

Design and Development of a System to Pump Water using Solar Energy for Rural Areas



R. Sriram

sridesigns84@gmail.com
Ph. No: 0 96205 57639

Student's Name	R. Sriram	PD (FT-2012)
-----------------------	------------------	---------------------

Academic Supervisor(s)	Sharath S. Shirsi and C. Dileepa	
-------------------------------	----------------------------------	--

Industrial Supervisor(s)		
---------------------------------	--	--

Keywords: Solar Powered, Fresnel Lens, Water Pumping, Stirling Engine, Functional Design

Abstract:

Water is an essential commodity for living. The water supply system helps people in obtaining the requirement by providing water to the places where they live. The present system involves delivery of water to the people required through various methods, but are facing multiple problems and the people have started raising their voice against it. Development of a system to pump water using solar energy has been in call for some time now as inconsistencies are being observed in the present infrastructure of the country.

The present market offers options that are costly with respect to the people of rural areas. Hence there is a call for cheaper designs that can fulfil the needs of those people in need of it. The proposed project "Design and Development of a System to Pump Water Using Solar Energy for Rural Areas" call for designing a working model that qualifies to answer the requirement. The research activity started with primary research and identified short fall in the existing infrastructure. The existing products in the market were scrutinised and QFD and PDS were generated based on data analysis. Concepts were generated considering the parameters in PDS. Different mechanical model designs were generated and the required parameters defined in it. Final concept selection was carried out through weighted ranking method.

The selected concept was developed into a working model considering the functionality of the product. The design is based on a miniature Stirling engine that is powered by sun light focused on to it through a Fresnel lens. The process of rapid prototyping was implemented to develop critical parts of the design. Product validation was carried out to identify the salient points of the design and its feasibility in addressing the issue prevailing in the society. The results achieved were positive and satisfactory.