Submitted Abstract

ID IMC22-FSAbstr- 500

First Author First Name Last Name	 Arthur (1) Lutz
Submitting Author First Name Last Name	 Arthur Lutz
Correspondence	a.f.lutz@uu.nl
Co-Authors **>> E-Mails will be not listed**	Smolenaars, Wouter (2); Dhaubanjar, Sanita (1,3); Jamil, Khalid (2,4); Biemans, Hester (2); Ludwig, Fulco (2); Immerzeel, Walter (1)
Organisations	1: Utrecht University, The Netherlands 2: Wageningen University & Research, The Netherlands 3: International Centre for Integrated Mountain Development, Nepal 4: Pakistan Agricultural Research Council, Pakistan
Country	Netherlands, The
Region	Western Europe
Title	Towards Pathways To Sustainability In Mountain-Dependent River Basins: Translating Global Sustainable Development Goals To Indus Development Goals.
Keywords	Sustainability, Water-Energy-Food Nexus, Indus, Sdgs, Mountain-Dependent River Basins
Type	List Of Focus Session
Focus Session ID	57

Abstract

The UN Sustainable Development Goals (SDGs) are a powerful concept to drive action towards a more sustainable future. However, the SDGs are formulated in a qualitative and generic way whereas specific and quantitative definitions of targets are required to steer policy and practice.

The Indus river basin is the most mountain water dependent river basin on Earth, and is a global hotspot for future climate change and socioeconomic development. The basin has the largest continuous irrigation scheme in the world, and hydropower is developing rapidly with a large hydropower potential still untapped. Therefore, water, food and energy are strongly interlinked in the basin's water-food-energy nexus. The basin already faces insecurity of water, food and energy in the present situation, and with strong projected climate and socioeconomic change, achieving the SDGs for these three resources in the basin will be challenging.

Here we present a novel approach to translate the global SDGs for water, food and energy (SDGs 2, 6 and 7) to quantitative targets specified for the Indus river basin. Our approach is based on a resource accounting framework operating at sub-basin scale and monthly time step, combining spatially distributed models for cryosphere-hydrology in the upstream and crop-hydrology in the downstream. The approach uses ensembles of downscaled projections for three climate change scenarios driving water availability and three sets of downscaled projections of socioeconomic drivers, including population and GDP, as main drivers for the demand for water, food and energy. The accounting framework considers dependencies between the three resources and represents scenario-specific exchange of resources between sub-basins in this transboundary river basin. The approach results in scenario-specific quantitative targets for water, food and energy to be realized to achieve the three related SDGs at the river basin scale.