

DATA ORIENTALISM IN THE MACHINE: A POSTCOLONIAL AND VISUAL DISCOURSE ANALYSIS OF AI-GENERATED CLIMATE IMAGERY OF PAKISTAN

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Abstract

Generative AI is increasingly used to visualise the climate crisis, yet few studies have examined the ideological work these systems perform when representing non-Western contexts. This paper conducts a postcolonial Visual Discourse Analysis of AI-generated climate visualisations produced by the Llama 4 model. Focusing on a corpus generated with the geographic tag “in the context of Pakistan”, the paper analyses a purposive sample of three contextualised images along with three comparator images. Drawing on Edward Said’s concept of Orientalism, Homi Bhabha’s account of colonial discourse, and postcolonial ecocriticism, this study finds that the GenAI resorts to a typological inventory of crisis iconography: dust, flood, and the suffering child, while erasing Pakistani institutional agency and geographic diversity. Read alongside comparator imagery, these findings reveal a colonial spatial logic coding suffering onto the Global South, solution onto the Global North, and governance onto a racially homogeneous professional elite. This reproduction, at scale and by default, of colonial representational conventions embedded in the training data of generative systems are manifestations of Data Orientalism. The paper concludes with recommendations for counter-mapping the global visual economy of climate communication.

Keywords: postcolonial critique, Orientalism, generative AI, climate communication, visual discourse analysis, Pakistan, Global South representation.

INTRODUCTION

Climate change presents not merely a scientific and environmental problem; it is also a representational challenge. Over the past half-century, the tools used to communicate the climate crisis have changed. There has been a shift away from scientific data, graphs, temperature records, satellite imagery, and other complex visuals towards photographs, maps, documentaries, simulations, and immersive experiences. One reason is that the technology has changed meanwhile, and also the audience of these communications which was previously experts, now include non-experts and publics at large. In addition to providing information, climate visualisations also work to influence understanding, perception, as well as emotion, which is a prerequisite for climate action. With the accumulation of ecological damages like sea level rise, unpredictable weather patterns and the resulting economic instability, the task of translating complex scientific data into narratives that can induce action, becomes daunting (Mohammed et al., 2024; Weiskopf et al., 2020). This is compounded by the fact that people feel that the crisis they are being warned about is distant temporally, geographically, and socially (Spence et al., 2012). Meanwhile, the rapid adoption of generative Artificial Intelligence (GenAI) has transformed the production of visual and creative content across domains (Fitria, 2023; Hassabis & Jumper, 2023; Li, 2024), increasing the capacity to generate personalised, localised visualisations of the climate crisis at minimal cost (Castillo et al., 2024; Luccioni et al., 2021).

This capacity, however, is not ideologically neutral. AI-generated climate change visualisations (AICCVs) are cultural artefacts produced by systems trained on human-made imagery. The data is vast but unevenly distributed. Thus, the biases embedded in that training data are reproduced in the model’s outputs (Putland, Chikodzore-Paterson & Brookes, 2025). When a generative system is prompted to visualise climate change in a Global South national context, this reproduction raises a specific and under-examined question: does the system draw on the accumulated visual

conventions of the Western colonial mind to construct generic, exportable images such as of developing world suffering, and if so, what ideological work does that construction perform?

This paper addresses that question directly, focusing on a purposively selected cluster of AI-generated images produced when the phrase “in the context of Pakistan” was added to an otherwise simple climate-visualisation prompt. Read individually and as a cluster, and situated against comparator imagery depicting Global North solution and governance, these images are analysed through a postcolonial and Visual Discourse Analysis (VDA), treating the visual grammar of AI output as a discursive practice that continues the representational history of colonialism.

RESEARCH GAP

The extant literature on AI and climate visualisation focuses, predominantly, on technical and data-driven problems. Most of the previous work focuses on image quality (Liu et al., 2024; Ye et al., 2024), data efficiency (Basole & Major, 2024; Rozić et al., 2023), or the representation of multivariate climate data (Jin & Guo, 2009; Nayeem et al., 2024), yet attempts only sparsely to interrogate the ideological and discursive biases encoded within these visualisations. Where qualitative critique exists, it tends to prescribe technical remedies—most notably, improving the training data (Putland, Chikodzore-Paterson & Brookes, 2025). However, in addition to stating the obvious, these recommendations also reproduce the very techno-solutionist logic that critical scholarship challenges (Sætra & Selinger, 2024).

Another gap is about the postcolonial dimension of AICCVs. Postcolonial and eco-critical scholarship has long examined how colonial power relations continue to shape representations of formerly colonised regions (Shakoor & Ahmad, 2022; Young, 2016), while communication scholarship has independently documented representational harms in humanitarian and climate imagery. Examples include the “compassion aesthetics” that structure charity appeals (Lidchi, 1993) and the “development gaze” that positions the Global South child as an object of Western pity (Manzo, 2008). Yet, limited studies have taken up a sustained post-colonial analysis of AI-generated climate visualisations associated with a specific Global South national context. In order to untangle the issue, this paper analyses climate-related visuals generated through Meta AI by adding the phrase “in the Pakistan-context”, to understand the automated, default reproduction of Orientalist representational conventions by a generative system that has no conscious ideological commitment, but that might statistically rearticulate the accumulated visual habits of its training corpus.

RESEARCH OBJECTIVES

This paper pursues three interrelated objectives:

1. To identify the recurring visual patterns, themes, tropes, compositional and narrative structures of AI-generated climate change visualisations produced in the context of Pakistan and analyse them by using VDA protocols.
2. To examine, through the lens of postcolonial critique, the extent to which this imagery reproduces a colonial spatial logic with different coding for the North and the South.
3. To give practical solutions for a more equitable representation.

RESEARCH QUESTIONS

The study tries to answer the following research questions:

1. What visual patterns do GenAIs automatically produce when prompted to visualise the climate crisis “in the context of Pakistan”?
2. How do these visual choices construct, erase, or distort Pakistani agency, diversity, and climate-injustice standing?
3. When compared to imagery depicting global climate solutions and governance, what coherent colonial logic emerges across the corpus?

LITERATURE REVIEW

Climate change is a “wicked problem” (McLoughlin, 2020). It is characterised by deep uncertainty and a misalignment between diverse societal interests. What makes climate change worrying is that it does not unfold linearly; it passes through irreversible tipping points (O'Neill & Nicholson-Cole, 2009). Ghosh (2016) frames the challenge of climate change as “a crisis of imagination” as much as a scientific one, since the crisis operates on spatial and temporal scales that exceed ordinary human cognition, and communicators must therefore find ways to make the crisis “palpable, seeable, and felt” (Hawhee, 2023; Riddick, 2024). Visualisation performs this bridging function by operating as a cognitive shortcut.

Historically, climate communication has relied on a visual rhetoric of iconographic necessity: images of melting glaciers or a solitary polar bear function as condensed, recognisable signifiers of an otherwise diffuse crisis (Manzo,

2010; O'Neill & Nicholson-Cole, 2009), yet continuous exposure to catastrophic imagery produces diminishing returns, inducing what has been termed apocalypse fatigue and increasing rather than decreasing the psychological distance: that they happen to some other people and not to them; and that this will be in a very distant future). This makes climate action difficult (Spence et al., 2012).

Because we have moved from the mere photographic capture of reality to the generation of synthetic media, the arrival of GenAI has brought an ontological shift in visual production. This generation often happens from text prompts. This ontological shift raises two problems. The first is a problem of indexicality: photographic images have historically derived their evidentiary authority from an assumed causal connection to the real, physical world (Peirce, 1934). AI-generated images lack this property. AI images depict an average space, time, and set of objects rather than anything specific. The second is a problem of bias: images have never been neutral windows onto reality (Messaris & Abraham, 2001; Popp & Mendelson, 2010; Urry, 1992), but GenAI compounds this situation by encoding the accumulated biases of its training data, thereby perpetuating existing societal ways of looking at and interpreting phenomena (Putland, Chikodzore-Paterson & Brookes, 2025).

Postcolonial and humanitarian-media scholarship has long shown that the Global South is often represented through crisis, pity, and dependency (Young, 2016); that analytical lens has rarely been applied systematically to AI-generated climate change visualisations. Said's (2016) concept of Orientalism describes a structuring binary in which the East is constructed as passive, undifferentiated, and in need of Western intervention, while the West is constructed as active, rational, and capable of resolution. Bhabha's (1994) account of colonial discourse further suggests that this binary operates structurally, through the accumulated weight of representational convention, rather than requiring deliberate or conscious prejudice on the part of any individual producer of images.

Within this framing, postcolonial ecocriticism examines the legacy of colonisation. It analyses how natural environments in colonised regions have been exploited, degraded, and, most relevant to this study, represented through the colonial lens (Shakoor & Ahmad, 2022). This paper applies this analytic vocabulary to generative AI systems trained on global datasets, examining how their automated outputs rearticulate historical visual hierarchies when prompted with Global South contexts.

Existing research on AI Climate Change Visualisation has largely focused on technical aspects, data efficiency, and representational fidelity; however, the ideological work that generative systems represent historically unequal geographies has received less attention. Lidchi (1993) identifies "compassion aesthetics" as a visual technology intended to produce pity in distant donors rather than solidarity with proximate communities. Manzo (2008) has identified an interesting icon of the "suffering child" as a dominant iconographic convention of humanitarian fundraising. These images usually use a combination of direct gaze, worn clothing, arid background, and failed infrastructure. These reduce structural injustices to individual pathos and position the viewer as a potential saviour. In visual social semiotics, the interaction between a represented participant and the viewer is structured by the distinction between a demand gaze and an offer gaze (Kress & van Leeuwen, 2020). A 'demand gaze' is established when a subject looks directly into the camera lens, thereby acknowledging the viewer and establishing a discursive demand for an interpersonal connection, relationship, or immediate emotional engagement.

In contrast, in an 'offer gaze', the subject's eyes are averted, closed, or looking away from the camera (Aiello, 2020; Oliveros, 2024; Putland, Chikodzore-Paterson & Brookes, 2025). Rather than initiating direct engagement, this indirect gaze offers the depicted individual to the audience's view impersonally as an object of information, study, or dispassionate observation—effectively positioning them as "specimens in a display case" rather than encouraging a human connection (Aiello, 2020; Putland, Chikodzore-Paterson & Brookes, 2025). The conventions related to representational issues in images were studied before the advent of generative AI. This paper investigates how these conventions are reproduced in AI-generated images.

THEORETICAL FRAMEWORK

The analytic framework operates at three interconnected theoretical traditions. First, taking insight from Foucault's (1980) conception of discourse that treats knowledge, ideology, and power as systems within social practices that define valid knowledge and structure perceived reality; on this view, AI-generated images function as discursive tools through which an AI-imaginary constructs a powerful regime of truth about climate change. Second, Kress and van Leeuwen's (2006, 2020) framework of Social Semiotics and Visual Grammar systematically expands this Foucauldian insight into the visual domain, providing an analytic vocabulary (gaze, camera angle, compositional information value, colour coding) for reading images as structured, language-like texts organised across three meta-functions: representational, interactive, and compositional meaning. Third, the postcolonial critique (Said, 2016; Bhabha, 1994; Young, 2016; Shakoor & Ahmad, 2022) supplies the macro-level ideological lens through which the patterns identified by social-semiotic description are read as instances of a longer colonial representational history. The VDA

methodology based on these three traditions is designed to perform a close description of an image's formal elements, through its intertextual relationship to other visual genres, to a critical account of the power relations it naturalises.

METHODOLOGY

Epistemological Justification & Qualitative VDA

This study adopts a social-constructionist and interpretivist approach. The basic premise of this study is that AI-generated synthetic images do not reflect objective realities that exist outside, but, instead, they construct "regimes of truth" (Foucault, 1980). A qualitative Visual Discourse Analysis (VDA) approach works for this inquiry, as quantitative content analysis or computer-vision metrics cannot unpack the subtle ideological work, intertextuality, and postcolonial power structures embedded in visual grammar of these AICCVs (Kress & van Leeuwen, 2020; Rose, 2016). VDA interrogated how synthetic representations reproduce discourses of orientalism, pity, and technological agency.

Prompt Design, Comparative Asymmetry, and Keyword Emergence

Images for this study were generated using Meta AI on Whatsapp. The model was the Llama 4. To test the model's baseline representational defaults, prompts were kept simple and avoided thematic descriptors (e.g., "drought", "flooding", "dust storm", "green city", "governance") or stylistic qualifiers (e.g., "photorealistic", "futuristic", "cinematic"). The prompt design used broad domain tags ("climate change," "climate crisis," "climate future"), crossed with basic visual style modifiers ("an image of", "a picture of", "a visualization of"). An example prompt was: "Generate an image of the climate crisis" for the non-geographically tagged version, and "Generate an image of the climate crisis in Pakistan", for the geographically-tagged version. Thus a methodological asymmetry was intentionally engineered to compare two prompt conditions: (a) geographically tagged prompts appending "in the context of Pakistan" and (b) context-unspecified baseline prompts. This design choice isolates how the geographic tag alone triggers specific visual tropes without explicit thematic prompting.

While prompts omitted disaster- or solution-specific keywords, the model systematically and unprompted generated explicit thematic metonyms—such as dust storms, floodwaters, and rusted water pumps for Pakistan-tagged prompts, and high-tech urban eco-topias or corporate boardrooms for context-unspecified prompts (in case of our comparator images). This unprompted emergence of specific tropes points to the model's latent statistical associations and underlying data bias.

Corpus Generation, Theoretical Saturation, and Sampling Reduction

The generation process yielded a total corpus of 285 images across multiple generation sessions. To transition from this broad corpus to a granular discourse analysis a two-stage process was applied:

1. **Theoretical Saturation & Clustering:** All 285 images were cataloged and iteratively categorized via open thematic coding based on their main theme (like compositional structure, color palette, gaze, subject type, and environment). Theoretical saturation was reached when continued generation produced no novel visual tropes. In the case of Pakistani-context images, the model repeatedly defaulted to three dominant archetypes (arid disaster, inundated flood, vulnerable child/infrastructure). In the case of context-unspecified prompts, the themes we got were predominantly apocalyptic East Asian urbanism, Western green urbanism, and corporate governance.
2. **Purposive Sampling:** From the saturated clusters, a purposive sample of six exemplar images (three Pakistan-context images and three context-unspecified comparator images) was selected for micro-level visual discourse analysis. Selection criteria prioritized images best exemplifying the core themes of each cluster and symbolic density. This also ensured that the micro-analysis reflects the systematic structural outputs of the model.

The Visual Discourse Analysis Protocol

The VDA protocol applied in this paper used the five-step procedure developed for the study: (1) technological documentation of the model, version, and prompt used to generate each image, treating the researcher's interaction with the model as a co-creative act rather than a neutral act of data collection. This condition was same for all the images and the only variation was in the prompt which was intentional; (2) micro-level analysis of visual grammar, attending to gaze (a demand gaze constructing social affinity versus an offer gaze positioning the subject as a specimen), camera angle, compositional information value, and colour; (3) meso-level analysis of intertextuality, metaphor, and condensing symbols, tracing how an image cites and recombines prior visual genres; (4) macro-level analysis of sociocultural practice and ideology, examining what an image renders visible versus invisible, and how

this distribution of visibility presents as natural the power relations prevalent in the society; and (5) synthesis, identifying anomalous or counter-discursive elements that might inform more equitable design.

Ethical Framing

Since no human research subjects are involved, the only ethical issues in this paper are related to the presentation itself. Methodologically, there were some constraints that can affect the scope of this inquiry. First, is the danger of misrepresentation. This is tackled by making it clear that while the Pakistan-context prompts utilised specific geographical tags, the comparator images were drawn from context-unspecified prompt groups rather than fully controlled, pair-matched "Global North" prompt tags. Consequently, comparisons drawn between the Pakistan cluster and comparator images are explicitly exploratory and interpretative rather than strictly experimental. Second, applying the visual discourse analysis to a purposive subset of six images from a single generative model (Llama 4) means that any claims to generalizability will be preposterous; the findings illustrate the habits of this specific model under these prompting conditions. They can not establish universal claims across all generative AI models or Global South territories without further studies.

Analysis

In the first part of the analysis, we investigate the Pakistani context images, conducting a micro-, meso-, and macro-level reading of the images. In the next section, we situate these findings within a broader visual economy by contrasting them with our comparator imagery, illustrating how a cross-corpus colonial binary codes suffering, technological resolution, and governance across geographical spaces.

The Pakistani Context Images

Although these images vary (moving from dust storm to flood, to drought and child), together they constitute a coherent visual grammar that reproduces an inventory of South Asian climate suffering rather than offering an account of any specific Pakistani place, event, or community.

At the micro level we analyse the gaze, the camera angle, and the color choices of these images. These are discussed below:

The two disaster images show an offer gaze: figures are rendered as silhouetted, posturally varied, and faceless masses. This functions as depersonalised abstractions available for dispassionate observation rather than as subjects capable of inquiring the viewer. A rupture occurs in the third image, where a young girl, photographed in tight medium close-up beside a rusted hand pump, presents the only demand gaze. This demand gaze is rare in the non-Western portion of the corpus. While a demand gaze conventionally creates social affinity, here it serves a humanitarian-pity discourse that substitutes for genuine agency or dignity.

Camera angle across the three images consistently diminishes human presence relative to catastrophe or infrastructural failure. In the first image (left image in figure 1), the dust-storm image employs a high oblique angle. This angle is generally characteristic of aerial news or NGO survey photography. The camera is surveying a devastated settlement and rendering its inhabitants small within a landscape of destruction. The second image (the flood image, the middle image in figure 1), uses a near-level angle, but the human figure is nonetheless visually diminished by the overwhelming mass of floodwater and debris. In the third image, although the camera sits close to the girl's eyeline, she is compositionally dwarfed by the rusted pump, which occupies equal or greater pictorial weight, so that infrastructural failure, rather than human presence, dominates the frame.

Chromatically, these three images have a commonality in that they all use an earth-tone palette of ochre, sandy brown, and dust beige. This functions as the system's apparent default chromatic code for Pakistan. This palette is geographically indexical in a narrowing sense: it associates the country exclusively with arid, semi-desert conditions. It also erases the country's mountains, plains, and coastal diversity, and encodes Pakistani climate futures as already degraded and exhausted. This is a marked contrast to the high-saturation cyan-blue and emerald palette that codes the Global North "green utopia" comparator image (see Figure 2).



Figure 1: Three Pakistani context images. From left to right, the first image showing a dust storm, the second, brown floodwater, and the third one a young girl, photographed in tight medium close-up beside a rusted hand pump.

At the meso-level, each image deploys a distinct condensing symbol. The symbols in the discussed images are the dust tornado, the brown floodwater, the rusted handpump and the child beside it. These are discussed below:

The first symbol, the dust tornado synthesises iconography drawn from unrelated contexts, including the American Dust Bowl and Sahelian photojournalism, condensing civilizational precarity and desertification into a single spectacular form. Second, the brown, debris-laden floodwater collapses a historically specific climate event, i.e. the 2022 Pakistan super flood, into a generic, timeless signifier of “Pakistani flooding” as a recurring condition rather than a historically produced catastrophe. This flood is among the most widely documented climate disasters in recent media history, so most probably, is highly represented in the training data. The third symbol, the rusted hand pump is among humanitarian visual communication's most overdetermined symbols, simultaneously condensing water scarcity, infrastructural neglect, governance failure, and developmental “backwardness,” and conflating climate impact with pre-existing underdevelopment without distinguishing between them or identifying the structural relationship connecting global emissions to local infrastructural failure. The third image relies on the “suffering child” trope: the combination of a dark-skinned child, direct gaze, worn clothing, arid background, and failed infrastructure that has been critiqued for reducing structural injustice to individual pathos and stripping its subject of political context (Manzo, 2008). That a generative system (re)produces this campaign aesthetic automatically, prompted with nothing more than a country name, indicates how deeply this convention is embedded in the model's training data. The two disaster images additionally recycle what is conceptualised here as the “apocalyptic village” trope, encoding the Global South village as the natural, vulnerable unit of climate impact and thereby excluding representation of Pakistani urban centres, universities, or governmental institutions.

At the macro level, an ideological pattern worth noting is the absence of Pakistani agency and complexity. Invisible across all these images are Pakistani institutional actors, climate adaptation practices such as early-warning systems and community water harvesting, and the country's geographical and cultural diversity. Also worth noting is the injustice of Pakistan's high climate vulnerability despite contributing less than one per cent of global cumulative greenhouse gas emissions (GermanWatch, 2021). This injustice is erased as climate impact is framed as a natural fate and not as the consequence of historical emissions of the developed countries. This erasure favours a legible suffering-image that prioritises the emotional economies of distant viewers over the needs of the depicted communities. These three images represent the manifestation of data orientalism: a generative system trained on datasets dominated by Western humanitarian and disaster photojournalism reproduces visual conventions associated with Orientalist discourse in which the East is constructed as passive, suffering, and in need of Western intervention (Kotliar, 2020; Said, 2016). The third image operates within what Manzo (2008) terms the “development gaze”, positioning the depicted as an object of Western compassion. She functions as a composite archetype, an algorithmically optimised pity-trigger that strips Pakistani girlhood of dignity. Thus, South Asian suffering exists for the moral benefit of Northern viewers.

The three images produce complementary mechanisms of viewer efficacy suppression (O'Neill & Nicholson-Cole, 2009; Moser, 2010). The dust-storm image induces overwhelm, depicting destruction that exceeds individual response capacity. The flood image produces helplessness-by-proximity, positioning the viewer close enough to feel concern but supplying no perceived action pathway. The child-and-pump image instigates some sort of pity-paralysis, in which the demand gaze solicits charity rather than engagement with structural political transformation. These three mechanisms present a recurring mode of efficacy suppression that systematically avoids encoding the possibility of

structural political response, Pakistani-led adaptation, or international climate justice. In the next section of the analysis, we compare these images with normal images.



Figure 2: From left to right dust storm imagery (without Pakistani context), second, the corporate boardroom, third, a green utopia

Comparison with Context-Unspecified Normal Images

Read in isolation, the Suffering South cluster establishes that Pakistan-context AICCVs default to a typological suffering iconography. However, when we compare these with the comparator images from the corpus, this cluster is revealed to be one half of a coherent, corpus-level colonial spatial logic. Next, we discuss the comparator images:

The first comparator apocalyptic-cityscape image, generated without any geographic context tag, depicts an anonymous, dense, dark-haired crowd rendered from behind, witnessing a towering smoke column between skyscrapers, framed through an extreme long shot. This composition exhibits patterns consistent with AI-reproduced Orientalist representation: the East/Southeast Asian urban vernacular and the crowd rendered as an undifferentiated, anonymous mass reproduce the colonial trope of Global South populations as suffering collectives, offloading the visual burden of climate consequences onto the Global South, while the institutional agents of historical carbon emissions remain unrepresented and invisible.

The second one, the corporate-boardroom image, depicts five professionals, predominantly light-skinned, deliberating around a glowing holographic globe. This image structurally forecloses the participation of the communities that bear the greatest climate burden, Indigenous knowledge holders, and non-expert citizens, normalising climate governance as the closed practice of a racially homogeneous, credentialed elite.

The third image, the “green utopia”, by contrast, depicts a Western-coded glass-and-greenery cityscape viewed from a high oblique, near-isometric angle associated with architectural masterplanning and institutional authority. Human figures are miniaturised to roughly two per cent of the pictorial space, and the chromatic register is dominated by high-saturation cyan-blue sky and emerald foliage—a corporate-branding chromatic code standing in direct chromatic opposition to the earth-toned “Suffering South” cluster. This image erases the Global South from the vision of climate solution altogether: the mining of rare-earth minerals and the lithium and cobalt required for the depicted renewable infrastructure; and environmental and labour exploitation in the Global South are absent.

Read together, these three comparator images and the “Suffering South” cluster complete a three-part ideological structure: suffering is coded onto the Global South, technological solution is coded onto the Global North, and governance is coded onto a racially homogeneous professional elite. This pairing of disaster (coded as Asian/Southern) with solution (coded as Western/Northern) reproduces a colonial spatial logic (Said, 2016) in which the Global South is depicted as the passive site of suffering while the Global North retains the technological agency for redemption. This logic operates not merely within single images but across the visual ecology of AI-generated climate change visualisations.

RESULTS

We have derived three main themes from our analysis. These are discussed below:

- I. Erasure and Substitution:** Specificity is erased and is substituted with generality. This is a typical behaviour of systems that work statistically. In our data, no specific place in Pakistan is shown. Instead, a general image is generated when we prompt the AI with the geographic tag “in the context of Pakistan”. The model defaults to a typological inventory of crisis: the overwhelming dust tornado, the generic brown floodwaters (which strip the historically specific 2022 super floods of their political-economic context), and the individual pathologising of the child beside the rusted water pump. These archetypes remind one of the visual lexicon of Western humanitarian photojournalism.
- II. Masking of Climate Injustice and Agency:** This typological framing erases the operational presence and resilience of Pakistani state and local institutional actors, community-led adaptation strategies, and the nation's geographic diversity. Thus, it masks the injustice of Pakistan's high vulnerability relative to its negligible historical emissions contribution.
- III. Geographic Coding of the Global Spatial Logic:** When analysed alongside the context-unspecified baseline comparator images, the Pakistan-context cluster functions as part of a corpus-wide colonial division of labour. Within this observed contrast, climate suffering is coded as inherently Southern, technological mitigation and green futurity are coded as Northern (in context-unspecified defaults), and climate governance is naturalised as the domain of a racially homogeneous, professional elite.

DISCUSSION

These results support this paper's main thesis: when prompted with a specific Global South geographic tag (like Pakistan) compared to context-unspecified baselines, GenAI systems resort to the default output of Orientalist representational conventions, even though these systems are devoid of ideological intent.

This computational replication reminds us of foundational claims of postcolonial theory. More than a product of individual, malicious “human authorship,” colonial discourse is an impersonal, self-replicating, and institutionalised system of representation. The assertion that colonial discourse operates through the accumulation of stereotype and convention, rather than conscious prejudice, finds its ultimate material expression in the statistical weights of large language and vision models (cf. Said, 2016 and Bhabha, 1994). The AI does not possess any intentions. So we cannot say that there was an intent to marginalise Pakistan; it merely executes these statistical weights of a visual archive historically curated by the Western colonial “development gaze.”

This automation of bias similarly operationalises the “compassion aesthetics” documented in humanitarian media (Lidchi, 1993; Manzo, 2008). Where earlier scholarship identified the “suffering child” as an intentionally constructed fundraising tool deployed by NGOs, this analysis suggests this aesthetic has reached a stage of statistical crystallisation. The Llama 4 model generates the pity-trigger archetype by default, proving that the visual habits of colonial philanthropy are now statistically reproduced into the infrastructure of consumer tech.

Theoretical Implications

This paper demonstrates that postcolonial critique, developed to analyse human-authored representational practice, can be fruitfully applied to analysing synthetic media. Data orientalism here is apparent by the presence of this statistical, and unintentional, reproduction of colonial logic by models trained on global archives. This mechanism differs from earlier accounts of media Orientalism in that it removes the possibility of locating responsibility in any single author's intent. The responsibility is instead diffused across the training-data curation practices and opaque design choices of corporations like Anthropic and OpenAI.

A worth noting aspect is the camouflage of climate injustice. By presenting Pakistani climate vulnerability as an ahistorical, localised in Pakistan, the AI suppresses the link between Northern consumption and Southern precarity. Pakistan's status as one of the most climate-vulnerable nations on earth. The country has been consistently ranked in the top ten by the GermanWatch Global Climate Risk Index (GermanWatch, 2021). This stands in contrast to its historical responsibility. The fact is that the country has contributed less than one per cent of cumulative global greenhouse gas emissions (World Resources Institute, 2021). The models' failure to represent this relationship shows a reality-modelling problem: they visualise the consequences of climate change while rendering its causes invisible.

Practical Implications

Based on the findings, we make three suggestions. First, a practice of counter-mapping: intentionally disrupting the defaults by integrating authentic Global South industrial infrastructure, community-led adaptation innovations, and the resilience of frontline populations into the visual archive. This will restructure how these models encode environmental causality. This can be done by the corporations that deploy these models or by the ordinary consumers of these systems who can do it through prompts or system settings. Second, as these systems default to some Global

South aesthetic (like the placeless typology of dust, flood, and suffering), this must be addressed through stratification in training data curation. Model developers should move beyond generic national tags and curate datasets that reflect distinct identifiers of nations, preventing the homogenization of Global South climate experience.

Finally, design briefs for AICCVs must explicitly define the intended viewer's subject-position. To counteract the pity-paralysis identified in this study, developers and users must prioritise a demand gaze that necessitates structural accountability rather than emotional consumption. For instance, design systems should be audited to identify whether they disproportionately reproduce some recurring tropes like the "suffering child", which our study showed they do. If this is the case with other models too, every such trope should be addressed individually.

Limitations

This study has several limitations. One constraint is the structural asymmetry in prompt design: context-unspecified baseline prompts were used as controls rather than pair-matched Global North country prompts. Additionally, the corpus was generated using Llama 4, and findings therefore speak to this model's visual grammar rather than being demonstrated across all the models generally. Second, the images subjected to close reading were selected through purposive, judgment-based sampling rather than random or exhaustive sampling, consistent with the interpretivist epistemology and constructivist ontology underlying this study but meaning that a different analyst might reasonably reach a different, though not arbitrary, reading of the same corpus. Third, the postcolonial critique developed here was applied to a single contextual prompt variable: Pakistan. Other nations, such as India, African countries, and Southeast Asian regions were beyond the scope of this paper. Testing pair-matched Global North national tags alongside Global South tags is necessary in future work to confirm whether any explicit country-level tag triggers disaster imagery or if this effect is strictly asymmetrical between Global North and Global South tags.

Future Research

Future research should extend this analysis across multiple Global South and Global North national contexts using pair-matched country prompts to test whether any explicit national tag triggers disaster imagery or if the effect is strictly asymmetrical. Research should also evaluate whether the Suffering South typology identified here for Pakistan generalises across countries, or whether distinct national or regional visual codes emerge. Future work should also incorporate longitudinal audience-reception studies to measure whether critically engineered counter-images—prioritising Pakistani agency, causal transparency, and dignified representation—produce demonstrably different levels of viewer efficacy and empathy compared with the default outputs analysed here.

Finally, as most of the problems of GenAI outputs can be attributed to training-data composition rather than to any coding flaw in the AI system itself, future research should investigate whether proper curation and auditing of datasets can correct a model's default geographic coding of climate suffering and solutions.

CONCLUSION

This paper demonstrates that generative AI systems, when prompted with a specific Global South context like Pakistan, automatically compile a typological inventory of suffering imagery derived from the legacy of Western humanitarian photography when contrasted against context-unspecified baselines. This Data Orientalism reflects the statistical regularities of a visual archive historically curated by colonial power. In this comparison, we see a coherent spatial logic: suffering is coded onto the Global South, while technological solutions and political agency are reserved for context-unspecified or Western-coded representations. By extending postcolonial critique into the domain of synthetic media, this study confirms that the responsible deployment of GenAI is a technical as well as a critical challenge. As generative systems increasingly define the "regime of truth" (Foucault, 1980) concerning climate change for billions of users, the reproduction of these colonial visual habits deepens the inequalities underlying the climate crisis. Moving forward, the counter-mapping of this visual economy is essential, not only for improving "image accuracy," but for representational justice for communities currently held in the grip of the algorithmic colonial gaze.

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