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BMBF Joint Project: Water Resources Management of an Underground River in a Karst Area on Java, Indonesia

With hydropower against water scarcity – Drinking water for up to 80.000 people

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Study Area

- Karst area 'Gunung Sewu' ("Land of thousand hills", 1.400 km^2) at District of Gunung Kidul, Indonesia, with hundreds of networked underground caves

Problems

- Total exchange of the surface run off to an underground river system due to karst infiltration
- Severe water scarcity during dry seasons

Goals

- Enablement of a reliable water supply through extraction of the underground water resources by usage of appropriate technologies based on renewable hydropower

Concept

- Damming up the river with concrete barrage
- Installation of underground hydropower plant
- Application of robust and cost effective pumps as turbine substitute
- Mechanical energy transmission to feed pump
- Demonstration cave and field laboratory for multiplication to other locations

Results

- Handover to Indonesian operating authority in March 2010
- Comprehensive capacity development accomplished by German side
- **Supply of more than 2.5 billion liters of water since the start-up of continuous operation in July 2011**

Location of project area Gunung Sewu on Java island, Indonesia

Left: Gunung Kidul during rainy season. Right: Gunung Kidul during dry season.

Upstream view on underground barrage (left), successful initial start-up in August 2008 (right)

Continuous operation of the hydropower plant enabled by comprehensive capacity development

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