Persönlicher Erfahrungsbericht

PROMOS 2016

Gasthochschule / Institution: KIT

Stadt, Land: Vietnam

Fakultät (KIT): Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften

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Aufenthaltsdauer: 1 Monat

Unterbringung: wechselnde Hotels

Für den Aufenthalt nützliche Links:

Belegte Kurse (ggf.): Datenerhebung zur Masterarbeit

Within the BMBF-funded joint project KaWaTech Vietnam, German and Vietnamese partners from universities, research institutions, industry and public authorities are cooperating together to develop innovative and sustainable technologies for the delivery and distribution of water in karst regions based on the Dong Van karst plateau in the north of Vietnam and thereby improve the quality of life for residents in the project region.
As pumping water from vast depths always comes with high energy demand, the use of hydropower represents an ideal autarkic solution for the often inaccessible regular energy supply, which usually lacks profitability and sustainability. Due to the region's extreme topography, there is a great potential for hydropower in the karst cave systems as well as on the surface, which up to this point is only used by a few small conventional hydropower plants.
The aim of this project is to use discharges that cannot be efficiently used by hydropower plants (due to high variability of discharges and efficiency curve of hydropower plants) to produce energy for the water supply. For this purpose a flexibly applicable technical concept for the enhancement of existing hydropower plants by a water conveying module based on the linkage of an inverted pump (PAT) as turbine replacement and a feed pump ought to be developed (Concept 1). The innovation of this concept lies in the first application under high-pressure

conditions (turbine as well as pumping head in a range of 20-70 bar) and the hydraulic and operational connection to an existing hydropower plant for energy production (hydropower plant Seo Ho).

I'm writing my master's thesis at the Economics and Management Department at the Karlsruhe Institute of Technology (KIT) in cooperation with the Institute of for Water and River Basin Management and I am conducting an economic assessment of Concept 1. The main goals of my work are:

1. Development of operating scenarios for the simultaneous operation of a hydropower plant and a water pumping facility from technical and economical point of view
2. Evaluation of cost-efficiency of a water supply system based on hydropower (Concept 1) compared to other supply concepts (e.g. wind/solar power, using energy from regular transmission grid)

In order to establish a solid data foundation for my work, a research trip to Vietnam was conducted. During this stay I held interviews with the local government, the national power company and the local water. The interviews were organized and supported by a colleague from VIGMR (Vietnam Institute of Geosciences and Mineral Resources, Hanoi).
Besides the interviews we installed a new data logger to collect discharge data in a cave upstream from the project area. I also spend some time monitoring the progress of the construction work of the project. All the information gained from the interviews will be used to develop strategies for operation of the combined water and energy supply facility, to estimate investment and operational costs and finally to assess the cost-efficiency of Concept 1 compared to other supply concepts.
During the trip to Vietnam and the interviews with the above stated parties, it was possible to improve the data, which will be used for the economic assessment of Concept 1 magnificently.

Working and travelling in Vietnam was rather easy. Even though many Vietnamese don't speak English, there were no problems to get the right bus, find a hotel, buy food, rent motorbikes (which is the best way to travel in that country), etc. Only asking for directions is a bit hard, especially in the countryside, where most people don't speak English. So I used offline maps to navigate.