

HISTORICAL PERSPECTIVES ON CLIMATE CHANGE IN SIKKIM

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Climate change is a strange phenomenon. It occurs slowly over a long period of time, imperceptibly. By bits and pieces, as they say. It then intensifies, affects and envelopes. It remains apparently unnoticed, seemingly uncared for and knowingly unprioritised in the thinking segment of human development. Lest we forget later on, it is the development that has triggered the climate change phenomenon. In our haste and hurry towards that noble and inviolate, supreme and sanctum goal we are averse to listening to any other sermon than that of development. It is such a sweet, enduring, calming, cooling and comforting concept that has remained unassailable to this day. Climatically speaking, the development concept is perennially salubrious. Not realizing the inherent, in-built hazards we have traversed far too long along the path to development to avert the impending human crisis that the earth scientists say, is looming close by.

The rapidity with which unnatural, unusual, imponderable events are visiting us daily, monthly and every year routinely as a cycle noticeably different than what used to be yesterday, we are inclined to believe that the day is not far off for the planet earth to be heading towards an intractable whirlpool. So far these occurrences are being ignored, isolated, marginalized or let us further say, being trivialized rather than responded and repaired. There is no dearth of knowledge, information or technology to deal with such an emerging situation but still the approach is passive, lackluster and even refractory. Are we waiting for the doom's day?

Long long back, I hazily remember to have read somewhere that at the advent of a motorized transport on earth, the then queen of England remarked rather casually: *but this is a nuisance*. How true she was. Now when we watch this wonderful invention invading every road, every household compound, every corner and contour of the world, be it villages, office locations or industrial complexes, carrying loads and loads of human beings and goods through a labyrinthine of arterial roads that it is simply nerve breaking; encircling and occupying every inch of our thinking space as if our long and assiduously built civilization were to cripple the moment this mode of transport is somehow wiped out from the face of the earth. No idea what happens but one thing is sure that the automobile industry is one of the main agents to contribute to climate change.

We cannot think of a world without the terrestrial, avian or the sea borne route transport system that we have developed as a distinct pattern of our so-called progress. It is the human ingenuity that has worked wonders throughout the earth, the sky and the sea. It has made our life cosy, comfortable and compatible to living, giving us the enjoyment of unassailable supremacy over other forms of life including the inanimate and mute objects. Equipped with knowledge of science and technology we march heedlessly and maraud mercilessly the vitals of nature's vault. The forests are the worst sufferers. They have been hacked down to be reduced to a very low and weak protective cover. And we must not forget that they are the principal carbon sequesters and act as vast sink against the deadly proliferation of carbon dioxide that causes green house effect. Except some countries and small states the world is without adequate forest cover to mitigate the spectre of the climate change.

What are the symptoms and symbols of climate change? How has it affected our life and living? Who is more impacted – the rich, poor, the urban dwellers or the peasants; can we tide over the menace of a hot climate or adapt to it, whether it is a man-made action or nature's way of unleashing an orgy on man's overexploitation and mismanaging her resources, are some of the pertinent queries that automatically invade our mind.

Everybody has a way of interpreting and analyzing the concepts and concerns of climate change in a way it affects him or her. Scientists and climatologists mirror the issue tearing apart all that is the subtlest in the scientific fabric and highlight the dangers and pitfalls that await our march towards a utopian development destination. The earth is becoming so hot that it is almost incendiary to comfortable living, they emphasise.



The early flowering of the Rhododendrons in the Himalaya is an evidence of rising temperatures impacting the phenological behavior of plants

If we ask a farmer about climate change or of a hotter earth his answer will be affirmative but indirect. He will talk of falling productivity from his farm land, erratic rainfall, extremes of heat waves or cold season excessively prolonged and overlapping into other regular seasons affecting his crops which all meteorologists, farm scientists or climate experts readily subscribe to. Social scientists and behaviour therapists will probably concur our experience that people in general have begun to show an increased level of being jittery, belligerent, arrogant and argumentative for petty issues as against being harmonious, warm and reciprocal to one another's feelings and common issues. The farmers' suicide in the South Indian states occurring in large numbers on account of not being able to pay their agricultural loans is a strange psychology that we have often been familiar with perhaps has the genesis in altered climatic patterns, not alone the monsoonic failures that the meteorologists will always assign the reason thereof. In fact these are the symptoms of climate change to me as I know of, too. I have some simple and straightforward ways of looking at climate change and lay down some personal observations.

Four thousand and five hundred feet is where our house in the remote West Sikkim village is situated. Thirty to forty years back, we never knew of and saw orange trees producing bumper fruiting around our village belt the size, luster, the taste and the juice as good as they are produced in areas climatically suited. But every year I enjoy my delicious orange fruits as much as the persons and people of low lying areas where it actually is supposed to grow. We can easily conclude that the climate belt has visibly shifted. This I assign to the infamous climate change phenomenon. While the marigold flowers had disappeared completely from the fields where they are so lovingly grown for generations for the Diwali festival, of late they seem to be on the return scantily. For a number of years we had to do without the traditional marigold. They are not as profuse as they used to be to decorate our houses as in the distant past. Whether this is due to altered climate condition that led to its decimation is a subject matter to be studied and confirmed by earth scientists and floriculturists.

In the context of changes brought about by the increase in temperature over the surface of the earth let us not forget the impact on the phenology of the vegetation. The floral world has begun to behave in a strange way. There are visible changes in the pattern of leaf shedding or in the appearance of new flush. There is a significant shift in the timing of the flowering of plants as well. It is generally observed that Rhododendrons have begun to flower earlier than their schedule season. *R. arboreum* is seen flowering from the month of January as against its normal timing somewhere after the middle of March. Whether the Azaleas are confused or my observation is wrong, they are flowering in my garden all around the year, at least some of them. Yellow Dendrobiums are in full bloom around Gangtok in the month of August, whereas I used to see them in full glory in the middle of Sept in the distant past. Likewise kitchen vegetables are, mostly available throughout the year apart from the ones supplied from the cold storage, while others come to the market grown under controlled conditions inside what are called greenhouses.

My relative who visited me from Kurseong while I was working on the computer writing this essay throws more light on climate change. What about the obvious and most discerning evidence of water freezing inside the water tape in the yesteryears during winter months in the hills whereas we do not encounter any these days, he said. Now-a-days we see less and less number of people sitting around wood fires in the outdoor to ward off the chill in the peak winter season, as we used to commonly see in the olden days, he enlightened. At 5500 feet altitude he is growing lady's finger when in the past this was not possible. Shri Khorlo is an agricultural technocrat in the Department of Agriculture in the State of Sikkim and hails from the remote and high altitude Lachung valley in North Sikkim. The other day he informed me that maize crop could never be raised in the valley on account of altitude and extreme cold climate whereas these days they ripen as good as in the



Lampokhri sacred lake in West Sikkim. The Sikkim Himalaya is revered as a sacred landscape and is home to sacred mountains, lakes, caves, rivers, springs etc. Local festivals, rituals and practices help in reinforcing this belief. Thousands of pilgrims flock to these locations to offer prayers every year

middle hills. These are classic examples of climate hotting up around our ambience. When the temperature belt so shifts on account of a rise in temperature, apparently the orange growing areas at lower altitudes will consequently suffer in terms of optimum production rendering farmers to a visible economic loss. Likewise for the maize crop. Consequently, people will be forced to migrate to newer livelihood opportunities which will be difficult to come by. It will lead to chaos and confusion and will ultimately result in civil unrest and strife. A great human tragedy of unimaginable magnitude is in the making only because we are too busy to rebuild, reconstruct and emerge as a global power whatever cost it may invisibly entail.

We, in the hills, associate the trend in climate change either with the melting of the snows and glaciers or to unusual and unseasonal weather patterns, that is, excessive heat or excessive cold that each individual experiences and shares with friends and neighbours on a daily basis. Take the example of Gangtok. Houses, shops and offices never needed room fans during summer season, here. Now almost every one of these has a fan to moderate the impact. Consequently when there is added heat in the atmosphere, the associates cannot be far behind, the mosquitoes. Nobody will deny that we are quite often visited by solitary mosquito in the night that tells right on your right ear that climate has changed. So I am here. These are simple yet strong indicators of the change that we must acknowledge. We do not need a complicated scientific postulation to prove the climate change theory. Everybody is fully familiar with it. Perhaps the least literate has the most profound traditional knowledge to avoid destroying the delicate environmental canvass and also as to how to restore and rebuild the imbalance because his weapon is the vast empirical knowledge. In the knowledge domain of the common man lies the answer to many of our development-generated ills which the juggernaut of science and technology has buried. He formulated a progressive living mode that was in complete compatibility with the laws of nature. It was sustainable, it was enduring, it was productive, it was innocuous. It is the transgression of nature that is at the root of the problem. A development paradigm which is least exacting to the entrails of mother nature will surely be most sustainable one. Natural farming with organic inputs used to be practiced in the past which is being resurrected now-a-days. This is a rediscovery of our tradition. Alternative medicinal systems like ayurveda, homeopathy, unani or naturopathy treatment are becoming more popular and effective. These are symptoms of our understanding of living the natural way. The western world has begun to rediscover the efficacy of the great oriental wisdom of respecting nature as against dominating it. It was generally reckoned as being archaic, static or superstitious and discarded. Yogic philosophy similarly has invaded the western mind and struck roots. Performance of *homa*, (the offerings of ghee-rice along with other ingredients into the fire) accompanied by chanting of Vedic hymns is reported to have a great efficacy in depolluting and ameliorating the atmospheric anomalies. These are eco-friendly, nature promoting ideas and ideals, principles and practices that our seers and saints advocated and prescribed so that this earth remains productive, vibrant and regenerative and that the health and longevity of this planet remains eternal.

Talking of the fans as above, about 15 years back I was in Bangalore in connection with the admission of my son into a local school. I was talking to a tailor where I had been to get my son's school uniform stitched. In the course of our conversation with him he went on to narrate what was Banaglore 40-45 years earlier. He said, inter alia, that forty years back there were no fans in Bangalore houses. He called upon me to see the scenario now. This was an example of a much hotter earth that every one of us should believe. A colleague of mine, an articulate forester, Dr Sandeep Tambe, last year, when the menace of bear attack to the human beings was at its peak all over Sikkim, wrote a master piece article in a local daily how climate change has affected wildlife food production in the natural habitat forcing the bears to intrude into human territory. This is a classic example of climate change and how it immediately impacts our life. What happens if the food production in our farmlands begins to drastically decline like that has taken place in the forests or some important food crops refuse to produce grains on account of altered site conditions brought about by the imbalance created by climate change. The bears came rolling their heads down towards us for food. Like wise, we cannot return to the forests for food, shelter and refuge as there are no more adequate forests to sustain us. These are stark realities. It seems we are sleeping over some of the most crucial issues facing human survival on earth.



Eco-friendly beliefs and faith that our seers and saints advocated and prescribed needs to be reinforced so that the health and longevity of this planet remains eternal

I have not dwelt upon so extensively on water front as yet. Water resources in the mountains comprise of springs, streams, lakes, rivers and glaciers. Everyday, we go through papers and the news broadcast by the electronic media highlight that there is constant reduction in their size and capacity. They are melting faster than generally believed thereby depleting the sources unsustainably. There was a sensational news item last year that caused immense furore- that the Himalayan glaciers will be completely exhausted within a period of 35 years! But several studies thereafter have also indicated that the water sources are drying out faster than anticipated. This is a grave situation.

Why should we fear living in a hotter earth? After all, life still exists elsewhere in similar situations. We humans have strange response impulses. We tend to tolerate, adjust and adapt rather than take to tackling a phenomenon which is beyond an individual's arena. The world community at the moment is exactly following this path. The crux of the matter is the very survival of earth due to this change. Can the earth bear the burden of such a burgeoning population with food production declining, water sources depleting, fundamental changes occurring in the seasonal shift of climate, apart from other deadly effects arising out of ozone hole depletion and the consequent health risks it entails.

The Atharva Veda stanza which the late Smt. Indira Gandhi, one of our most beloved, bold and brilliant Prime Ministers used to quote in her writings and speeches, runs as follows:

“What of thee I dig out, Let that quickly grow,

Ever let me not hit thy vitals,

Or thy heart.”

These lines most emphatically convey the conservation philosophy that is so much needed now as never before to stabilize a continuously degrading earth.

Apart from her political acumen and leadership qualities, the forest fraternity particularly hold her in very high esteem because of her concern for forest, environment and wildlife. She spearheaded the movement for environmental conservation from the Swedish capital of Stockholm as early as 1972. Thereafter, the concept of conservation and sustainable development began slowly to be inbuilt in the developmental agenda of the world community.

While developing nations point out the responsibility of climate change to the developed world, the latter throws the ball back to the court of the third world countries blaming them for their enhanced level of energy consumption and growing population thereby leading to more carbon emissions. In the melee so created, we have virtually done nothing tangible to lower the graph. On the other hand, nation after nation are bent on meeting the challenges posed by a hotter world and are proposing to bring out the alternative adaptive measures. This result in skirting the principal issue of repairing the damages and restoring the normalcy. We, the representatives of the world community meet as a routine ritual to deliberate on climate change, produce verbiage in volumes, invite unprecedented media glare and return to our respective territories to accelerate the pace of development as in it hinges the so-called destiny of each of our nations ignoring the precipitous fall that we are about to encounter in the not-so-distant future.

It will be worthwhile to mention here that Sikkim has already constituted a high level Commission consisting of scientists and experts in the field to study our own position vis-à-vis the national and world scenario of a hotter climatic effect on the snows and glaciers of Sikkim. Since such high altitude studies entail concomitant hardships and hazards and that these kinds of studies require a long time to arrive at the conclusions and results every one of us is waiting as to how the studies will prove to be for the state. While Sikkim has done everything to rest the foundation of environmental stability on the strongest pillars of conservation, preservation and protection both at the level of policy and legally and administratively the effects of such a change in climate may be fairly slow, it is hoped. But environment occupying a very large canvas transcending national and international boundaries, a great deal of situations and circumstances not being wholly within the ambit of Sikkim's purview, any aberration, thereof, if any, cannot be subsumed to our inaction. With about 47% of forest cover and 83% of the geographical area being under the forest land category, about 31% of it being under protective area network, the conservation of nature in Sikkim is beyond the prescribed policy parameters with no withdrawals of any kind from the forest floor for the last decade and a half.

Sikkim, a small speck of Himalayan landmass, striving to make a mark as a developed state with a unique model of environmental conservation and development coexisting is, however, dangerously vulnerable to the effects of global warming and cannot insulate itself notwithstanding the fact that we maintain the best records in conservation calculations. The land use, the forest cover, the agricultural pattern, tourism regulations, the industrial base are so patterned here as to become least contributory to climate change. With an enviable forest greenery spread over the entire hills and valleys, from east to west, from north to south, the private woodlands, the large cardamom agro-forestry fields, the bamboo grooves, the roadside plantations, the urban forests, the memorial forests (Smriti Vans) all of these makes a very strong case for Sikkim for award of carbon bonus that the climatologists so much talk about providing as a measure to reduce the impact of a hotter temperature. While we are doing everything possible which admittedly no other state of the Indian Union has so far achieved in the environmental field with the available manpower, resources and commitment at our disposal, certain forces and factors that are beyond the control and command of the local administration must be addressed at the national and international level such as the protection of our precious snows that cover our hill tops, our lakes and glaciers that are the water reservoirs not only for the state of Sikkim but neighbouring Paschimbanga and even Bangladesh.

Our geographical size and location is our distinct advantage. Our outreach for communication and extension of conservation activities that we propose to parcel out to different Panchayat bodies, clubs and committees, is much shorter and quicker compared to big sized brother and sister states. Implementation and supervision,



Melting glaciers, heavy downpours and higher runoff rates has increased the peak flow rate of rivers

monitoring and evaluation, coordination and correction become so effectively advantageous. We obtain greater transparency in our projects and programmes. We have adequately realized the importance of maintenance of synergy between ecology and economy. It should be our endeavour to uninterruptedly pursue the present pace of implementing conservation programmes which we have formulated and continue to build a bridge between the government and the people which is our unique feature so that the we do not head towards a precipice that may be of our making.

It goes without saying, therefore, that climate change will have a far reaching consequence for human survival. Agricultural productivity will fall, drinking as well as irrigation water will be scarce, newer and unknown diseases will surface that will be difficult to either treat or eradicate. Everything will change- the character and composition of vegetation, the wildlife population, human behaviour and outlook on life. Livelihood strains will alter our age-old values and traditions. It will destabilise our culture, dehumanize us and perhaps degrade us as lesser beings than the supreme creatures that God intended us to be. It all depends on how fast we respond to the survival challenges that nature has thrown towards us. Should we neglect and remain passive the end is faster. On the other hand, if we show the urgency and commitment there is nothing which can prevent us from staging a comeback.

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Rhododendron barbatum in full bloom. The early flowering of the Rhododendrons in the Himalayas is an evidence of rising temperatures impacting the phenological behavior of plants