

Design of a Mechanical Device for Carrying Water in Rural Areas



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Abstract:

Water scarcity is the one of the most important problems faced by the developing countries as well as the underdeveloped countries. Rural people have to travel lot of distance to fetch water because of limited access to water sources like wells, piped water supply, ponds and rivers and small scale irrigation projects. The women normally collect water from these sources by using pots, jars, buckets and other utensils. This leads to ergonomic problems and causes stress related injuries for those who collect water for their daily needs. The project intend was to develop a design for carrying water with minimum effort and to reduce the burden of women and other people who carry water, thereby eliminating stress related diseases among them. The reduction in water carrying time and effort could be utilized for effective work. This it will result in their economic productivity.

The primary and secondary research was helpful to understand the needs of rural people who collect water for their household purposes. Data collection has been carried out by adopting literature review, product study, market study and environment study. Market study has been conducted to know about similar products in the market and also to find out the scope of new product in current market. Ethnography study has been conducted to understand user behaviour, user pattern and user needs. Ergonomic study has been conducted for deciding product parameters and to understand the product dimensions. QFD and PDS has been generated by using customer voice and technical aspects.

The product has been designed by considering ergonomics, functionality, and manufacturability and usability issues like poor road condition, availability of water sources in rural areas. Final concept has been selected by means of weighted ranking method. 1:1 working model has been fabricated to validate the final concept. Feedback was collected from the end users. Major user requirements such as usability, ergonomics and functionality were satisfied by the final design. User feedback on final design was empowering and satisfying.