

Household Vulnerability and Agricultural Innovation Uptake: Exploring Linkages and Interdependences

Impact Assessment of the Seeds for Needs Initiative in Bihar, India

August 2017 – November 2018

The Study

The study is an impact assessment commissioned to the Development Impact Unit (DIU) in order to evaluate Seeds for Needs benefits from the end-users perspective in terms of development outcomes and impacts.

The state of Bihar, where 6 different projects falling under the S4N umbrella were implemented, is chosen as a case study.

The research is supervised by E. Gotor, Head of the DIU. F. Scafetti, DIU Research Fellow, is in charge of its implementation. Support from the India Regional Office is provided by A. Paliwal, Consultant. Extensive support for the survey and questionnaire design was offered by J. Van Etten, Bioversity Costa Rica, M. Van Wijk and J. Hammond from the International Livestock Research Institute (ILRI).

Framing Condition

The research is framed around the concept of vulnerability.

For the purpose of our study, we narrowed this concept to the inability of rural households to withstand adverse impacts from multiple climatic stressors to which they are exposed - where stressors refers to unexpected changes and consequent disruption of livelihoods.

By highlighting the **social, demographic and economic dimension of vulnerability**, we acknowledge that farmers have different levels of access to resources to prepare for, cope with and recover from yield losses caused by climate change.

Because S4N brings changes in the resources at households' disposal in the form of **agricultural inputs** and **reduced information asymmetry**, we test the hypothesis that **adopters are better equipped to directly preserve and improve their agricultural production** and, indirectly, their **livelihood quality** and stability.

We wish to answer the **research questions**:

- What interdependencies exist among households' sensitivity, adaptive capacity and innovation adoption?
- To what extent has the Initiative contributed to sensitivity reduction and adaptive capacity increase?
- What differences in vulnerability can we observe among non-beneficiaries?

About the project

The intrinsic features of agriculture make it particularly challenging to identify and diffuse effective, cost-efficient and innovative solution to mitigate the impact of climate change on smallholders' crop yields. Bioversity Initiative **Seeds for Needs (S4N)** represent an innovative approach to **help seed supply and smallholders' demand meet**.

Engaging farmers as "**citizen scientists**" through participatory varietal selection, and creating a platform for continuous interaction between farmers and scientist, S4N enables farmers to test, reproduce and eventually cultivate those varieties most adapted to their environment.

The Initiative in India started in 2011 in the Vaishali district of Bihar. The research on the target crops, **rice and wheat**, received extensive funding and witnessed an increasing participation, reaching a peak of 15000 farmers in 2015.

Research Implementation

A quantitative survey is currently being implemented in three districts of Bihar, namely: Vaishali, Samastipur and Chapra. Sample size is of 600 randomly selected household, stratified according to three levels: beneficiaries, non-beneficiaries from the same village, and non-beneficiaries from areas not covered by the project.

The questionnaire consist in an adapted version of the **Rural Household Multi Indicator Survey (RHOMIS)**, specifically tailored to include information on the participation to project activities, cultivation of target crops and the exposure to shocks. Data is collected with **Open Data Kit (ODK)** software.

The study aims to develop a theoretical basis and practical methodology to identify key factors of social vulnerability and their interdependencies in Bihar rural areas. A comparative analysis of beneficiaries and control groups is then performed to assess the user-level changes in vulnerability to climate change attributable to the project activities. The DIU plans to conclude the evaluation by the end of 2018.

