



# Water and Development Research Group

WDRG is a multi- and interdisciplinary research group, working rigorously on various aspects of water. Our research themes vary from "water for food" to the "role of power and politics in water management". WDRG has a strong modeling knowledge on big data and spatial analysis from local to global scale.

## New publications

See full list next page and at [Aalto Research](#)

V. Sandström et al. (2023)  
**Disparate history of transgressing planetary boundaries for nutrients**  
Global Environmental Change. 78, 102628

D. Chrisendo et al. (2022)  
**Oil palm cultivation improves living standards and human capital formation in smallholder farm households**  
World Development. 159, 9, 106034

M. Kallio et al. (2022)  
**Unpacking dasymetric modelling to correct spatial bias in environmental model outputs**  
Environmental Modelling & Software. 157, 12, 105511

## Latest blog post

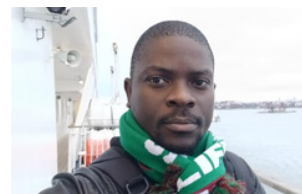
**Expert Elicitation Explained by an Expert**

Daniel Chrisendo reports the findings of a recent article led by Anna Chrysafi. The study quantifies the interactions between different variables in the Earth system process through expert elicitation.

Next WDRG Newsletter in March

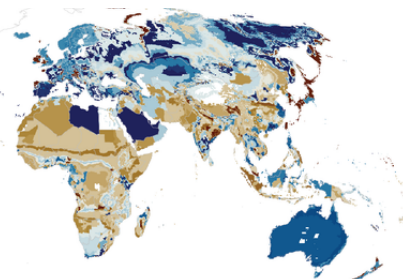
## People

**Ozias Hounkpatin** is a postdoctoral researcher working in the SOS.aquaterra project in WDRG. His research focuses on soil conservation and nutrient management. Ozias's background is in soil science and especially in digital soil mapping using a machine learning approach.



**Qiankun Niu** started as a doctoral researcher in October 2022. Her research is about food security, climate change and land use. Her background is in agricultural drought and crop yields at China Agricultural University.

**Venla Niva** defended her thesis "*The interplay of environmental and social drivers of migration - A global synthesis*" in Aalto University in October 2022. Find her thesis [here](#). She is currently working as a postdoc in WDRG, continuing the development of global net-migration data and quantitative analysis of its drivers.



## Podcasts



**Suolaista vettä on meret täynnä, mutta puhtaan makean veden puute on tappaa kuivuusalueilla**  
**Tiedeykkönen - YLE**

Our professor Olli Varis was interviewed in Tiedeykkönen podcast. Listen to Olli's interview [here](#) (in Finnish only) if you'd like to learn more about droughts and water scarcity around the world.

## Conferences

Anni Juvakoski presented her research at the **IWA conference** in October 2022. The topic of Anni's presentation was "*Technology transfer barriers of frugal water treatment technologies: A case study on solar drinking water disinfection*".

Miina Porkka, Vili Virkki, Matias Heino and Venla Niva attended the fall meeting of **American Geophysical Union** in Chicago, US, in December 2022. Their presentations were about [the planetary boundaries for freshwater](#) and [land-use, seasonal forecasting in predicting crop productivity](#) and [estimating global human mobility patterns](#).



# Water and Development Research Group

WDRG is a multi- and interdisciplinary research group, working rigorously on various aspects of water. Our research themes vary from “water for food” to the “role of power and politics in water management”. WDRG has a strong modeling knowledge on big data and spatial analysis from local to global scale.

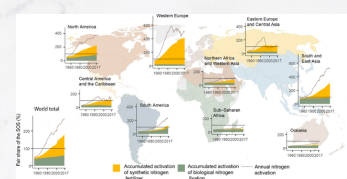
## New publications

See full list at [Aalto Research](#)

V. Sandström et al. (2023)

**Disparate history of transgressing planetary boundaries for nutrients**  
Global Environmental Change. 78, 102628

We assessed history of fair shares of the SOS in access to nutrients to produce food. Planetary boundaries were transgressed in 1970 (nitrogen) and 1964 (phosphorus). Since then, the activation has doubled (nitrogen) and tripled (phosphorus). History of nutrient activation shows clear disparities between countries and regions.

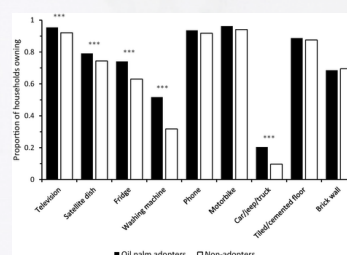


D. Chrisendo et al. (2022)

**Oil palm cultivation improves living standards and human capital formation in smallholder farm households**

World Development. 159, 9, 106034

We present an analysis of the effects of oil palm cultivation on smallholder farmers' living standards. We used panel data from Sumatra, Indonesia, and detected that oil palm improves nutrition, education, and general living conditions. We found positive implications for current and future welfare through human capital formation, while negative environmental effects associated with deforestation need to be reduced.

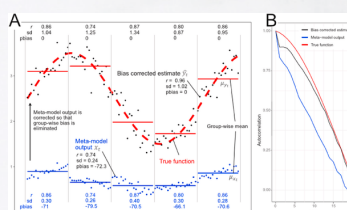


M. Kallio et al. (2022)

**Unpacking dasymetric modelling to correct spatial bias in environmental model outputs**

Environmental Modelling & Software. 157, 12, 105511

We introduce dasymetric modelling (DM) as a spatial bias correction method by showing a relationship between DM and linear scaling bias correction. DM consists of meta-modelling, bias correction, and areal interpolation components. We found that performance of meta-models are significantly improved by DM and that DM corrects the wider spatial autocorrelation patterns in meta-model outputs.



V. Arabzadeh et al. (2023)

**Urban vertical farming with a large wind power share and optimised electricity costs**

Applied Energy. 331, 10, 120416

K. Davis et al. (2022)

**Beyond the Green Revolution : A roadmap for sustainable food systems research and action**

Environmental Research Letters. 17, 10, 100401

X. Qi et al. (2022)

**Rising agricultural water scarcity in China is driven by expansion of irrigated cropland in water scarce regions**

One Earth. 5, 10, P1139-1152.

R. Zhong et al. (2023)

**Rising agricultural water scarcity in China is driven by expansion of irrigated cropland in water scarce regions**

Journal of Cleaner Production. 385, 135740

K. Korhonen-Kurki et al. (2022)

**Empirical insights into knowledge-weaving processes in strategic environmental research**

Journal of Environmental Policy and Planning. 24, 6, 733-748.

C. Mohan et al. (2022)

**Poor correlation between large-scale environmental flow violations and freshwater biodiversity: implications for water resource management and the freshwater planetary boundary**  
Hydrol. Earth Syst. Sci., 26, 6247–6262

K. Morovati et al. (2023)

**Contributions from climate variation and human activities to flow regime change of Tonle Sap Lake from 2001 to 2020**

Journal of Hydrology. 616, 13, 128800

K. Liu et al. (2022)

**Assessment of ecological water scarcity in China**

Environmental Research Letters. 17, 10, 104056