

Project proposal template

Graduate School studentships

March 2015

<i>Project title</i>	Advanced, sustainable septic tank technologies for meeting Ghana's wastewater treatment challenges
<i>First Supervisor</i>	Dr <input type="text" value="Parneet Paul"/>
<i>Second Supervisor</i>	Professor David Kofi Essumang, University of Cape Coast (Ghana)
<i>School</i>	Civil Engineering and Construction <input type="text"/>
<i>Other member of supervisory team (no more than three KU supervisors in total)</i>	<input type="text"/>
<i>Specific requirements beyond 2:1 degree</i>	<input type="text"/>

Project summary
(max 4,000 characters)

Rapid population increase, urbanisation and industrialisation in the major cities of Ghana have resulted in deterioration of water quality and shortages of fresh water supplies. Moreover most wastewater generated is discharged without any treatment. Whilst technologies for wastewater treatment are well established in industrialised countries the same technologies have often not been successfully applied in Ghana. The reasons are myriad, but key among these are non-enforcement of environmental regulations and the high cost of the installation and operation of centralised treatment systems. Therefore, it is important to investigate novel treatment technologies especially decentralised options that not only effectively treat influent but also make the treated wastewater available for reuse. This project aims to investigate together with the University of Cape Coast in Ghana, at lab bench-scale level, the development of low energy membrane septic tank units that allow full on-site effluent recycling for a Ghanaian context; and to further examine add-on Effective Microorganism (EM) modules to enhance anaerobic activity in the septic tank by using ordinary solid organic household wastes. The basic project methodology would thus involve developing a flexible prototype structure that enables the investigation of different membrane module types, septic tank configurations (e.g. black water only, greywater sullage only, combined systems, etc.), and add-on options for sustainable energy sources to produce the recyclable permeate, e.g. solar/wind energy, and for enhancing waste stream degradation, e.g. EM module addition. Benefits of these units include: reduced sludge; superb effluent quality; small footprint; reduced operational energy; & reduced through-life support costs. Units will be customisable to local conditions.

