

## TWO PHD POSITIONS ON WATER-FOOD-ENERGY

### **The challenge**

Assessing the environmental sustainability of alternative future development paths requires an integrated and multi-disciplinary approach to understand the complex interrelations between water, energy, food, land use and climate. In the upcoming Horizon 2020 project MAGIC, a consortium of European research groups uses a holistic approach to study the feasibility, viability and desirability of different policies. The approach will be based on systems understanding involving balances of resource use and availability at regional to global scale. The project will provide insight in regional and planetary boundaries to growth as well as interregional dependencies.

In the project, the Water Management Group of the University of Twente will contribute its expertise on water systems and water management, focusing on the links of water use to food and energy production. Researchers from the Water Management Group published extensively on globalization of water, water footprints and water scarcity in the world's leading journals. The project offers the opportunity for two new PhD students to join our team and expand this research in challenging and internationally appealing directions.

### **The positions**

One PhD student will focus on the water-energy nexus. A comprehensive analysis of water consumption and greenhouse gas emissions in energy production will be made, considering the water and carbon footprints of different forms of fuels and electricity and of energy transformation and storage. Both water consumption (green and blue water footprints) and water pollution (grey water footprint) are covered. Research will yield a new global gridded component of the energy sector for the Water Footprint Assessment tool Aqua21, which the group is currently developing. Results are used in scenario studies assessing EU energy and water policies.

Another PhD student will focus on the water-land-food nexus. Water and food security, appearing in UN's Sustainable Development Goals, are operationalized and assessed in scenario studies employing the water and land footprint concepts. Research will contribute to the global Aqua21 tool, including a new module to trace water and land footprints along supply chains, allowing the assessment of international resource dependencies. Results are used in scenario studies assessing EU policies on water, food, trade and fertilizer use in agriculture.

### **Our offer**

We offer a position as a PhD student. The salary for PhD research starts at € 2174,- gross per month for the first year and extends to a maximum of € 2779,- gross per month in the fourth year (in accordance with the Collective Labour Agreement for Dutch Universities). In addition, the University of Twente offers attractive fringe benefits.

### **Your profile**

We are looking for two enthusiastic PhD students with an open mind, strong communicative qualities and excellent comprehension of English, both in spoken language and in writing. Prerequisite for both of the positions is an MSc degree in environmental sciences, hydrology, civil engineering or a related specialization. Candidates should have affinity with conceptual thinking from a holistic view, ample skills

in modelling and geo-information systems, and be flexible in acquainting themselves with knowledge from new scientific fields and working in multi-disciplinary teams.

### **Information and application**

For more information please contact dr. Maarten Krol, telephone +31 53 4892615, or prof.dr.ir. Arjen Hoekstra, +31 53 4893880. The start of the project is as soon as possible. Your written application, with a CV and, if applicable, a list of publications and references should be sent **before 15 May 2016** through the vacancy website of the University of Twente: <http://www.utwente.nl/vacatures/en>. Candidates expecting to graduate soon are also invited to apply.

### **The Organisation**

The **University of Twente** stands for life sciences and technology. High tech and human touch. Education and research that matter. New technology which drives change, innovation and progress in society. The University of Twente is the only campus university in the Netherlands; divided over six faculties we provide more than fifty educational programmes. The University of Twente has a strong focus on personal development and talented researchers are given scope for carrying out pioneering research.

The **Faculty of Engineering Technology (CTW)** is one of the six faculties of the University of Twente. CTW combines Mechanical Engineering, Civil Engineering and Industrial Design Engineering. Our faculty has approximately 1800 bachelor and master students, 300 employees and 150 PhD candidates. The departments of the faculty cooperatively conduct the educational programmes and participate in interdisciplinary research projects, programmes and research institutes.