



ATSAF - CGIAR++ Junior Scientists Program Final Report

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Country: India

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**Title: Measurement of farmers' intentions on water conservation and
management in rural India: A questionnaire based on the Theory of
Planned Behavior**

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Final Report for CGIAR++ Junior Scientists Program of ATSAF e.V.

In the period between February 2021 and July 2021 I participated at the CGIAR++ Junior Scientists Program of ATSAF e.V. to write my master thesis about „Measurement of farmers’ intentions on water conservation and management in rural India: A questionnaire based on the Theory of Planned Behavior“. This took place with the kind support of my professor Dr. Günther Schulze at the department of International Economic Policy at Albert-Ludwigs University of Freiburg, with Dr. Thomas Falk and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) Pantancheru, India.

India faces an acute water crisis and at least 30 cities could run out of water approximately in the year 2050, according to the WWF. This water crisis affects of course not only urban, but also rural areas in India, where in 2017 the rural population in the country was approx. 450 million with a rising trend in population. This water stress threatens not only the assurance of sufficient drinking water for the ever-growing population but also brings with it other problems: Water stress leads to sanitation problems, which became a visible problem especially during the CoVid-19 pandemic. Other areas of everyday life are also affected by it, such as food security. Especially rural areas base their food provision and income on agricultural activities, a sector which is facing severe water challenges as a notable share of water is allocated to it. With climate crisis acting as a catalyst for droughts and delayed monsoon phases, the pressure to find rapid, economic and sustainable solutions to this crisis is growing.

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), International Food Policy Research Institute (IFPRI), Foundation for Ecological Security (FES), and other organizations as well elaborate a large-scale project "Scaling up experimental learning tools for sustainable water governance in India“, which tries to improve water resources in rural India. Approximately 1,500 rural communities in six Indian states are involved in this field experiment and are going to benefit with this project, where more sustainable water management is going to be achieved. This is

supposed to be reached through active experiential learning within collective action games, community debriefings and participatory water planning tools. The goal is to positively influence the behavior of farmers and their water consumption, which should lead to greater awareness and behavioral change, contribute to better governance and bring about more sustainable water management.

The initial idea of my thesis was the key question what could drive farmers in India to save more water on their farm, due to the fact that a notable share of water is allocated to agriculture. The literature provides many approaches to answer this question, ranging from physical, economic, political, institutional to social factors, etc. In order to narrow down this multi-dimensional problem, I focused on behavioral factors which could have an impact on water consumption and management of farmers. Especially, when voluntary action is preferred over top-down regulations this can be a helpful approach and starting point to understand farmers' motivation.

The main goal of my thesis was to compose a questionnaire that enables the collection of empirical evidence regarding the social-psychological factors which influence the behavior of farmers with respect to water efficient crop cultivation practices as well as the maintenance and operation of water infrastructure, based on the project's treatments. The data gathered with the questionnaire aims at tackling the following questions: Which are the main behavioral, normative and control beliefs of i) Water efficient crop cultivation practices and ii) Management and maintenance of check dams in the farmers' village, according to the Theory of Planned Behavior? Have behavioral, normative and control beliefs been activated or altered where the project interventions were implemented and do they have a significant influence on farmers' behavior regarding the two practices? Also, the questionnaires can measure how strong the influence of attitude, subjective norms and perceived behavioral control is on farmers' intentions. Due to the fact that intentions can act as a predictor for actual behavior, the questionnaires give the opportunity to observe and quantify farmers' intentions and to operationalize the long-term effect of the project's interventions. This tool is not only useful to generate a measure for behavior but also to elaborate policy recommendations. To my current knowledge, such research does not exist yet regarding the impacts of cognitive factors influencing



crop-choice decisions and participation in maintenance of check-dams of Indian farmers. Therefore, it was an incredible possibility to contribute something small to close this research gap in the future and to better understand farmers' intentions regarding water conservation and management.

My CG-Center ICRISAT was very helpful at any point: They provided me with sufficient material to get an overview about the purpose, execution and process of the large-scale project. I was invited to participate into online workshops and had access to the drop-box folder with all relevant documents to keep track with the development of the project. My supervisor Thomas Falk was very kind, patient and helpful. He helped me to elaborate a topic for my master thesis that could suit as a helpful tool for the intervention. We communicate during the whole time of my thesis and he supported me in different tasks, such as elaborating an adequate research question and theory, as well as organizing relevant interview-partner which were needed for my survey. Also, the organizations ICRISAT and FES were great at supporting my thesis: For the questionnaires I had to conduct an exploratory survey to elicit the behavioral beliefs of the research population in question. In this case the participants were supposed to be farmers or other types of agricultural operators in rural India. With the help of ICRISAT and FES, two different 10-item elicitation questionnaires were developed and conducted in the period between July and September 2021. The exploratory survey had to be conducted through telephone interviews to minimize health risks during the pandemic. For this purpose, FES provided 40 phone numbers of Indian farmers of the regions Karnataka and Andhra Pradesh. The interview was conducted in the respective native language (for example Telugu) of the participants. ICRISAT provided two experienced and great members of their organization, who conducted the interviews and translated the questionnaires to the interview-partners in the respective native language of the participants, as well as translated and transcribed the responses in English for me. Also, I was enrolled at the training/study Program at ICRISAT, where regular workshops were held on different topics, for example for soft skills where giving presentations was trained or other topics related to agriculture in India .

I was able to gain first insights into field research, even though normal procedures were not possible during the year. Nevertheless, it was interesting to see the development and process of such a large-



scale project, how many people and parties are involved and to work with competent researchers which helped me at anytime with their expertise. My masters thesis with the topic I chose myself would not have been possible without the help of Dr. Thomas Falk and ICRISAT as well as the open mindedness for interdisciplinary topics of my professor Dr. Günther Schulze, and I am very grateful for this opportunity. Also the kind support of ATSAF helped a lot in this difficult and uncertain times. The flexible application deadlines have immensely helped to be able to reorient oneself, especially since my previous plans with another organization were cancelled due to the pandemic. Also the application process and the communication with the members of ATSAF e.V. was great and they helped me with any question I had. The financial support was also an extreme relief, so that I could fully concentrate on writing my master's thesis.

I would like to thank ATSAF e.V. for the possibility to participate at CGIAR++ Junior Scientists Program, which was an important experience for me and my future research career. I have learned a lot about the work on a field research project, had the chance to network and has strengthened my decision to remain in the field of development economics with a focus on agriculture.

I am very grateful for this opportunity und would like to thank you,

Kindly, Laura Spezzano
