# WEEG NEWSLETTER December 2019

The newsletter is published monthly by the University of Southampton's Water and Environmental Engineering Group WEEG, and reports things of interest in this field worldwide, as well as ongoing undergraduate student and research work in WEEG itself.

We believe that water and energy are the most important topics worldwide for the next decades. Our work covers river and coastal engineering, water and wastewater and energy related to water.

**Editorial:** Water is a priority topic in many parts of the world, South America included. WEEG is contributing here at the highest level:

## Hydraulic Engineering International: *Water stress in Peru*

Many of our readers may not know that Lima, the capital of Peru, is the second largest desert city in the world – it receives less than 25 mm of rainfall per year! For comparison, Paris gets 637 mm. Lima, on the west coast of Peru, is a city of 10 million people located in a desert zone and relies on the water draining from snow and glaciers in the Andes. This means it is experiencing problems similar to those now occurring in India and Pakistan: glaciers have been melting more quickly recently due to global warming, but as the glaciers shrink less and less water will be available in future. The rapid retreat of the glaciers not only reduces the water supply, but at the same time can create the risk of flash flooding.

**Fig. 1: Retreating glacier in the Peruvian Andes**

In addition, there are other major water problems in the country, with 3 million people (in a total population of 32 million) without access to safe drinking water, and 8 million without access to improved sanitation. As you can imagine, water is a big topic in Peru.

In December 2019, staff and former students of WEEG met in Lima to attend the First International Forum on Water Advances and Challenges, hosted by the National Authority of Water of Peru (ANA). This three-day event was organised by former Southampton MSc student Enrique Messeth. Over 200 delegates from 20 countries met to discuss issues of water supply, management and development in South America.

**Fig. 2: Desertification in Peru**

This high-profile meeting was attended by the President of Peru, Mr Martín Vizcarra (Fig 3). The forum also received addresses by the Ministers of Water Resources and of Housing and Sanitation.


**Fig. 3: President Vizcarra speaking at the Conference**

Derek Clarke (WEEG lecturer in hydrology and water resources) gave an invited presentation on the issues of climate change and water availability. Ben Fawcett (former member of WEEG staff, now in Australia) also made a presentation describing the challenges of sanitation in a rapidly growing city.

Enrique Messeth (Fig 4) graduated in 2008, and since then has worked in Kazakhstan, Ireland and Taiwan. He is now Peru's Coordinator of the United Nations Sustainable Development Goal No 6 ("Ensure availability and sustainable management of water and sanitation for all").

**Fig. 4: Conference Panel**

So, water resources are a topic which is of the highest priority in many countries worldwide; and the University of Southampton's WEEG is proud to be a recognised as major player in this field.

## *Small but prestigious grant: British Council Grant for co-operation with South Asia*

Together with the University of Engineering and Technology in Peshawar, Pakistan we have been awarded a £5k grant to explore the generation of electricity from hydropower in irrigation systems.

**Fig. 5: Two typical drop structures (pictures courtesy of A Anwar, IWMI Lahore)**

A Group Design Project with six 4th year students is developing the technology to generate hydropower at low drop structures, with drop heights between 1 and 2.5 m.

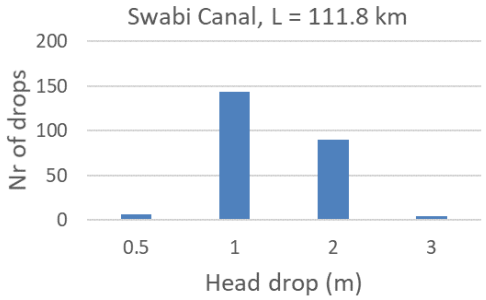


**Fig. 5: Drop structures – numbers for drop heights of 0.5 to 3.5 m**

The University in Peshawar is looking for suitable sites. Here we should add that there are quite a few drop structures in irrigation canals: one typical example in Peshawar has 243 drop structures over a length of 111.8 km, with a total (unused) hydropower of 2.2 MW. Drop heights range from 0.5 to 5 m, with the majority of drops between 1 and 2.5 m (Fig. 5), although there is one 17 m drop as well.

We are currently preparing small and large scale (1:2 scale) tests. Once the design is defined, we will apply for more funding to build a prototype.

## *Year 3 Individual Projects: WasteCAT*

Only space for a very short mention of an Individual Project which is looking at the Waste Collection Assessment Tool. This piece of software allows scoping and benchmarking of waste collection services in terms of their energy use, staffing and vehicle requirements, can be downloaded for free with a manual from http://borrg.soton.ac.uk/resources. The research is looking critically at some of the parameters used in the model to find ways of improving them and extending the model's applicability. Lots of original ideas coming from the student, more news later.

Contact: Dr S Heaven, s.heaven@soton.ac.uk

## Jobs in water engineering:

This section gives you an idea of the types of work you can do in the water industry.

**Advert:** Asset performance engineers are responsible for managing and maintaining water industry infrastructure - Natural Resources Wales has some interesting posts in flood risk management

### Asset Performance Engineers

https://www.icerecruit.com/job/192816/asset-perfornance-engineer/?LinkSource=TopJob

## Civil and Environmental Engineering at Southampton University:

**WEEG:** the Civil and Environmental Engineering pathway offers the chance to deepen your knowledge in water-related areas, and gives you a better preparation for environmental engineering projects.

**Contact:** Sonia Heaven s.heaven@soton.ac.uk, Bldg 178, Room 5015

## Further information:

We have two Facebook pages, which provide a logbook of our laboratory activities:

www.facebook.com/Hydraulicslaboratory/

www.facebook.com/environmental.lab.university.of.southampton/

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