



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

# IJRSET

International Journal of Innovative Research in  
**SCIENCE | ENGINEERING | TECHNOLOGY**

# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 12, Issue 4, April 2023

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

Impact Factor: 8.423

9940 572 462

6381 907 438

[ijirset@gmail.com](mailto:ijirset@gmail.com)

[www.ijirset.com](http://www.ijirset.com)

# Self-Activating Flood Barrier System

Gopal Junare<sup>1</sup>, Dnyaneshwar Mahankar<sup>2</sup>, Pavan Nikam<sup>3</sup>, Dhammpal Sawale<sup>4</sup>

Dhiraj Wankhade<sup>5</sup>

U.G. Student, Department of Civil Engineering, Siddhivinayak Technical Campus, Shegaon, Maharashtra, India<sup>1 2 3 4</sup>

Assistant Professor, Department of Civil Engineering, Siddhivinayak Technical Campus, Shegaon, Maharashtra, India<sup>5</sup>

**ABSTRACT:** Flood impact is one of the most consummate disasters on the earth. further than a half of ecumenical flood tide damages accounts in Asia. Natural factors similar as heftily ponderous downfall, high cataracts and high runs, etc. are the causes of flood tide and along with that mortal factors similar as incongruous land use, deforestation in head regionsetc. and so on. cataracts cause losses of life and damage parcels. further urbanization, more impervious area and lower infiltration and more preponderant flood tide peak and discharge do as the population grow. threat operation has been considered as a well-defined strategy for dealing with threat posed by natural, environmental or man- made hazards, similar as flood tide. nearly every time in our county extreme high flood tide events were irregularly passed which is caused by the loss of mortal lives, land values and structure, which has a vigorous influence on mortal being similar as discomfort living and trouble to examination of subsistence Quandaries come more critical due to further rigorous and frequent flooding probably due to climate change, socio- profitable damage, population relegation and lack of coffers similar as mazuma. A tone cranking flood tide hedge must be installed in flood tide prone position in order to minimize the goods of flood tide and initiate a preventative system to guard the property

**KEYWORDS:** Risk management, Self-activating barrier, Socio-economic, Flood disasterlabelling.

## I. INTRODUCTION

Flood is a natural miracle and it may also be told by manmade conditioning. Flooding is the most common disaster of nature among all disasters leading to profitable losses and deaths. In several corridor of India cataracts has been intermittent miracle, which causes loss public property and lives and bringing in numerous misery to the People. The means of reducing flood tide probability Focuses on modifying the hydraulic characteristics of a threatening body of water by means of engineered results. for illustration, the use of dikes, levees, and heads. The indispensable means to reduce the threat of flooding is to reduce the damage caused by flooding. In this paper we've bandy some flood tide proofing fashion and ways to ameliorate their outturn. Events similar as stormy eruptions, earthquakes, landslides are a part of natural systems and these are the illustration of geophysical events. If we give a look on all natural disasters also we find the cataracts are the most expansive and devastating one When we talk about a flood tide the most common images that come to mind are disaster and problems.

## II. PROBLEM STATEMENT

- 1) How to reduce the impact of flood tide for a minimal time at that time people stuck in flood tide may reach to the safe position
- 2) How to reduce the impact of flood tide in an effective way with the use of automatic bias? And if yes also how it's possible?
- 3) How tone cranking hedge retains the flood tide.

## III. OBJECTIVE

- 1.To study impact of flood tide on lives of people.
2. To study causes of flood tide and give unique results
3. To matriculate different ways and find the stylish suited one to reduce the impact of flood tide.
4. Analyses the impact of flood tide by making working model



5. Develop or ameliorate early warning exigency response systems and evacuation procedures for flood tide hazard events.

#### IV. SCOPE OF WORK

During a flood tide event, the responsible authorities need to make opinions on operation of walls and on evacuation strategies. Temporary flood tide protection is occasionally an option. tone cranking hedge plays an important part in temporary flood tide protection. In this system flood tide is retained by the hedge so that time for evacuation increases but also the time for decision timber also increase. This support can be given during flood tide event operation or during the factual flood tide event.

#### V. AREA OF STUDY

##### SHIROLI.

This place is positioned in Kolhapur, Maharashtra, India, its geographical equals are 16 ° 44' 0" North, 74 ° 36' 0" East and its original name (with diacritics) is Shirolī. According to Census 2011 information the position law or town law of Shirolitown is 567330. Shirolitown is located in Shirolī Tehsil of Kolhapur quarter in Maharashtra, India.It's positioned 1 km down from sub- quarter headquarter TehsildarShirol (office) and 45 km down from quarter headquarter Kolhapur.As per 2009 stats, Shirolī town is withal a Grampanchayat. The total geographical area of town is 3441 hectares.

**Table No. 1 “Rainfall Data”**

SR.NO.	YEAR	AVERAGE ANNUAL RAINFALL (in mm)
1	2011	1569.28
2	2012	1227.04
3	2013	1335.57
4	2014	1313.92
5	2015	794.55
6	2016	1293.50
7	2017	1320.69
8	2018	1449.59
9	2019	2410.90
10	2020	1653.19

#### VI. LITRETURE REVIEW

1.“Sherin P. Rajan et.al (2020)” In this paper they mooted One of the major impacts is the flooding in Cochin International Airport which is an event unlooked- for, reacted in its suspended flight operations. An applicable defence system is demanded to attack this issue. One analogous effective system is the tone- twiddling Flood Barrier(SAFB). It can be applicable to both pastoral and communal areas. The SAFB uses the pressure from approaching flood tide drift water to raise its barricade automatically, hence furnishing protection against extreme high- water situations and water incident events. The barricade is so effective in a manner that it can palliate the hydraulic risks, repel hydrodynamic pressures and are suitable of diverting the flux of water from affecting the exposed area. The SAFB is the swish volition when looking for a reliable, cost-effective result where a endless barricade is not possible. The structural analysis is carried out for SAFB by using two paraphernalia videlicet, Gator board and Froth board singly. For this,

original tests including stiffness test & fatigue test were done on this paraphernalia to find out its structural parcels which are essential to carry out the analysis process. From the logical exploration, the graph shows that Gator board has farther divagation, original stress & strain, indeed though it's in the limit of safety.

2. **“J. Dhanusuya et.al (2020)”** In this paper they bandied flood tide threat due to natural, manmade and environmental hazards also they carried threat in different position of conduct. The first position is the functional position, which is related to operating an being system. A stable functional flood tide operation structure will permit governments to reply rightly, protecting off damage and saving lives. The alternate position is a design planning position, which is used when a new or a modification of an being design is planed Ex. heads, check heads, diversion conduit, tone- closing flood tide hedge. The third position is designing position the factual cost of a design is estimated and compared with the benefits attained from the planned design. Also, they bandy about check heads, retaining walls, bonding. Also, they bandy the possible result in a flood tide prone area.

3. **“P. Ravi kumar et.al (2018)”** In this paper, the manner of furnishing the flood tide drift hazard zones is presented and applied in Cuddalore quarter of Tamilnadu. Since, Cuddalore is located on littoral region it's proximately flat and prone to dihydrogen monoxide recession. The Cumulated approach of hydrology and topography was employed to identify the condition of flood tide drift and circumscribe the flood tide drift drift trouble zones exercising the data of high rain fall times 2005, 2008 and 2010. The weighted sum analysis has been used to identify the flood tide drift threat zones. Using non- structural measures, or in other words harmonizing with flood tide drift is an nascent approach in flood tide drift damage mitigation. Flood hazard zonation is one of the subsets and could be applied as a congruous apply in flood tide drift vessel operation so that in mundane condition is a guideline for construction of structures and architectures and in flooding condition could set the voidance routes and safe spots.

4. **“Saroj Adhikari et.al (2020)”** The study anatomized downfall data for 30 times from 17 meteorological stations to determine flood tide threat in the hilly areas of Nepal. The probability of circumstance and return period were used as the styles to calculate the flood tide event. Probability of circumstance was calculated from seven different styles Chegodayev, Blom, California, Weibull, Gringorten, Hazen and Sevruk and Geiger system and mean probability was taken from these styles. The mean probability was also used to calculate the return period. The common operation of these styles involves the ranking of the downfall data and calculated as a rate of the ranked values to the length of the samples i.e. number of times. There turn period is an estimation of the anticipated return of the periodic observation i.e. extreme downfall associated events and the probability determines the chances of circumstance of these events in terms of chance. The Pansayakhola station and time 1999 has a advanced return period of 24 times and 42 times, but the least probability of circumstance(4.13) and(2.36) independently. While, the station Nepalthok and time 1992 has a return period of one-time interval corresponding to the smallest average downfall, but have further than 95 of probability of circumstance. The study also reported that the loftiest return period (42 times) was observed. in the month of July and least in November. Return ages with advanced probability need robust mitigation measures for the circumstance of frequent flood tide events. Hilly regions of Nepal is largely vulnerable to flood tide pertaining to a advanced share of land content and attention of thick population which demands a realistic approach to reduce the threat of cataracts or hydrological events.

5. **“JohnM. Nestler et.al (2017)”** This report describes levee lapses as druthers to traditional levees for flood tide threat operation and environmental benefits. It's organized into three sections 1. Information about levees for reducing flood tide damage, emphasizing environmental. 2. Description of the Engineering with Nature (EWN) conception for considering environmental benefits of U.S. Army Corps of masterminds (Corps) conduct 3. Explanations of applicable Corps policy Administrative Orders (EOs), mastermind Regulations (ERs), and Memorandums of Understanding( MOUs) the summaries describe how hydraulic, flood tide threat operation, and environmental benefits were quantified. The report includes environmental considerations for levee lapses Developed by Rock Island District for the Upper Mississippi River (UMR). corridor of the UMR aren't leveed, which provides sapience into the ecological response that could be anticipated from large- scale levee lapses. Levee lapses are precious tools for reducing flood tide damages and give environmental benefits harmonious with the EWN conception, the Chief's Environmental Operating Principles, and ERs, including the Resilience Initiative Roadmap. The report concludes that levee lapses should be considered for applicable spots.

6 **“Chandni Ahuja et.al (2015)”** This paper describes the flood tide prone areas of India along with the flood tide forestalment and operation ways. In this paper they bandy gutters and flood tide problem (Region wise). also, they bandy some system which are used to control the cataracts and give some relief to the flood tide prone areas by dwindling overflows of a flood tide and the flood tide situations (Reservoir, dam, channelization of swash, diversion of





flood tide water This paper focuses not only on the reasons, affects and preventative measures taken during cataracts but also over the use of flood tide water in an effective way. Through this paper they introduce a new perspective of flood tide operation system which aids to the recycling and exercise of flood tide water by ground water storehouse.

**VII. METHODOLOGY**

The study was carried out for impact of flood in Kolhapur District. We have done an detailed case study on the crucial role played by the Self-activating barrier insituation of floods. Also we studied about various causes of floods and also, we provide all possible solution.

Why we choose tone cranking flood tide hedge?

- 1) It's an automatic system, no force needed for running.
- 2) It's effectively useful when the flood tide arises at night because it's automatically used.
- 3) The volume of flood tide retained by tone cranking flood tide hedge is further than any other fashion.
- 4) There's no need of any external energy similar as electricity because its workshop on hydraulic energy/ water pressure.




**SELF-ACTIVATING FLOOD BARRIER**

The Self-Activating Flood Barrier (SAFB) which they describe as a floating entrenched wall that remains recessed during normal conditions. When flood waters begin torise, the basin in front of the flood barrier fills, causing the wall to rise. Once thebasin is filled, the barrier locks into a watertight position. SAFB’s include telemetrystems that will provide warning when activated and the company describes theproduct’s lifespan as 50 to 100 years. The maximum length of one barrier is 50meters (164 feet).

TheSelf-Activating Barrier’s success can be attributed to its’ simple yet ingenious approach to flood defence, using the advancing floodwaters to automatically raise the barrier, effectively using the problem as the energy to create a highly effective solution.

**Table No. 2 “Classification of Floods & Flood Barrier”**

Sr. No	Types of Floods Barrier	Material Used	Types of Floods
1	Aqua box	Plastic	Storm water, Drain water
2	Flood Block	RCC, Sand Bags	Ponding
3	Quick Dam	Super absorbent polymer	Flash flood
4	Sand Master	Sand bags	Ponding
5	Water gate Flood	PVC	Coastal floods
6	Flood Break	Steel structure	Urban floods
7	Self-activating Flood Barrier	Aluminum sheet , plywood,	

<p>➤ Lowered State</p>	 <p>(a)</p>	<p>Initial stage of self activating flood barrier. The wall is reinforced for impact strength. On top, a steel lid locks in the entrenchment space under normal (non flood) conditions.</p>
<p>➤ Activated State</p>	 <p>(b)</p>	<p>The wall rises and floats. As soon as the receptacle is completely filled.</p>
<p>➤ Raised State</p>	 <p>(c)</p>	<p>The wall rises and floats. As soon as the receptacle is completely filled, the ending face will “ lock ” the hedge into a penetrable position.</p>



<p>➤ Position of SAFB before flood</p>	 <p style="text-align: center;">(d)</p>	<p>Initial stage of flood tide barrier. The wall is corrugated for impact strength. On top, a lid cinches in the trenchment space under normal (non-flood tide) condition.</p>
<p>➤ Position of SAFB After flood</p>	 <p style="text-align: center;">(e)</p>	<p>Now the water can rise further without submerging the defended area. Once the water position subsides to a normal position, the receptacle is drained through a drain pipe with non-return faucets or by a pump. Once the water has left the receptacle, the wall returns to its sleeping position within the receptacle. The lid on top of the wall also closes to help the flux of waste or debris.</p>

Figure No.: (a) (b) (c) (d) (e)

#### VIII. CONCLUSION

A specialized disquisition has been made on a preventative System of tone- cranking flood tide hedge to defence extreme flood tide Events and the following conclusions were drawn.

1. From the disquisition a result to extreme flood tide events Has given which is technically possible, economically doable and environmentally respectable flood tide defence System.
2. The present disquisition has embellished the people Towards the significance of tone- cranking flood tide hedge and Created mindfulness among all mortal beings to meet the Benefits and that we've set up to be a good preventative result in the right position
3. It significantly reduces the man power since it operates by Automatic and it greatly minimizes the hazards that beget Loss of mortal lives.
4. For other ways, we need warning time and time to set up or install the flood tide hedge which we dont have in these cases. The SAFB Overcomes all the issues associated with this flood tide defence.
5. The hedge system has proved to be stylish flood tide protection and has formerly been erected and install in several countries around the globe.

#### REFERENCES

- [1] "P. S, Vaishnavi S, Sherin P Rajan (2020)"Self-OperatingFlood Barrierin Cochin InternationalAirport.(2020). e-40779-4104 Vol:77(133)
- [2] "S. Bharani Devi, J. Dhanusuya" A Case Study on Flood RiskManagement. (2020) e-ISSN: 2395-0056, p-ISSN: 2395-0072, Vol.:07, ISSUE:02.
- [3] "P. Ravikumar Published"Delimiting The Flood Risk Zones inCuddaloreDistrict,TamilNadu,India.(2018) ISSN:2321-9653; Vol. 6 ISSUE - V
- [4] "Chandra Man Rai, Ramesh Chhetri, Benu Prasad DahalandSarojAdhikari"AnalysisofRainfallandReturnPeriodstoAssessFlood RisksinHilly AreasofNepal.(2020) ISSN: 2581Vol.3 pp 1-15.
- [5] "Chandni Ahuja, Resham Raj Shivwanshi (2015)" Flood Detection and Management. (2015) ISSN: 2229-5518, Vol - 6, ISSUE – 8.
- [6] "M. Ranjitham1, M. A. Parvez" Swot Principle in Flood Risk Management. (2020) e-ISSN:2289-7577 Vol.3: No2
- [7] "R.G. Awopetu, S.O. Awopetu" The Impact of Flood on the Socio-Economic Life's of The People. (2019) ISSN 1743-3509 Vol.133
- [8] "CastakaagusS.IdaBagusBudiyanto" Prototyping of Flooding Early Warning System using Internet of Things Technology and social Media (2010) DOI : 10.1051/201019716003
- [9] "S.N Jonkman, JK Vrijling" Repairing Flood Damage: Ground Floor and Basements. Building Research Establishment, Good Repair Guide 11 Part 2, BrePress. (2010) DOI:10.1007/s11063-0089227-5.
- [10] "Dr. Mohan Kanda, P.M. Bowker" Repairing Flood Damage: Immediate Action. Building Research Establishment, Good Repair Guide 11 Part 1, BrePress. (2008).
- [11] "Abawua M.J" Flood Risk Assessment: A Review (2005) ISSN: 1119-8362 Vol No. (1) 57-63.
- [12] "Erich J. Plate," Flood Risk and Flood Management. (2002) ISSN:12: D:76128.
- [13] "Gemma Cremen, Carmine Galasso,JohnMcCloskey " Modeling And quantifying tomorrow's Risk Form natural hazards (2000) Vol.817\ 152552.





**INNO SPACE**  
SJIF Scientific Journal Impact Factor  
**Impact Factor: 8.423**



**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

**9940 572 462** **6381 907 438** **ijirset@gmail.com**



[www.ijirset.com](http://www.ijirset.com)

Scan to save the contact details