

Himalayas: A Wake-Up Call

(Blunders – Lapses - Threat -
Need for Action - Consequences)

Colonel KS Dhami (Retd)*

All is not lost with melting of glaciers – yearly rains and snow in the catchments areas will keep the rivers flowing. The danger lies from glacial lakes bursting; and in the water run-off due to reckless degradation of Himalayan forests and pastures – storehouse of water – which can keep the rivers flowing even when there is no rain. The source of the Indus, Himalayas oldest river, is not a glacier but moss covered earth named by the Tibetans “Senge Khabab” (Lions Mouth) - marked by Chortens and prayer flags.¹

In the build up to the ‘Copenhagen Summit on Climate Change’ a number of extreme views were expressed on the effect of global warming on melting of Himalayan glaciers. The Intergovernmental Panel on Climate Change (IPCC) claimed that Himalayan glaciers ‘will melt by 2035’ and on the other extreme was Dr VK Raina’s claim that there was ‘no abnormal melting’ ; Minister Jairam Ramesh took the middle path with the view ‘all was not well’ .These controversial opinions have led to embarrassment and lack of credibility of many individuals and organisations—not to mention doubts amongst the people.²

All these controversies could have been avoided if a ground check had been done and taken into account the “*International Geophysical Year 1956-57*” programme during which a number of Himalayan glaciers were studied and their snout position fixed. In 1955 Geological Survey of India organised an expedition to the Bara Shigri glacier as India’s part of this programme.³ Geological Survey of India (GSI) should have this information. From these

*Colonel KS Dhami (Retd) was commissioned into 14 Horse on 12 Jun 1960. Later, he volunteered for the Parachute Regiment, commanded 6 PARA and took premature retirement on 01 Jan 1983. He has trekked across the Himalayas extensively and recorded the changing state of glaciers, icecaps, rivers, ecosystems and wildlife.

fixed positions of snouts and those taken every five / ten years one will have a clear ground-based- data covering over 50 years period to put aside all doubts about the abnormal melting rate/ retreat of glaciers. If this has not been done it would be a major lapse – another ‘Himalayan Blunder’. It is also surprising that such an important ground-based-data observation – giving conclusive evidence – has not been brought out by anybody especially by the GSI and other institutions keeping track of Himalayan environment.

The IPCC has erred with the date ‘2035’ but not with the assessment that ‘most of the Himalayan glaciers are in an abnormal melting state’. The Government is responsible for its failure, in not coming out with data to clear doubts on the melting rate of Himalayan glaciers because it has organisations, resources and expertise at its disposal to do so conclusively. It was left to Dr VK Raina, retired deputy director-general of the GSI, to draw attention that melting of Himalayan glaciers by 2035 assessment was wrong and there was ‘no abnormal retreat’, but then stated that he could not give ‘conclusive evidence’ as there was only one automatic weather monitoring station in the Himalayas.⁴ One wonders where Government scientists/advisers and its aided institutions were, whose job it is to keep a tag on what is happening in the Himalayas—a serious omission or just incompetence or not bothered. In our governance system ‘the buck does not stop’—it keeps rolling ensuring no one is held accountable.

The serious threat is from deforestation and glacial lakes. With too much hype and focus on glaciers, the greater threat in the Himalayas from bursting of glacial lakes and water run-off due to deforestation is not getting the attention it deserves. Bhutan is the only country in the Himalayas where the forests are being preserved and potentially dangerous glacial lakes identified for taking protective measures. After the devastating 1994 flash floods, the Royal Government of Bhutan (RGB) – with assistance from GSI — emptied glacial lakes posing danger through controlled bursting and preserved some for their scenic beauty through stabilising works. Now it is controlling dangerous ‘glacial lakes outburst flooding (GLOF)’ with Japanese assistance.⁵

On the question of glaciers retreating and some advancing, the ground reality is that most Himalayan glaciers are melting at

an abnormal rate, some more than others, depending on their location and glacier characteristics. Some glaciers are not just retreating; they are shrinking and cracking, the limit of ablation rising, and accumulation zones decreasing. It is the increase in volume/weight of glaciers that leads to true advance of glaciers. You cannot judge the true advance of the glacier from the snout only as it is possible that the advance could be due to sliding of the glacier consequent to fragmentation / shearing. Some glaciers, as a whole or on breaking up, advance and then stop/melt forming a moraine dam behind which glacial lakes are formed.

Nepal and Bhutan have no doubts on climate change and its effects; and despite their limited resources have taken preventive measures. Nepal has 49 weather monitoring stations at selected locations and a network of 12 stations (more coming up) set up with German help to collect ground-based data on glaciers / glacial lakes. Bhutan has similar set up and a labour oriented force for inaccessible places.⁶

Precipitation in the Himalayas is in the form of rain and snow-plus avalanches fed snow on glaciers. With global warming the snowline has gone higher. *At some altitudes where once it snowed now it rains; and nothing melts snow and ice more than rain.* Trans-Himalayan regions which were considered to be in the rain shadow now have been infiltrated by monsoon rains. The combined effect of rain at higher heights, rise in ablation limit due to increase in temperatures, and reduction of accumulation zones, is the major cause of fast retreating /disappearing glaciers, ice caps, snow beds/shelves.

To get a true and broad view of the state of the Himalayan snow cover, glaciers and glacial lakes there is a need for high resolution remote-sensing satellite system, ground - based monitoring stations and most important, ground observation. From start of the winter till May/June the higher regions of the Himalayas are covered by a white mantle of snow making it difficult to differentiate glaciers, ablation limits, lakes and snow fields. It is from May that true picture of the landscape emerges and scientific means and ground observation can be carried out to note glacial retreat/advance, snow / debris covered ablation line and yearly mass balance. The period from June to the beginning of winter snows, is also the time to take corrective action to drain out glacial lakes threatening to burst and turn into 'mountain tsunamis'.

Bhutan, which is most prone to formation of glacial lakes, has taken protective measures starting from 1994 when a glacier lake burst causing loss of life and massive damage to villages, roads, bridges and power projects. In 1998, Bhutan with its labour force armed with digging tools – against time – reduced the waters from high altitude Raphstreng Tso glacial lake, the water level of which had reached dangerous level. The lake was seven days march from the road head. Another glacial lake Thorthurim Tso (with three times the water of the lake that burst in 1994) has formed in the upper reaches of the Po Chu (river) is being controlled with Japanese help. Bhutan and Nepal have set up surveillance of potentially dangerous lakes (20 in Nepal, 24 in Bhutan) to give timely warning.⁷

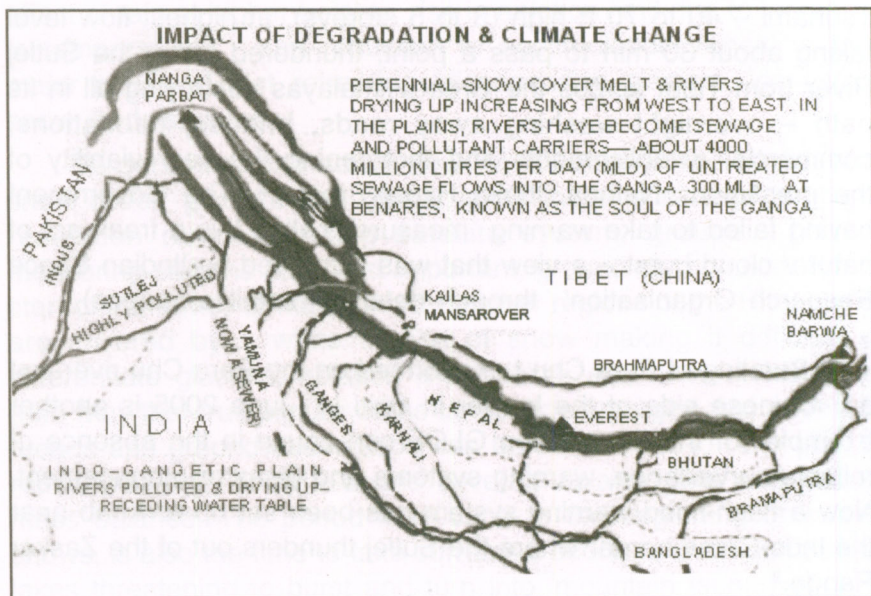
The surveillance and warning systems in Bhutan and Nepal consist of electronic sensors, transmitters, sirens, personal deployed with wireless sets and satellite phones. *GLOF can result in catastrophic consequences if timely preventive steps are not taken as has recently happened in the 'Sutlej Basin'.*

In the Indian Himalayas, the most destructive have been the bursting of a glacial lake on the Sutlej in Tibet. On the night of 31 July / 1 August 2000, a massive wall of water – a Himalayan Tsunami – 40 to 70 ft high (3 to 5 storeys), at highest flow level taking about 30 min to pass a point, thundered along the Sutlej River from Tibet across the Great Himalayas destroying all in its path – overnight washing away roads, bridges, habitations, commercial establishments and threatening the very viability of the prestigious Nathpa Jhakri Hydel Project.⁸ (The Government having failed to take warning measures called this a freak act of nature/ cloud burst – a view that was disproved by 'Indian Space Research Organisation' through detailed satellite images).

Bursting of Para Chu Lake formed on the Para Chu river just on Chinese side of the border in Spiti in June 2005 is another example of the devastation GLOF can cause in the absence of reliable surveillance, warning systems and disaster management. Now a flash-flood warning system has been set up at Khab near the Indo-China border where the Sutlej thunders out of the Zaskar Range.⁹

Time has run out for discussions, ritual meetings and waiting for more data; which, with clear ground situation before you, will only be of academic value. The hill - folk who are most affected are not interested in whether Himalayan glaciers are melting due to climate change, black carbon/brown clouds, natural or divine causes—they want action on the ground. Added to this is the constant threat in the Himalayas of landslides and cloud bursts.

For the Defence Forces, what is happening in the Himalayas is a serious security matter. GLOF triggered through natural cause, sabotage, raids, aerial strikes is a potential threat, which beside causing economic damage can disrupt operations and ground maintenance routes at critical times. There is an urgent need for the Armed Forces for continuous surveillance and monitoring of glaciers, glacial lakes; and carrying out controlled bursting of those that are dangerous. Four big Himalayan rivers – Indus, Sutlej, Karnali and the Brahmaputra – have their source in Tibet and three have a long run before entering India. The extent of destruction can be visualised from the floods in the Sutlej basin caused from floods originating in Tibet. Overall coordination and compiling data could be done jointly by the 'USI' and the 'Adventure Cell' in the Army HQ. Refer to the map below:-¹⁰



The resources are there on the ground: Unmanned Aerial Vehicles for Surveillance, Satellites, Army and Para Military Forces, personnel of GSI and Mountaineering Institutes. What is lacking is a sense of urgency and coordination of effort by Central and Hill State agencies.

It is not possible, nor is it necessary to get ground based scientific data and physical ground monitoring of all Himalayan glaciers. A few that could be selected to cover the complete Himalayan Range are: Kolahoi (Kashmir), Bara/Chhota Shigirj (Lahaul), Gangotri (Central Himalayas), Khumbu (Nepal) and Thorthom (Bhutan) or glaciers that have been identified as 'benchmark'. In the Trans-Himalayas Region, Parkachik glacier, which has easy access, in the Suru valley, Ladakh could be selected. Army units and Mountaineering Institutes located near these could do the ground check. Coordination of the Eastern Himalayas could be done by The Himalayan Mountaineering Institute (HMI) Darjeeling, the Council Members of which include representatives of Nepal and Bhutan Governments.

The need of the hour is for action on the ground for the sake of the mountain folk and ultimately for the people of the Indo-Gangetic Plain – collection of data can carry on simultaneously. The emphasis should be on monitoring formation of glacial lakes and steps to stop them from bursting, through controlled draining/blasting; and a foolproof flood warning system to measure, transmit state of dangerous glacial lakes and forecast water level upstream.

"Natrusahat Param Balam" (There is no greater force than Enthusiasm)

- Bhagawad Gita

This is the spirit expressed in the Nepal and Bhutan scientist's motto "Rugged as the Himalayas we will not Buckle". Indian Government departments/organisations/aided institutions - totally out of touch with ground realities – can take a cue from them: not be chair borne, and show the 'will and spirit' to perform.

Indian hill states – J&K, Himachal, Uttarakhand, Sikkim and Arunachal – need to act quickly on the lines of Bhutan to manage glaciers and deforestation in the interest of their hill-folk, and not depend wholly on the Centre.

There should be no doubt that the main cause of accelerated global warming is destruction of forests and carbon emissions. We cannot stop the *Himalayan glaciers and the snow cover from melting, but forests can be preserved and increased – they are the key to survival.*

Global warming, on noticeable basis, began with the Industrial Revolution when tree cutting started on a massive scale to fuel it. Environmentalists then warned against its harmful effects, if cutting of forests went on uncontrolled. Deforestation in the Himalayas started with the East Indian Company in 1816 – exploitation continued under the Crown. *Yet, it is the post-Independence period that saw massive cutting of trees—with no thought of its disastrous affects.*

The signal from the recently concluded Copenhagen Summit on Climate Change is clear – you are on your own—keep beating the drum but do not forget our mountains, rivers and the poor. It is time to accept the challenge. Survival lies in proper balance between development and acceptable carbon emissions; preserving and planting forests on a massive scale; controlling explosive population growth, accountability and clamping down on rampant corruption.¹¹

End Notes

This article is based mainly on my experiences and ground observations and interaction with locals during my treks and drives across the Himalayas from the extreme East to the West including Bhutan, Nepal and Trans-Himalayas regions of Indian Himalayas. My particular interest was in forests, glaciers, icecaps, rivers, ecosystems and wildlife.

1. Empires of the Indus by Alice Albinia, Published by John Murray, 2008, page 306. The book is a work of research covering the story of the Indus from the sea to its source.
2. News Report Times of India 11 November 2009 and other papers / media reports before and after the Copenhagen meet on Climate Change which covered the controversy regarding melting of Himalayan glaciers by 2035
3. <http://hplahaulspiti.nic.in/River.htm> refers to the International Geophysical Year 1956-57 programme covering fixing snout positions of glaciers and participation of Geological Survey of India

4. <http://www.worldwildlife.org/who/media/press/2009/WWFPresitem14549.ht> Gives details of steps taken by Bhutan after the Glacial Lake Outburst Flooding (GLOF) in 1994. It is after these floods that Bhutan got on to taking protective measures against GLOF.
5. Ibid 2
6. <http://www.scidev.net/en/features/monitoring-climate-change-at-the-top-of-the-world.html> Gives details of weathering stations set up by Bhutan and Nepal.
7. Ibid 6
8. <http://www.indiatogether.org/2005/jul/gov-sutlej.htm>. More detail of the damage caused is covered in an article "Sutlej: The Untamable Himalayan Powerhouse" in Hindustan Times dated 3 August 2005 by self.
9. <http://www.indiatogether.org/2005/jul/gov-sutlej.htm>. mentions of the Diplomatic failure in engaging the Chinese into sharing vital data on river hydrology within its territory
10. Map showing 'Impact of Climate Change'. Pollution Figures given in News report in The Tribune, Chandigarh, 5 November 2008. The government decides to declare Ganga a National river.
11. More on the Himalayas magnificence, degradation and consequences is on my website: www.himalayanecotrails.com, plus details of a slideshow "Himalayas: The Last Awakening Call", a presentation which was given by me at the Prime Minister's Office on 15 October 2007.