Adaptation Insights

Madagascar

Addressing Climate Change Adaptation in Africa through Participatory Action Research

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Adaptive Options for Growing Atriatry Rice in the Context of Climate Change : The Case of Marovoay

Landscape of Marovoay, vary atriatry rice fields in district 3 (Photo : Nosy Alizany, CCAA-Madagascar)

In Madagascar, rice remains a national strategic commodity, as it has been since colonial times. As such, it has received special attention from all successive governments since independence, with boosting operations targeting major rice growing areas. Today, the plain of Marovoay, the country's second rice bowl with some 15 400 hectares of rice fields, is experiencing problems related to climate variability.

The Plain of Marovoay

The plain is subdivided into 13 sectors, each equipped with a modern irrigation system. Water is tapped either from a natural spring or a dam, or by pumping from the Betsiboka River across the plain. Currently, four types of rice varieties are grown in the area: vary jeby (flood recession rice), dimby alotra (second season irrigated rice grown on vary jeby plots), vary asara (rain-fed rice) and vary atriatry (semi-rain-fed rice). The success of the latter depends on the proper operation of dams. Planted during the rainy season and transplanted to upland rice fields, vary atriatry rice receives rainfall at the beginning of the cycle before being irrigated with water from a dam until it matures.

The hillside dams are emptying faster due to a shortening of the rainy season. Moreover, each year, tens of thousands of cubic meters of sand clog the main canals whose maintenance and repair are the government's responsibility. In this context, the CCAA-supported project "Vulnerability and Adaptation of Agricultural Systems in Madagascar" facilitated reflection among a group of farmers and the municipalities of Ankazomborona and Marovoay, to help them better adapt their rice system to climate risks. This brief summarizes the ideas that emerged from the group on adaptation measures taken during this project and the support needed to accompany their longer-term adaptation strategy.

Using short-cycle rice varieties as an adaptive measure

The participatory appraisal exercise has shown that in the context of climate change, the main risks facing the rice variety atriatry are the water availability and distribution issues. According to farmers' statements, once, when the seasons were still "regular", slightly intense rainfall spread from late March to June assured the supply of hillside dams after the end of the long rainy season in March. Thus, water from these dams was sufficient until the end of the cycle known as vary atriatry, in the month of August. Unfortunately, this is not the case now.

Asked to reflect in a focus group on actions to reduce the negative impacts of climate change on economic activities, farmers have primarily opted for researching on both higher efficiency and short cycle variety of rice. For this, they decided to test two varieties while keeping the usual technical route. There were mixed results: some managed to record about 2.2 t / ha as yield, a figure which was vastly above the 1.5 t / ha average yield recorded, while others showed rather disappointing results. The causes of this difference in productivity were discussed at a participatory evaluation meeting of the focus-group during which they managed to conclude that for better yield, it is necessary to use organic and chemical fertilizers. Unfortunately, this solution is too expensive for rice farmers since they have less access to credit. Furthermore, their ability to invest in their plot is rather limited : in fact, one kg of NPK fertilizer costs about $ 1.4, which is equivalent to the daily expenditure of an average household. The access to these inputs is one of the biggest problems, which can be resolved only through concerted action among policy-makers, partners supporting development and farmers as well.

In the plain of Marovoay, mechanized repairs and maintenance of dam canals by the Rural Engineering Service is essential to support the adaptation of atriatry rice-growing to the shortening of the rainy season.

Gap and sand on the main canal called "Karambo" of the check dam of Amboromalandy (Photo : Nosy Alizany, CCAA-Madagascar)

Siltation of Lake Rico (Photo : Nosy Alizany, CCAA-Madagascar)

Growing asara rice in the context of water shortages

Faced with a massive water shortage, asara rice growers required small-scale irrigation dams. Consultation with local actors, involving farmers, heads of villages and municipal representatives, helped determine the location of these irrigation infrastructures as well as their characteristics (including their size, beneficiary and non-beneficiary households, etc.). The work was carried out and paid for by farmers themselves. Some works have begun, but only one structure of the four identified is currently being finalized.

Limits to local action and the need for outside support

Along with rainfall shortages, the problem relating to the silting of primary canals is ongoing. The construction of small dams is a local response to this silting issue, but it is insufficient given the magnitude of the task. Indeed, in February 2010, an estimate by the Rural Engineering Service of Marovoay reported 22,876 m3 of sand blocking the primary canals of the plain's four main dams. At certain points, the level of sand in the main canal called Karambo reached the banks of the canal. The scale of work on this type of canal requires heavy equipment, which exceeds the technical and financial capacity of grassroots associations. Rice farmers of Marovoay therefore require support from policymakers at regional and national levels and from decentralized technical services to regularly maintain and repair dams and their main canals before each crop season. ■

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