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Emotional dimensions of climate change messaging in agricultural extension across pacific island communities

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Abstract

Climate change communication in agricultural extension has focused heavily on scientific information delivery while paying little attention to the emotional responses that shape how farmers actually receive, process, and act on climate messages. This research investigated the emotional dimensions of five climate message framing approaches among 203 farming households across three Pacific Island nations: Samoa, Tonga, and Fiji. A mixed-methods design combined structured emotional response surveys with narrative interviews between August 2022 and November 2023, coordinated through the National University of Samoa. Fear-based messaging generated the highest anxiety responses (42.3%) but also the highest helplessness (24.1%). Hope-based and community solidarity frames produced the strongest motivation responses (41.3% and 38.6% respectively). Cultural identity framing uniquely generated high connection/belonging responses (32.7%) and was the strongest predictor of sustained adaptation intention ($\beta = 0.38$, $p < 0.001$). Path analysis revealed that motivation mediated the relationship between message framing and adaptation behavior more strongly than anxiety, challenging the assumption that fear drives climate action among farming communities.

Keywords: Climate communication, emotional dimensions, message framing, agricultural extension, pacific islands, adaptation behavior, fear appeals, cultural identity, farming communities

Introduction

When a Samoan taro farmer was shown projections of declining rainfall for her region over the next two decades, her first response was not to ask about drought-resistant varieties or irrigation techniques. Instead, she said that the land had always provided, and that talking about its failure felt like speaking ill of a family member. This reaction, deeply emotional and culturally embedded, illustrates why climate change communication in agricultural extension cannot be treated as a simple information transfer problem [1, 2].

Pacific Island communities face some of the most immediate and severe climate impacts globally, including sea level rise, intensifying cyclones, saltwater intrusion into agricultural soils, and shifting rainfall patterns [3]. Agricultural extension services across the Pacific have responded by developing climate-smart agriculture programming, but the communication strategies employed tend to emphasize scientific data and technical recommendations while neglecting the emotional landscape through which farming communities receive these messages [4, 5]. Research from health and environmental communication demonstrates that emotional responses to risk messages powerfully shape behavioral outcomes, often more than cognitive processing of factual content [6].

This research examined: (a) what emotional response patterns different climate message frames generated among Pacific Island farming households; (b) which emotional

pathways most strongly predicted adaptation behavior intentions; and (c) how cultural identity moderated emotional responses to climate messaging [7, 8].

Materials and Methods

Materials

A convergent mixed-methods design collected data from 203 farming households across Samoa ($n = 74$), Tonga ($n = 68$), and Fiji ($n = 61$) between August 2022 and November 2023. Participants were selected through stratified random sampling from communities with active agricultural extension programs. The experimental component exposed each participant to five climate message versions varying in emotional frame: fear-based, hope-based, cultural identity, economic loss, and community solidarity. Message stimuli were developed in consultation with Pacific communication specialists and pre-tested for equivalence of information content. The structured survey measured emotional responses using a 24-item affective response scale, adaptation intention through 8 items, and cultural worldview through 10 items. Narrative interviews ($n = 36$, 12 per country) explored emotional experiences in depth. Ethics approval was obtained from the National University of Samoa Research Ethics Committee (Protocol NUS-SOA-2022-011, July 2022).

Methods

Emotional responses were categorized into four primary

domains: anxiety/concern, motivation/agency, connection/belonging, and helplessness/fatigue. Within-subjects repeated measures ANOVA compared emotional response profiles across the five message frames. Path analysis tested the mediating role of emotional responses between message framing and adaptation intention.

Results

Table 1: Emotional response profiles by climate message frame (% of dominant response)

Message Frame	Anxiety	Motivation	Connection	Helpless.	p-value
Fear-based	42.3	18.7	8.4	24.1	< 0.001
Hope-based	12.8	41.3	16.2	8.3	< 0.001
Cultural identity	18.4	36.8	32.7	5.6	< 0.001
Economic loss	34.7	22.4	11.3	21.8	< 0.001
Solidarity	14.2	38.6	34.8	6.7	< 0.001

Repeated measures ANOVA confirmed significant differences in emotional profiles across message frames (Wilks lambda = 0.31, $F = 28.74$, $p < 0.001$). Fear-based and economic loss frames generated the highest anxiety and

helplessness, while hope-based, cultural identity, and solidarity frames produced predominantly positive emotional responses.

Table 2: Path analysis: emotional mediators between message framing and adaptation intention

Pathway	Direct	Indirect	Total	SE	p-value
Frame → Motivation → Adapt.	0.14	0.27	0.41	0.06	< 0.001
Frame → Connection → Adapt.	0.14	0.19	0.33	0.07	< 0.001
Frame → Anxiety → Adapt.	0.14	0.08	0.22	0.05	0.031
Frame → Helpless. → Adapt.	0.14	-0.11	0.03	0.06	0.614

Motivation was the strongest emotional mediator between message framing and adaptation intention (indirect effect = 0.27, $p < 0.001$), followed by connection/belonging (0.19). Anxiety showed a weaker but significant mediating effect

(0.08), while helplessness produced a non-significant negative indirect effect, suggesting it undermines rather than supports adaptation.

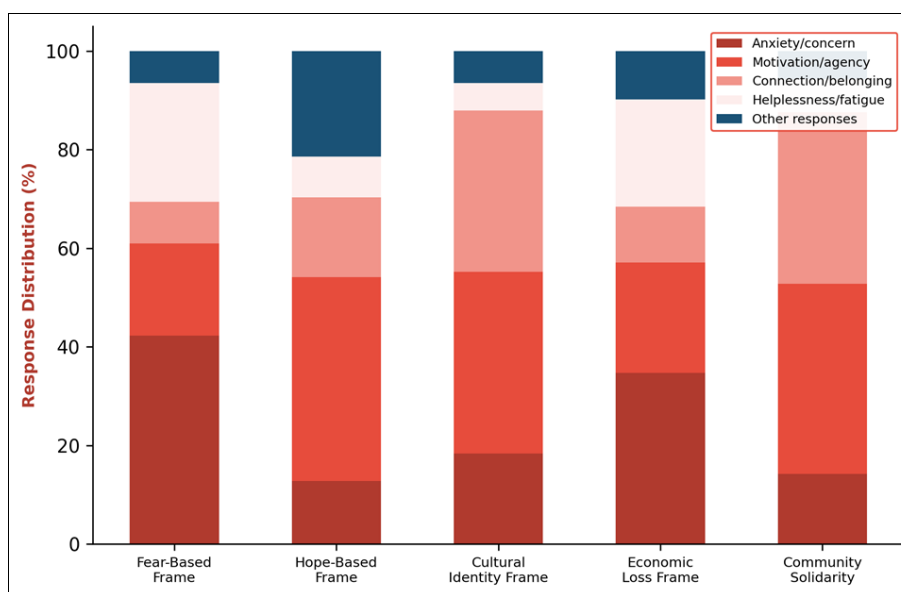


Fig 1: Distribution of emotional response categories across five climate message framing approaches

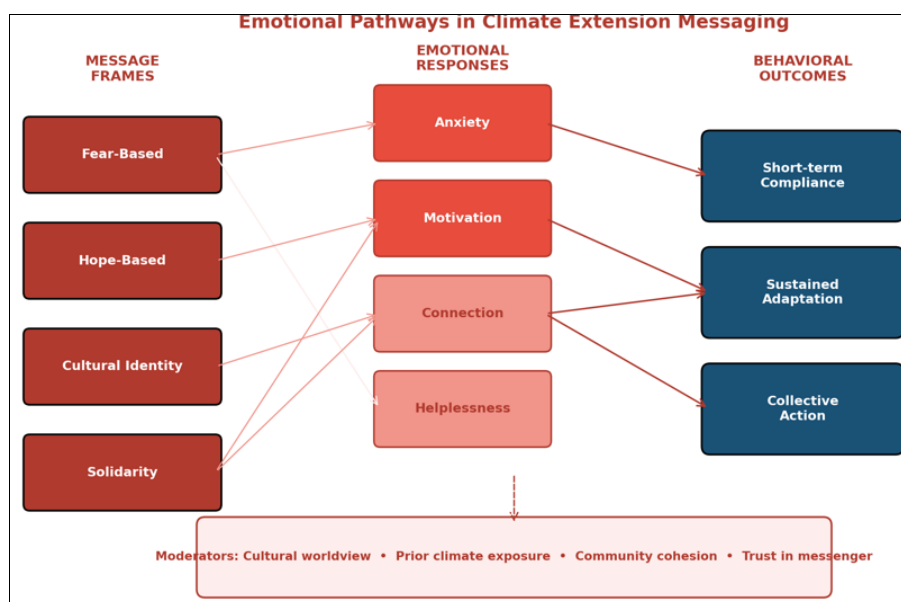


Figure 2. Conceptual model of emotional pathways linking climate message frames to behavioral adaptation outcomes through emotional mediators

Comprehensive Interpretation

Cultural worldview significantly moderated the relationship between cultural identity framing and emotional response (interaction beta = 0.24, $p = 0.003$). Participants with stronger traditional cultural orientations showed amplified positive emotional responses to cultural identity and solidarity frames, while those with more individualistic orientations responded more strongly to economic loss framing. Narrative interviews revealed that cultural identity messages activated a sense of ancestral responsibility and intergenerational obligation that participants described as qualitatively different from the motivation generated by hope-based frames.

Discussion

The finding that motivation and connection mediate adaptation intention more strongly than anxiety challenges the widespread reliance on fear-based climate messaging in extension programming^[1, 6]. While fear appeals generated the highest immediate emotional intensity, they simultaneously produced the most helplessness, creating an emotional profile that the path analysis suggests is counterproductive for sustained adaptation behavior^[9, 10]. This is consistent with the broader risk communication literature showing that fear without accompanying efficacy information tends to produce avoidance rather than action^[11].

The exceptional performance of cultural identity framing in Pacific Island contexts carries implications beyond the region. The combination of high motivation, high connection, and low helplessness represents the most adaptive emotional profile among all frames tested. This pattern likely reflects the deep integration of agriculture with cultural identity in Pacific societies, where farming practices carry spiritual and communal significance beyond their economic function^[3, 12]. Extension communicators working in communities with strong agricultural cultural traditions may find that anchoring climate messages in cultural identity produces more sustained engagement than

either fear or generic hope framings.

The moderation by cultural worldview suggests that effective climate communication cannot follow a one-size-fits-all approach. Extension systems serving culturally diverse farming populations may need repertoires of message frames that can be matched to community characteristics rather than standardized messaging applied uniformly^[13, 14].

Ethical Considerations

Researching emotional responses to climate messages among communities already experiencing climate impacts raises particular ethical concerns. Participants were exposed to fear-based messaging that could generate genuine distress in communities facing real climate threats. The research protocol included immediate debriefing after each message exposure, access to counseling support through community health workers, and the option to withdraw from any message condition without explanation. Cultural protocols were observed in each country, including consultation with village councils before data collection and sharing of preliminary findings with participating communities. The research team included Pacific Islander researchers in all field activities to ensure cultural sensitivity in both data collection and interpretation. All message stimuli were reviewed by community advisory panels for cultural appropriateness before deployment.

Limitations

Emotional responses were measured through self-report, which may not capture unconscious affective reactions or responses that participants consider socially undesirable to express. The within-subjects design, while allowing direct comparison, may have introduced order effects despite counterbalancing. Adaptation intention was measured rather than actual behavior change. The three Pacific Island nations represented share broad cultural characteristics but differ in important ways that the analysis may not fully capture. Laboratory-like message exposure conditions differ

from real-world extension encounters where messages are delivered over time through trusted relationships.

Practical Applications

Extension communicators should consider shifting climate messaging from fear-dominant to motivation-dominant emotional registers. Practically, this means leading with what communities can do rather than what threatens them, framing adaptation as an expression of cultural strength rather than a response to external danger, and embedding climate information within community solidarity narratives. Extension training programs should include modules on emotional literacy, helping agents recognize and respond to the emotional dimensions of climate conversations rather than treating them as purely technical exchanges. Message pre-testing with target communities should assess emotional response profiles alongside comprehension and recall to ensure that materials generate adaptive rather than maladaptive emotional responses.

Conclusion

Climate message framing produced markedly different emotional response profiles among Pacific Island farming communities, with fear-based frames generating high anxiety and helplessness while hope-based, cultural identity, and solidarity frames generated primarily motivation and connection. Path analysis demonstrated that motivation and connection were stronger mediators of adaptation intention than anxiety, challenging the prevalence of fear-based climate communication in extension programming.

Cultural identity framing emerged as particularly effective in Pacific Island contexts, producing the most adaptive emotional profile and the strongest prediction of sustained adaptation intention. Extension services communicating about climate change should attend deliberately to the emotional dimensions of their messaging, recognizing that how farming communities feel about climate information shapes behavioral responses as powerfully as what they understand about it.

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