Climate Misinformation and Media Literacy: A Case Study of Rwanda: A Research Paper

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Abstract
This paper examines climate misinformation through the case of Rwanda, a country combining high climate vulnerability with a tightly regulated media environment. Drawing on climate science, disaster response, and media-freedom literature, alongside Rwanda-specific data on digital access, literacy, and misinformation literacy from adjacent COVID-19 research, the paper argues that Rwanda's information-control approach appears to reduce measured public exposure to misinformation without a clear basis for concluding that it reduces underlying vulnerability. The analysis further shows that Rwanda's low overall internet and social media penetration, combined with a pronounced urban-rural digital divide, means that radio, community networks, and closed messaging channels such as WhatsApp are likely more consequential vectors for climate misinformation among the agricultural populations most exposed to climate risk than the open social media platforms that dominate existing misinformation research. The paper concludes by identifying the need to measure climate misinformation exposure directly in Rwanda, an evidence gaps the existing literature has not yet filled.

Keywords: *climate misinformation; media literacy; Rwanda; information governance; press freedom; WhatsApp; radio; East Africa*

1. Introduction

Climate change is one of the most scientifically well-supported phenomena of the modern era, yet public understanding of it remains distorted by misinformation and disinformation. While much of the research on climate misinformation has focused on North America and Europe, far less attention has been paid to how false and misleading climate narratives circulate in the Global South, where the human and economic stakes of climate change are often highest. This paper examines the dynamics of climate misinformation through the lens of Rwanda, a small, densely populated East African nation that is both highly vulnerable to climate change and operating within a distinctive media and governance environment. Rwanda offers an instructive case: it combines

high exposure to climate-related disasters, a state-controlled media landscape, and documented efforts to counter misinformation, making it a useful window into how misinformation dynamics differ outside the Western contexts where most research originates.

This paper has three aims. First, it reviews how climate misinformation is defined and how its tactics have evolved globally. Second, it examines Rwanda's specific media and information environment, drawing on available empirical research about misinformation literacy in the country. Third, it analyzes what the Rwandan case reveals about the relationship between government information control, media literacy, and resilience to climate misinformation, and what this suggests for other developing countries.

2. Rwanda as the Study Context

Rwanda is a small, densely populated, landlocked country in East Africa, bordered by Uganda, Tanzania, Burundi, and the Democratic Republic of the Congo. It covers approximately 26,300 square kilometers and had a population of roughly 13.2 million at the 2022 census (National Institute of Statistics of Rwanda [NISR], 2023). A large proportion of the country's workforce and food production depends on rain-fed agriculture across its hills (Government of Rwanda, 2020), leaving it particularly exposed to climate change. Rainfall has grown increasingly unpredictable in recent years, with dry spells damaging harvests and intense rainfall triggering landslides and flooding. The country has warmed by approximately 1.4°C since 1970, faster than the global average (REMA, n.d.; World Bank Climate Knowledge Portal, n.d.), and roughly 70% of Rwanda's working population is employed in agriculture (Government of Rwanda, 2020), underscoring how directly climatic shifts translate into livelihood risk.

The consequences of this vulnerability are not abstract. Torrential rains on 1–3 May 2023 triggered large-scale flooding and landslides across Rwanda's Western, Northern, and Southern provinces, affecting approximately 52,000 people, claiming 131 lives, and destroying 5,472 houses (International Federation of Red Cross and Red Crescent Societies [IFRC], 2023). Climate information is therefore critical to supporting adaptation in vulnerable communities. The Rwanda Meteorology Agency (Meteo Rwanda) provides seasonal forecasts and warnings that farmers use to plan planting and that households in hazard-prone areas use to take early protective action. The effectiveness of this early-warning system depends entirely on whether that information is received, understood, and trusted, which means false or misleading information can compromise every stage of the chain, from initial receipt to final action. Rwanda's media landscape shapes how this information circulates. Broadcasting is regulated by the Rwanda Utilities Regulatory Authority (RURA), while journalists operate under a self-regulatory body, the Rwanda Media Commission (Freedom House, 2022). The government also exercises considerable control over the broader information environment: The Cybercrime Law (Law No. 60/2018; Republic of Rwanda, 2018a) and the Penal Code (Law No. 68/2018; Republic of Rwanda, 2018b) criminalize the dissemination of false information. Supporters argue this protects the public from unsubstantiated and potentially harmful claims, while critics contend the same legal tools can be used to suppress dissent, a tension that runs throughout this paper's analysis of Rwanda's approach to misinformation.

3. Climate Change and Public Understanding

Climate change refers to the long-term alteration of temperature and weather patterns, driven primarily by human-induced greenhouse gas emissions (Intergovernmental Panel on Climate Change [IPCC], 2021). Its consequences include warmer average temperatures, altered

precipitation patterns, and more frequent extreme weather events such as droughts, floods, and heatwaves. These impacts disproportionately affect low-income countries that depend on rain-fed agriculture, despite their limited contribution to global emissions (IPCC, 2022).

Public understanding of climate change matters because much climate adaptation happens at the community level: farmers time their planting around seasonal forecasts, families in high-risk areas develop evacuation plans, and local authorities decide whether to act on early warnings. Where public understanding is strong, communities adapt more effectively and manage risk better; where it is weak, adaptation is delayed and warnings are often ignored. This makes the accuracy of the information circulating in a community, and the public's ability to distinguish sound information from false claims, a matter of direct practical consequence rather than an abstract communications problem.

4. Climate Misinformation: Definitions and Tactics

Climate misinformation is false or misleading information about the causes, impacts, or solutions to climate change. The key distinction between misinformation and disinformation is intent: misinformation is shared without an intent to deceive, typically by people who believe it to be true, whereas disinformation is created or spread deliberately to mislead (Wardle & Derakhshan, 2017). The two frequently overlap in practice, since content that originates as disinformation is often passed along by people unaware that it is false. Climate misinformation takes several forms, including denial that climate change is occurring, claims attributing it to natural rather than human causes, fabricated disaster reports, inaccurate predictions and warnings, and misleading claims about adaptation options (Treen, Williams & O'Neill, 2020). Misinformation affects public understanding, attitudes, and responses to climate change in several ways. It can undermine trust in scientific and meteorological institutions by offering a competing, pseudo-scientific narrative and by creating a false impression of scientific disagreement, which discourages people from acting on official warnings (van der Linden, Leiserowitz, Rosenthal & Maibach, 2017). Alarmist or fabricated warnings can likewise cause unnecessary panic in the short term and complacency over the long term, both of which carry serious consequences for climate-sensitive communities.

Scholarship also identifies a clear evolution in denial tactics globally. Early "old denial" narratives rejected the existence of warming altogether or denied that human activity was the cause. As scientific consensus solidified and became harder to dispute credibly, denial strategies shifted toward what researchers term "new denial": rather than rejecting climate science outright, these narratives acknowledge that the climate is changing but attack, discredit, or minimize proposed solutions, exaggerate their costs, or question the motives of those advocating for climate action, in effect a shift from denial to delay (Coan et al., 2021). Common tactics include selectively citing outlier studies, amplifying scientific uncertainty, elevating non-expert voices to manufacture a false sense of balance, and targeting climate scientists directly (Yale Climate Connections, 2025). This disinformation is no longer confined to its original strongholds in the United States, Canada, Australia, and the United Kingdom; as climate action has spread globally, so has organized disinformation, aided by translation technology and messaging platforms that move false narratives rapidly across borders and languages (European Commission, n.d.; Vitalsigns, 2025).

5. Media and Information Channels

Misinformation spreads through the same channels as verifiable information. On social media platforms such as Facebook, X, and TikTok, content is ranked by popularity rather than accuracy, which amplifies sensational stories regardless of veracity. Messaging apps such as WhatsApp add

a further complication: messages circulate within private groups of family and friends and take on the perceived credibility of the person sharing them, making such content both harder to monitor and, often, more trusted than an anonymous public post.

Traditional media outlets also propagate misinformation, whether deliberately or not. Radio remains the most pervasive information source across much of rural sub-Saharan Africa, and call-in shows can amplify unsubstantiated reports in real time. Television and newspapers may oversimplify scientific findings or give airtime to fringe voices in the name of balance. Content from all these sources is then further disseminated through community meetings, churches, and informal word of mouth. Understanding these channels is central to designing any effective response, since an intervention aimed at one channel, for instance formal broadcast regulation, may have little effect on misinformation moving through private messaging groups or informal community networks.

6. Digital and Information Access in Rwanda

Understanding which channels carry climate misinformation in Rwanda requires an accurate picture of how Rwandans actually access information. This picture differs sharply from that of wealthier, more digitally saturated countries, and it differs sharply between urban and rural areas within Rwanda itself. Table 1 summarizes the most recent available indicators.

Indicator	Value	Year
Total population	≈14.4 million	2025
Internet penetration (share of population)	34.4% (2024); 38% (2025)	2024–2025
Active internet users	≈5.5 million	2025
Active mobile (cellular) connections	12.29 million (86.2% of population)	2024
Social media users	≈930,400 (6.5% of population)	2024
Urban internet use rate	57%	2025
Rural internet use rate	19%	2025
Household smartphone ownership	34%	2025
Adult (15+) literacy rate	≈79%	2022

Table 1. Digital access and literacy indicators for Rwanda, compiled from the most recent publicly available data. Sources: population, active internet users, and 2025 internet penetration from the ITU as reported by TechCabal (2025); 2024 internet penetration, mobile connections, and social media users from DataReportal (2024); urban and rural internet use and household smartphone ownership from the Integrated Household Living Conditions Survey (EICV7) as reported by TechCabal (2025); adult literacy from UNESCO Institute for Statistics (2022).

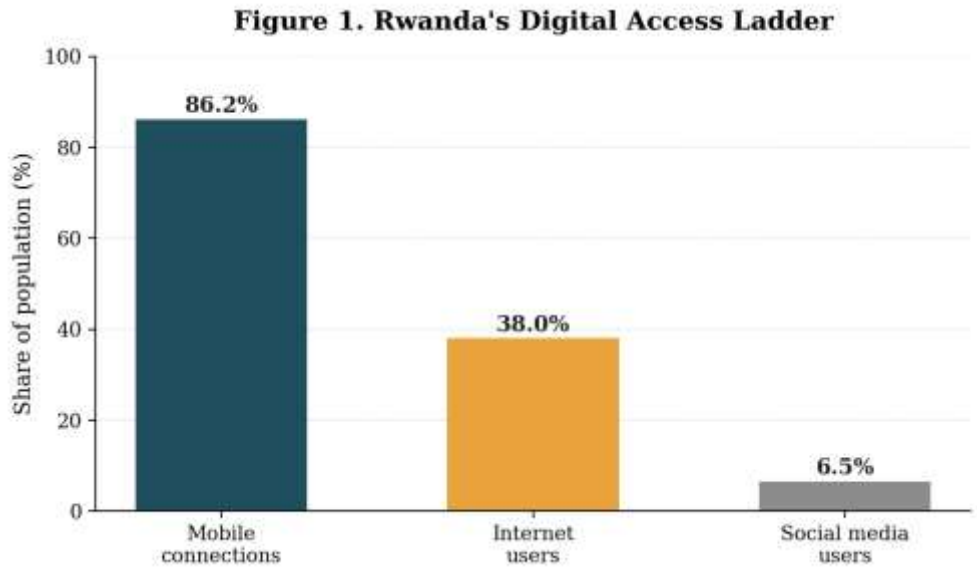


Figure 1. Rwanda's digital access ladder: mobile connections far outstrip internet use, which in turn far outstrips social media use, based on the figures in Table 1.

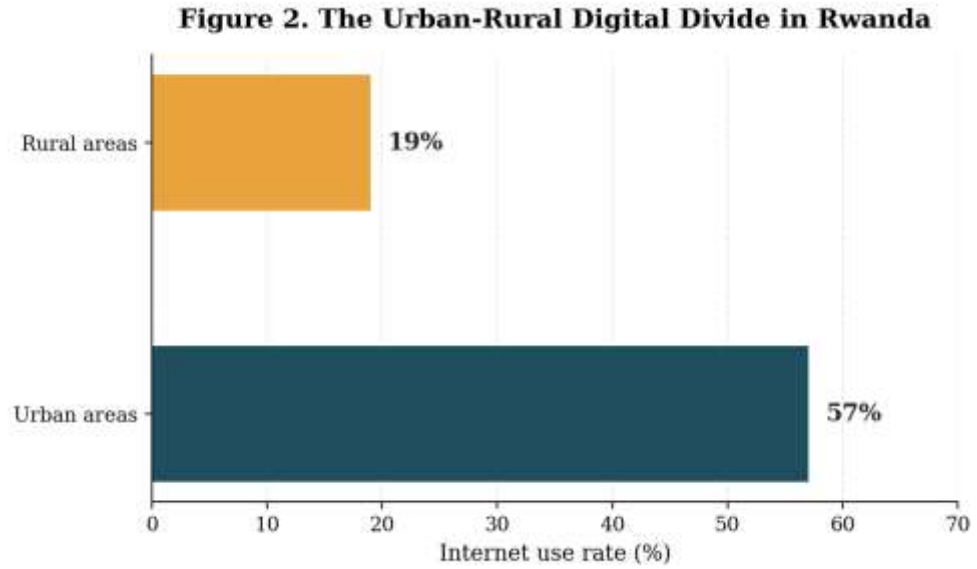


Figure 2. Internet use in Rwanda is roughly three times higher in urban areas than in rural areas, based on the figures in Table 1.

Three patterns stand out. First, mobile phone access (86.2%) far outstrips internet access (34–38%), meaning most Rwandans' primary information channel is voice calls and SMS rather than data-dependent apps or websites, a gap that matters because most misinformation research assumes a social-media-saturated population that does not describe most of Rwanda. Second, social media penetration is low in absolute terms (6.5% of the population), which suggests that platforms such as Facebook, X, and TikTok, the primary focus of most global climate misinformation research discussed in Section 4, may carry comparatively limited weight in Rwanda relative to radio, community meetings, and word of mouth, the channels described in Section 5. Third, the urban-

rural digital divide is stark: internet use in urban centers (57%) is roughly three times that in rural areas (19%), and rural, agricultural communities are precisely the population identified in Section 2 as most exposed to climate risk from erratic rainfall and flooding. Taken together, this suggests that climate misinformation interventions designed around social media monitoring and fact-checking, the natural focus given global research trends, may miss the populations in Rwanda who are simultaneously least connected to the internet, most reliant on radio and oral information networks, and most exposed to the physical consequences of climate change.

7. Rwanda's Regulatory Approach to Misinformation

Rwanda's information environment differs sharply from the open, adversarial media markets typically studied in climate misinformation research. Freedom House's Freedom on the Net assessments describe Rwanda as maintaining one of the most restrictive press environments in East Africa, with the government exercising tight control over the political system and online media, and with self-censorship widespread among journalists (Freedom House, 2020, 2022). In a comparative analysis of East African media systems, researchers found that among Rwanda, Uganda, and Kenya, Rwanda has the most restrictive press, Uganda occupies a middle position, and Kenya is considered the freest of the three (Regis University, 2024).

Figure 3. Relative Press Freedom Ranking, East Africa

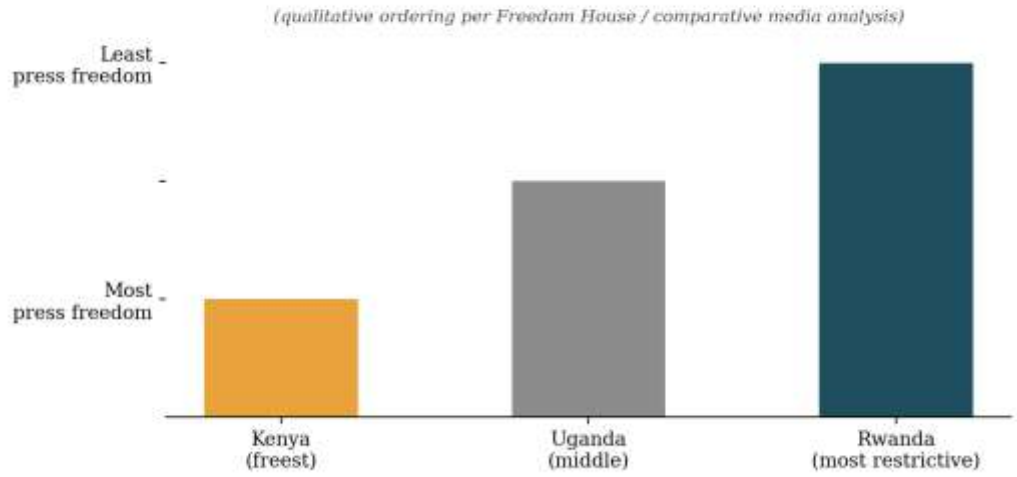


Figure 3. Rwanda's relative position on press freedom among its East African neighbors. This is a qualitative ordering drawn from Freedom House (2022) and comparative media analysis (Regis University, 2024), not a standardized numeric index.

This regulatory posture is not limited to broadcasting oversight through RURA or the criminalization of false information under the Cybercrime and Penal Code laws described in Section 2. In 2019, the Rwandan government announced plans to regulate social media content specifically, citing the need to curb the spread of misinformation and defamation (Ntirenganya, 2019). Government officials argued this was necessary because platforms such as Facebook and Twitter were being used to spread false information and mobilize disorder, while critics countered that the same regulatory tools could be used to suppress dissent and target independent journalists and government opponents. This tension, between misinformation control and press freedom, is central to understanding Rwanda's approach: unlike the largely unregulated, advertising-driven platforms that dominate climate disinformation debates in the West, Rwanda's government has

positioned itself as an active gatekeeper of acceptable public discourse, including around misinformation.

8. Empirical Evidence on Misinformation Literacy

The most directly relevant empirical evidence comes from a large comparative study of digital misinformation literacy conducted across Kenya, Rwanda, and Uganda, surveying 3,203 respondents in 2021 in the context of COVID-19 news (Cohen et al., 2023). While the study focused on pandemic misinformation rather than climate misinformation specifically, its findings are highly relevant because it is described as the largest known empirical investigation into digital misinformation literacy in the East African region, and because the underlying psychological and media-literacy dynamics it measures, such as the ability to distinguish true from false claims and perceived exposure to false information, generalize across misinformation topics, including climate change. The study found that Rwandan and Kenyan respondents were more accurate at identifying false COVID-19 statements than Ugandan respondents, who were instead more accurate at identifying true statements. Rwandans and Kenyans also reported higher perceived misinformation literacy than Ugandans. Notably, Rwandans reported feeling less exposed to false COVID-19 news online than either Kenyans or Ugandans. Taken together with Rwanda's restrictive media environment, this pattern is suggestive: lower perceived exposure to misinformation in Rwanda may partly reflect the government's active suppression and regulation of online content, rather than an organic absence of false narratives. In other words, Rwanda's relatively strong misinformation-detection performance coexists with, and may be partially explained by, tighter state control over what circulates in the first place.

Separately, Rwandan institutions have taken direct action against health misinformation. In 2020, the Rwanda Media Commission, supported by UNESCO and partner organizations, trained 66 journalists (UNESCO, 2020) on fact-checking and rumor management specifically to counter COVID-19 misinformation, citing the pandemic's disruption of containment efforts due to circulating false claims. While targeted at health information, this training model, building journalist capacity to verify and debunk claims, is directly transferable to climate reporting and reflects an institutional infrastructure that could be extended to climate misinformation specifically.

9. Discussion: What Rwanda Reveals About Climate Misinformation

The Rwandan case complicates a common assumption in misinformation research: that press freedom and media pluralism are the primary safeguards against public susceptibility to false claims. Rwanda appears to achieve comparatively strong misinformation-detection outcomes not through an open marketplace of competing narratives, but through a combination of state content regulation, coordinated journalist training, and a tightly managed information space, reinforced by the legal deterrents described in Sections 2 and 7. This raises an uncomfortable but important analytical question for climate communication specifically: does suppressing the circulation of misinformation reduce public vulnerability to it, or does it merely reduce measured exposure while leaving underlying susceptibility unaddressed, or push false narratives into less visible channels such as private messaging platforms? This matters for climate misinformation because, as noted in Sections 5 and 6, the diffusion of climate disinformation increasingly relies on channels such as WhatsApp and radio that are both difficult to monitor and, per the digital access data above, more central to how rural, agricultural Rwandans actually receive information than the open social media platforms Rwanda's regulatory apparatus is best positioned to police. Rwanda's apparent

success in one part of the information environment, formal broadcast and public social media, may not extend uniformly to the informal and closed channels that matter most for the populations at greatest climate risk. Rwanda's agricultural dependence and acute climate vulnerability, illustrated starkly by the May 2023 floods and landslides described in Section 2, also mean that climate misinformation, should it take hold, carries higher practical stakes than in wealthier, more climate-insulated countries. False claims that discourage adaptive behavior, for instance, skepticism about climate-resilient crop varieties, distrust of Meteo Rwanda's early warnings, or confusion about the causes of increasingly erratic rainfall, could directly undermine community-level adaptation of the kind described in Section 3. This suggests that climate misinformation research and interventions in contexts like Rwanda should be less concerned with denial of climate change itself, which appears to have limited traction given high firsthand exposure to climate impacts, and more concerned with misinformation about specific adaptation and mitigation measures, a pattern consistent with the global shift toward "new denial" and delay-oriented misinformation described in Section 4. Finally, the existing journalist training infrastructure built around COVID-19 misinformation response offers a practical foundation. Extending fact-checking and rumor-management training already used for health misinformation to climate-specific content, in partnership with organizations such as UNESCO and the Rwanda Media Commission, represents a low-cost, high-leverage intervention that builds on demonstrated institutional capacity rather than requiring new infrastructure.

Limitations. This study is a desk-based analysis of secondary sources and carries several limitations. First, it contains no primary data on climate misinformation in Rwanda; the central empirical evidence comes from a 2021 survey of COVID-19 news (Cohen et al., 2023), and its findings may not transfer directly to climate narratives. Second, the measure of exposure in that survey is self-reported and perceived, so lower reported exposure in Rwanda cannot by itself distinguish suppression, under-reporting, or genuinely lower circulation. Third, the digital access indicators in Table 1 come from different sources and years (2022 to 2025) and rely partly on secondary reporting of survey data. Fourth, the characterization of Rwanda's press environment draws on qualitative assessments rather than a standardized numeric index. The claim that radio, community networks, and closed messaging channels are the more consequential vectors for rural populations is therefore an informed inference that future work should test directly.

10. Conclusion

Rwanda presents a distinctive case study in climate misinformation: a country with severe and growing exposure to climate impacts, a tightly controlled media environment, and empirical evidence of comparatively strong misinformation-detection ability among its population. This combination suggests that Rwanda's relative resilience to misinformation, at least as measured in existing research on COVID-19 news, cannot be separated from its approach to information governance, an approach that raises legitimate trade-offs between misinformation control and press freedom. As climate disinformation tactics globally shift from outright denial toward more subtle attacks on climate solutions, and as false narratives increasingly spread through encrypted and cross-border channels like WhatsApp, Rwanda's existing journalist-training infrastructure and government attentiveness to misinformation offer a plausible foundation for targeted climate-specific interventions. Future research should directly measure climate misinformation exposure and belief in Rwanda, rather than relying on adjacent findings from COVID-19-focused studies, to confirm whether these dynamics hold specifically for climate narratives.

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