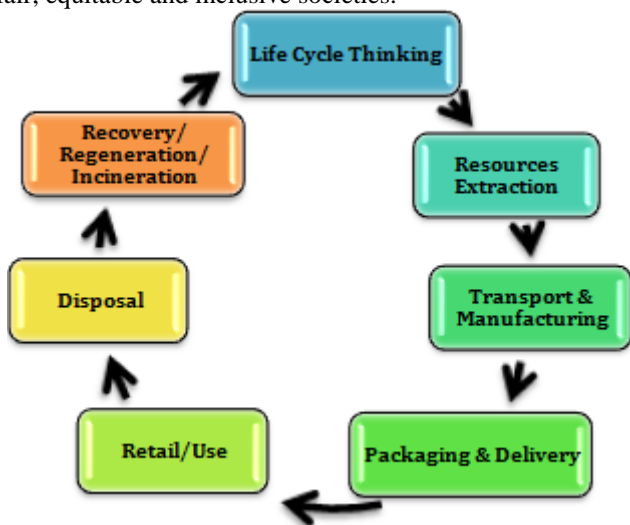


Figure 4: Life Cycle Thinking in Green Ways

They must foster innovative and creative solutions to today's global challenges. These will be born from new ways of thinking and attitudes by people of all ages and from all walks of life. No society can afford to leave anyone aside. Particular attention must be given to the needs of Africa. Equally, emphasis must be given to the empowerment of women, youth, and indigenous people in order to ensure inclusive participation in decision-making processes and their important contribution towards achieving sustainable development. The empowerment of marginalized groups must be based on the respect of human rights and supported by scaling up investment in human capital.

Since the adoption of Agenda 21, sustainable development has remained elusive for many African countries. Poverty remains a major challenge and most countries have not benefited fully from the opportunities of globalization, further exacerbating the continent's marginalization.

To develop inclusive, green societies, greater support is needed to assist African efforts for peace, democracy, good governance, respect for human rights and fundamental freedoms, including the right to development and gender equality. Supporting human and institutional capacitybuilding at the regional, subregional and national levels, consistent with national policies, programmes and nationally-owned and led strategies for poverty reduction and sustainable development will be critical to this endeavor. Support is also needed in developing and implementing science, technology and innovation policies for sustainable development; developing related research and development capacities; developing and implementing holistic education policies and programmes to achieve the EFA and MDG goals; and leveraging the power of culture and communication and information for sustainable development.

Women make up a majority of the world's poor and adult illiterates. When they are marginalized in all policy and decision-making processes at national, regional and global levels, when half of humanity is left on the margins, it is impossible to tap into the full potential of humankind to address issues of sustainable development which concern us all. A key instrument to change this situation is to invest in women's and girls' education to lift them out of poverty and to give them equal opportunities to engage in all development processes as full and active citizens.

Education – the foundation for green society: Green societies are educated societies in all of its dimensions. Investing in education is crucial for achieving sustainable development, poverty eradication, equity and inclusiveness. Education holds the key to productivity and sustainable growth, improves health and nutrition, income, and livelihoods, creating a condition for achieving all of the MDGs and the EFA goals. No country has ever climbed the human development ladder without steady investment in education.



Figure 5: Green Thinking & Efforts to Go Green and for Better Future

A second critical factor is the quality of education. Years of schooling alone do not guarantee that students will receive an education relevant for their lives and careers. Quality – that is the content of the education provided, the excellence of teachers, actual attainments and achievements – matters as much as quantity. There is a positive feedback loop between education and innovation as a prime mover of sustainable growth in green economies, where innovation, green skills and the capacity to cope with change will be significant drivers of each economic sector. Education is a sound investment; quality education is a smart investment for building inclusive, green societies.

- 1) Educating for a sustainable future:** Education for Sustainable Development (ESD) is a particularly important dimension of quality education. It provides people at all levels of education, but in particular youth, with the skills, competencies and knowledge needed to

impart values indispensable for behavior and practices conducive to sustainable development, and for multicultural and multi-ethnic societies aspiring to democratic citizenship. It is fundamental for preparing young people for green jobs, for adapting to a changing physical environment, and for changing unsustainable consumption and production patterns. ESD must be strengthened and promoted at all levels and in all educational settings throughout life. This calls for mainstreaming education for sustainable development comprehensively into relevant national education policies and practices. It equally calls for developing effective mechanisms to link green growth labour market objectives to educational programmes, particularly through technical and vocational education and training. It entails reforming formal, informal and nonformal education systems so as to prepare young men and women for a green labour market and to retrain the existing workforce.

- 2) **Mobilizing science for green transformations:** To develop innovative, green solutions to address the climate, food and energy crises facing the world today, science, technology, research and development capacities for sustainable development must be strengthened. An estimated 2.5 million engineers and technicians will be needed in sub-Saharan Africa alone to achieve improved access to clean water and sanitation. This demonstrates the need to strengthen science education, stem brain drain, and encourage more young men and women to go into scientific disciplines. Open Access to scientific information is a prerequisite for generating knowledge for sustainable development. Scientific evidence and ethical principles should inform behaviours, policy action and governance decisions to strengthen sustainable development agendas. Climate science must be a key factor in designing informed policy responses to mitigate and adapt to climate change and for disaster preparedness and resilience.
- 3) **A green future must be blue: the role of oceans and freshwater:** Our ocean provides significant social and economic benefits and plays an important role in poverty alleviation, and is at the core of global systems that make earth habitable for people. To mitigate the rapid degradation of the ocean, there is a need for integrated scientific, evidence-based policy-making that cuts across several domains in order to connect the environmental, social and economic aspects of ocean governance.

Securing access to safe drinking water (MDG 7) for all and wisely managing this resource is a high priority on the sustainable development agenda and has a multiplier effect on achieving all other EFA goals and MDGs. Expanding safe drinking water and sanitation services would drastically cut the loss of life from water-related illnesses and free up scarce resources in developing countries. Upgrading water supply and sanitation services can also improve education, allowing more girls to attend school instead of spending hours each day collecting water, underlining the close linkage between education and health-related MDGs. It would also save million of work days. The overall economic loss in Africa alone due to lack of access to safe water and basic sanitation is estimated at \$28.4 billion a year or

around 5% of GDP. To address this issue will require strengthening education, training, capacity-building and awareness raising efforts on the sustainable management of freshwater resources. It will also require enhancing the knowledge base necessary for informed decision making processes in relation to water management and consumption, and developing sustainability policies which address global risks, including those associated with water, in an integrated and coordinated manner.

- 4) **Conserving biodiversity for life:** Biodiversity is crucial for reducing poverty and promoting sustainable development, in view of the basic goods and ecosystem services it provides. More than 1.3 billion people depend on biodiversity and on basic ecosystems goods and services for their livelihoods. UNESCO Biosphere Reserves are ideal places for testing and demonstrating innovative approaches to sustainable development that reconcile the conservation of biological and cultural diversity, and economic and social development. They also contribute to the transition to green economies by experimenting with green development options, building also on indigenous knowledge for sustainable development, such as sustainable tourism and training for green jobs. The economic value of biodiversity and ecosystem services must be factored into green economy policies and approaches.
- 5) **Mitigating and coping with climate change:** Global environmental change has profound social and human dimensions. A holistic approach, which takes scientific, educational, socio-cultural and ethical dimensions into account, is therefore crucial in successfully addressing climate change. Migration linked to climate change needs to be better understood and the knowledge generated has to be translated into appropriate social policies. Specific attention should be paid to the situation of vulnerable groups, as climate change has been shown to affect human beings differently, according to their gender or socio-economic status. All parts of society need to be encouraged to take concerted action in order to mitigate and adapt to climate change.
- 6) **Disaster preparedness to support countries in post-conflict and post disaster situations:** The frequency of natural disasters has increased fivefold since the 1970s. This increase can partly be attributed to climate change, unsustainable development and extremes of weather. Ever larger populations are at risk, mostly in developing countries. Scarcity of natural resources, and difficult living situations, brought upon by these disasters can lead to conflict.

Conflicts undermine the prospects for boosting sustainable economic growth, reducing poverty and achieving the Internationally Agreed Development Goals (IADGs). Sustainable development cannot be achieved without peace. As such, priority must be given to promoting a culture of peace and non-violence, and advocating for tolerance and mutual understanding. This involves education; scientific cooperation; emphasis on the role of cultural diversity, intercultural dialogue and heritage in all its forms; and a focus on the role of media. This will involve activities to address disrupted or dysfunctional educational, cultural or media services in post- and post-disaster situations. When supporting post-conflict recovery and reconstruction processes,

special attention must be given to the root causes of conflict and to encouraging national dialogue and reconciliation efforts, so as to mitigate the risk of a relapse back into conflict. More support is also needed for disaster prevention and increased disaster preparedness, including for early warning systems and forecasting, dissemination of mitigation measures and proper information, education and public awareness.

- 7) **Culture - a driver for effective sustainable development:** Systematically integrating cultural specificities in the conception, measurement, and practice of development is imperative as it ensures the involvement of the local population and a desirable outcome of development efforts. Cultural industries alone account for more than 7% of global GDP. Sustainable tourism, cultural as well as creative industries, and heritage-based urban revitalization are powerful economic subsectors that generate green employment, stimulate local development, and foster creativity. Local and indigenous knowledge systems and environmental management practices provide valuable insight and tools for tackling ecological challenges, preventing biodiversity loss, reducing land degradation, and mitigating the effects of climate change. In the transition to green societies, dialogue and tolerance will be key for mutual understanding and the building of bridges among nations and countries, leading to a culture of peace, which is a prerequisite for sustainable development. In that context, we must make the most of the world's cultural diversity, as it fosters development and social cohesion.
- 8) **The media – building awareness for green policy priorities:** Well-informed and professional media form an essential platform for debate, discourse and knowledge-sharing; facilitate governance and accountability; create awareness about issues and shape public policy and opinion in favour of sustainable, green societies and economies. Strengthening the institutional and professional capacity of media and ensuring their safety and protection from life threatening dangers and commercial pressures is essential for investigative journalistic reports to flourish and for consistent public awareness and engagement on sustainability issues. In this regard, ICTs, and in particular broadband technology, hold enormous potential.
- 9) **Improving governance for sustainable development:** A more coherent institutional framework at global, regional and national levels must be established. Good governance for sustainable development requires adequate frameworks especially at local and regional levels, which include all stakeholders, including civil society, youth, public and private partners, academia and marginalized groups. At the global level, there should be a clear recognition of well established mandates, experience and comparative advantages of UN organizations and related operational, technical and normative programmes.
- 10) **A call to action:** The complex and multifaceted challenges of our times call for an urgent and holistic response. An in-depth rethinking of development in all its dimensions is imperative. The future needs green economies. The future needs green societies. By their very nature, education, the sciences, culture, information

and communication have the power to induce and support the necessary transformational changes towards sustainable development and green societies. In this sense, UNESCO is committed to a human rights-based approach to development, especially at the country level. It will continue to leverage these capacities for developing an inclusive, sustainable development agenda for Rio+20 and beyond. This report provides concrete examples of UNESCO's work at global, regional and national levels to achieve this grand objective.

8. Conclusion

The concept of a “green economy” is that improved human well-being and reduced inequality can be driven by investments to reduce environmental impacts. It is based on the finding that economic growth is compatible with protecting the environment. We explored the relationship between the economy and the environment based on several theories. The Environmental Kuznets curve (EKC) hypothesis is that economic growth eventually leads to a reduction in environmental impacts. The empirical evidence supports the EKC hypothesis for some pollutants, but it does not apply to other environmental impacts, most importantly to carbon emissions. The Porter hypothesis states that well-designed environmental regulations can actually result in lower costs for firms. Again, the theory is valid in some cases but the evidence finds it does not apply to all regulations. Decoupling suggests that economic growth can be “delinked” from negative environmental impacts. Absolute decoupling has occurred in some instances, but much greater decoupling progress is needed to achieve sustainability targets. The field of industrial ecology seeks to maximize resource efficiency and recycling. It promotes using the wastes from one industry as the inputs into additional production. Through dematerialization products can be constructed using a smaller volume of materials. Another focus of industrial ecology is to use materials that are nontoxic, recyclable, and low-polluting. We explored the common perception that protecting the environment harms the economy. The evidence indicates that the benefits of environmental regulations far exceed their costs. Rather than leading to job losses, protecting the environment can actually be a source of net job creation. Environmental protection does not harm international competitiveness and has little effect on GDP growth rates. While creating a green economy will entail short-term costs, the long-term benefits are projected to be significant. Rates of GDP growth are expected to be higher under a green economy scenario than a business as usual scenario, while environmental impacts are significantly reduced. The transition to a green economy will require strong policy action, including eliminating harmful subsidies, training workers, using economic policy instruments such as taxes and tradable permits, and meaningful international agreements. Overall, *“Think Ecology, Do Ecology and Save Ecology”*, may be a unique and better pathway to the Green Economy of ongoing and upgrading society instead of Green Growth or Sustainable Development, these mythical efforts. At last, this paper is not end word to environmental backwash and developmental swash, but an effort only to find out the essential way for blue-green existence of mother planet with respect to the

mega-debate on environment-development, east-west and conservation-civilization. So, path is open to discuss for searching the non-debatable way against all the debatable facts.

References

- [1] Barbier, E.B. (2005), Natural Resources and Economic Development, Cambridge University Press, Cambridge
- [2] Barbier, E.B. (2010), "Poverty, development and environment", Environment and Development Economics 15:635-660
- [3] Barbier, E.B. (2010a), A Global Green New Deal: Rethinking the Economic Recovery. Cambridge University Press and UNEP,
- [4] Cambridge, UK. Barbier, E.B. (2010b), "A Global Green Recovery, the G20 and International STI Cooperation in Clean Energy", STI Policy Review 1(3):1-15
- [5] Dasgupta, P. (2008), "Nature in Economics", Environmental and Resource Economics 39:1-7
- [6] FAO, (2010a), Global Forest Resources Assessment 2010: Main Report. FAO, Rome
- [7] Millennium Ecosystem Assessment, (2005), Ecosystems and Human Well-being: Synthesis, Island Press, Washington D.C.
- [8] OECD (2008), Costs of Inaction on Key Environmental Challenges, OECD, Paris
- [9] Pearce, D.W. and Barbier, E.B. (2000), Blueprint for a Sustainable Economy, Earthscan, London
- [10] Pearce, D.W., Markandya A. and Barbier, E.B. (1989), Blueprint for a Green Economy, Earthscan, London.
- [11] Pezzey, J.C.V. (1989), "Economic Analysis of Sustainable Growth and Sustainable Development." Environment Department Working Paper No. 15
- [12] The World Bank, Washington, D.C. Polasky, S. and Segerson, K. (2009), "Integrating Ecology and Economics in the Study of Ecosystem Services: Some Lessons Learned." Annual Review of Resource Economics 1:409-434
- [13] UNESCO's Commitment to Sustainable Development, "From Green Economies to Green Societies": An opportunity not to be missed: The UN Conference on Sustainable Development (Rio+20), Rio de Janeiro, Brazil, 20-22 June 2012
- [14] United Nations Development Programme, Environment and Energy, (August, 2012), GREEN ECONOMY IN ACTION: Articles and Excerpts that Illustrate Green Economy and Sustainable Development Efforts
- [15] UNEP (2011), Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication
- [16] UNDP (2009), Human Development Report 2009 – Overcoming Barriers: Human Mobility and Development
- [17] UNEP, ILO, IOE, and ITUC (2008), Green Jobs: Towards Decent Work in a Sustainable, Low-carbon World, UNEP, Geneva
- [18] UNEP, (2010) Green Economy Developing Countries Success Stories, UNEP, Geneva
- [19] WWF, IUCN, and UNEP (1991), Caring for the Earth, Gland, Switzerland