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Small-scale wind pump design for use in rural areas in Sudan

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In recent decades, many cases of scarcity of fresh water in many parts of the world had been recorded. The United Nations statistics estimated that more than 2 billion people on the earth still lack the means to gain access to a safe source of drinking water. Rural access to clean water is best achieved through pumping from underground water aquifers rather than using surface water sources, which are often polluted. Because of the relatively small quantities of water required, wind pumping for village supply and livestock watering can be cost-effective given a good wind site. The aim of this study was to design a wind pump that is able to provide underground water to the rural areas in Sudan. In particular, eastern Sudan area has been noted as the most areas suffering from lack of drinking water. Therefore, Tokar area selected as a suggested place to implement this design. The overall design goals of this work focused on affordability and simplicity of design rather than efficiency. These objectives were achieved using a wooden multibladed turbine connected to reciprocating pump in order to create a system that was robust and easy to construct in such low-technology area. In comparison to competitors, this design could be the most affordable option by a significant margin. It makes wind pump is a cost-effective, low technology method of pumping clean water.