

Animal Driven Gear Box (ADGB) for Multiple Rural Applications

Background

The use of animals for farming has been very ancient, however, the technologies for harnessing of animal energy has remained at a primitive level for a very long time. As a consequence, with the advent of fossil fuels, the use of animals has greatly dwindled. Nevertheless, from all considerations, animals have proved to be a renewable, sustainable & holistic source of energy. Therefore RuTAG IIT Delhi took an initiative to standardize the Animal Driven Gear Box (ADGB) and power transmission system developed by M/S Panchal Pumps & Systems, Kanpur. Further, gear box was coupled with multiple applications such as Screw Pump, Chaff-Cutter, Atta-Chakki, and Paddy Thresher. The technology was very much appreciated by small farmers who use bullocks for farming.



Standardized Animal Driven Gear Box with Screw Pump



Chaff-Cutter



Atta-Chakki



Paddy Thresher

Area of the Project

Agriculture, Farming equipment.

Challenges

- ADGB was not standardized.
- Gearbox was heavy & bigger in size.
- Excessive load on bullocks due to absence of lever support.
- Gearbox was expensive.
- Power transmission to couple with ADGB was not standardized.

Salient Features and Advantages

- Redesigned gearbox is lighter in weight & smaller in size.
- Simplified designs with reduced cost and user-friendliness.

- Gearbox design is standardized.
- Power transmission is redesigned & standardized to couple with ADGB.
- Lever support is provided to reduce load on bullocks.
- Standard gear box & power transmission can be used to run multiple applications such as Screw Pump, Chaff-Cutter, Atta-Chakki, and Paddy Thresher.

Project Timeline

- Problem Identification: 2012.
- Design Improvements and manufacturing: 2012 – 2014.
- Dissemination: 2014 onwards.

Impact of the Technology

- Fuel dependent applications can now run on animal power which is renewable.
- Efficient harnessing of animal power.
- Environment friendly.

Success Stories

- More than 40 gear boxes have been sold.
- Currently being used in Uttar Pradesh, Maharashtra, Madhya Pradesh, Karnataka, Jharkhand, and Assam.
- Vendors have been identified for fabrication, manufacturing and assembly.

Current Funding

Office of the Principal Scientific Adviser (PSA) to the Govt. of India.

Field Agency/ Dissemination

M/s. Panchal Pumps & Systems, Kanpur.

In Project Pipeline

- Technology dissemination.

Benefits from Industry Collaboration

- Improved industry – academia relations.
- Better market penetration.
- Dedicated vendors/ manufacturers.

Tentative Cost of ADGB with applications*

- Gear box cost approx. Rs. 45,000;
- Cost of Screw Pump Rs. 45,000;
- Power Transmission System Rs. 22,000;
- Chaff-Cutter Rs. 14,000;
- Atta-Chakki Rs. 14,000;
- Paddy Thresher Rs. 8,000

* This cost does not include freight, installation, GST and other levies.