

GLOBAL WARMING AND CLIMATE CHANGE; DEVELOPING A CULTURE OF SUSTAINABILITY SOLUTIONS¹

Earth is my mother, air is father, fire is my friend, water is my close relative and sky is my brother. I am related to them through such relationship (Bhartrihari)²

The science of climate change

The global mean temperature has risen by 0.85 degrees celsius since pre-industrial times and continues to rise, largely as a result of anthropogenic changes including burning of fossil fuels (and resultant higher concentration of carbon dioxide in the atmosphere) and large scale deforestation. Since pre industrial times we have used 35% of the known fossil fuels and cut down one-third of the then existing forests releasing huge amounts of carbon dioxide in the space.³ This has resulted in rising temperature, unprecedented melting of arctic ice sheets, retreat of glaciers, ocean acidification, desertification of land, shifting of seasons and weather patterns, increase in the frequency and severity of natural disasters etc.

The rise in global warming and temperature is directly attributed to increase in atmospheric carbon concentration (due to green house effect) and there is no guarantee that the rise in temperature can be prevented even if we stopped burning fossil fuel today. The increase in carbon concentration depends on the fossil fuel burned and is not precisely predictable. The overwhelming scientific opinion believes that to avoid catastrophic climate change, the rise in temperature by the end of the century should not be more than 2DC. This target has also become a political rallying point and was adopted in the Cancun Climate Summit in 2010. However, many small island nations will be submerged and face extinction even when the temperature rise is kept at 2DC. Therefore, a number of countries have been persistently asking to keep the rise in temperature below 1.5DC.

To prevent rise in temperature below 2 DC, the atmospheric carbon concentration has to be maintained below 350 ppm. A World Bank Report suggested that unless abated with proactive efforts, the runaway climate change threatens a rise in temperature by 4 to 6 DC by the end of century (Turning Down the heat, WB, 2012). In March 2015 the global carbon concentration reached 400 ppm.⁴ A carbon concentration of 450 ppm will most likely push us beyond 2DC.

The IPCC AR 5 report suggests that we can put up only 1000 GT of CO₂ in the atmosphere (known as carbon budget), and this will allow us a 50:50 chance of staying within 2 DC threshold. The IPCC Report also tells us that we have used more than 52% of carbon budget till 2011 and at the current rate of fossil fuel consumption(40.3 GT CO₂/year)we will blow up the carbon budget in 12 years ie. by 2032. This will have a 2/3rd chances of keeping the temperature below 2DC. In the scenarios to keep the rise in temperature below 1.5DC, the carbon budget is reduced further to 400 GT of CO₂.

¹ The discussion paper is prepared for larger public interest.

² Bhartrihari, believed to have lived in 5th Century CE was a Sanskrit author who wrote grammar as well as poetic compositions.

³ Since 1750 we have used 35% of the known 17000 GT of fossil fuels and cut i/3rd of of then existing forests of 60 million square kilometers

⁴ The carbon concentration breached 400 ppm threshold at Mauna Loa (Hawaii) observatory for the first time in May 2013.

This means that a large part of the existing known reserves of fossil fuels will have to be left unused. Globally, this equates to 88 per cent of the world's known coal reserves, 52 per cent of gas and 35 per cent of oil (Nature 2014). The current average per capita emission of 4tco2e per person will have to be brought down to 2 tco2e. To make this happen and stay below 2 degree target emissions will have to be reduced by 40-70% by 2050, the later we peak and sharper the reduction curve will have to be. Even if we peaked today, reductions will have to be above 5% per year in order to stay within 2 degrees.

Current Global efforts

The global emissions are still increasing by 2% per year. The last two decades have witnessed intensified efforts by international community to stabilize climate and shift to a low carbon development pathway. Science dictates the need for rapid and deep cuts in the use of fossil fuels and emissions, however, despite efforts political consensus on taking effective measures have been eluding. The UNFCCC (2012) and the Kyoto Protocol (1997) created a distinction between the developed and industrialized countries on the one hand and developing and poor countries on the other, mandating deep cuts by the developed countries and provide leadership by providing finance and technology have been flouted and therefore global negotiations have been unable to arrive at some concrete political solutions. Developing countries have been fighting a losing battle asking for equity and appropriate development space for them in the global treaty.

The Kyoto Protocol (1997) asked 43 industrialized countries to reduce their emissions by 5.2% collectively over 1990 emissions. However, during 1990 to 2012 USA, Canada, Australia and Japan have actually increased their emission by 6%. Western Europe managed to reduce its emission only by 7% (against a target of 8%). Most of the recent emission reduction has come from Eastern Europe and Russia where emissions shrunk by 55% due to economic recession. The Annex 1 Countries have reduced only by 1.5% of their emissions during 1990 to 2012, while emission from these countries amounted to more than 80% of emissions stock during 1990-2012.

The IPCC Report says that the global GHG emission must reach net zero rate by 2080-2100, and the global Co2 emissions must achieve net zero earlier by 2055-2070. The estimated limit for GHG emission is 42 GTCO2e by 2030 and 47 GTCO2e by 2025. Currently global GHG emissions are approximately 50 GTCO2e (2010). The UNEP's analysis shows a shortfall of 8-10 GTCO2e in 2025 and a shortfall of 14-17 GTCO2e in 2030 on the estimated targets (UNEP, 2014) under the existing commitments/pledges of the countries. Manifestly, the current commitments are not enough to prevent the rise in temperature below 2 degrees. The report also finds that while Brazil, China, the EU28, India and the Russian Federation are on track to meet their 2020 pledges; Australia, Canada, Mexico and the United States are likely to require further action to make good their pledges.

China (23% of global emissions), the USA (17%), the EU (12%) and India (6%) are four biggest countries in terms of overall emissions. However, India's per capita emissions remains much lower (1.7 tonnes) than that of the US (17 t), EU (7 t), China (6.7 t).⁵ China and the US together are responsible for half of the global emissions (29% and 17% respectively). The US never ratified the Kyoto. China being a developing country was not required to do binding cuts.

In November 2014 they declared that China's emission will peak by 2030 (with 20% contribution from non fossil sources), while the US would reduce their emissions by 26-28% by 2025 over a 2005 baseline. In Copenhagen the US had declared that it would reduce its emission by 17% by 2020 over 2005 (amounting to less than 3% reduction over 1990 baseline). The new pledge is equally unambitious and

⁵ At 2011 level.

requires less than 0.5% reduction per year. China which overtook the US as the biggest polluter in 2007 had declared before Copenhagen COP that it will reduce its emission intensity by 40-45% by 2020 over 2005 baseline. China's emission has kept growing attracting increased global pressure and domestic pressure due to extremely poor ambient air quality. The recent declaration means that China will continue to spew at least 12-14 Gt till 2030.

India has always maintained that its emissions will remain below per capita emissions of developed countries despite its pursuit for economic growth. In Copenhagen summit (2010) India committed reduce its emission intensity by 20-25% by 2020 over 2005. India has also declared a National Action Plan on climate change in 2008, which included mitigation and adaptation in various sectors including solar energy, energy efficiency, forests, water, agriculture, housing and Himalayan ecosystem. Recently India upgraded its target to achieve 100,000 GW from solar energy from 2000 GW by 2022. The government also aims to integrate three more missions on wind energy (current installed capacity at 20,000 MW), coastal zone and health. India has also removed subsidies and deregulated prices of diesel and petrol, and enhanced the cess on coal from (INR 50 per ton to INR 200 per ton). More than 22 out of 35 states at Union Territories have too developed their sub national action plans on climate change in reportedly the most extensive exercise on sub national plans.

EU has committed to reduce their GHG emissions at least by 40% by 2030 and by 85% -90% by 2050 over 1990 baseline.⁶ This is an upgrade on their earlier target to reduce 20% by 2020. However, in view of the fact that EU has already achieved 20% reduction by 2012, the new declaration also comes as highly disappointing. Lack of ambition among the major polluters and especially the US has motivated countries like Canada, Australia, Japan and Russia to renege on their Kyoto promises. As a result the Second Commitment Period of Kyoto Protocol (2013-2020) only covers 21 countries and only 15% of global emissions.

Climate finance forms one of the core requirements for enabling developing countries to move towards low carbon development pathways. The UNFCCC and the Kyoto Protocol lays down various provisions related to financial obligations of the industrialized countries as they have historically appropriated much of the available atmospheric space to the exclusion of the poor and developing countries, and therefore developing countries must be compensated the opportunity cost and their contribution in climate stabilization. In 2010 in Cancun, the industrialized countries (A1) committed to provide USD 100 billion from 2020 onwards to support developing and poor countries as long term finance forming the Green Climate Fund (GCF). However, till 2014 the developed countries could mobilize only USD 10.2 billion against the expectations of developing countries for USD 15 billion.

On the road to Paris

This year will mark two important events, which have the potential of defining the future of the world. First is the adoption of Sustainable Development Goals (SDGs) by the United Nations (in September) and second, a possible adoption of a new global agreement on climate change (which exhorts all countries irrespective of their social and economic conditions and their contribution to the crisis to contribute to climate stabilization) at Paris in December.

As we approach Paris, people all over the world are getting increasingly disillusioned by the anthropocentric approach to development, promise of the politics and justice of the market to deliver a sustainable solution to climate crisis. Science dominated by politics and economics has also failed to provide solutions, which will go beyond looking at only material gains as progress and development. The

⁶ The KP asks EU to reduce by 40% by 2020.

prevalent approaches to climate change and sustainable development are being looked as “finding solution in the same problem ridden framework,” “not addressing the root causes” and “not being ambitious enough.”

The prevalent models of growth (growth fundamentalism) are coming under increasing attack from all quarters and people in all parts of the world are increasingly getting attracted to alternative development pathways, which have found expressions in opinions ranging from radical (degrowth, deglobalization, occupy etc.) to spiritual and ethical (climate as moral question, environmental stewardship, synergy between human and nature relationships, rights of mother earth etc.).

An increasing volume of research have focused on debates related to worldviews of traditional and indigenous populations and integration of their values to larger questions (crises) of the day viz. growth and development, climate change and global warming and environmental protection (buen vivir, sumak kawsay, happiness index etc). People all over the world are getting disillusioned by the promise of science (especially geo-engineering and other untested technology) and politics (continued domination of developed and rich countries on the global negotiations). Social and environmental movements have emphasized the power of alternatives and the need for creating lived realities as an alternative model; faith based groups have talked about climate change as a moral and ethical issue appealing to the conscience of its followers.

Looking beyond science and politics; need to re-imagine human relations with natural world and cultural traditions as essential value for conservation

Rio Earth Conference promised to bring equitable and sustainable development and conservation of nature and climate on the mainstream political agenda. However, the Rio+20 Conference noted with disappointment that we have failed to live and act up to expectations. The reasons are not very difficult to decipher. In the last few decades we have witnessed an artificial dichotomy between science and tradition in approaches to address environment and climate change. Religion, faith, spirituality and ethics have been underemphasized, giving a place of prominence to economics, unduly privileging certain knowledge systems to the exclusion of others. Over this period the values, both western and non-western, that underpin relationships between peoples, place and nature were steadily lost from conservation policy and practice. This has resulted in loss of a very large body of knowledge of lived experiences, culture, tradition, worldviews, ancient wisdom and actions associated with them.

The relationships between people and nature are socially and culturally conditioned, creating a diversity of reasons for conserving biodiversity across different cultures and societies⁷. Over the years the communities across the world have evolved practices that underscore socially, culturally and religiously sanctioned values to conserve natural resources. It is interesting to understand that these practices are as diverse as our nature is. The diversity in these approaches exhibits community's efforts to respond to conservation needs of the local natural resources.

This compels all of us to have a relook at social and cultural values as an alternative to science and politics driven approach to conservation of nature. All cultural traditions have been characterized by predominance of values of responsibility (duty), inclusiveness (community living) and harmony with nature. All ancient philosophies - Chinese, Greek and Roman, Persian, Jewish, Native American, Latin American, Arabic, African, Oceanic, Korean and Japanese and all others not only preached but practiced them. In these ancient philosophies, the idea of conservation of nature is not new. Over 2,000 years ago, royal decrees in India protected areas and species. Sacred groves, forests, springs, rivers and mountains

⁷ Yamin 1995

were revered as places where the ancestors resided, spirits lived or rituals were performed (Byers *et al.* 2001).

Pope Francis's recent encyclical on climate change (June, 2015) also reinforces these cultural traditions calling for 'ecological conversion' of the faithful brought renewed focus on culture, tradition and religion and ethical behavior. In *Laudato Si* (Praise Be), he warns of harming birds and industrial waste and calls for renewable fuel subsidies and energy efficiency.

Hindu cultural traditions offers specific guidelines for ethical living including self-control, restraint, simplicity and dietary guidelines respectful of the sanctity of all life. There are innumerable references to the worship of divine in nature in Vedas, Upanishads, Puranas, Sutras and other sacred texts. Hinduism teaches that Panchamahabhuta (the five great elements) space, air, fire, water and earth that constitute the environment are all derived from prakriti, the primal energy. Each of these elements has his own life and form. Upanishads further elaborate that the human body is composed of related to these five elements. This bond between our senses and the elements is the foundation of our human relationship with natural world. Protection of environment and nature has been part of dharma (duty/virtue/cosmic order) consciousness and extension of divinity for many Indian traditional groups and they do not see religion, ecology and ethics as separate areas in life. Traditional groups like Bishnois protecting animals and trees, Swadhyayis making Vrikshamandirs (tree temples), or adivasis protecting their sacred groves, etc. has been a practice that has been integral with their lives, and part of their dharma to respect the creation. Indian traditions of Ahimsa and Sanyasa deify the principles of non-violence with the nature, and living frugally without putting undue burden on nature or society. Many also see Gandhian value systems as a treatise on ecology. His message of simple life, abhorrence of waste, truth and non-violence, and his distaste for overtly mechanical and industrial political economies, and above all swaraj (imagination of self-sufficient village economies) all inspired many about his belief on nature being a part of oneself and respect for it. Later iconic Chipko (hug tree) movement in the 1970s manifested how people protected tree at the cost of their lives.

Looking at India's rich tradition Arnold Toynbee said once, at this supremely dangerous moment in human history, the only way of salvation of mankind is the Indian way. Here we have the attitude and the spirit that make it possible for the human race to grow together into a single family." Perhaps Mr. Al Gore also meant the same when he said in a Conference on environment that "we have been on the wrong track from last 300 years. It is time to rethink and turn to east." (Soni, Suresh 2013)

Simhastha Kumbh as an imagery of Indian traditional environmental and social values

Kumbh is a religious gathering where millions of Indians gather to show their reverence for the rivers. The Kumbh held at Ujjain in Madhya Pradesh is known as Simhastha Kumbh. Millions people visit Simhastha Kumbh and this year it is expected that Simhastha will be visited by 50 million people. This is supposed to be the biggest religious and cultural gathering in the world. The "Kumbhs" being an age old event, has drawn attention of the world communities for a variety of reasons. Premier Universities and Business Schools in different parts of the world have already undertaken a number of researches to understand different dimensions of the Kumbh. This is also a high time to reiterate the values of "Vedic Darshan" that underlines the ecological sensitivity within the Hindu tradition; that exalt the earth (prithvi), water (jala), fire (agni), air (vayu), and ether (akasa). The Simhastha is also an opportunity to understand how these practices have been instrumental in maintaining balance between human and nature.
