ADAPTED WATER SUPPLY TECHNOLOGIES

EVEN IN POOR DEVELOPED AND REMOTE AREAS THE WATER SUPPLY CAN BE IMPROVED SUSTAINABLY BY USING TECHNOLOGIES ADAPTED TO THE LOCAL CONDITIONS. THE WATER SUPPLY PLANT ERECTED HERE SERVES AS A TRAINING FACILITY TO FIELD-TEST A SUPPLY SYSTEM BASED ON REVERSE-DRIVEN PUMPS WHICH ARE FED BY A WOODEN PENSTOCK.

DECENTRALIZED WATER SUPPLY

The achievement of a **sustainable water supply** in remote areas is commonly very challenging due to lacking infrastructure, energy supply and financial resources. Decentralized solutions associated with the application of adapted technologies demonstrate the highest potential for creating lasting development in the affected areas.

In this context, **the constructed water extraction plant** serves as a **demonstration and training facility** for transferring the knowledge concerning high potential water supply technologies. Here, two highly adaptable technologies can be field-tested: an **innovative water supply system** based on reverse driven pumps and a **wood stave pipeline** for power generation.

Inlet reservoir – for supply of the wooden pipeline within the water supply system. The reservoir also contains an adjustable weir for variation of the machinery's operating point

Constructional aspects – The connections between the wood stave pipeline and steel pipe need to be carefully considered in order to guarantee a watertight link between these materials

Wood stave pipeline

Test line area – Here, different flow resistances can be adjusted in order to investigate their impact on the plant's water supply potential

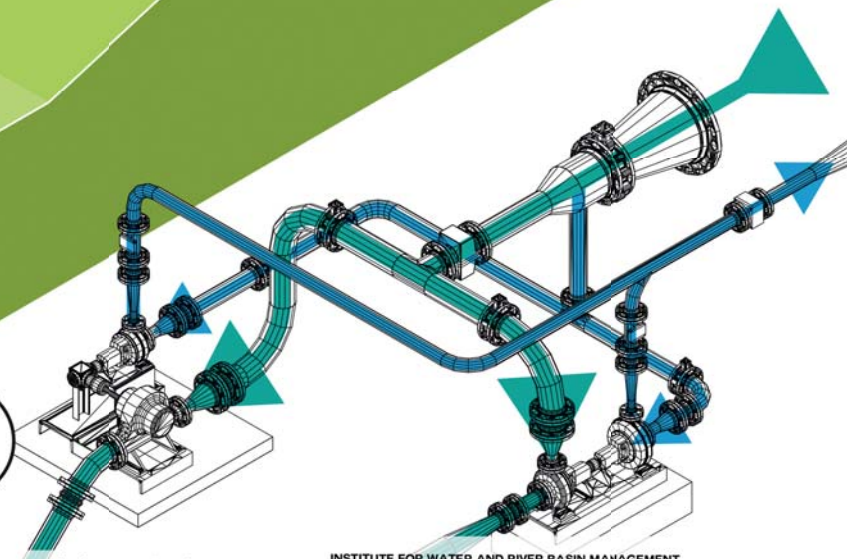
Control Panel – All measured operating parameters (PAT discharge, pump discharge, rotation speed of the machinery) are displayed here

Conveying module

Tailrace – The water discharged by the "pumps as turbines" flows into the tailrace and back into the original channel

WOOD STAVE PIPELINES

Wood stave pipelines have been **comprehensively field-tested** over many years and are **high adaptable** in their application in remote and poorly accessible areas. Their comparatively **minor weight and dimensions** as opposed to steel or concrete pipelines is an immense **advantage** since wooden staves and steel rings as single components of wood stave pipelines can be transported separately and be **successively assembled on-site**. Here, depending on the local boundary conditions such as topography, the pipeline can be adjusted regarding length, course and diameter. Generally, the simple structure of a wood stave pipeline leads to **financial benefits** compared to the usage of steel or concrete pipes. Additionally, a wood stave pipeline is an **ecologically sustainable technology** since it is based on regenerative resources.



CONVEYING MODULE

Independent of the method and technology applied, **water supply always requires** the provision of **energy**. Here, a reverse-operated centrifugal **pump** serves **as turbine substitute** (called "pump as turbine", PAT) for power generation in order to **drive a high pressure pump** via mechanical coupling. A low-cost and low-maintenance but highly robust operation, PATs display major advantages **for decentralized applications**. Since a PAT requires a pressure head to generate power just like a common turbine, in this plant a wood stave pipeline is applied to transfer water from a higher energetic level to the PAT.

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