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# ENVIRONMENTAL CHALLENGES AND SUSTAINABLE DEVELOPMENT: A STUDY IN GANDHIAN PERSPECTIVE

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**Abstract**

***It has been observed throughout the world that during the recent years, the incidents of natural calamities are increasing day by day. And everyone knows that due to the disturbance/Imbalance in environment, these calamities are occurring everywhere. The recent incident of July, 2013 of Uttarakhand (INDIA) can be quoted here. But on the other hand, at the adjoining place in Uttarakhand, the famous place related to Chipko Movement (Hug the Trees Movement) of 1970-73 where no such causality is reported so far explains many things here. But the question arises here is that the present nature of development and Sustainable Development is the real cause for the same or not. Further, the researcher intends to study that alongwith the development, the concept of Disaster Management should also be developed so that if in near future such (e.g. Uttarakhand) type of situations arises how the precious lives can be saved by providing them medical and other necessary facilities at that moment for their survival. So question arises here that the present form of development is for whom and for what purpose and at what cost or at the cost of humanity or we need to redefine the concept of Sustainable Development in our own comfort zone. The present paper deals with eight parts with the introduction, a case study of Uttarakhand Tragedy with what went wrong during the same and what the Gandhian Scholars of that region have to say on this. The next part deals with the need for the disaster management and its action plan with the future suggestions. In the end the researcher has tried to bring the ground realties also after the tragedy and how in the present the same kind or worst situations are handled after learning the new lessons. Most of the data for this article is collected through the newspapers (e-additions), stories coming up from different segments and through personal visits to the affected areas.***

**Article**

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**Part I**

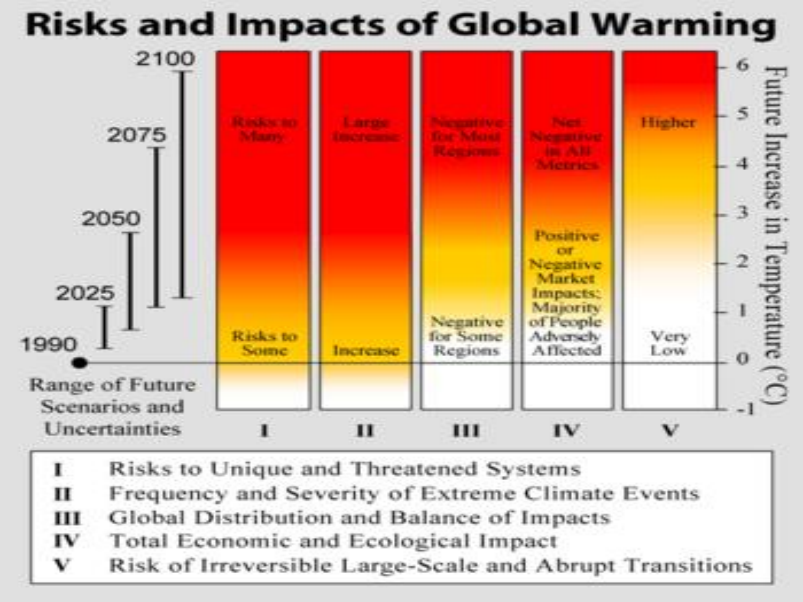
**Introduction**:

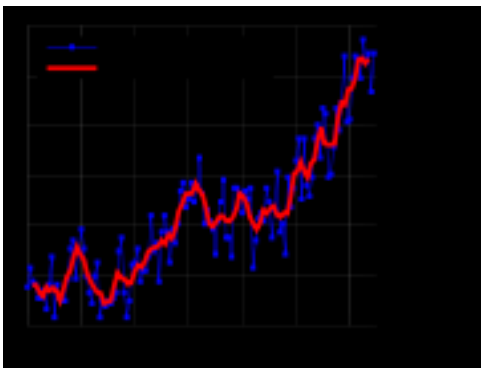
"The world grows smaller and smaller, more and more interdependent…today more than ever before life must be characterised by a sense of Universal Responsibility, not only nation to nation and human to human, but also human to other forms of life." - His Holiness the XIV Dalai Lamai

Gandhi ji very rightly said that, "The Earth provides enough to satisfy every man's need, but not for anybody's greed." And when we go into the deeper meaning of the basic definition of sustainable development, it states of require taking from nature as much as it can replenish. It requires voluntary reduction of wants, decentralization of decision-making and in harmony with nature, intend of trying to conquer it or dominate it and to stop thoughtless exploitation of natural resources in endless quest for more riches and comforts. As a matter of fact, happiness does not depend on riches and worldly comforts. It is totally a matter of one's physical and psychological inclination. The present day problem of environmental pollution was not known during the time of the Buddha and other great personalities upto 20th Century, as during their time the people lived in peaceful harmony with nature, without attempting to subjugate and exploit it. We all are well aware about the fact that Buddhism and other religions teach us that if man is to enjoy nature's benefits, he has primarily to lead a righteous life. Today man's insatiate craving for all types of wants has made him to be more and more unrighteous. Presently, this situation has led to an ominous vicious circle wherein unrighteousness or adharma has made the life more difficult. With these difficulties life is made more irreligious. The tragedy here is that a vicious circle continues to gather momentum. Ironically, science has also drawn a very clear picture, albeit materialistic, that documents the current crisis in the earth's environment. The earth

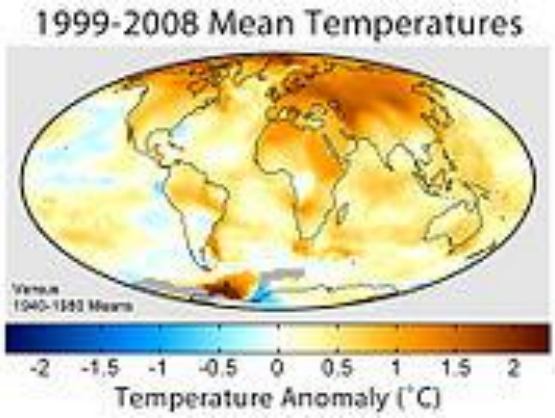
is a beautiful environment for many living beings including human beings who are inextricably interconnected in the web of life for survival and growth. Traditionally this interconnectedness was expressed by the notion of a Great Chain of Being which comprises matter, body, mind, soul, spirit in all its diverse expressions, each level embracing the other until finally all things are enfolded by spirit, the Goddess, God, Tao, Brahman, Atman, Buddha or the like depending on the religious tradition. (Smith cited in Wilber 1998,p.6). However, the rise of empiricism in Western culture with its profoundly materialistic, atomistic and analytic world view has resulted in the disintegration of this Great chain or nest of being world view and the fragmentation and reduction of the earth and its inhabitants to a purely material, atomistic world to be exploited and manipulated by scientific endeavours. This has contributed greatly to the current environmental devastation which positions the earth on the brink of environmental collapse. Ironically, science has also drawn a very clear picture, albeit materialistic, that documents the current crisis in the earth's environment. As early as in 1962, Rachel Carson published her profound work, 'Silent Spring', linking the use of pesticides with the destruction of other species particularly birds and the contamination of the water and earth. In 1980 the World Conservation Strategy was launched by the UN, followed in 1987 by the 'Bruntland Committee Report', all outlining the delicate interdependence of the planet's people, environment and other species and arguing for a sustainability policy and conservation strategies. Species are disappearing at the rate of one every twenty minutes. Every minute, 12,000 tons of CO2 are added to the environment and 51 acres of tropical rainforest are destroyed. Every hour, 1692 productive acres of land become desert, and 1800 children die of malnutrition (as per Environmental statistics, 2012) Global temperatures are rising and the rate is predicted to be between 2 and 6 degrees centigrade depending on the model and this temperature rise will have profound disturbances in weather and crop patterns. The scientific evidence that we are destroying our planet is clear. The awareness of protecting life and living environment has been generated in recent time. However, in Buddhism, it was one of the main basic laws which were set out by the Buddha some 25 centuries ago for his students to follow.ii

But when we see the things in the present context we find that a natural disaster is the effect of a natural hazard that could be out of the following forms i.e., flood, tornado, hurricane, volcanic eruption, earthquake, or landslide. In these natural disasters, it has been observed that it not only leads to financial and environmental but also a large number of human losses. The resulting loss depends on the vulnerability of the affected population to resist the hazard, also called their resilience.iii The effects, or impacts, of natural disaster due to climate change may be physical, ecological, social or economic. Evidence of observed climate change includes the instrumental temperature record, rising sea levels, and decreased snow cover in the Northern Hemisphere. According to IPCC (2007a:10), "[most] of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in [human greenhouse gas] concentrations". It is predicted that future climate changes will include further global warming (i.e., an upward trend in global mean temperature), sea level rise, and a probable increase in the frequency of some extreme weather events. Signatories of the United Nations Framework Convention on Climate Change have agreed to implement policies designed to reduce their emissions of greenhouse gases. Overview of the same could be like this:





**Global Mean Surface Temperature difference from the average for 1880-2009**




Mean surface temperature change for the period 1999 to 2008 relative to the average temperatures from 1940 to 1980

Part II

A Case Study of Uttarakhand Tragedy: Natural or Manmade

In the light of Sustainable Development, when we see what happened in the Uttarakhand and in its nearby places, it has been observed that due to too much concrete construction at a very haphazard way leads to the mass destruction and this time the destruction is not in terms of casualties but it is also in terms of the destruction of the buildings, roads which links the state with its neigbouring villages, places and other important places. To reconnect the same it would take too much time, energy and other sources and of course lots of money at a time when the rate of Indian Economy and development is at its lowest level whereas the inflation rate is at higher levels.

In Uttarakhand, the devastating loss of life, livelihoods, and homes, the death toll crosses the mark of thousand, way beyond official figures. This tragedy was triggered by extreme unseasonal rains in North India, 2-3 weeks in advance of what is normal for this region. The Director of the Indian Meteorological Department (IMD), Dehradun, said that 340 mm fell in a single day at Doon, a record not seen for five decades (such extreme and unseasonal rainfall seems to indicate a global warming induced climate change phenomenon as warmer air due to global warming has the capacity to hold more moisture, leading to more intense bursts of rainfall in a particular region). The natural monsoon cycle in India has already been badly disrupted, and a new cycle of extreme rainfall events and prolonged droughts have been reported from all over the country in the recent past. And of my own city Chandigarh (250 North of New Delhi), the October month of 2013 is most wet month after 3 decades, which is not normal. Further, the crops of the Northern region were badly damaged due to too much and late rains. Thus, contrary to statements by senior politicians, the Uttarakhand disaster is not natural: it is no less man-made than the other contributors to the tragedy. And if it is indeed induced by global warming, similar catastrophes could recur with increasing frequency and intensity anywhere in the country or in other countries too in the coming years.

**Reasons of the Problem:**

There has also been extensive devastation of local lives and the regional economy. Serious devastation has been reported from over 200 villages. Innumerable locals, including agricultural workers, drowned in the raging waters or were submerged under mud and debris. Houses have collapsed or been washed away. Tourism and the local employment it generates have been hit indefinitely at the peak of the tourist season. Floods, landslides and debris

have devastated agriculture along the rivers. In Uttarakhand, a chaotic process of 'development' that goes back many years exacerbated the effects of this extreme rain. Some of the reasons of the same are:

Extensive deforestation of mountain tracts, by the state and more recently due to 'development' projects, led to soil erosion and water run-off, thus destabilizing mountain slopes and contributing to more intense and frequent landslides and floods.

Unchecked hill tourism has resulted in the huge growth of vehicular traffic, spread of roads not suitable to this mountainous terrain, and the construction of poorly designed and unregulated hotels and structures near the rivers beds.

**Sand mining along river banks has intensified water flows into rivers.**

Most of all, the construction and planning of hundreds of small, medium and large dams across the Himalayan states from Himachal Pradesh and Uttarakhand in the Northern Himalayas to Sikkim and Arunachal Pradesh in the east, have destabilized an already fragile ecosystem and threatened biodiversity. A staggering 680 dams are in various stages of planning, or construction in Uttarakhand alone! These dams have a direct connection with the extent of the damage that can be caused in such flooding events, in that the tunnelling and excavation in the so-called run-of-the-river projects cause huge and unregulated dumping of excavated debris into river basins, leading to increased siltation, and in turn aggravating the flood situation. The electrical power generated by these dams will be consumed by urban elites elsewhere. It is ironic that these dam projects, while adversely impacting people's access to their river commons, claim to be climate change solutions in the guise of renewable and green energy, and have already made huge profits by fraudulently claiming CDM (Clean Development Mechanism) status. In 2009, the CAG had warned the government of Uttarakhand that the "potential cumulative effect of multiple run-of-the-river projects can turn out to be environmentally damaging". Like many other warnings by environmentalists and local community groups in the past, this was also ignored. And now we are facing one of the biggest disasters that the country has seen in decades.

**Part-III**

**What went wrong during Uttarakhand Tragedy:**

On 14th June, 2013 the Indian Meteorological Department predicted heavy to very heavy rainfall in the hilly regions of Uttarakhand in during next 48-96 hours. But they miserably failed at sounding a timely alert indicating the magnitude of the massive disaster.

Under modernization of the IMD, 55 Doppler radars were approved by Government of India way back in 2007-08. The IMD was to furnish an estimated price which would then go to the Ministry of Earth Sciences, which in turn sends it to Planning Commission for approval. But in these six years, the file is shuttling between three departments, moving at a snail's pace and net result is zero. This radar could have saved thousands as a dark storm brewed over the hills of Uttarakhand. Had it not been caught in red tape, the Doppler radar could have sent out timely warnings and thousands could have been evacuated in time.

Dr. Chandan Ghosh, Head of the Geo Hazards, National Institute of Disaster Management said, "Uttarakhand govt. had placed request of Doppler radar (which can forecast cloud burst when attached to supercomputer) with Centre but the same couldn't be installed due to bureaucratic hurdles."

It is a surprise that in the first phase of installation of these radars, Uttarakhand got the miss. Seventeen radars were installed at various locations but none in Uttarakhand.

Despite being prone to frequent cloudbursts, flashfloods and landslides, Uttarakhand has virtually no system in place for early warnings, weather forecasts or even dissemination of rainfall and landslide related data. What is worse, despite the assurances, it may take over an year before the system is deployed in the misery struck hills.

"The valleys of the Yamuna, the Ganga and the Alaknanda witness heavy traffic of tourists. For this, the government has to construct new roads and widen the existing ones," says Maharaj Pandit, professor with the Department of Environmental Sciences in Delhi University. He says that a study should be conducted to assess the carrying capacity of the Himalaya and development should be planned accordingly. According to him, during his visit to Uttarakhand for a research project, his observation: "I was sitting at the Prayag bridge for tea and started counting the number of buses crossing it. Within seven to eight minutes, 117 buses crossed," he says.

Data with the Uttarakhand State Transport Department confirms this. In 2005-06, 83,000-odd vehicles were registered in the state. The figure rose to nearly 180,000 in 2012-13. Out of this, proportion of cars, jeeps and taxis, which are the

most preferred means of transport for tourists landing in the state, increased the most. In 2005-06, 4,000 such vehicles were registered, which jumped to 40,000 in 2012-13. It is an established fact that there is a straight co-relation between tourism increase and higher incidence of landslides.

**Threat from dams**

The Ganga in the upper reaches has been an engineer's playground. The Central Electricity Authority and the Uttarakhand power department have estimated the river's hydroelectric potential at some 9,000 MW and have planned 70-odd projects on its tributaries. In building these projects the key tributaries would be modified—through diversion to tunnels or reservoirs—to such an extent that 80 per cent of the Bhagirathi and 65 per cent of the Alaknanda could be "affected". As much as 90 per cent of the other smaller tributaries could be "affected" the same way.

Pandit says that rampant construction, be it of roads, or dams, has led to land use change and the cumulative effect is getting reflected in the extent of damage rains have caused.

**Landslides more frequent now**

"Our mountains were never so fragile. But these heavy machines plying everyday on the kutcha roads have weakened it, and now we suffer landslides more often," says Harish Rawat, a BSc. student in Uttarakhand's Bhatwari region that suffered a major landslide in 2010.

Rawat lost his home to the landslide when a major part of the main market and 28 shops were wiped out by the landslide. About 25 other houses were destroyed completely.

Another local resident, Ram Prasad Tomar, a driver by profession in Uttarkashi town, says it is road cutting that has made the mountains so weak. He says the way mountains are cut to make roads has rendered the mountains unstable. "Road contractors, who come from outside, do not understand the mountains. Most of the expressways that are being constructed now are tangled in legal cases. After cutting of mountains, landslides continue for up to four years, and contractors go bankrupt clearing the debris," he says.

Padma Shri awardee KS Valdiya told that while "heavy rain and cloudbursts were natural, the tragedy that followed was entirely man-made".

Valdiya, an honorary professor at Bangalore's Jawaharlal Nehru Centre for Advanced Scientific Research, said the heavy loss of life and property in the deluge was a result of "criminal oversight" over the decades of the state's geological features and water channels by various authorities.

"These features are well-mapped and documented. But engineers and builders choose to overlook them," said Valdiya, who comes from the state and has been studying the region for close to 50 years.

The geologist identified four major ways in which constructions flouted scientific norms. First, he said, the seismic fault-lines of this earthquake-prone state were not kept in mind while building roads.

"These tectonic fault-lines, which are active and see back-and-forth movements, have been cut in many places by roads. More dangerously, roads are built along the fault-lines at many places. As a result, tiny seismic movements in the fault-lines weaken the rocks at the base of the roads, making these stretches susceptible to cave-ins and slides," Valdiya said.

The second area of rampant neglect, the expert pointed out, was drainage. "I have never seen road engineers provisioning for draining out all rainwater that can possibly enter the stretch. Where one to two metre bridges are required, they build small culverts. At places where drains have been provided for, these are usually filled with debris."

Buildings have been constructed over old drains and streams, blocking the natural pathways of rainwater, he said. "One of the reasons for the devastation at Kedarnath was that people had constructed houses on the west stream of the Mandakini river that had been dry for decades. When the river returned to its old course following the deluge, these constructions were washed away," he added.

Valdiya said another type of transgression, similar to the previous one, was construction taking place on river flood ways. A flood way is the area covered by the river at the time of its biggest flooding in the past 100 years.

"In places along Alakananda/Ganga such as Karnaprayag and Rishikesh, constructions have taken place on the lower terraces which are part of the flood way. Sooner or later, water would get to these places," the expert said.

Lastly, Valdiya said roads have been built over the debris of previous landslides because it's costlier to build paths higher up on the hills where the rock is firmer.

"Sadly, the department geologists are often no more than rubber stamps, okaying everything the engineers say. Independent geologists are never consulted," he said.

Importantly, the events focus attention on the debate on the December 18, 2012 notification of the Ministry of Environment and Forests, which declares the entire watershed around the 135-km stretch between Gaumukh and Uttarakashi, along the Bhagirathi river, as an eco-sensitive zone under the Environment Protection Act, 1986. This, in practice, bans all construction activity in the area. The State government has been opposing it stoutly, arguing that such an order will adversely affect development and the economic progress of the region.

The notification, if implemented, would result in the closure of hydropower projects of 1,743-MW capacity along the Bhagirathi and a ban on mining and construction, especially of hotels and resorts, and land use conversion. Power projects and mining and construction activities are the main causes of preventable environmental degradation. The Uttarakhand Assembly passed a resolution against it, and Chief Minister Vijay Bahuguna met Prime Minister Manmohan Singh last month to urge him to cancel the notification.

The former Deputy Director-General of the Geological Survey of India, V.K. Raina, told The Hindu that natural calamities such as cloudbursts and flash floods could not be prevented, but deaths and damage could be contained if there were laws to regulate construction along the rivers, and authorities were equipped to deal with the situation. "Construction in Uttarakhand is not planned. The owners have taken a calculated risk and paid for it."

Had India Meteorological Department alerted the State government, authorities should have been prepared to deal with the threat, or they would have stopped more people from going to these places. "There seems to be no accountability and no coordination," he said. "Such things will keep happening in future, and people living in ecologically sensitive areas also have needs which have to be fulfilled…, but there needs to be enough restrictions on the activities, including the movement of pilgrims and tourists."

Suggesting that the States along the Himalayan ranges reconsider their development models, Sunita Narain of the Centre for Science and Environment, said that while there could not be a blanket ban on development activities in these fragile zones, given the needs of the people, "we need to look at ways of development without destroying natural resources."

Terming the Uttarakhand tragedy a "man-made disaster," Ms. Narain said development in the ecologically sensitive areas had to be different from the plains. "We cannot have roads on the Himalayas like the ones on the Alps. The Himalayas are young mountains," she said. Technology was available for this, and one need not depend on the Border Roads Organisation as it outsourced construction works.

Calling for conservation of ecological heritage, Gopal Krishna of Toxics Watch Alliance said no agency should be allowed to build permanent structures in ecologically fragile zones. "Development fundamentalism, combined with religious tourism, is eroding ecological heritage." "In the aftermath of these disasters, if lessons are indeed learnt, all ongoing development projects must be reviewed, and their carrying-capacity and cumulative impact on the Himalayan ecosystem should be assessed and the ecological integrity of the Himalayan watershed made non-negotiable."

Studies conducted by the Chinese Academy of Sciences in Kunming and the University of Delhi on the impact of the dams planned in the Himalayan region predicted that "about 1,700 square kilometres of forests would be submerged or damaged by dams and related activities." "Stage-managed and faulty environmental clearances in India and China contributed to the colossal crisis that is staring us in the face," Mr. Krishna said.

**Part IV**

**What Gandhian Scholars has to say on this: iv**

Gandhian freedom fighter, Sunderlal Bahuguna became a journalist and later turned into a full time activist working for a self-sustaining ecological model for the mountain state of Uttarakhand. He spearheaded the anti-Tehri dam movement and led Chipko movement aimed at protecting and regeneration of native species of trees.

The recent flash floods that ravaged Uttarakhand have given immense pain to an ailing 87 year old Bahuguna. In a freewheeling interview with Manan Kumar, Bahuguna and his equally deserving wife Vimla, spoke about environmental issues troubling Uttarakhand and possible solutions.

Q. How do you view the recent disaster? Was it a natural disaster or man-made?

It is a man-made disaster. When you try force change nature and its landscape, it gets back and punishes you. This was a land meant for meditation, but it has been turned into purely a tourist destination. The government and the big private money have brought in changes on a gigantic scale, totally unsuitable and detrimental for fragile ecosystem of the Himalayas. If the government wants to end this cycle of disasters it should ban excavations, big dams, and construction of roads in higher altitude and fragile regions. Dams on free flowing serpentine rivers are making the living water dead.

Q. But why construction of roads should be stopped? Will it not impact tourism based economy of Uttarakhand?

These mountains are highly sensitive even a little tinkering has a detrimental impact. Roads have done the maximum damage to the mountains. Roads should be constructed only the lower reaches and at the base of mountains, to travel upwards rope-ways should be constructed. This will help us save land which is our most valuable resource. Switzerland has done it beautifully. It has kept the beautiful natural landscape intact by constructing rope-ways instead of roads. Why cannot we learn from Switzerland and do the same here instead of defacing the mountains. Rope-ways has two advantages, one, it does not pollute and two, it does not cut into the mountains and make them fragile and landslide prone. Moreover, tourists got to the mountains to enjoy natural beauty but once lopsided development takes it away then how will you sustain tourism?

Q. Why despite becoming a state, Uttarakhand has failed to take care of its mountains?

Uttarakhand was made a state so that the government can witness the problems faced by people living in remote and difficult mountain areas. But the problem of the government (politicians and bureaucrats) is that it cannot climb mountains. Once I went to Kilsu, near Dodital, and found that no candidate had come there to canvas. I asked a village guy the reason? He said how you can expect these politicians to climb up that too on foot. The politicians and officials cannot go beyond Dehradun. It is place that has all the goodies – railway, airport and big bazaars. For them it is easier to go out but difficult to go up in the mountains. On the other hand, the native who were already suffering from back breaking work of walking with loads of weight wanted road connectivity.

Q. Why our mountains have become barren?

Besides the reason I have already stated, the British policy to plant pine at the cost of indigenous species of Baanjh, Burans and Deodar did a great harm to our mountains. The British wanted trees that could be grown fast, whose wood does not sink and gives good return. Pine suited this. This wrong policy was carried on by our government and people knowing well that pine erodes the soil and makes it saline.

Q. Why did Chipko movement aimed at protecting and regeneration of native species of trees could not sustain?

For the success of any movement you need continuity and increasing interest of the people. That unfortunately did not happen in the case of Chipko. If government and people can still adopt the two slogans given by Chipko, the situation can change. The slogans - Dharench Paani, take the water flowing in rivers to the mountain tops and Dhaal par Taal i.e. plant trees on the mountain slopes can ensure recovery of mountains while keeping the sustainable growth intact.

**Part V**

**Need for Disaster Management Plan:**

It has been observed that adaptation to disasters does not just mean desperate rescue work during and after the event, but also reducing vulnerability and risk before. Effective adaptation involves a series of measures that need to be adopted on a war footing. The sustainable development of a hill economy, and equity – not profit for a few – should be at its core.

NDMA Drill Had Exposed Gaps in State's Disaster Management Planv

Uttarakhand government took no step to address shortcomings in three years.

A mock drill organised by the National Disaster Management Authority (NDMA) in May-June 2011 in three districts of Uttarakhand had raised many crucial questions. After the drill, that was conducted in Dehradun on May 27, Haridwar on May 30 and Tehri-Garhwal on June 1, many solutions were offered to reduce damage in the state in the event of a disaster. None were implemented. The report of this drill is not public yet.

An important observation following the drill noted the gaps in communication between government agencies in the event of collapsed roads and linkages. It also noted that the coordination between various agencies at state and district level was better than at the local level—tehsil, block or town. This, in effect, meant that practical implementation of disaster management would have gaping holes.

"We found that the communication failed due to damage to roads and the kind of terrain the state has, and that it is not possible to have alternate communication routes either," said Jyoti Kumar Sinha, member of NDMA. He said as nothing can be done to ensure that this communication does not break during natural calamities, NDMA made some suggestions.

Food shortages could have been averted

"There is one linear road which connects different villages in Uttarkashi and Chamoli. NDMA suggested locations on roads should be identified where stock of food and supplies can be stored. Storage should also contain relief material for disaster situation," said Sinha. Though landslides have crippled the road, it is still usable, he said. At least the food shortage that many pilgrims are facing today in cut off areas could have been averted to an extent.

No system in place below district level

However, the system works only till the district level. "But to control the disaster at the sub-divisional and tehsil level, no system is available," stated the report. It suggested the state to follow an "incidence response system" under which the sub-divisional officer or the block development officer or the tehsildar becomes the "incidence commander" during a major disaster. In this system, district magistrate coordinates activities of incidence commanders.

This system, along with the seven desk system, can increase efficiency of management and timely communication manifold, said another official of NDMA. The recommendation, as part of a general guideline for all the states, was issued in India in 2003-04. Most states, including Uttarakhand, are yet to implement it.

In fact Kedarnath, one of the most affected areas, has no rain gauge, says the Indian Express. In the whole of Rudraprayag district where Kedarnath is situated, there is just one rain gauge at the district headquarter, it reported.

This shows how agencies like IMD, CWC, NDMA and SDMA have failed to put in place basic systems of warning, forecasting, monitoring and information dissemination that can greatly reduce disaster potential of any area.

In a state like Uttarakhand, which is prone to disasters like cloud bursts, flash floods, land slides, the indiscriminate building of hundreds of hydropower projects, each project entailing dam, massive underground tunnels that need to be blasted through, the roads, townships and deforestation, the disaster and damage potential goes up multi fold, particularly when there are no credible environment of social impact assessments at project or basin level, no credible compliance system in place, nor any carrying capacity study.

Even the wrong operation of projects can add to the disaster potential, as happened in case of Tehri in September 2010.

Too many hydropower projects, underground tunnels, roads, encroachments of riverbeds by buildings coupled with deforestation have worsened the impact of the flash floods manifold. These are places where there is a heavy tourist influx.

The collapse of buildings like a set of playing cards next to the river shows these were encroachments on the riverbed and floodplains. The river needs path to flow and when it takes the path it needs, the disaster for these buildings was inevitable.

There have been seven similar flood-related disasters in Rudraprayag in the last 34 years. The administration should have learnt, this is not the first time such a disaster has hit us.

Both Uttarkashi and the Chamoli-Rudraprayag-Kedarnath area faced monsoon disasters last year in August-September 2012, killing several people.

**Part VI**

**Suggestions for Future in Gandhian Perspective:**

That the governments at the Central and State level retreat to a low carbon pathway of development that has equity, decent employment, and sustainability at its core.

That the planning and construction of dams in the entire Indian Himalayas be reviewed, and all construction be halted until such a review is carried out.

That the use of explosives in all such infrastructure development works is completely stopped.

That, given the likelihood of extreme rainfall events and other climate extremes in the future, extensive and sub-regional warning systems are put in place urgently across all the Himalayan states, the coastal areas and beyond.

That a proper assessment of the carrying capacity of specific ecosystems is carried out.

That the stretch from Gaumukh to Uttarkashi be declared an eco-sensitive zone without further delay.

That a river regulation zone be enforced such that no permanent structures are allowed to be constructed within 100 metres of any river.

That the residents and their organizations are thoroughly consulted in a democratic plan on climate change, in the revival of the local hill economy, and the generation of decent employment.

That local people are compensated for the loss of life and livelihood, and that urgent plans are put in place for the revival of local livelihoods and agriculture.

That the central government learn from the Uttarakhand catastrophe to put in place prior adaptation measures not just for the mountainous regions but beyond, for coastal and the drought-prone interiors as well.

**Part - VII**

**Ground Realties in the Present time:**

The State Government reopens pilgrimage to Badrinath, Yamunotri and Gangotri by September end.

Clamped a blanket ban on construction of houses and commercial establishments along river banks and announced setting up of a statutory body for development of flood-hit areas.

In Delhi, Finance Minister P Chidambaram said financial aid will be sought from multilateral bodies like the World Bank and the Asian Development Bank for reconstruction and rehabilitation of the devastated areas in Uttarakhand.

Facing flak for the mushrooming illegal constructions on river banks, many of them used as hotels and tourist lodges, present Uttarakhand Chief Minister Vijay Bahuguna ordered a blanket ban on construction of houses and commercial establishments in such areas.

Further, Unveiling a slew of steps being taken at a press conference, he said a Rehabilitation and Reconstruction Authority, to be chaired by him, will be set up to look at, among other things, safeguards required to face challenges that may arise in coming decades.

**Part – VIII**

**Lessons Learnt from the Uttarakhand Tragedy:**

A super cyclone had struck 14 coastal districts of the Odisha State on Oct 29-31, 1999. Around 10,000 people were killed that year, as high velocity winds, blowing at nearly 300 km per hour, destroyed homes. But learning new lessons from the past and of course from the Uttrahkhand tragedy, the Odisha Government done a commendable job in minimizing casualties due to Phailin. Before the cyclone could hit the State, people from the affected areas were shifted to the safer places, electricity was cut so that damaged could be minimized and proper health care facilities were provided alongwith the food supplies. Further, the host of agencies have decided to put in place mechanisms to ensure they are not taken by surprise the next time.

**IMD to Improve Weather Forecast**

The IMD will improve its forecast mechanism in the landslide prone areas by installing more state-of-the-art Automatic Weather Stations and 'closely spaced' Doppler instruments for monitoring and developing an Early Warning System, NDMA officials say. GSI has started preparing an 'inventory' of landslides in five worst-affected districts of Uttarakhand by stationing 20 geologists.

**Arctic Sea Ice Connection**

The Geological Survey of India (GSI) has decided to map all moraine-dammed lakes in the Himalayan catchments and assess their geotechnical stability, after the Gandhi Sarovar Lake breached earlier this June leading to the devastation in Kedarnath. The government is also considering another presentation by the Earth System Sciences Organisation, which suggests a 'physical link between intense monsoon convection over north-west India in Uttarakhand and melting of Arctic Sea Ice.

**Conclusion:**

As in the very beginning mentioned that several recent events like flash floods, earth quakes, forest fires, too much rain falls, cloud bursts, unexpected snowfalls and Sunami and other incidents in different parts of the world are the result of global warming resulting from the increase in atmospheric absorption of the heat being radiated from earth's surface, has made the people to realize that there is something wrong with the environment. Now the larger society and environmentalists in particular as well as policy makers seem to have woken up and have started discussion on the problems of Global Warming and Climate change. In India's context, the impact of global warming is already visible in the fast retreating Himalayan Glaciers, declining snowfall, razing average temperature, excessive floods and shift in vegetation. As global warming is a threat not just to our environment but to the all-round growth and development also. In this respect, a crucial UN climate Summit was also held in Copenhagen in December 2009, calling for an early action to combat this threat. Today, the fact remains that sustainable development requires taking from nature as much as it can replenish. Accordingly, it requires Gandhian principle of wantlessness or non-possession which enjoins man to learn how to live in harmony with nature and his fellow-beings and even with animals. He had warned man to stop thoughtless and blind exploitation of natural resources in the pursuit of his endless quest for greed and material comforts. Regarding approach to holistic life, Gandhi does not approve of the Western concept of accumulation of unnecessary material which is based on mass production leading to the culture of maximum consumption and consumerism as our insatiable desires to have more and more, have accelerated the process of depletion of natural resources. In fact containment of wants is relevant and directly connected with natural resources and bio-diversity and eco-system. His advice was commendable when he argues that happiness does not depend on riches and worldly comforts but internal satisfaction and self-suffering for the cause of others. His idea of trusteeship was also a symbolic one in the direction of spirituality. Even Gandhi stressed on holistic approach where there are ethics in economics and religion in politics. Very convincingly he explained: "The Earth provides enough to satisfy every man's need, but not for anybody's greed." Gandhi had already warned against the craze for machination and blind industrialization where man had become a cog in the machine and he was shocked to know that due to this, the hands of millions of workers had ceased to work as hands and now the problem of unemployment is very much visible and alarming in almost all developing countries. Hence, there is much relevance of Gandhi's approach to appropriate technology with human face. To Gandhi science and spirituality must go hand in hand otherwise science without spirituality would result in disaster and would pose a threat to the world. In this respect, Gandhi's approach can provide a suitable alternative if we care for the welfare and existence of the mankind otherwise Nature has its own ways to create as well as to destroy. Gandhi's message of simple living and high thinking can be followed to change the life style to protect the Ecology and Environment. It would depend on us, how serious are we in this context, is a question to be answered?

We all know that it is not possible to return back to environment of earlier days. But by the practice of Buddha's, Gandhi's and other spiritual leaders teachings we can minimize or overcome the environmental pollution if there is a sense of awakening amongst those countries which are producing maximum toxic gases in the world and keeping remarkable contributions in polluting the environment thus the environmental crisis.vi

To make all livings happy The Buddha emphasized on the Kerma of oneself. As you sow so you reap. If you destroy the nature, nature will destroy you. There is no exception. As Buddha's teachings tell us that everything is interconnected and interrelated through the concept of dependent origination, the theory must reach the scientists and technologists of the developed country so that there brings no harm for their actions to the living beings of the world specially to the existing environment.