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**ABSTRACT**

This report provides background and guidance for the use of defence systems in coastal areas of India. In India destruction caused by tidal waves have caused sever harms over the coastal regions which cause due to least use of any or various types of coastal defence systems. In this project, we have gathered information regarding various coastal defence systems and prepared a model over it determining the efficient coastal defence system among those with respect to the surge.

**KEYWORDS:** Seawall, tidal waves, coastal structure, wave modelling, coastal defence systems (CDS).

**1. INTRODUCTION**

- 1) The coastal area is always subjected to the tidal waves which impact it to the great extent which causes problems like erosion, threat to the lives and economical hazards. The various mechanisms that provided by now for the protection of the sea walls and an efficient wall to provide for Coastal defence structure.
- 2) The tides are the natural disasters whose impact cannot be completely eliminated and these waves can destroy the entire coastal area which might also destroy lives of people, also affect the nature and economy of the country which is not easy to recover thus its impact must be minimized
- 3) By providing optimum impact resisting system means analyzing the different types of coastal defence with respect to the model results and eliminating the less efficient types of CDS
- 4) In this study the different types of the CDSs are to be studied, analyzed and ultimately finalization of the CDS is to be done by experimental model over case study
- 5) There are different types of CDS such as vertical sea wall, curved sea wall, sloped sea wall, stepped sea wall, rock sea wall, offshore breakwater.
- 6) We have undertaken a study over experimental models of CDS by preparing a tank for different CDS for determination of efficient option with respect to the reduction of surge during tidal hazards.

**2. DEFENCE SYSTEM**

Man-made structures such as seawalls, revetments, bulkheads, etc. intended to prevent damage of properties situated on the coast are called as coastal defence systems. The method, which is use for reduction of the impact of flood and its optimizing the resultant waves after analysis, are all the methods of Coastal Defence Systems (CDS).

**Different Coastal Defence Systems to be used-**

- Vertical sea wall
- Curved sea wall
- Sloped sea wall
- Stepped sea wall
- Rock sea wall
- Offshore Breakwater

Are the different types of sea wall we will be considering in our project for optimum impact of the waves regarding the surge (over-topping water waves). In the present scenario the use of coastal defence structure in India is near to nowhere over the coastal regions.

Forces acting over the seawalls

1. Hydro-static force
2. Buoyancy force
3. Hydrodynamic force
4. Flood velocity
5. Surge force
6. Drag force

#### Advantages of coastal defence system:

- The main advantage of a seawall is that it provides a high degree of protection against coastal flooding.
- Reduction in erosion of coastal area can be observe.
- It helps in constructing and maintaining the infrastructure near to the shoreline
- It provides increasing structural height at shoreline
- Limitations of coastal defence systems:
  - Natural tidal waves cannot be completely eliminated but the intensity might get to minimum extent
  - CDS can only limit propagation of the waves to certain limit
  - CDS may get fail due to excessive loading
  - If the magnitude of the waves come to certain extent, it may cause CDS failure, which leads to a threat to the nature and living beings.

### 3. EXPERIMENTAL SETUP

#### Specifications

The tank made from 10 mm sheets connected together with a solvent-based acrylic glue

- Length 1500 mm
- Width 200 mm
- Height 400 mm

The dimension of the tank for the project have been derive from regular and periodic contact with the various trusts regarding the projects they have conducted regarding wave propagation.

### 4. CONCLUSION

By this experimental study, we will be able to conclude the specific seawall, which might be most efficient to be apply as a coastal defence system over the coastal region of India regarding the factor of surge.

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