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Lessons learned from the impacts of climate change on a water infrastructure programme in the Brazilian semiarid[1]

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Climate models indicate that semiarid regions around the world are likely to experience increased rainfall variability and longer droughts in the coming years. The IPCC global scenarios (RCP4.5 and RCP8.5) suggested a warming of 0.5-2.0°C for the Brazilian Northeast region between 2016 and 2035 (IPC-IG 2016).

This One Pager reflects on the impacts of the longest drought of the last 50 years in the Brazilian semiarid on the implementation of the Cisterns Programme.

In 2013, Law No. 12.873/2013 instituted the National Programme to Promote Rainwater Harvesting and Other Social Technologies for Access to Water—known as the Cisterns Programme—to promote access to water for human and animal consumption and food production. The 'first water' cistern (consumption cistern) was the first social technology to emerge aiming to increase water availability for domestic consumption, storing 16,000 litres of water per household. The 'second water' cistern, storing 52,000 litres, aims to guarantee access to water for production in rural areas, specifically for populations in socially vulnerable situations, promoting food and water security.

Both technologies are implemented with the direct involvement of the beneficiaries, who offer financial contributions or labour towards the construction of water reservoirs. There are two capacity-building courses for the 'second water' cisterns: Water Management for Food Production (*Gestão da Água para Produção de Alimentos*—GAPA) and Simplified Water System for Production (*Sistema Simplificado de Água para Produção*—SISMA), in addition to the provision of production kits to foster the start of food production activities (e.g., seeds, seedlings, seed beds, etc.).

A study conducted in 2017/2018[2] evaluated the impacts of the 'second water' programme on the livelihoods of family farmers. Researchers interviewed 39 beneficiaries in the Brazilian states of Ceará, Pernambuco, and Bahia, as well as 10 local technicians and coordinators involved with programme implementation, and another 10 involved with programme coordination at the national level. The study found that cisterns play a significant role in beneficiaries' food production and security (Cavalcante, Mesquita and Rodrigues-Filho 2020).

The research observed that extreme weather events influence the programme in various ways. For example, cisterns should be combined with other infrastructure (such as stone tanks and mud pits) to store surplus water volume during heavy rainfall events, so that beneficiaries can have a supply of water during the dry season.

The timeline for programme implementation must also consider the region's weather patterns and forecasts, to try and mobilise, select and train farmers at more opportune times prior to droughts.

The production kits provided in tandem with the social technologies should also be reassessed. Cases of loss of animals, seeds, and seedlings, as well as delay and loss of construction materials due to extreme weather events (such as heavy rains) were observed.

Visits from agricultural extension agents during extreme weather events are crucial, as they present an opportunity to address other, less practical issues, such as the dissemination of climate knowledge. Building the capacities of all agents regarding climate risk education is essential.

Programme planning should consider worst-case scenarios so that the influence of climate variables on policy implementation strategies can be fully analysed. Moreover, programme courses and materials should have their language adapted to the specific audiences in climate change hotspots, aiming to expand climate knowledge to programme coordinators, agricultural extension agents and beneficiaries. Increased knowledge about climate change can influence beneficiaries' planning and early adaptation to future events, promoting better agroecological practices.

It is also important to include a margin in the programme's budget to provide water for the construction of the technologies themselves, to fill the dead storage capacity (the volume of water that must be maintained in the cisterns to avoid structural damage), or even to provide a certain amount of water to foster the start of production during the dry season. We believe that through these measures, social programmes involving the provision of water infrastructure for vulnerable rural populations will become better adapted to climate change in semiarid regions.

References:

Cavalcante, L., P. Mesquita, S. Rodrigues-Filho. 2020. "2nd Water Cisterns: Social Technologies promoting adaptive capacity to Brazilian Family Farmers." *Desenvolvimento e Meio Ambiente*, Vol. 55, 433-450.

IPC-IG. 2016. "Climate Change and Impacts on Family Farming in the North and Northeast of Brazil." *IPC-IG Working Paper* No. 141. Brasília: International Policy Centre for Inclusive Growth. <https://ipcig.org/pub/eng/WP141_Climate_change_and_impacts_on_family_farming.pdf>. Accessed 9 August 2021.

Notes:

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