

# “Global Warming And Green Economy In The Context Of Indian Economy And Sustainable Development”

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## ABSTRACT

Perhaps social and economic issue is getting so much attention these days as the need to transition to a low-carbon economy. Most scientific evidence suggests that a 50 to 85 percent reduction in greenhouse gas emissions (GHG) must occur by 2050 to prevent global temperatures from rising more than two degrees Celsius. Toward that end, numerous advocacy groups, scholars, think tanks and others have proposed a variety of steps to take based on a set of assumptions about the green economy. Yet, while we need to take bold action to address climate change, much of what passes for conventional wisdom in this space is in fact either wrong or significantly exaggerated. Across the world, Green Economy concept has been gaining ground and India is no exception. Green Economy is a development strategy which harmonises both economic development and ecological sustainability. Stated objectives of environment-friendly sustainable measures have, so far, largely not been met in developing countries due to overpowering need of basic development priorities, lack of fund flow from the developed world for mitigation and adaptation purposes, etc. India is facing the problem of co-existence of the conventional economic growth strategy and piecemeal efforts to make the economy ready to mitigate and adapt to the climate change issues. The present paper found that the existing production and consumption system cannot make the development a really sustained and sustainable one. Adopting the multi-dimensional Green concept is going to have ripple effects on employment, trade, agriculture, domestic industries, business pattern, which, accordingly, require extensive fiscal reforms, vigilance on changing international trade relations and trade patterns, skill development, indigenous research and development for resource efficiency, political stewardship, public awareness, etc. . While acknowledging the importance of development of strategies to adopt the principles of Green Economy in tune with stage of economic development, the paper points out the critical gaps and problems faced by India as well as their possible solutions.

**Keywords:** Global warming, Green economy, Indian economy & sustainable development,

## 1. INTRODUCTION

There are several key reasons why conventional wisdom is incorrect, or at best significantly overstated. One is that because the magnitude of change needed is much larger than many realize, many conventional solutions simply won't achieve the global scale needed. The simple equation below demonstrates the scale of the challenge. Growth in global GHG emissions is largely a factor of population change, per capita income change, and our “dirtiness” of every unit of consumption. The last factor describes how much less polluting (in terms of GHG emissions) our business -as-usual economy needs to become as the other two factors vary.

**Greenhouse Gas Change = Population Change \* Per-Capita Income Change \* Dirtiness Factor**

If the goal is to reduce GHG by 50 percent by 2050, it's not enough for each unit of

economic activity to be 50 percent “cleaner.” Global population is expected to grow by 46 percent (not a desirable goal and one we can and should take efforts to slow). Moreover, per-capita income growth is expected to increase by 129 percent (a desirable goal). Put those two factors together, and now the planet's economic activity must become 84 percent less polluting to achieve the over 50 percent reduction in GHG. That is, we need an 84 percent reduction in our “dirtiness” for every unit of energy we utilize. By any measure, this is a great hurdle given the expectations that neither population nor income growth are going to hold steady over the next four decades.

Sustainability of economic growth in a finite resource environment has long been questioned and acknowledged as a complex issue. Complexity arises because of potential non-linearity's in the relationships among economic and ecological variables. Rate of depletion of resources over the years becomes faster than the

regeneration and thereafter the economy runs the risk of lesser resources, raising the cost of extraction and pushing the economy towards its limits to growth. Such severe resource depletion and ultimate resource exhaustion consequently lead to economic contraction or sustained economic depression. The slow feedback from decline in non-renewable natural resources to the production of goods in the economy hides the perils of unsustainable economic practice. Therefore, proactive economic policies maintaining a sustainable stock of resources are needed. If a dynamic equilibrium between the resources and economy is to be achieved then the natural resource consumption rates will have to be moderated through economic policies.

After the Global Financial Crisis, the world has decided to adopt GLOBAL GREEN ECONOMY Concept with the objective of reviving the world economy, saving and creating jobs, and protecting vulnerable groups, promoting sustainable and inclusive growth, reducing risks from carbon dependency and ecosystem degradation and the achievement of the Millennium Development Goals (MDGs), 2000. As governments started devising a new international financial architecture to prevent such crises in future of this scale and ways to jump start economic recovery, they began to recognise and address the risks emanating from climate change. Green Economy is based on a set of transformative actions - ambitious and far-reaching. The transition to a Green Economy in the context of sustainable development and poverty eradication must be underpinned by an ethical framework of shared values and principles that extend beyond the traditional technology-based economic system.

## 2. LITERATURE REVIEW

### *WHAT IS GREEN?*

In 2010, a report on environmental claims made in the North American market and the researchers expressed that *green* is a difficult word (Defining Green Products 2010). The complicating matters is the widespread use of terms such as natural, organic, planet-friendly, earth-friendly, ecological, non-toxic, biodegradable, plant-based, chlorine-free, and 100% compostable, which consumers erroneously assume are synonymous with *green* (TerraChoice 2009). It is no wonder that every company has a *green* story. The development and offering of *green* products and services positively impact consumer and investor perceptions of a company and it also improve the bottom line of the company (Mohajan 2012a, b).

To define green, Yaranella et al. (1999) expressed that; "Green evokes small incremental improvements in social practices, modern technology, and human habitats, while sustainability implies a revolution in organizing our personal and collective lives and inhabiting the planet."

Prior to begin the main research discussion, here I present reviews of some of the available literatures which give the glimpses of the present unsustainable economic issues, concept of Green Economy and its various aspects.

In an ICRIER Working Paper, 'Low Carbon Pathways', Himanshu Gupta observed that global emissions of CO<sub>2</sub> if allowed unabatedly lead towards the irreversible path to rise in temperatures. He prescribed low carbon alternatives which can generate electricity at a sustainable rate. For an energy-secure future, the country should focus on phasing out of fossil fuels, by electrification and supply of electricity from domestically developed clean sources of energy, which might be expensive and involve risky investment decisions but will be beneficial in the long run and can generate electricity at a comparable rate. Alternatively, energy efficiency measures in all energy demand sectors such as agriculture, industry, and transport can secure sustainable energy future by cutting down energy consumption significantly.

Shoibal Chakravarty in his article 'Cheap Oil, Climate Change Mitigation and India' finds link between oil price crash and China's economic slowdown and mentions gain in terms of rise in real income and reduction in subsidies which opens up opportunities to better targeting and cash transfer. In the long run, growth in alternative fuel sources during previous prolonged period of high oil prices and rapid decrease in the price level of these alternative energy sources can reduce heavy dependence on oil in public transport. A number of policies have already been initiated by India. The author has cautioned about India's climate change prospects in view of fall in global coal prices.

Martin Khor in the article, 'Risks and uses of the green economy concept in the context of sustainable development poverty and equity', has mentioned in details about the risks of misuse of Green Economy concept as one dimensional manner where stress has more been given to environmental aspects rather than the developmental and equity dimensions, Disregard of the principle of common but differentiated

responsibilities, Inappropriate use of environment for trade protectionist purposes against the developing countries, Provisions of subsidies for research and development of environmentally sound technologies may put the developing countries at a disadvantage, Concerns of developing countries against the attempt of the developed counterparts for gaining access to their markets in the name of trade in environment goods, Problems of reconciliation of two principles of allowing price signals to better continuous flows of ecological services, while depletion of stocks imply reduced services in future with adverse effects on human well-being. He identified recognition of economic and social values of environmental resources among others as the important measures.

The Green Economy Approach has become necessary in view of the need for abundant non-polluting energy sources. This Approach consists of increased device efficiency, fuel switching, decreasing energy intensity in the production process and transport sector. As stated in **B. Sudhakara Reddy's** article, 'India's Energy System Transition – Survival of the Greenest', for rapid dissemination of green technology, technological dynamism and innovative complementarities are necessary. It stated that the Govt. has the role of designing policies, helping scaling up of new technologies and encouraging entrepreneurial activities. Green Economy approach delivers more social benefits than costs but needs supportive policies to determine the appropriate technology and incidence of costs and benefits.

**Francesco Tubiello**, et.al. in 'Climate Change Response Strategies for Agriculture: Challenges and Opportunities for the 21<sup>st</sup> Century', points out the climate change challenges like elevated CO<sub>2</sub> concentration, precipitation changes, increased weeds and pests, the agriculture sector is going to face in view of soil and water scarcity and the need to increase food supply. The paper gives mention about the synergies between mitigation and adaptation measures.

In the article, 'The Green Economy in the G-20, Post-Mexico: Implications for India', **Lydia Powell** has mentioned that India can be a testing ground for green Economy because in spite of economic strength it is still a poor country. India's economic strategy is in line with knowledge-based economy which provides a mean for green growth which avoids environmental impact without compromising the job creation and economic

growth. Despite various Green initiatives of the Govt., India's contribution to GHGs emissions during 2002-12 has been second to China. India's position on this issue like rejection of prescriptive policies and unilateral measures associates it with the poorer nations which seek financial assistance.

**Greenstone Michael, Janhavi Nilekani, Rohini Pande, Nicholas Ryan, Anant Sudarshan, Anish Sugathan** in their article 'Lower Pollution, Longer Lives - Life Expectancy Gains if India Reduced Particulate Matter Pollution' pointed out severe air pollution in India – WHO estimates that 13 of the 20 cities in the world with the worst fine particulate (PM<sub>2.5</sub>) air pollution are in India which has the highest rate of death caused by chronic respiratory diseases anywhere in the world. Cleaner air is not incompatible with India's quest for high economic growth as it causes substantial benefits in terms of longer lives contributing to India's economic productivity for many years. He mentioned the need for restructure of environmental law and regulations and implementation of market-based environmental regulation, such as emissions trading systems (ETS).

### **3. OBJECTIVES OF THE STUDY**

In this paper we want to describe Global Warming & green Economic in some details. As the business is related to environment, so that economic in green projects become an essential part of the sustainability of organizations. Our aim is to establish global warming & green economic in grass root levels of the country. In our research we emphasize the global green economic programmes at present and future.

### **4. METHODOLOGY**

In our discussion we have stressed on the secondary results of the researches on global warming & green economic. We have taken an attempt through our works to initiate green economic in the developing countries. Every society needs green economic for the eco-friendly business. The populations of the world growing rapidly and for this large population we need green economic to make the earth as a living place of the all species of organisms.

### **5. RESULTS AND DISCUSSION**

Global growth patterns, the degradation of environmental capital and the distribution of wealth and risk – within and between countries – are strongly intertwined. The key question the

developing countries are facing is how to reconcile the environmental goals with growth, poverty reduction and other serious problems like water and food supply crises, volatility in energy and food prices, rising greenhouse gases (GHGs) emissions, income disparity, chronic fiscal imbalances and terrorism.

### ***5.1 Adverse Effects of Climate Change***

India having huge development priorities will be adversely affected by climate change, in terms of availability of fresh water, low ground water recharge, food production, ocean acidification, increased vector born and water borne diseases with impact on human health, agriculture, water resources, natural ecosystems, and biodiversity. The future of agriculture, which provides livelihood of 58 per cent Indian population, is threatened by loss of biodiversity and ecosystem services, depletion and erosion of top soil nutrients, scarcity of freshwater, aggravated water pollution caused by poor nutrient management, hazardous chemical release, rising greenhouse gases (GHGs) emissions and disposal of waste, under the business-as-usual scenario. In this interconnected world even a drought or flood caused by climate change in one part of the globe can soon challenge supply chains or move commodity markets in another country with profound implications for the poor and the vulnerable groups.

### ***5.2 Climatic Effects on agriculture production***

Agricultural productivity growth has generally been modest and the sector remains hampered by weak technical capacity, numerous sources of inefficiency and growing pressure on environmental sustainability, in particular the water and land resources on which the sector depends. In India, every 1°C rise in temperature could reduce 4-5 million tons of wheat production and badly affect fruits, vegetables, tea, coffee, medicinal plants, and rice production. On the other hand, demand for food is likely to both grow more rapidly and become more diverse with rising living standards, urbanisation and population growth, placing more pressure on agricultural supply capacity. Experiences of monsoonal variations in different parts of the country – 10 to 12 per cent increased monsoon seasonal rainfall along the west coast, northern Andhra Pradesh and north western India and on the other hand, decrease in seasonal rainfall by 6 to 8 per cent in eastern Madhya Pradesh, north-eastern India and parts of Gujarat and Kerala, the chief grain producing regions of India.

### **5.3 Problems of Rapid Urbanisation**

India has been experiencing fast urbanisation with the share of urban population increasing from 17.3 per cent in 1951 to 31.2 per cent in 2011 and the population is slated to increase to 590 million by 2030. High employment opportunities and higher per capita income attract large number of migrants from surrounding rural areas resulting in an increased number of slums. Such growth in city population has increased the necessity of urban basic services like water supply, sewage collection and disposal, solid waste management, public healthcare, sanitation, etc. Slum dwellers' lack of durable housing, secure tenure and access to basic services – including health services, adequate food, education and employment opportunities, decent transport, credit and the rule of law – often further entrench them in poverty.

### **5.4 Problems of Waste Management**

Due to rise in economic growth, India's per capita waste generation rate increased from 440 gm/person/day in 2001 to 500 gm/person/day in 2011. India still being in a stage of transition to developed nation, its waste collection is largely inefficient due to lack of infrastructure to handle such a huge quantity of waste. Open dumping is a major method of waste disposal and burning of garbage causes significant air pollution. Moreover, solid waste management in India has a predominant involvement of child labour which deprives many children their basic rights like education, food, nutrition and chains them into vicious circle of poverty.

### **5.5 Problems of CO2 Emissions**

According to the International Energy Agency (IEA) estimates, India will account for 14.2 per cent of the world's energy-induced CO2 emissions which will increase by 57.4 per cent during 2005–30. But India's share in incremental world energy demand during the same period will be about 6 per cent only. India's high share in pollution can be attributed to India's heavy reliance on coal with high ash content (low calorific value), only 1 per cent share of zero-carbon fuels, in total primary energy demand and biofuels which meet 90 per cent of all rural energy needs, but emits black carbon in the process. Similarly, 90 per cent of rural and 33 per cent of urban households do not use clean cooking fuels. India's CO2 emission growth rate accelerated to

an estimated 7 per cent a year in the recent period 2006–13, from 4 per cent a year in 2000–06 and that was caused mainly by a slowdown in the pace of reduction in the energy to GDP intensity (leading to faster growth in total energy demand), and faster growth in the CO<sub>2</sub> to energy intensity.

### **5.6 Gap in Power Supply & Associated Health Issues**

With the increase of incomes, as households climb the energy ladder, electricity becomes the most preferred carrier for lighting. The share of gas/ electricity has gone up from 7.7 per cent to 27.2 per cent. In spite of economic improvement, bio-fuels (fuel wood, charcoal/coal, dung, etc.) retained a major share in energy use by the households. Nearly 0.4 billion people in India (45.1 per cent rural and 7.8 per cent urban households) do not have access to electricity. This inadequacy in access to modern energy services leads to loss of employment opportunities, negative health effects, negative effect on vulnerable groups of women and children, slum dwellers, rural poor people. Climate change, ozone layer depletion and air pollution, all pose significant threats to human health, both individually and combined.

### **5.7 India & Green Economy**

Both developed and developing countries have realised that keeping within global ecological limits is possible by the ability to shape collective action through a rule-based approach and accordingly, the environment concern has been increasingly incorporated in the manufacturing and infrastructure sector. Thus it has become imperative for India to switch to more resource efficient Green Economy where business and industry will be the key driving forces.

### **5.8 Employment Generation**

As India is on its path of high growth, it will create more infrastructures, services and jobs and thus the choices of Indian business will determine the level of sustainable outlook of the country. A more sustainable and cleaner environment in India will see generation of hundreds and thousands of downstream jobs to make it a low-carbon Green Economy, increasing the growth of global carbon markets which will further increase jobs like carbon financial consultants, analysts, financiers, carbon accountants, business risk analysts, etc. Buildings already account for more than 30 per cent of India's electricity use, and two-thirds of the

buildings that will exist in India by 2030 have yet to be built. Rise in green and energy efficient buildings will increase the demand for architects, engineers, technicians, plumbers, construction workers, etc.

### **5.9 Sustainable Consumption and Production**

In the era of global supply chains, negative externalities of production and consumption patterns in anyone country can have effect on the biophysical and social environment in neighbouring countries. The Sustainable Consumption and Production (SCP) with the fundamental objective to decouple economic growth from environmental degradation, is one of the Green Economy strategies to achieve three objectives of sustainable development – social, economic and environmental development. Shifting of consumption without slowing down sustainable growth shifts savings to sustainable production, investment for restoration of natural capital, long-lasting infrastructure, stimulate jobs in new innovation, and create new markets. SCP policies and actions are not anchored in coherent policy frameworks, hence, it calls for a combination of supporting policies like procurement, economic instruments in areas of agriculture, water, energy, etc., technological innovations and important lifestyle changes.

### **5.10 Sustainable Agricultural Practices**

Sustainable farming practices lead to greening of the small farms which is the most effective way to increase food availability and food security, reduce poverty, increase carbon sequestration and water efficiency, building natural capital stocks and link marginalised farmers with international supply chains. Theoretically, restoring the 2 billion hectares of degraded agricultural land could boost food production by up to 79 per cent. Sustainable agriculture offers opportunities to achieve economic development, save and create jobs, reduce poverty, cut down GHGs emissions, ensure food safety of consumers and offer trade opportunities for developing countries.

### **5.11 Potential Benefits of Green Energy Measures**

Severe shortages of electricity supply and high urbanisation rates demand more energy efficient public transportation systems in cities of India. Energy has become central to the country's chronic trade imbalance, and India's external trade deficit for fuels averaged an annual 6.4 per cent of

GDP over 2008–12. Due to recent fall in world oil prices, current account deficit has been lowered recently, even though the country's external position nevertheless remains vulnerable to volatility in energy prices which underlines the importance of alternative green energy sources and reforms to reduce unnecessary existing inefficiencies and waste in energy use. As in the rest of the world, the cost of renewable energy has seen rapid decline in recent years. The price of imported coal could be 30–50 per cent higher than the cost of wind and solar by 2020. Replacement of the marginal unit of energy supply from imported coal with a marginal unit from financially competitive renewable energy would allow India to secure substantial additional social benefits, such as greater energy security and a cleaner environment. Globally, projected investments of US\$630 billion in the renewable energy sector by 2030 would translate into at least 20 million additional jobs – 2.1 million in wind energy, 6.3 million in solar photovoltaic (PV), and 12 million in bio fuels-related agriculture and industry.

### **5.12 Green Reform and Poverty Reduction**

Researchers have found important complementarities between green reform and poverty reduction in areas of efficient water, energy and transport infrastructure, alleviation of poor health issues, efficient cost reducing technologies, increasing productivity and easing environmental pressure which can help the emerging countries like India to achieve the Millennium Development Goals (MDGs), 2000. The recently adopted 2030 Agenda for Sustainable Development Goals which is to improve upon the achievements of the MDGs and also outlined 17 goals to wipe out poverty, reduction of inequality, ensure availability and sustainable management of water and sanitation, sustainable energy, sustainable consumption and production, etc.

### **5.13 Growing Green Markets & its Benefits**

Globally, the market for water supply, sanitation, and water efficiency is estimated at US\$253 billion and is expected to grow to US\$658 billion by 2020. Estimates show that US\$15 billion per year towards meeting the MDGs of halving by 2015 the proportion of people (counted in 1990) without sustainable access to safe water and basic sanitation could generate global economic benefits worth US\$38 billion annually. The global market for organic food and beverages is projected to grow to US\$105 billion by 2015 from US\$62.9 billion in 2011. There has been an

increased demand for organic products with sales increasing by over US\$5 billion a year across the world. The countries with the most organic producers are Uganda, followed by India, Ethiopia and Mexico. Organic agriculture based on sustainable agriculture practice, use of local resources and traditional knowledge, thus offers a real trade and poverty reduction opportunity for India and developing countries.

## **6. CONCLUSIONS AND RECOMMENDATIONS**

At the UN Conference on Sustainable Development, 2012 (Rio+20 Conference), the Green Economy approach was endorsed as an important tool for sustainable development and poverty eradication where these two goals would permeate all three pillars of sustainable development. The new concept sets aside the common misconception of trade-off between economic development and environmental stewardship, because all human activity depends on the existence of a responsible framework for using environmental assets, which is more true about the poorest populations as they depend disproportionately on the ecological commons both for livelihoods and for consumption.

Governments should recognise the futility of the one-size-fits-all model or sectoral approaches rather develop solutions that embrace the complexity and interconnectedness of the global economic system, achieving the national priorities in line with the sustainable development. Though the present international discussions on sustainability have been dominated by the imperative to reduce our collective carbon footprint, they are in themselves insufficient as they do not address more underlying root causes. The unsustainable way in which our natural resources are valued, used and managed is the most fundamental problem and there is need to operate within the 'planetary boundaries'. However, these national pathways can be informed and assisted by an international framework of rules, best practices and actors.

The Green Economy responds to global economic, social and financial crises by reallocating natural, social and financial capital into creating benefits for economic development, social equity and environmental protection. Reconciliation of short-term versus long-term priorities by adopting resource-efficient and less polluting pathway enable the countries to leapfrog the usual development trajectory avoiding future costs. Countries like Japan, South Korea, China

and Germany have already positioned themselves as green technology leaders and India should not be the perennial technology buyer.

Due to the higher vulnerability to potential economic and social impacts of environmental degradation, if the developing countries continue to follow the same path to economic prosperity as did by the developed countries, their increasing emissions will cause serious climate problems even though they presently have minor shares in global GHGs emissions. There are miles to go to achieve all the targets of MDGs evenly across the world. India's remarkable growth under liberalisation, privatisation and globalisation process has been clouded by a degrading quality of environment, growing scarcity of natural resources and inequality –

i. The future of agriculture, which provides livelihood of 58 per cent of Indian population, is threatened by loss of biodiversity and ecosystem services, depletion and erosion of top soil nutrients, scarcity of freshwater, aggravated water pollution caused by poor nutrient management, hazardous chemical release, rising greenhouse gases (GHGs) emissions and disposal of waste, under the business-as-usual scenario;

ii. Indian cities are plagued by poor basic services for growing urban population and consequent problems of waste management;

iii. India's high CO<sub>2</sub> emissions growth despite its low share in world energy demand;

iv. Inadequacy in access to modern energy services leads to loss of employment opportunities, negative health effects, negative effect on vulnerable groups of society;

v. Increased volumes of trade and resultant unsustainable levels of resources and increased GHGs emissions.

vi. A more sustainable and cleaner environment in India will see generation of downstream jobs to make it a low-carbon Green Economy.

vii. Reaping positive externalities in production of energy and resource efficient for international green trade for India.

viii. Sustainable farming practices increase food availability and food security, reduce poverty.

ix. Middle class consumers will grow significantly by 2030, which would put pressure on resources and points to the need of shift to better consumption pattern with sustainable production and resource utilisation.

x. Waste management and recycling may be proved to be difficult for the developing countries like India to handle this in the initial stage as they lack comparative advantages and need capacity building in this area.

xi. The composition of goods and services produced depend on environmentally efficient consumption patterns which are, in turn, highly influenced by the distribution of incomes worldwide and within countries. The core problem of income inequality in India has not been resolved, so it requires equitable distribution of income for meeting the sustainable development objectives.

xii. There are ample evidences of misallocation of capital in the unsustainable sectors in India – property, fossil fuels, and structured financial assets but low investment in renewable energy, energy efficiency, public transportation, sustainable agriculture, and land and water conservation) causing reproduction of risks and perpetuation of the same.

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