

Vacancy	PhD in socio-hydrology: Water-related human dimensions of drought in north-east Brazil
Organization	Wageningen University
Department	Environmental Sciences, Water Resources Management group
Chair holder	Prof.dr. Petra Hellegers
Starting date	1 April 2019
Duration	4 years at 1 fte

In April 2019 an interdisciplinary research project will start, coordinated by Wageningen University:
Diagnosing drought for dealing with drought in 3D: Toolbox for increasing drought preparedness of actors in water and climate governance, starting from north-eastern Brazil

This project is a joint effort of Brazilian and Dutch organizations including: Wageningen University (WU; The Netherlands); the Research Institute of Meteorology and Water Resources (FUNCEME; Brazil); the Federal University of Ceará (UFC; Brazil) and the Brazilian Research Agricultural Corporation, National Research Tropical Agroindustry Center (EMBRAPA; Brazil).

Project description: To manage drought better, human influences on drought must be better understood. Current frameworks for drought monitoring and water accounting focus on the natural boundary conditions and therefore offer little help in distilling human influences on drought. This project combines insights from socio-hydrology and water management to produce an entirely new approach, incorporating the study of **water-related human dimensions (D₁)**, socio-hydrological dynamics (D₂), and the structuring of dialogues (D₃) among actors. The project will develop and test the integrated, participatory 3D Drought Diagnosis (3DDD) toolbox. We will investigate nested scale levels, related to local water resources and virtual-water transfers together with actor networks of users, managers, traders, and policymakers. Test case is the drought-affected north-east of Brazil. Finally, the 3D Drought Diagnosis toolbox can be used to enable existing drought monitors to provide contextualized information in drought-affected regions worldwide. We will demonstrate how proposed drought management solutions perform with regard to cross-scale synergies and trade-offs in relation to the UN Sustainable Development Goals 2, 6, 10, and 13. The project will kick-off with three PhD candidates, each focussing on one of the three D's: water-related human dimensions (D₁), socio-hydrological dynamics (D₂), and dialogues among actors (D₃). As a PhD candidate in this project, you will work in an international and interdisciplinary team, studying the development and impact of droughts using approaches from different scientific disciplines.

In the context of the 3DDD project Wageningen University is looking for a **PhD student in the field of socio-hydrology: Water-related human dimensions (D₁) of drought in north-east Brazil.**

The PhD student will focus on the following **research question:**

What are the different human influences on the detectable variations in drought (in space and time) and the distribution of well-being and prosperity (over the population) associated with three water-related human dimensions (D₁): water use, water management, and virtual-water transfers?

Together with two other PhD students and a post-doctoral researcher you will develop and test an integrated, participatory 3DDD toolbox for providing actionable knowledge to improve water and climate governance supported by drought monitoring frameworks. The toolbox will serve to increase drought preparedness of actors in multi-level water and climate governance. You will focus on water-related human dimensions by looking at human drivers and impacts of drought at field and basin levels, related to agricultural practices, water management and international trade. You will use statistical methods and different approaches for water accounting for diagnosing recent drought events in north-east Brazil.

Your tasks.

- Cross-scale review of water accounts for drought-affected communities and selected drought events. This will build on existing approaches (water footprint assessment and water accounting).
- Development of contextualized indicators using the *downstreamness* concept for in-depth analysis of river basins in north-eastern Brazil (i.e. Jaguaribe, Piranhas-Açu, and São Francisco). This in-depth analysis, supported by data from field-pilots, will produce a framework of contextualized indicators of human influence on drought impacts, building on existing overviews.
- Evaluation of action prospects for dealing with drought. This assessment will encompass local actors (marginalized communities and innovative farmers) and remote actors, including those associated with conjunctive water use, increasing water-use efficiency, and policies impacting virtual-water transfers from and to north-east Brazil.
- Writing academic publications in international journals and a PhD thesis.

Who we are.

Wageningen University & Research centre aims to deliver a substantial contribution to the quality of life. Within our domain, healthy food and living environment, we search for answers to issues affecting society - such as sustainable food production, climate change and alternative energy. Every day, 6,500 people work on 'the quality of life', turning ideas into reality, on a global scale.

This PhD-project will be carried out at the Water Resources Management (WRM) group of Wageningen University. WRM is part of the Department of Environmental Sciences of Wageningen University. WRM is engaged in interdisciplinary research and education at the intersection of water, technology, and society. The PhD-project will be conducted in close collaboration with the Hydrology and Quantitative Water Management (HWM) group of Wageningen University. HWM's research and teaching focus on understanding and prediction of hydrological processes in river basins and deltas for improved water management.

What we look for.

We are looking for a candidate with the following qualifications:

- a master degree (MSc) in agronomy, hydrology, water resources management or a related field
- experience in data analysis (GIS, statistics) and preferably modelling (crop-, hydrological models) and coding / scripting (e.g. in R, Matlab, Python, or Fortran)
- experience with collecting social data (household surveys, interviews) is an asset
- eager to work on yet unexplored topics, and able to independently propose research directions
- a creative, critical and collaborative person with an interest in interdisciplinary research
- ability, willingness and commitment to collaborate in a research team and write joint publications
- excellent communication in English (<https://www.wur.nl/en/Education-Programmes/PhD-Programme/English-language-requirements.htm>), and good communication skills
- some knowledge of the Portuguese language would be an asset.

Conditions:

This PhD project is in the form of a Sandwich PhD. This means that your PhD defence will at Wageningen University. You will stay in the Netherlands for 18 months and in Brazil for 30 months. Your supervisors will be experts from Wageningen University and project partners from Brazil (UFC, EMBRAPA, FUNCEME). Your monthly allowance will be: €1,400 (in the Netherlands) and €1,000 (in Brazil). There is additional budget for research activities, attending courses and workshops, international travel, etc.

You can only apply for a Sandwich PhD if you are a national of one of the countries in the following regions: Middle and South America, Africa, countries that belong to the former Soviet Union and that are not an EU-member state and all Asian countries except Israel, Japan, South Korea and Singapore.

Contact information:

Additional information about this project can be obtained from
Dr Pieter van Oel (Wageningen University; pieter.vanoel@wur.nl)
Dr Lieke Melsen (Wageningen University; lieke.melsen@wur.nl)
Prof.dr. Eduardo Martins (FUNCEME; espr.martins@gmail.com)

You can apply up and until 28 February 2019.

For this position you can only apply by sending your CV and motivation letter to pieter.vanoel@wur.nl

Job interviews will be held in the period 11-15 March 2019 in Fortaleza, Brazil.