



RAIN – Sustainable technologies in flood and drought-prone settlement areas in Ghana

Client II – International partnerships for sustainable innovation

Ghana, like the entire African continent, is affected by climate change. Temperatures in Ghana will continue to rise in the future, and rainfall in the rainy season and drought in the dry season will increase, causing socio-economic damage. The joint research project “RAIN” aims to develop strategies and appropriate water treatment processes to reduce vulnerability and increase the resilience of settlements to the effects of climate change, thus enabling sustainable water use.

Challenges

All of Ghana, but especially the northern savannah belt, is exposed to floods, droughts and bush fires. The accumulated rainwater seeps away unused. The urban areas, particularly the capital Accra in the south of the country, suffer from heavy rainfall events more and more frequently.

The Ghanaian government recently published guidelines and documents for adapting to climate change which call for appropriate action to address the challenges.



Unused rainwater accumulation in a rural area.

Solutions

Within the “RAIN” collaborative project, the research consortium aims to combine an early flood warning system with intelligent water management and supply plans. It also aims to identify potential approaches to sustainable water use through training and further education measures among population groups and decision-makers. The “RAIN” joint project aims to strengthen the Ghanaian climate projects and contribute to achieving the climate adaptation targets set by the Federal Government.

The project comprises one urban and one rural pilot region, which will make it possible to transfer the approaches and findings of the project to the WASCAL/SASSCAL regions. The capital city Accra serves as the urban research area, and Kumasi and its surrounding region makes up the rural research area.

Valid data will be generated through a local data collection process. This data will then be used to develop a model for predicting local meteorological impacts of climate change, which will be tested as an early warning system for natural disasters.

The consortium aims to calculate meaningful forecasting scenarios for flood and drought adaptation measures. A concept detailing the promising modeled measures will be drawn up to introduce sustainable flood protection and water management techniques that promote the conservation of water and reuse of treated water. This includes a multi-stage treatment chain from the treatment of rainwater and water from retention basins to water-saving distribution methods.

Pilot approaches will be used to demonstrate the technical potential of the treatment chain using adapted technologies for water collection, storage, removal of turbidity and pollutants (heavy metal adsorption), disinfection (biolight irradiation) and water-conserving drip irrigation in the pilot regions with support from the local population. The partner consortium will include local decision-makers in the search to find the technical solution best adapted to suit local conditions.

Transferring knowledge into practice

The research network will, for example, provide training for planning, administration, and plant operation experts

and relevant user groups on the subject of adaptation to climate change and sustainable water use. The knowledge gained from this project will be funneled into developing training modules and also integrated into the education plans of both PAUWES and WASCAL with the aim of expanding the transfer of knowledge and the exchange of experience between the research institutions and the wider population.



Water recirculation, oxygenation and disinfection plant for shallow, open water reservoirs.

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Contact

Dr.-Ing. Friedrich-Wilhelm Bolle
Research Institute for water- und waste management
at the RWTH Aachen e. V.
Kackertstraße 15–17
52056 Aachen, Germany
Phone: +49 241 802-6825
E-mail: bolle@fiw.rwth-aachen.de

Project partner

Ruhr-University of Bochum; Aqua-Technik Beregnungsanlagen GmbH & Co. KG; AWAS International GmbH; Kwame Nkrumah University of Science and Technology, Department of Planning; University of Ghana; Envaserv Research Consult Ltd

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