

Case Study On Flood Control System

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Abstract- floods lead all natural disasters in the number of people affected and in resultant economic losses, with these numbers rising at alarming rates. Flood is the most prevalent and costliest natural disaster in the world which devastates both life and economy on large extent. It is defined as, “High-water stages in which water over flows its natural or artificial banks onto normally dry land, such as a river inundating its floodplain.” India receives major rainfall in four months spanning from June to September. Distribution of rain across India is dissimilar as some areas receive heavy rainfall while some are at deficit. The variation also varies time to time; the areas which are not traditionally prone to floods also experience severe inundation due to downpour and cloud bursting. Urban flood has become one of the major problems now a days, the recent floods in Kerala, Uttarakhand and in metropolitan cities like Delhi, Mumbai, Kolkata point towards the need for proper management of floods and the drainage system .In this project work, we have focused on to devise methods for flood control system.

Keywords- flooding, Flood control , water bodies,Overflow, runoffs

I. INTRODUCTION

In India, a vast federal country with 28 states and eight union territories, the responsibility of flood control and management is scattered across many agencies. The water resources ministries of different states oversee the flood control in consultation with the Central Water Commission (CWC). The main job of CWC is to procure the data of hydrology at the national level – like river discharge measurement and water level in dams etcetera – to alert the states about any imminent or potential flood. Besides, there is a Ganga Flood Control Commission (GFCC), under the Union Jal Shakti Ministry to “deal with flood and its management in Ganga basin states.”

In addition to this, the India Meteorological Department (IMD) provides rainfall or cyclonic event forecast which is used by all the agencies for preparedness to deal with the floods. For the national-level response to disasters, there is National Disaster Management Authority (NDMA) which works under Prime Minister Office (PMO) – and National

Institute of Disaster Management (NIDM) – a body under the Union Ministry of Home Affairs (MHA). The job of relief and rescue is carried out by the National Disaster Response Force (NDRF) with state counterparts.

Despite such a plethora of agencies, flood control and management remains a problem in India. Experts believe “streamlining and coordination” among the vast network of agencies is missing.“It is true that various organisations are working at different levels across the country but the problem is in synchronization, collaboration or coordination among these agencies. It is very weak and institutional management is required for effective flood management. We should focus on developing a platform where all the information comes together that can be used effectively and efficiently.” Prasoos Singh, Associate Fellow with Delhi-based The Energy and Resources Institute (TERI) told Mongabay-India.

II. IDENTIFY,RESEARCHANDCOLLECTIDEA

Floods in India are turning more severe, unpredictable and rather intractable. In 2018 alone, India suffered damages worth over Rs. 950 billion due to floods.

Number of urban floods is on the rise mainly due to poor drainage and encroachment of old water bodies of cities and towns.

Despite several agencies involved in flood control, there is a clear lack of coordination among them in the management of floods.

Despite this July being the driest July in the last five years, many parts of India, especially the states of Assam and Bihar, are still reeling under the floods. More than 10 million people are estimated to have been affected and at least 125 people have died due to floods in these two states until the first week of August this year. Besides, hundreds of villages of Uttar Pradesh were inundated, Maharashtra’s capital Mumbai was waterlogged and Kerala has an impending flood.

Flooding is a normal process during monsoon and to some extent, it is needed to carry out some natural processes like bringing alluvial soil to fields, groundwater recharge or

replenishment of waterbodies. However, due to erratic weather patterns and an increasing number of intense rainfall events, the floods have become unpredictable and intractable.

III. WRITEDOWNYOUR STUDIESANDFINDINGS

Causes of flooding

Floods are caused by many factors or a combination of any of these generally prolonged heavy rainfall (locally concentrated or throughout a catchment area), highly accelerated snowmelt, severe winds over water, unusual high tides, tsunamis, or failure of dams, levees, retention ponds, or other structures that retained the water. Flooding can be exacerbated by increased amounts of impervious surface or by other natural hazards such as wildfires, which reduce the supply of vegetation that can absorb rainfall.

Methods of flood management

Dams

Many dams and their associated reservoirs are designed completely or partially to aid in flood protection and control. Many large dams have flood-control reservations in which the level of a reservoir must be kept below a certain elevation before the onset of the rainy/summer melt season to allow a certain amount of space in which floodwaters can fill.

Diversion canals

Floods can be controlled by redirecting excess water to purpose-built canals or floodways, which in turn divert the water to temporary holding ponds or other bodies of water where there is a lower risk or impact to flooding.

Floodplains and groundwater replenishment

Excess water can be used for groundwater replenishment by diversion onto land that can absorb the water. This technique can reduce the impact of later droughts by using the ground as a natural reservoir

River defenses

In many countries, rivers are prone to floods and are often carefully managed. Defenses such as levees, bunds, reservoirs, and weirs are used to prevent rivers from bursting their banks. A weir, also known as a lowhead dam, is most often used to create millponds, but on the Humber River in Toronto, a weir was built near Raymore Drive to prevent a

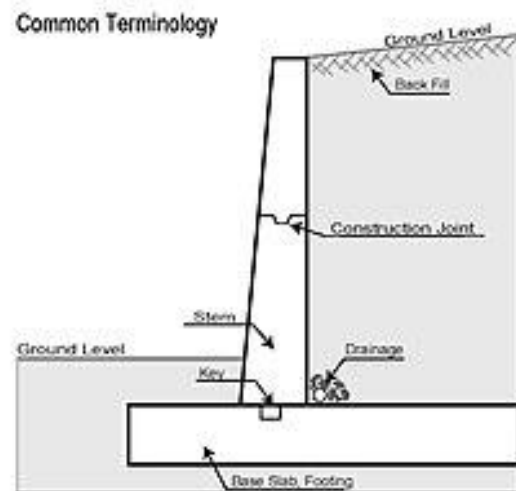
recurrence of the flood damage caused by Hurricane Hazel in October 1954.

Coastal defenses

Coastal flooding has been addressed with coastal defences, such as sea walls, beach nourishment, and barrier islands.

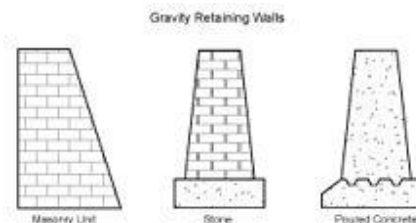
Retaining walls

Retaining walls are relatively rigid walls used for supporting soil laterally so that it can be retained at different levels on the two sides. Retaining walls are structures designed to restrain soil to a slope that it would not naturally keep to (typically a steep, near-vertical or vertical slope).



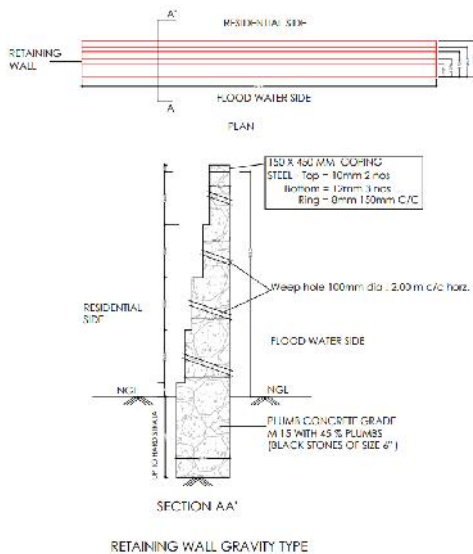
Gravity

Gravity walls depend on their mass (stone, concrete or other heavy material) to resist pressure from behind and may have a 'batter' setback to improve stability by leaning back toward the retained soil. For short landscaping walls, they are often made from mortarless stone or segmental concrete units (masonry units). Dry-stacked gravity walls are somewhat flexible and do not require a rigid footing.



We have designed a Retaining wall structure for minimizing the flood water effect and to avoid

The financial and property loss.



1. This Gravity type Retaining wall is designed to avoid the incoming of flood water and minimize the effect occurring.
2. The excavation is done min.1.5m or upto hard strata below N.G.L.
3. The base width is considered 1.2m.
4. Height of wall above N.G.L. is considered 5m respectively.
5. Side of wall where flood water can come in contact is kept plain surface.
6. This wall construction is done by considering the plumb concrete with grade M15 having black stones of size 6”.
7. At the top surface of steel a coping of 6” x 18” is done with Nominal reinforcement. This coping will provide the stability and covering for top surface.

If a residential house near to flood prone area then a construction of this type of retaining wall around the house at proper location can restrict the flood water and by providing proper drainage facility , we can minimize the effect of floods on large scale.

Present Status of Flood Management activities in India

Different measures have been adopted to reduce the flood losses and protect the flood plains. Depending upon the nature of works, flood protection and flood management measures may be broadly classified as under:

- a. Engineering / Structural Measures
- b. Non-Structural Measures
- c. Catchment Area Treatment

IV. CONCLUSION

Institutional Arrangements and Reforms

As per constitutional provisions, the subject”Flood Management” falls within the purview of the States. The flood control & management schemes are planned, investigated and implemented by the State Governments with their own resources as per priority within the State. The Union Government renders assistance to States which is technical, advisory, catalytic and promotional in nature.

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