

Implications of the Green Economy for Higher and Future Education Institutions in India

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ABSTRACT

Learners of all ages need to be able to develop the knowledge, skills and attitudes to live more sustainably, change patterns of consumption and to contribute to a greener future. Education and training have a key role to play in supporting people to move from awareness about the environment to individual and collective action. A growing number of initiatives and actions on climate change, biodiversity and sustainability are taking place across India in education and training. However, despite progress and growing public interest, learning for environmental sustainability is not yet a systemic feature of education policy and practice in the India. *Higher education (including further education) is viewed by many as an enabling platform for the generation and acquisition of green economy knowledge and skills for the future we want. The question this paper seeks to address is: are Indian institutions of higher education green economy ready? This question is not only limited to the curricula, but to broader impact areas in higher education that include the institutionalisation of green economy in policy, research and research management structures, in depth understanding of the green economy concept and the manner in which it links to existing paradigms like sustainable development as well as higher education private sector partnerships. The paper shows that there are a number of emerging initiatives that can be seen to be developing green economy education and training in higher/further education contexts, but that much more needs to be done. The paper shows a 'slow awakening' to the green economy call as revealed by activities from the United Nations Educational, Scientific and Cultural Organisation (UNESCO)*

INTRODUCTION

Our life styles are among the determining factors and precursors for the pattern of development in vogue in contemporary civilisation. The younger generation especially students of higher education and the future generation may opt for changes in their life styles. These changes will certainly be some determining factors in the renewal of development, specially with respect to the products as well as demands of all types of industry. Higher educational institutes and their teaching staff members have major responsibilities in shaping the above mentioned changes directly. Higher education students should be served wisely in this mission. This would mean the provision of a sound environment education during which students form and reform their philosophy which will serve them as a context for their decisions and actions during active life and work.

Article 4(i) of the United Nations Framework Convention on Climate Change (UNFCCC) contains a promissory note by the Parties in terms of education, training and public awareness with regards to climate change (UNFCCC, 1992). Parties agreed that they would promote and cooperate in these aspects and encourage the widest participation in the process, including that of the involvement of non-governmental organisations. In fact, Article 6 is wholly dedicated to education, training and public awareness. Parties are reminded of their responsibilities to promote and facilitate such at the national and, as appropriate, sub-regional and regional levels. In accordance with national laws and regulations, and within their respective capacities, they should focus specifically on: the development and implementation of educational and public awareness programmes on climate change and its effects; public access to information on climate change and its effects; public participation in addressing climate change and its effects and developing adequate responses; and training of scientific, technical and managerial personnel.

Parties are also tasked to cooperate in and promote, at the international level, the development and exchange of educational and public awareness material on climate change and its effects; and the development and implementation

of education and training programmes, including the strengthening of national institutions and the exchange or secondment of personnel to train experts in this field, in particular for developing countries.

Higher education (including further education) has a potentially critical role to play in green economy (including climate change) readiness globally. Higher education is viewed by many as an important knowledge generation and acquisition platform where skills can also be developed for the future we want. The world's higher education institutions have been involved in initiatives that include conservation education, environmental education education for sustainable development and climate change education.

NATURE OF NATURAL DISASTERS a natural disaster could occur due to an immediate extreme event or it could be the result of a long duration process, which disrupts normal human life in its established social, traditional and economic system to a considerable extent. The United Nations define it as “the occurrence of a sudden or major misfortune which disrupts the basic fabric and normal functioning of a society (or community).” The term „Disaster“ is commonly used to denote any extreme event, be it natural man-made, which brings about loss of life, property, infrastructure, essential service and means of livelihood to an extent that it becomes difficult to cope with the situation due to being beyond the normal capacity of the affected communities to deal with unaided. A hazardous situation turns into a disaster event when the affected community (or district or state or country) needs immediate and prolonged assistance and support to deal with the situation and its aftereffects. Disaster is the culmination of a hazard in a situation where the impact is accentuated by the vulnerability of the community. To be more specific, a hazard may be regarded as a pre-disaster situation, in which some risk of disaster exists. In fact, hazards can be posed both by natural phenomena and by man-made events. Therefore, disasters can be natural or man-made. The severity of a disaster is assessed on the basis of disruption to normal pattern of life, impacts like loss of life and property, injury, hardship and adverse effects on health; community needs; specially shelter, food, clothing, medical assistance and social care; damage to infrastructure, buildings, communications; and the requirements of rehabilitation.

3. NATURAL DISASTERS IN INDIA India's unique geo-climatic position makes India particularly vulnerable to natural disasters. India is a vast peninsula of sub-continental size and surrounded by sea on three sides and has the Himalayas range on the fourth side, which has some of the tallest mountains of the world. That is why India has to face a very large variety of disastrous events of geological, oceanic or climatic origin. There is a broad classification of natural disasters in India. Brief description is mentioned below as per the geological origin of these disasters.

A). EARTHQUAKE- A sudden geological event below the surface of the earth results in generation of waves that travel far and wide and cause vertical and horizontal vibrations. The consequential motion causes destruction. The severity of the impact depends on the magnitude of earthquake, which in turn depends on the amount of energy released at the spot where the geological event took place below the surface of the earth. Earthquakes occur suddenly, and thus there is no dependable technique for prediction of earthquakes as yet. India is highly vulnerable to earthquakes and severe earthquakes have occurred here.

B) VOLCANIC ERUPTION Volcano can be described as a vent or chimney, to the earth's surface, from a reservoir of molten rock, called magma, deep in the crust of the earth. It is not that volcanoes are always emitting lava, steam, or smoke. Many volcanoes have been “sleeping” for decades or even longer. In the context of forecasting of volcanic eruptions, it can be stated that short-term forecasts within hours or days may be made through volcano monitoring techniques. There are only two volcanoes in the Indian Territory i.e. Narcondam and Barren Islands-both in Andamans. Both the volcanoes are “sleeping” volcanoes” although the Barren Island volcano emits some heat and smoke occasionally and goes to sleep again. India is not much affected due to the volcanoes compared to the other countries like Italy, Mexico, Indonesia and Iceland.

C). LANDSLIDES Landslides are defined as the mass movement of rock debris or mud down a slope and have come to include a broad range of motions, whereby falling, sliding and flowing under the influence of gravity dislodged earth material. They also occur as secondary effects of heavy rainstorms, earthquakes and IRA-International Journal of Management & Social Sciences 55 volcanic eruptions. Landslides occur as a consequence of changes, either sudden or gradual, in the composition and structure of rocks or vibrations in the earth's surface. Landslide can be caused by poor ground conditions, geomorphic phenomena, heavy rainfall, earthquakes or undercutting of the base of slopes by rivers and quite often due to heavy spells of rainfall coupled with impeded drainage. They are common in mountainous areas, such as Himalayas and the Western Ghats where they frequently destroy the infrastructure, agriculture and dwellings, resulting in considerable loss of life and property besides blocking vital needs in the inaccessible areas.

D) SNOW AVALANCHE An avalanche is defined as the event in which a large mass of snow, ice, rock or other material moves swiftly down a mountain side or over a precipice and crushes everything in its path. An avalanche starts when the large mass of snow, ice and rock overcomes the frictional resistance of the sloping surface, either due to rain, melting of ice base or vibrations of any kind. It will be seen that landslides and avalanche are events of mountain regions and are rather similar in nature and impact. The basic difference is that landslide involves movement of rock, soil and mud whereas avalanche comprises, snow, ice and rock. Landslides can occur in smaller hills or rocky slopes but avalanches occur in high mountains with snow in abundance. **E) TSUNAMI** Tsunami is a Japanese term for sea waves generated by undersea earthquakes. These waves may originate from undersea or coastal seismic activity, or volcanic eruption. Sea water is displaced into a violent and sudden motion ultimately breaking over land even at very long distances with great destructive power. It is to be noted that while the coasts are hit by very high waves of water, there is hardly any appreciable wave on the high seas. Therefore, ships on the high seas are not affected. In most cases, tsunami could be the after-effect of undersea earthquake due to which the abrupt vertical movement of ocean floor generates waves, which travel at high speed in the ocean. As they approach land, their speed decreases while their height increases. It can be highly destructive to coastal areas as was witnessed during then catastrophic tsunami event in December 2004.

F) CYCLONE Tropical cyclones are characterized by destructive winds and copious rainfall, which causes flooding. In such storms, winds can exceed speeds of over 120 kmph. Due to such strong wind forcing, sea-water accumulates ahead of the cyclone as it moves towards the coast. When a cyclone hits the coast, the accumulated enormous mass of sea-water strikes the coast as a giant sea wave called storm surge which can have heights of the order of tens of metres. The storm surge with torrential rains and very strong winds brings widespread devastation to coastlines and islands lying in their paths. Cyclones pose a major threat to life and property. These storms are called cyclones in India. In other parts of the world they have different nomenclature, like hurricanes in America and typhoons in Japan. In India, there are two cyclone seasons viz. Pre-monsoon (April & may) and Post-monsoon (October & November). More cyclones form in the Bay of Bengal than in the Arabian Sea.

G) FLOOD- Flood denotes inundation or accumulation of water. In other words, it results from an imbalance between inflow and outflow of water. Floods can occur through heavy rains, dam failure, rapid snow melts, river

H) DROUGHT- Drought is a temporary reduction in water availability on an area for unusually long period. Depending on the resulting water scarcity, a drought has disastrous and long-term socio-economic impacts, which may last for months and in some cases years. It is a slow phenomenon. It is generally caused by adverse water balance or scarcity of water to satisfy the normal needs of agriculture, livestock or human population. There are three types of droughts i.e. meteorological drought, hydrological drought, agricultural drought. Meteorological drought occurs when the monthly or seasonal rainfall over an area is appreciably below normal. Hydrological drought occurs when the water scarcity over an area results in reduction in the available water in surface water bodies and the water table also recedes. Agricultural drought occurs when the water scarcity results in partial or total loss of crops and affects agricultural activity adversely.

I) HEAT WAVE AND COLD WAVE These are spells of extreme surface air temperature over a region for rather prolonged periods of several days for few weeks. When the maximum temperature in the day over an area overshoots in the hot weather months (March to June), it leads to heat wave. Similarly, when the minimum temperature falls appreciably below normal in the winter months, it is called cold wave.

J) GLOBAL WARMING Increase in greenhouse gases (carbon dioxide, methane, nitrous oxide and others) retards cooling of the earth's surface at nights and this tends to increase the minimum temperature i.e. morning temperature, almost all over the globe resulting in the phenomenon called Global Warming. There would not only be less cooling of the earth's surface at night but the atmosphere will also get warmer due to trapping of the heat on account of greenhouse effect.

K) SEA LEVEL RISE Any increase in the average temperature of the earth is bound to have two impacts. Firstly, the glaciers, permafrost, ice caps on the poles and mountain peaks will witness increased melting and consequent increase in the waters in rivers and oceans. Secondly, the large body of water in the seas will expand in volume due to increased temperature. Both these factors will create a rise in the level of water in the seas and oceans, which eventually poses serious problems to the inhabitants of coastal and island areas and affects their socio-economic wellbeing.

L). OZONE DEPLETION Ozone is an isotope of oxygen which is created in the lower stratosphere where under conditions of low atmospheric pressure, the ultraviolet radiation in the sun's rays breaks the oxygen molecule into

atomic oxygen, which combines with oxygen molecule to form ozone. The ultraviolet radiation breaks up the ozone molecule into a normal oxygen molecule and atomic oxygen. Thus the process goes on and creates a layer of ozone in the upper atmosphere with maximum density of ozone around 20 km or so above the earth. This process consumes a large part of harmful ultraviolet radiation in the sun's rays and thus saves human, animal and plant life on the earth from the harmful effects of ultraviolet radiations. Certain chemicals in use on earth send chlorine up in the upper atmosphere where under certain conditions of low temperature and darkness, chlorine consumes atomic oxygen in a chemical reaction with the result that ozone formation is reduced thus lowering the ozone density in the ozone layer in upper atmosphere. This process of ozone depletion ensures that less amount of ultraviolet radiation in the sun's rays gets consumed in the ozone layer and more ultraviolet radiation reaches the earth's surface to create harm.

Emergence of Green Global Economy- India, which had been growing at a rate of 8.5% until 2011, faced an economic slowdown with the growth rate falling to around 5% in 2013. The agricultural sector's contribution to India's Gross Domestic Product (GDP) has dropped from 17.4% in 2006-07 to 14.2% in 2010-11ⁱ, while the manufacturing sector has underperformed, accounting for only 20% of GDP, due to high interest rates, infrastructure bottlenecks, slow decision-making by the government, and weak domestic demandⁱⁱ. Furthermore, the service sector, which accounts for nearly 65% of GDP, has also been losing its momentum due to segments like the banking and real estate facing demand and investment constraintsⁱⁱⁱ. Yes, tracking the economic numbers shows that India needs to tackle its economic issues but the problems are much deeper. The proportion of population living in extreme poverty has declined from 47% in 1947^{iv} to 22% in 2012^v, yet nearly 56%^{vi} of the current population cannot meet their basic needs. Similarly, while there is a demographic boom of young people in the country with nearly 285 million people between the age group of 15-29 years^{vii} (2009-10 to 2011-12), the jobless nature of growth added only 15 million jobs between 2004-05 and 2011-12^{viii}.

Furthermore, the environment has suffered gravely with the economic progress as from 1990 to 2008, India's GDP per capita rose by an impressive 120% leading to the natural capital to decline by 31%^{ix} in the same period. Adding to that, currently India is operating on almost twice its bio-capacity^x; indicating that the population's demand from the ecosystem exceeds the capacity of that ecosystem to regenerate the resources. To ensure that inter-linkages between the economic, societal, and environmental aspects of development are overarching, India needs vital transitions. A green economy strengthens pro-poor economic growth by building up natural capital and secures livelihood options of the poor.

United Nations Environment Programme (UNEP) defines Green Economy as one that results in 'improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities'^{xi}. The dynamic movement towards a green economy is to focus on enabling a world that ensures the well-being of not just human beings, but also the planet. Green economy does not substitute the concept of sustainable development^{xii}, but looks at adoption of a holistic approach, that includes issues of social marginalisation, intergenerational equity, employment creation, poverty eradication, etc. along with the incorporation of pressing environmental concerns.

The current trend of unsustainable growth and development, i.e., the Business As Usual (BAU) approach is supplementary to severe environmental impact. It assumes no fundamental changes in policy or external conditions, and the environmental and societal well-being play second fiddle to the goals of the market. There may be gains with respect to GDP growth, and poverty alleviation may occur for a brief period of time, but these development benefits will be attained at an unaffordable price. The depleting stock of the world's natural resources due to current development patterns has had detrimental impacts on the well-being of the current generation but it poses unprecedented risks and challenges for the future generation^{xiii}.

In India, policy options targeted towards greening the manufacturing, energy, transport, construction, etc. sectors will cost the economy a meagre 0.2% to 0.4% of the annual GDP growth^{xvi} along with contributing to employment generation. By maintaining and building up natural capital and mitigating resource scarcity, these investments will provide the basis for enhanced human well-being, opportunities for job creation, and sustained economic development for the next 20 to 40 years. The movement is thus from mere economic growth towards achieving a triple win development that includes social integration, economic viability, and environmental sustainability. Redefining the way progress is looked at, with the needs of our society and our natural infrastructure, the concept of green economy is to create long-term priorities for investment that will form the basic fabric of improving levels of human well-being and natural capital systems.

Green Skills in the Indian Green Economy

The widespread adoption of more eco-friendly approaches to economic production and consumption is changing the nature of work, and thus the skills required of many workers. While the greening of economies presents challenges, it also offers considerable potential for job creation, a matter of urgency in countries struggling to recover from the global economic crisis and to address longer-term employment concerns. The development of skills for green jobs is crucial to ensuring an efficient transition to a green economy by matching supply and demand for skills. It is also vital in helping workers adjust to a rapidly changing workplace. Green job skills development is not only reactive, but can be an important driver of change itself. Promoting skills for green jobs fosters investment in green activities and accelerates the green transformation. A number of factors are driving the transition to greener jobs. Change in the physical environment, brought about in part by unsustainable consumption and more than a century of emissions intensive industrialization, is already affecting the work practices and skill needs of agricultural workers, especially in arid and semi-arid regions. Environmental policy and regulation is pushing industry towards greater sustainability, increasing the demand for green job skills.

What are the key skills challenges as economies go green?

Challenge 1: Skill shortages are already hampering the transition to greener economies. A lack of the skills needed to meet the requirements of changing and newly emerging occupations impedes green investment and hinders green economic development. This equally applies to skills of established occupations for which demand is growing. Shortages generally reflect underestimates of growth and labour demand, particularly in technology-driven green sectors. In green building, for instance, skills shortages frequently arise when projects are undertaken without sufficient provision for skills development. Similarly, a lack of efficient coordination between investment in a green economy and investment in skills can lead to shortages of relevant green job skills. Many countries lack sufficient teachers and trainers in environmental awareness and specialist areas such as renewable energy.

Challenge 2: Skills and environmental policies need to come together. While most countries have drawn up some environmental policies, few have put in place the skills development strategies needed to implement them (see figure 1). Without coherence between skills and environmental policies, skills bottlenecks may well impede the successful transition to greener production and consumption. European countries are taking a lead in this area, notably France (see box 3). Outside Europe, the United States and Australia stand out in terms of their training response to the challenges posed by greening. In the least developed countries, skills development strategies are rarely included in national climate change adaptation plans. The reasons for this include weak coordination between national planning and labour ministries, and a lack of adequate resources and institutional capacity to implement such strategies. Coordination within individual sectors is also important. In the case of renewable energies, for example, policy coordination and planning are needed to smooth the pace of investment over time so as to provide stable employment for workers, avoid periods of serious skill shortages, and make future demand for skills more predictable, both for providers of training and education and for their students.

Challenge 3: Green structural change will be profound in certain sectors. High carbon emitting sectors are most likely to be negatively affected by green structural change. These include mining, fossil fuel based energy generation, and manufacturing, forestry and agriculture (see figure). Workers moving out of declining sectors into growing ones will require retraining. The role of employment services in matching skills and jobs and in retraining workers and jobseekers is thus crucial. The automobile industry is one of the key industries to face significant change. In many countries government policy now includes mandatory standards for fuel consumption, tax and duty reductions for vehicles with lower CO₂ emissions, special tax incentives and other fiscal green measures to promote purchases of eco-friendly cars. Such measures, in varying

Challenge 4: Occupations will change at different rates and in different ways as economies go greener. Not all greening will involve fundamental change in occupations. Some occupations will not change at all: the woman sitting behind the wheel of an eco-friendly bus fuelled by compressed natural gas (CNG) will need the same skills as drivers of other buses. There will be far more established occupations requiring skill upgrades than brand new occupations. Where new occupations are created they often call for higher-level qualifications, either because of their dependence on new technologies or because they require sophisticated skills in, for example, networking, organization or consultancy. The core skills identified as necessary for the new green worker include environmental awareness and willingness to learn about sustainable development as well as general learning and decision-making ability. Good communication skills are also needed so that workers in different sectors can work together effectively towards green solutions. In the green building sector, for example, the ability to work with other trades is critical to improving a building's energy efficiency.

Challenge 5: Skills required in a greener economy need to be identified. Ways of classifying and measuring green jobs are only now being refined. In their absence, most countries have hitherto relied on qualitative data gathered through enterprise surveys, occupational research or consultation with experts. There is thus a need to develop complementary quantitative methods to identify the specific occupational needs of a greening economy.

Skill needs in a greening economy are usually first identified at the level of individual enterprises, which are quick to respond to new regulations or technologies that affect specific jobs or change markets. However, company-level change can have only a limited effect on the national workforce. Industry-level initiatives have greater impact. Developing countries often have much less elaborate systems for anticipating skill needs, and tend to create a parallel system of analysis running alongside the existing training system and/or labour market information system, or conduct one-off surveys. **Challenge 6:** Appropriate training needs to be put in place promptly. Training systems need to respond quickly, as demand changes fast. This is a particularly challenging requirement, given that the updating of courses usually takes a couple of years. Government-sponsored training programmes have proved valuable, notably where they take advantage of formal education and training systems with well-established flows of information between industries and training institutions. General schooling and university systems have tended to respond well to new demands, but in many countries institutions offering technical and vocational training have reacted more slowly. This represents a major challenge since the bulk of training for green occupations is channelled through vocational training. Enterprises in most countries and public employment services in a few have proved to be efficient channels for upgrading skills.

Emerging Green Economy Education Interventions in India : Focus on Higher and Further Education

It is increasingly clear that education and skills, attitudes, and behavior are crucial for sustainable and inclusive growth. The 2030 Agenda for Sustainable Development (UN 2015) requires a comprehensive response in terms of human capital development, talent solutions, and education and training.

The Global Education Monitoring Report of 2016 (UNESCO 2016) reinforces the role of education in every dimension of sustainable development. Better education leads to greater prosperity, improved agriculture, and better health outcomes, less violence, more gender equality, higher social capital, and an improved natural environment. Education and skills also provide the key tools—economic, social, technological, and behavioral—to take on the Sustainable Development Goals (SDGs) and to achieve them.

The manner in which the Sustainable Development Goal (SDG) for education (Goal 4) links with other SDGs is as follows:

Goal 1: Education is critical to lifting people out of poverty.

Goal 2: Education plays a key role in helping people move toward more sustainable farming methods, and in understanding nutrition.

Goal 3: Education can make a critical difference to a range of health issues, including early mortality, reproductive health, spread of disease, healthy lifestyles, and well-being.

Goal 4: Education for women and girls is particularly important to achieve basic literacy, improve participative skills and abilities, and improve life chances.

Goal 5: Education and training increase skills and the capacity to use natural resources more sustainably and can promote hygiene.

Goal 6: Educational programs, particularly nonformal and informal, can promote better energy conservation and uptake of renewable energy sources.

Goal 7: There is a direct link among such areas as economic vitality, entrepreneurship, job market skills, and levels of education.

Goal 8: Education is necessary to develop the skills required to build more resilient infrastructure and more sustainable industrialization.

Goal 9: Where equally accessible, education makes a proven difference in social and economic inequality.

Goal 10: Education can give people the skills to participate in shaping and maintaining more sustainable cities, and to achieve resilience in disaster situations.

Goal 11: Education can make a critical difference in production patterns (e.g., with regard to the circular economy) and in consumer understanding of more sustainably produced goods and prevention of waste.

Goal 12: Education is key to mass understanding of the impact of climate change and to adaptation and mitigation, particularly at the local level.

Goal 13: Education is important in developing awareness of the marine environment and building proactive consensus regarding wise and sustainable use.

Goal 14: Education and training increase skills and capacity to underpin sustainable livelihoods and to conserve natural resources and biodiversity, particularly in threatened environments.

Goal 15: Social learning is vital to facilitate and ensure participative, inclusive, and just societies, as well as social coherence.

Goal 16: Lifelong learning builds capacity to understand and promote sustainable development policies and practices.

Source: ICSU and ISSC (2015)

India has a Vibrant and a Stable Economy with a Labyrinth of Reform Policies and Programs India is one of the fastest growing economies in Asia, with a rising share in world GDP. The rate of GDP growth touched 9% in 2008, while the rest of the world was struggling with a financial crisis. India also presents a unique example in managing an enormous population of 1.2 billion people with large geographical, socioeconomic, and political diversity that is governed through a representative democracy consisting of federal, state, and local governments with differing political ideologies and policy emphases. Stark inequities exist across the various states, economic sectors, demographic groups, and employment types in India. Some states are relatively wealthy and can be easily compared with fast-emerging economies of the world, and some regions are extremely poor and can be compared to Sub-Saharan Africa in Asia. Overall, living conditions are difficult for many individuals and families, with 33% of households with no electricity, 53% with no toilets on the premises, and 42% with no bathing facility. Across the economic sectors, nearly 54% of the population of India is engaged in agriculture, which contributes less than 17% to GDP.

The manufacturing sector employs nearly 21% of the labor force but has a relatively low contribution to GDP of 18%, whereas the services sector, which contributes over 65% to national GDP, employs just 25% of the labor force. Of a total labor force of 475 million, more than half (55%) are illiterate. Ninety-two percent of the labor force are informally employed in the unorganized sector—in agriculture, building and construction, textiles, retail trades, logistics, and transportation—while less than 10% (30 million) are estimated to be in the organized sector. Across demographic profiles, female literacy is 65% compared with 82% for males. Labor force participation of women came down from 36% in 1983 to 25% in 2011. Women earn 62% of men's salaries for equal work. The majority of the labor force work under exploitative and vulnerable conditions, finding employment through informal means such as word-of-mouth references, and contractors. India ranks low (134th) on the Human Development Index (HDI) among 187 countries (UNDP 2011). Policy measures in India to safeguard vulnerable situations and promote equity are elaborate and widely spread between the national and provincial legislative systems. The Unorganized Worker's Social Security Act, National Floor Level Minimum Wage, National Policy on Child Labour, and Contract Labour (Regulation and Abolition) Act are just some such measures. In addition, a number of employment generation programs, education schemes, and incentive systems aim to provide a just, humane, and equitable society. The Mahatma Gandhi National Rural Employment Guarantee Act, National Rural Livelihood Mission, and National Skill Development Policy are innovative schemes and policies to reform the old systems and to address chronic issues of low employability, poor productivity, and lack of opportunities.

Skills Development Efforts are Diverse and Varied

The TVET landscape has historically been diverse and complicated, with multiple agencies such as the Directorate General of Employment and Training, Ministry of Human Resource Development (MHRD), Ministry of Rural Development, and nearly 17 other ministries engaged in education, vocational training, technical training, and skills development. The launch of the National Skill Development Policy in 2009 led to the formation of the National Skill Development Corporation (NSDC) in 2009, the National Skill Development Agency (NSDA) in 2013, and the Ministry of Skill Development and Entrepreneurship in 2014. In addition, various industries and industry associations, NGOs, and the aid community have been independently working to achieve skills targets. The cumulative capacity of skills development, through all government programs, is about 10 million people per year against a target of 500 million by 2022 (Planning Commission 2011).

While the primary focus of policy makers and training providers is on basic provisioning and on ensuring that large numbers of beneficiaries get enrolled in skills development programs, the ability of certified graduates to do a job productively and remain employable remains questionable in the absence of quality benchmarks and an adequate control and coordinating mechanism. Further, the lack of linkages and pathways among primary, secondary, vocational skills, and higher education providers affects the motivation of the students and pushes vocational education toward a low status. The absence of productive linkages between the education system and industry further poses problems with regard to retraining, which, in addition to having cost implications, also affects the productivity of industry and trade. Industry representatives during the ADB-EdUHK survey and interviews agreed that there is a large and burgeoning shortage of skilled workers. In the face of higher demand, coupled with poor training and accreditation mechanisms, the private sector has been increasingly forced to establish its own training and quality control mechanisms.



Environmental Education- Present Scenario in India

India is one of the very few countries in the world where a commitment to environmental protection and improvement is enshrined in the constitution. Environmental Education has been a major thrust of both the Ministry of Environment and Forests (MoEF) and the Ministry of Human Resource Development (MHRD) of the Government of India. While the MHRD works towards the environmentalization of the formal curriculum, the MoEF focuses on non-formal educational programmes and strategies to reach the larger community that includes children, youth, urban and rural communities, industry, decision makers etc. In addition to the efforts of the government a large number of voluntary organizations are involved in promoting EE in both formal institutions and non-formal settings. The main sources of funds for educational institutions and NGOs for EE activities are the government (Central and States), independent trust, donor agencies, etc.

The National Policy on Education, 1986 states “There is a paramount need to create a consciousness of the Environment. It must permeate all ages and all sections of society, beginning with the child. Environmental consciousness should inform teaching in schools and colleges. This aspect will be integrated in the entire educational process” The National Policy on Education visualizes a national curricular framework, which contains a common core including several elements having direct bearing on the natural and social environment of the pupils. These core areas are expected to occupy place of prominence not only in instructional materials but also in classroom and out-of-school activities. Today EE in the formal educational system in India is handled at *three levels*. It is a *composite subject* called Environment at the *primary school level*; it is infused into environment *in regular school subjects at the middle and secondary school level*, and is a *separate subject at the college level*. For EE to be effectively taken up in the curricular, co-curricular and extracurricular mode, resources and facilities have to be built up and strengthened both within and outside the school and college system.

Objectives of Environmental Education

Awareness: To acquire an awareness and sensitivity to the total environment and its allied problems

Knowledge: To gain a variety of experiences in and acquire a basic understanding of, the environment and its associated problems;

Attitudes: To acquire a set of values and feelings of concern for the environment and motivation for actively participating in environmental improvement and protection.

Skills: To acquire the skills for identifying and solving environmental problems;

Participation: To encourage citizens to be actively involved at all levels in working toward resolution of environmental problems (UNESCO, 1978).

Evaluation ability: To evaluate environs measures and education programmes in terms of social, economic, ecological and aesthetic factors.

Goals of Environmental Education

EE aims to develop:

Awareness, sensitivity and a positive attitude towards environment.

Knowledge and understanding of the ecological process.

Greater participation in activities that help to overcome environmental challenges.

Importance of Environmental Education

The country accepted the need for environmental education, with the recommendations of Tiwari Committee (1980). Many people recognize an urgent need for environmental education. Besides introducing the subject of ‘environmental science’ at all levels of education, we must give much emphasis on the new approaches and programmes of environmental education. The lay public in rural, tribal, slum and urban areas, women and students and teachers in schools, colleges and universities need to be educated about the environment.

Environmental Education must strongly promote the need for personal initiatives and social participation to achieve sustainability. Environmental Education is important for understanding the basis of our existence and those around us. Hence, this stresses on the subject. Environmental education, together with sound legislation, sustainable management, and responsible actions by individuals and communities, is an important component of an effective policy framework for protecting and managing the environment. Environmental Education is a new focus for education. It is a way of helping individuals and societies to resolve fundamental issues relating to the current and future use of the world’s resources. However, simply raising awareness of these issues is insufficient to bring about change. Environmental Education must strongly promote the need for personal initiatives and social participation to achieve sustainability.

The concept of environmental education is not a new one as a major part of human knowledge is derived from nature. Environment pollution in different forms continues to trouble us but environmental education makes it possible for us to understand the clear outcome of human activity on the environment. Those who want to pursue environmental education seriously shall also study related disciplines such as physical science, biological science, social science and applied science. Environmental education can be pursued at under graduate and post-graduate level.

The Parameters of Environmental Education

The EE should:

- Consider the environment in its totality - natural and built, technological and social (economic political, technological, cultural historical, moral, aesthetic);
- Be a continuous lifelong process, beginning at the pre-school level and continuing through all formal and non-formal stages;
- Be interdisciplinary in its approach, drawing on the specific content of each discipline in making possible a holistic and balanced perspective;
- Examine major environmental issues from local, national, regional and international points of view so that students receive insights into environmental conditions in other geographical areas.
- Focus on current and potential environmental situations, while taking into account the historical perspective.
- Promote the value and necessity of local, national and international cooperation in the prevention and solution of environmental problems;
- Explicitly consider environmental aspects in plans for development and growth; Enable learners to have a role in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences;
- Relate environmental sensitivity, knowledge, and problem-solving skills and values clarification to every age but with special emphasis on environmental sensitivity to the learner's own community in early years;
- Help learners discover the symptoms and real causes of environmental problems;
- Emphasize the complexity of environmental problems and thus the need to develop critical thinking and problem-solving skills
- Utilize diverse learning environments and a broad array of educational approaches to teaching/learning about and from the environment with due stress on practical activities and first-hand experience.
- To achieve the goals and objectives of environmental education, it was seen that environmental education needs to be planned nationally.
- In the formal school, environmental education concepts may be carefully integrated with different subject areas in a creative and functional manner. However, it requires careful planning and implementation strategies.
- **Various Dimensions of Environmental Education**
- Environmental education is now being seen as an instrument and a process that enables participation and learning by people of all ages, based on two-way communication rather than the old paradigm of a one-way flow of information, from teachers to pupils. The content and substance of environmental education is also undergoing review and change. Reorienting education as a whole towards sustainability involves the various levels of formal, non-formal and informal education at all levels of society. It involves a three-fold classification of environmental education based on different disciplines.
- **Environmental studies** : It is concerned with environmental disturbances and minimization of their impact through changes in social sciences
- **Environmental science**: It deals with the study of the processes in water, air, soil and organisms which lead to environment damage
- **Environmental engineering**: It deals involves the study of technical processes used to minimize pollution

Elements of Effective Environmental Education Programs

An agency or organization's mission and environmental priorities provide direction for program development in environmental education, guiding the development to goals and objects and their choice of target audience. Tying environmental education programs to the agency or organization's primary purpose helps focus program development and justify funding, prevent the establishment of generic environmental education programs, and aid in program efficiency and sustainability. Environmental education programs are often distinguished from informative or interpretive programs, as they have objectives beyond information dispersal and involve working with an audience that often has pre-defined learning objectives. A school group, for example, has predefined learning objectives in the form of a curriculum— what teachers will teach, the order in which concepts should be covered, and expected knowledge and skills The key to relevant environmental education programs is finding commonalities among the existing learning objectives and the agencies or organization's mission and priorities. By doing so, the needs of both the provider (the



agency or organization) and the audience are met. Teachers or leaders of the groups that will be participating in the program can often help find these commonalities by providing and explaining materials that offer learning objectives.

Effective environmental education programs and materials need to present information and ideas in a way that is relevant to the learners. This need for relevance stems from children's cognitive development, as they develop the ability to think concretely before they can think abstractly. When programs move beyond what is relevant and meaningful, learners don't have the chance to build their learning on what they already know - learning becomes too abstract. Thus, content is more effectively conveyed when embedded in a local context, giving learners a chance to explore and experience what's around them. The sensitivity, knowledge and skills needed for this local connection provide a base for moving out into larger systems, broader issues and an expanding understanding of causes connections and consequences. Likewise, skill building and application must be couched within the context of solving real problems— problems that directly affect learners either at home, at school or in their community. When environmental education is taught in the place where they live and through authentic situations, a learner's own experiences become a part of their education.

Enjoyable learning experiences also help make programs more relevant to the learners. Many environmental educators realize the value of learners having direct contact with nature. Small bits of wild places where kids can explore are disappearing and time to visit them becomes more and more rare, resulting in the "extinction of experience." Thus, environmental educators need to re introduce learners to their local area by exploring and experiencing it, by learning about it and celebrating it. By doing so, environmental educators help learners develop a sense of wonder and a sense of place, fostering the awareness and appreciation that motivate them to further questioning, better understanding, and appropriate concern and action. (While enjoyable experiences in nature are one way to launch an environmental education program, it is not the only way. Learners in a central city environment, for example, may become interested in the environment through efforts to clean up a toxic waste site because it is damaging their water supply.)

Effective environmental education programs involve stakeholders in all stages of the program, from the development of the program to its evaluation.

Successful programs bring a coalition of stakeholders together to design, implement and evaluate a program that meets their needs (Monroe, 1999). Stakeholders are those that have a stake in the program that is developed. They are the people who care about a program, are willing to develop a commitment to it and are best able to offer input into it. These stakeholders might be teachers, funders, agency supervisors, community leaders, landowners, extension workers, parents, and curriculum developers. Their participation lends a variety of perspectives to the program, shaping the program focus and audience. Their participation also helps achieve buy-in early in the process, so that as the program is developed, it is more likely to be used. Another advantage of using the program is developed; it is more likely to be used. Another advantage of using stakeholders is that it reinforces the image of community partnership and/or ownership and interest in the program.

CONCLUSIONS

This paper has reviewed the emergence of the green economy, scoping some of the key concepts associated with it. It further looked at some of the emerging developments internationally as educational institutions are called upon to re-orient towards a green economy and low carbon development in response to climate change. Indian education system scenario there is a need to focus on adaptation the paper indicated some of the scope and dynamics of the challenges that are being posed to higher and further education in response to the emergence of the green economy Specifically, specialised green economy skills will take time to develop. The paper scoped a range of economic sectors that require specialist green economy skills like renewable energy and energy efficiency, natural resources management, waste management, green transportation and urban infrastructure programmes. Overall, green economy skills are demanded across each and every sector of the economy. Institutions of higher and further education are therefore challenged to review existing practices (such as the few case examples alluded to above) and to expand these into more systemic efforts to remain relevant in an ever changing skills and jobs environment Overall, technical and vocational skills remain key in the green economy and this may also demand a revision of university programmes within a framework of green economy learning pathways as outlined in the example from the USA above in which technical and vocational training can be expanded into areas of ongoing specialisation and lifelong learning in higher education In sum, to support a holistic higher education system for a greener future, governments and other institutions tasked with developing policy must do so in order to prepare stakeholders that include both business and labour for the new global challenge, and that do so within a whole institution and whole system approach to educational development.



REFERENCES

- [1]. Barbier, E. (2011). The policy challenges for green economy and sustainable development. *Natural Resources Forum*, 35, 233–245
- [2]. Berkshire Publishing (2011). Berkshire Encyclopaedia of Sustainability – The business of sustainability: Higher education. www.berkshirepublishing.com, visited 30 April 2013.
- [3]. Cai, W., Wang, C., Chen, J. & Wang, S. (2011). Green economy and green jobs: Myth or reality
- [4]. Centre for Environment Education, Greening Formal Education: Concerns, Efforts and Future Directions. Preliminary Report, Ahmedabad, India, 1998.
- [5]. Centre for Environment Education, Environmental Education in India, a Report, Ahmedabad, India, 1998.
- [6]. The case of China’s power generation sector. *Energy*, 36, 5994–6003.
- [7]. Department of Energy and Climate Change. (2011). *Skills for a green economy: A report on the evidence*. London: Department of Energy and Climate Change
- [8]. Ravindranath, M. J. Environmental Education in Teacher Education, a paper, Centre for Environment Education, 1999
- [9]. Ravindranath M. J., Environmental education in teacher education in India, *Journal of Education for Teaching*, Volume 33, Issue 2, 191- 206, May 2007 , (<http://itec.macam.ac.il/>)
- [10]. Sharma.V.S., Environmental Education, Anmol Publications Pvt. Ltd.,New Delhi, 2005.
- [11]. Nanda.V.K., Environmental Education., Anmol Publications Pvt. Ltd.,New Delhi, 2005.
- [12]. Usha devi V.K and Dhanya, R. Indian Journal of Environmental Education, Volume 9, April 2009 8-15. (<http://cpreec.org>)