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## CHAPTER FIVE



# Modelling of a Solar Parabolic Trough Concentrator

Debashree Debadatta Behera

Shiv Sankar Das

### Abstract

The objective of this research is to design a solar parabolic concentrator with Magnifying glass for water heating and cooking purpose. There were numbers of magnifying glass strips inserted on the reflector in order to achieve maximum reflectivity and to reduce heat losses due to re-radiation. The Instantaneous efficiency was achieved as 25%. The manual tracking system was used to rotate the concentrator as per the maximum availability of solar radiation. The maximum focal length and rim angle were taken as 0.3125m and 450 respectively.

**Keywords:** Parabolic Trough, Magnifying Glass, Rim Angle, Focal Length.

### Introduction

Ending poverty and ensuring sustainability are the defining challenges in recent time. Energy has the answer to both. Access to modern energy services such as electricity, natural gas, modern cooking fuel, etc. are necessary for improved health and agricultural productivity (UNDP, 2001). In order to provide modern energy services to all, clean energy has the answer to both. Clean energy is defined as that energy source or form which when used does not produce negative externalities (Das, 2020). Energy derived from sun, wind, water and waves are termed as clean energy sources as they generate very less amount of green house gas.

H. Jamali [1] investigated the impact of mirror reflectance on the thermal efficiency of solar parabolic trough collector. The main objective of this paper is to use high reflectance mirror and generally Aluminium and