

Societal Acceptability Conditions of Genome Editing for Upland Rice in Madagascar

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Abstract : The appearance in 2012 of the CRISPR-CaS9 genome editing technique marks a turning point in the field of genetics. This technique would make it possible to create new varieties quickly and cheaply. Although some consider CRISPR-CaS9 to be revolutionary, others consider it a potential societal threat. To document the controversy, we explain the socioeconomic conditions under which this technique could be accepted for the creation of a rainfed rice variety in Madagascar. The methodological framework is based on 38 individual and semistructured interviews, a multistakeholder forum with 27 participants, and a survey of 148 rice producers. Results reveal that the acceptability of genome editing requires (i) strengthening the seed system through the operationalization of regulatory structures and the upgrading of stakeholders' knowledge of genetically modified organisms, (ii) assessing the effects of the edited variety on biodiversity and soil nitrogen dynamics, and (iii) strengthening the technical and human capacities of the biosafety body. Structural mechanisms for regulating the seed system are necessary to ensure safe experimentation of genome editing techniques. Organizational innovation also appears to be necessary. The study documents how collective learning between communities of scientists and nonscientists is a component of systemic processes of varietal innovation. This study was carried out with the financial support of the GENERICE project (Generation and Deployment of Genome-Edited, Nitrogen-use-Efficient Rice Varieties), funded by the Agropolis Foundation.

Keywords : CRISPR-CaS9, varietal innovation, seed system, innovation system

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