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## **Flood Control and Flood Mitigation**

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**Abstract**— when we see the water rising, it's past the point where it is possible to plan for a surge. So as to successfully deal with the dangers connected with the surge, it is basic that we have set up an exhaustive surge hazard moderation system that we can actualize some time recently, amid and after the occasion. This paper investigates a few issues identifying with the property danger and life hazard control and readiness as they relate to surge, including pre-crisis structure and site movement procedures. The paper underlines discoveries and focuses out how these discoveries contrast from the famous discernments with respect to some imperative parts of flooding. The motivation behind this paper is to present primary discoveries of how to control and to deal with the conditions in Kashmir keeping in mind the end goal to keep the event of surge in the stream Jhelum.

**Keywords:** Flood Control, Flood Mitigation, Hazard Control.

### **I. INTRODUCTION**

The late surge, specifically the surge of September 2014 in Kashmir Valley brought on casualties, made a huge number of individuals destitute furthermore made incredible demolition the economy. There was no notice of substantial downpours or the surge. The general population, the state and the military in the zone were unconscious by the 2014 surges .Due to substantial downpours, surge water broke the banks of waterway Jhelum and as an after-effect of this, and the Srinagar city was submerged. The digging of waterways did in the most recent decade has not helped the circumstance. Indeed, it has aggravated it in certain cases – for instance, the Doodhganga and Rambiyaar tributaries of the waterway Jhelum .As the surge waters conveyed a gigantic silt stack, the sheer power cleared away the scaffolds and streets that embank these turbulent streams .As Kashmir valley is reliant on the 'Keep running of-waterway undertakings' with the end goal of power as the development of damn is not allowed under 'Indus Water Treaty'. As the Kashmir valley is yet to completely abuse its run –of –the –river power era potential, this was not seen as the confinement, but rather the state is helpless amid extraordinary precipitation , the frequency of which is liable to increment if worldwide climatic change designs imitate themselves in the Himalayan locale and heighten great climate conditions.

General considerations:-

- 1: Natural catastrophes are a piece of nature. They have dependably existed and will keep on existing.
- 2: Society has turned out to be more helpless against regular dangers .Human obstructions in nature like deforestation, urbanization, farming practices, and shameful waste have significantly changed the circumstances in the entire stream bowls. In the same time, defencelessness in the surge inclined territories have been becoming always.

3: The surge hazard increments when danger is characterized as the likelihood of event increased by its effect. The likelihood of flooding is relied upon to increment as the world's atmosphere is evolving quickly.

4: Flood insurance is never supreme, we will need to remember the capriciousness of surge .Risk administration will be the more fitting strategy to manage it.

5: Rivers don't perceive the national outskirts. Tests have demonstrated that neighbourhood surge control assurance measures can have negative impacts both downstream and upstream. Subsequently, it is essential to consider the entire waterway bowl.

Measures that reduce damage by reducing discharge	Measures that reduce damage by reducing stage	Measures that reduce damage by reducing existing damage susceptibility	Measures that reduce damage by reducing future damage susceptibility
Reservoir	Channel improvement	Levee or floodwall	Land-use and construction regulation
Diversion		Flood proofing	Acquisition
Watershed management		Relocation Flood warning and preparedness planning	

**Table 1. Flood Damage mitigation measures**

Risks connected with flooding.

Risks connected with flooding can be separated into:-

1: Primary impacts.

2: Secondary impacts.

3: Tertiary impacts.

Essential impacts are those impacts which are brought on because of the immediate contact with the surge waters. As the release expands, speed of water additionally increments.

A: With high speed, streams can transport particles as a suspended burden .Such vast particles incorporate shakes and dregs as well as , amid surge , could incorporate such substantial items like vehicles, house and scaffolds.

B: Massive measure of disintegration can be refined by waters .Such disintegration can undermine span structure, levees, and structures bringing on their breakdown.

C: The high speed of surge water permits the water to convey more silt as a suspended burden. At the point when the water retreat, speed is for the most part much lower and residue is by and large saved.

Auxiliary impacts are those impacts that happen due to the essential impacts and tertiary impacts are the long haul changes that occur.



Optional Effects incorporate:-

1: Disruption of administrations:

A: Drinking water supply may get to be contaminated, particularly if the sewerage treatment plants are overflowed. This may bring about infections and other destructive impacts.

2: Gas and power administration might be disturbed.

3: Transportation frameworks might be disturbed, bringing about the deficiency of nourishment and tidy up supplies.

Tertiary Effects:-

1: Location of stream channels may change as the after-effect of flooding, new channels create, leaving the old channels dry.

2: Sediments kept by flooding may annihilate ranch land.

3: Jobs might be lost because of the interruption of the administrations, pulverization of business.

4: Corruption may come about because of abuse of the alleviation reserves.

5: Destruction of untamed life living space.

### Surge Hazard Mapping

Surge Hazard Mapping is utilized to decide the territory powerless to flooding when release of a stream surpasses the bank-full stage. Utilizing verifiable information on waterway stages and release of past surges, alongside topographic information, maps can be built to show territories anticipated that would be secured with floodwaters for different releases or stages. In building such maps flying photos and satellite pictures of earlier surges are contemplated to assistance to decide the range that would be secured.



#### Surge Mitigation Measures:-

Surge alleviation measures can be separated into three principle ranges:-

- 1: Control over River.
- 2: Control over Land.
- 3: Other measures.

#### Control Over The River:

To accomplish control over the stream and tallness of the water conveyed by the waterway, the channel, surge plain or watershed must experience some physical adjustments.

These include:

- 1: Construction of dams, maintenance bowls or supplies on standards or tributaries to store over the top water and discharge it step by step after the risk has passed.
- 2: Levees or floodwalls can be developed to keep surge waters to a floodway, accordingly diminishing surge harm.
- 3: Channel change, which incorporate fixing to evacuate undesirable twists, extending and augmenting to expand size of conduits.
- 4: Water shed treatment: - can likewise be utilized to help the dirt on slants to end up more retentive of precipitation until surge statures have subsided. Water shed treatment includes crop revolution, development of patio, control strip trimming

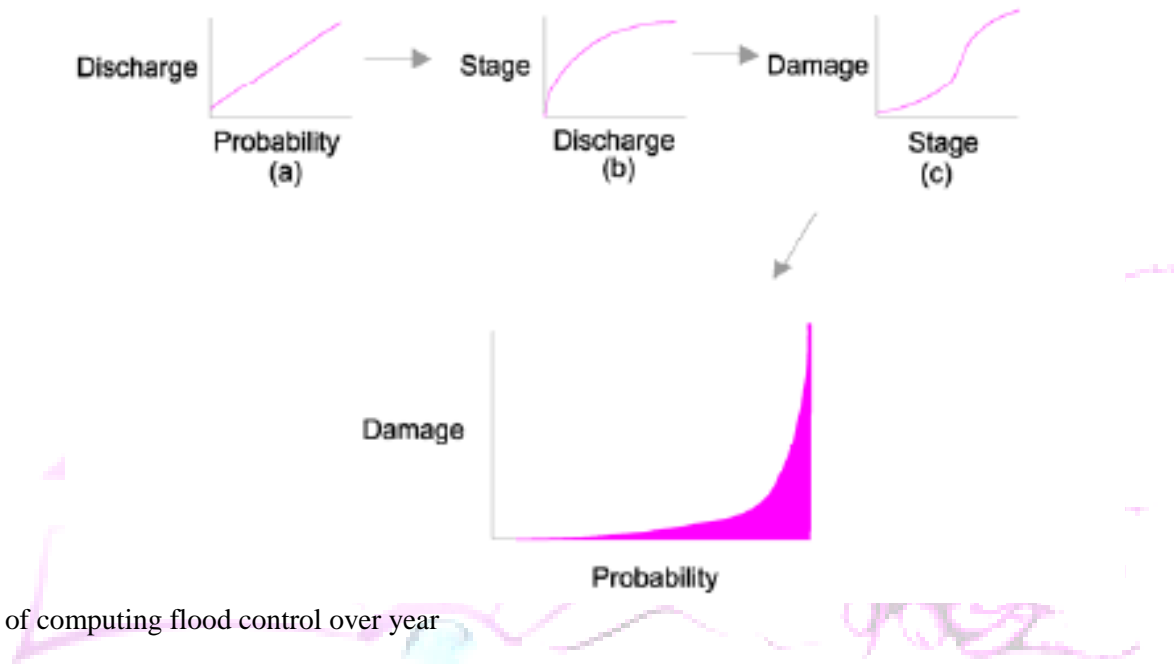
#### Control Over Land.

1: Designing surge ways and infringement lines: - These are the parallel limits of the floodway where no development or area filling ought to be allowed. This is done to guarantee that the stream of water is not blocked.

2: Zoning: - This a lawful apparatus utilized by governments to control improvement in zones which are liable to wind up inclined to flooding.

3: Subdivision Regulations: - These determine the way in which the area might be separated .Floodway cut-off points or infringement lines forbid filling in the channels and floodway that limit stream and require that every part contains a building site with a height over the surge level.

4: Building codes: - These are the models for development of structures and different structures and , if implemented, can be decrease harms to structures in surge inclined ranges.



#### Extra Migration Measures

1: Flood Proofing :This is the blend of auxiliary changes and acclimation to properties which can be utilized as a part of new or existing development .Actions incorporate drainage control, defensive covering, height or rising mooring and under sticking.

2: Flood Forecast: - This is dependable, exact, and convenient estimating of surges, combined with auspicious departure to spare lives and lessen property misfortune.

3: Temporary Evacuation: - This expels persons and property from the way of surge waters.

4: Permanent Evacuation: - This expels an influenced populace from territories subject to immersion.

This includes the procurement of grounds and the evacuation of advancements.

The ebb and flow release limit of the Jhelum stream, which snakes through the area is 25,000cusecs. With existing surge spill channels, Jhelum takes around 35,000 cusecs.

A year ago in September, the Jhelum volume achieved 1.2 Lakh cusecs, bringing about remarkable flooding.

## II. CONCLUSION

The surge powerlessness situation in the Jhelum bowl has intensified amid the most recent couple of decades as the majority of the wet terrains that utilization to go about as wiper amid the flooding, have been urbanized and changed over into solid scene in the whole Kashmir Valley. Keeping in mind the end goal to forestall such a case, plan ought to be founded on a coordinated methodology covering every single applicable part of water administration, physical arranging, land use, transport and urban improvement.

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