

# POLICY BRIEF



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## PERCEIVED IMPACT OF CLIMATE-SMART AGRICULTURE ON MILLET PRODUCTIVITY AND FARMERS' RESILIENCE: EVIDENCE FROM CINZANA RURAL COMMUNE, MALI

In Mali's semi-arid regions, millet is both a staple crop and a livelihood source, yet farmers face declining yields due to climate variability, land degradation, and limited resources. Climate-Smart Agriculture (CSA) practices offer promising solutions, but adoption remains uneven. Understanding farmers' perceptions, adoption drivers, and barriers is crucial to strengthen resilience and guide policies that ensure food security under changing climatic conditions.



*Contour ridge tillage and agroforestry systems in Cinzana.*

### OVERVIEW

This policy brief summarizes evidence from millet farmers in Cinzana rural commune, showing how CSA practices influence productivity and resilience. It highlights adoption barriers, socio-economic drivers, and institutional gaps, while offering targeted policy recommendations to foster CSA adoption.



*Focus group discussion with men from Folanassibougou.*

### POLICY RECOMMENDATIONS

- 1. Improve access to technologies and inputs**
  - Promote labor-saving tools and facilitate farmers' access to seeds and equipment.
- 2. Enhance and modernize agricultural extension services**
  - Increase field presence and use participatory planning to build farmers' skills and trust in, and long-term adoption of, CSA practices.
- 3. Strengthen institutional and financial support for climate resilience**
  - Promote well-targeted institutional engagement, including funding, context-specific training, and policy support, to help farmers adopt and sustain CSA practices.

## KEY FINDINGS

- **Climate-Smart Agriculture (CSA) practices and productivity**

Farmers in Cinzana widely adopted **organic fertilizer** and **farmer-managed natural regeneration** ( $\approx 100\%$ ) followed by contour ridge tillage ( $\approx 48\%$ ). These practices were generally linked with improved soil fertility, better water retention, and **higher millet yields** (20-30% according to farmers). However, adoption levels were uneven, and benefits depended on access to inputs and labor availability.

- **Farmers' perceptions and resilience to climate change**

Most farmers generally appreciate CSA, seeing it as crucial for coping with drought, strong winds, and declining soil fertility, and for enhancing food security and **resilience in dry years**. However, they still **face challenges in wet years** with floods and heavy rains, and remain concerned about **labor intensity**, tool access, and limited institutional support, which constrain broader adoption.

- **Socio-economic and institutional determinants**

Adoption was strongly influenced by **education, farmers' organisation membership, mechanization, and extension services**. Institutions supported CSA through training, inputs, gender programs, and information-sharing, but support was often limited, short-lived, and poorly targeted, leading to **low farmer trust**. Continuous, reliable, and inclusive engagement is needed.

## RESEARCH APPROACH

The study focused on ten CSA practices promoted locally by the Climate Change, Agriculture and Food Security (CCAFS) program: zaï, half-moons, contour ridge tillage, farmer-managed natural regeneration, strip intercropping, mulching, alley cropping, organic fertilizer, drought-tolerant varieties, and tree planting.



Household surveys in the climate-smart village of N'Gakoro.

## CONCLUSION

While the identified CSA practices in millet farming contributed to improved yields and resilience during dry years in Cinzana, their effectiveness against excessive rainfall and floods remains limited. The results highlight the importance of targeted interventions, including context-appropriate CSA techniques, training, input support, gender inclusion, and stronger institutional engagement. Strengthening the science-policy-practice interface and ensuring continuity beyond short-term projects will be crucial to enhance adoption, resilience, and productivity. Further research should evaluate the effectiveness of CSA impacts over time, interactions among practices, and more sustainable institutional strategies.

## REFERENCES

Diarra, B. E. (2025). *Perceived impact of climate-smart agriculture on millet productivity and farmers' resilience: evidence from Cinzana rural commune, Mali*. Master's thesis, Université Félix Houphouët-Boigny (UFHB)

