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Climate risk perception and climate information use: gendered differences among South African entrepreneurs

THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

Summary

- Entrepreneurs in South Africa are increasingly vulnerable to extreme weather events and there are differences in vulnerability between women and men.
- Women face 'triple differential vulnerability' from climate risk, systemic barriers and managing household-level climate impacts.
- In climate risk terms, women are more likely than men to report adverse outcomes from flooding and drought.
- Systemically, women lack awareness of impending extreme weather events and are reliant on family support in the absence of access to finance.
- Use of weather and climate information is widespread, with 75% of entrepreneurs using it for decision-making.
- Women tend to favour short-term tools like daily forecasts, which may limit longer-term decision-making, whereas men use more medium-term information. There are also gendered differences in preferred methods of delivery.
- Of the women who do not use weather and climate information, many cite a lack of awareness and distrust in the reliability.

Recommendations to improve equality of outcomes

- **Tailor climate information to gendered job categories:** Focus on sector-specific solutions, such as real-time weather alerts for women in informal trade roles and medium-term forecasts for men in building, carpentry and vehicular maintenance.
- **Enhance access to actionable climate information:** Disseminate this information through a wider range of channels, and ensure that forecasts are relevant and practical and can enable informed decision-making.
- **Bridge the gap between awareness and taking action:** Provide training on disaster risk reduction and create support systems to empower women in proactive adaptation.
- **Start addressing structural gendered inequalities:** Increase women's access to financial resources and develop mentorship programmes to encourage long-term planning.

Policy briefs provide analysis on topical issues, presenting specific recommendations to inform ongoing policy debates. Drawing on the Grantham Research Institute's expertise, they summarise either our research findings or the state of knowledge about a particular issue.

This policy brief was written by **Denyse S Dookie, Katharine Vincent, Miriam Murambadoro, Emma Archer, Palesa Base, Songo Benya, Declan Conway, Kate Gannon** and **Gina Ziervogel**.

Research context: entrepreneurship in South Africa

Entrepreneurship[1] is often seen as an important engine of economic growth due to the way it can foster innovation, create jobs and stimulate competition (Jobanputra, 2023). In many countries, including South Africa, the entrepreneurial landscape is made up of both formal- and informal-sector businesses, many of them micro, small and medium-sized enterprises (MSMEs). Data from the UN Conference on Trade and Development indicates there are over 2 million MSMEs in South Africa, which constitute less than one-third of all formal jobs (UNCTAD, 2024). However, their survival rate is low, with about 20% failing within the first two years and two-thirds within five years (ibid.).[2]

South Africa has one of the highest unemployment rates globally, at 33.2% in 2024,[3] and the challenge of finding work remains the leading reason people start informal businesses (Statistics South Africa, 2025).[4] By the end of 2024, the informal sector constituted 19.5% of total employment in South Africa. While there was a higher proportion of women in the informal sector between 2001 and 2005, during the period 2009–23 men were more likely to run informal businesses (ibid.).

Entrepreneurship thus remains key for income generation in South Africa, and creating an enabling environment for entrepreneurs would likely improve business survival, sustainable livelihoods and economic development. A promising initiative is in place to develop a national entrepreneurship strategy for small (formalised) businesses and start-ups (UNCTAD, 2024), emphasising reducing bureaucracy, improving access to finance, and fostering entrepreneurial skills through education and training. But setting the foundation for a resilient, innovative and agile entrepreneurial ecosystem also needs to include the informal sector and to focus on building resilience to climate change (Crick et al., 2018; Gannon et al., 2021). We show in this policy brief how an approach that focuses on climate information use, particularly with gendered dimensions, is critical to ensuring equitable and effective climate adaptation decision-making for entrepreneurs across both the formal and informal sectors.

"An approach that focuses on climate information use, particularly with gendered dimensions, is critical to entrepreneurs' decision-making."

Why focus on gendered dimensions – and why is a gender-sensitive approach needed?

Climate change poses a profound threat to economic activity, livelihoods and natural systems, while also exacerbating existing social vulnerabilities (IPCC, 2022). The effects are particularly acute where livelihoods are closely tied to natural resources, which is the case across Africa.

Women entrepreneurs, who play a critical role in supporting family welfare and contributing to key value chains, face heightened challenges. Socially constructed gender roles and norms often shape the types of economic activities that men and women engage in, influencing their exposure to climate risks and their capacity to adapt. Women's businesses are thought to be disproportionately exposed to climate risks, and they often bear the dual burden of managing household-level climate impacts while navigating systemic barriers to adaptation, such as limited access to land, finance and education. This 'triple differential vulnerability' underscores the urgent need for targeted interventions to support women entrepreneurs in building resilience to climate change (Gannon et al., 2022). But despite the barriers women face, women-led businesses make significant contributions

1. Defined by Prince et al. (2021) as the "act of generating and developing an idea for validation."

2. For comparison, a review of US private-sector business established from the period 2013 to 2023 estimated that over 20% of small businesses failed within the first year (BLS, 2024).

3. Compared with a world average of 4.9% and a Sub-Saharan African average of 5.8% (World Bank data, 2025).

4. Estimates show that the informal sector is most concentrated in Gauteng province (28.9%), followed by KwaZulu-Natal (16.8%) and Limpopo (15.8%), with most informal businesses operating in trade (48.2% in 2023).

to climate adaptation by providing goods and services that enhance community resilience (Gannon et al., 2021; Seshie-Nasser and Oduro, 2018).

Recognising and addressing the gendered dimensions of climate vulnerability is essential for ensuring equitable and effective responses. Without this focus, adaptation strategies risk perpetuating existing inequalities and failing to meet the needs of the entire population. Access to weather and climate information (WCI) is a critical enabler of climate adaptation, helping individuals and businesses make informed decisions to manage risks and seize opportunities (Craig et al., 2025; Dookie et al., 2023), but gender norms create significant inequalities in its use. Women often face barriers, such as lower levels of education, limited access to technology and exclusion from decision-making spaces, that may hamper their ability to benefit from climate information services (Gannon et al., 2022). The design and dissemination of climate information often fail to account for the specific needs and preferences of women, too, resulting in gender-blind services that primarily benefit men (Archer, 2003). The capacity to act upon this information also reflects gender norms and access to assets and adaptive capacity.

A gender-sensitive approach to the design and delivery of climate information services that addresses these differences can ensure that services are accessible, relevant and actionable for all users, which in turn could have transformative effects on resilience and adaptation outcomes.

Surveying entrepreneurs in South Africa

We surveyed 202 individuals in South Africa in November and December 2024, 102 women and 99 men, randomly selected at their workplaces by our enumerators, who were instructed to engage with a diverse range of entrepreneurs. Most respondents were from Gauteng province (see Figure 1), and many of them from the township of Katlehong, a densely populated urban area featuring a mix of formal, state-sponsored and informal housing. While many residents have access to electricity, clean water, health clinics and schools, Katlehong faces significant challenges related to poor service delivery and overcrowding. Unemployment is high and the informal sector plays a vital role in the local economy.

A high percentage of the survey respondents had completed at least secondary education. Of these, 83 respondents (41%) confirmed their business was registered, while 113 (56%) indicated it was not. They were asked 37 closed and open-ended questions which focused on the nature of entrepreneurship, impacts of extreme weather events, coping strategies, and use of weather and climate information for business purposes. Key terms and concepts used in the survey are defined in Box 1.

Survey findings: differences between women and men entrepreneurs

Extreme weather events have particularly negative effects on women

Extreme weather events (EWEs) are significantly affecting entrepreneurial activities in South Africa. Most respondents (71 women [70%] and 72 men [73%]) reported that their business had been affected by EWEs often multiple times over the past three years. Men and women tend to work in different business categories (see Figure 2); more women than men entrepreneurs reported negative impacts from these events, particularly

Box 1. Key terms and concepts used in the survey

Gender: Socially constructed differences between men and women, recognising there are many different identities beyond this binary division.

Inclusion: Proactively including different social identities/groups, considering factors including age, race, religion and disability.

Entrepreneur: Anyone making their own living for profit (not salaried employees), including those engaged in piecework, contracting or owning businesses of various sizes.

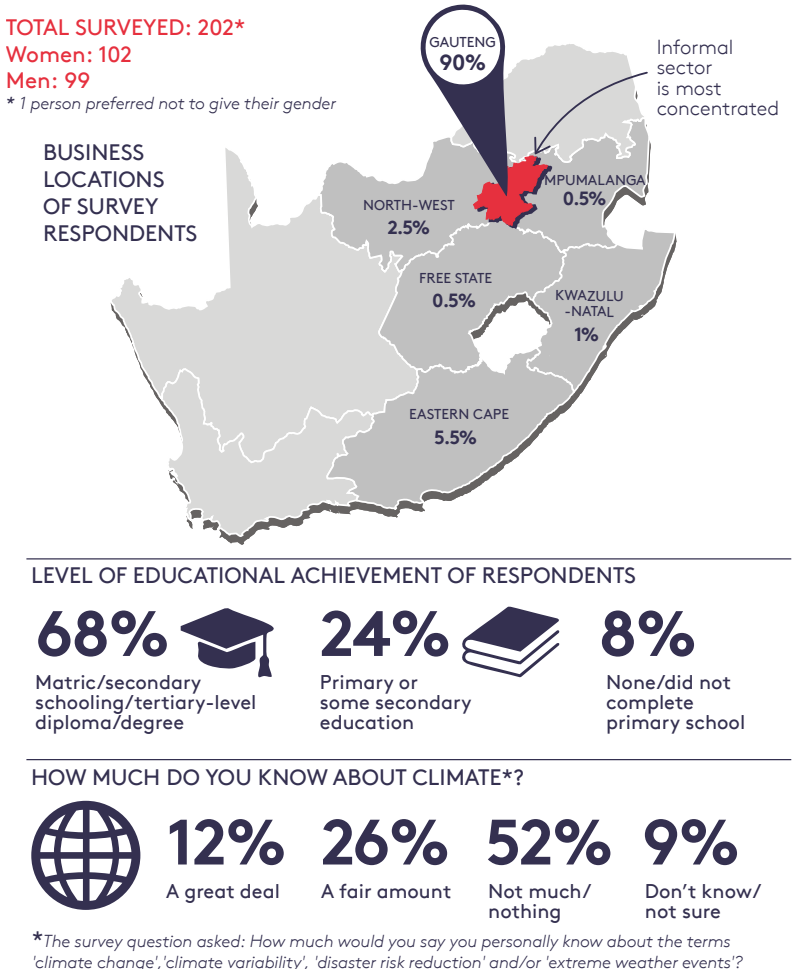
Extreme weather events (EWEs): Events characterised by their unusual magnitude, location, timing or extent at a specific place and time of year. Includes include droughts, floods, extreme temperatures, extreme rainfall and extreme wind/dust storms.

Weather information: 'Nowcasts' – very short-term weather forecasts that predict conditions over the next few hours; daily and other short-term forecasts of up to 10 days, including rainfall, temperature and wind speed.

Climate information: Longer-term projections from seasonal (3 to 6 months) to 100-plus years.

Weather and climate information (WCI) services: Tailored information to meet specific user needs.

Figure 1. South African entrepreneurs survey: overview of respondents



from strong winds, flooding and drought, with heavy rainfall considered to have the most impact. Both men and women reported that impacts included physical damage, business closure, and missed opportunities and income due to a decline in customers. While women reported predominantly negative impacts, men more often reported positive effects (primarily due to increase in sales/demand for their businesses).

Women have lower EWE awareness and poorer access to resources to respond

Entrepreneurs' awareness and preparedness for EWEs, and coping strategies, vary significantly between men and women. Women were more likely to report being unaware of impending EWEs, while men attributed impacts to the unexpected or compounding nature of such events. Women often relied on family support or took no action in response, whereas men were more likely to use personal savings or other resources to cope. At least 37 women (36% of the 102 surveyed) felt that their gender plays a role in their ability to access business resources for preparing for and responding to EWEs. Statistical analysis confirms a gender-based disparity in resource accessibility, with women experiencing more barriers than men.

Men and women have different timeframe preferences

Access to and use of WCI is a critical factor for entrepreneurs managing climate risks. About 75% of those surveyed (80 women [78%] and 71 men [72%]) reported using WCI to guide business decisions, such as assessing

risks to business locations and operations. Women were more likely to frequently use near-term nowcasts and daily forecasts while men reported slightly greater use of medium-term seasonal forecasts. Use of long-term climate projections was low across the board.

Men and women have different preferences for how they receive WCI

Women preferred receiving WCI through apps, WhatsApp, SMS/text and community networks, while men favoured email, radio and social media platforms. Both genders showed similar preferences for accessing WCI via websites and television.

Relevance and reliability are barriers to using WCI

Among non-users, women often cited a lack of awareness about WCI or doubts about its relevance and reliability. For instance, one woman who sold items including clothing likened the predictive ability of WCI to that of a *sangoma* – a traditional healer or diviner: "I don't think it's a reliable source for me to base decisions for my business on. It's like going to the *sangoma*, it's all predictions, it could be right, and it could be wrong."

See Figure 2 for a further summary of key findings.

Policy recommendations

Our research in South Africa and analysis of the survey with entrepreneurs lead us to make the following recommendations for government policymakers in areas related to entrepreneurship, business, economic growth and community resilience, the business community, climate information providers and boundary organisations.[5]

1. Better tailor and deliver WCI to reflect gendered preferences

Since the impact of extreme weather events on businesses is significantly associated with job category, and women and men are concentrated in different sectors, it is important to produce actionable information that addresses the unique vulnerabilities of female- and male-dominated businesses. For instance, for women working in food/hospitality, street vending and convenience stores, strategies need to consider the provision of resources to mitigate immediate disruptions, such as temporary shelters, storage facilities and real-time weather alerts. Men working in building and carpentry could benefit from a focus on longer-term adaptation strategies, such as infrastructure improvements and training in the use of climate-resilient materials and techniques. Increasing awareness of and access to WCI can be achieved through improved and more appropriate means of information delivery that is more engrained within the community and better designed for specific sectors.

2. Bridge the gap between awareness and action

Building broader trust in the relevance and utility of WCI and developing strategies to assist acting on such knowledge is vital. For short-term planning, training is needed on disaster risk reduction to help women and men understand the utility of WCI to anticipate and mitigate the impacts of extreme weather events. Community-based support systems could provide women with the resources and networks needed to make better decisions based on WCI. For longer timescales, business cooperatives and women's organisations could provide training programmes to help members interpret and apply long-term projections for proactive planning.

"Access to and use of weather and climate information is a critical factor for entrepreneurs managing climate risks."

5. Boundary organisations are those that bridge the gap between, in this case, science and policy, by facilitating communication, collaboration and knowledge exchange. They often take climate information and translate it into appropriate climate services.

Overall, inclusive climate communication campaigns that address the specific needs and challenges faced by women and men in vulnerable sectors could help close the awareness–action gap, as could providing impact-based forecasts that are more in tune with user needs.

3. Address structural gender inequalities

Women's reliance on short-term forecasts and relatively more cautious decision-making may stem from structural roles, limited resources and lesser decision-making power, which constrains their long-term planning ability. Addressing these structural barriers could include increasing women's awareness of and access to financial resources, such as loans, grants and insurance, to help reduce reliance on family support and enable proactive adaptation; creating mentorship and training programmes to build women's confidence in making strategic business decisions; establishing peer networks to share best practice and success stories of women-led businesses that have successfully adapted to climate risks to further build trust in the utility of WCI and improve salience; and providing incentives for long-term investments, such as subsidies for climate-resilient technologies or tax breaks for businesses adopting proactive adaptation measures.

4. Foster gender-sensitive climate policies

While respondents did not identify gender as a primary barrier to accessing resources overall, women were more likely than men to perceive gender as having some influence, indicating subtle inequities. National policies in South Africa acknowledge the importance of gendered dimensions in climate information use (these include the National Framework for Climate Services, the Climate Change Act [2024], its Nationally Determined Contribution [NDC] under the Paris Agreement, and the National Climate Change Adaptation Strategy [NCCAS]). However, gaps remain in implementation, accessibility and representation. There is limited evidence of practical mechanisms to ensure that women can access and use climate information effectively. Although barriers such as literacy and technology access are noted, more focus is needed on addressing these challenges through targeted interventions, such as tailored communication strategies or capacity-building programmes. It is also unknown whether there is adequate representation of women in the design and dissemination of climate information services, which could increase the likelihood that their unique needs and perspectives are adequately addressed.

Gender-sensitive climate policies could be encouraged by conducting community-level engagement to identify and address specific barriers women face in accessing resources. Raising awareness about gender dynamics in resource access could promote equitable distribution of support and opportunities. And a more cohesive integration and alignment of gendered perspectives across both adaptation and disaster risk reduction policies could help ensure consistent gender-sensitive approaches in climate adaptation efforts towards encouraging inclusivity and fairness.

Conclusions

Overall, this research from South Africa indicates that although gender does not significantly influence the overall use of climate information, there are pivotal areas that warrant further attention. Firstly, women's reliance on short-term forecasts and possibly relatively more cautious

"This research indicates that although gender does not significantly influence the overall use of climate information, there are pivotal areas that warrant further attention."

Figure 2. Survey findings - key differences between women and men entrepreneurs

EFFECT OF EXTREME WEATHER EVENTS ON BUSINESS

71% of respondents affected by these events over past 3 years

50% of respondents affected multiple times

Most impactful

heavy rainfall

Others

flooding

strong winds

drought

Negative impacts:
- felt by 65% of respondents
- physical damage, business closure, missed opportunities and income
- felt more by women

Positive impacts:
- felt by 4% of respondents
- increase in sales/business demand
- felt more by men

AWARENESS OF EXTREME WEATHER EVENTS AND COPING STRATEGIES

AWARENESS

29% of affected women were unaware of impending threat

40% of affected men thought an event was unexpected and were uncertain how it would impact business

COPING STRATEGIES

21% used personal finances; **19%** did nothing; **10%** received family support

28% used personal finances to revive business; **16%** did nothing

DID GENDER PLAY A ROLE?

36% said yes, in relation to access to resources; **50%** said no

18% said yes; **57%** said no

CURRENT USE OF WEATHER AND CLIMATE INFORMATION

75% use this information for business decisions (78% of women, 70% of men)

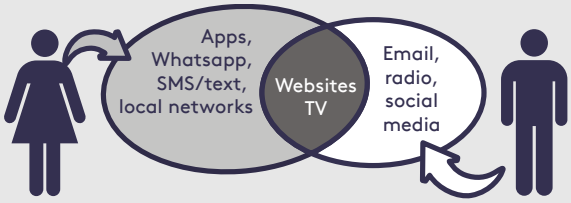
Nowcasts:
30% use frequently
(34% of women, 26% of men)

Daily forecasts:
40% use frequently
(same for women and men)

Seasonal forecasts:
6% use frequently
(4% of women, 8% of men)

Climate projections:
4.5% use frequently
(<4% of women, >5% of men)

PREFERENCES FOR RECEIVING INFORMATION



BARRIERS TO USING WEATHER AND CLIMATE INFORMATION

25% of respondents said they do not use this information for business decisions (51 out of 201 respondents)

22 women
do not currently use this information
- **10** have heard of it but think it's not reliable, useful or relevant
- **4** would like to use it but don't know how
- **8** have never heard of it

29 men
do not currently use this information
- **12** have heard of it but think it's too expensive or not useful or relevant
- **9** would like to use it but don't know how
- **7** have never heard of it

decision-making reflect a reactive approach to adaptation, likely shaped by societal norms, structural roles, resource constraints and the immediate vulnerabilities of their business sectors. Further, women's reported lack of awareness of oncoming extreme weather events highlights a gap between accessing climate information and effectively using it for preparedness. The gendered distribution of job categories also plays a critical role in shaping how men and women experience and respond to extreme weather. Women's businesses may be more likely to be exposed to immediate disruptions, while men's businesses face longer-term impacts.

Understanding and addressing these differences can enhance the effectiveness of climate information systems and ensure equitable access to resources and decision-making opportunities for both men and women – both in South Africa and in countries facing similar challenges.

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