卒業論文要旨

Proposal of safe water and energy self-support system combining simple ecological slow sand filtration (ESSF) and small hydropower plant (SHP) to apply it for community development of the mountainous region in Rwanda

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ルワンダの中山間地域コミュニティーにおける簡易緩速砂濾過(ESSF)と小水力発電を組み合わせた水・エネルギー自給システムの提案

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Rwanda is located in the central part of Sub-Sahara Africa with moderate precipitation and water resources depending on the mountainous and hilly topography. The government of Rwanda has executed the immigration policy to relocate the local people into the optimum cluster of the village unit in the hilly and mountainous region with moderate to rich rainfall. Drinking stream and river water without treatment, however, has high risk of infectious (waterborne) disease to die many children under the age of 5 years.

The purpose of this study is to propose the conjunctive distributed type of supplying safe drinking water and energy by mini-hydropower to divert either stream or river water into pipe conduit system with topographic head difference of 10-100m. Small scale ecological slow sand filtration (ESSF) water purification system using the pet bottle and bucket is developed to evaluate the optimum efficiency of the filtration speed of 10 m/day by checking the zero bacteria coliform. Supplying safe drinking water and energy/electricity for the vulnerable small local community in the hilly and mountainous region aims to resolve the basic human needs (BHN) and poverty problems by achieve the target of Millennium Development Goals (MDGs) in Rwanda.