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## Exploring improvements in water management for the cotton and textile industry – results from a case study in Punjab and its contribution to achieving UN-SDGs in Pakistan

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Pakistan is the world's fourth-largest producer of cotton. A major share of textiles sold in Germany is produced in Pakistan. The irrigation of cotton plants as well as dyeing and finishing processes during textile production require tremendous amounts of water. In addition, rivers, soil and groundwater are lastingly polluted by salinization, intensive use of pesticides and fertilizers in cotton farming as well as discharge of untreated waste water by textile companies.

The main focus of the InoCottonGROW project, funded by German BMBF, is to address this complex, multidisciplinary water management problem in the region of Lower Chenab Canal in Punjab. Hydrologists, engineers, political scientists, ethnologists and economists on the scientific as well as on the stakeholder side, are working together towards identifying technically, economically and institutionally feasible ways of increasing the efficiency of water use along the cotton-textile value chain in Pakistan.

A more sustainable water resource management is aimed to be achieved by a suite of measures on a technical and organizational level. Some of the technical measures like alternative irrigation techniques are experienced in applied studies within the project. Project activities include:

- application of the water footprint concept as a regional steering instrument for national decision makers, manufacturers, retailers, and consumers
- analysis of the current state of water efficiency, water quality, and concurrent usages in Pakistan using a combination of satellite remote sensing, field-site studies, hydrologic and hydraulic modelling, company surveys and monitoring
- demonstration of efficient technologies along the cotton-textile value chain, including efficient cotton irrigation, dyes and process chemicals, textile machinery, suitable wastewater treatment processes, and analytical instruments for water pollution monitoring

Results of the practical investigations of these different approaches on field level are finally evaluated with respect to their contribution to achieving the UN Sustainable Development Goals. The systematic approach to link regionally collected and modeled data with national water

management indicators will be described following a stepwise approach:

- definition of management scenarios in order to indicate potential changes in future irrigation practices and waste water treatment
- qualitative assessment approach based on an established scheme by the International Council for science (ICSU, 2017) to analyze the impact on selected SDGs by these management scenarios
- quantitative assessment of the impact on selected SDG indicators (such as indicator 6.4.2: Level of water stress) starting with hydrological modelling of water availability and water demand on a local scale and up-scaling these simulation results

## **References**

International Council for Science 2017 A Guide to SDG Interactions: from Science to Implementation. ICSU, Paris.