



DELTA IN TIMES OF CLIMATE CHANGE II INTERNATIONAL CONFERENCE

OPPORTUNITIES FOR PEOPLE, SCIENCE, CITIES AND BUSINESS
ROTTERDAM THE NETHERLANDS, 24–26 SEPTEMBER 2014

Deltas in Depth scientific sessions	
Deltas in Depth 3. Fresh water management	
DD 3.1 Surface water quantity and quality	
Chair	Dr. Gualbert Oude Essink, Deltares, the Netherlands
Presentations	<ul style="list-style-type: none">● Prof. Paul Whitehead, University of Oxford, United Kingdom● Zahirul Haque Khan, Institute of Water Modelling, Bangladesh● André Marques Arsénio, Delft University of Technology, the Netherlands● Dr. Cor Jacobs, Wageningen UR, the Netherlands● PhD Ali Shafquat Akanda, University of Rhode Island, USA

Gualbert Oude Essink opens the meeting stressing the urge of good freshwater management, because available liquid fresh water is but a small portion of the total water mass on the surface.

Modelling impacts of climate change and socio economic pathways on extremes of Hydrology and water quality in the Ganges-Brahmaputra-Meghna Delta of Bangladesh, Prof. Paul Whitehead, University of Oxford, United Kingdom

Paul Whitehead from ESPA (Ecosystems Services for Poverty Alleviation) is presenting his work on the alterations of nutrient flow due to climate change in the Ganges-Brahmaputra-Meghna (GBM) Delta. By using the INCA (Integrated Catchment) model he analyzed various Shared Socio-economical Pathways (SSP) to indicate future trends. Results are that these SSPs will most probably not change peak flow in the Ganges very much, except when there will be a major agricultural growth. Nutrient affluent discharge can be controlled when the National Ganga River Master plan is put to power. The discussion was focused around the calibration of the model and the used scenarios. The calibration was done up to catchment level. Sub catchments were not calibrated individually due to the size of the entire catchment. The models are based on the A1B scenarios of the IPCC.

Salinity intrusion and water availability under changing climate in the Coastal Ganges Delta in Bangladesh, Zahirul Haque Khan, Institute of Water Modelling

Sea level rise due to climate change impacts the Bangladesh coastal zone, but salt intrusion is mainly caused by the decreased outflow from the Indian Farakka Barrage. In many areas, during the dry season, the salt concentration threshold (1ppt for drinking water, 2 for agriculture) is exceeded. In the medium saline zone the salt concentration can reach up to 8 ppt, in the high saline zone (Sathkira) it peaks up to 20ppt and more in the dry season, but does not move to under threshold levels year round. Models show that by constructing a barrage downstream from the Ganges to divert water in to the Gorai River the salinity problems might be solved for the high saline region, without increasing salinity problems in the low affected area. The discussion was centered around the question how legislation on trans boundary conflicts evolved in Europe and what in what sense the Asian rivers are not to be compared with European rivers. The difference between Europe and Bangladesh is that in Europe you will have political and economic leverage to take action once treaties are not kept. India does not have any benefit from lower Ganges, and it can therefore not be punished economically. According to the Minister of Water from Bangladesh who attended the session the only solution will be the construction of the Ganges Barrage.





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Centralized and de-centralized wastewater treatment in Maputo, Mozambique, Sustainable water supply in urbanizing Maputo, Mozambique, André Marques Arsénio, Delft University of Technology, the Netherlands

Maputo, Mozambique suffers from fresh water shortages, improper sanitation, limited access to drinking water, and reuse of untreated waste water. By studying the centralized and decentralized water systems in the city, an integrated approach can be developed on social and technical aspects improvements. Wastewater use for irrigation is a potential solution to the water shortages. It contains nutrients and is available where needed. Yet there are still ways to improve the system.

A questions from the audience was about the contaminate rate in the wastewater. Although the contaminant rate is too high according to the norms it is still useable, yet improvements must be installed to reduce the contamination in the near future.

Assessment of evaporative water loss from Dutch Cities, Dr. Cor Jacobs, Wageningen UR, the Netherlands

In Dutch cities heat islands can increase the temperature up to 7 to 10 degrees centigrade. This temperature can be lowered by evaporation. Evaporation is the link between the energy and water budgets, heat mitigation and water management. It is crucial in ground water management and contributes some specific problems. The rate of evaporation is unknown for most Dutch cities. Through two methods the rate of evaporation in Rotterdam and Arnhem was measured. Goal was to assess the possibilities of converting the crop factor in to a city factor; unfortunately there is no relation with the reference evaporation. An important role is expected of open water bodies and water storage on flat rooftops to enlarge the evaporation rate, but further research must be done to create hard evidence.

Population Vulnerability to seasonal Freshwater Fluxes and Diarrheal Diseases in the Bengal Delta, PhD Ali Shafquat Akanda, University of Rhode Island, USA

Large areas of Bangladesh are at risk of endemic and epidemic cholera outbreaks. In the flood prone area these outbreaks occur in spring, while in the drought prone areas they occur in fall. This biannual behavior of cholera outbreaks and the scale of calamities are underestimated and should be included in the public health response system.

Wrap up of the entire session

The applicability of science is very important, creating information that can be used by practitioners and scientists creates added value.

