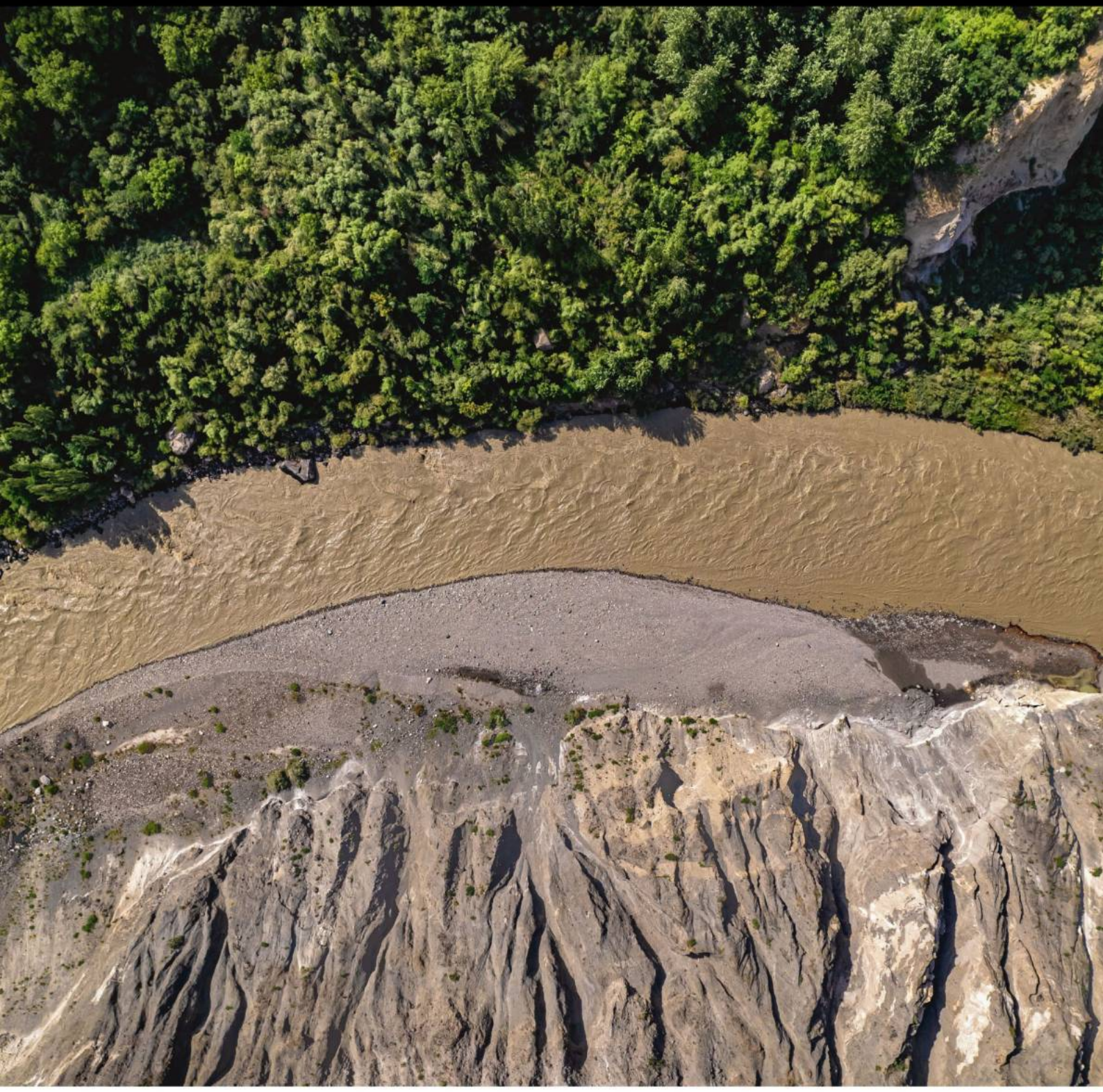
Climate Disinformation in Pakistan:

Silencing Indigenous Peoples' Voice



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PREFACE

Climate change is a lived reality that shapes the daily existence of millions in Pakistan. From devastating floods to prolonged droughts, from glacial lake outburst floods in the north to rising sea levels in the south, the country's ecological fragility is evident. Yet alongside this physical crisis, another quieter but equally destructive challenge has emerged with the spread of climate disinformation. Falsehoods, distortions and manipulated narratives are increasingly shaping public perceptions, weakening trust in institutions and silencing the voices of Pakistan's Indigenous Peoples, who are most affected by the climate catastrophe.

This report, Climate Disinformation in Pakistan: Silencing Indigenous Peoples' Voices, represents a comprehensive baseline study of climate-related disinformation in the country and its impact on Indigenous communities. It seeks to understand how disinformation intersects with climate vulnerability, governance and indigenous resilience.

The findings are sobering. Disinformation thrives during crises, spreads rapidly through social media and often carries emotional, conspiratorial or fatalistic undertones. For Indigenous Peoples, whose livelihoods are deeply tied to fragile ecosystems, such disinformation not only erodes trust in science and institutions but also undermines traditional knowledge systems and excludes them from climate policy discourse. In this way, the climate crisis is compounded by an information crisis, both of which demand urgent and coordinated responses.

This publication is intended as a resource for policymakers, journalists, civil society, technology companies and Indigenous communities themselves. It highlights the systemic nature of climate disinformation and offers recommendations for building resilience through fact-checking alliances, community-based verification networks, ethical journalism and digital literacy initiatives. Above all, it underscores that climate resilience cannot be achieved without information integrity.

IMS and IRADA hope that this report will serve as a catalyst for dialogue and action. By confronting disinformation head-on, Pakistan can strengthen its climate governance, amplify Indigenous voices, and ensure that responses to the climate emergency remain grounded in evidence, inclusivity, and integrity.

Sincerely,

Adnan Rehmat
Pakistan Country Representative, IMS

Muhammad Aftab Alam
Executive Director, IRADA

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ABBREVIATIONS

AI	Artificial Intelligence
BBC	British Broadcasting Corporation
CEJ	Centre for Excellence in Journalism
CSO	Civil Society Organisation
DDMAs	District Disaster Management Authorities
DRF	Digital Rights Foundation
FGD	Focus Group Discussion
FNF	Friedrich Naumann Foundation for Freedom
GB	Gilgit-Baltistan
GHG	Greenhouse Gas
GIZ	German Agency for International Cooperation
GLOF	Glacial Lake Outburst Flood
ICT	Islamabad Capital Territory
IPs	Indigenous Peoples
IRSA	Indus River System Authority
iVerify	Independent Fact-Checking Initiative
KII	Key Informant Interview
KP	Khyber Pakhtunkhwa
KPDMA	Khyber Pakhtunkhwa Disaster Management Authority
LUMS	Lahore University of Management Sciences
MEL	Monitoring, Evaluation, and Learning
MoCC&EC	Ministry of Climate Change and Environmental Coordination
MSME	Micro, Small and Medium Enterprise
NAP	National Adaptation Plan
NDC	Nationally Determined Contribution
NDMA	National Disaster Management Authority
NGO	Non-Governmental Organisation
NSPP	National School of Public Policy
PECA	Prevention of Electronic Crimes Act
PEMRA	Pakistan Electronic Media Regulatory Authority
PDMA	Provincial Disaster Management Authority
PTA	Pakistan Telecommunication Authority
RTI	Right to Information
SME	Small and Medium Enterprise
UN	United Nations
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
WAPDA	Water and Power Development Authority
X	Formerly known as Twitter

EXECUTIVE SUMMARY

Pakistan is unfortunately no stranger to the adverse impacts of climate change. As one of the world's most climate-vulnerable countries, it routinely endures floods, heatwaves, droughts, glacial lake outburst floods and environmental degradation. But Pakistan's climate crisis appears to be compounded by a parallel surge in its information disorder. The country's rapidly expanding digital information ecosystem is being polluted with false, misleading and politically manipulated climate narratives that often proliferate at unprecedented speed.

These dual crises have put the country's Indigenous Peoples (IPs), which cover diverse groups ranging from tribal people, fisher folk, pastoralists, ethnic minorities and mountain communities, at severe risk of fatalities, economic damages and dispossession.

This study represents Pakistan's first comprehensive baseline research on climate disinformation. It examines the ways in which climate-related falsehoods disproportionately affect IPs and other marginalised groups, silencing their voices and affecting their responses to the climate catastrophe.

Using a mixed-method design that comprised desk research, quantitative data collection based on social media monitoring and an online national survey of over 250 respondents and qualitative insights derived from 14 expert interviews and three focus group discussions with IPs, the report makes four key contributions: it identifies the main types of climate disinformation in Pakistan, describes the distribution patterns of the identified climate disinformation, examines its impact on indigenous communities and offers policy recommendations for climate and information stakeholders.

Findings show that climate disinformation in Pakistan is overwhelmingly **crisis-triggered, emotionally charged and predominantly spread through social media**. Almost all disinformation cases (95%) identified by the study emerged during high-impact natural disaster and environmental degradation events such as floods, heatwaves, droughts and smog episodes, when public demand for rapid access to information is usually at its highest and official communication might be slow or inconsistent. Climate disinformation was found to be circulated primarily through social media networks and messaging apps (98% of identified climate disinformation cases), with a prevalence of Urdu and regional-language messages.

The study identifies five distinct forms of climate disinformation in Pakistan:

- **Alarmist and sensationalised content**, which exaggerates climate impact to provoke fear, confusion and emotional reactions rather than informed understanding.
- **Conspiracy-driven narratives** that suggest hidden agendas or external actors manipulating climate events, undermining trust in institutions and science.
- **Denial and delay narratives** where scientific consensus is rejected or inaction is promoted by downplaying risks and questioning the urgency of climate response.
- **Oversimplified or false solutions** that promote misleading or ineffective fixes to distract from evidence-based mitigation and adaptation strategies.
- **Religious fatalism**, which frames climate change effects as predetermined or divinely inevitable, reducing perceived human responsibility and discouraging action.

The study also confirms findings from literature about structural weaknesses within Pakistan's news media environment, which include a lack of consistent news coverage of climate issues, limited scientific literacy among journalists, editorial incentives favouring sensationalism over accuracy and the absence of systematic fact-checking protocols. These gaps, exacerbated by platform algorithms that reward virality over veracity, create a situation where climate-related disinformation may spread unchecked.

The report shows that the climate disinformation impacts IPs in five ways:

- First, it **affects community safety and Indigenous livelihoods** by creating a false sense of security or conversely unnecessary panic among IP communities that may lead to damage, displacement and poor adaptation and mitigation practices.
- Second, disinformation related to natural disasters **generates fear, uncertainty, confusion and psychological distress** among vulnerable IP communities, creating emotional trauma and diminishing their self-confidence in their ability to respond to climate risks.
- Third, climate-related disinformation **erodes trust of IPs in scientific forecasts, institutional information** and **the official responses of state authorities**, as viral disinformation messages and rumours fill the information vacuum created by the absence of clear, timely and accessible climate communication.
- Fourth, it **discourages Indigenous ecological knowledge** and **diminishes the credibility of local adaptation methods** by painting these methods as primitive, unscientific or outdated.
- Fifth, climate disinformation **intensifies the existing exclusion, marginalisation and invisibility of IPs** in climate policy frameworks and climate governance mechanisms, silencing their voices and forcibly transforming them from custodians of community resilience to subjects of pity or blame within the policy and media discourses.

The study underscores that climate disinformation is not an isolated digital problem but a systemic governance challenge. It undermines trust in science and institutions, weakens public engagement and delays adaptation efforts. This crisis of information integrity demands coordinated action across sectors. The report offers the following recommendations for key stakeholders to address climate disinformation and its impact on Indigenous peoples and communities in Pakistan.

- UN bodies should support the government in integrating climate information integrity in national climate and digital governance frameworks and ensure Pakistan's compliance with relevant international conventions and declarations on the rights of Indigenous Peoples.
- The relevant ministries of the federal and provincial governments should embed information integrity into Pakistan's climate governance frameworks, including the National Action Plan and Nationally Determined Contributions, to ensure coordinated and accountable action on climate misinformation.
- iNGOs should facilitate the creation of a National Climate Fact-Checking Alliance linking journalists, researchers, media organisations and civil society for real-time verification and rapid debunking of false climate narratives.
- CSOs should establish community-based verification networks, conduct grassroots awareness campaigns, promote digital safety and information verification capacity building for IPs and document and amplify local climate knowledge.
- Media should set up climate news beats within newsrooms, ensure the presence of trained journalists for environmental reporting, institutionalise fact-checking protocols, provide training for journalists on climate science and disaster reporting and adopt ethical editorial standards

for coverage of climate emergencies.

- Technology companies should implement algorithmic accountability measures to curb the viral spread of climate disinformation, promote verified climate information through priority ranking and contextual labels, collaborate with fact-checkers to monitor regional-language climate content for falsehoods and support rapid-response climate information alerts for Pakistan during climate-induced extreme weather events.
- Indigenous communities should engage in peer-led digital literacy programmes that build capacity to recognise and counter climate disinformation and collaborate with independent media to document

In conclusion, the report highlights that Pakistan's fight against climate change cannot succeed without confronting the parallel crisis of climate disinformation. Climate resilience depends not only on infrastructure and adaptation planning but equally on safeguarding truth, transparency and trust. Building an informed, digitally literate and scientifically engaged society is therefore essential to ensure that the responses to climate change protect the rights and livelihoods of vulnerable IP communities and remain grounded in evidence, inclusivity and integrity.

1. Introduction

Pakistan is confronting an escalating climate catastrophe that mirrors a broader global crisis. Around the world, rising temperatures, erratic monsoon patterns, unprecedented heatwaves, melting glaciers and intensifying floods are reshaping societies and overwhelming governance systems. As one of the top 10 most climate-vulnerable countries, Pakistan experiences these impacts with disproportionate severity: recurring floods inundate entire districts, glacial lake outburst floods threaten mountain communities, drought cycles devastate rural livelihoods and extreme heatwaves push cities beyond safe living conditions.

Amid this accelerating climate emergency, a newer and increasingly dangerous threat has emerged: the spread of climate-related disinformation. Instead of supporting public understanding and informed decision-making, the digital information ecosystem often witnesses the amplification of false, misleading or sensationalised content distorting scientific facts, undermining trust in institutions and weakening community resilience. It is this intersection between climate fragility and the information disorder that the present study investigates, examining how disinformation shapes perceptions, behaviour and governance.

On social media platforms, now the primary source of news and information for millions of Pakistanis, the circulation of unverified claims, AI-generated visuals, conspiracy narratives and sensationalised commentary often spreads at a pace that far outstrips official communication. In moments of crisis when timely scientific information is most urgently needed, misleading content could fill information gaps, shape public behaviour and fuel panic or mistrust. The disinformation also appears to be increasingly systemic, driven by political interests, algorithmic amplification, weak media literacy and the absence of coordinated climate communication structures. Climate disinformation might therefore evolve into a parallel crisis that could compound physical climate risks by distorting public understanding, weakening institutional credibility and undermining both community resilience and policy coherence.

This report therefore investigates climate disinformation in Pakistan through an integrated lens combining environmental communication, digital media analysis and community perspectives. It seeks to establish a baseline for the scale, nature and impact of climate disinformation. It also attempts to provide evidence on how climate disinformation intersects with notions of vulnerability, governance and institutional trust to affect IPs and to recommend mechanisms for building resilience against the information disorder in the climate domain.

1.1 Methodology

The study employs a mixed-methods approach integrating desk research, media monitoring, field-based qualitative inquiry and a nationwide public survey. A structured desk review analysed policy documents, existing research and regulatory frameworks to contextualise Pakistan's climate governance landscape and information ecosystem.

News media sources and social media platforms were monitored to identify climate disinformation trends using a typology-based coding framework that categorised narratives such as denial, delay, conspiracies etc. (See Annexe 1). The time periods selected for monitoring was January 2024 to October 2025 and included high-salience climate events (such as floods, heatwaves and smog incidents) as well as routine weeks. For mainstream media, news content published by Dawn, Geo News, ARY News, Samaa TV, Dunya News, Express News and Aaj TV was analysed. For social media, public posts on Facebook, TikTok, Threads, Instagram, WhatsApp (identified groups) and X (formerly known as Twitter) were sampled. Using a typology-based claim-capture template, each identified post, video or news item was logged with details such as date, platform, language, tone, narrative code, and target audience.

A double-coding procedure was used to ensure analytical consistency. Quantitative tabulation then produced counts and percentages by platform, language, tone and factuality while qualitative review by coders was used to link the narrative of the identified messages to possible harm. The monitoring resulted in the identification of 219 climate-related disinformation and misinformation posts, which were further examined to detect patterns and features.

Field research consisted of Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) with journalists, fact-checkers, policymakers, civil society actors and IP representatives. A total of 14 interviews were completed (See Annexe 2 for the profile of the interviewees). Three FGDs were conducted with IP communities, one each in Buner (Khyber Pakhtunkhwa), Multan (South Punjab) and the Thatta and Badin coastal regions of Sindh (See Annexe 3 for the profile of the FGD participants).

Key terms

False information can be understood through three interrelated concepts: Misinformation, Disinformation, and Malinformation. The key differences among them are the quality of being false and the intent to harm or deceive.

Misinformation involves the sharing of false or misleading content without the intent to deceive; those sharing it may genuinely believe the information to be true.

Disinformation, in contrast, refers to false information that is intentionally created and spread to mislead or manipulate audiences.

Malinformation, while based on real information, is with harmful intent to expose private data or through deliberately manipulating context in order to distort facts to undermine individuals or groups.

Climate disinformation is disinformation and/or malinformation spread to intentionally distort the target audience(s)' understanding about climate, environment, climate change and actions undertaken affecting environment (whether positive or negative) for political, financial, or ideological gain by those with vested interests in denying its reality or impacts.

Box: Key terms explained [1]

An online survey was used to gauge public perceptions of, and exposure to, climate disinformation (See Annexe 4 for survey questionnaire). The survey was distributed using convenience sampling. It received 250 valid responses. Respondents included students, youth representatives, researchers, journalists and community activists with representation from across the country. However, survey limitations include the inability to generalise findings due to the non-random sampling method and the small sample size as well as the likelihood of self-reporting bias in questions related to identification and awareness of climate disinformation. Data collected through these different research methods allowed triangulation to validate research findings and confirm patterns emerging from the data analysis. All the data collection was completed from September to October 2025.

[1] Definitions from https://www.undp.org/eurasia/publications/information-pollution and https://climatepromise.undp.org/news-and-stories/what-are-climate-misinformation-and-disinformation-and-how-can-we-tackle-them

1.2 Background

This section provides an overview of the IP communities in Pakistan and describes how climate change and deforestation affect their lives and livelihoods.

1.2.1 Indigenous Peoples in Pakistan

Indigenous Peoples (IPs) in Pakistan comprise a diverse set of ethnic, tribal, pastoral, forest-dependent and coastal communities whose identities are rooted in long-standing relationships with specific territories, languages and customary institutions. [2]

The Constitution of Pakistan does not formally recognise Indigenous Peoples as a category of citizens. But general fundamental rights, such as equality (Article 25), freedom of religion (Article 20), cultural preservation and protections against discrimination, apply to all citizens including IPs.[3] Article 246 defined tribal areas, some of which were federally and provincially administered until the 18th and 25th Constitutional Amendments formally merged them into the provinces of Khyber Pakhtunkhwa and Balochistan. [4]

The absence of explicit constitutional recognition for IPs weakens tailored safeguards for their customary land, language and self-governance. Internationally, Pakistan ratified the International Labour Organization (ILO) Convention 107 on Indigenous and Tribal Populations in 1960.[5] Convention 107 is now considered outdated due to its integrationist approach.[6] It has been replaced by the more relevant ILO Convention 169 on Indigenous and Tribal Peoples adopted in 1989, which Pakistan has not yet ratified.[7] Pakistan voted in favour of the UN Declaration on the Rights of Indigenous Peoples (UNDRIP) in 2007, signalling formal support for IP rights such as culture, identity, participation and land or resource protections.[8]

There is no official census category for IPs in Pakistan, so population figures rely on estimates. The Pakistan government reported the size of its indigenous population to be around 4 million persons in 2013 while commenting on the application of ILO Convention 107.[9] It updated the figure to 5 million in 2018, in its report for the same Convention 107.[10] However, these reported statistics indicate that Pakistan only considers the population of the merged tribal districts of Khyber Pakhtunkhwa, formerly known as FATA or Federally Administered Tribal Areas, for the purpose of the convention. A 2014 Pakistan Poverty Alleviation Fund document noted that “there is no authentic inventory of indigenous peoples

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[2] Country technical note on indigenous peoples’ issues: Islamic Republic of Pakistan. Islamic Republic of Pakistan. International Fund for Agricultural Development. https://www.ifad.org/en/w/publications/pakistan-country-technical-note-on-indigenous-peoples-issues

[3] Michel Boivin. Introduction The indigenous groups in the Islamic Republic of Pakistan: a challenging category. Brill Encyclopedia of Religions of Indigenous People in South Asia, edited by Marine Carrin, Leiden-Boston: Brill, pp. 847-861., 2021. hal-03959091. Accessed at https://share.google/NxbvGJj8IJc23FVVj

[4] Constitution of the Islamic Republic of Pakistan. Pakistan Code. https://pakistancode.gov.pk/english/UY2FqaJw1-apaUY2Fqa-apaUY2Fvbpw%3D-sg-jjjjjjjjjjjj

[5] Ratifications of C107 – Indigenous and Tribal Populations Convention, 1957 (No. 107). ILO. https://normlex.ilo.org/dyn/nrmlx_en/f?p=1000:11300:0::NO:11300:P11300_INSTRUMENT_ID:312252

[6] A practitioner’s perspective on the rights of indigenous peoples since the adoption of the ILO Convention No. 169. Minority Rights Group. https://minorityrights.org/a-practitioners-perspective-on-the-rights-of-indigenous-peoples-since-the-adoption-of-ilo-convention-no-169/

[7] Ratifications of C169 – Indigenous and Tribal Peoples Convention, 1989 (No. 169). ILO. https://normlex.ilo.org/dyn/nrmlx_en/f?p=1000:11300:0::NO:11300:P11300_INSTRUMENT_ID:312314

[8] United Nations Declaration on the Rights of Indigenous Peoples: resolution / adopted by the General Assembly. United Nations digital library. https://digitallibrary.un.org/record/609197?ln=en

[9] Pakistan comments. Indigenous and Tribal Populations Convention, 1957. ILO. https://normlex.ilo.org/dyn/nrmlx_en/f?p=1000:13101:0::NO:13101:P13101_COMMENT_ID:3143621

[10] Ibid.

in Pakistan".[11] The 2004 International Labour Organization (ILO) country technical note suggested that indigenous or tribal peoples may constitute roughly 15% of Pakistan's then 126 million population, but this historical estimate is outdated.[12] These details underscore both the scale of IP presence and the apparent exclusion of IPs from policies due to lack of official demographic recognition.

Pakistan's IP landscape cuts across ecological zones.[13] The northern mountains (Gilgit-Baltistan, Chitral and northern parts of Khyber Pakhtunkhwa) include the Kalash people in three valleys of Chitral (Bumburet, Rumbur, Birir), several ethnic or tribal mountain communities with strong customary land systems and distinct languages, such as the Wakhi and Burusho, and nomadic pastoralists. Khyber Pakhtunkhwa and its tribal districts are populated by a large number of Pashtun tribes, sub-tribes and clans. The western and south-western rangelands of Balochistan and southern Khyber Pakhtunkhwa are inhabited by not only Baloch and Brahui tribal groups, but also nomadic and semi-nomadic pastoralists, such as the Kuchi or Khorasani, and drought-exposed livestock societies. The Sindh riverine and desert belts as well as the Middle Indus river basin are home to customary communities, such as the Kihal and Mor tribal fishing peoples, and the agrarian or pastoral groups in the Indus floodplain, such as the Ode. The indigenous fisherfolk, including the Med or Mohanna and other coastal tribes, reside in the coastal parts of Sindh and Balochistan where they rely on sea and delta ecosystems and maintain distinctive maritime cultural systems.

Research shows that some forest and land laws, which have provisions for the protection of indigenous peoples, are not implemented effectively, leading to violations of the rights of indigenous peoples.[14] The Kalash, Brahui, Sheedi and Balti communities have faced issues related to encroachment of their lands by outsiders, land dispossession, resource exploitation, cultural erasure and marginalisation.[15]

Furthermore, the IPs sustain livelihoods that are deeply interconnected with their surrounding ecosystems, seasonal cycles and ancestral lands. Their income and food security depend on traditional practices such as pastoralism and herding in the high mountains and rangelands often governed by customary grazing routes and communal tenure, small-scale terraced agriculture and forest-linked subsistence in northern valleys with heavy dependence on springs, glaciers and communal irrigation, forest use, coastal and inland fishing, artisanal crafts and eco-tourism, all of which rely on stable climatic conditions.

As climate variability intensifies, these ecosystem-dependent livelihoods face increasing disruption, amplifying both economic vulnerability and cultural loss.

1.2.2 Climate Change in Pakistan

Pakistan faces one of the most severe climate change-related risks among developing nations. Owing to its diverse topography from the glaciated peaks of the Hindu Kush Karakoram Himalaya (HKH) region to the low-lying Indus River plains and arid rangelands, the country is highly vulnerable to shifts in temperature, rainfall patterns, extreme weather, glacier melt and sea-level rise.[16]

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[11] Indigenous People Planning Framework. Pakistan Poverty Alleviation Fund. Accessed at https://share.google/ET6IrmXFoiEAduaN5

[12] Pakistan country technical note. ILO. https://share.google/kUorZiyhImreqX70a

[13] Country technical note on indigenous peoples' issues: Islamic Republic of Pakistan. Islamic Republic of Pakistan. International Fund for Agricultural Development. https://www.ifad.org/en/w/publications/pakistan-country-technical-note-on-indigenous-peoples-issues

[14] slam, M., Khan, M. M. A. & Aslam, S. I. (2022). An examination of the indigenous legal frameworks for protecting the rights of indigenous peoples in Pakistan. Journal of Development and Social Sciences. http://dx.doi.org/10.47205/jdss.2022(3-IV)59

[15] Ibid.

[16] National Climate Change Policy 2021: https://www.mocc.gov.pk/SiteImage/Policy/NCCP%20Report.pdf

Mean temperatures in Pakistan have risen in recent decades, with the rise of 0.47°C between 1961-2007, and extreme heat episodes have become more frequent, contributing to heatwaves, drought stress and expanded arid zones.[17] One of the most dramatic manifestations of climate change in Pakistan is the increasing incidence of intense monsoon rains combined with glacial melt, which has contributed to major floods in recent years. For example, the 2022 floods affected over 30 million people and resulted in around US $14.9 billion in estimated damage.[18] Water security is under threat as glaciers in the HKH region shrink, snowpack declines and dry season flows drop, placing added pressure on agriculture, hydropower and livelihoods in mountainous and downstream areas.[19] At the same time, deforestation and forest degradation amplify Pakistan's climate vulnerability. Natural forest cover is low, extending to only 2% of the land area in the year 2020, according to Global Forest Watch.[20] Tree cover losses between 2001 and 2024 have amounted to around 9,500 hectares, with Khyber Pakhtunkhwa and the tribal districts accounting for 95% of all tree-cover loss.[21] Around 78% of the tree cover loss was attributed to logging.[22] Forest clearing increases risk of landslides, sediment runoff, flood peaks and soil erosion.[23] For IPs such as the Kalash, deforestation is exposing their valley to rain-induced erosion and landslides and climate-induced regular floods have created existential risks for their culture.[24]

Agriculture, which accounts for 23% of Pakistan's GDP and employs nearly 38% of the labour force, and livestock, which makes up 62% of the agriculture sector, are already facing disruption from shifting seasonal patterns, reduction in water availability and decline in soil productivity.[25,26] These stresses are magnified by climate change and environmental degradation.[27] Droughts, water scarcity due to extreme heat, and floods are altogether leading to internal displacement and climate-induced migration for indigenous peoples and vulnerable communities.[28] According to the International Displacement Monitoring Centre, there were around 26 million internal displacements in Pakistan between 2008 and 2024 due to various disaster events.[29] For indigenous communities such as the fisherfolk in Pakistan's coastal areas, the displacement caused by rising sea levels, saltwater intrusion and climate-induced disasters is not only causing a loss of their homes but also their cultural heritage and livelihoods.[30] Pakistan's largest city, Karachi, is expected to receive an estimated 2.3 million climate migrants by 2050 if global temperature exceeds 1.5°C above pre-industrial levels.[31]

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[17] Climate change profile of Pakistan. Asian Development Bank. https://dx.doi.org/10.22617/TCS178761

[18] Economic Survey of Pakistan 2022-23: Annex-III: Pakistan floods 2022 impact assessment: https://www.finance.gov.pk/survey/chapters_23/Annex_III_Pakistan_Floods_2022.pdf

[19] Federal minister Dr. Musadik Malik urges global action at COP 30 as HKH glaciers face rapid meltdown. Ministry of climate change and environmental coordination. https://mocc.gov.pk/NewsDetail/YmFjYjJmMjUtZThjMS00ZmY2LThiMDMtN2Q3MGZiOTk1MWNm

[20] Pakistan. Global Forest Watch. https://www.globalforestwatch.org/dashboards/country/PAK/

[21] Ibid.

[22] Ibid.

[23] How Does Deforestation Affect Runoff? Sustainability Directory. https://pollution.sustainability-directory.com/question/how-does-deforestation-affect-runoff/

[24] Pakistan's indigenous community left to battle disasters by drawing on conventional wisdom. Dialogue Earth. https://dialogue.earth/en/climate/pakistans-indigenous-community-left-to-battle-disasters-with-conventional-wisdom/

[25] FAO in Pakistan: Pakistan at a glance. Food and Agriculture Organization of the United Nations. https://www.fao.org/pakistan/our-office/pakistan-at-a-glance/en/

[26] Syed et. al. (2021). Climate impacts on the agricultural sector of Pakistan: Risks and solutions. Environmental Challenges. https://doi.org/10.1016/j.envc.2021.100433

[27] Climate-smart agriculture in Pakistan. World Bank group. https://climateknowledgeportal.worldbank.org/sites/default/files/2019-06/CSA-in-Pakistan.pdf

[28] No place to call home: Climate change is costing indigenous communities their homes and livelihoods. Islamic Relief. https://reliefweb.int/report/pakistan/no-place-call-home-climate-change-costing-indigenous-communities-their-homes-and

[29] Pakistan. International Displacement Monitoring Centre. https://www.internal-displacement.org/countries/pakistan/

[30] In Pakistan, sea level rise and displacement follow fisherfolk wherever they go. Mongabay. https://news.mongabay.com/2025/03/in-pakistan-sea-level-rise-displacement-follow-fisherfolk-wherever-they-go/

[31] Eight million climate migrants arrive in ten Global South cities by 2050 if emissions don't fail. C40 Cities. https://www.c40.org/news/eight-million-climate-migrants-arrive-ten-south-cities-by-2050/

Given Pakistan's limited contribution to global greenhouse-gas emissions (just under 1%), the scale of its climate impacts highlights the vast imbalance between cause and effect.[32] Yet the country's adaptive capacity remains constrained by institutional, infrastructural and socio-economic challenges.[33] At the international level, Pakistan has ratified the United Nations Framework Convention on Climate Change[34] and ratified the Paris Agreement in 2016.[35] Its latest Nationally Determined Contributions (NDC) set a target of 50% reduction in project emissions by 2030, with 35% of these subject to provision of international grant finance.[36] In 2022, as chair of the G77, Pakistan led the negotiations that helped set up the Fund for Responding to Loss and Damage.[37] The fund will assist highly climate-vulnerable developing countries to respond to economic and non-economic loss and damage from the adverse effects of climate change.[38] Nationally Pakistan's 2021 climate change policy was supported by the 2023 National Action Plan, which has a focus on climate-smart water and land management, mainstreaming climate adaptation and enhancing climate resilience through disaster emergency preparedness and response, among other priority and cross-cutting areas.[39] Pakistan has also issued policy guidelines to establish carbon markets and their operationalisation.[40] But with devastating floods in 2022 and 2025, the progress on the national strategies remains uneven and vulnerability remains high.

In summary, the adverse impact of climate change in Pakistan is not a distant future concern but a current reality. Rising temperatures, escalating extremes, glacial and hydrological stress, diminishing forests, livelihood disruption and growing risks of climate-induced disasters all combine to pose not only a severe threat to the indigenous communities, but also a profound development challenge for society as a whole.

1.3 Pakistan's Digitalisation and the Rise of Disinformation

This section describes the country's digital transformation, including the digitalisation of the media sector, and examines the spread of disinformation, leading to a discussion on emergence of climate disinformation in Pakistan.

1.3.1 The Digitalisation of the Media Sector

Pakistan has undergone rapid digitalisation since 2015, boosted by the launch of 3G and 4G mobile Internet services. Between 2018 and 2025 alone, official estimates suggest that the number of Internet subscribers nearly doubled to reach around 150 million, with Internet penetration now at around 60%.[41] With a mobile teledensity of 79% and 196 million mobile cellular subscribers[42], most people use mobile phones to access the Internet.[43]

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[32] Pakistan. Climate promise. https://climatepromise.undp.org/what-we-do/where-we-work/pakistan

[33] Wazir et. al (2024). National climate policy framework and international obligations. Khyber Journal of Public Policy. https://nipapeshawar.gov.pk/KJPPM/PDF/CIP/P1.pdf

[34] Parties to the United Nations Framework Convention on Climate Change. United Nations Climate Change. https://unfccc.int/process/parties-non-party-stakeholders/parties-convention-and-observer-states

[35] Pakistan. United Nations Climate Change. https://unfccc.int/node/61134

[36] Pakistan Updated Nationally Determined Contributions 2021. Ministry of Climate Change and Environmental Protection. https://www.mocc.gov.pk/SiteImage/Policy/PakistanUpdatedNDC2021-compressed.pdf

[37] Pakistan hails 'pivotal step' as countries adopt COP27 deal with 'loss and damage' fund. Dawn. https://www.dawn.com/news/1722046

[38] Fund for responding to Loss and Damage. https://www.frld.org/

[39] National adaptation plan. Ministry of Climate Change and Environmental Coordination. https://www.mocc.gov.pk/SiteImage/Policy/NAP%20Digital-compressed.pdf

[40] Pakistan policy guidelines for trading in carbon markets. Ministry of Climate Change and Environmental Coordination. https://www.mocc.gov.pk/SiteImage/Policy/Pakistan%20Policy%20Guidelines%20for%20Trading%20in%20Carbon%20Market.pdf

[41] Telecom indicators overview. Pakistan Telecommunication Authority. https://www.pta.gov.pk/#telecom-indicators-info

[42] Ibid.

[43] Internet's access in Pakistan: Issues and way forward. PIDE. https://pide.org.pk/research/internets-access-in-pakistan-

Table 1 Annual broadband penetration.

2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
33%	37%	45%	51%	54%	57%	61%

Source: PTA

Social media users comprise roughly a quarter of the around 240 million population.[44] TikTok (67 million users), YouTube (56 million users) and Facebook (49 million users) are the most used social media networks.[45] TikTok has shown the largest increase in the domestic user base in recent years. Among communication and messaging apps, WhatsApp is most popular, with an estimated 52 million users in the country.[46]

Table 2 Social media penetration (% of population, at start of year)

Year	Social media	Facebook	YouTube	TikTok	Instagram	X
2021	21%	18%	16%	N/A	5%	1%
2022	32%	20%	32%	8%	6%	2%
2023	30%	16%	30%	7%	5%	2%
2024	30%	18%	30%	22%	7%	2%
2025	26%	20%	22%	26%	7%	1%

Source: Datareportal Digital Pakistan reports

TV broadcast news still remains the main source of information, with 56% using it to access news.[47] But around 36% of the public gets their news online, replacing print as the second most preferred medium.[48] The rise in Internet use has also compelled traditional news organisations to grow their online presence. Pakistan has nearly 40 broadcast news organisations[49] and around 675 print news publications[50], almost all of which now operate social media accounts. Mainstream TV news organisations ARY News and Geo News have over 20 million followers on Facebook and YouTube respectively. Dawn.com, the news website of Pakistan's oldest and most prominent newspaper, is also one of the top 30 most visited websites in the country, according to one estimate.[51]

Alongside the traditional news organisations, a new crop of independent digital news media have emerged in recent years. These national, local and hyperlocal digital news outlets are offering public

issues-and-way-forward/

[44] Digital 2025: Pakistan. Datareportal. https://datareportal.com/reports/digital-2025-pakistan

[45] Ibid.

[46] WhatsApp users by country 2025. World Population Review. https://worldpopulationreview.com/country-rankings/whatsapp-users-by-country

[47] Public trust in the media during the coronavirus pandemic. Media Matters for Democracy.

[48] Ibid.

[49] For TV, see: https://pemra.gov.pk/assets/uploads/licensing/stv/list_of_licences_issued_stv.pdf

[50] For print, see: https://opendata.com.pk/dataset/number-of-newspapers-and-periodicals-by-language-in-pakistan-2011-2020

[51] Top websites ranking in Pakistan. Similarweb. https://www.similarweb.com/top-websites/pakistan/

interest journalism to communities underserved by the mainstream news media as well as providing for the niche thematic information needs of citizens. Many among them, such as the Tribal News Network, Times of Karachi, Raftaar and The Centrum Media, have developed large online audiences across social media platforms. Others such as Voicepk.net, have a dedicated focus on rights-based investigative journalism. Yet others, such as ProPakistani, cater to thematic news interests. According to one estimate, there are at least 55 and as many 120 such digital native news media across the country, with around 80% of them already providing coverage to environment and climate change issues.[52] This independent digital news ecosystem has also amplified the voices of the indigenous peoples of the country, by reporting on their rights and concerns.

However, despite the growth in digitalisation, Pakistan also has a considerable digital divide, with around 100 million still without access to the Internet.[53] Rural-urban, socioeconomic and gender disparities further exacerbate issues of Internet access and connectivity.[54] Only 21% rural areas have Internet access compared to 55% urban areas[55], for instance, and women are 25% less likely to use mobile Internet compared to men despite recent gains in Internet adoption by women in the country.[56] These infrastructure issues directly affect the access to information of IP communities in the country, which are often based in rural and remote regions.

1.3.2 The Rise of Disinformation

While the rapid digitalisation has opened new opportunities for civic participation, youth engagement and innovation in the country, the social media platforms have also been used deliberately or inadvertently for the circulation of false or misleading.

Past research has observed online disinformation messages in Pakistan across all areas of public life, including politics, health, religion and climate.[57] The use of coordinated campaigns, hate speech, foreign interference, conspiracy theories and malicious attacks to spread disinformation messages have led to real-world harm for public health, trust in public institutions, the public participation of women and religious minorities, and the safety of journalists and human rights defenders, among other online and offline risks in a politically polarised society.[58] The production and distribution of online disinformation have become a "fully functional economy", according to one analysis, which benefits from the tendency of social media algorithms to reward sensationalism and emotionally charged content over verified facts and independent journalism.[59]

AI-generated deepfake content has increased the complexity of the disinformation problem, as witnessed during the 2025 Indian unprovoked attacks on Pakistan, where cross-border disinformation campaigns by Indian user accounts on social media used AI-based manipulated and digitally altered content to wage a kind of information warfare alongside the military conflict.[60] Foreign and domestic disinformation also poses a systemic economic risk, capable of undermining investor confidence and

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[52] Trends report. Public interest media directory of Pakistan. https://pkpublicmedia.com/report/

[53] Khan et. al (2024). The digital divide in Pakistan: Access to technology and its socio-economic implications. https://assajournal.com/index.php/36/article/view/241

[54] Bridging the digital divide. Criterion Quarterly. https://criterion-quarterly.com/bridging-the-digital-divide/

[55] Ibid.

[56] The Mobile Gender Gap Report 2025. GSMA. https://www.gsma.com/r/wp-content/uploads/2025/06/The-Mobile-Gender-Gap-Report-2025.pdf

[57] Naeem, W. & Rehmat, A. (2022). Countering disinformation in Pakistan. International Media Support. https://www.mediasupport.org/publication/countering-disinformation-in-pakistan-lessons-and-recommendations-for-digital-journalism/

[58] See footnote 57.

[59] Policy brief: Disinformation economy in Pakistan. Accountability Lab and Media Matters for Democracy. https://pakistan.accountabilitylab.org/wp-content/uploads/2025/08/Disinformation-Economy-of-Pakistan.pdf

[60] How social media lies fuelled a rush to war between India and Pakistan. The Guardian. https://www.theguardian.com/media/2025/may/28/how-social-media-lies-fuelled-a-rush-to-war-between-india-and-pakistan

destabilising markets.[61]

Policy and regulatory measures to counter online disinformation have resulted in the criminalisation of online disinformation under Pakistan's controversial anti-cybercrimes legislation, with a jail term of three years and a fine of two million rupees for intentional distribution of false information.[62] But critics and human rights activists have warned about the misuse and selective use of the law's disinformation provision to target independent journalists and silence critical online expression because of the arbitrary and unclear process by the authorities to classify any content as disinformation.[63]

Independent efforts to consistently and reliably debunking disinformation through fact-checking remain limited in scale and scope, despite the impressive efforts of fact-checking units of AFP Pakistan Fact Check, Soch Fact Check, Geo Fact Check, Facter and iVerify Pakistan. Pakistan's worsening freedom-of-expression situation, indicated by its position on the World Press Freedom Index where it currently ranks 158 out of 180 countries[64], further undermines the efforts of independent public interest media, journalists and fact-checking organisations to counter online disinformation and misleading content with credible and trustworthy information.

Recent coalition-building efforts, such as the Coalition Against Disinformation, have put their focus on critical thinking and media literacy awareness for youth by collaborating with universities and academia.[65] Customised educational interventions have shown promising results for information discernment and ability of citizens to identify disinformation based on empirical evidence in Pakistan.[66] But the effectiveness of these efforts is often frustrated by the inaction and lack of accountability of Big Tech companies in downgrading and removing harmful disinformation content from their platforms.[67]

1.3.3 Climate Journalism and Climate Disinformation

Research on climate journalism in Pakistan finds that coverage remains largely reactive and dominated by disaster-centric, event-based reporting with minimal focus on structural causes, adaptation or scientific accuracy[68]. Less than half of the TV news bulletins put flood-related news among the top headlines during the 2022 floods.[69]

Pakistani journalists face significant professional constraints including limited expertise, editorial prioritisation of political news and commercial pressures that discourage coverage of environmental issues[70]. Many reporters still view climate misinformation as a peripheral concern, in part because

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[61] Impact of disinformation on Pakistan's economy. National School of Public Policy. https://nspp.gov.pk/wp-content/uploads/2025/02/Impact-of-Disinformation-on-Pakistan.pdf

[62] NA passes controversial Peca amendment bill amid walkout by PTI, journalists. Dawn. https://www.dawn.com/news/1887195

[63] Pakistan: multiple journalists and a dozen YouTube channels targeted under Peca in less than a year. RSF. rsf.org/en/pakistan-multiple-journalists-and-dozen-youtube-channels-targeted-under-peca-less-year

[64] Pakistan. World Press Freedom Index. RSF. https://rsf.org/en/country/pakistan

[65] Coalition formed to combat threats to public interest journalism. Voicepk.net. https://voicepk.net/2023/03/coalition-against-disinformation-to-combat-threat-to-public-interest-journalism/

[66] Ali, A. & Qazi, I. A. (2021). Countering misinformation on social media through educational interventions: Evidence from a randomized experiment in Pakistan. https://arxiv.org/pdf/2107.02775

[67] APC condemns tech platforms' inaction as disinformation and online violence escalate during India-Pakistan conflict. APC. https://www.apc.org/en/pubs/apc-condemns-tech-platforms-inaction-disinformation-and-online-violence-escalate-during-india

[68] Hussain, S., et al. (2022). Media Reporting of Climate Change Crisis in Pakistan: Identifying Corrective Strategies. Pakistan Social Sciences Review. https://journals.sagepub.com/doi/10.1177/02666669221104612

[69] Munim, Y & Arslan, M. (2023). Media coverage and natural disasters: Analyzing electronic media's coverage of Pakistan floods 2022. Media Matters for Democracy. https://mediamatters.pk/wp-content/uploads/2023/04/Media-coverage-and-natural-disasters.pdf

[70] Ejaz, W., Ittefaq, M. & Arif, M. (2021). Understanding influences, misinformation, and fact-checking concerning climate-change journalism in Pakistan. Journalism Practice 16(2–3): 404–424. https://doi.org/10.1080/17512786.2021.1972029

newsroom routines are influenced more by political and economic imperatives than by scientific literacy or public-interest journalism.

The environment or climate change news beat continues to rank "lower down in the reporting hierarchy because it is too far removed from the centres of power".[71]

Within the country's broader digital misinformation and disinformation crisis situation, climate disinformation has also began to figure more regularly. Climate disinformation includes false or misleading narratives that distort the understanding of climate science, misrepresent environmental policies or discredit adaptation and mitigation efforts.[72]

While disinformation dynamics have been extensively studied in political and health contexts, their intersection with climate and environmental issues remains under-examined, despite direct implications for governance, humanitarian coordination and citizen resilience. One recent research study by the Digital Rights Foundation noted a proliferation of misinformation in connection with the 2025 floods in Pakistan, with a significant share of AI-generated video clips to weaponise and sensationalise the natural disaster.[73] The research noted that the floods-related misinformation largely went unchecked by the social media platforms, with no or limited efforts by the platforms to protect users from falsehoods during the emergency situation.

This indicates a serious concern that online climate-related misinformation and disinformation may pose a significant challenge to the IPs and climate-vulnerable communities in Pakistan. Building on this background and literature review, the next sections will provide the findings of the media monitoring and data analysis of the present research study to identify and examine the incidence, forms, spread and impact of climate disinformation in the country.

[71] Khan, R. S. (2024). Pakistan: On the Frontline of Climate Change. GIZ Pakistan & Centre for Excellence in Journalism, Karachi. https://cej.iba.edu.pk/pdf/pakistan-on-the-front-line-climate-change-english-metadata-included.pdf

[72] Climate disinformation. European Commission. https://climate.ec.europa.eu/eu-action/climate-disinformation_en

[73] Khan, S. (2025). Combatting flood misinformation in Pakistan: Generative AI and platform accountability in the age of climate crisis. Digital Rights Foundation. digitalrightsfoundation.pk/wp-content/uploads/2025/09/Combatting-Flood-Misinformation-in-Pakistan.pdf

2. Forms of Climate Disinformation

To understand how climate falsehoods emerge, spread, and influence public perception in Pakistan, this study undertook a systematic classification of disinformation narratives circulating across digital and hybrid media ecosystems. The monitoring of news media and social media resulted in a sample of 219 identified records that underpins the study's evidence on how and where climate disinformation circulates in Pakistan. The quantitative analysis is given in Table 1 below.

Table 3 Coding analysis of monitored data

Category	Key findings	Percentage (Count)
Total Records	219 unique disinformation cases captured.	100% (219)
Event Context	Majority of disinformation messages shared during crisis events.	Crisis: 95% (208); Routine: 5% (10)
Source Type	Disinformation was predominantly found on social media.	Social: 99% (217), Online news: 1% (2)
Platforms	Facebook led other social networks in terms of disinformation incidence.	Facebook: 42% (93) TikTok: 29% (64) Twitter / X: 15% (32) Instagram: 13% (28)
Languages used	Multilingual spread with most messages in Urdu.	Urdu: 51% (112) English: 34% (75) Punjabi: 2% (4) Others (e.g. Pashto, Seraiki etc.): 13% (28)
Tone	Alarmist tone dominated.	Alarmist: 71% (155) Persuasive: 14% (30) Neutral: 8% (18) Fatalistic: 4% (9) Mocking: 2% (5) Other: 1% (2)
Factuality	96% of the content was either false or misleading.	Misleading: 63% (137) False: 34% (75) Other: 3% (7)
Narrative Codes	Alarmist narratives were found most commonly.	Alarmist: 70% (154) Conspiracy: 16% (34) Fatalism: 5% (11) False solutions: 3% (8) Denial: 1% (2) Other: 5% (10)

Based on the analysis, the following five forms of disinformation were identified.

2.1 Alarmist and Sensationalised Content

The study highlights that alarmist or sensationalised content is one of the most prevalent forms of climate disinformation in Pakistan. During major climate crises such as the 2022 and 2025 floods, social media platforms were inundated with exaggerated and emotionally charged visuals; many of them AI-generated or manipulated shared without verification. Posts frequently used hyperbolic captions like "millions drowned" or "entire cities vanished," often disconnected from verified meteorological or relief data. Such content appeared to spread rapidly across Facebook, TikTok and WhatsApp, blurring the line between fact and fiction. By amplifying fear and dramatising events, these narratives not only seemed to fuel public panic but also appeared to erode trust in official early-warning systems and credible news outlets, seemingly creating misinformation loops that hampered effective crisis response and risk communication.

A striking 70% of the identified climate disinformation messages had an alarmist tone using fear and emotional exaggeration to drive engagement. This aligns with common social media algorithms that reward sensational content, furthering virality.

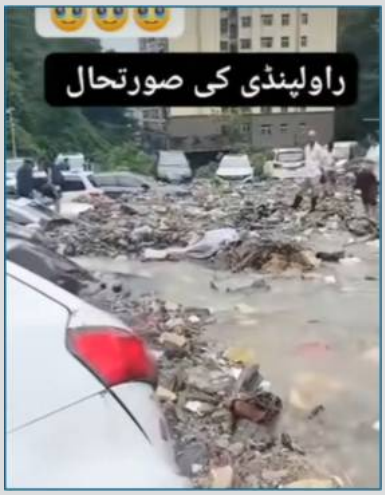

Figure 1 One misleading post used past floods visuals from China to make a claim about floods destruction in Rawalpindi

Journalists interviewed for the study noted that climate coverage lacks "drama", compelling newsrooms to exaggerate events to increase viewership. This sensationalism fuels public confusion and amplifies climate-related rumours. During monsoon seasons, routine rainfall is frequently mischaracterised as "cloudbursts" or "flash floods" to mask governance failures, especially in Karachi. "Climate news doesn't have drama and channels sensationalise to get TRPs (TV ratings)," said one journalist respondent. KIIs also revealed that unqualified commentators frequently appear on television news and provide misleading information. One journalist recalled a self-proclaimed "expert" falsely claiming that earthquakes were caused by climate change during a national broadcast demonstrating the lack of editorial fact-checking.

2.2 Conspiracy-driven Narratives

The study reveals that conspiracy-driven narratives have emerged as a distinct and damaging form of climate disinformation in Pakistan, particularly during high-impact events such as the 2022 and 2025 floods. These narratives falsely attribute climate disasters to foreign manipulation or geoengineering, often framing them as acts of sabotage by bad-faith actors.

Circulating widely across Urdu-language Facebook pages, YouTube channels and WhatsApp groups, such claims are typically supported by fabricated satellite images, AI-generated visuals or unverified "expert" commentary. By exploiting public anxiety and nationalist sentiment, these conspiracies erode trust in scientific institutions and authorities such as the National Disaster Management Authority (NDMA), Indus River System Authority (IRSA) and the Water and Power Development Authority (WAPDA), undermining confidence in official data and disaster management responses. Ultimately, these conspiracy-driven climate disinformation messages seemed to politicise humanitarian crises, deepen social polarisation and distract citizens from addressing the underlying structural causes of climate vulnerability and poor governance.

Common narratives frame climate change as a "foreign agenda" or claim that disasters are artificially created by neighbouring countries. During the 2025 floods, AI-generated videos leaned on the Indian release of dam water into Pakistan to circulate additional false claims widely, exploiting geopolitical tensions and diverting public attention from governance shortcomings.

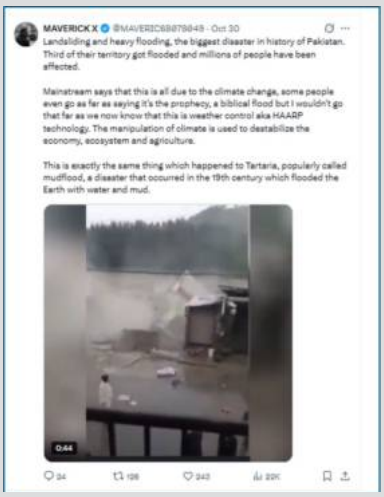

Figure 2 A social media post links the Pakistan floods with a conspiracy theory.

A policy expert interviewed for this study highlighted that false narratives often also emerge in the local context due to a lack of technical expertise and the exclusion of scientific voices from policymaking and public discourse. The interviewee cited the long-standing controversy around the Kalabagh Dam as an example where the public's limited understanding of the technical and environmental dimensions of the issue may have given rise to conspiracy theories and conflicting narratives.

2.3 Denial or Delay Narratives

The study indicates that climate change denial, delay and minimisation remain infrequent and subtle forms of disinformation in Pakistan's information ecosystem. These narratives often reject established scientific consensus or portray climate change as a Western-driven agenda aimed at controlling developing economies but their incidence on social media was found to be limited compared to other frames.

During news media monitoring, however, several online opinion pieces and talk shows were found to contain commentary that described climate change as "imported hysteria" or dismissed its human-induced causes, framing recurring floods and droughts as part of "natural weather cycles" rather than consequences of deforestation, urban sprawl, or emissions.

By presenting the floods as unrelated to climate drivers and instead framing them as moral, religious or routine natural events these disinformation messages attempted to undermine scientific consensus and discredit credible news sources. To this effect, this form also had overlap with the religious fatalism narrative discussed later. Such content was usually found to be disseminated through political commentators and certain media outlets that prioritised populist or ideological discourse over science-based reporting. By trivialising the urgency of climate action, these narratives appeared to undermine policy mainstreaming, discourage investment in adaptation measures and erode public understanding of Pakistan's genuine climate vulnerabilities.

Interview respondents explained that climate-related misinformation and disinformation are sometimes not limited to individuals but are at times propagated by government authorities to conceal their shortcomings. One respondent said that instead of acknowledging structural failures in the aftermath of extreme weather events, the government often labels such incidents as "flash floods" or "cloudburst" to deflect responsibility despite clarifications from the Meteorological Department.

2.4 Oversimplified or False Solutions

Oversimplified or false solution narratives are a recurring form of climate disinformation in Pakistan, particularly within government campaigns and influencer-driven content, based on the monitored data. These narratives oversimplify complex climate challenges by promoting a single symbolic action, such as large-scale tree plantation drive, as a complete solution to issues such as floods, heatwaves or pollution. Posts highlighting the "10 billion Tree Tsunami" frequently present plantation imagery as evidence of climate resilience, often without context on survival rates, ecosystem diversity or the broader need for land-use planning and emission control, even though afforestation and reforestation are crucial climate strategies.

Similarly social media posts on cloud seeding in the data set exemplified the oversimplified or false solution narrative by presenting cloud seeding as a comprehensive fix for complex climate and environmental challenges. Viral Facebook, Instagram and WhatsApp content framed artificial rain as a decisive solution to smog, heatwaves or drought, even though cloud seeding offers only short-term, highly limited benefits under very specific atmospheric conditions.

Such one-dimensional messaging appeared to divert public attention from essential systemic measures such as sustainable urban drainage, water management and industrial regulation, reducing climate adaptation to a publicity exercise rather than a holistic, science-based process. Consequently, these tokenistic representations seemed to create an illusion of progress while perpetuating policy complacency and weakening accountability for meaningful environmental action.

2.5 Religious Fatalism

The study found the religious fatalism frame emerges strongly during moments of crisis, particularly floods and glacial hazards, and is amplified through WhatsApp group chat messages. Based on insights from FGD participants, local FM radio and offline community announcements also use this narrative frame to communicate about climate-induced natural disasters and extreme weather events.
In FGDs with Indigenous communities, several respondents articulated their understanding of natural disasters by interpreting them as an "act of God" and therefore inevitable, which reduced their willingness to prepare for climate threats or evacuate early. Such narratives frequently frame floods, heatwaves or monsoon extremes as divine punishment for societal wrongdoing, rather than as outcomes of governance failures, environmental degradation or global emissions.

This fatalistic framing, while culturally familiar, discourages proactive adaptation and weakens trust in scientific forecasting. The study found that more action-oriented religious interpretations also coexist

with fatalistic ones, creating competing moral messages that shape climate response behaviour among vulnerable Indigenous communities. These messages framed floods, cloudbursts and glacial lake outbursts as divine retribution for moral failings such as corruption or perceived social immorality. In other instances, some messages also framed extreme weather events as divine reward. The narrative frame validates past research, which has found religious fatalism in peasant populations regarding floods.[74] Such fatalistic readings risk discouraging preventive action and reinforcing the idea that floods, heatwaves or glacial disasters are beyond human influence, rather than partially driven by governance failures, land-use decisions and global emissions.

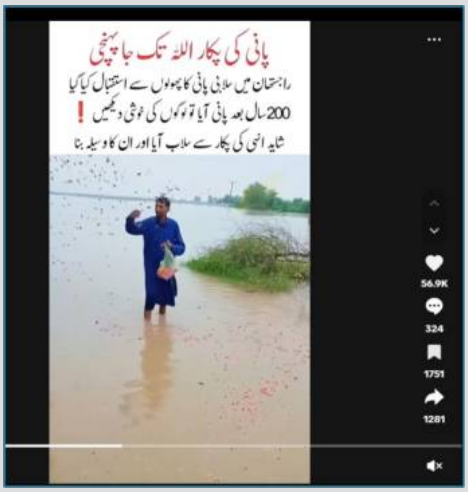

Figure 3 One message caption claimed the flood was divine reward for desert communities

Overall, based on monitored data and FGD responses, the religious fatalism frame contributed to psychological resignation, delayed action and heightened risk exposure, especially in isolated rural and coastal regions where formal climate communication is weak.

[74] Ahmad, A. N. (2019). Disaster cosmologies in comparative perspective: Islam, climate change and the 2010 floods in Pakistan's Southern Punjab. https://doi.org/10.1111/johs.12235

3. Patterns of Distribution and Spread of Climate Disinformation

This section describes the characteristics of the spread and distribution of climate disinformation identified during the data analysis.

The findings show that climate disinformation in Pakistan is not uniform but manifests through multiple interconnected forms that reflect the country's socio-political, linguistic and media dynamics. From conspiracy theories and denialist narratives to tokenistic climate campaigns and sensationalised visuals, these disinformation patterns exploit emotional, religious and nationalist sentiments to shape public perceptions of climate issues.

The analysis reveals three main features about the distribution and spread of climate disinformation.

First, climate disinformation spikes during crises such as floods, heatwaves, and smog episodes when public demand for rapid updates is high and official communication is slow or inconsistent. In such instances, the climate disinformation thrives in the absence of verified, real-time information and dedicated climate news coverage by media outlets. Almost all disinformation episodes (95%) were recorded during crisis events such as floods, heatwaves, and extreme weather occurrences. This suggests strong temporal correlation between climate shocks and misinformation surges, reflecting opportunistic amplification during emotionally charged periods.

Second, false narratives spread most effectively in Urdu and regional languages, often framed through emotional, religious or nationalist messaging that increases their believability. The dominance of Urdu-language content (51%) underscores how localized narratives, often embedded with cultural and religious undertones, are more likely to resonate with grassroots audiences. English-language disinformation tends to target more urban and educated demographics.

Third, social media platforms, especially Facebook, TikTok and WhatsApp, amplify sensational or conspiratorial content far faster than verified information. An overwhelming 99% of content originated from social platforms, led by Facebook and TikTok, indicating that visual and short-form content reels, clips, or memes play a central role in disinformation dissemination. Around 80% of survey respondents also cited these social media networks as their primary sources of exposure to misleading content related to climate. Table 2 shows the platforms where each form of climate disinformation was found most frequently.

Table 4 Distribution of climate disinformation forms by platforms

Form	Share of narratives	Platforms
Alarmist / Sensationalised	70%	Facebook, TikTok
Conspiracy / Geoengineering	12%	YouTube, Urdu FB
Denial / Delay	6%	Twitter, Op-eds
False Solutions	3%	Government PR, influencers
Religious Fatalism	5%	WhatsApp, FM Radio
Others (Greenwashing etc.)	4%	TikTok, WhatsApp

TikTok and WhatsApp emerged as the most influential platforms for climate rumours. The content on these platforms spreads rapidly due to ease of sharing, multimodal visuals and low detectability. Narratives driven by entertainment appeared to shape perceptions more powerfully than explicit hate speech. “Visuals on TikTok influence opinions far more than words and people remember images,” one multimedia journalist interviewed for the research said.

Survey respondents further noted that the most common forms of disinformation are short, emotionally charged social media “memes,” edited clips, and viral videos that are widely shared without any fact-checking or source verification. This trend reflects how digital virality, rather than credibility, often dictates the public’s exposure to climate-related narratives in Pakistan.

FGD participants stressed that while IPs are disproportionately affected by climate change, they are also uniquely exposed to climate misinformation circulating through informal communication networks, WhatsApp voice notes and regional-language social media channels. This exposure is amplified by their limited access to verified digital platforms and the near absence of official climate information in Indigenous languages.

FGDs also demonstrated that Indigenous communities frequently receive climate-related information through different media channels, village elders, community intermediaries, mosque announcements and family network rather than formal alerts from any government channel. Participants explained that during floods, heatwaves or any other climatic events, rumours spread rapidly because they arrive first and are framed in familiar languages and trusted voices. This makes communities highly susceptible to false weather warnings, sensational claims, and conspiracy narratives, especially those shared via WhatsApp. The absence of fact-checking practices at community level further reinforces the “trust heuristic”, where content is accepted without verification simply because it is shared by a known person that is trusted by the receiver of information.

Digital rights experts interviewed for the study highlighted the rapid growth of AI-generated flood visuals, crisis footage, and synthetic “women-in-crisis” content is designed to sexualise and exploit gendered vulnerability. This represents an escalation from traditional rumours to algorithmically amplified multimodal manipulation.

4. The Impacts on Indigenous Peoples

Based on the forms of climate disinformation identified by the study and their spread, this chapter examines the impacts on IPs and their ability to protect themselves and their natural environment. The findings from the FGDs revealed that climate disinformation interacts with long-standing structural vulnerabilities among IP communities of limited access to credible climate information, low digital literacy, linguistic exclusion and marginalisation from environmental decision-making to produce severe and multifaceted harms.

4.1 Effects on Community Safety and Indigenous Livelihoods

Evidence from the FGDs with IP communities showed that climate disinformation has directly endangered them. Participants cited cases where families ignored evacuation warnings because misleading social media updates suggested that flooding would not reach their villages. In some instances, exaggerated claims about floods caused unnecessary panic and displacement, while in others, underreporting of risk delayed protective action. Farmers and herders described how inaccurate rainfall and temperature information often sourced from viral posts affected cropping calendars, livestock movements and seasonal planning, leading to economic loss and resource depletion.

Climate disinformation directly affects community safety and wellbeing across Pakistan, with impacts ranging from physical harm to long-term social vulnerability. In Pir Baba (Buner), nearly 800 shops were destroyed partly because shopkeepers trusted misleading television and social media updates instead of verified evacuation warnings, illustrating how misinformation can translate into real, material losses.

Families in several districts such as Badin, Sanghar and Thatta prematurely abandoned their homes after panic-inducing TikTok videos predicted "total destruction," causing unnecessary displacement before any verified alerts were issued. Farmers in Jalalpur Pirwala altered sowing and irrigation schedules after believing a viral YouTube prediction of "record rainfall," which never occurred, resulting in crop losses and wasted agricultural inputs. Pastoral and nomadic communities in Buner moved livestock early due to false Facebook alerts about incoming storms, leading to animal deaths and reduced grazing productivity. Communities in Multan district underestimated heatwave risks and failed to take precautions after influencers claimed the Met Office had exaggerated temperature warnings, contributing to heat-related illnesses. Religious fatalistic messages on WhatsApp discouraged families in rural Sindh from preparing for floods or heatwaves, leading to reduced stockpiling of water, delayed relocation and increased exposure to harm, according to FGD respondents. Villages in Badin district such as Bhugra Memon and Ahmed Rajo redirected fuel, cash and labour based on a fake voice message warning of a "massive dam burst," diverting essential resources needed for genuine emergency preparation.

FGDs revealed that women in Indigenous communities are disproportionately harmed by climate disinformation due to gendered information hierarchies. Women often receive updates second or third hand through male family members, which means already distorted misinformation may become even more inaccurate by the time it reaches them. This places women at heightened risk during evacuations, agricultural decision-making or livestock management. Women in coastal Sindh, for example, shared that they received climate-related information late or in distorted form because updates were filtered through male family members, affecting evacuation timing and safety. Participants stressed that without targeted communication that directly reaches women, disinformation will continue to widen gender inequalities and exclusion from climate response processes

4.2 Fear, Confusion, Psychological Distress and Cultural Impact

Widespread psychological distress, particularly in rural Sindh and southern Punjab, was noted where

communities routinely encounter rumours about imminent floods, food shortages or mass displacement. These rumours seemed to create chronic anxiety among the IP communities that remains poorly documented but deeply felt.

Respondents noted a rising sense of fear, uncertainty and psychological strain from repeated exposure to alarming or fabricated climate narratives. Rumours about imminent "area-wide destruction," foreign interference or mass displacement triggered emotional distress, especially among women and youth. According to respondents, exaggerated AI-generated flood visuals circulating during monsoon seasons created widespread panic, fear and psychological distress, particularly among children and elderly community members.

In one example quoted during an FGD, conspiracy narratives blaming neighbouring communities or foreign countries for "releasing water deliberately" generated mistrust and conflict between ethnic and local groups. Similarly, respondents mentioned that conflicting death tolls and disaster figures shared by PDMA, local authorities and media during the 2025 floods created deep confusion for them about how to respond, leading communities to hesitate in taking protective action.

The frequently recurring keywords in open-ended responses of "chaos," "confusion," "trust," "discourage" and "fatalism" reflect the psychological challenge faced by IP communities, who often experience heightened exposure to emotional, misleading content.

A gender expert interviewed for this study said an unseen anxiety has taken root among indigenous community members, driven by misinformation that distorts their understanding of climate events and future risks.

Climate change is already causing displacement among Pakistan's IPs particularly in Balochistan, Sindh and Gilgit-Baltistan. When disinformation masks or trivialises these impacts, communities are denied recognition and timely support.

- In Balochistan, prolonged droughts and floods have destroyed grazing lands, forcing Indigenous families to migrate to peri-urban areas, where they lose their livelihood base and cultural identity.
- Glacial lake outburst floods (GLOFs) in the north threaten mountain communities, yet limited communication and sensationalist reporting prevent accurate early warning or inclusion in adaptation planning.
- Media often frames these disasters as isolated "acts of nature," omitting structural causes deforestation, poor planning, and marginalisation thereby depoliticising Indigenous suffering.

As communities are displaced without recognition of their rights, they lose not only homes and income but also spiritual, linguistic and social continuity, integral to their Indigenous identity.

4.3 Erosion of Trust

Climate disinformation has weakened trust in institutions such as NDMA, PDMA and the MoCC&EC, with many survey respondents relying instead on informal or international sources. FGD respondents also consistently highlighted the absence of clear, timely and trusted climate communication from government agencies, especially during disasters. They explained that official updates rarely reach IP communities, and when they do, they are typically in Urdu or English, limiting accessibility. As a result, reliance on informal channels becomes necessary even when they are unreliable. This governance vacuum allows disinformation to travel unchecked, shaping community perceptions of state performance and deepening mistrust between IPs and disaster-management authorities.

Pakistan's disaster-management landscape is marked by weak crisis communication and institutional gaps that allow disinformation to flourish, particularly during high-impact events. Delayed, incomplete, or contradictory updates from PDMAs and district authorities create an information vacuum that communities quickly fill with rumours and viral posts. Even officials often lack reliable real-time data, resulting in conflicting figures during emergencies. For example, during the 2025 Buner floods, death tolls were reported as 79, 150 and 162 by PDMA, local responders and newspapers respectively, highlighting severe failures in data verification and interagency coordination.

These communication breakdowns contribute directly to mismanagement of aid and public expectations, as false alerts about flood severity, evacuation timelines or relief distribution caused chaos on the ground. KIIs confirmed that such misinformation delayed evacuations and led to preventable casualties. "People refused to evacuate because they trusted WhatsApp more than the authorities," one journalist respondent from Sindh province said. At the same time, political incentives further distort crisis communication as some agencies appeared to intentionally reframe routine rainfall as "cloudbursts" to deflect responsibility for infrastructural failures while others seemed to strategically shape disaster narratives to protect political interests or leverage international funding opportunities.

One interview respondent observed that indigenous groups often develop mistrust toward clean energy or air quality interventions, perceiving them as externally imposed or economically threatening. The interviewee said this resistance, shaped by misinformation, slows behavioral change and undermines policy implementation. Moreover, the respondent shared, environmental journalists and activists challenging powerful actors on issues like industrial pollution or governance lapses frequently face online harassment and reputational attacks, illustrating how disinformation can suppress civic engagement.

Across Indigenous and rural communities, repeated exposure to false alerts and contradictory government messaging has eroded trust in institutions, pushing people toward WhatsApp groups, local gossip and unverified sources instead of official channels. This is also validated by the survey results. Among the survey respondents, around 65% had said that mixed or contradictory messages from government departments, news outlets and online influencers have weakened public confidence in Pakistan's climate governance. Many respondents described feeling "confused" or "disillusioned," suggesting information inconsistency rather than complete absence of data is a key driver of public distrust and disengagement from official climate initiatives.

According to FGD participants, disinformation portraying climate-related projects as foreign agendas led some Indigenous communities to refuse participation in adaptation activities such as early-warning systems and tree-planting initiatives. Data from FGDs showed that false claims about emergency volunteers being "paid agents" undermined trust in trained community disaster responders, reducing local cooperation during crises.

4.4 Discouraging Indigenous Knowledge and Adaptation Methods

For centuries, Pakistan's Indigenous Peoples have practiced local ecological management systems rotational grazing, watershed protection, forest regeneration, and community-based flood control. However, climate disinformation and top-down narratives erode the credibility of these knowledge systems:

- Climate change is often portrayed only in scientific or global policy language, sidelining community-based observations of shifting monsoon patterns, glacial melt, or drought cycles.
- This delegitimisation discourages younger generations from valuing Indigenous knowledge, weakening social transmission of resilience strategies.

In Sindh, for example, Indigenous Ecological Knowledge (IEK) related to soil fertility and riverbank cultivation has shown strong adaptive potential, yet policy neglect and misinformation diminish its perceived value. Some younger respondents reported questioning community-based coping practices because online narratives portrayed traditional knowledge as outdated or unscientific. In one example shared by respondents, Indigenous youth in GB and Chitral discarded traditional early-warning signs, such as changes in glacier sounds or animal behaviour, after consuming sensationalised social media content, leading to misjudged flood risk. This diminishing confidence threatens long-standing Indigenous adaptation systems that have supported community survival for generations. Fatalistic and politicised narratives were further found to discourage adaptation, contributing to feelings of helplessness and reducing willingness to participate in climate responses or advocate for their rights.

4.5 Exclusion from Climate Communication, Discussions and Policy

Many respondents stressed that the exclusion of Indigenous voices from climate governance further reinforces their challenges of dealing with climate disinformation as IPs lack avenues to validate or challenge false narratives.

Indigenous communities remain largely invisible in Pakistan's national and provincial climate policies. Disinformation contributes to this invisibility by framing climate change as a purely scientific or global issue detached from local realities.

- In media narratives and policy documents, the unique vulnerabilities and adaptation capacities of Indigenous and pastoral communities are rarely acknowledged. For instance, Khyber Pakhtunkhwa's Climate Change Policy has been criticised for failing to address pastoral livelihoods or Indigenous land-use systems.
- The absence of accurate, culturally grounded information about these communities allows mis-framing of their identities and practices presenting them as marginal actors rather than as key partners in adaptation and forest stewardship.
- Language barriers, poor digital connectivity, and event-driven media coverage mean that Indigenous voices seldom enter national discourse. This information gap permits external actors to define narratives about their needs, often inaccurately or paternalistically.

As a result, Free, Prior and Informed Consent (FPIC) central to Indigenous rights is frequently overlooked in Pakistan's climate and environmental planning.

The exclusion and invisibility of IPs from climate discussions is also reflected in the profound information asymmetry exists between climate institutions and Indigenous communities. Many Indigenous settlements lack digital infrastructure or literacy, limiting their access to verified climate forecasts or adaptation resources. In the absence of credible information, rumours, fatalistic narratives and external manipulation fill the vacuum. Conversely, state and mainstream media tend to circulate overly technical or politicised narratives that exclude Indigenous perspectives. This double bind means Indigenous Peoples are both uninformed and misinformed, leading to maladaptive decisions such as reliance on unsustainable coping strategies or distrust in official warnings as discussed above.

In Pakistan, climate disinformation appears to effectively function as a structural amplifier of inequality silencing Indigenous voices, eroding trust and legitimising extractive or exclusionary climate actions. It is transforming Indigenous communities from custodians of resilience into subjects of pity or blames within policy and media discourse. Addressing this requires a rights-based and inclusive climate communication framework that integrates Indigenous knowledge systems into adaptation planning, ensures access to accurate, locally relevant climate information, recognises community land and resource rights, and builds capacity for Indigenous-led monitoring and counter-narratives.

Only through transparency, respect for Indigenous epistemologies and participatory climate governance can Pakistan move from disinformation-driven marginalisation toward informed, equitable and resilient adaptation.

5. Recommendations

The research evidence reveals a pattern of crisis-triggered, emotionally charged and linguistically localised climate disinformation, often weaponised to exploit fear, faith and nationalism. The consequences are multidimensional, including the erosion of trust in science, delayed adaptation, policy fatigue and exclusion of IPs from informed decision-making.

To build resilience against the twin challenges of climate change and climate disinformation, Pakistan needs a coordinated, whole-of-society effort supported by stronger policies, better communication systems and inclusive community engagement. The following are practical recommendations tailored for key stakeholder groups responsible for shaping the country's climate information landscape.

The Federal and Provincial Governments in Pakistan should:

- Integrate information integrity and climate communication into national frameworks such as the National Adaptation Plan (NAP) and Nationally Determined Contributions (NDCs).
- Establish a National Climate Communication and Disinformation Response Framework under MoCC&EC with dedicated units at provincial and district levels.
- Develop climate-specific media and digital guidelines within PEMRA and PECA to address misinformation, manipulated content, and AI-driven false visuals during crises.
- Strengthen PDMA and DDMA communication systems, including real-time multilingual alerts, early-warning dissemination, and community-based communication channels.
- Institutionalise collaboration between MoCC&EC, NDMA, PDMA, PTA, PEMRA, and the Ministry of Information to build a coherent national climate narrative.

The United Nations and International Human Rights Mechanisms should:

- Support the government in integrating climate information integrity into national climate and digital governance frameworks.
- Support efforts to ensure Pakistan's compliance with relevant international conventions and declarations on the rights of Indigenous Peoples
- Facilitate the creation of a national observatory on climate disinformation, monitoring trends, risks, and impacts through digital analytics and community reporting.
- Provide technical support to embed Monitoring, Evaluation, and Learning (MEL) indicators within national climate programmes to track information resilience.
- Strengthen UN-led communication campaigns by producing verified, accessible, multilingual climate content targeting vulnerable communities.

Civil Society Organisations (CSOs) should:

- Establish community-based verification networks to identify and debunk climate-related misinformation before it spreads.
- Conduct grassroots awareness campaigns using theatre, FM radio, WhatsApp groups, and local influencers.
- Promote digital safety and information verification training for women, youth, and community

leaders.

- Document and amplify local climate knowledge and lived experiences to counter external misinformation and enhance public trust.

Media Organisations and Journalists should:

- Create Climate Desks within newsrooms and ensure the presence of trained editors who understand environmental reporting.
- Institutionalise fact-checking protocols and partner with academic institutions and fact-checking organisations for real-time verification.
- Provide compulsory training for journalists on climate science, disaster reporting, and digital verification tools.
- Adopt editorial standards that discourage sensationalism and ensure responsible coverage during climate emergencies.

Technology Companies should:

- Implement algorithmic accountability measures to curb viral spread of false climate content, especially during disasters.
- Increase transparency in identifying, flagging, and removing climate disinformation and misinformation in line with global best practices
- Promote verified, authoritative climate information through priority ranking, contextual labels, and misinformation warnings.
- Collaborate with fact-checkers and local organisations to monitor regional-language climate content, including Pashto, Sindhi, Punjabi, Balochi, and Shina.
- Support rapid-response climate information channels for Pakistan, especially during monsoon, heatwave, and GLOF seasons.

Indigenous Communities should:

- Establish community-managed information hubs to disseminate credible climate updates in Indigenous languages.
- Engage in peer-led digital literacy programmes that build capacity to recognise misinformation and create local counter-narratives.
- Collaborate with independent media to amplify authentic Indigenous perspectives and ecological knowledge systems (IKS).
- Promote the leadership of Indigenous women and youth through community radio, local theatre, digital storytelling, and mobile outreach.

6. Conclusion

Pakistan stands at a pivotal moment where the two accelerating crises of worsening climate emergency and the rapid expansion of digital disinformation are increasingly intertwined. This study demonstrates that climate disinformation in Pakistan is not a peripheral or isolated communication challenge; it is a structural threat that actively undermines resilience, governance and community preparedness. The findings reveal a consistent pattern of misleading and fabricated narratives spreading faster and more widely than verified scientific information during moments of high vulnerability such as floods, heatwaves, smog episodes and droughts. These narratives distort public understanding, fuel confusion, weaken institutional credibility and delay life-saving actions.

The consequences are particularly severe for IPs and rural communities living on the frontlines of climate impacts. Their reliance on oral communication networks, WhatsApp messages and low-connectivity platforms combined with linguistic exclusion and limited access to formal early-warning systems creates a dual burden of information scarcity and information distortion. Disinformation erodes traditional ecological knowledge, disrupts collective decision-making and undermines long-established coping systems that have historically helped communities withstand environmental shocks. Women, already positioned at the margins of communication hierarchies, face an even deeper information divide, receiving climate updates last and often in incomplete or distorted forms, heightening their exposure to risk. Disinformation was found not only to misguide IPs but also reshape their emotional landscape, undermining confidence, weakening collective agency and intensifying disengagement from climate governance and resilience planning.

Across media and governance systems, the absence of dedicated climate news desks, weak fact-checking practices, algorithm-driven amplification of sensational content and unregulated AI-generated visuals altogether contribute to an information ecosystem that rewards virality over veracity. The study underscores that without systemic reforms in climate communication from newsroom practices and digital-platform governance to provincial disaster-management systems and community-level outreach, disinformation will continue to outpace scientific narratives to the detriment of the IPs and broader societal response to climate change. The patterns of distribution and spread of climate distribution also revealed that climate disinformation has slowed down behavioural change and adaptation by promoting denialist, fatalistic or conspiratorial beliefs that undermine public engagement. It has also disproportionately impacted Indigenous communities, rural populations and women, who depend heavily on informal communication networks and thus experience greater exposure to misleading or fear-based content.

Yet the research also highlights clear pathways toward a more resilient and equitable climate information landscape. Indigenous communities expressed a strong demand for contextually grounded, multilingual and culturally relevant information systems. Journalists, fact-checkers and policy experts highlighted the need for coordinated real-time communication mechanisms and stronger institutional collaboration. The recommended actions from establishing a National Climate Communication and Disinformation Response Framework to creating Indigenous-led information hubs and promoting digital literacy offer a practical blueprint for bridging the information gap.

Ultimately, safeguarding Pakistan's climate future requires safeguarding the integrity of information itself. Truth, transparency and trust must become core elements of climate governance. Building resilience to disinformation is therefore not simply a communication exercise, it is a governance imperative, a rights-based obligation and a prerequisite for equitable adaptation and disaster preparedness. By centering indigenous knowledge, empowering vulnerable communities, strengthening institutional coordination and ensuring that credible, science-based narratives reach all segments of society, Pakistan can transform climate communication from a source of confusion into a foundation for collective action.

The country's ability to navigate an increasingly unstable climate landscape will depend not only on infrastructure, policies or technology, but also on whether its people especially those most at risk are equipped with accurate, timely and trustworthy information. Climate resilience begins with information resilience.

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Annexe 1: Coding Framework

This coding framework and associated typology served as the backbone of content monitoring and analysis, ensuring that all climate-related narratives are captured, categorised and compared systematically. Each type of climate disinformation was identified and operationalsed based on literature review, with indicators, examples and coding rules.

Category 1: Climate Change Denial

Definition: Claims that reject the existence, human role, or scientific consensus on climate change.

Indicators: Phrases like “climate change is a Western hoax,” “Pakistan’s weather has always been this way.”

Pakistan Context: Often amplified by fringe religious groups, political commentators, and occasionally on YouTube channels.

Category 2: Climate Delay Narratives

Definition: Narratives that accept climate change but argue against urgent action, suggesting postponement until technologies improve or until wealthier countries act.

Indicators: “We can’t afford climate action now,” “Industrial growth first, environment later.”

Pakistan Context: Seen in debates on coal power expansion and resistance to stricter emission standards in transport and textiles.

Category 3: False Solutions

Definition: Promotion of policies, technologies, or projects as climate-positive while ignoring or concealing their harmful impacts.

Indicators: “Large dams are the ultimate climate solution,” “Tree plantation drives equal climate mitigation.”

Pakistan Context: Mega-dam projects framed as climate-resilient while displacing local/indigenous communities; corporate campaigns planting exotic species for CSR “climate branding.”

Category 4: Greenwashing

Definition: Corporate, government, or institutional branding campaigns that exaggerate or fabricate climate benefits to mask destructive practices.

Indicators: Advertising that emphasizes “net zero commitment” while companies expand fossil fuel projects.

Pakistan Context: Cement, textile, and energy companies using “green” messaging without credible emission reduction pathways.

Category 5: Deforestation-Narrative Denial

Definition: Claims that downplay or dismiss the extent and impacts of deforestation.
Indicators: "Pakistan is a forest-rich country," "Cutting trees has no link to floods."

Pakistan Context: Prominent during debates on Ravi Riverfront Urban Development, timber smuggling in KP, and forest land diversion in Gilgit-Baltistan.

Category 6: Conspiracy Theories & Scapegoating

Definition: Claims attributing climate events to external manipulation or hidden agendas.

Indicators: "Foreign powers are causing floods through HAARP," "NGOs exaggerate disasters to get funds."

Pakistan Context: Widely circulated on Facebook and WhatsApp, often following major floods, heatwaves, or IMF negotiations.

Category 7: Geoengineering Myths / Weather Manipulation

Definition: Assertions that climate disasters are engineered by foreign or hostile actors using advanced technology.

Indicators: Mentions of "cloud seeding," "chemtrails," or "artificial rain/flooding."

Pakistan Context: Spikes observed during 2022 floods and 2024 drought debates, linked to online influencers and diaspora conspiracy channels.

Category 8: Fatalism

Definition: Assertions that climate change is God's will, pre-ordained fate or divine curse. It is different from denialism because it accepts the reality of climate change but expresses that we are helpless against it except for improving our own morality.

Indicators: Mentions of "azaab", "qayamat ki nishani" etc.

Pakistan Context: Potential references to fatalism in photos or videos of the onset of natural disasters, such as floods, and the aftermath of extreme weather events, such as images of destruction.

Any other category: For suspected climate disinformation or misinformation content that does not fall in any of the above categories, the coders should mark the content "other". During analysis, the content marked other can be reviewed to operationalise new themes and assign category labels. This will allow the content analysis to identify any additional categories of climate misinformation or disinformation that are unique to the information ecosystem of Pakistan.

Cross-Cutting Attribute: Intentionality

- Misinformation vs Disinformation: Coders will distinguish unintentional errors (e.g., inaccurate reporting by a local news outlet) from intentional campaigns (e.g., systematic framing by corporate lobbies).
- Coding Rule: When intent cannot be established, the default is "misinformation."

Analytical dimensions

Each coded item will also be analysed along the following dimensions:

- Narrative Type: Using typology above.
- Medium/Channel: Print, broadcast, social, messaging app.
- Format: Video, photo, text
- Language: English, Urdu, other
- Reach or Engagement Proxy: Circulation, views, likes/shares, or prominence in TV slot.
- Target Audience or Community: Youth, rural poor, indigenous peoples, urban middle class, policymakers, journalists, general public etc.

Annexe 2: List of Key Informant Interviews

The following list provides the profile of the key informants interviewed for the study.

Code	Description	Date of interview
KII01	Climate Journalist-KP	September 30,2025
KII02	Representative of Government	October 2, 2025
KII03	Representative of Humanitarian sector	October 3, 2025
KII04	Representative of Development Sector	October 6, 2025
KII05	Gender Expert	October 7, 2025
KII06	Climate Journalist-KP	October10, 2025
KII07	Climate Journalist-Sindh	October 13, 2025
KII08	Fact checker	October 14, 2025
KII09	Climate Journalist-Punjab	October 14, 2025
KII010	Policy Expert	October 15, 2025
KII011	Representative of CSO	October 16, 2025
KII012	Climate Change Expert	October 16, 2025
KII013	Environmental Lawyer	October 17, 2025
KII014	Multimedia Expert/Social Media	October 17, 2025

Annexe 3: Profile of Focus Group Discussion Participants

The following list mentions the profile of the focus group discussion participants.

Code	Description
FGD01	Representatives of Buner Indigenous People
FGD02	Representatives of Multan Indigenous People
FGD03	Representatives of the Thatta and Badin Coastal Areas Indigenous People

Annexe 4: Survey Questionnaire and Research Guides

Online Survey Questionnaire

This survey is part of the "Baseline Study on Climate Disinformation in Pakistan, "commissioned by IRADA in collaboration with IMS. The study aims to understand how false or misleading climate narratives circulate and affect communities, journalists, and institutions in Pakistan. Your responses will remain confidential and anonymous.

Type of respondent (multiple choice)

- ☐ Journalist / Editor
- ☐ Fact-checker / Digital rights actor
- ☐ CSO / NGO representative
- ☐ Indigenous or local community member
- ☐ Policymaker / Government officer
- ☐ Researcher / Academic
- ☐ Other:

Province / Region

Have you personally come across false or misleading information about climate change or deforestation in Pakistan?

Where did you encounter it most often?

- ☐ Facebook
- ☐ X (Twitter)
- ☐ TikTok
- ☐ YouTube
- ☐ WhatsApp / Telegram groups
- ☐ Television news
- ☐ Newspapers / Web portals
- ☐ Other:

During which type of events does climate disinformation rise most?

- ☐ Floods / Monsoon rains
- ☐ Heatwaves / Smog episodes
- ☐ Forest fires / Deforestation

- ☐ Drought / Water scarcity
- ☐ Policy controversies (e.g., PECA, forest acts)
- ☐ Not Sure//I have not come across climate disinformation
- ☐ Other:

Which types of misleading narratives have you observed?

- ☐ "Climate change is exaggerated or a Western hoax." (Denial)
- ☐ "Pakistan cannot afford climate action now." (Delay)
- ☐ "Tree plantation drives solve all climate problems." (False solutions)
- ☐ "Companies/government exaggerate green credentials." (Greenwashing)
- ☐ Deforestation is not a serious issue." (Deforestation denial)
- ☐ "Floods or heatwaves are caused by foreign powers (HAARP etc.)." (Conspiracy)
- ☐ "These disasters are divine punishment; nothing can be done." (Fatalism)

In your view, what could be the motivations behind climate disinformation narratives??

- ☐ Political influence
- ☐ Economic/Corporate interests
- ☐ Religious or cultural beliefs
- ☐ Lack of knowledge / misinformation
- ☐ Foreign agenda framing
- ☐ Other:

Have you observed any harassment or intimidation linked to climate discussions?

- ☐ Yes
- ☐ No
- ☐ Prefer not to say
- ☐ Other:

How confident are you in identifying false climate information online?

- ☐ Very confident
- ☐ Somewhat confident
- ☐ Not confident

Where do you get news about climate and weather?

- ☐ TV
- ☐ Radio
- ☐ Whatsapp
- ☐ TikTok
- ☐ Community meetings
- ☐ Other:

Do you trust these sources?

- ☐ Yes
- ☐ No
- ☐ Sometimes
- ☐ Other:

Have you heard or seen any false or confusing messages about climate change in the news about climate or weather?

- ☐ Yes
- ☐ No
- ☐ Sometimes
- ☐ Other:

Have you heard or seen any false or confusing messages about climate change in the news about climate or weather?

- ☐ Yes
- ☐ No
- ☐ Sometimes
- ☐ Other:

How can people be helped to understand true climate information?

- ☐ Radio/TV in local language
- ☐ Community workshops
- ☐ Social media campaigns
- ☐ School education

- ☐ Religious leaders
- ☐ Other:

How does climate disinformation affect your community?

- ☐ Reduces trust
- ☐ Creates confusion/Chaos
- ☐ Discourages action
- ☐ Leads to fatalism
- ☐ No Impact

Do people discuss climate issues openly?

- ☐ Yes
- ☐ No
- ☐ Sometimes

Who influences climate opinions the most locally?

- ☐ Local leaders
- ☐ Teachers
- ☐ Social media
- ☐ Religious figures
- ☐ Other:

Any messages you want to share about climate information in your area?

Would you like to be contacted for a follow-up discussion (15 min)?

- ☐ Yes
- ☐ No

Key Information Interview Guide

Introductory Note

Thank you for taking the time to participate. I am conducting a study to understand how climate-related disinformation (false or misleading information on climate change, deforestation, and environmental issues) spreads in Pakistan, its impacts, and how we can develop effective responses. Your insights will remain confidential, and information will be used for research purposes only.

Background & Role

Can you please describe your role and experience in relation to climate/environmental issues?

In your work, how often do you come across information on climate change, deforestation, or environmental governance in media and public debates?

Understanding Disinformation

From your perspective, what are the most common false or misleading narratives about climate change or deforestation in Pakistan?

How do these narratives vary across different media channels (TV, newspapers, radio, social media, WhatsApp)?

In your view, who are the main actors or groups spreading these narratives (e.g., political figures, media outlets, corporate actors, online influencers)?

Community Exposure & Impact

Which groups or communities do you think are most vulnerable to climate disinformation (e.g., rural poor, women, youth, indigenous peoples)?

Can you share examples of how disinformation has affected community perceptions, decision-making, or participation in climate/environmental issues?

Have you observed instances where climate disinformation led to harassment, intimidation, or exclusion of activists, journalists, or community members?

Governance & Policy

In your opinion, how effective are existing policies and institutions (e.g., Ministry of Climate Change, PTA, media regulators, forest departments) in addressing climate disinformation?

What are the key gaps or challenges in the governance framework (legal, institutional, enforcement)? Are there examples of coordination or lack thereof between environmental and digital governance institutions on this issue?

Countermeasures & Solutions

What kinds of fact-checking or awareness initiatives have you seen in Pakistan that address climate misinformation/disinformation?

What strategies do you think would be most effective at the policy level (e.g., legal reforms, institutional strengthening)?

What role should media, civil society organizations, and technology platforms play in countering climate disinformation?

How can responses be designed to ensure they safeguard freedom of expression while reducing harm from false narratives?

Final Reflections

What recommendations would you make for strengthening national capacity to prevent and counter climate disinformation?

Are there specific examples, cases, or experiences you believe are important for us to document?

Would you be open to reviewing or validating some of the findings later in the study?

FGD Guide

What changes in weather, water, or seasons have you noticed in recent years, and how have these affected your livelihoods (farming, herding, fishing, or forests)?

When you hear about climate change or mosami tabdili, what does it mean to you and your community?

Where do you usually get information about weather or climate radio, social media, elders, or government departments?

Have you ever come across false or confusing news or messages about weather, floods, or forest use? How did people react to it?

How do such messages or rumours affect your trust in officials, media, or NGOs?

Have any climate or environmental projects (like tree planting, conservation, or dams) affected your land or forest use? Were you consulted beforehand?

What traditional knowledge or local signs do you use to predict weather or manage natural resources? Do you think people today still follow this traditional knowledge, or is it being lost? Why?

What kind of information or support would help your community prepare better for climate change?

What message would you give to the government, media, or organisations about how to communicate truthfully and respectfully with Indigenous communities?

Institute for Research, Advocacy, and Development (RADA), is an independent social enterprise aimed at catalyzing participatory reforms and development through innovative research, proactive policy strategies, and vigorous capacity building initiatives. Registered as a company limited to shares with the Securities and Exchange Commission of Pakistan (SECP), the organization endeavors to promote inclusivity and pluralism governance and information, freedom of expression and media development, and the rule of law and access to justice.

IRADA focuses on promoting:

- inclusivity and pluralism through support for civil liberties, peace an rights of minorities and marginalized communities;
- governance and information through support for right to information transparency and open government;
- freedom of expression and media development through support of professionalism in media, safety of journalists and enabling laws fo free speech;
- rule of law and access to justice through support for fundamental rights and equality before the law.

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