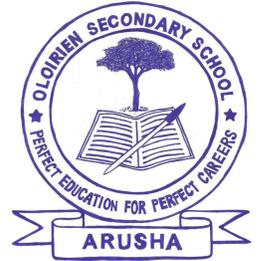




Wind Powered Generator

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Introduction: It is estimated that only 2% of rural Tanzania is electrified while the remaining 98% heavily depends on kerosene and crude biomass energy sources. The burning of kerosene and crude biomass energy sources, such as firewood, contribute to global warming and climate change, therefore there is a need to help people in rural areas to switch to clean energy sources, such as electricity. Wind generated electricity is cheap, renewable and environmentally friendly. People in rural areas mainly use kerosene and crude biomass energy sources, such as charcoal and firewood due to the following reasons: Kerosene, charcoal and firewood are readily available in rural areas than other clean energy sources, Most people in rural areas are unable to afford the initial capital costs in setting up a wind powered generator, Poor availability of the resources required to set up a wind-powered generator in rural areas.



This project was influenced by the need to reduce the risk of people, in rural areas, acquiring respiratory illnesses as a result of indoor pollution that mainly comes from unvented kerosene lamps and firewood smoke. Through this project we intend to offset a significant proportion of carbon emissions by reducing the reliance on kerosene and firewood. We also focused to address the shortage of clean, affordable energy in Tanzania and weaken the monopoly by the Tanzania Electricity Supply Corporation (TANESCO), through this project.

Methods:

1.1 MATERIALS AND METHODS

1.1.1 Materials

The following is a list of materials used during this project

Materials	Means of procurement and Quantity used	Function
Bicycle wheel	Procured from used bicycle Only 1 wheel is required	To provide frame for mounting the blades
Square hollow section	Bought from a local hardware store for 8,000/= Only 1 piece is required	a) To hold the blades on the wheel b) To hold the motors at the margin of the rim
roof cap shingles	Bought from a local hardware store for 4,000/=, one can also reuse an old iron sheet Only 1 piece is	a) To provide the surfaces for the blades b) To provide the surface for the tail (vane)

	required	
Dc electric motors	Removed from old radio sets 6 motors were used	They act as the dynamos which convert mechanical energy to electrical energy
Hinges	Bought from a local hardware store for 200/= each	To allow the free movement of the motor towards the bicycle wheel
Springs	Provided to us by Mr. Bernard (workshop director) 3 springs needed	To provide the appropriate tension between the motors and the wheel
Connecting wires	Borrowed from the school lab About 6m is enough	For collecting electricity from the motors and connecting it to the LED lamp
LED light	Picked up on the way by Mr. Colman	

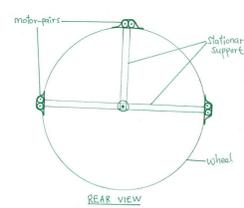
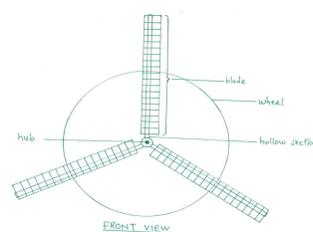
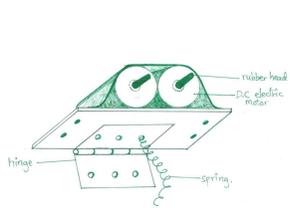
1.1.2 Equipments

The following are the equipments that were used in constructing the wind turbine. These equipments were provided to us by the ARIEE organization in their workshop.

Equipments	Function
Hand riveting machine	For riveting surfaces together
Drilling machine	For boring holes on surfaces
Metal saw	For cutting the square hollow section

Procedure

Cutting the square hollow section into 3 equal pieces,
Cutting the roof cap shingle into 3 sheets and mount them to the hollow section to make the blades, Mounting the blades at evenly spaced positions on the wheel by welding,
Cutting the remaining piece of the hollow section to construct a stationary support where the motors and the wheel would be mounted,
Putting the motors together in pairs and attaching it to a hinge and spring,
Mounting the motor-pairs to the stationary support such that the motor rubber heads touch the bicycle wheel, thus creating a simple gear system,
Mounting a bearing at the base of the stationary support so as to allow free movement of the turbine according to the wind direction,
Mounting a tail (vane) at the rear end of the stationary support to direct the turbine towards the wind,
Connecting the wires from the motors in a parallel connection and leading them towards the LED light bulbs,



Further information:

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