

Sustainable agriculture for the future

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# Shaping South Africa's weather & climate services - together for agriculture

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**O**ne small decision, such as when to plant, spray, or move livestock, can make or break a farming season. With both climate change and natural climate variability increasingly shaping conditions across South Africa, these kinds of decisions increasingly depend on reliable weather and climate information.

Across the country, most farmers, extension officers, and agricultural planners already use

forecasts and early warnings to guide their work and decisions. But how accessible are these services? Which ones are people using, and what kind of information do they still need?

These are questions driving our research at the Agricultural Research Council (ARC) in the Agrometeorology Division, and they formed the basis of a recent study published in [Environmental Development](#). In that study, we





Figure 1: QR code linking to the national questionnaire on weather and climate service needs in agriculture.

examined how weather- and climate-sensitive sectors (e.g., agriculture and food security, human health, and water resources) across South Africa access, use, and value weather and climate information.

The current article takes a closer look at the agricultural and food security sector responses, highlighting what's working well, where the gaps remain, and how we can shape South Africa's weather and climate services together for agriculture. In essence, weather and climate services turn raw weather/climate data into usable products, including forecasts, early warnings, historical trends and climate

projections, to support better decisions, from this week to future seasons.

The national questionnaire that informed the study remains open through this [link](#) or the QR code below (Figure 1). Continued participation from those working in agriculture and its supporting sectors will help us refine and expand these services to better meet agricultural needs.

So far, there have been 42 responses from across South Africa's agricultural landscape, including farmers, extension officers, policymakers, and researchers. Though modest in number, these early responses provide valuable insight into how weather and climate services are used and where they can improve. Each additional response to this questionnaire helps build a clearer picture of what is working, what is missing, and how services can better support agricultural decision-making from farm to national level.

**What the agricultural sector responses say about weather and climate risks**

Respondents identified drought and reduced rainfall, heavy/extreme rainfall and flooding, and increased temperatures and extreme temperatures, as the most pressing risks affecting agricultural activities. Strong winds, wildfires, and other natural disasters also featured prominently. None of these risks are new, but together they highlight why reliable and readily available weather and climate

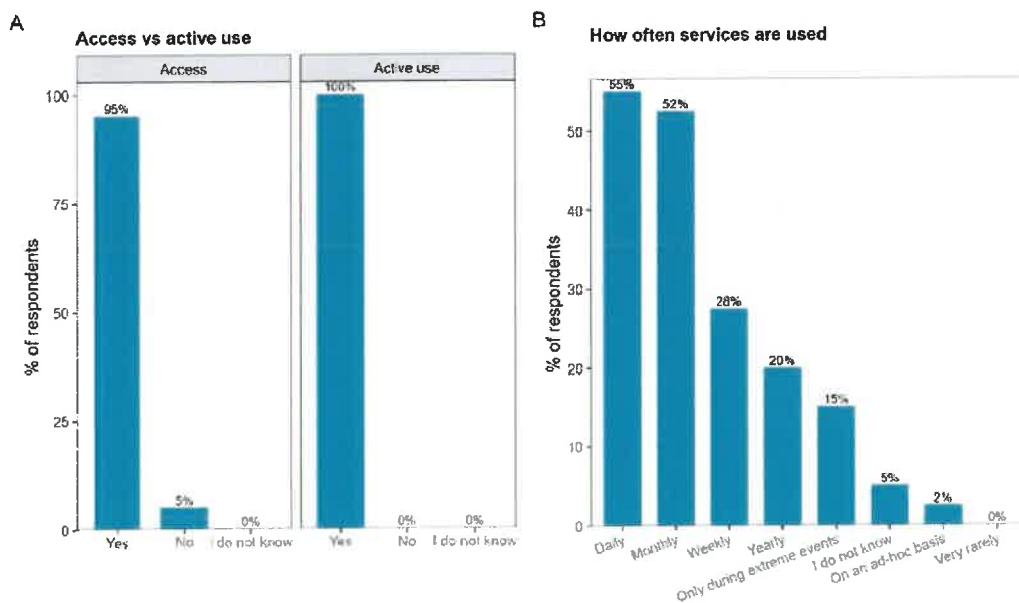


Figure 2: (a) Access and use of weather and climate services; (b) Frequency of use among respondents.

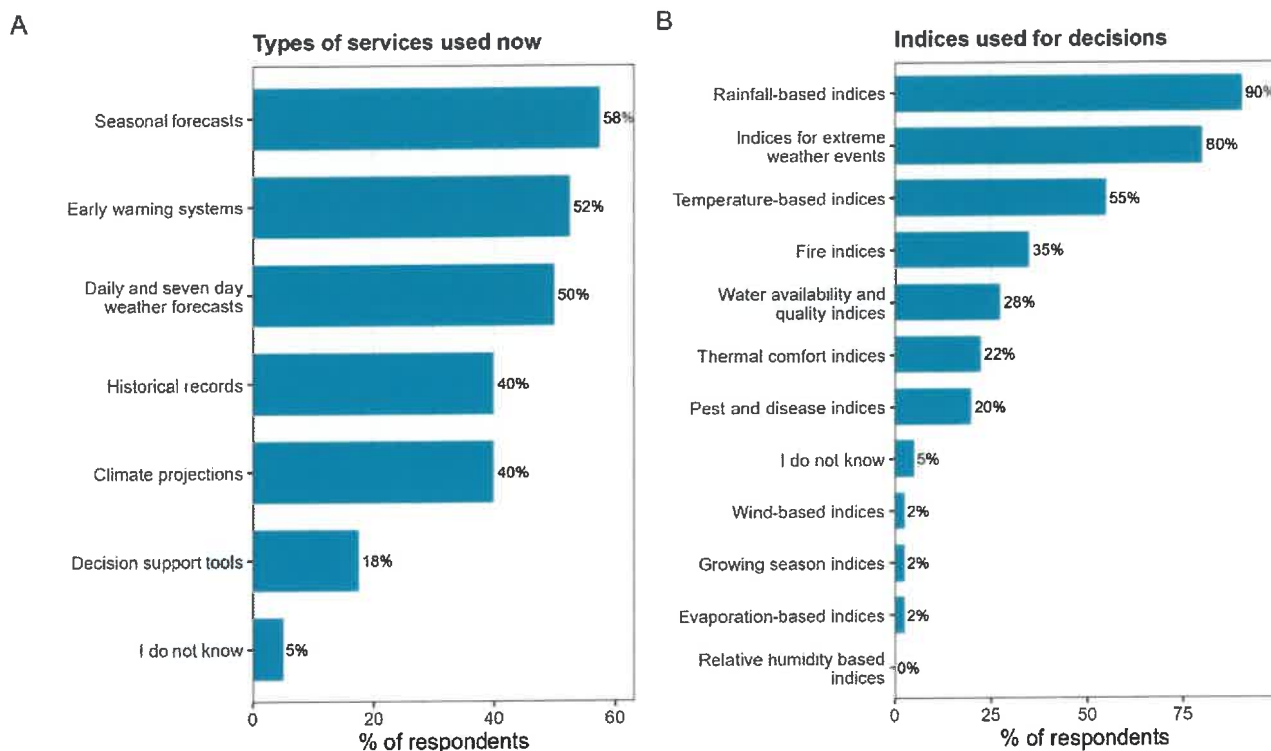


Figure 3: (a) Commonly used weather and climate services; (b) Indices most valued by agricultural stakeholders.

services, from daily forecasts to seasonal outlooks, lie at the heart of agricultural risk management and decision-making.

### How weather and climate services are used

Almost everyone in our agricultural sample reported both accessing and using weather and climate services (Figure 2a). Most use these services daily for operational decisions, while others rely on weekly or monthly updates for planning (Figure 2b). Internet-based access via computers or smartphones dominates, though radio and extension service updates remain vital in some areas and for specific user groups.

Stakeholders reported using a wide range of weather and climate services. The most common were forward-looking products, such as seasonal forecasts, early warning systems, and daily and seven-day weather forecasts (Figure 3b). When asked about the types of information that can be most useful for agricultural decisions, rainfall-based indices (e.g., number of rain days, and indices for the start and end of the rainy season) topped the list, followed by indices for extreme weather events (e.g., number of heatwave days, and

heavy rainfall events), and temperature-based indices (e.g., number of warm and cool days; Figure 3b).

### Why users choose certain weather and climate services and providers

Three main uses stood out for this question, such that respondents noted these services are used to inform planning or decision-making, for risk management, and for development of adaptation and mitigation plans.

When choosing a particular service provider, users valued not just accuracy and relevance, but also the supplier's reputation and affordability. Those supplier preferences dovetail with the benefits people said they're getting from the services, such that many noted that weather and climate services support their operational decisions, promote climate change adaptation, and help reduce risks. In short, when information is timely, local, and simple to interpret, it moves quickly from screen to field.

### Barriers to access and use

Key constraints include internet connectivity issues, energy supply issues, and insufficient localisation in terms of spatial resolution of

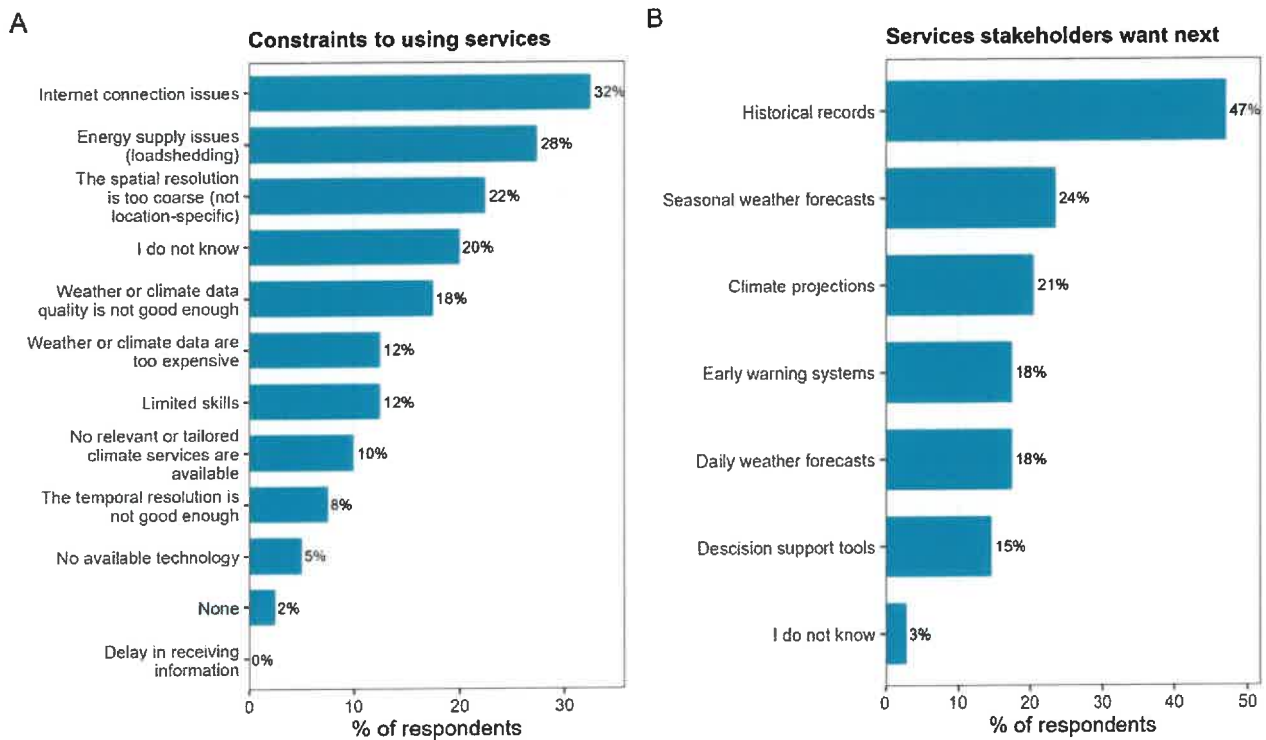


Figure 4: (a) Reported constraints in using weather and climate services; (b) Stakeholders' priorities for future services.

information. Concerns about data quality, cost, and a lack of technical skills were also common. Some respondents felt existing products were not sufficiently tailored to their needs, a reminder that even the best science loses value if it is inaccessible or overly technical.

### What users want next

Looking ahead, respondents expressed clear preferences for access to historical data, future climate projections, and more seasonal forecasts (Figure 4b), all in formats that are visual, local, easy to interpret. Mobile apps and web-based portals were the most requested platforms, followed by email or perhaps even WhatsApp updates. The common thread across all requests is usability, such that tools must be practical for farm and advisory work.

### Co-development: building services together

Building better weather and climate services is about more than improving models or adding weather stations. It is about co-development, designing with users so that information arrives in the right format, at the right time, and at the right scale.

Our team at the ARC and our partners are using these insights to shape the next

generation of agricultural tools, from mobile-first interfaces to clearer messaging around seasonal outlooks and indices. Therefore, every additional response we receive to the above-mentioned questionnaire helps us prioritise features, test formats, and anchor services in the daily decisions that matter. If you work in agriculture, whether on the farm, in extension, research, or policy, we invite you to share your views. Access the questionnaire via the [link](#) or QR code in Figure 1 and help shape how South Africa's weather and climate services evolve. Together, we can turn forecasts into confident decisions for every farm, every advisory office, and every season ahead.

### Acknowledgments

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