

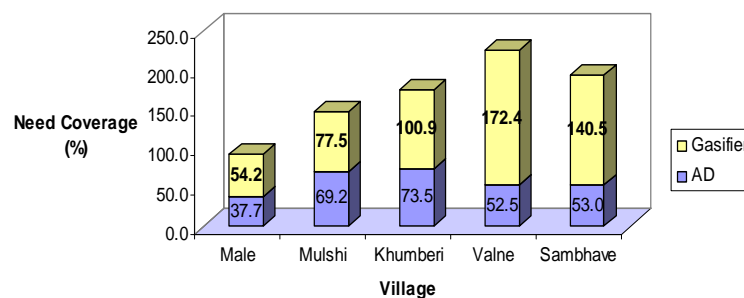
# Biomass Feasibility Assessment for Mulshi Community Micro-plant

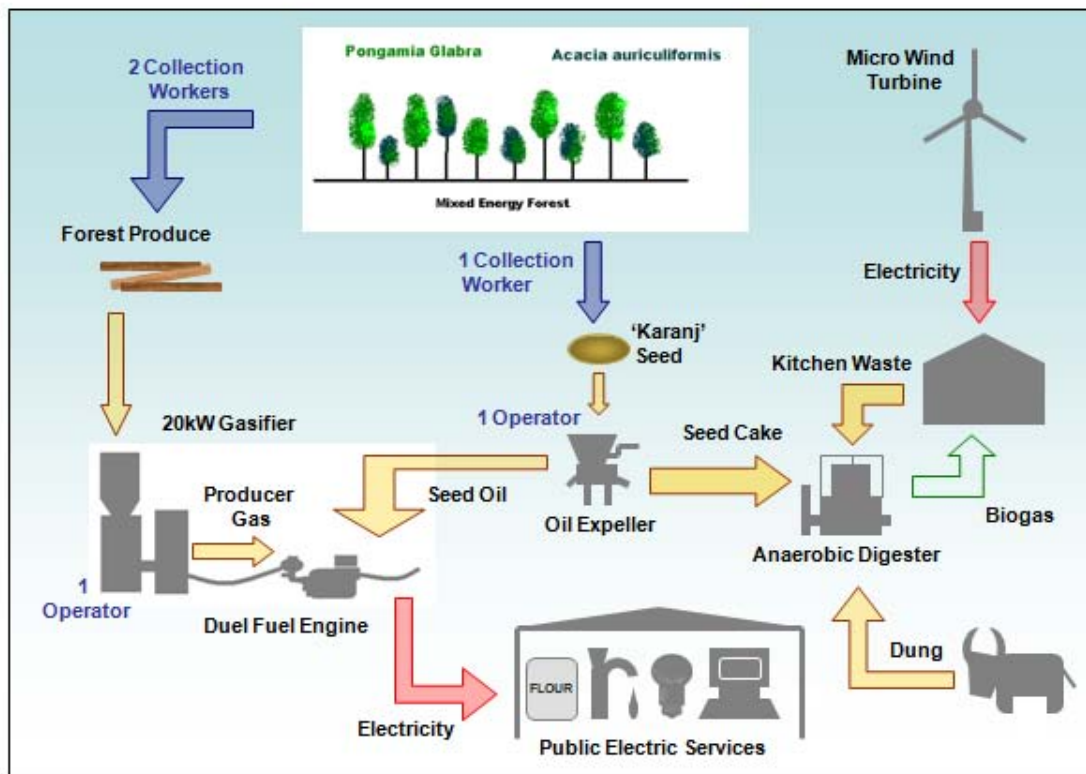
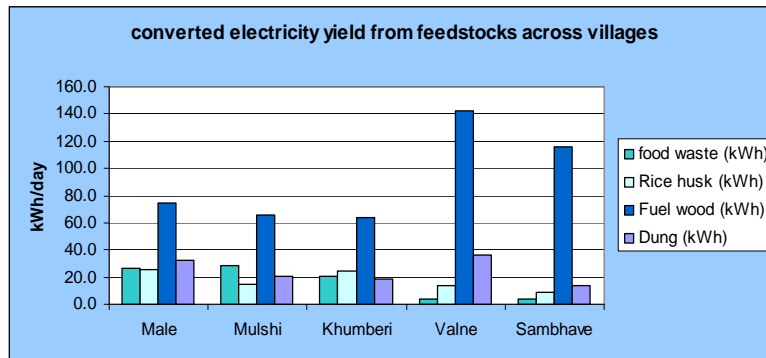
## James Vaux

The purpose of the project was to assess the potential for biomass power generation to provide one of the villages in the Mulshi taluka of Tata Power Company's Mulshi dam catchment area with a community plant to help meet their power needs. Villagers lack up to 10 hours a day of electricity due to load-shedding, and the primary cooking fuel is firewood, which leads women to spend an average of 380 hours a year collecting two tonnes of firewood, and causes health problems through smoke-filled homes. Challenges included the company's lack of distribution rights over the area, preventing distribution of any electricity generated by the project to villagers' homes, the unstable supply and price of biomass feedstocks, and the unintended consequences of increasing demand for (even non-edible) biomass in a low-waste rural economy.

I proposed a multi-phase solution for the most promising village, Valne (76 households, 506 permanent residents). Phase 1 consists of a community-run system involving a 20kW gasifier and dual fuel engine generator, fed by minor forest produce from a mixed species energy plantation of 20 hectares on available company-owned wasteland, and supplying services at a central village locus, including irrigation/drinking water lifting, flour milling, school lighting and computer-running, and public area lighting. A fee-for-service model generates per unit electricity profit sufficient for a payback period of 9.3 years on a soft loan for the capital cost of Rs. 360000 (\$8,100), although increasing the load and substituting seed oil for diesel in phase 2 quadruples profit and the payback period reduces to only three years. Forestry, feedstock collection and gasifier operation jobs are created: three in phase 1, with more jobs created in later phases, which involve the replacement of diesel in the engine with Pongamia oil from the energy forest, use of seed-processing byproducts, dung and kitchen waste to generate biogas in domestic plants, and micro-wind to meet the domestic electricity shortfall. The project offers annual CO<sub>2</sub> emissions savings of 87.5 tonnes versus coal-powered generation, not including the reduced methane and deforestation resulting from biogas-cooking in phase 2. Improved agriculture, longer study hours, fewer health problems and increased enterprise are among the benefits.

Village Electricity Need Coverage by Gasifier and A.D.







With members of Valne SHG and Panchayat in the village meeting area.