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RAIZ Resilience building through Agroecological Intensification in Zimbabwe

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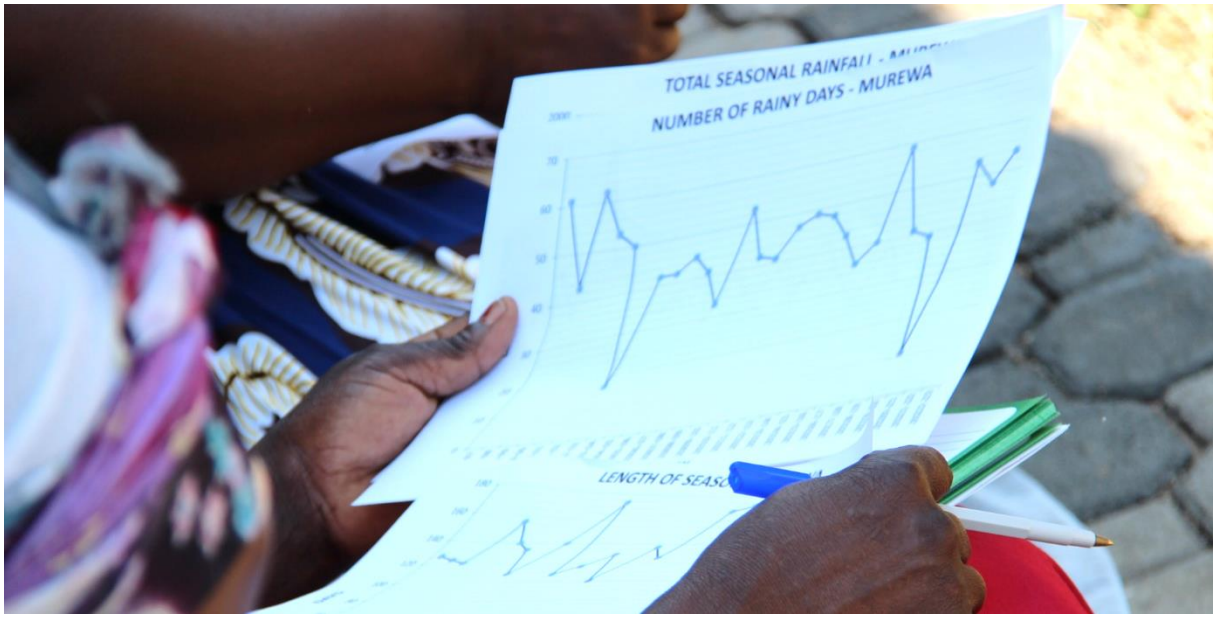
Do smallholder farmers have access to relevant climate information services?



A farmer analysing historical climate during a PICSA[1] workshop in Ward 28, Murewa district

Highlights:

- 33% of mixed crop livestock smallholder farmers do not have access to climate information services (CIS) in our case study in Murewa district, Mashonaland East province of Zimbabwe.
- Farmers voice their need of context-specific CIS to better manage their farming systems and lower climate-related risks.
- Diversifying CIS distribution channels could help reaching a maximum of farmers.
- Farmers often prefer direct access to climate information over CIS-based agronomic advice, as it allows them to tailor decisions to their specific sets of constraints and goals.
- Farmers trained in climate concepts and weather forecast are more likely to use CIS effectively and adopt climate-smart practices in their farming systems.
- Such trainings are well-received by both farmers and extension services.

Details of the question / issue:

The majority of the smallholder farmers in the Global South depend on rainfed farming systems, making them vulnerable to climate variability and extremes. Zimbabwe is no exception, with 70% of the population relying on rainfed agriculture. Since the formation of the Global Framework for Climate Services, efforts have been made to improve the production and dissemination of climate information services (CIS) in agriculture. Indeed, the international community acknowledges that CIS can "*enable better management of the risks of climate variability and change and adaptation to climate change*" (World Meteorological Congress in 2012). However, the extent to which CIS have been adopted by the smallholder farmers is still mediocre with a number of constraints yet to be addressed such as limited number of service providers and communication channels. Our work focuses on two contrasted agroecological regions, Murewa district (sub-humid) and Mutoko district (semi-arid) in Mashonaland East province of Zimbabwe, to better understand the needs and the use of CIS for mixed crop livestock smallholder farmers.

Findings:

According to a large survey[2], one third of the farmers do not have access to climate information services (CIS) in Murewa district, Mashonaland East Province. When farmers access CIS, it is mostly from the radio broadcast and it is restricted to receiving generalized daily weather forecasts for all publics, with low geographical resolution. They use that information mainly to decide the planting date. Farmers are asking for more specific ward- or district-level CIS such as seasonal and daily forecast, and onset of rainy season to better adapt their cropping strategies regarding planting date and choice of variety. Some farmers, diversifying their activities and investing in horticulture production with relatively high added value in the cooler season, are even asking for frost forecast to lower climate-related risks in these specific activities. These results highlight farmers' real interest in CIS and the need to improve context-specific production and dissemination.

The structure for CIS dissemination to farmers in Zimbabwe is organized as follows[3]: The Meteorology Service Department (MSD) is the main source of climate information and tailored information for agriculture is disseminated through the ARDAS (former AGRITEX) extension Department. Currently a minority of farmers declare having access to such information and the reason is multifactorial, as revealed by our case study[4]:

- ✓ When climate information reaches ARDAS district office, it is often translated into agronomic advice to be disseminated to farmers by agriculture extension officers. That information is not perceived by farmers as CIS and they tend to prefer direct access to CIS so they can build their own decision based on their knowledge of their constraints and goal.
- ✓ The major channel of communication is WhatsApp. The information is not timely accessed and may not be delivered totally in remote places with network challenges or to farmers without smartphones.
- ✓ The farmers benefit most from the physical meetings conducted by the agriculture extension officers. However, it is unsure whether extension officers have sufficient availability to satisfactorily and timely reach with such physical meetings with all the farmers living in the area they are expected to cover (often over a thousand of farmers per extension officer).
- ✓ Farmers below 60 years old or farmers affiliated to informal and formal groups (representing 60% of surveyed farmers) access CIS significantly more than the other farmers. This result is consistent with our recent literature review[5] showing that access and use of CIS is correlated to farmers' age and participation to social groups.

A context specific CIS was implemented during the particularly dry 2023-2024 cropping season using a well-established method, PICSA[1]. Observing farmers' decision making and agronomic performances at harvest highlighted that:

- ✓ Farmers very much appreciated to be given not only agronomic advice but also tools and methods to better understand seasonal, weekly and daily forecast.
- ✓ For highly resource-constrained smallholder farmers, who must also navigate market risks and manage multiple interrelated activities with various goals, climate-related risk at the field scale is just one of many factors considered when making decisions.
- ✓ Training extension services and farmers is critical for them to better understand climate-related risk and probabilities and build a relationship of trust between the various stakeholders.
- ✓ Translating weather forecasts into agronomic advice requires better integration of farm-level risks and local context-specific factors.
- ✓ Developing a crop modelling approach hand in hand with MSD could help build robust indicators easily translatable to agronomic advice at field scale.

- ✓ Context-specific CIS need to be timely disseminated with a particular effort on inclusivity to reach a maximum number of farmers. Diversification of distribution channels could help going in that direction (text-messages, WhatsApp, in-school distribution, extension officers).

Discussion / limitations/ perspective:
Concurrently, the Ministry of Agriculture has launched a pilot project on CIS dissemination for the 2023-2024 cropping season and the three wards involved in the RAIZ project have been selected to participate. Each agriculture extension officer is receiving text-messages with 3-day weather forecast. Within the RAIZ project, a crop modelling approach is being developed using long series historical climate and automated weather stations to better assess the risk related to climate and build simple indicators to guide stakeholders on the field and improve agronomic advice.

Methodological details

[1]The Participatory Integrated Climate Services for Agriculture (PICSA) approach guides the farmers into understanding the role played by climate change and variability. The smallholder farmers are then empowered to make knowledgeable decisions in their context. It also takes into consideration the technological constraints of the community. The approach was implemented through participatory workshops with 45 smallholder farmers using visual aids and participatory tools in Murewa and Mutoko disctricts. Agriculture extension officers and Meteorology Service Department (MSD) were actively taking part in the PICSA workshops. The notion of risk and probability was also discussed in regards of historical rainfall distribution of the last 30 years in their specific district. As the 2023-2024 rainy season was particularly dry with early rain considered as a false start by MSD, the official recommendation was not to plant.
[2]A survey was conducted with 248 farmers in 3 Wards of Murewa district in 2022. Farmers were interviewed about the effect of climate on their cropping management, and their interest, access and use of climate information services.
[3]The 248-farmers survey in Murewa district highlighted the sources of information available to the farmer. This provided a basis for targeting the institutions involved in the production and dissemination of the information. Key informant interviews were conducted with the Meteorology Services Department of Zimbabwe, the ARDAS Department of the Ministry of Agriculture, a private organization Eco farmer, and ARDAS extension officers and village heads in Murewa district.
[4]30 farms, embracing a diversity of farmers (age, location, access to CIS), were monitored in ward 26 and 28 of Murewa district. A 10-day recall of all farm activities was recorded during the entire cropping season 2022-2023 to better understand their use of CIS to manage their farming systems.
[5]Nyoni, R. S., Bruelle, G., Chikowo, R., & Andrieu, N. (2024). Targeting smallholder farmers for climate information services adoption in Africa: A systematic literature review. Climate Services, https://doi.org/10.1016/j.cliser.2024.100450

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