

## **6. WAVE ENERGY HARNESSING DEVICE - THE OSCILLATING WATER COLUMN WITH THE PROJECTING SIDE WALLS**

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The oscillating water column (OWC) device basically consists of vertical rectangular cylindrical chamber and a tunnel with self rectifying air turbine which is fixed to the upper part of the chamber. The lower bottom of the chamber is opened to facilitate the oscillations of the water column inside the chamber. The oscillations cause the air to force out and suck into the chamber through the tunnel, hence turn the self rectifying turbine. Also this model has two projecting side walls towards the incident wave direction. These side walls help to focus the waves and increase the amplitude of the incoming waves to the chamber.

This research is directed to harness available sea wave energy round the clock and to construct an energy harnessing device with high efficiency of work considering the factors such as geometry of the harnessing device and physico - mechanical characteristics of sea waves. This study is intended for small scale power generating units to harness energy for the sea going vessels; for battery charging and for small scale electricity units. The wave energy harnessing units will also be useful to the fishing community.

Design of the device is researched analytically and experimentally, Analytically we found that the efficiency of the system depends on the function of wave characteristics and geometric parameters of the system.

Experiments will be designed as random experiments to make a non linear regression model to define more accurate efficiency relationship with geometrical parameters of the chamber, and the wave characteristics. The combination square methods is used to identify the random experiments in this regard.