SMALLHOLDER FARMING

No water, no crops: irrigation schemes could be a powerful way for South Africa's smallholder farmers to adapt to climate change

Across South Africa's rural landscape, thousands of hectares of fertile land lie unused. Irrigation systems have collapsed, water no longer reaches crops reliably, and many farmers lack the support needed to keep production going. So writes Thulasizwe Mkhabela, research fellow and ad hoc lecturer at the University of KwaZulu-Natal.

This is evident in one of the country's most impoverished provinces, the Eastern Cape, where more than 53% of the communal land with irrigation installed is currently unused. (Most of this land falls under communal tenure and is farmed by smallholders on fragmented plots where they grow produce for household consumption and to sell at local markets.) Despite significant public investment over several decades, many irrigation schemes have fallen into disrepair, water delivery has become unreliable, and large areas of farmland have been abandoned.

As an agricultural economist specialising in land systems, irrigation, and food security, I examined whether revitalising smallholder irrigation schemes in the Eastern Cape is economically and socially viable, and what actually makes them work.

The study, titled 'Evaluating the socio-economic viability of revitalising communal irrigation schemes in the Eastern Cape, South Africa: an analytic hierarchy process approach to land-system governance', published in the journal, ***Critical Insights in Agriculture***, examined 10 irrigation schemes in the Eastern Cape, covering over 9 400 ha of land. Mkhabela went into the field to see how the projects were working, interviewed irrigation experts and used a systematic method to compare what matters most:

- infrastructure condition
- good management

- reliability of water delivery to farmers.

The research found that irrigation schemes don't only fail when they break down. Unstable arrangements to use land and weak day-to-day management stop water from flowing regularly and consistently. This matters because as rainfall becomes more erratic and droughts more frequent, farmers relying on rainfed agriculture will need to be able to irrigate crops. If their irrigation systems fail, farmers will be left fully exposed to climate shocks.

Failed communal irrigation schemes are also a missed opportunity. If revived properly, these could become a powerful tool for climate adaptation.

How irrigation for communally owned land is supposed to work

Between the 1940s and 1980s, the apartheid government set up large, state-run irrigation systems as part of the Bantustan or homeland system. After South Africa's first democratic elections in 1994, the new democratic government tried to move control of these systems from the state directly into the hands of the local farmers and communities. The post-apartheid government also began trying to revitalise smallholder farmer irrigation systems.

The idea was that the irrigation systems would help industrialise agriculture and ensure food security in rural areas where jobs were scarce and unemployment rates and poverty were high.

A communal irrigation scheme in the Eastern Cape typically consists of shared infrastructure – such as canals, pumps and pipelines – serving multiple farmers. It is supposed to be kept in good working condition through a combination of government support, farmers working together in water user associations, and local management committees. Communal irrigation schemes in the Eastern Cape typically draw water from rivers, dams, or springs via gravity-fed canals and electric pumps.

Financially, the system is a shared responsibility. The government generally pays for large-scale infrastructure and major rehabilitation. Farmers, organised into water user associations, are responsible for daily operational costs like electricity, fuel, and minor maintenance.

The real problem isn't just broken pipes

Over the last 30 years, many communal irrigation schemes across South Africa have been plagued by chronic underperformance and system collapse, leading smallholder farmers to abandon farming. Hundreds of millions of Rand of irrigation equipment lies derelict due to low productivity, broken infrastructure and the desertion of farmland by the people meant to use it.

The people interviewed told the research team that government efforts over the years have focused heavily on repairing physical infrastructure. But this study found that even when infrastructure exists, or management structures are in place, breakdowns in coordination, maintenance, or operation still disrupt water supplies. For example, blocked canals, poor scheduling, or uneven use of water prevent irrigation from reaching crops.

Managers became stuck in administrative bureaucracy and conflict resolution rather than the technical and logistical reality of farming. Their core function was to oversee the schemes, but they frequently lacked the specialised technical skills or the budget for constant repairs. They could hold meetings, but they couldn't guarantee that water would reach the crops.

What needs to happen next

The following recommendations emanate from the study:

- First and foremost, maintenance must be prioritised: Funding must be specifically allocated to routine repairs and spare parts.
- Water delivery must be scheduled. Managers must follow precise calendars that dictate who gets water and when. This helps ensure that the system isn't overwhelmed or unevenly used.
- Technical support on the ground. Schemes need dedicated 'water masters' or technicians. They should be at work every day, managing water flow levels. Distant committees that only meet to discuss problems after they occur aren't working out.
- Systems must be suitable: Instead of generic high-tech systems, irrigation projects should be tailored to what the local farmers can actually afford to operate and fix themselves.

In short, the focus must shift from "Is the pipe in the ground?" to "Is there water in the pipe today?"

The key lesson from the research is that irrigation should be treated as a service, not just as infrastructure.

The way communal land in the Eastern Cape is governed must also change. Land-use rights for individual farmers are unclear when land is managed by traditional authorities. Legally, communal land is held in trust under customary systems, but in practice, individual farmers have informal or insecure use rights. They can't invest in their farms if they don't have secure and predictable access to land.

Stronger coordination between the government departments responsible for water, agriculture and land is also essential. Fragmented decision-making has been a major barrier in the past. South Africa has already invested heavily in smallholder irrigation schemes. The challenge now is to revive them and make them work.

Some of the 10 Eastern Cape irrigation systems are still in working order and deliver water fairly reliably. They also have formal agreements to use the land. The government should get these projects working at full capacity. For those schemes that are derelict, the government must first negotiate formal agreements between farmers and traditional authorities. This will stabilise them.

Partnerships between smallholder farmers and private agribusinesses could bring skills, market access and funding as long as they're fair and do not weaken smallholder land rights.

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- To view the original study, visit: https://bit.ly/4uQl4un