Lessons from Uttarakhand

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June 2013 has been a month of catastrophe, trials and suffering in the Garhwal Himalaya in Uttarakhand. This is the region known as Devbhoomi, or the abode of the Gods, sacred to Hindus, Buddhists and Sikhs alike. The source of the most sacred river in India, the Ganga and its biggest tributary, the Yamuna lies in the region called Gangotri and Yamunotri. This is in West Garhwal, but between that and the Eastern most Garhwal glacier of Pindar lies the source of rivers such as Mandakini, Alaknanda, Bal Ganga and Bhilangana. The holy temples of Badrinath and Kedarnath, together with Surkandadevi, Budha Kedar, Hemkund Saheb, etc., are all a part of Devbhoomi. The Jyotirling at Kedarnath was the northern most dham of Adi Sankara. It is the ambition of every Hindu and every Sikh to make a pilgrimage to Devbhoomi before he or she dies. This region, together with Ladakh, Himachal Pradesh and Arunachal Pradesh borders China through Tibet. The Chinese have always eyed these territories with greed and all of them have been subjected to Chinese incursions from time to time. These high mountainous regions are very remote and overlooked as they are by the Tibetan Plateau, they are almost impossible of access from the Indian side, but not so for China through Tibet, where the going is easier because of the Tibetan Plateau. For the defence of these areas, therefore, it is vitally important that roads should be built and the British built Hindustan Tibet Highway is a prime example of the need to have a road infrastructure up to the border. That is why the Border Roads Organisation (BRO) has been working on road construction for a number of years and that is why some connectivity has been provided to distant places. These roads also connect sacred places where pilgrims congregate and this has had a major impact on the Himalaya in general and Garhwal in particular. We shall revert to this shortly.

The Himalaya is one of the youngest mountain ranges in the world, being fold mountains formed by plate movement. The Himalayan Range is still growing, which means that because of tectonic pressure and dynamics the mountains have not stabilised. This is in sharp contrast with the igneous rock based mountain ranges such as the Aravallis, Vindhyas and Satpuras, which are amongst the oldest mountain ranges in the world and are relatively stable. By contrast the Himalaya is still in a state of metamorphosis. It is also a fact that the Himalaya is the watershed which provides India with large perennial rivers which are full of water even in the summer through snow melt. By contrast the rain fed rivers of peninsular India carry a much smaller post monsoon flow and if the monsoon is not regular and the catchment has been deforested, many of the rivers just run dry.

Young, unstable mountains have a tendency to suffer from land slide. Soil stability is ensured by vegetation, ranging from grasses to shrubs to trees. Whereas the lower slopes have a combination of broad leafed trees and, as one moves up of pinates and ever greens, the higher slopes naturally are largely pinate ever greens, such as deodar, blue pine, fir, etc. Wherever there is vegetation there is relative soil stability. Neeru Nanda, an IAS officer (now retired) did a study of the Tehri and Uttarkashi Districts of Garhwal in 1986-87. In her book, bearing the title "Forests for Whom?" Neeru writes "In myth and religion Uttarakhand is typified by the Ganga, holy river of the Hindus, which surges out of the yawning cavernous mouth of the Gangotri glacier at Gaumukh, foaming white spray forming a high mist, like a cavalcade escorting the massive torrent as it rushes down the sacred Himalaya to nurture the great North Indian Plain.

Nowadays we repeat the old legend of the descent of the Ganga, giving it a new significance. Shiva, the Lord of the Himalaya, came forward to break the gigantic descent of Ganga from heaven. As the mighty river got entangled and dispersed in Shiva's matted locks she began meandering her slow way down to give life and sustenance to the Indo-Gangetic Plain. Thus Shiva's locks saved the earth from being washed away by the force of her torrent. We can take this legend as a symbolic explanation of the role played by the matted roots of Himalayan forests in protecting the entire ecosystem, not only of the Himalayan mountain system but also of the Gangetic Plain. But Shiva's locks have been shorn now. Like Samson, the strength of the great Himalaya, bereft of their mighty forests, is being slowly sapped away".

This quotation is very apt because in the recent flood fury we have seen how a fragile mountain range, whose ecological system has been dangerously disturbed, wreaks destruction when incessant rain swells the rivers and they become raging, uncontrollable torrents. Normally water creates a course for itself to enable it to flow in a defined channel. When, however, that channel is disturbed that same life giving water becomes a weapon of destruction. The hills which contain water in a defined channel themselves began to crumble in the absence of vegetation and the resultant landslides destroy roads, disrupt the flow of water, cause the rivers to rampage and directly attack the habitation of man. That is exactly what we have seen in Uttarakhand.

For why this happened there are many reasons, for which we have to go back to the British Forest Policy between 1818 and 1859. The East India Company ruthlessly destroyed the ecology and economy of Kumaon and British Garhwal. During this period there was clear felling, especially for sleepers for railway construction. This, incidentally, caused widespread destruction in the Central Indian Forests also, where sal and teak were mercilessly cut for railway sleepers. One Capt. Reid and his associate, Finn, were largely responsible for the massive deforestation and this was followed by the British Government policy of a silvi culture system which clear felled pristine forests and converted them into uniform age class mono culture of sal and, in the higher regions, pine. A.E. Osmaston, in preparing a working plan for Garhwal in 1921-22 has said, "It is the Himalayan broad leafed forests which protect the myriads of mountain streams which go to maintain the village 'sera' and the water system of the hills, which, in turn, goes to feed the Ganges". Despite this, broad leaved forests were destroyed, eventually leading to widespread water scarcity, drought and depressed agriculture. As Neeru puts it, "A well knit cyclic relationship can be established – broad leaved forests maintained the water system of the Himalaya which, in turn, supported agriculture and good harvests, to which leaf compost and cattle manure contributed significantly. Maintenance of large herds of cattle was made possible only by the existence of extensive broad leafed forests where the system of transhumance could be practised… Through reckless destruction of broad leafed forests under taken by government fiat, the British Government not only destroyed the ecosystem and local economy, it also failed in its avowed objective of advancing the mono culture of chir pine. This failure of the system can be established by citing one particular phenomenon, that of mass felling of chir pines by storms in which sometimes a single storm was seen to destroy over a lakh of pine trees in a contiguous belt in areas which have been brought under scientific management by British rule. Such mass destruction during storms is often reported in Garhwal and has been personally witnessed by this writer in 1982-83 in Mori-Naitwad area of Purola sub division in Dehra Dun District".

The greater accessibility of the region because of roads originally meant to be military highways has brought about a sea change in the nature of pilgrimage in Uttarakhand. It has also resulted in our hill stations being absolutely inundated by tourists. In the Char Dham, or Devbhoomi, pilgrimage goes back to well before Adi Sankara. As pilgrimage increased the remote region began to be connected by designated foot paths along which the pilgrims trekked. Every eleven miles was a Chatti, a place where pilgrims get refreshments, even a meal and, if necessary, shelter for the night. Naturally the pilgrims numbered only a few thousand, just sufficient for the destinations to be able to accommodate them, feed them and permit them to have darshan. There was minimum disturbance of the environment, not many buildings existed and the few that did took into account the topography. Between man, nature and prayer there was a delicate balance and the system survived. Then came roads and now suddenly travel was done by bus. However, the Garhwal Mandal Vikas Nigam and Kumaon Mandal Vikas Nigam created only that much of infrastructure which could attract and cater for a larger number of pilgrims than before, but still within the bearing capacity of the region. However, when motor cars which provided individual transport explosively proliferated, traffic on the roads, the number of visitors to Char Dham and the demand on local resources grew exponentially. The hills saw a frenzied growth of construction activity in which hill sides were cut, the land rendered hollow by excavation for building materials and the rivers became constricted as whole new towns grew on their banks and sometimes even in their beds. Massive deforestation took place in order to accommodate all these new activities and the hills became exposed and scarified. Samson lost his locks and his strength was sapped. Then came the rains, and what rains! The sodden earth of the mountains, whose angle of repose is steep and has stability only because of the binding force of vegetation, suddenly became subject to a classical slip circle as the soil supersaturated and then there was drawdown. Naturally massive landslides took place and the combination of rushing waters and falling hills swept away everything in their path. Roads, bridges, buildings, vehicles, all disappeared and only those survived who could cling on to a supporting structure rock face or some flat ground.

There is also the question of dams on rivers. The power of water exceeds the power of any weapon of mass destruction. The latent energy of water is greater than the sum total of all nuclear energy. It is essential to harness this energy as a source of electricity because in the long run it is the cheapest and certainly the least polluting. It is alleged that dams built for this purpose are responsible for floods because they constricted the flow of water, held it back and when it did break away it came in the form of destructive floods. Certainly if obstruction is caused in the course of water flow consequences would follow. Either the obstruction would be overtopped and toppled, or the water would either bypass it or burst its banks and spread into the flood plain. This has happened with some run-of-the river projects, which have been wiped out. Tehri dam officials, however, state that the reservoir of the dam has prevented downstream flood which would otherwise have destroyed Rishikesh and Haridwar. Nevertheless dam construction on mountain rivers in unstable seismic zones, where the soil itself unstable, is a very difficult proposition. However, the hydro electric project at Uhl, Jogindernagar has survived for more than eighty years without damaging the environment and continues to supply power to Himachal Pradesh and the Punjab. Similarly the massive hydel projects on Gersoppa and Jog falls built by the Mysore Maharaja, under the guidance of Sir M. Vishewsarayya, continue to thrive to this day. That means that it is possible to plan structures on rivers which harness the water for hydro electricity, without damaging the environment or disturbing the ecological balance. If the Mysore

Maharaja could do it, if the British could do it, surely the IIT Roorkee which, as the Thompson College of Engineering, produced the best hydraulics engineers in the world can also do it. Why can it not design projects for harnessing hydel power, without disturbing the balance of nature, of our mountain rivers? Why can the other IIsT not participate in evolving technologies which should be appropriate for the mountainous regions? If they are unable to do so, why are we wasting our funds on them?

One disturbing things about the recent events is that whereas we have been extremely worried about the pilgrims from outside who came to visit Devbhoomi and were stranded, no body seems to be worried about the local residents. The Army, Air Force and ITBP performed a heroic task at considerable risk to themselves, which included losing twenty men in a single helicopter crash and rescued more than one lakh people. The Air Force established a world record in rescuing people by helicopter. The way the Indo-Tibetan Border Police, the Army and the Air Force have performed makes us very proud of them and of the country. The way politicians have behaved makes us thoroughly ashamed. The pilgrims were saved, will go home, mourn their dead but eventually slip back into their normal lives. However, there are the local people who live in villages which are scattered, do not have road connectivity, have very little electricity and where people eke out a living from the soil. The destruction of their hills by construction which caters to the pilgrims and other tourists and the resultant fury of nature have destroyed their villages, their fields and their means of livelihood. What does the government intend to do for them? What sort of rehabilitation and development do they need? How does one restore their schools and ensure their upgradation, how does one give them health care, how can their land be made productive once again so that they can earn a livelihood? These are issues which have to be addressed very seriously, much more seriously than has ever been done before.

The highest priority would be to try and restore the hills, the environment and the ecological balance which kept them intact and enable the people to survive. Regeneration of the forests, partnership of the people in the process and generation of employment thereby would have to be made universal and all-embracing. The second would be to try and improve the means of communication without necessarily building roads which would be chocked by the vehicles of people coming from all over India in the hope of finding salvation. The third would be to give to the people that expert advice which could enable them to move from subsistence agriculture into agriculture which could make them reasonably prosperous. All this is within the realm of the possible, provided there is political will. The district administration is very thinly spread on the ground and, therefore, it clearly did not have the manpower or equipment to deal with a disaster of these dimensions. However, government must have a relook at the district administration and ensure that it is adequately equipped to deal with the day-to-day development requirement of the local people. A massive administrative exercise is needed in this behalf. Will it be undertaken?

One encouraging things about the present situation is the Bhilangana and Balganga valleys, which are still largely undisturbed and have not suffered much damage. From Ghamsiali to Ghuttu and Budha Kedar the fury of the elements did not strike viciously. Here is a living example of what can be achieved if nature is respected and left undisturbed. Therefore:-

1. Road connectivity of major pilgrimage sites should be kept limited, private vehicles should not be allowed beyond a point, most pilgrims must travel on foot, but

arrangements can be made to travel by public buses, the numbers of which are controlled and can carry a limited number of passengers.

2. The number of pilgrims admitted to a particular site must be limited. The limit should be that which is within the carrying capacity of the site to be visited. There should be no permanent construction at pilgrimage destinations for accommodating visitors. If accommodation is provided it should be tented so that there is no excavation for building materials, no site clearance, no felling of trees and no construction on river banks.
3. An aggressive policy of afforestation must be adopted so that deforested areas are rehabilitated and vegetation of the appropriate type is used to stabilise the hill side.
4. In the short and medium term we will have to maintain well trained and well equipped teams of rescuers and persons who can handle a natural calamity, with the location of each team being carefully designed so that man and machines can come into action very quickly in case of any natural disaster.
5. Any intervention in such eco-sensitive areas should be minimal, be attuned to the fragile nature of the region, not based on any construction beyond the bearing capacity of each settlement and the region as a whole.
6. The tourism load should be kept to a manageable level and should not exceed the bearing capacity of the region. Matheran does this very competently by not allowing any vehicle into the town limits and beyond 'gadi-adda'.
7. If pilgrims have to go on foot beyond a point the pilgrimage load would decrease. Let us encourage this.
8. Let us either independently set up an institution in this behalf, or entrust the task to IIT Roorkee, which can advise government on every aspect of engineering intervention in the region which ensures growth and development, but which does not cause environmental damage.

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