

Paradise Lost: Lessons to Learn

Climate Change Should Alert Global Community Before it is Too Late

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1. Introduction

The worst-ever flood of 7 September 2014 that deluged Kashmir has given rise to enormous challenges both to the government and people. Aftermath of natural calamity particularly rehabilitation of hundreds of thousands needs coordinated efforts, comprehensive planning and professional management which includes making residential areas habitable, restoration of basic civic facilities, focus on health care delivery system and educational institutions and above all providing shelter to homeless and means of livelihood to those who lost everything because of this major disaster. Wisdom need to be summoned to overcome the crisis.

Jammu & Kashmir (J&K) is situated in one of the most captivating and tumultuous geographical regions of the world. J&K is nestled in the Himalayan, Pir Panjal and Karakoram mountain ranges, at the cross rounds of South and Central Asia. Kashmir is known as “paradise on earth” because of its enchanting beauty throughout the world. Its high snow-clad mountains, scenic spots, beautiful valleys, rivers with ice-cold water, attractive lakes and springs and ever-green fields, dense forests and beautiful health resorts, enhance its grandeur. Each and every millimeter of the valley demonstrates unmatched natural beauty. There are Siwalik Hills towards the south and very lofty mountains in the north, the peaks of which always remain covered with snow. The territory of J&K lies between four degrees of latitude from 32.17 to 36.58 north. (Fig 1).

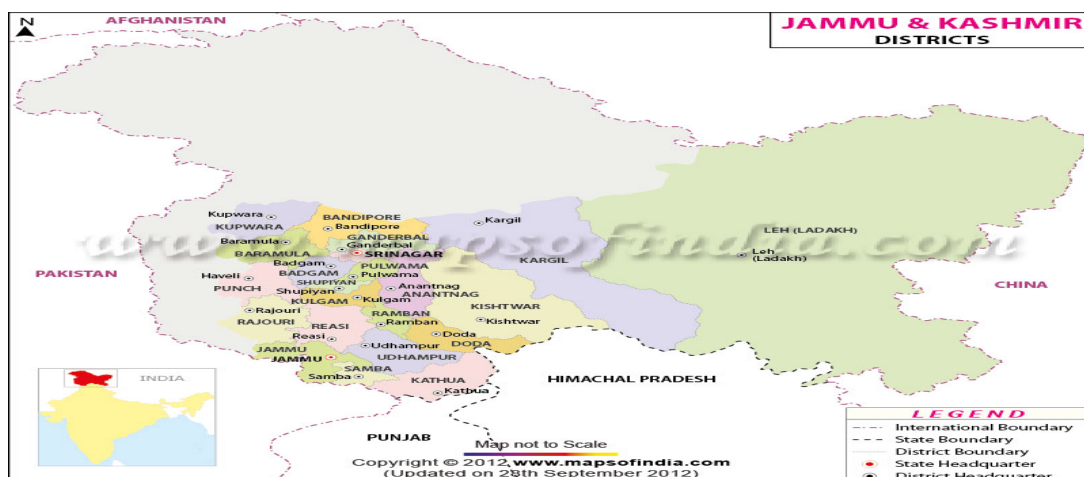


Figure 1: The Map of J&K showing all Districts and Major Roads

[Source: <http://www.mapsofindia.com/maps/jammuandkashmir/jammuandkashmir-district.htm>]

The State of J&K lies between the hot plains of the Jammu Province and coldest dry table-land of Ladakh. These territories are, as such, transitional in climate. Winter is cold and of long duration. Summer is very short and milder.⁽¹⁾ Kashmir has an area of 15220 square kilometers. It possesses some of the highest and most beautiful mountain peaks, massive glaciers, blue lakes, rivers, forests, and meadows. In the 1901 Census of the British Indian Empire, the population of the princely state of Kashmir was 2,905,578 with Valley's population 1,157,394.⁽²⁾ According to 2011 Census J&K's total population is 12548926 with 124 density. Srinagar has a population of 1250173 and density 1056, with district area of 294 square kilometers having 70% flood affected area. All the heavy rain and snow melt of south Kashmir must flow through a narrow stretch of about 10 km of flat land between the plateau of Srinagar airport to the west and the spurs of the Zabarwan range to the east.^(3,4)

2. Deluge in Paradise

During the first week of September 2014, the incessant rains in J&K resulted in unprecedented floods that tell the tale of human misery not witnessed by this state in over 100 years. Kashmir has been ravaged, people have been dispossessed, thousands are in mourning the passing away of their loved ones, hundreds and thousands are in a state of shock. The signs of history, art, culture, heritage, architecture and pristine natural beauty stand demolished. After the dam near Rajbagh in Srinagar fell, Jhelum and Dal Lake became one within minutes. Water level at some places rose up to 25 feet. In Anantnag district, houses were submerged while people were asleep. Since there was swirling water everywhere, people kept moving to upper levels of their houses till either there was no more room left to move up or they were rescued. Those in smaller

houses could put up little resistance. The catastrophe will resonate with people's lives and history, unless we fail to write it down. (Fig 2-a, b).



Figure 2(a, b) : The satellite photos show lakes where fields used to be, and in entire communities only the roofs are visible.
[Source: Digital Globe and Google]

The destruction and devastation caused by floods has been a nightmare. Hundreds of educational institutions suffered a colossal damage. Six large hospitals in the city were inundated in the floods. Fourteen children/neonates died at the G B Pant hospital after the water entered the hospital. Due to the floods the doctors and paramedical staff also couldn't reach the hospitals hitting the services badly here. A large number of patients remained trapped in the hospitals, with families having no means to contact the patients. Large number of patients was also evacuated by the defense forces from the hospitals.

3. Environmental Concerns

English writer Sir Lawrence WR,⁽⁵⁾ who was appointed the first Settlement Commissioner of Kashmir, in his book "The Valley of Kashmir" in 1895 describes the vulnerability of Kashmir to floods: "The flood of 1893 was a great calamity, but it has had the good effect of warning the State that valuable house property in Srinagar was inadequately protected and works are now in progress which may render Srinagar secure from inundation. But the security of the city unfortunately means loss to cultivation on the banks of the river above Srinagar, for all floodwaters of the south must pass the city to the outlet at Baramulla. The more, therefore, that Srinagar is protected, the more obstruction will be there to the passage of waters from the south. All things point to the fact that the founders of Srinagar have bequeathed a serious engineering problem to their successors, and some say the only way out is to lower the bed of the river at Baramulla, regulating the water level of the valley by gates. Perhaps a solution might be found in edging.

Odisha's super cyclone in 1999 and Cyclone Hudhud of 12 October 2014 striking Odisha and Andhra Pradesh, torrential rains in Mumbai in 2005, Uttarakhand downpour in 2013 and now J&K floods constitute five clear weather related events in just fifteen years, each causing massive devastation and human misery. Exploitation of natural resources, human greed and unplanned urban development has started showing its effect on climate change.

3.1 Deforestation

Survival of Kashmir with its distinct identity is dependent on the survival of forests. Forest cover excluding the urban forests was estimated to cover about 50 percent of total geographical area of Kashmir helping to maintain the moderate temperature. Forests of Kashmir by helping to keep the climate cooler, high pressure maritime wind currents moving from the Mediterranean Ocean does not cause heavy precipitation over Kashmir. This is the reason why Kashmir always gets only partial monsoon related disturbances. In the past several decades, due to lack of accountability, Kashmir has been losing forest cover at an alarming rate. According to some estimates, 10,000 conifers are axed annually in Kashmir turning 40 percent of forest cover into human habitation. Likewise, timber smuggling mafias who operate with have devastated forests. Kashmir has undergone extensive, but the chaotic growth of concrete structures everywhere due to absence of proper planning for urban development, deforestation, blocking of water channels, clogging of Jhelum river and culminating into the current episode of fateful flooding.

Moreover, “carbon footprint” has been on the rise in Kashmir contributing significantly to the rise in atmospheric temperature. As soon as the spring ends in Kashmir, the population begins to swell to many million extra individual in the form of a million Amarnath pilgrims and visitors of all types. Their stay and movement in and out of Kashmir requires transportation and other logistics, contributing to an overall increase in the carbon footprint. Likewise, maintaining the presence of more than half a million security personnel round the year and throughout Kashmir requires huge logistical support, therefore, constant vehicular movement for bringing in supplies and shifting of personnel contributes further into the vehicular pollution, this along with the consumption of charcoal and wood in winters adds significantly to the carbon footprint. The immediate effect of enhanced carbon footprint is the rise of temperature in the mountain climate of Kashmir.

3.2 Climate Change

The current situation in J&K could very well be another manifestation of an extreme weather event, induced by a changing climate. It is a combination of an intense and unprecedented rainfall event combined with mismanagement (of natural drainage) and unplanned urbanization and lack of preparedness reminding of impact of climate change. More than 50 percent of the lakes, ponds and wetlands of Srinagar have been encroached upon for constructing buildings and roads in the past 100 years. It also noted that the banks of the Jhelum River have been taken over in a similar manner, vastly reducing the river's drainage capacity.

In 1928 has witnessed a heavy flood when the river Jhelum carried a discharge of 80,000 cusecs (2265m³/s) against the capacity of 32,000 cusecs (906m³/s). At that time many villages across south and north Kashmir were affected leading to the huge loss of life and damage to the property (mud houses in particular). In 1950, the floods of similar magnitude hit the valley when the flood flow encountered due to the discharge of about 35,000 cusecs.

The areas of south and central Kashmir were affected with the flash floods while in north places like Hajin and Naidkhai were the main sufferers. In July 1959, River Jhelum, swollen with a sudden high-volume release of glacial melt, breached its banks at several points and the resulting floods reportedly caused 82 deaths.

The repeated flood problem in the valley is due to inadequate carrying capacity of the river Jhelum in its length from Sangam to Khandanyar. Just upstream of Srinagar at Padshahi bagh, a flood spill channel with capacity of 481 m³/s (17,000 cusecs) takes off to by-pass the city. People have been filling in the wetlands around Srinagar for construction just as they have been filling in the Dal. In spite of flood spill channel, floods can be caused by Jhelum in the Srinagar town, if the discharge of river through the town exceeds 991m³/s (35,000 cusecs).⁽⁶⁾

4. The Inside Story

On September 7, 2014, the roaring waters of the Jhelum tore apart the embankments and flooded the low-lying areas, taking by surprise a population of nearly a million. It was not a matter of hours, rather within minutes, the low-lying localities were inundated. It will take years before the whole story of the flood-caused devastation in Srinagar would be told in words and pictures. Such is the magnitude of the tragedy that has befallen the state. Nature's fury and its impact would be felt for decades to come. Flash floods resulting from slow to extremely intense rainfall starting from south Kashmir area (Kulgam, Anantnag, Pulwama) and progressing in the central Kashmir (Srinagar) and ended at north Kashmir (Sopore, Baramulla, Bandipora) swept away mountainsides, villages and towns, thousands of people, animals, agricultural fields, irrigation canals, domestic water sources, roads, bridges, and buildings – in short, anything that stood in the way. The valley remained disconnected with the rest of the world. The devastating flood wiped out large portion of both public and private infrastructure as well as business. Situation in Jammu province is no different. Several villages were badly affected. Rescue teams failed to reach many cut-off villages during first ten days in various districts (particularly Poonch, Rajouri, Reasi and Udhampur) of the Jammu region. Landslides have destroyed houses built on hillocks in these areas. Besides, 74 people including members of a marriage party, who were travelling in a bus, were washed away by flood in Rajouri district. 27 people have also died of floods in Poonch district. (Fig 3: a,b,c)



Figure 3 (a,b): Deluged Kashmir



Figure 3 (c): Udhampur Panchari Village (Jammu Province of J&K) wiped out in 1 minute

In his book “The Valley of Kashmir”, Walter Lawrence says “Srinagar city was inundated twice in the 19th century — 1841 and 1893. In 1893, Srinagar turned into a lake and Maharaja Amar Singh provided rescue boats and made people move to safe places.”⁽⁵⁾ Scientists have been warning for long that drainage channels of the city were blocked due to the construction of new colonies and the link between the lakes had been cut off because of unplanned urbanization. The wetlands and lakes act as sponge during floods, but now residential colonies have been constructed on them. The recent floods have exposed the need for saving wetlands in Kashmir.

The **Jhelum** River flows in India and Pakistan. It is the largest and most western of the five rivers of Punjab, and passes through Jhelum District. It is a tributary of

the Chenab River and has a total length of about 725 kilometres (450 mi).⁽⁷⁾

The **Dal Lake** (jewel in the crown of Kashmir) is located within a catchment area covering 316 square kilometres (122 sq mi) in the Zabarwan mountain valley. The open area of the lake has been reduced to 12 sq km from 24 sq km and its average depth is down to three metres due to the silt. The lake covers an area of 18 square kilometres (6.9 sq mi) and is part of a natural wetland which covers 21.1 square kilometres (8.1 sq mi), including its floating gardens. Vegetable growers have encroached into the lake. Multi-story buildings and small crafts factories have been set up on illegal landfills created by the land mafia. Hence, the lake’s ability to naturally drain out the flood waters has greatly suffered.⁽⁸⁾

The **Wular** in Bandipora district is one of the largest fresh water lakes in Asia was formed as a result of tectonic activity and is fed by the Jhelum River. The lake's size has shrunk by 87.58 sq km in the last century from 217.58 sq km in 1911, the lake area reduced to 130 sq km in 2011-12 during a demarcation by the revenue department. However it faces environmental threats including the conversion of large parts of the lake's catchment areas into agriculture land, pollution from fertilizers and animal wastes, hunting of waterfowl and migratory birds and weed infestation in the lake itself.⁽⁹⁾

5. Survival First

The devastation caused by the flood is colossal. It claimed hundreds of human lives and destroyed everything that came its way—residential houses, schools, colleges, hospitals, paddy fields, orchards, government establishments and businesses et-cetera. It has rendered thousands of people homeless and jobless. The destruction around has left the entire society traumatized.

One of the major problems faced by people has been the breakdown of entire communication network in Kashmir, creating chaos and adversely affecting the rescue operation. Television and Radio Kashmir had to suspend its operation after water flooded their offices. Surface transport was equally affected particularly the 300 kilometer National Highway (lifeline of Kashmir).



Figure 4 (a)



Figure 4 (b)



Figure 4 (c)



Figure 4 (d)

Figure 4 (a, b, c, d): Glimpses of human misery during the deluge

6. Healthcare Sector

The floods have taken a heavy toll on the state-of-art hospital buildings and sophisticated biomedical equipment and losses are estimated to be few hundred crores INR. Some of the premier hospitals in Srinagar were closed for more than three weeks due to ravaging floods. These hospitals have suffered massive damage to infrastructure and high-end diagnostic machinery. The private health sector has also suffered a huge loss. In Karan Nagar (a medical hub) all the private diagnostic centres equipped with latest and high-end machinery.

The lone Children Hospital at Sonwar, has been closed due to inundation of the entire area. Here, over 500 persons including attendants, patients and hospital staff were stranded for over 50 hours without any food and drinking water. Out of 300, at least 180 neonates/children from Children Hospital were rescued and admitted to 92 Base Hospital when flood waters rose.

As flood waters entered lone maternity (Lalla Ded) hospital of Kashmir on September 7, patients, doctors, attendants and new born were caught in worst-ever catastrophe faced by the State. By the evening of September 7, hospital basement was flooded with about 10 ft of waters. The power supply disconnected, generators failed, oxygen supply failed, no blood reserve in the blood bank and whole building was reeling under the darkness. There was utter desperation and utter helplessness. Two neonates, who were on ventilators, expired in the evening as oxygen supply had failed. At least 30 neonates and premature babies were on oxygen when the flood water submerged the hospital. On fourth day, hospital staff somehow managed to get out of the hospital. As desperation grew, patients were asked to leave the hospital if they wish to do so as unhygienic atmosphere could have taken many lives. More than 300 patients and 400 attendants were trapped in the hospital for four days (Fig 5).



Figure 5: Maternity (Lalla Ded) Hospital, Srinagar

At Bone & Joint hospital, all patients were evacuated and shifted to a Nursing Home at Gupkar. Another government hospital at Bemina bypass, SKIMS Medical College, which receives patients from entire north Kashmir comprising of three districts, was the first hospital that took the hit in the flood, damaging its ground floor.

The areas of Srinagar marooned in the flood waters have been declared as hotspots for outbreak of communicable diseases by the health department and people have been advised to be cautious while dealing with water and food items. The diseases which may spread due to flood and polluted water include cholera, typhoid, measles, Hepatitis A and E, leptospirosis, Acute Respiratory Infections (ARIs), Acute Diarrheal Disease (ADD), Conjunctivitis and Rabies. People of these areas have been advised to be extra cautious while dealing with water and food items. Post Traumatic Stress Disorder (PTSD) is on the rise in Kashmir after the worst ever flood hit the state. Psychiatrists in Srinagar say that there has been a remarkable increase in the number of patients who were suffering from “early symptoms” of PTSD. There are patients who are witness to the ordeal caused by the floods. Though it takes around three months for a person to fully develop the symptoms, psychiatrists are trying their best to treat the disorder before it takes a more alarming shape. During 2005 Snowstorm in Waltengo Nar village of Anantnag district, trauma affected the mental health of people for several months. Children suffered more. The impact of disaster on children is mediated by personal experience, developmental competency, parental reaction and the level of disaster response. Children show higher level of intrusion and avoidance during the aftermath. Social cooperation and extra care by parents towards children is essential to overcome the trauma.

A high level team of Government of India has estimated the losses to health infrastructure at over 256 crore INR terming the loss as “colossal.” The team headed by Union Health Minister, Dr Harsh Vardhan, visited the State on September 14 and carried out the assessment of the damages to the equipment and infrastructure in the hospital due to the floods.⁽¹⁰⁾ But health experts estimate the loss around 500 million INR. Revival of the healthcare delivery system (particularly large teaching hospitals) is a bigger challenge and is likely to take more than a year. The Union Health Minister proposed that boats should be mobilized to send medicines to the people of the flooded areas of Srinagar. These “floating clinics” can be used to

deliver medicines, first aid and other supplies to those areas where floodwaters are yet to recede and boats are the only mode of access. Presently several NGOs and local volunteers have set up Medical Relief Camps in different localities to deal with the outpatients. Passionate volunteers in huge numbers contributed to the cleaning operations in the hospitals. What is needed most is to restore the inpatient services including Operating Rooms, as quickly as possible.

7. Baby Boom

More than 3,500 babies were born in government hospitals in Kashmir at the peak of devastating floods that affected most of the tertiary care hospitals in the Valley. Nearly 2,300 normal deliveries and 1,260 Caesarean sections were conducted from September 4 to 20 in various District hospitals of Kashmir which were functional during this period. Some deliveries were conducted by the doctors under candle light.

8. Education Sector

The floods have adversely affected the education infrastructure in almost all the flood-ravaged districts and some schools need to be rebuilt as they have collapsed or suffered extensive damage, whereas others need major repairs.⁽¹¹⁾

The deluge has completely destroyed thousands of school buildings while thousands others have been partially damaged, rendering them unfit for schooling. According to official figures, out of 11526 primary and middle school buildings, 1986 have collapsed while 2685 were partially damaged. As per the departmental survey, 2397 students enrolled in different primary and middle schools have been left without buildings.” The private schools have also reported heavy loss to infrastructure of more than 1500 school buildings”.⁽¹²⁾ Another 450 schools in private sector have suffered extensive damage.

9. Economic Impact

The government of J&K on 29 September, 2014 termed Kashmir floods as an international disaster. “This was not a disaster of national but international ramifications,” Chief Secretary, Khanday MI said. Earlier, Prime Minister Narendra Modi had declared Kashmir floods as a “national

disaster". He said this was a classic case on urban flooding and would be studied worldwide. Kashmir was hit by one of the worst floods in a century in which thousands were rendered homeless. Kashmir had suffered losses in excess of 1 trillion (100,000 crore INR). Across the State, 125000 families have been affected due to floods. "According to a rough estimate, the housing sector in Kashmir has suffered losses over 30,000 crore INR while the business sector had suffered losses worth more than 70,000 crore INR". In 2010, minister for Public Health Engineering and Flood Control had prepared a report seeking 2200 crore INR warning a massive flood in Kashmir. "Had the project been sanctioned, Jhelum and the flood channels that retained 35,000 to 50,000 cusecs of water would collectively have retained 120000 cusecs of water, which was the discharge of the flood," the chief secretary said. He also stated that 5642 villages were affected across the State with 2489 in Kashmir valley, 3153 in Jammu division and 800 villages remained sub-merged for over two weeks. Giving details of the damages the Chief Secretary said more than 350000 structures – mostly residential houses – have been damaged in the floods, which were the worst in the state over the past 112 years. "More than 83,000 'concrete' houses have been fully damaged while 96,089 such houses have suffered partial damage. Similarly, 21,162 'kucha (non-concrete)' houses have been fully damaged while 54,264 such houses have been partially damaged". "The crop losses have been to the tune of 5611 crore INR including 1568 crore INR losses to the horticulture sector," adding 6.5 lakh hectares of land has been affected by the deluge. "Over 10,000 milch animals and 33,000 sheep and goat perished in the floods". Tourism infrastructure and government residential colonies have suffered losses to the tune of 5,000 crore INR.^(13, 14) Loss to higher educational institutions has been estimated to be over 100 crores INR.

According to Kashmir Center for Social and Development Studies (KCSDS) affected 2,600 villages - 1,700 in Kashmir and rest in Jammu. Over 390 villages were fully submerged and 1,225 partially in Kashmir resulting in colossal damage to housing and business sectors. The summer capital of Srinagar, and Anantnag and Kulgam saw the devastating flood wiping out large portion of both public and private infrastructure as well as business. The worst hit is the housing sector which has witnessed damage to 15 percent infrastructure. As per rough estimates damage to housing sector has been 30,000 crore INR. The KCSDS, which is an amalgam of experts from fields like economy, academics and business, said that out of 20,50,000 houses in J&K as per 2011 census, at least 3,00,000 houses have got either fully or partially damaged. "On an average we have calculated that every affected house has suffered a damage of 1000,000 INR including the household items," said the statement. The Group has calculated damage to public infrastructure at 25,000 crore INR as a vast network of roads and bridges and government institutions have been washed away by floods while premier hospitals located in the city have been badly hit both in terms of infrastructure and machinery.⁽¹⁵⁾

According to Kashmir Traders Federation, the business community has suffered a massive damage of 30000 crore INR. Of 400,000 shops and business establishments, as per KSCDS, at least 100,000 have been badly destroyed and the losses include spoiling of stocks, merchandise and infrastructure. The agriculture and allied sectors which were severely hit in south Kashmir districts have suffered damage of 3000 crore INR as paddy, fruits and vegetables have been washed away by floods and the transport sector faced loss of 500 crore INR, according to KCSDS. The loss to public infrastructure spanning health, education, roads, government buildings etc has been pegged at 25000 crore INR. The tourism, transport, horticulture have similarly been laid low. More so, the tourism which is likely to suffer a debilitating impact of the flood for some time to come. Not only has the tourist infrastructure like hotels taken a battering, the tourist confidence has also been shattered. According to KCSDS, the projected loss from the drastic drop in tourist arrivals and the continuing establishment costs will be around 10,000 crore INR.⁽¹⁵⁾

Major road connectivity in the state was disrupted as landslides at many places have blocked the 300-km National Highway from Jammu to Srinagar. Bridges, culverts, and other installations along the highway have been damaged. As per official estimates, of total 15517 roads around 12553 have been completely or partially damaged across J&K in the flood. Road infrastructure suffered damages estimated at 1427 crore INR. Moreover, the floods have also damaged 272 bridges, 306 culverts/footbridges and 242 approaches to bridges. The road infrastructure of the Roads & Buildings department has suffered damage worth 916.38 crore INR.⁽¹⁶⁾ The tragedy of the families dependent on manual labor for much of their annual income is compounded by the fact that the season is over for the year, and is unlikely to resume even next year given the destruction of the roads and bridges in the area. Several thousand valley families will now fall below the poverty line.

10. Rebuilding the Paradise

The epic tragedy in Kashmir offers a unique window of opportunity for real-time design of policy. There are many interpretive models of a smart city mostly anchored on innovation in design on land use—for homes, business, government offices, public transport and recreational space—and use of information and communication technology for efficiency in energy management, adoption of green energy and practices that make growth sustainable. In essence: efficiency and harmony with nature. Government should emulate cities that were rebuilt post disasters. Greensburg in Kansas which was flattened by a mile-wide F5 tornado in 2007 chose the green, smart route to rebuild the city. Fukushima which was bludgeoned by an earthquake, measuring 9 on the Richter, and tsunami is being rebuilt with new concepts. A better weather forecasting (Doppler radars) and other modern systems should be a top priority. The Asian Development Bank, the World Bank, and the Global Facility for Disaster Reduction and Recovery (GFDRR) of the World Bank can be approached for help and to quantify the need for financial resources in recovery and rehabilitation. It is not

only about money. It is also about building our own capacities in disaster risk management and in post disaster reconstruction.

According to financial expert Drabu H, “there are three distinct steps in this process: first, the guidelines for damage, loss and needs assessment; second, conducting damage and loss assessments after disasters, and third, estimation of post-disaster needs for Recovery and Reconstruction. Deriving the financial needs for recovery and reconstruction can be done following a sector by sector damage and loss assessment, which itemizes distribution and priority setting based on sectors of the economy, and different population groupings in the affected area.”⁽¹⁷⁾

11. Learning from Adversity

The state of Jammu and Kashmir is exposed to natural disasters including floods, cyclones and earthquakes which are major threats to its economy. Of late, there have been floods in 1950, 1954, 1957 and 1959 and out of these the floods that hit Kashmir during 1957 and 1959 were two floods of greatest magnitude recorded in Kashmir. In the past, all boats in Dal, Wullar lakes and other water bodies would be commandeered with the owners given premium compensation whether they were actually used or not. They would be attached to different police stations to remain available on call and a good number of them would be loaded on the trucks and kept in readiness in control rooms for deployment. Sand bags were procured in large numbers to plug the breaches. There would be a daily press briefing by the top officials of the government, which would also create a feeling of readiness for people of low lying areas that they might have to evacuate any time. People witnessed buildings tumbling down, bridges collapsing and carcasses of animals floating around and dashed to electric poles and trees. Water gushing into residential colonies turned them into the ghost towns with no sign of life but only occasional cries of birds which could be heard from far off places, giving an impression as if there was no life. Disaster management occupies an important place in the policy framework as it is the poor and underprivileged who are most affected on account of calamities and disasters.

12. Strengthening the System

According to Union Minister of State for Home “the recent floods have shown that preparation level in J&K to deal with such calamities was not up to the mark and favored urgent measure to ramp up disaster management capabilities in the country. “We have seen helplessness in the administration of J&K. Preparation level was not up to the mark.”⁽¹⁸⁾ Most important point is whether such natural disasters can be managed in present high tech age to avoid or limit death and destruction. It could have been done, had administration taken prompt and effective measures to disaster of advance warnings from remote sensing department and weather forecast from the Meteorological (MET) department, who had predicted excessive rains and possibility of floods, 24 hours in advance. Defense Forces and National Disaster Relief

Force (NDRF) have discharged their mandatory role of rescue operations with full responsibility but the commendable work done by local youth at the risk of their lives without material and equipment has been phenomenal and heroic. Rebuilding is a real challenge. Focus should be on planting of trees on a large scale. Timber smuggling and logging has to be confronted with urgency. Grasslands, which are used for pasturing, should be converted into woodland.

13. Looking Ahead

The writing on the wall is how to safeguard the health of an ecologically sensitive region. Kashmir needs technological innovation that will enable people to produce more welfare without tampering with nature and history of living in this beautiful valley. It also needs an institutional revolution not only to modernize irrigation bureaucracies but the whole apparatus of administration. There is need to rejuvenate small and medium towns in Kashmir. Innovative and robust administrative system is required to meet the challenges of the deluge. Moreover, it needs a strong political will.

14. Summary

Through the centuries, earthquakes, fires, floods and war have leveled many of the world's great cities. There have been historic disasters like the U.S. cities Galveston, Texas; Dayton, Ohio; St. Louis, Missouri; Anchorage, Alaska; Greensburg, Kansas 2007; and Antigua, Guatemala, 1541; Lisbon, 1755; Hungarian city Miskolc, 1878 flood; Saint-Pierre, Martinique, 1902; San Francisco, 1906; Tokyo, 1923; Berlin, 1943-45; Hiroshima, Japan 1945; Mostar, Bosnia, Brisbane experienced major flooding in 1893 and 1974 ; 1992-95; Beirut, 1975-90; New Orleans 2005; Port-au-Prince, Haiti, 2010; Santiago, Chili, 2010; Australia, beginning in December 2010; Japan Tsunami, 2011 and City of Evans, Colorado, 2013's devastating floods. But Cities Were Destroyed and Completely Rebuilt. As recovery efforts begin in areas ravaged by floods, rebuilding may seem like an impossible task right now. But rebuilding will happen. Why we pretend the next storm won't happen—and flush billions in disaster relief down the drain. Government must create the taskforce for Rehabilitation and Reconstruction Authority to co-ordinate the rebuilding programme. One can hardly see the majestic Chinars, the fragrant pine trees and the luxuriant weeping willows that provided harbor to those buffeted by the fates? The enchanting beauty of Mughal gardens, refreshing springs and breathtaking waterfalls bemoan the state of the torn apart land, the polluted streams, and the suffering people. To pursue development with concern for the fragile Himalayan environment is essential. Eco-sensitive development is more sustainable and equitable. Taking full advantage of scientific advances particularly in MET Sciences, Information Technology and rebuilding the cities/towns is an inescapable necessity. Emergency preparedness is absolutely essential.

References

- [1] <http://www.peacekashmir.org/jammu-kashmir/geography.htm>
- [2] The Imperial Gazetteer of India (Volume 15), pp. 99–102.
- [3] http://www.jkenvis.nic.in/administrative_demography.html
- [4] Digest of Statistics, 2011-12 .: http://www.jkenvis.nic.in/administrative_demography.html
- [5] Sir Walter Roper Lawrence. The Valley of Kashmir (1895), published by Asian Educational Services, 1895, ISBN 8120616308, 9788120616301.
- [6] <http://www.kashmirmonitor.in/news-unplanned-development-caused-havoc-72626.aspx>
- [7] Jhelum River -- Encyclopedia Britannica. Retrieved on 2013-10-04.
- [8] Jain, Sharad K; Pushpendra K. Agarwal and Vijay P. Singh (2007). "Hydrology and water resources of India". Dal Lake (Springer). p. 978. ISBN 1-4020-5179-4. Retrieved 27 December 2009
- [9] Wular Lake". World Wide Fund for Nature India. Retrieved 17 March 2010
- [10] <http://www.risingkashmir.com/goi-team-pegs-loss-to-hospital-infra-at-rs-256-cr/>
- [11] <http://www.greaterkashmir.com/news/2014/Sep/29/survival-first-schooling-can-wait-10.asp>
- [12] <http://www.risingkashmir.com/floods-damage-1000s-of-schools-in-valley/>
- [13] <http://www.risingkashmir.com/kashmir-floods-an-international-disaster-govt/>
- [14] <http://www.kashmirmonitor.in/news-flood-loss-put-at-rs-1-lakh-crores-72752.aspx>
- [15] <http://www.greaterkashmir.com/news/2014/Sep/28/devastating-deluge-12-lakh-families-hit-in-jk-40.asp>
- [16] <http://www.greaterkashmir.com/news/2014/Sep/29/flood-ravages-jk-s-road-infrastructure-8.asp>
- [17] www.greaterkashmir.com/news/2014/Sep/25/opinion.asp
- [18] <http://www.risingkashmir.com/jk-inadequately-prepared-for-floods-goi/>