

Electrification changes irrigation and agriculture patterns in Bihar

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A Case Study prepared for a World Bank Project and for DESI Power

(Source: DESI Power records, interviews)

Introduction

Decentralised Energy Systems India Pvt. Ltd. (D.E.S.I. Power™) is focused on creating an empowered rural India where green energy is a means to achieve economic development of the region. DESI Power works in close partnership with villagers in planning, implementing and running the implementation program. In 2001, DESI Power identified the rural Bihar region in general and the powerless Baharbari village in Araria district, as a potential site for a 50 kW power station, based on gasification of hardwood, maize residue, dhaincha, rice husk briquettes. The 50 kW plant was later upgraded to 61 kW. The raw material was available in abundance in neighbouring villages.



The Village Cooperative Model

In the village of Baharbari, DESI Power created a cooperative to own and operate the biomass gasification based power plants. The cooperative called Baharbari Oudyogik Vikas Swablambi Sahkarita Samiti (BOVSSS or BOVS in short) was formed by the local villagers. It is the direct consumer of DESI Power plant, and uses the electricity for lighting and micro-enterprises for its members. The electricity is used for running its micro-enterprises such as Irrigation pumps, chura (flattened rice) mill, wheat mill, paddy processing unit, battery charging, small workshops and evening lighting in the village and in the market. It also does fishery in its ponds.



Right at the start, villagers identified irrigation water as their most needed input. DESI Power and BOVS worked out a solution which was based on selling water rather than electricity: under ground power lines and pumps were installed in the fields and a channel-based supply system was set up. The irrigation pumps run for 5-6 months in a year for 10-12 hours daily. About 200 acres of land are under cultivation in which different types of crops such as, paddy, wheat, maize, dhaincha, jute,

mustard, are cultivated round the year as per season. Before the power supply from DESI Power, most farmers were dependent on monsoon and rain for their cultivation. Only a few affluent farmers were able to use diesel generator for irrigation. After the power availability from biomass, even these farmers switched to the power supplied by DESI Power.

The farmers used to pay about Rs. 180 for a 3 hour diesel power supply to run their 5HP irrigation pumps. The same farmland was able to be irrigated in 2 hours from DESI Power supplied electricity at a cost of Rs. 120, with the same 5HP pump, thus not only saving in money but also in time to irrigate. As a reference, it takes approximately 6.5 hours to irrigate one acre of farmland with 5HP pump and biomass electricity.



Changes in Agricultural Crop Pattern

Earlier the main crop for the farmers was paddy, wheat and jute. After the power plant came in existence and irrigation pumps were set up in the fields by BOVS, the number of crop increased as the water was available on demand. People started cultivating two crops of paddy in succession. A new breed of bio-energy plant, Dhaincha, was introduced to the farmers which became the cash crop for them as power plant was directly purchasing it from the farmers for fuel. Due to water availability, farmers started cultivating maize which was not the case earlier. They are generating good revenue from it as they are selling the maize in the market and the residue corn-cob to the power plant for running the plant. Thus they are getting the value addition of their crop.

The Impact

According to one of the directors of BOVS, Mr. Mahishanand Sardar, availability of irrigation water has increased agricultural productivity, and thereby the financial strength of farmers. Or, as he says, "Paani hai to kisaan hai, Roshni hai to roji hai" (Farmer's life flourishes if there is water and people's livelihood improves if there is power). Thus the village has achieved true EmPowerment of the villagers as a result of access to electricity to them.

"Paani Hai To Kisaan Hai, Bijli Hai to Roji Hai" – Mahishanand Sardar



पानी है तो किसान है, बिजली है तो रोजी है"