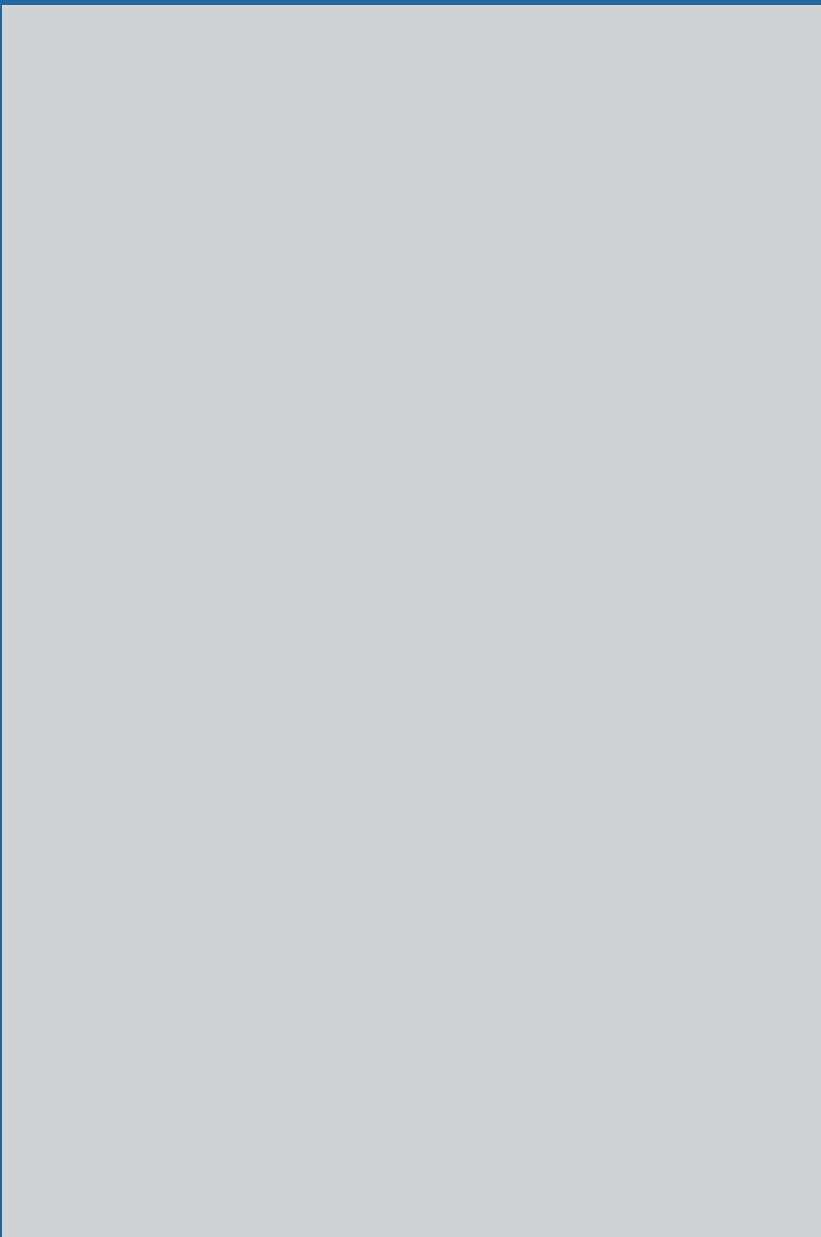
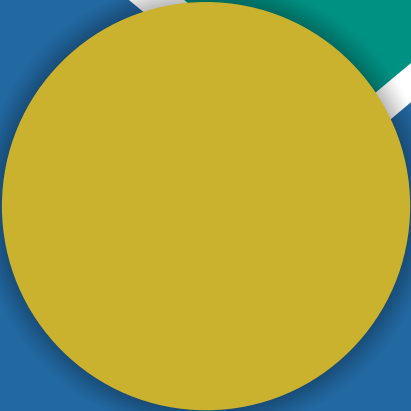


# An Updraft Gasifier



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In many parts of the world biomass is utilized/used as energy source especially for remote areas where supply of high quality fossil fuels of electricity is not possible or costly. Biomass is a central substitute on energy basis. Energy generated from biomass acts as main alternative energy source to luxurious energy assets. By use of burning and cleaning techniques it can be converted into an economical fuel. Gasification is a process of conversion of solid carbonaceous fuel into combustible gas by partial combustion. The resulting gas, known as producer gas, is more versatile in its use than the original solid biomass. The gas produced by gasifier is good source of heat burning, and by cleaning and cooling can be used in internal combustion engines.

## Machine Development

An updraft gasifier was designed and fabricated to run 15 to 18.6 kW (20-25 hp) four stroke diesel engines for tube well operation in the Department of Farm Machinery and Power, University of Agriculture, Faisalabad, Pakistan. The gasifier was tested with different biomass (corn cobs, rice husk, saw dust) for three years and the performance was found good, regarding the gas production, quality of gas to be used in engine, easy maintenance and operation. The breakeven point is achieved only in 500 hours of use, means only in one season of Rabi or Kharif, if rental services are provided to other farmers. The operational cost of tubewell with 15 kW engine is nearly half the cost if operated with gasifier using 15 kg corn cobs + 0.5 L diesel (Rs. 75+45=120) as compared with 2.5 L diesel consumption resulting a cost of Rs.225 per hour. The gasifier was tested for three years and good results were found for tube well operation thus replacing electricity and minimizing the use of diesel (15-20%) making operational cost only 50% of the diesel cost for existing system.

## Impact

Energy production using agricultural waste/crop residue at affordable prices for farm applications

