



News from IEI's Asian Regional Initiative in Bangalore (India) – September 2015

Value-addition to food crop processing: converting banana plant-waste to cooking fuel – up-scaling strategy

We have been demonstrating how clean energy services can be derived sustainably in villages, by integrating economically- and environmentally-beneficial farm activities with the conversion of their waste to fuel. In this case, currently being extended, banana plantations have been developed with efficient resource use and the plantation waste is being used for the generation of biogas for providing stove-fuel to homes.

Hence, in addition to the increased production of a nutritious food source and enhanced local income from banana sales, additional value is being added through the replacement of indoor-air-polluting solid-biomass-fuelled stoves with clean gas-fuelled stoves and the consequent impacts on local health and the quality of life, and availability of organic manure from digester effluents.



The photographs show the old solid-biomass-fuelled cooking place, later replaced with gas-fuelled stoves within each home.

While the first phase of the project was successfully demonstrated at community-scale with each large digester linked through extensive pipelines to houses around the community, this up-scaling strategy extends the model to small groups in different locations. This is intended to prove that even if entire villages/hamlets cannot be served, or all homes are unable to participate, groups of families willing to commit to a joint endeavour can avail of the integrated benefits. It is also designed to evaluate whether or not the small-scale entrepreneurial model can function, i.e. if an entrepreneurial family can accumulate revenue from banana and gas sales to return the costs of an integrated “banana plantation (with efficient micro-irrigation) => gas generation” system. Access to water remains a critical prerequisite: for sustainability, it is imperative that water is available either from surface sources or from groundwater that is not already over-exploited.



At the project sites -- four small farms, in one village each of Ramanagara district, Karnataka state – the first crop of bananas have been harvested.

Meanwhile, banana-plantation-waste -- chiefly the additional (“pseudo”) stems that develop around each fruit-bearing stalk – had been used as digester feedstock during plant growth. As the construction of each biogas plant was completed, its “fuelling” with these stems was begun. The stems are chopped, mixed with measured amounts of water in the appropriate solid-to-water ratio, and inserted in the input tank. The main fruit-bearing stalks can also be used now.

The construction of all four biogas-plants -- two of 10m³ and two of 8 m³ plant -- have been completed. The biogas-digester capacities were planned to suit the number and size of families involved and their expected cooking fuel requirements. All the plants have floating-drum digesters that have been successfully constructed by the project team for other projects and in other locations. Each has been linked to a cluster of homes around, to which gas is being supplied as cooking fuel.

A handbook is now being prepared with the steps required for the establishment of such integrated “banana plantation & biogas generation” systems.

Both phases of this project -- the initial village-based demonstration and this extension – have been financially supported by the Wuppertal Institute for Climate, Environment, and Energy, Germany, through their Wisions-SEPS programme.

IEI-Asia shortlisted by the ISTIC-TWAS “Successful Innovation in Science and Technology in Developing Countries” Competition 2015

The International Science, Technology, and Innovation Centre for South-South Co-operation (ISTIC) under the UNESCO, together the World Academy of Sciences (TWAS) conducts a biennial competition to select marketable innovations in science and technology from developing countries.

This year IEI-Asia’s case study “*Sustainable farming communities: improved livelihood through efficient resource-use integrated with clean energy from waste*” is one of the twelve that have been short-listed for final selection at the competition scheduled for 10 - 11 October 2015, in Kuala Lumpur, Malaysia. The study encompasses four of the field projects that have been described in these newsletters during the past eight years; they involve improved farming livelihood through increased activities such as fruit/vegetable growing with efficient resource-use, integrated with the generation of fuel from the waste and the use of this fuel for better energy-services.