

## Valuating Ecosystem Services of Urban Ponds - case study from Bangladesh

Nina Carle

Goethe University of Frankfurt, Physical Geography, 11, Frankfurt am Main, Germany (nina.carle@stud.uni-frankfurt.de)

A climate risk assessment for the city of Barisal was carried out by a consultancy firm, financed by KfW Development Bank of Germany. Due to high dependencies on natural capital of people in developing countries they are facing high vulnerability when it comes to changes of the asset category 'natural capital' (here: urban ponds), whether due to the exposition on climate (change) related impacts, implemented measures or land use change. With a closer view on the city's assets, the question remained open to the author 1) Under current conditions, what is the demand for ecosystem services (ES) 2) What is the value of the benefits and the how much is the contribution to the city's welfare? 3) What are the future changes in the demand for ES? And what are the future changes on the supply side (pressures and threats to the ecosystem)?

**Methodology:** The City of Barisal in Bangladesh has a calculated number of around 10.000 urban rain-fed ponds, representing 6.5% of the city area, which represents a huge natural water supply and gives the city its characteristic face. In August 2015 a user survey was conducted in the city of Barisal, in every ward (administrative unit), to determine the demand for ecosystem services related to urban ponds, evaluating over 600 ponds.

The findings will present the huge variation of provisioning ecosystem services and an important regulating service, related to economic and domestic use, in a spatial resolution. It will be shown, how the importance of ES changes, by changing the unit of analysis (families or ponds or the city) and the importance for the livelihood of pond owners and users. A relationship between pond area(m<sup>2</sup>) and number of users was detected, also the role of compensation payments for the pond owners by the users. It will be shown how natural capital, privately and publicly owned, contributes in an important way in buffering unequal distribution of societies resources in the short- and long-run. However society's demand for ES will change in the future, as climate models indicate a change in precipitation patterns for Barisal.

Climate change is operating multisectoral and therefore all assets have to be considered to detect the potential damage. This research can show the pathways of people depending on natural capital in developing countries, sharpening the view for vulnerable groups. Furthermore the research can deliver a contribution to the discussion on (financial) investments to build resilient futures.