

# Kashmir Floods 2014: Realities versus Possibilities

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## Abstract

Jammu and Kashmir has been witnessing floods and other natural disasters from times immemorial. There have been many events on account of floods especially in the Kashmir Valley on account of its bowl shaped topography which makes it one among the most vulnerable regions of the country. The state of Jammu and Kashmir witnessed one of the worst floods in its history on 7<sup>th</sup> of September 2014 leaving life paralysed especially in the capital city of Srinagar and adjoining areas. Considered to be an unprecedented event, the Flood fury inflicted a loss of more than one lakh crore rupees as per the official estimates. The hardships were further aggravated due to communication breakdown and as such a poor response initially. However, the need felt was to have a robust response mechanism to deal with such disasters in future in order to save life and property. Flood Early Warning System needs to be strengthened all across the region to ensure timely warnings and forecasts. Prioritisation of both structural as well as non- structural measures needs to be made on both short and long term basis. Despite some big initiatives like the World Bank funded Jhelum Tawi Flood Recovery Project (JTFRP) or the PMDP, need to strengthen the Institutional Mechanism at various levels remains of paramount importance.

## Key Words

Disaster Vulnerability Structural Mitigation Rehabilitation

## Introduction

Jammu and Kashmir State with a geographical area of 222236 sq. kilometres covers the northern most extremity of the country and is divided into three distinct geographical divisions (Jammu, Kashmir valley and Ladakh). Given its geography the state has no homogeneity with regard to its topography and drainage. Similarly the climate of the State differs from one region to another on account of variations in altitude. While most of the Jammu region experiences climatic conditions similar to that of Punjab plains, the valley of Kashmir experiences temperate climatic conditions and the Ladakh region with deserted conditions qualifying it to be called the cold desert. For administrative purposes the state is divided into 22 Districts.

Jammu and Kashmir is a multi-hazard prone state where natural disasters like earthquakes, floods, Landslides, avalanches, windstorms have been witnessed of and on. Most parts of the Valley of Kashmir fall in Seismic Zone V while as Jammu and Ladakh regions fall in Seismic Zone IV. In the recent past the region has witnessed some major natural disasters which include avalanches in 1995, blizzard in 2005, Kashmir earthquake of 8<sup>th</sup> Oct. 2005, Floods of 2006, Leh Cloudburst and Flash floods of 2010 and the latest September 2014 Floods. Huge losses have been incurred by the State on account of both life and property. However, the September 2014 Floods have been declared as the worst over a century with economic losses beyond Rupees one lakh crores in addition to 300 deaths, thereby qualifying as the worst economic disaster worldwide of 2014. As per the statistics released by Ministry of Home Affairs, Govt. of India, Jammu and Kashmir constituted around 5.2% with reference to number of deaths due to natural hazards in the country in 2005. Similarly the State constituted around 44.3% deaths due to flash floods to the national figures in the year 2010 owing to August 2010 Ladakh flash floods. The State on an average contributes around 4% and

3% share in the total number of deaths due to landslides and avalanches respectively in the country. In addition, the state also occasionally faces windstorms, hailstorms, fires, drought, cloudburst, etc.

Institutional Mechanism to deal with disasters in the State has been put in place especially after the enactment of the National Disaster Management Act (2005), by notifying the State Disaster Management Authority and the DDMA with Chief Minister as the Chairman of the SDMA and the Deputy Commissioner of a District as the Chairman of the DDMA respectively with different stakeholders as its members. However, it has been observed that in absence of a full-fledged and dedicated authority at the State as well as lower levels there is an urgent need to strengthen the SDMA as well as the DDMA.

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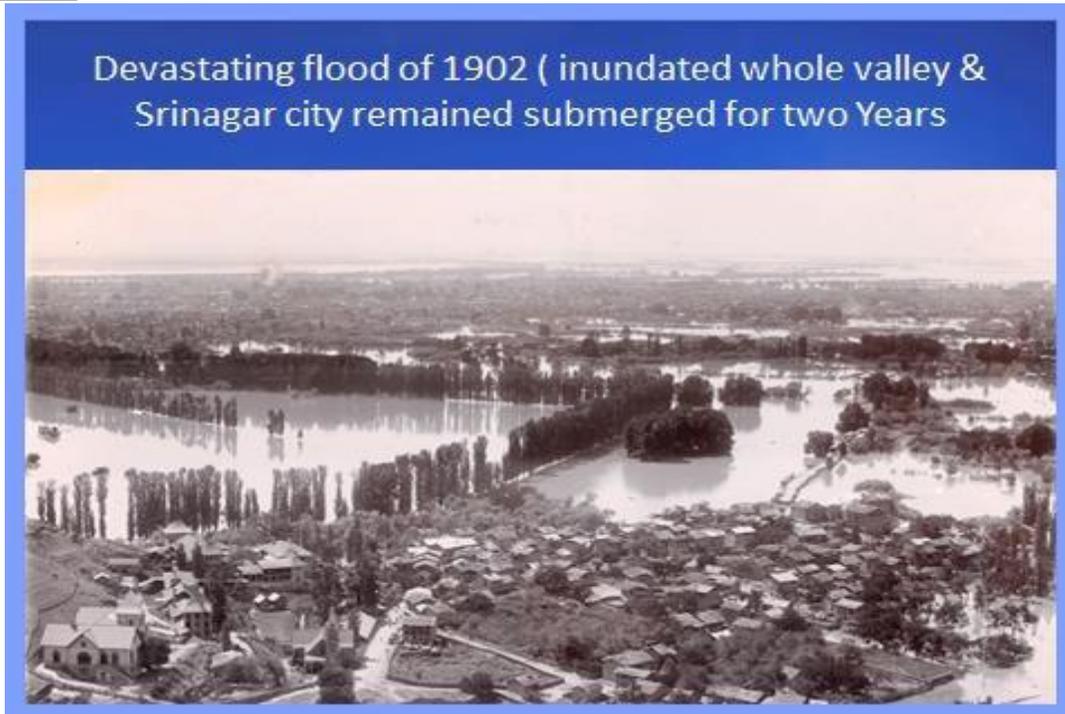
### **Flood Vulnerability of Kashmir and September 2014 Floods**

Jammu and Kashmir is fast witnessing the impacts of global warming and climate change. Coupled with large scale deforestation, unplanned urbanization, encroachments and environmental degradation, the State is fast losing its glory on account of natural scenery for which the State was known and would earn millions of rupees through tourism sector. The climate of the State is becoming warmer day by day and the seasonal patterns are fast changing with extreme weather events of too much or too little precipitation in the form of rain and snow. There are areas which are permanently experiencing drought like conditions and there are areas which would hardly receive any precipitation that now get flooded (2010 flash floods in Ladakh) is a living example. The flood vulnerability scenario in the Jhelum basin has worsened during the last few decades as most of the wetlands that used to act as sponge during flooding, have been urbanized and converted into concrete landscape in the entire Kashmir valley

As per the available information, Floods in Kashmir have occurred at regular intervals in the past in **1903, 1905, 1909, 1928, 1948, 1950, 1951, 1953, 1954, 1956, 1957, 1959, 1962, 1963, 1964, 1969, 1972, 1973, 1976, 1986, 1992, 1995, 1996, 2006 and 2014**. Out of all these floods, the floods of **1903 & 1959** were considered to be the worst of all till **2014**.

BUT, the Flood of **2014** is in no doubt the most devastating breaking all the previous records (*Deptt. of Irrigation & Flood Control, Govt. of J&K*).

**Flood of 1902-03**



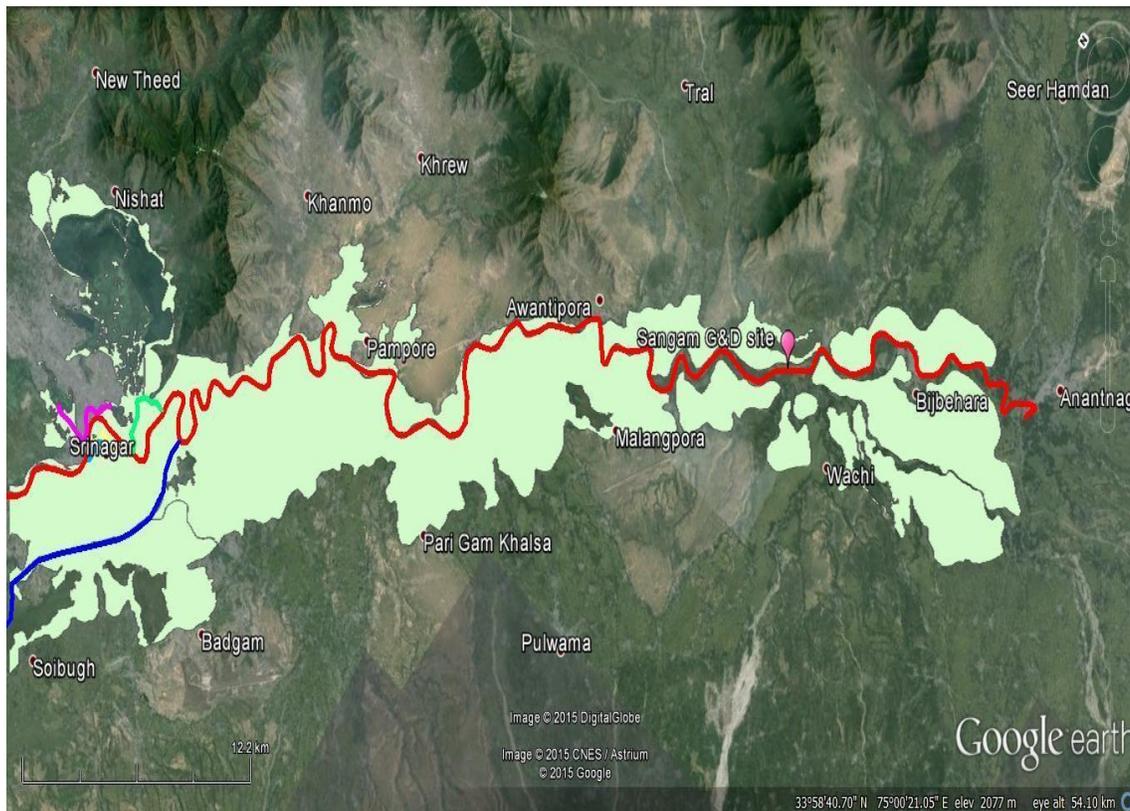
Source: Irrigation & Flood Control Department, Government of Jammu and Kashmir

**Floods of 2014**



Table showing the highest gauge readings in Kashmir

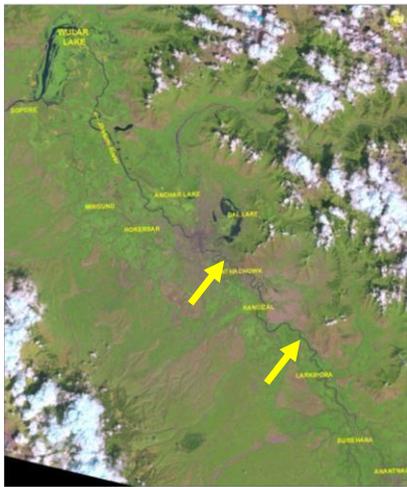
Site	Highest gauge ever recorded (in feet)	Year
Sangam	34.70	2014
	32.60	1992
Ram Munshibagh	29.50	2014
	22.60	1995
Asham	19.35	1996



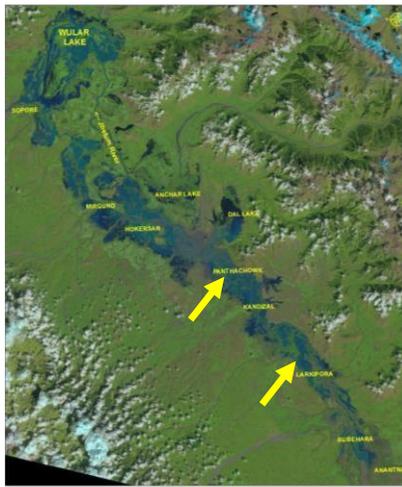
## High Magnitude Flood (2014)

*Source Department of  
Environment and Remote  
J&K*

The monsoon which was deficient in states like Punjab (-63%) and Himachal Pradesh (-48%) was over normal in J&K which received 55% excess rainfall. The rainfall data collected by Indian Metrological Department (IMD) from 28th August to 10th September 2014 revealed that rainfall received in South Kashmir area of Anantnag (402.3 mm; normal 32.9 mm), Kulgam (540.5 mm; normal 42.9 mm), Shopian(406 mm; normal 29.2 mm) and Pulwama (292.7 mm; normal 19.9 mm) was on an average of about 13 times higher than normal. The river gradient of Jhelum (country slope) from Anantnag to Wullar Lake is very mild, about 1 in 10000 , which in simple terms means “after every 10 kilometres there is 1 metre drop in elevation” thereby making water to flow very slow and at certain places it seems that the water is stagnant .



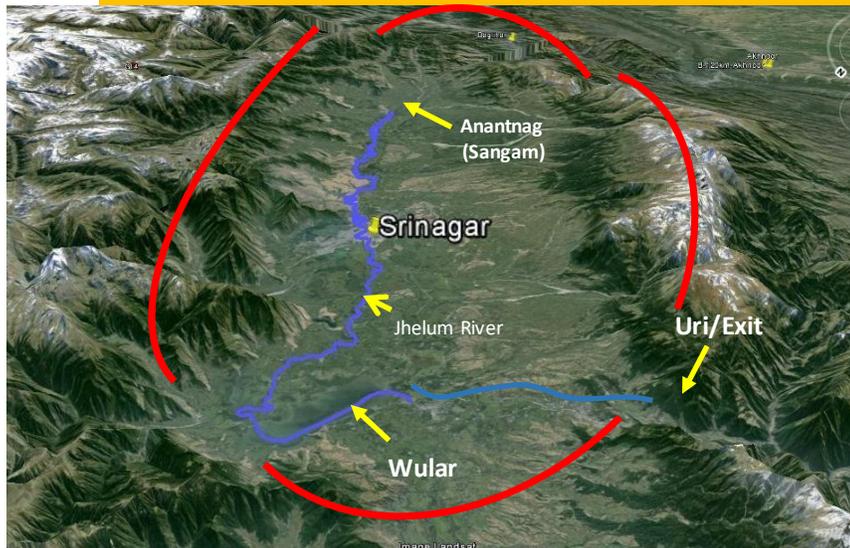
**PRE-FLOOD**  
LANDSAT-8 Satellite Image showing  
Floods as on 25 August, 2014



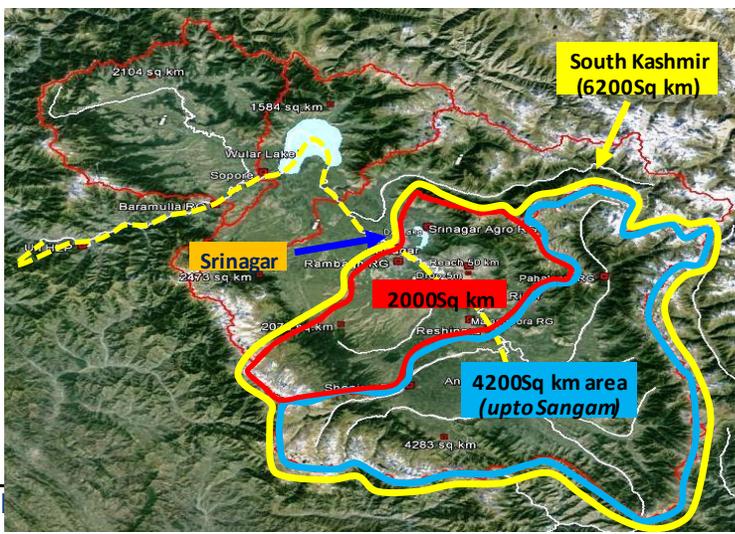
**POST-FLOOD**  
LANDSAT-8 Satellite Image showing  
Floods as on 10 September, 2014

*Source -  
Department  
of Ecology,  
Environment  
and Remote Sensing*

### Bowl shaped topography of Kashmir



- Mountains surrounding on all sides.
- Relatively flatter portion in the middle of mountains.
- *Only one exit route*
- *One drainage path (Jhelum), flowing from South to North Kashmir (Length = 225 km)*



### Catchment Areas of Kashmir Valley

Total catchment of River Jhelum is 12500 Sq. Km. (6200 Sq. Km upto Srinagar)

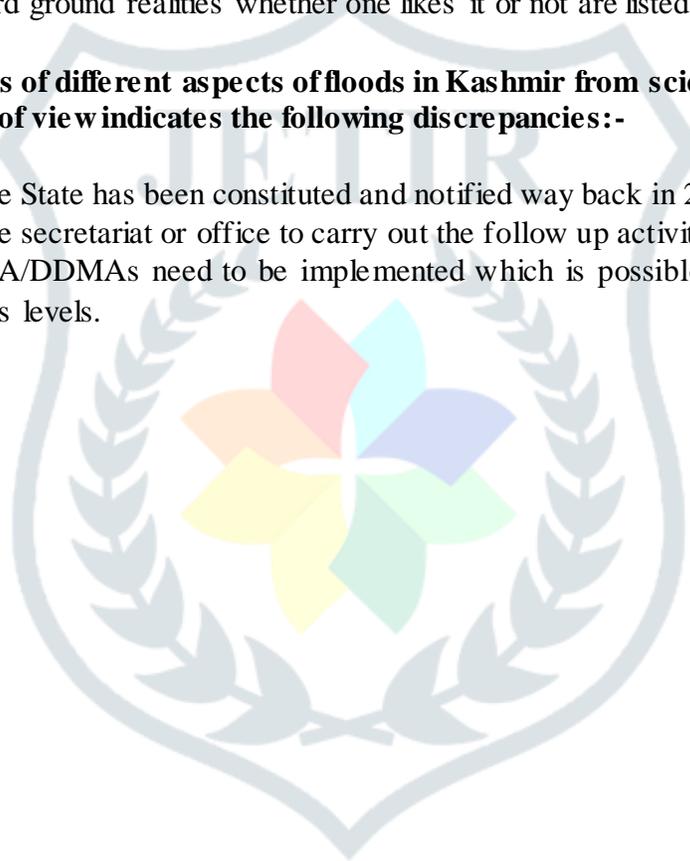
It has been observed that intense rainfall from 1<sup>st</sup> to 7<sup>th</sup> September 2014 causing the floods was a combination of effects of western disturbances and its interaction with the monsoon rains over the state. This was further aggravated by urbanized and mismanaged floodplain of the river and also due to the prolonged extreme precipitation recorded over the entire valley. The two major reasons responsible for flood vulnerability of the valley include inadequate carrying capacity of the river Jhelum and natural flat topography of the basin

(Romshoo S, 2014). The layout of Kashmir valley is highly prone to flooding. The geomorphic, hydrographical and drainage characteristics of the river system of the Kashmir valley make it an ideal playground for frequent flooding.

The broad issues concerning flooding in Kashmir have been thoroughly discussed and debated upon by different stakeholders including the academia, technocrats, policy makers, Civil Society etc. especially post flood 2014. Some of the hard ground realities whether one likes it or not are listed as under:

**A thorough analysis of different aspects of floods in Kashmir from scientific, administrative, technical and social point of view indicates the following discrepancies:-**

Although the SDMA for the State has been constituted and notified way back in 2007, there is a dire need to have a unified and exclusive secretariat or office to carry out the follow up activities. The decisions taken in different meetings of SDMA/DDMAs need to be implemented which is possible only through a dedicated institutional set up at various levels.



There is lack of adequate Flood Management Infrastructure which is further handicapped due to inadequate information/data on vulnerability assessment which would serve as a tool with different stakeholders. Unplanned urbanization in the floodplains causing shrinkage of wetlands, choked drains plus siltation of water bodies due to indiscriminate upstream deforestation has further aggravated the situation thereby causing widespread destruction.

In terms of any technological intervention which reflected through the absence of a reliable Flood Early Warning System (FEWS) in the State, it becomes very difficult for the stakeholders to gauge the situation and issue any accurate flood warnings.

Communication failure and absence of a reliable alternate communication system in disaster situations in the State has always been a cause of concern which was again reflected in the September 2014 Floods as well.

Absence of the approach of Mainstreaming Disaster Management in all developmental activities including construction of Rail tracks, Roads, Buildings and other linkages has also left its non-erasable footprints in increasing the miseries on the one hand and wastage of resources on the other. Absence of any planned strategy suggesting measures and steps for Climate Change Adaptation has badly impacted the State in view of its very sensitive and fragile ecosystems.

Flood Management is a multidisciplinary and complex subject that warrants an integrated approach where all stakeholders need to join hands and find solutions at local and regional levels. These floods have been an eye opener to tell us that majority of our infrastructure has been developed around water balloons where a single prick is enough to wash away everything. Adoption of a multi-pronged strategy to counter the flood threat combined with various flood mitigation measures has to be supported with a proper urbanization plan. The government has launched an ambitious flood mitigation strategy under the World Bank funded Jhelum Tawi Flood Recovery Project (JTFRP) under which a host of activities have been initiated including strengthening of the critical infrastructure like bridges and hospitals. In addition several activities were undertaken under the Prime Ministers Development Programme (PMDP) but looking at the floods of 2014 we have to go a long way to reduce the flood vulnerability in real terms.

In order to minimize the impacts of floods in the region in general and the valley in particular, a host of activities will have to be undertaken on short term as well as long term basis. This will involve a combination of Structural and Non-structural Measures.

### **Short term Measures**

In order to save life and property by reducing the flood risk the following short term measures deserve immediate attention:-

- a) A multidisciplinary approach to study and suggest measures by developing insights into flooding mechanism in Jammu and Kashmir.
- b) Immediate strengthening of the flood infrastructure in the state including bridging/strengthening the breaches and embankments coupled with necessary dredging wherever required in addition to strengthening of lifeline infrastructure especially the Hospitals. Reclaiming of the encroached wetlands which would serve as a detention in the past.
- c) Public awareness through Mass Media with focus on Community Based Disaster Preparedness as First Responders.
- d) Preparation of local level DM Plans highlighting the response mechanism and the resources available both public and private.
- e) Operationalization of Flood Early Warning System in the Jhelum and Chenab Basin to ensure timely preparedness and evacuation whenever required.
- f) Bringing together the management of all water bodies under one command in the region.

g) Establishing of a 24x7 Emergency Operation Centre (EOC) and District EOCs as envisaged in the draft State DM Plan.

### Long term Measures:

- a) Possibility of the construction of alternate Flood channel from Dogripora (Pulwama) to Wullar lake needs to be taken up with considerations to its feasibility considering the topography and drainage characteristics as well as economic costs.
- b) Institutionalization of the State Disaster Management Authority and similar institutions at the lower levels (e.g. DDMA) with dedicated men and machinery at the district and other levels.
- c) Integrated approach to deal with the siltation problems in the catchment areas by taking up Watershed Management Programmes with the local communities as stakeholders. This can be done on the pattern of Joint Forest Management where benefits are shared among the stakeholders.
- d) Regulation of river bed mining needs to be taken up in tune with the morphology, hydrologic and geologic parameters.
- e) Large scale Training and Capacity Building to create a pool of trained human resource at different levels and also to create public awareness regarding Do's and Don'ts.
- f) Building byelaws, construction practices, land use pattern, HFL, etc. need to be revisited in order to check further illegal constructions and encroachments. Further, studies need to be conducted by consolidating fragmented information and data related to floods in the State. This shall involve pooling of resources/information available with different departments, academia, Research Institutions and individuals.
- g) Carrying out systematically all the activities identified in the Draft SDMP through proper resource allocation.
- h) Use of technology like GIS and Remote Sensing in carrying out Hazard Zonation and Vulnerability Assessment maps for efficient Decision Support System.
- i) Strengthening of SDRF by way of men and machinery to make it at par with NDRF.

### Conclusion:

It is evident that Kashmir has a long history of Floods in view of its topography and drainage with only one exit at Uri. The State has witnessed unprecedented floods in 2014 which has been termed as the Extreme of Extremes. Against the carrying capacity of around 40,000 cusecs, the river along-with the FSC was overloaded with around 120000 cusecs of water which in simple terms means filling 3 buckets of water in one bucket of the same capacity. In absence of an established institutional set up for Disaster Management in the State, things went out of gear which was further aggravated by the communication breakdown.

Given the fact that to manage this much volume of water within the natural embankments would be beyond the capacity of any government machinery in any part of the country with the available resources, it is equally a hard reality that human activities in the form of unplanned urbanization, deforestation, encroachments and other factors have equally contributed to the increasing flood vulnerability of the State. On this basis, some experts have rightly termed it as 'A Natural Hazard But a Manmade Disaster.' However, to minimize the adverse impacts of Floods and to reduce the Flood Risk in the State in future, a mix of Structural and Non Structural Measures backed by a strong Institutional set up will have to be taken up on both short and long term basis. Only then can we revive the lost glory of the region known as the (Paradise on Earth) as we believe that "Har Andheri Raat ke Baad Suraj Taloo Hota Hai" (After Every Dark Night there is Sun in the Morning).

A glimpse of devastation near the Flood Spill Channel in Srinagar



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