

CASE STUDY: FLOODS IN PUNE AND MAKING AWARE PEOPLE USING WEB TECHNOLOGIES

Mr. Abhishek J. Asawale
IndrayaniKunj, Vatare Mala
B.T.KawadeRoad, Mundhwa,Pune – 36
asawaleabhishek@gmail.com

Abstract:

Flood is deemed one of the world's most damaging disasters. It has been the most recurrent and frequent disaster in the last few years. This causes both economic losses and affects the lives of living things. India has also suffered from flooding several times over the last few years. Since 2013, North India, Gujarat, Assam, Kerala have been affected. And it reaches Maharashtra this year. This year, many cities have been affected. The Pune is also affected by the flood situation. It's due to poor river management and drainage systems, cloudbusting and climate change. Last year Kerala was flooded because of the tsunami and this year the flood was triggered in Pune due to heavy rainfall. This impacts people's lives and other living things and also economic conditions. Few regions of Pune were submerged due to floods, so this paper is an overview of the Pune floods, the precautions to be taken and awaring people using web technologies.

Keywords: Flood, Disaster, Pune, Damage.

Introduction:

The Flood is defined as “*High-water stages in which water overflows its natural or artificial banks onto normally dry land, such as a river inundating its floodplain*”. Flood is the most prevalent and most expensive natural disaster in the world that has devastated both life and the economy to a large extent. The monsoon season in South Asia usually begins around the beginning of June each year, bringing heavy rainfall and possible floods to the country. Nevertheless, the monsoon season of 2019 started at the end of June and was unusually heavy in terms of rainfall, with an average rainfall rise of 6.5 percent across India. The main reasons for Flood and Flash Flood are mostly

- 1) Excessive precipitation in river catchments or concentration of runoff from tributaries and river flow over their strength.
- 2) When Urban drainage Basins get filled up there is no ground for water to sink into, which causes flooding for low-lying areas.
- 3) Storm surges associated with hurricanes and other events may lead to major floodings, such as tsunamis that are sometimes triggered by underwater earthquakes.

We should aware people using web techniques such as making advertisement and let people know what precautions can be taken to reduce the flood situations and what should be done in those situations. We should make online portal were people can suggest PMC authorities to improve the drainage systems.

River Basins:

Pune is on the western edge of the Deccan Plateau. The city is blessed with the rivers Mula and Mutha, which originate in the Sahyadri ranges and crosses Pune. The two rivers converge further and are formed at the confluence of the Mula-Mutha River, which flows further into the Bhima River.

The total length of these three rivers passing through Pune Municipal Corporation is 44km approximately. Out of this, 22.2km is Mula River, 10.4km is Mutha River and 11.8km is MulaMutha River.

The streams Mula and Mutha are both dammed upstream. Mutha River has three reservoirs – Khadakwasla, Warasgaon, and Temghar, while Mula River has the Mulshi Dam, which controls the flow of water in the streams. Rainfall can only be observed in the catchment area below the lakes in the reservoirs.^[1]

Flood prone areas^[2]:

Water is released from the dams at times and in monsoons when the dam capacity is full. Thus, the floods of Mula and Mutha occur only during heavy monsoons. PMC and the irrigation department have already identified and marked the low flood line and high flood line. Constructions are not permitted by PMC in the flood zone. However, there are old and unauthorized buildings and slums in flood zones. Khadakwasla Dam brust is the highest risk of flooding. Life and property loss would be heavy.

The ward which is affected and endangered are Ghole Road, Tilak Road, Warje, Dhole Patil, Aundh, Kasba and SangamWadi. During floods, the Sangamwadi Slums must be relocated to each monsoon.Wards with low-lying areas such as Tilak road ward Vittalwadi and Anandnagar are more vulnerable as floodwater enters buildings and parking spaces. Mahrashinagar's slums are more vulnerable to floodwater in the Swargate ward.

Floods and flash floods are regular events with low to moderate impact in PMC boundaries. PMC has the Floods and Flash Floods SOP set. There is a coordinated effort for an early warning system with the PMC, Police and Fire Department to evacuate residents in flood zone and low slum areas. Temporary shelters are established and services are provided for food, water, and sanitation by PMC.Due to cutting of trees during the time of heavy rain fall, water runs in speed and force which also result in floods.

Estimated Loss [3]:

Only in Pune approximately 1000 animals have washed away with flood stream and 20 to 30 peoples lost their lives and few are missing.

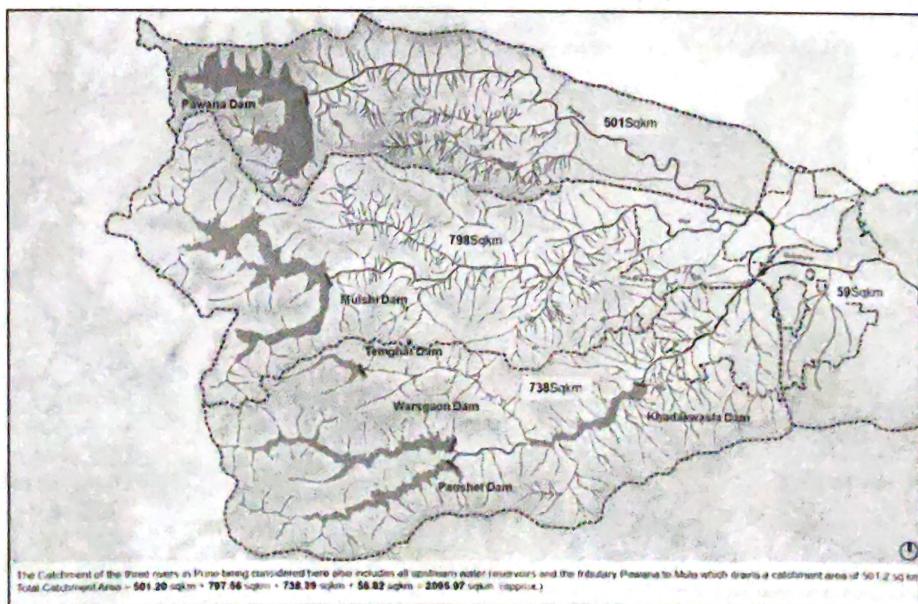
On 27 September due to water release from Khadakwasla Dam because of this The overflowing Amboli Odha and Bhairoba Nalla triggered flooding throughout the surrounding area. Because of the overflowing the worst affected areas were Sahakarnagar, Aranyeshwar, Bibwewadi, Dhankawadi, Parvati and Wanowari. In that rainwater 160 Vehicles (approximately) were swept away among these, 10 vehicles belonged to the police.

The downpour affected the supply of electricity to about 1,25 lakh customers in different areas. Three transformers were uprooted, power poles destroyed and feeder columns submerged. In Khed, Nasrapur and Shivapur, five transformers are washed away in the district.

Prevention should be taken:

- 1) PMC authorities must improve the drainage systems, the walls of streams and Nallas, and river basins of Pune.
- 2) People should be relocated to far from flood lines.
- 3) The elevation of houses from ground level must be more.
- 4) There is need of plantation besides the roads and in hill areas to avoid floods.
- 5) The stream diversion must be planned properly.

Graphs, Tables and Photographs:

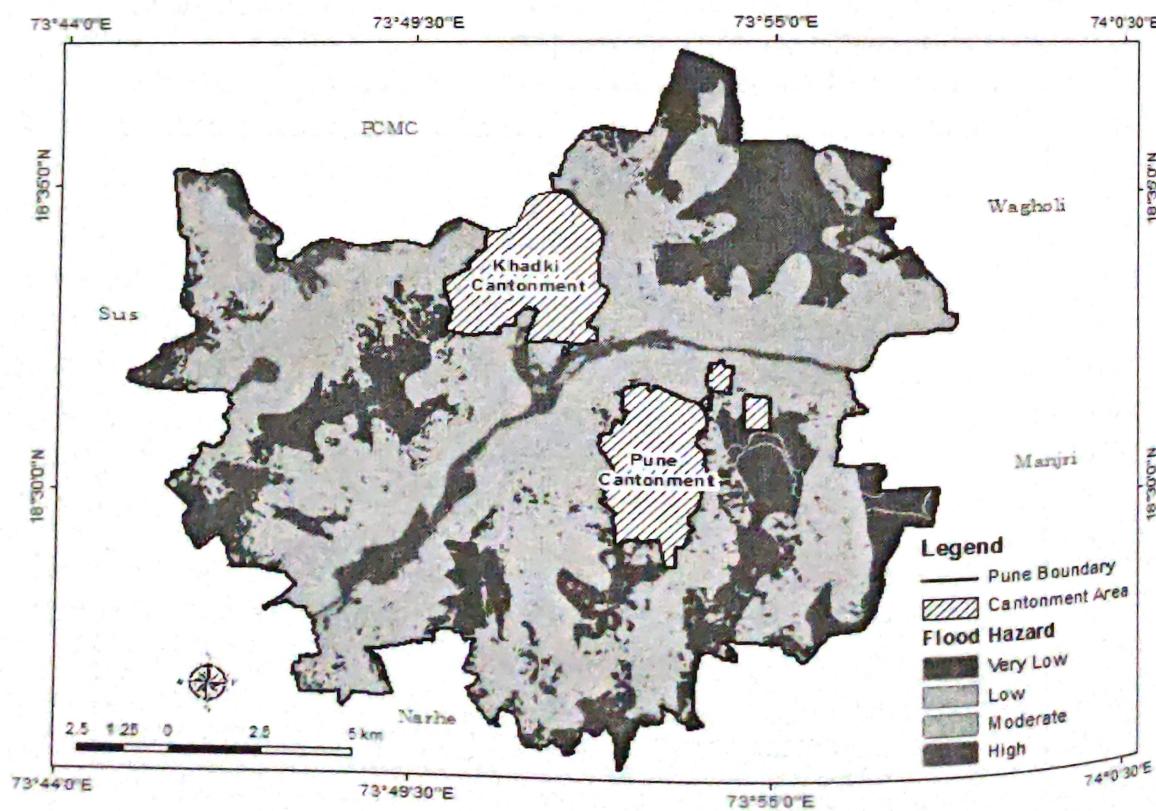


Map of River Basins of Pune

Table showing Vulnerability, Capacities, and Risks for Pune Wards^[2]

Name of the Ward	Vulnerability	Capacities	Risk
Aundh Ward	High	High	Fairly High
Warje Karvenagar Ward	Medium	High	Low
Bhawani Peth Ward	High	High	Fairly High
Kasaba-Vishram	High	High	Low
Tilak Road Ward	High	High	Fairly High
Sahakarnagar Ward	Medium	High	Low
Bibvewadi Ward	High	High	Medium
Hadapsar Ward	High	High	Medium
Kondhwa Wanawadi Ward	High	High	Medium
Dhankawadi Ward	High	High	Medium
Ghole Road Ward	Medium	High	Low
Kothrud Ward	High	High	Medium
Dhole Patil Ward	High	High	Medium
Yerwada Ward	High	High	Medium
Nagar Road Ward/Wadgoan Sheri	Low	Medium	Low

Map showing Flood Prone Areas

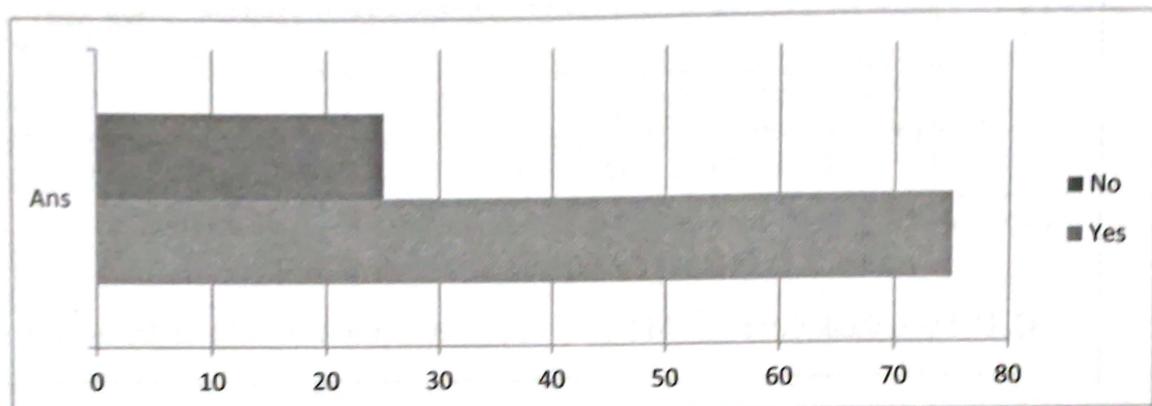


Some Survey Questionaries:

Q. Did you get any resources help for evacuation in floods ?

- | | | | |
|---------------------|-------|---------------------|-------|
| 1)Temparary Shelter | : 20% | 2)Boat | : 10% |
| 3)Relief Centers | : 45% | 4)none of the above | : 25% |

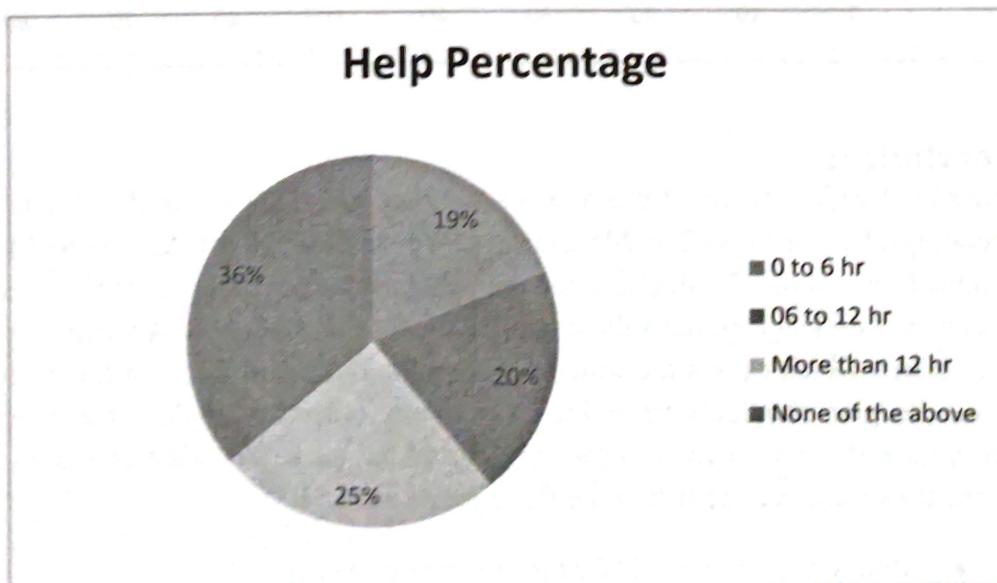
Q. Do you think PMC authorities take any stratergies for prevention of flood?



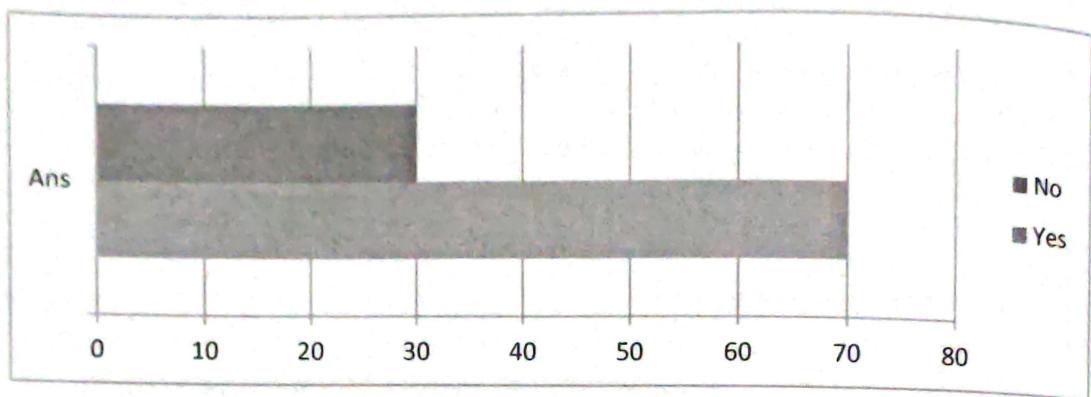
Q. Do you think that the flood disaster can be handled at which of the following.

- | | | | |
|-------------------|-------|-----------------------|-------|
| 1) District Level | : 45% | 2) State Level | : 30% |
| 3) Natinal Level | : 20% | 3)International Level | : 5% |

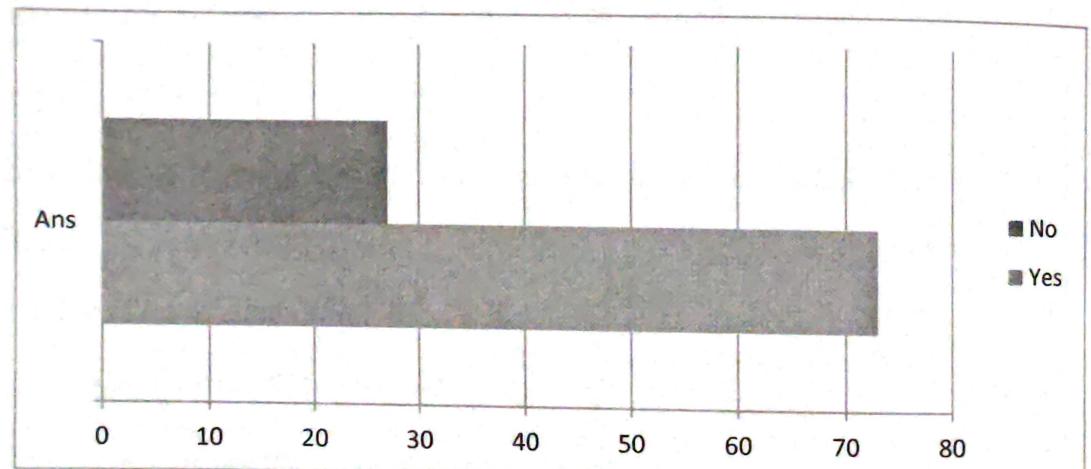
Q. How fast did you get the response from Authorities or Organisations?



Q. Did you get early flood warnings?



Q. Did you think there should be any improvement in channel and drainage systems?



Conclusion:

The Flood which triggered this year in the Pune had done savior damage to lives and economy of Pune as well as Maharashtra. We should take precautions and take major actions to avoid the flood. Our drainage Systems are not that well maintained and due to concrete drainage systems there is no place for the water to sink when they are filled with water, which causes the water to get on the roads and flooding for the low-lying areas. Peoples shouldn't be living near rivers, odhas and nallas, the most affected people are those who living near that. By taking such following precautions we can avoid floods and reduce risk of the flood prone areas.

- Monitoring of various lakes in and near pune city.
- Their should be plantation of trees in the hills and besides roads.

- There is lots of waste getting deposited in the streams.
- The sewage system need to be monitor and the waste need to be pumped properly.
- Dams should be properly maintained.
- PMC authorities should apply proper strategies for prevention of flood.
- Flood forecasting systems should be improved.

References:

- [1] pmc.gov.in/en/pune-river-development
- [2] pmc.gov.in/sites/default/files/15-MARCH-2016-PUNE-PRESENTATION-REPORT-30.pdf
- [3] timesofindia.indiatimes.com/city/pune/how-pune-went-under-water-vehicles-washed-away-in-floods/articleshow/71322737.cms