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| **Abstract:** |  |
| **In today's technological world, power energy is vital. It's used in every facet of modern life and the global economy. There is an even greater imperative for poor countries to access economical and reliable energy sources. A hybrid power system combines different energy from many sources, generally renewable sources, while only requiring a single connection point. This study discusses a renewable hybrid power system based smart irrigation system powered by an off-grid wind and solar energy. An Arduino Nano microcontroller controls this smart irrigation system, and this system automatically measures the soil and water conditions (Irrigation) with a soil moisture sensor and a pump motor. It also gives updates through a GSM-based IoT application. All of this power is stored in a battery to use power later. The hybrid power generation system is designed using solar energy (generated by a 360-degree dual-axis sun tracker) and wind power (generated by a Savonius vertical axis wind turbine). There are several prototypes for the agricultural industry on the market, and their prices were high and low applications based. Therefore, by taking all those conditions in mind, this system is designed. The main goal of this project is to help the farmer by using this hybrid renewable energy-based smart irrigation system and reduce pressure on using commercially generated electricity in agriculture.** | |