



News from IEI's Asian Regional Initiative in Bangalore (India) – September 2017

We at IEI-Asia are continuing with our efforts towards *extending sustainable access to better energy services in regions where they are lacking*. Research leads to the design of projects and field demonstrations; we then share the lessons from our experiences, to enable replication with appropriate modifications.

Our focus thus far has been mainly on rural regions, because of the location of most people in south-Asia and the number of under-served. Further, an integrated approach -- that links farming output to energy generation via utilisation of waste -- can address several challenges simultaneously: the local people benefit from supplementary livelihood and increased food production as well as cleaner and more efficient energy services. On a broader scale, environmental impacts are reduced.

But the field demonstrations provided us with several insights – problems that can and do occur, possible solutions through precautionary measures that should be taken, and more effective operational practices. To facilitate effective and large-scale implementation of farm-to-energy activities, we are highlighting these insights.

One of the most important pre-requisites is water: Obviously critical for life itself, assured accessibility of water is essential for increased farming activities, and for the biogas option among waste-to-energy systems. To meet the water requirements of the planned farming/livestock-rearing and biogas generation systems, we had selected localities where groundwater was reported to be accessible. (This means that groundwater levels were in the safe or semi-critical categories of the Central Groundwater Board, and deep-wells were permitted to be drilled to extract water).

But in the longer-term, two problems are being encountered:

- Although groundwater is available at the commencement of the projects, the subsequent availability is reduced;
- in some locations with continuous withdrawal and inadequate re-charge, groundwater levels have fallen steeply, resulting in deep-wells going dry. This has led to re-drilling to deeper levels, or even abandonment of existing wells (adversely affecting the farming activities).

A much preferable alternative is to take remedial measures to rejuvenate (i.e. re-access fresh water through) wells, as shown here.

Rejuvenation of abandoned/dried deep-wells:
Steps include:-

- Initially, a pit has to be dug around the well (Figure 1, courtesy *Nanasaheb Dharmadhikari Pratishthan*).



- To help filter the water entering the pit, it has to be filled with successive (larger to smaller-sized) layers, comprising boulders (large stones), smaller stones, and sand.

- A few holes are usually made on each side of the casing pipe of the well to enable water entry. To prevent soil from also entering through these holes, that section of the pipe has to be covered with mesh, jute-sacking, or mosquito netting.



- Then, structure(s) to direct flowing water towards the well have to be built. One alternative is to dig a catchment pond adjacent to the well (Figure 2, courtesy **Sankalpa Rural Development Society**). Another option is to dig sloped trenches towards the well, from higher levels. These efforts are required to help prevent the wells going dry later.

Apart from the labour (and, if chosen, excavation equipment), costs may be incurred for the filtering material (stones and sand). But the results more than justify these.

Our next newsletter (December '17) will look at community rain- and farm- water-harvesting structures.