



Water Supply for the Demonstration Global Interactive Village Environment

Background

The Demonstration Global Interactive Village Environment (DemoGIVECon) is a concept on how to build villages and/or smaller cities for a sustainable lifestyle as a competitive alternative to cities and megacities. As a key element, it aims at electrification of rural areas in India through off-grid solutions. Integrated and scalable green technologies are a fundamental prerequisite for DemoGIVECon, which will be fully self-sustaining with energy, water as well as food. All waste streams shall be incorporated in an optimized value-chain to re-use as much as possible, for instance food waste and manure from local livestock will be used as substrate for biogas production, which can power the village. Fish farming in aquaponds will both provide fish and will also produce waste streams with a high biogas yield.

Scope:

This MSc work will focus on the water supply system and the work shall:

- define the volume and size of the water supply system based on literature data the amount of water required
- propose solutions to meet the water demand without using groundwater, i.e. how to collect rainwater in a suitable way, how to recycle and clean waste water, water storage (fresh and waste)
- define the energy demand to drive the full water cycle including the required pumps and piping system
- evaluate the potential of a biogas plant based on sewage and also other waste streams such as food waste including the mass & energy demands of a biogas plant

The location of the village will be defined at the start-up of the project as will other required boundary conditions, such as number of inhabitants, age distribution, annual weather data and hours of rainfall & sunshine, vicinity to a river (for potential hydropower) as well as miscellaneous of importance for the energy and water supply and management. This definition process will be done in an iterative way with close contact to the project group. Measures for water harvesting, storing, distribution, purification, quality assurance and use of residuals will be investigated. Besides drinking and household water, water needs for farming shall be taken into consideration. A principle model for system design together with a practical water management manual is to be worked out.

The project group:

The architecture company **Designavd Friberg & Palmér AB** is a small well-established architecture office, located in Stockholm, Sweden.

ScanIndian Sustainable Solutions, SISS is a small Swedish consultant company working with concept development and networking with strong business relations in India.

COWI AB is one of the largest Scandinavian consultancy companies working with infrastructure, energy & process engineering solutions.

Regular meetings will be held with the student(s) to ensure good communication as well as an interesting MSc thesis to work with.

Duration:

The project should start in spring 2016 and should not extend for more than 6 months.

Specific starting date to be discussed.

Location: KTH - Energy Department. The student will be provided required hardware and software.

Main Supervisor: Björn Laumert, PhD – KTH, Jürgen Jacoby, PhD - COWI

Examiner: Björn Laumert, PhD – Associate Professor

To apply send your CV together with University grades and expected starting date