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RESEARCH ARTICLE

A STUDY ON FLOOD DEFENSE SYSTEM

[1]Dr. Chandra Mouli, K., [2,*]Dr. Pannirselvam, N. and [3]Anitha, V.

[1]Professor and HOD-Department of Civil Engineering, NRI Institute of Technology, Visadala (V), Medikonduru (M), Guntur, Andhra Pradesh, India
[2]Associate Professor-Department of Civil Engineering, SRM Institute of Science and Technology, Kattankulathur, Chennai, Tamilnadu, India
[3]Asst. Professor, Department of Civil Engineering, NRI Institute of Technology, Visadala(V), Medikonduru(M), Guntur, Andhra Pradesh, India

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ABSTRACT

Floods are the natural disasters which affect the environment, human race and even infrastructure to a great extent. Flooding is one of the most burning issues in the world. The ill effects of flooding have to be minimized or should be prevented through the application of the various amazing flood defence systems. This article mainly focuses on the several flood mitigating methods or systems that can be carried-out effectively during the floods inorder to reduce the ill aspects of devastating floods. The effective use of these economical flood defence systems can appropriately lead to the intended results i.e. reduces the loss of life and property.

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INTRODUCTION

In nature flood occurs and the benefits of natural floods almost certainly compensate the negative aspects. Flood occurs dueto large-scale human development of the landscape. Flooding occurs frequently disrupt many people's lives each year and personal tragedies. Flood prevention is really something left up to cities and towns. As individuals, should avoid the minimum amount of toxic substances (paints, solvents, automotive fluids, etc.) around our homes, there will be less of these substances to spill when any sort of unfortunate natural disaster befalls the community.

Objectives

- The main objective is utilizing best available data and science; continually improve understanding of the location and potential impacts of flood hazards, the vulnerability of building types and community development patterns and the measures needed to protect life safety.
- Continually provide state, county and local agencies with updated information about flood hazards, vulnerabilities and mitigation initiatives.
- Develop or improve early warning emergency response systems and evacuation procedures for flood hazard events.
- Consider the impacts that future development will have on the environment's capacity to withstand the impacts of flood events and the opportunities this development may create for environmental restoration.

Anti-flood methods

Sand Master: From US Company, the very old system allows an extra-ordinary mechanism that provides the sand bag bins on a monumental scale. With its high production rate, the sand master provides sand bag bins with a much better chance of completing the preparations prior to the arrival of a flood. This incredible mechanism is capable of producing 4800-6200 sandbags in 8 hour's time. First, empty bags are attached to the sand master with a speed lock. Once the trigger activated tension rings secures the bags tightly in place, the sand master is ready to proceed further (Fig.1).

***Corresponding author:* Dr. Pannirselvam, N.,**
Associate Professor-Department of Civil Engineering, SRM Institute of Science and Technology,Kattankulathur, Chennai, Tamilnadu, India.

Fig. 1. Illustrates the mechanism of sand master (Source: https://www.youtube.com/watch?v=5ZZyYyN2Dcw)

The sand master works by ploughing straight into the sand and fills empty bags already securely locked entire to the device. The filled bags are then carried to the drop of location where they are closed, securely tied and drop where they are needed. It is available as sand master 20 for skid steers (efficient in stacking 20 sandbags at a time) and sand master 26 for backhoes andloaders (efficient in stacking 26bags at a time). The sand masters can meet the defense between preservation and total devastation during a major flooding event.

Dam Easy: Due to the weather's unpredictable nature, a flash warning effect can occur without warning. Installed within minutes, without excessive choose of brackets, this quick and easy barrier uses a unique compaction seal to completely cover at a potential of water leakage in precious home environment. The dam easy barrier can be installed in three simple steps. First step is to position the barrier in the opening just at the side of our door. Next, we have to use a wrench to extend the side panels into firmly in place (Fig. 2 and 3).

Fig. 2. and 3 Illustrates the arrangement of dam easy barrier (Source: https://www.youtube.com/watch?v=5ZZyYyN2Dcw)

This provides at a 1.1m away which covers the distance of all door reveal spaces. Finally, we use the compaction handle to inflate the seal and that ends the installation of the barrier. We can provide it with some concrete works and extension pole can be installed for wider spaces that count for the use of multiple barriers. A security cover is also available to prevent dampening.

Water Bloc: It is a simple yet amazingly effective flood barrier. The water bloc effectively stops any approaching water heading the way. This highly efficient flood barrier is used to protect homes and even entire neighborhoods. When water approaches, the water bloc does exactly what its name implies. It blocks it. It is made of high strength PVC fabrics designed to maximize punching resistance, tensile strength etc. The water bloc is a tube shaped structure incorporating (Fig.4).

Fig. 4. illustrates the arrangement of water bloc barrier (Source: https://www.youtube.com/watch?v=5ZZyYyN2Dcw)

Flood Break: The entire flood gates automatically blocks pedestrians' way from street level flooding. Without supervision or human activation of any kind, these gates are self-deployed. Under normal conditions, the gate remains architecturally blended in with the surrounding infrastructure. When flood water strikes, the rising water creates hydrostatic pressure required to activate and raise the gate firmly in its position. The rising water also activates self-ceiling rubber caskets. They keep the water from seeping through the barrier. When the barrier reaches a 90° upright position, the flood water holds the gates firmly in place. When the water recedes, the gate falls slowly back into its recess location. Thoroughly tested and built last for years, flood break flood gates have made a major impact in flood protection technology (Fig.5).

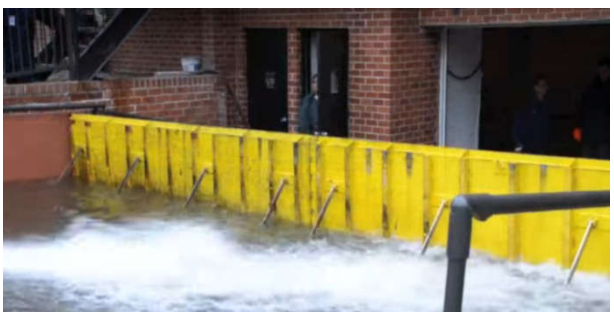

Fig. 5. Illustrates the mechanism of flood break barrier (Source: https://www.youtube.com/watch?v=5ZZyYyN2Dcw)

Flow Defense Flood Barrier: In innovated flood barriers from the land down under, the barrier is levelly hidden within a small area of walkway or roadway. This flood barrier also requires no human intervention for activation (Fig. 6).

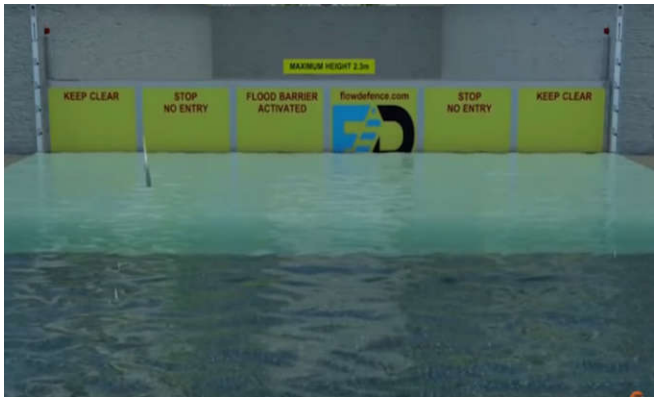

Fig. 6. Illustrates the mechanism of flow defense flood barrier (Source: https://www.youtube.com/watch?v=5ZZyYyN2Dcw)

Like the pedestrian and roadway gates from the flood gate method, the barriers from flow defense also use rising flood water to create the hydrostatic pressure required to activate and raise the gate. But instead of rising it in the roadway or walkway, the flow defense barriers raise from beneath the surface vertically. To achieve the water pressure required to raise the barrier, the flow defense system uses a small grate that positions it with the surface just in front of the hidden barrier assembly. As flood waters flow into the grate, they fill the barrier with enough water to float the barrier upward into its right position. The flow defense barrier also automatically lowers as the flood water recedes by offering four times flood protection at a great reduce of labour, maintenance etc.

NAOQ Flood Barrier: The NAOQ flood fighting system includes two distinct barriers that can defense much faster using less man power. The NAOQ boxwall BW 50 is a free standing flood barrier that uses the weight of flood water to retain in its place. Made of light weight, easily transportable block sections, the BW 50 can be erected by a single person. The box of BW 50 has been shown in figure 7 to be amazingly effective. It is wide enough to be united by just two people. The NAOQ tube wall consists of tube shaped sections filled by airpump and arranged in a chain-like integration including a skirt that is also anchored by the flood water. The tube walls works best. It is now being employed around the world.

Fig. 7.Illustrates the mechanism of NOAQ flood barrier (Source: https://www.youtube.com/watch?v=5ZZyYyN2Dcw)

Rapidam: It is a quickly applicable flood protection method. With incidents of flooding, the Rapidam gives residence in emergency that is a better chance to protect homes, businesses, and credible infrastructure. It is made of a special PVC cloth which is rolled up erectly by only two or three people. The free standing models include individual 10m sections that can be extended by connecting the sections together allowing a 20m section to be setup in about 15 minutes (Fig. 8).

Fig. 8. Illustrates the mechanism of Rapidam flood barrier (Source: https://www.youtube.com/watch?v=5ZZyYyN2Dcw)

The height of this arrangement may range from 180-1800m. Once the upper barrier section is raised, the weeding edge is secured by special screw anchors. When the flood arrives, the weight of the water holds the barrier in place. Secured to the grant by stainless steel bolts, the rapidam version requires the installation of a concrete beam. Pre installed into the concrete, the bolts are removed and screwed back when the rapidam is rolled up. It is able to hold back a ton of water per meter.

Flood Block: It is a robust, flexible flood barrier that can be rapidly deployed by one person. The flood block can be computed in any length and in any direction required. Its ability to form shut corners is awesome and perfect for creating various shapes. This allows the flood block to be used in entire home or business. Flood block units can automatically fill with the rising flood waters. Flood blocks are light weight, stackable and can be deployed amazingly fast. With its convenient portability and conformable design, the flood block stands ready to block the water whenever water rises in its level (Fig.9).

Fig. 9. Illustrates the mechanism of Flood Block flood barrier (Source: https://www.youtube.com/watch?v=5ZZyYyN2Dcw)

Conclusion

- Flood events are a part of nature. They have existed and will continue to exist. As far as feasible, human interference into the processes of nature should be reversed, compensated and in the future, prevented.
- Appropriate instruments and measures should be developed for all flooding related problems.

- We will have to keep in mind that flood protection is never absolute and may generate a false sense of security. The concept of residual risk, including potential failure or breach, should therefore be taken into consideration.
- Flood forecasting and warning is a prerequisite for successful mitigation of flood damage. Its effectiveness depends on the level of preparedness and correct response. Therefore the responsible authorities should provide timely and reliable flood warning, flood forecasting and information.

REFERENCES

Best Practices on Flood Prevention, Protection and Mitigation (from online source).

Concept development of all-new flood protection system by Simen Stromsnes, Norwegian University of Science and Technology, Department of Engineering Design and Materials, NTNU-Trondheim.

https://www.trpc.org/DocumentCenter/View/4414/Flood-Plan-Goals-and-Objectives-Comparison.

https://www.youtube.com/watch?v=5ZZyYyN2Dcw.

John T. Hickey, Jose D. Salas, 1995. Environmental Effects of Extreme Floods, U.S - Italy Research Workshop on the Hydrometeorology, Impacts and Management of Extreme Floods, Perugia (Italy).

Kadar, Istvan, 2018. Mobile flood protection walls, Pollack Periodica, *International Journal for Engineering and Information Sciences*, 10(1), pp. 133.

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